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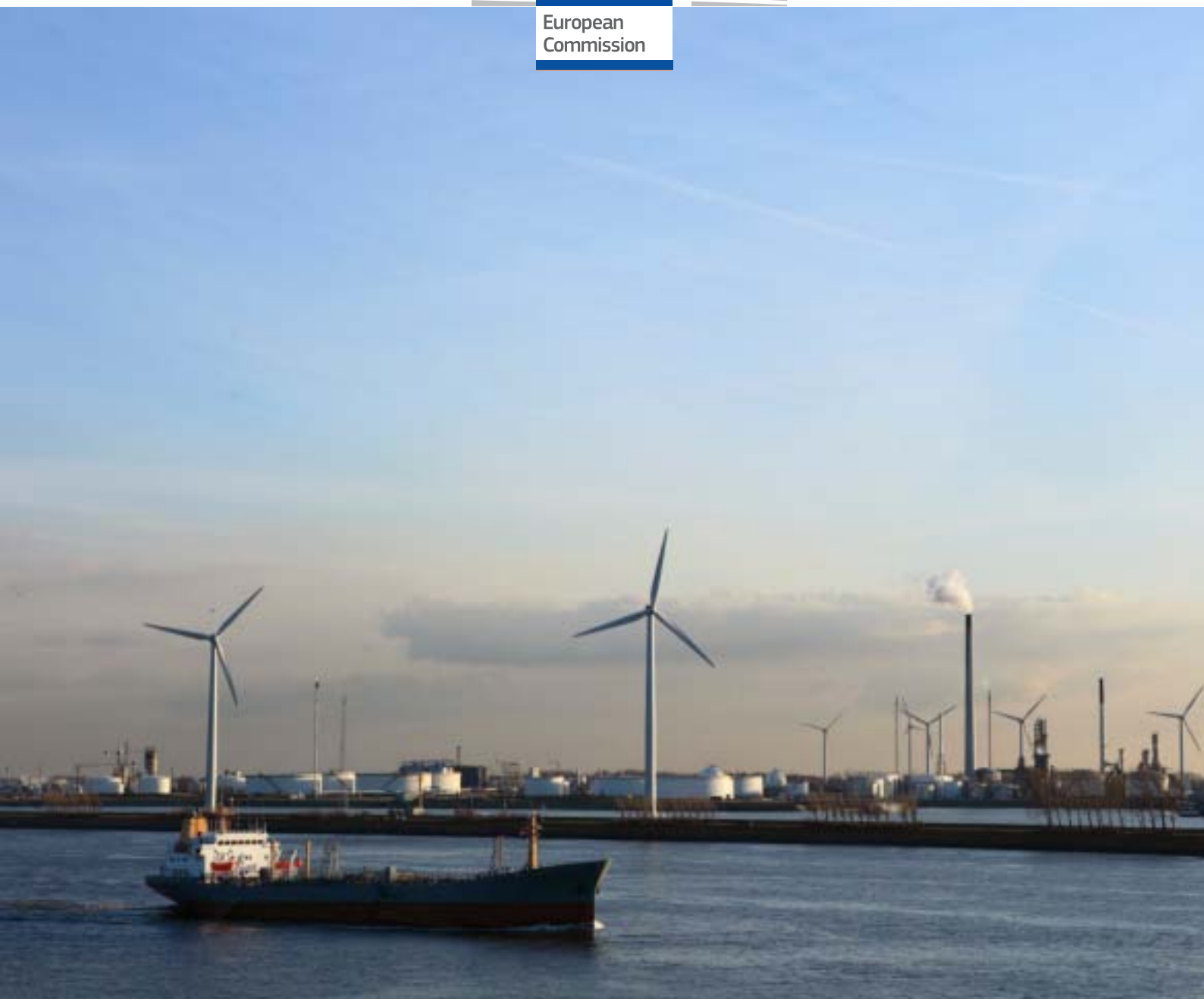

EU ENERGY, TRANSPORT AND GHG EMISSIONS

TRENDS TO 2050

REFERENCE SCENARIO 2013

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REFERENCE SCENARIO 2013

EUROPEAN COMMISSION
Directorate-General for Energy, Directorate-General for Climate Action and Directorate-General for Mobility and Transport

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Authors

E3M-Lab: Prof. P. Capros, A. De Vita, N. Tasios, D. Papadopoulos, P. Siskos, E. Apostolaki, M. Zampara, L. Paroussos, K. Fragiadakis, N. Kouvaritakis, et al.
IIASA -GAINS model: L. Höglund-Isaksson, W. Winiwarter, P. Purohit
IIASA -GLOBIOM model: H. Böttcher, S. Frank, P. Havlík, M. Gusti
EuroCARE: H. P. Witzke

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ABBREVIATIONS & UNITS

BEV	Battery Electric Vehicle
BGR	Federal Institute for Geosciences and Natural Resources (Bundesanstalt für Geowissen-schaften und Rohstoffe)
CAPEX	Capital Expenditure
CCGT	Combined Cycle Gas Turbine
CCS	Carbon Capture and Storage
CDM	Clean Development Mechanism
CHP	Combined Heat and Power
CIS	Commonwealth of Independent States
CNG	Compressed Natural Gas
CO_2	Carbon dioxide
DG ECFIN	Directorate General for Economic and Finan-cial Affairs
EED	Energy Efficiency Directive
ENTSO-E	European Network of Transmission System Operators for Electricity
EPBD	Energy Performance of Buildings Directive
EPC	Economic Policy Committee
ESCO	Energy Service Company
ESD	Effort Sharing Decision
ETS	Emissions Trading Scheme
EU	European Union
EU28	European Union of 28 Member States
EU27	European Union of 27 Member States (before accession of Croatia)
EU15	European Union of 15 Member States before the 2004 enlargement (Austria, Belgium,

bn	billion
boe	barrel of oil equivalent
Gpkm	giga passenger-kilometre, or 10^9 passenger-kilometre
Gtkm	giga tonne-kilometre, or 10^9 tonne-kilometre
GWh	gigawatt-hour or 10^9 watt-hours
km	kilometre
ktoe	1000 toe
Mt	million metric tonnes
Mtoe	million toe or 10^6 toe
MW	megawatt or 10^6 watt
MWh	megawatt-hour or 10^6 watt-hours
p.a.	per annum
pkm	passenger-kilometre (one passenger transported a dis-tance of one kilometre)
t	metric tonne
toe	tonnes of oil equivalent
tkm	tonne-kilometre (one tonne transported a distance of one kilometre

	Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom)
EU12	Member States joining the European Union after 2004, excluding Croatia (Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovenia, Slovak Republic)
EUROSTAT	Statistical Office of the European Union
EV	Electrically chargeable Vehicle
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GIC	Gross Inland Consumption
HDV	Heavy Duty Vehicle (HGVs and buses)
HGV	Heavy Goods Vehicle
IATA	International Air Transport Association
ICE	Internal Combustion Engine
IEA	International Energy Agency
IEA-WEO	International Energy Agency World Energy Outlook
IPPC	Integrated Pollution Prevention Control
LCV	Light Commercial Vehicle
LDV	Light Duty Vehicle (LCVs and passenger cars)
LNG	Liquefied Natural Gas
LPG	Liquefied Petroleum Gas
LULUCF	Land Use, Land Use Change and Forestry
MS	Member State
NREAP	National Renewable Energy Action Plan
NTC	Net Transfer Capacities
OECD	Organisation for Economic Cooperation and Development
OPEX	Operational expenditure
PHEV	Plug-in Hybrid Electric Vehicle
PV	Solar Photovoltaic

RES	Renewable Energy Sources
RES-E	Renewable Energy Sources for Electricity
RES-H&C	Renewable Energy Sources for Heating and Cooling
RES-T	Renewable Energy Sources for Transport
RP	Resource-Production
TEN-T	Trans-European Transport Network
TYNDP	Ten-Year Network Development Plan (adopted by ENTSO-E)
USGS	United States Geological Survey

INTRODUCTION

1. Introduction

Purpose of the publication

This report is an update and extension of the previous trend scenarios for development of energy systems taking account of transport and GHG emissions developments, such as the "European energy and transport - Trends to 2030" published in 2003 and its 2005, 2007 and 2009 updates[1]. The purpose of this publication is to present the new "EU Reference scenario 2013" ("Reference scenario" later in the text). This Reference scenario was finalised in July 2013. It focuses even more than previous ones on the energy, transport and climate dimensions of EU developments and the various interactions among policies, including now also specific sections on emission trends not related to energy. Its time horizon has been extended up to 2050. It reports for the first time on EU28 including Croatia. Moreover, the modelling process has included four rounds of consultation of Member States experts on Member State specific assumptions and draft modelling results. The responsibility for the results rests, however, with the authors of the scenario who were commissioned to do this work by Directorate General for Energy, Directorate General for Climate Action and Directorate General for Mobility and Transport.

This new update is based on the latest available statistical year from EUROSTAT at the time of the modelling (the year 2010). In comparison to the previous version, the newest macro-economic data already shows the statistical effects of the on-going EU's economic downturn in activity of different sectors as well as energy consumption and GHG emissions. The demographic and economic forecasts reflect recent projections by EUROSTAT and the joint work of the Economic Policy Committee and the European Commission (DG ECFIN) respectively. The "Ageing Report 2012"[2] has been the starting point of this ex-

[1] Please see: http://ec.europa.eu/energy/observatory/trends_2030/

[2] Please see: http://ec.europa.eu/economy_finance/publications/european_economy/2012/2012-ageing-report_en.htm.

The Reference scenario was elaborated by a consortium led by the National Technical University of Athens (E3MLab), using the PRIMES model for energy and CO_2 emission projections, the GAINS model for non-CO_2 emission projections and the GLOBIOM-G4M models for LULUCF emission and removal projections, supported by some more specialised models (e.g. GEM-E3 model that has been used for projections for the value added by branch of activity, PROMETHEUS model that has been deployed for projections of world energy prices and CAPRI model for agricultural activity projections). Please see more information about these specialised models in the section on total GHGs emissions. The scenarios are available for the EU and each of its 28 Member States simulating the energy balances and GHG emission trends for future years under current trends and policies as adopted in the Member States by spring 2012.

The PRIMES model is a modelling system that simulates a market equilibrium solution for energy supply and demand in the EU28 and its Member States. The model determines the equilibrium by finding the prices of each energy form such that the quantity producers find best to supply matches the quantity consumers wish to use. The market equilibrium is achieved for each time period and the simulation is dynamic over time. The model is behavioural but also represents in an explicit and detailed way the available energy demand and supply technologies and pollution abatement technologies. The system reflects considerations about market economics, industry structure, energy/environmental policies and regulation, which are conceived so as to influence market behaviour of energy system agents. The modular structure of PRIMES reflects a distribution of decision making among agents that act individually about their supply, demand, combined supply and demand, and prices. The market integrating part of PRIMES subsequently simulates market clearing.

In this exercise the more detailed PRIMES-TREMOVE transport model was also used to develop the transport projections; this model is now fully integrated with the main PRIMES model.

PRIMES is a general purpose energy model; it is conceived for designing projections to the future, scenario building and policy impact analysis. It covers a medium to long-term horizon. Its modular structure allows either for integrating model use or for partial use.

ercise giving long term population and GDP growth trends up to 2060 while the short and medium term GDP growth projections were taken from DG ECFIN.

The recent boom in shale gas development and exploration of unconventional oil reserves are increasing the fossil fuel reserve basis and thus changing the projections about the developments of international fuel prices. The fuel prices have been updated in the new scenario to take into account the recent developments.

Significant progress has been made towards the achievement of the targets set out in the EU Energy and Climate Package, and new legislative measures, most notably the Energy Efficiency Directive[3], have been adopted at EU level. Several changes have occurred at national levels as well.

This report focuses on trend projections understood in the sense of a Reference scenario. Similar to the Reference scenario latest update from 2009, this Reference scenario starts from the assumption that the legally binding GHG and RES targets for 2020 will be achieved and that the policies agreed at EU level by spring 2012 (notably on energy efficiency) as well as relevant adopted national policies will be implemented in the Member States. Following this approach the Reference scenario can help enlightening the debate on where currently adopted policies might lead the EU and whether further policy development, including for the longer term, would be needed. This Reference scenario can therefore also serve as benchmark or reference for assessing the impacts of envisaged policy initiatives at EU level in the areas of energy, transport and climate.

Some technology development forecasts have changed since the latest update in 2009 both in positive way: faster than expected development for solar PV technology and negative: slower than expected developments for CCS and remote off-shore wind technologies.

Furthermore, international events, such as the Fukushima nuclear accident of March 2011, have changed the perception related to nuclear power generation and tightened the security requirements for nuclear technologies.

In the context of climate change policies, specific Copenhagen/Cancun pledges for 2020 have been also set in other world regions, which have been considered in the world energy price modelling part of this exercise.

EU Reference scenario 2013

The new Reference scenario determines as core element the development of the EU energy system under current trends and adopted policies. It includes current trends on population and economic development including the latest 2010 statistics and takes into account the highly volatile energy import prices environment of recent years. It portrays economic decisions, which are driven by market forces and technology progress in the framework of concrete national and EU policies and measures adopted until spring 2012 and which are or will be implemented over the next years. The Reference 2013 scenario includes all binding targets set out in EU legislation regarding development of renewable energies and reductions of greenhouse gas (GHG) emissions, as well as the latest legislation promoting energy efficiency.

These assumptions together with the current statistical situation derived from the EUROSTAT energy balances represent the starting point for projections which are presented from 2015 onwards in 5 years' steps until 2050.

The Reference 2013 scenario benefited from the comments of Member States experts. Many comments and additional information communicated by the Member States were accommodated in revising the draft Reference scenario, while preserving a harmonised approach to EU energy system modelling.

The modelling has involved Member States experts at various stages starting from responses to a very detailed policy questionnaire and the Member States' comments on macro-economic and sectorial economic projections. As a second step, detailed transport

[3] For precise references to legislation, please see Table 2.

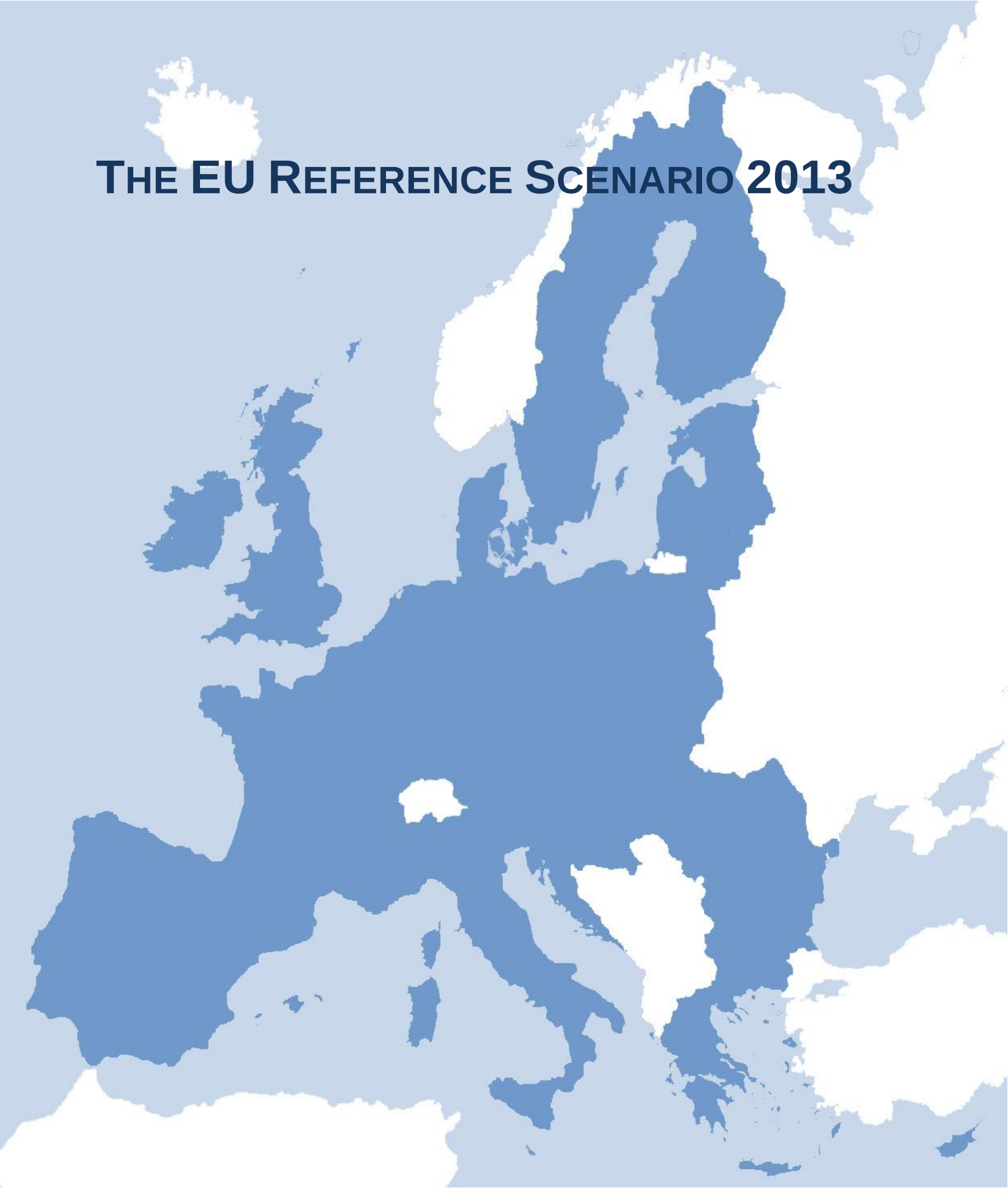
activity modelling took place on the basis of these consulted/revised economic trends, which, in turn, were consulted with Member States' experts in autumn 2012. The third modelling step consisted in energy system and economy modelling with PRIMES based on the revised economic and transport results from stages 1 and 2. The draft outcome of the energy modelling was again consulted with experts from the Member States. This step included also the modelling of energy related and industrial CO_2 emissions. The final step was the modelling and consultation of non-CO_2 GHG trends, including energy related ones, and of CO_2 emissions and removals related to land use, land use change and forestry (LULUCF). The macro-economic assumptions and the results of the energy modelling were important drivers for such GHG emissions, which were also based on modelling of other areas such as agriculture and forestry.

Member States comments have been accommodated as far as possible while striving to provide a consistent EU Reference scenario based on harmonised assumptions on e.g. GDP and world energy prices as well as EU and national policies and making sure that imports and exports of energy among Member States match. It needs to be, however, noted that the responsibility for these results lies with the consultants and the Commission services. In any case, the comments from Member States have helped a lot to improve the quality of the projections, on which this report gives an account, focusing on EU28 results.

In addition to its role as a trend projection, the Reference scenario is a benchmark for scenarios featuring alternative policy approaches or framework conditions (e.g. higher energy import prices, more ambitious renewables and climate policies).

All numbers included in this report, except otherwise stated, refer to European Union of 28 Member States.

THE EU REFERENCE SCENARIO 2013



2. Main assumptions

Macroeconomic and demographic scenario

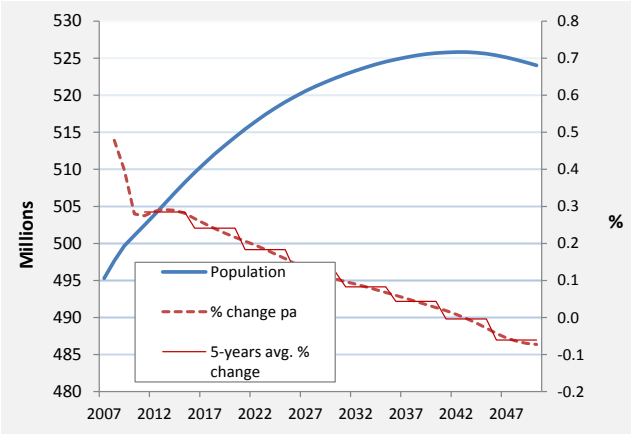
The Reference 2013 scenario builds on macroeconomic projections of GDP and population which are exogenous to the models used. The historical time series from 1995 to 2010 were entirely updated using the time series from EUROSTAT. The economic indicators therefore fully reflect the economic downturn as it occurred in recent years up to 2010.

GDP and population projections by MS are considered as given. The scenario mirrors the recent DG ECFIN projections for the short and medium term (following the agreement reached in the Economic Policy Committee (EPC)) and the EPC/DG ECFIN Ageing Report 2012 (from first quarter 2012) for the long-run. The GEM-E3 model is used to project the structure of the economy and gross value added generated by different sectors, consistently with the given GDP projection.

The macroeconomic scenario comprises numerical projections of GDP (volume), households' income, population and sectorial activity (using gross value added in volume as a proxy) for 22 sectors, in each EU Member State. The 22 sectors comprise: 10 energy intensive industries, 6 non energy intensive industries, 3 service sectors, construction, agriculture and the energy supply sector (the value added of which is not used as input to the energy model given that it simulates the energy markets by considering all relevant drivers for energy demand and supply).

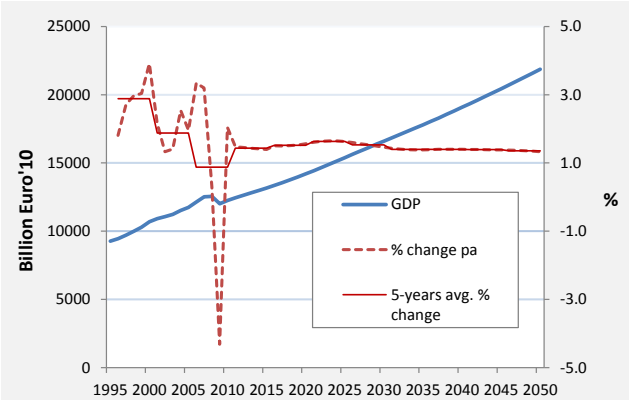
The population projections are based on EUROSTAT population projection for the period 2010 to 2050. This projection assumes fertility rates rising slightly, further life expectancy gains, and continued, but decelerating inward net migration to the EU. As a result, the EU population is projected to increase up to 2040 and decline slightly thereafter (see Figure 1). It is projected that the population undergoes significant changes in its age structure: the projections point to a significant reduction in the population aged 15-64 and an increase in persons aged 65 or more.

FIGURE 1: POPULATION OF EU28[4]



The GDP projection assumes a recovery from the current economic crisis, followed by steady GDP growth rates in the medium term (avg. 1.6% pa over the period 2015-2030, down from the 2.2% pa during 1996-2007), see Figure 2. In the longer term, lower growth rates are assumed (avg. 1.4% pa over the period 2030-2050). GDP/capita is projected to increase by a factor of 1.7 between 2010 and 2050. Labour supply is linked to slowly growing and then declining population as well as its ageing; this combined with assumptions on productivity trends from the Ageing report explain rather low potential GDP growth rates for the EU.

FIGURE 2: GDP OF THE EU27[5]



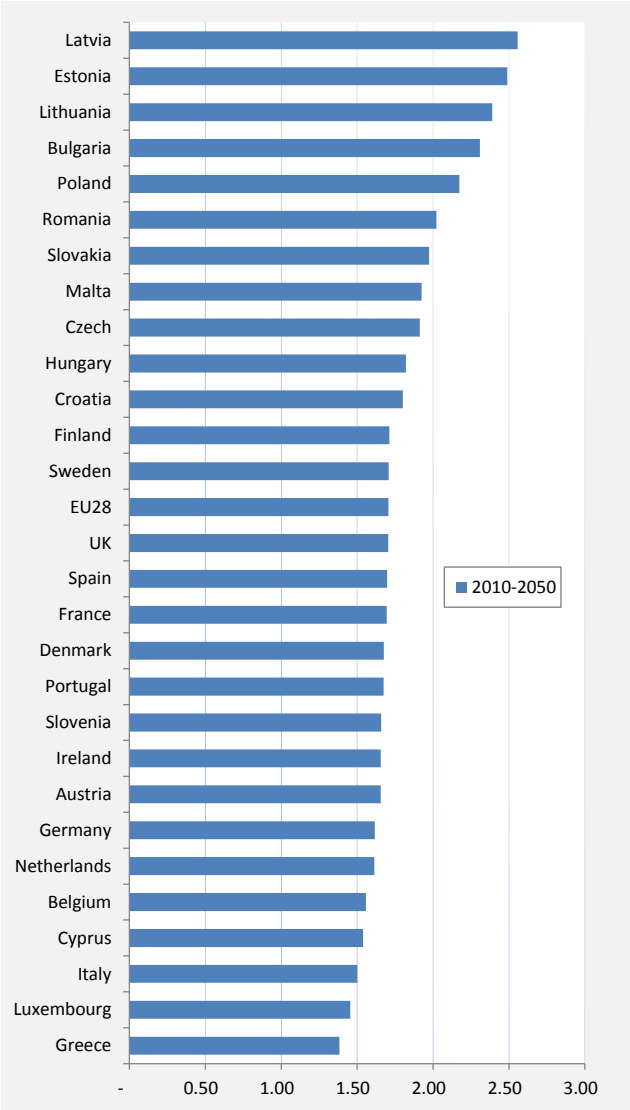
The highest GDP growth rate is projected in the period 2015-2030 whereas declining labour force and slowdown in productivity growth lead to lower growth

[4] Due to lack of consistent data for Croatia data is shown from 2007 onwards

[5] GDP is shown for the EU27 only as past consistent data for Croatia is only available from 2010 onwards.

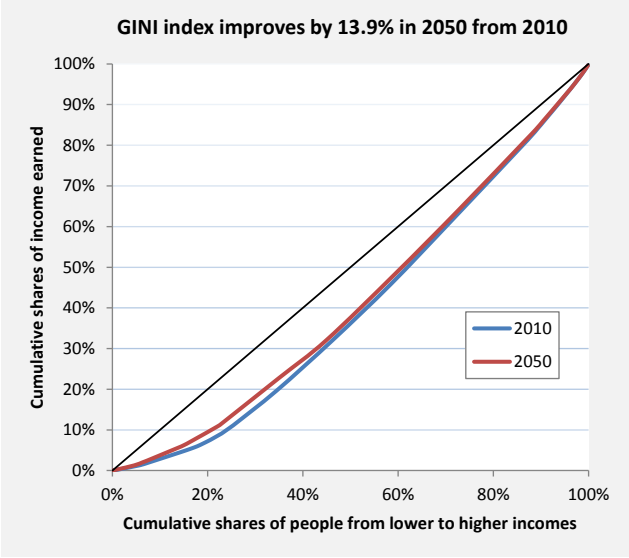
pace in the long term. Nevertheless, the slowdown in population growth allows for steady growth of GDP per capita in the long term. In this respect, the convergence is shown in the EPC/DG ECFIN Ageing Report 2012, which materialises through higher growth rates of the new Member States and, in the longer term, lower dispersion of GDP per capita among all the Member States (see Figure 3).

FIGURE 3: AVERAGE ANNUAL GROWTH RATE OF GDP PER CAPITA



The impact of the current debt crisis is significant in several EU countries, which will struggle to return to growth in the short term; on the other hand, several countries with lower GDP/capita are likely to see their relative position improved.

FIGURE 4: GINI INDEX FOR THE EU28 MEMBER STATES[6]



The Reference scenario projection sees a continuation of trends towards higher share of services in GDP, which generate 78% of total value added by 2050. The projection also shows a recovery of activity in industry after the current crisis with industry being projected to grow predominantly through shifting towards higher value added products, rather than higher amounts of products. For energy intensive industries recovery and then slow growth pace is projected. Non energy intensive industries see a more significant growth. The remaining sectors - construction, agriculture and energy sector - see a rather slow growth of activity.

- For basic metals (ferrous and non-ferrous) global projection shows steady growth of world consumption of basic metals, with very slow decoupling from world GDP growth. Faced with the global competition and demand growth mainly in other world regions, the EU's share in global market steadily declines, continuing past trends. Activity is, however, projected to remain in the EU, thanks to shifting production to high quality

[6] An improvement of the GINI coefficient by -13.9% means that in 2050 there is a better cohesion than in 2010 (lower inequality among incomes in MS). The main improvement of the GINI index comes from the lowest classes of income frequency distribution which means that poorer countries tend to grow faster than richer countries in the EU.
The calculation of the GINI coefficient includes Croatia.

products and to the tight links with equipment goods industry also located in the EU. EU production of pig iron and primary aluminium is projected to increase more slowly than growth of the basic metals industry, which include electric arc and recycled metals.

- For energy intensive chemicals, the recovery from crisis is slow and followed by slow growth. The EU production of fertilisers and petrochemical products is projected to stabilise and slightly decline in the long term as a result of weakening of EU competitiveness and low demand in the internal market. Other chemicals, particularly pharmaceutical and cosmetics, are projected to grow slightly faster.
- The non-metallic minerals sector – cement, ceramics, glass - is characterised by slow recovery from crisis followed by a slower growth pace than before the crisis. Slower growth is related to lower demand due to slowdown of construction activity linked to demographic change.
- For the paper and pulp industry there is significant recovery from crisis and sustained growth, although pulp production grows much less than the entire paper sector. Nonetheless there is a slow decline of EU share in global trade of paper and pulp.
- The equipment goods industry (engineering) is projected to remain the most dynamic sector in the EU industry, growing at steady pace, albeit slightly more slowly than in the period before the crisis.
- Other industries (food products, wood products, etc.) also see steady growth with the exception of textile industry, which is projected to decline, due to competition from other world regions.

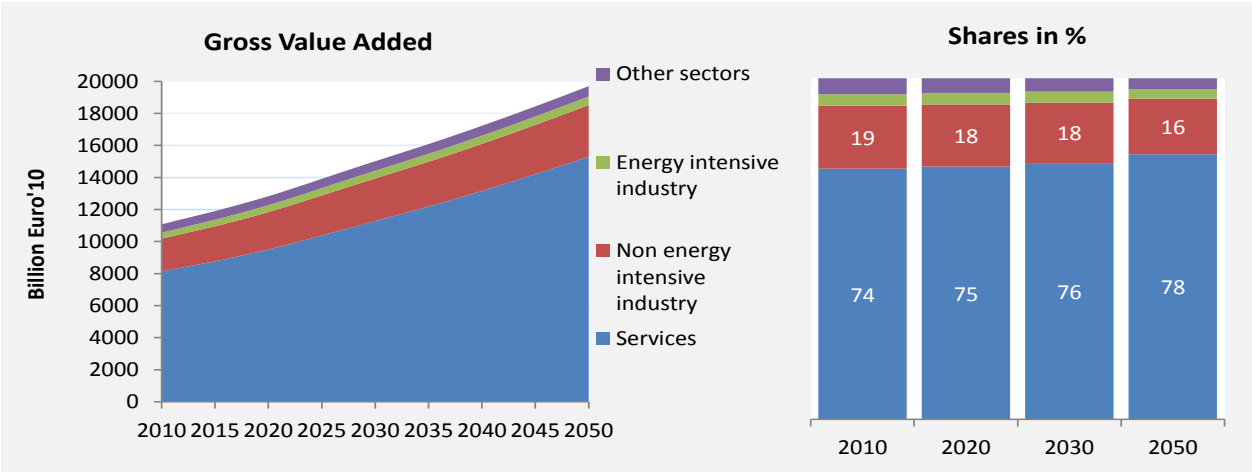
The macro-economic and sectorial projections are available by Member State (see Appendix 1).

World fossil fuel prices

The world fossil fuel price projections have undergone substantial revisions of key assumptions compared to the previous Reference scenario exercise: "Trends to 2030 – Update 2009" including on reserves notably of shale gas and other unconventional hydrocarbons, world economic developments and the reflection of Copenhagen/Cancun pledges. Prices are projected to develop along new trajectories rather different from the past ones, particularly for gas.

The projection has been developed independently with the PROMETHEUS model (stochastic world energy model) and was finalised in January 2012. The International Energy Agency World Energy Outlook (IEA WEO) for 2011 was published while work on the PROMETHEUS projections for the Reference scenario was already in progress, consequently an effort was made to harmonise some of the assumptions but otherwise the results have been arrived at inde-

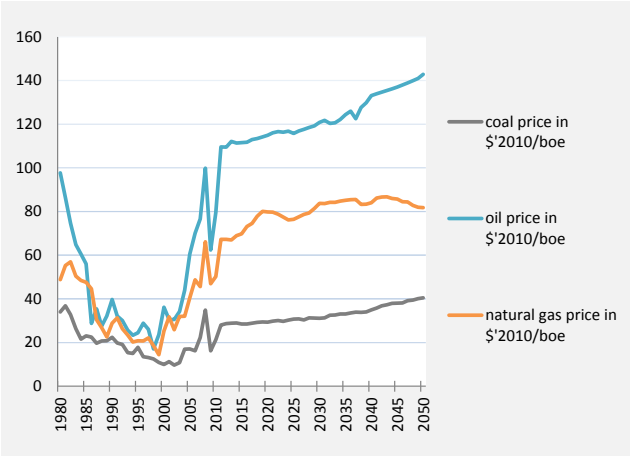
FIGURE 5: STRUCTURE OF THE ECONOMY IN EU28



pendently.

Large upward revisions for conventional gas and oil resources availability (following USGS, BGR, IEA) have been implemented as well as the inclusion of worldwide estimates of unconventional gas resources (tight sands, shale gas and coal bed methane) based on estimates from IEA. The change implies that the natural gas resource base increases more than 2.5 times with important implications on prices.

FIGURE 6: FOSSIL FUEL IMPORT PRICES



Regarding economic drivers, overall higher GDP growth is projected than in the previous exercise: major upward revisions were undertaken for China, India and Middle East and North Africa regions. For Europe DG ECFIN Ageing reports were used, whereas other regions basically follow IEA projections.

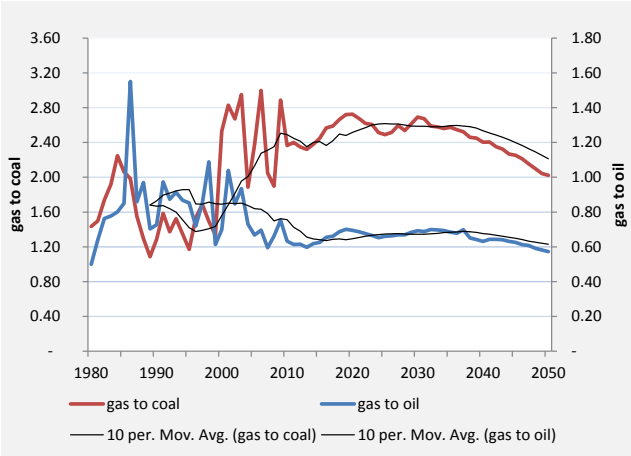
For the overall projection, the Copenhagen-Cancun pledges are expected to be respected through carbon prices as well as dedicated policies and measures. China, India and the CIS meet their pledges through "lack of ambition", whereas OECD Western Pacific fall considerably short because of high ambition compared to track record so far. Apart from the EU, no additional climate related policies are assumed for the period beyond 2030.

Up to 2035, the projections result in oil prices which are broadly in agreement with IEA-WEO 2011 and 2012 update (reporting up to that time horizon). For the shorter term, higher prices reflect failure of productive capacity to grow in line with demand (fuelled by economic recovery in the EU and US and persistent growth in emerging regions). The situation eases somewhat around 2020 before declining resource-production (RP) ratios result in resumption of upward trend in prices.

In the longer term, gas prices do not follow the upward trend of oil price. This is mostly due to the very large additional undiscovered resources that were factored in, including unconventional gas. More importantly, natural gas prices stabilise at a level that is still high enough to ensure economic viability of unconventional gas projects.

The downward revision of gas prices compared with the 2009 Baseline had also impacts on coal prices given that both fuels are competing in power generation.

FIGURE 7: RATIO OF GAS TO COAL AND GAS TO OIL PRICES



Energy technology progress

The EU Reference Scenario 2013, as the previous Reference scenarios, deals explicitly with the penetration of new technologies notably in power generation and transport and specifically with progress in renewable technologies including further technology learning. As analysed in the part on results, the penetration of new technologies leads to changes in the energy mix, alongside other drivers such as relative prices and costs, policies to promote energy efficiency, renewables and new technologies and broader market trends regarding economic efficiency and better use of resources. These interdependent developments also bring about energy efficiency improvements on both the demand and supply side. They also result in energy technology changes, which in the modelling are represented by an uptake of specific energy technologies from a broad portfolio of different technologies that change over time. The tech-

nology portfolio in the Reference Scenario includes the following categories:

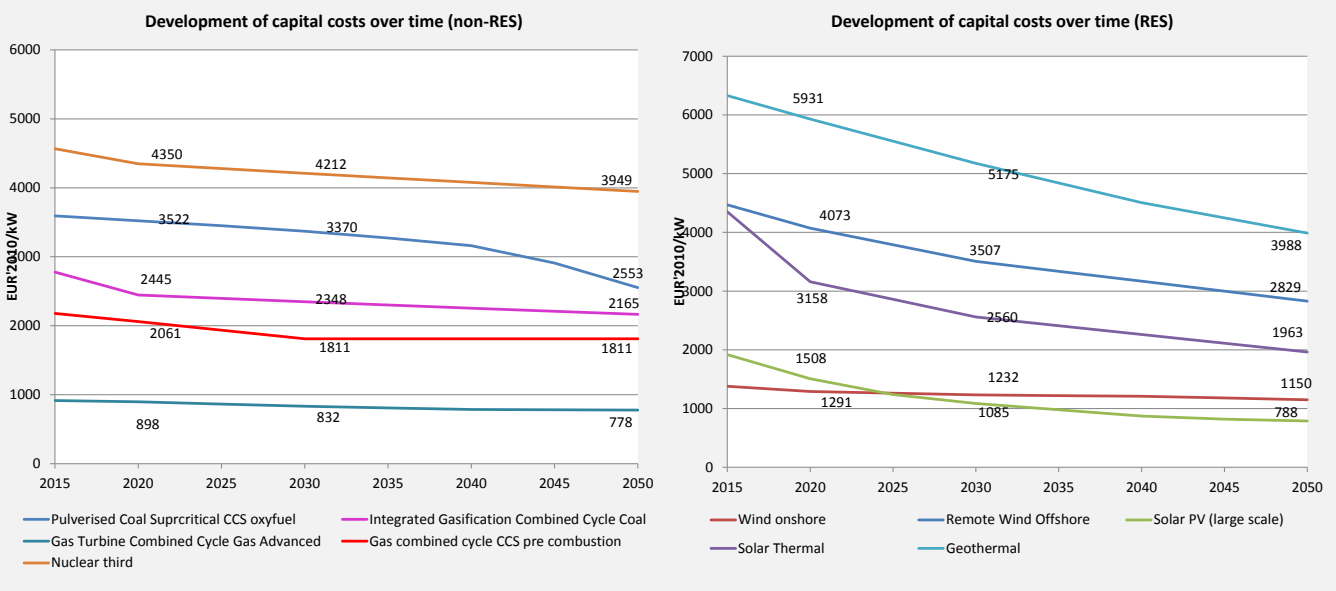
- End-use energy efficiency (thermal integrity of buildings, lighting, electric appliances, motor drives, heat pumps, etc.).
- Renewable energy in centralized and decentralized power generation, in direct heating and cooling applications, as well as for blending with petrol or diesel oil.
- Supercritical coal plants, advanced gas combined cycle plants and CHP.
- CO_2 carbon capture and storage (CCS).
- Nuclear energy including 3rd and 4th generation.
- Advanced transmission and distribution grids and smart metering.
- Plug-in hybrid and battery/full electric vehicles, both for passenger and freight road transportation (light commercial vehicles).
- Improvements in conventional engines in transport.

Although the key features of the technologies in the portfolio are known today, the projected evolution of their technical and economic characteristics presupposes that substantial industrial research and demonstration takes place enabling deployment at a wide scale.

Compared to the 2009 Reference exercise the development prospects of certain technologies have changed considerably and these have been taken into account in the PRIMES model. The changes include:

- Solar photovoltaics (PVs): techno-economic improvements in the solar PV industry have surpassed previous expectations and costs have changed already for the short term. The development of PVs starts from lower costs, than previously expected and has a positive learning curve throughout the projection period.
- Remote offshore wind: in the previous exercise, following the review of available literature assumptions, the assumptions about remote offshore wind were very positive, including strong cost reductions. Following the latest literature review, assumptions about techno-economic developments have been revised upwards. Capital costs for remote offshore wind developments are now expected to be significantly higher and the costs to reduce more slowly.
- Nuclear: since the Fukushima accident in March 2011 security standards for nuclear power plants have been tightened, leading to higher costs for their construction and testing requirements. Costs for nuclear power plants are therefore increased. With the new risk assessment, financing conditions for nuclear

FIGURE 8: DEVELOPMENT OF CAPITAL COSTS OVER TIME FOR POWER GENERATION TECHNOLOGIES



power plants have also worsened and this is also reflected in the modelling.

- CCS: the construction of power plants equipped with carbon capture technologies has been developing at a much slower pace than expected at the time of development of the 2009 Reference exercise. Development of CCS is also hampered and delayed due to public acceptance issues over building of the storage capacities. The new difficulties and the delays in the development of CCS are taken into account in this new exercise.
- Demand side technologies have been updated where is was found necessary following latest literature review which includes the most up to date preparatory studies for the preparation of eco-design regulations and the amendment of CO_2 from light duty vehicles regulation.

The modelling also assumes that learning curves apply for specific technologies, thus reflecting decreasing costs and increasing performances as a function of cumulative production. The steepness of the learning curve differs by technology, depending also on their current stage of maturity.

TABLE 1: EXAMPLES OF COSTS AND EFFICIENCIES OF DEMAND SIDE TECHNOLOGIES

Appliance/Equipment		Unit	Base case	Improved	Advanced	Best
Domestic Dishwashers	*Consumption*	*kWh/hour*	1.05	-5%	-10%	-20%
	Costs	*EUR'10/appl*	349	29%	80%	130%
Domestic Lighting	*Consumption*	*kWh/hour*	0.03	-26%	-80%	-82%
	Costs	*EUR'10/appl*	4	34%	130%	165%
Domestic AC (Electricity)	*Efficiency*	*COP*	2.50	21%	47%	52%
	Costs	*EUR'10/kW*	415.7	20%	61%	85%
Domestic boiler -Dwelling size (natural gas)	*Efficiency*	*(Useful/Final)*	0.68	9%	23%	30%
	Costs	*EUR'10*	3342	15%	49%	71%
Water heating boiler (natural gas)	*Efficiency*	*(Useful/Final)*	0.64	21%	42%	47%
	Costs	*EUR'10*	700	40%	101%	131%

For power generation technologies the Reference scenario takes an optimistic view about the future, without however assuming breakthroughs in technology development. All power technologies known today are projected to improve in terms of unit cost and efficiency.

Taking into account the technology portfolio available, energy efficiency gains in the scenarios are driven by microeconomic decisions, reflecting the market agents' aim of minimizing costs and maximizing economic benefits operating in the context of public policies that promote energy efficiency. Similarly, renewables and CHP development are driven by private economic considerations also taking into account supportive policies which are assumed to continue in the Reference scenario and gradually decrease in the longer term (see policy assumptions).

The techno-economic characteristics of existing and new energy technologies used in the demand and the supply sectors of the energy system evolve over time and improve according to exogenously specified trends including learning rates. At any given time, several technologies are competing with different performance and costs as presented by examples in Table 1. Following the logic developed in the previous PRIMES versions, consumers and suppliers are generally hesitant to adopt new technologies before they become sufficiently mature. They behave as if they perceive a higher cost (compared to engineering cost evaluations for the operation of such equipment) when deciding upon adoption of new technologies.

Public policies at EU and national level, through information campaigns, industrial policy, R&D support, taxation and other means, aim at pushing more rapid adoption of new technologies by removing or compensating uncertainties associated with their use. In this way, the technologies themselves reach maturity more rapidly as a result of "learning-by-doing" effects and economies of scale. Supportive policies for the adoption of new technologies thus lead to modifications in the perception of technologies.

In the end, agents adopt new technologies because they aim at reducing the costs of energy services, which represent an important household budget/company balance sheet item. On macro-economic

level, GDP growth is therefore associated with continuous improvement of the technological basis leading to improved energy intensity, which is also supported by the effects from structural change in the economy.

Last but not least, the deployment of some of the new technologies depends on the development of new infrastructure and regulations, which are partly driven by government. This is the case, for example, for interconnectors and grid expansion, CCS regarding the transportation and storage of captured CO_2 and for the electrification of transportation which depends on TSOs and DSOs undertaking grid and control systems investments.

Technology assumptions are based on extensive literature review by the PRIMES team and have additionally been checked by the Commission Services, notably the Joint Research Centre of the European Commission.

Policy assumptions

The Reference scenario 2013 includes policies and measures adopted in the Member States by April 2012 and policies, measures and legislative provisions (including on binding targets) adopted by or agreed in the first half of 2012 at EU level in such a way that there is almost no uncertainty with regard to their adoption. This concerns notably the Energy Efficiency Directive, on which political agreement was reached by that time. The policies and measures reflected in the Reference 2013 scenario are described in Table 2.

TABLE 2: EU AND OTHER POLICIES INCLUDED IN THE REFERENCE SCENARIO 2013

EU LEVEL POLICIES

	Energy Efficiency	
1	Ecodesign Framework Directive	Directive 2005/32/EC
2	Stand-by regulation	Commission Regulation (EC) No 1275/2008
3	Simple Set-to boxes regulation	Commission Regulation (EC) No 107/2009
4	Office/street lighting regulation	Commission Regulation (EC) No 347/2010
5	Lighting Products in the domestic and Tertiary Sectors regulations	Commission Regulation (EU) No 347/2010 Commission Regulation (EC) No 859/2009 Commission Regulation (EC) No 244/2009 Commission Regulation (EC) No 245/2009
6	External power supplies regulation	Commission Regulation (EC) No 278/2009
7	TVs regulation (+labelling) regulation	Commission Regulation (EC) No 642/2009
8	Electric motors regulation	Commission Regulation (EC)No 640/2009
9	Freezers/refrigerators regulation	Commission Regulation (EC) No 643/2009
10	Household washing machines regulation	Commission Regulation (EU) No 1015/2010
11	Household dishwashers regulations	Commission Regulation (EU) No 1016/2010
12	Industrial fans regulation	Commission Regulation (EU) Regulation No 327/2011
13	Air conditioning and comfort fans regulation	Commission Regulation (EU) No 206/2012
14	Circulators regulation	Commission Regulation (EC) No 641/2009
15	Energy Labelling Directive and delegated Regulations covering: lamps and luminaires,	Directive 2010/30/EU supplemented by Delegated Regulations and

	household tumble driers air conditioners televisions household washing machines household refrigerating appliances household dishwashers and Commission Directives covering: household electric ovens household combined washer-driers household electric tumble driers	Commission directives
16	Labelling of tyres regulations	Regulation (EC) No 1222/2009 Commission Regulation (EU) 228/2011 Commission Regulation (EU) 1235/2011
17	Directive on end-use energy efficiency and energy services	Directive 2006/32/EC
18	Energy Performance of Buildings Directive	Directive 2010/31/EU and Commission Delegated Regulation (EU) No 244/2012
19	Energy Efficiency Directive	Directive 2012/27/EU
	Power generation and energy markets	
20	Cogeneration Directive	Directive 2004/8/EC
21	Completion of the internal energy market (including provisions of the 3rd package). Since March 2011, the Gas and Electricity Directives of the 3rd package for an internal EU gas and electricity market are transposed into national law by Members States and the three Regulations: - on conditions for access to the natural gas transmission networks - on conditions for access to the network for cross-border exchange of electricity - on the establishment of the Agency for the Cooperation of Energy Regulators (ACER) are applicable.	Directive 2009/73/EC Directive 2009/72/EC Regulation (EC) No 715/2009, Regulation (EC) No 714/2009 Regulation (EC) No 713/2009
22	Energy Taxation Directive	Directive 2003/96/EC
23	Regulation on security of gas supply	Regulation (EU) 994/2010
24	Regulation on market integrity and transparency (REMIT)	Regulation (EU) 1227/2011
25	Nuclear Safety Directive	Council Directive 2009/71/Euratom
26	Nuclear Waste Management Directive	Council Directive 2011/70/Euratom
27	Directive on the promotion of the use of energy from renewable sources ("RES Directive")	Directive 2009/28 EC

(Cross-sectoral) Climate policies		
28	EU ETS directive	Directive 2003/87/EC as amended by Directive 2004/101/EC, Directive 2008/101/EC and Directive 2009/29/EC and implementing Decisions, in particular 2010/384/EU, 2010/634/EU, 2011/389/EU (cap), 2011/278/EU, 2011/638/EU (benchmarking and carbon leakage list)
29	Directive on the geological storage of CO_2	Directive 2009/31/EC
30	GHG Effort Sharing Decision	Decision 406/2009/EC
31	F-gas Regulation	Regulation (EC) No 842/2006
Transport related policies		
32	Regulation on CO_2 from cars	Regulation (EC) No 443/2009
33	Regulation EURO 5 and 6	Regulation (EC) No 715/2007
34	Fuel Quality Directive	Directive 2009/30/EC
35	Regulation Euro VI for heavy duty vehicles	Regulation (EC) No 595/2009
36	Regulation on CO_2 from vans	Regulation (EU) No 510/2011
37	Eurovignette Directive on road infrastructure charging	Directive 2011/76/EU
38	Directive on the Promotion of Clean and Energy Efficient Road Transport Vehicles (in public procurement)	Directive 2009/33/EC
39	End of Life Vehicles Directive	Directive 2000/53/EC
40	Mobile Air Conditioning in motor vehicles Directive	Directive 2006/40/EC
41	Single European Sky II	COM(2008) 389 final
42	Directive on inland transport of dangerous goods	Directive 2008/68/EC
43	Third railway package	Directive 2007/58/EC
44	Directive establishing a single European railway area (Recast)	Directive 2012/34/EU
45	Port state control Directive	Directive 2009/16/EC
46	Regulation on common rules for access to the international road haulage market	Regulation (EC) No 1072/2009
47	Directive concerning social legislation relating to road transport activities	Directive 2009/5/EC
48	Regulation on ground-handling services at Union airports	Part of "Better airports package"[7]
49	Regulation on noise-related operating restrictions at Union airports	Part of "Better airports package"[8]
50	Directive on the sulphur content of marine fuels	Directive 2012/33/EU

[7] Council agreement on general approach (22 March 2012), European Parliament vote (16 April 2013)
[8] Council agreement on general approach (7 June 2012), European Parliament vote (11 December 2012)

Infrastructure, innovation and RTD and funding		
51	TEN-E guidelines	Decision No 1364/2006/EC
52	EEPR (European Energy Programme for Recovery) and NER 300 (New entrants reserve) CCS and innovative renewables funding programme	Regulation (EC) No 663/2009, ETS Directive 2009/29/EC Article 10a(8), further developed through Commission Decision 2010/670/EU
53	EU research, development RTD and innovation support (7th framework programme) - theme 6 and its expected continuation under Horizon 2020, Competitiveness and Innovation Programme, e.g. Sustainable Industry Low Carbon scheme SILC I (2011-2013)	
54	EU Cohesion Policy – ERDF, ESF and Cohesion Fund	
55	TEN-T guidelines	Decision 884/2004/EC and expected continuation – 30 May 2013 trilogue agreement on revised TEN-T guidelines[9] supported by the Connecting Europe Facility
Environment and other related policies		
56	State aid Guidelines for Environmental Protection and 2008 Block Exemption Regulation	Community guidelines on state aid for environmental protection
57	Landfill Directive	Directive 99/31/EC
58	EU Urban Wastewater Treatment Directive	Directive 91/271/EEC
59	Waste Framework Directive	Directive 2008/98/EC
60	Nitrate Directive	Directive 91/676/EEC
61	Common Agricultural Policy (CAP)	e.g. Council Regulations (EC) No 1290/2005, No 1698/2005, No 1234/2007 and No. 73/2009
62	Industrial emissions (Recast of Integrated Pollution and Prevention Control Directive 2008/1/EC and Large Combustion Plant Directive 2001/80/EC)	Directive 2010/75/EU
63	Directive on national emissions' ceilings for certain pollutants	Directive 2001/81/EC
64	Water Framework Directive	Directive 2000/60/EC
65	Substances that deplete the ozone layer	Relevant EU legislation implementing the Montreal protocol, e.g. Regulation (EC) No 1005/2009 as amended by Commission Regulation (EU) 744/2010

[9] Source: http://europa.eu/rapid/press-release_IP-13-478_en.htm

NATIONAL MEASURES

66	Strong national RES policies	National policies on e.g. feed-in tariffs, quota systems, green certificates, subsidies, favourable tax regimes and other financial incentives are reflected.
67	National Energy Efficiency policies	National policies promoting energy efficiency implementing EU directives and policies, as well as specific national policies are fully taken into account
68	Nuclear	Nuclear, including the replacement of plants due for retirement, is modelled on its economic merit and in competition with other energy sources for power generation but also taking into account the national policies, including legislative provisions in some MS on nuclear phase out. Several constraints are therefore put on the model such as decisions of Member States not to use nuclear at all (Austria, Cyprus, Denmark, Estonia, Greece, Ireland, Italy, Latvia, Luxembourg, Malta and Portugal). The nuclear phase-out in Belgium and Germany is respected while lifetime of nuclear power plants was extended to 60 years in Sweden. Nuclear investments are possible in Bulgaria, the Czech Republic, France, Finland, Hungary, Lithuania, Poland, Romania, Slovakia, Slovenia and Spain. For modelling the following plans on new nuclear plants were taken into account: Finland (1720 MW by 2015), France (1600 MW by 2020), Lithuania (1400 by 2025), Poland (1600 MW by 2025), Slovakia (940 MW by 2015). Member States experts were invited to provide information on new nuclear investments/programmes in spring 2012 and comments on the PRIMES Reference scenario results in winter 2013, which had a significant impact on the modelling results for nuclear capacity.

OTHER SUPRA-NATIONAL LEVEL POLICIES

69	Energy Star Program (voluntary labelling program)	
70	International Maritime Organisation (IMO) International convention for the prevention of pollution from ships (MARPOL), Annex VI	2008 amendments - revised Annex VI (Prevention of Air Pollution from ships)
71	WTO Agreement on trade with agricultural products from Uruguay round fully respected	
72	Voluntary agreement to reduce PFC (perfluorocarbons, potent GHG) emissions in the semiconductor industry	
73	International Civil Aviation Organisation (ICAO), Convention on International Civil Aviation, Annex 16, Volume II (Aircraft engine emissions)	
74	IMO, Inclusion of regulations on energy efficiency for ships in MARPOL Annex VI	IMO Resolution MEPC.203(62)

Further assumptions

Discount Rates

The PRIMES model is based on individual decision making of agents demanding or supplying energy and on price-driven interactions in markets. The modelling approach is not taking the perspective of a social planner and does not follow an overall least cost optimization of the entire energy system in the long-term. Therefore, social discount rates play no role in determining model solutions. Social discount rates can however be used for ex post cost evaluations.

On the other hand discount rates pertaining to individual agents play an important role in their decision-making. Agents' economic decisions are usually based on the concept of cost of capital, which is, depending on the sector, either weighted average cost of capital (for larger firms) or subjective discount rate (for individuals or smaller firms). In both cases, the rate used to discount future costs and revenues involves a risk premium which reflects business practices, various risk factors or even the perceived cost of lending. The discount rate for individuals also reflects an element of risk averseness.

The discount rates vary across sectors and may differ substantially from social discount rates (typically 4-5%) which are used in social long-term planning. In the PRIMES modelling, the discount rates range from 8% (in real terms) applicable to public transport companies or regulated investments as for example grid development investments (in the form of weighed average cost of capital) up to 17.5% applicable to individuals (households and private passenger transport, following extensive literature review on discount rates of private consumers). Additional risk premium rates are applied for some new technologies at their early stages of development impacting on perceived costs of technologies.

More specifically, for large power and steam generation companies the cost of capital are 9%. In industry, services and agriculture the discount rate amounts to 12%. Households have an even higher discount rate of 17.5%. For transport, the discount rate depends on the type of operator. Private passenger transport investments (e.g. for cars) are based on a discount rate of 17.5%, while for trucks and inland navigation ships, which are considered as investment goods the rate is 12%. Public transport investment is simulated with an assumed discount rate of 8% for the whole projection period reflecting the acceptance of longer pay-back periods than those required in industry or private households. All these rates are in real terms, i.e. after deducting inflation.

The decision-making environment of businesses and households on energy consumption is expected to change because of the implementation of the Energy Efficiency directive (EED). The EED will bring about higher market penetration of Energy Service Compa-

nies (ESCOs) or similar institutions as well as the reduction of associated risks as perceived by potential clients through quality controls and certifications. This will entail lower perceived discount rates and is reflected in the new Reference scenario. The implementation of the EED and the widespread penetration of ESCOs is mirrored by the reduction of discount rates by up to 2 percentage points in services and up to 5.5 percentage points in households. Discount rates are assumed to decline linearly from their standard levels in 2010 to reach the policy driven values by 2020 and they remain at these levels throughout the remaining projection period. Thus the discount rates for households are reduced in the context of the Reference scenario to 14.75% in 2015 and 12% from 2020 onwards throughout the entire projection period. For services the discount rate was progressively decreased to 11% in 2015 and 10% from 2020 onwards (see Figure 9).

FIGURE 9: DISCOUNT RATES USED IN PRIMES

Discount rates (in real terms)	Standard discount rates of PRIMES	Modified discount rates due to EED	
		2015	2020 - 2050
Power generation	9%	9%	9%
Industry	12%	12%	12%
Tertiary	12%	11%	10%
Public transport	8%	8%	8%
Trucks and inland navigation	12%	12%	12%
Private cars	17.5%	17.5%	17.5%
Households	17.5%	14.75%	12%

Degree days

The degree days, reflecting climate conditions, are kept constant at the 2005 level, which is higher than the long term average without assuming any trend towards further warming. The degree days in 2000 were fairly similar to the ones in 2005. The year 2010 was not considered to be representative in terms of degree days. Such an approach facilitates comparison of statistics with the projection figures that are based on climate conditions at the beginning of this century. This simplification can be also justified by consistency reasons given the status of model development. A selective inclusion of global warming trends only for some modelling parts where this would be feasible (heating degree days) and not for others (e.g. water supply conditions for power generation, impacts on agriculture) could lead to misleading results. Further research and modelling work is needed for an inclusion into a reference scenario.

Exchange rates

All monetary values are expressed in constant prices of 2010 (without inflation). The dollar exchange rate for current money changes over time; it starts at the value of 1.39$/€ in 2009 and is assumed to decrease to 1.30 $/€ by 2012, at which level it is assumed to remain for the remaining projection period.

3. Results for the EU Reference scenario 2013

The Reference 2013 scenario reflects current trends in developments in the EU energy system and in the global energy supply and demand, as described in detail in section 2, as well as the consequences of adopted policies presented in the Table 2. In this section, the main effects of these trends and of the implementation of policies listed above are presented, notably on energy demand, power generation and emissions developments for the EU28.

The projections were performed by the PRIMES model and its satellite models: PRIMES-TREMOVE transport model and PRIMES biomass supply model. The horizon of the projection is 2050 and results are available in five-year time steps, for each Member State and for the EU28.[10]

Considering the timeframes of the policies included in the Reference 2013 scenario, the results are presented distinguishing between three time periods, up to 2020, 2020-30 and 2030-50. Up to 2020 the main driver of developments is the achievement of the targets of the 20-20-20 Climate and Energy Package and the EED. This period is characterised by increased penetration of RES and by strong energy efficiency improvements. In parallel, until 2020, increasing international fossil fuel prices have considerable implications on energy demand. Moreover, the reader should keep in mind that the period 2010-2015 is characterised by increased growth rates in energy demand, as the economy is projected to be recovering from the recent economic crisis (see the macroeconomic data in Appendix 1).

In the decade 2020-30, the Reference scenario 2013 does not incorporate further targets with regard to RES, but market dynamics, the on-going enabling policies (such as streamlined authorisation procedures) and technology cost reductions allow for further penetration, albeit at lower growth rates. Also energy efficiency measures implemented up to 2020 continue to deliver improvements in this period (as the lifetime of new appliances, renovated buildings etc. extends beyond the lifetime of the policies). As with renewables, the improvement rates slow-down in the absence of specific new policy measures. International fossil fuel prices are high but more stable in comparison to the previous decade.

The ETS Directive continues to influence the energy system, as the number of EU-ETS emissions allowances, continues decreasing linearly at 1.74% p.a. as specified in the directive. This drives strong emission reductions in particular in the power generation sector, including in the longer term – up to 2050.

Overview of the implications of energy efficiency policies and measures

The Reference 2013 scenario reflects all the policies that have been adopted in recent years regarding energy efficiency in the EU and in MS, including the Energy Efficiency Directive (EED) (see Table 2). In the following, we discuss these measures and provide a general overview of their effects on the energy system, as well as their reflection in the PRIMES model.

First of all, the EED (via its energy savings obligation) and the Energy Performance of Buildings Directive (EPBD) provisions bring about energy efficiency improvements in buildings through energy-related renovations of the existing building stock as well as improvements of the energy performance characteristics in new constructions. Renovations lead to better insulation of the buildings (e.g. through window replacement, better façade insulation, roof insulation) or changes in heating devices, resulting therefore in energy savings at a building level. After 2020, further energy savings are induced as new households are built following regional passive house standards.

Regarding heating systems, in the context of the Reference 2013 scenario, the replacement of equipment is accelerated, as the energy efficiency measures incorporated induce a more rapid uptake of advanced technologies, whereas in the absence of such energy efficiency measures, replacement with new, more efficient technologies would occur only at the normal end of lifetime of the heating equipment. Energy efficiency improvements in heating systems are accelerated further through synergies of the different efficiency measures, such as increased technology

[10] Summary results for EU28 and for each country are presented in the Appendix.

transparency (labelling), efficiency standards (eco-design), highly efficient technical building systems (EPBD), professional support through energy service companies (ESCOs) and energy efficiency obligations on energy distributors and/or retail sellers which are therefore obliged to achieve significant energy savings at their customer sites, etc. The same efficiency improvements apply for cooling/ventilation, water heating and lighting.

The PRIMES model can simulate different energy efficiency policies with different modelling techniques. The model-specific instruments used affect the context and conditions under which individuals, in the modelling represented by stylized agents per sector, make their decisions on energy consumption and the related equipment.

An example of such modelling instruments is the modification of model parameters in order to mirror technology performance or the effects of building codes that are determined jointly in the process of calibrating the interdependent model output to the observations from the relevant statistical year (in this exercise: 2010). Another technique is modification of assumptions about technical and economic performance of future technologies that are available for future choices by consumers within the model projection.

Furthermore, there are specific modelling instruments for capturing the effects of measures that promote or impose efficiency performance standards (BAT, eco-design) and become increasingly important over time as new items penetrate the market while old items are getting out of use. Such modelling instruments relate to individual technologies or groups of technologies and modify the perception of associated costs by the modelled agents or influence the portfolio of technologies that will be available for consumer choice. Another type of measures are those which improve consumer information through education, labelling, correct metering and billing, energy audits and technology support schemes aiming at inciting consumers to select more efficient technologies. Such measures are dealt with through the modelling instruments discussed in this section or are directly reflected in the modelling mechanisms, where economic agents are per se informed correctly about the prevailing and to some extent future prices., depending on the sector (there is less foresight in final demand sectors with shorter equipment lifetimes than in power generation).

The energy efficiency policies mentioned above modify modelling parameters. This applies for example for the factors that affect perception of net energy costs (investment costs minus perceived benefits) including risk factors (e.g. risk related to maintenance costs or technical reliability of advanced technologies if chosen prior to fully established commercial maturity of such technologies). Such changes influence in turn the mix of different technologies delivering the same type of energy services. As in reality, the modelling reflects the existence of mixes of technologies and appliances for the same purpose with different energy consumption and other characteristics, for which economic actors have different perceptions regarding costs. The factors affecting perception of costs vary by equipment type. The efficiency policy induced changes in the Reference scenario for household appliances lead to perceived cost decreases in the more advanced technology options of between 12 and 20% compared to the costs that would have been perceived in the absence of the energy efficiency policies.

The penetration of ESCOs as explicitly incited by the EED leads to an environment with reduced risks for the consumers engaging in energy efficiency renovations, which can include both changes in the building structure and changes in the energy equipment. This is represented in the modelling by reduced discount rates for certain sectors, mirroring the changes in the decision making conditions and constraints of e.g. households and services. Consequently, the (high) subjective discount rates which prevail in capital-budgeting decisions when such decisions are taken solely by individuals, facing high information costs, are reduced, moving closer to business interest rates. In fact, the involvement of ESCO and the obligation for energy distributors and retail sellers to facilitate energy efficiency investment at the premises of final customers enable individuals to make more cost-

effective choices thanks to the professional support of e.g. ESCOs and utilities that are obliged to achieve energy savings with their customers. In this way lower discount rates reduce the high weight that initial investment costs have compared with future energy cost savings. In addition, these measures also induce lower technical and financial risk, hence reducing the perceived costs of new technologies and saving investments, (see also point above on perception of costs). The discount rates used for the Reference scenario 2013 are reported in the introductory section.

Another key modelling tool are efficiency values (EVs) reflecting a variety of broad and sometimes unspecified instruments that bring about efficiency improvements. In the most concrete form these values represent the price of hypothetical White Certificates, reflecting the marginal costs of reaching energy savings obligations, e.g. for energy distributors and retail sellers regarding energy efficiency at final customers sites. In the Reference scenario, these values represent the implementation of the EED energy savings obligations in domestic and service sectors, specific building renovation policy efforts or a large range of other pertinent measures, such as energy audits, energy management systems, good energy advice to consumers on the various benefits of energy efficiency investment and better practices, targeted energy efficiency education, significant voluntary agreements, etc.

In modelling terms therefore, the PRIMES model includes a number of instruments to reflect policies leading to efficiency improvements.

The EED includes specific public procurement provisions which translate into a 3% p.a. refurbishment rate in the modelling and induce multiplier effects, as the public sector assumes an exemplary role, i.e. private consumers are imitating the public sector energy efficiency actions. Moreover, energy efficiency obligations on energy distributors and retail sellers, as well as alternative policy measures (e.g. financing, fiscal, voluntary, and information measures) required by MS according to the EED, drive further investment choices in improving thermal integrity of houses and buildings, as well as the introduction of more efficient appliances and better management of existing equipment in final energy use sectors. For the modelling of the energy savings obligation or alternative measures it has been assumed that the possible exemptions for ETS installations and transport are used.

Energy efficiency improvements also occur on the energy supply side, through the promotion of investments in CHP and in distributed steam and heat networks. These investments are combined with incentives on the consumer side to shift towards heating through district heating, both in the residential and the tertiary sectors[11].

Improvements in the network tariff system and the regulations regarding the design and operation of gas and electricity infrastructure are also required in the context of the EED; moreover, the EED requires MS and regulators to encourage and promote participation of demand side response in wholesale and retail markets. In this context, the Reference 2013 scenario assumes that intelligent metering is gradually introduced in the electricity system, enabling consumers to more actively manage their energy use. This allows for demand responses so as to decrease peak and over-charging situations, which generally imply higher losses in the power grids. Thus, efficiency is also improved as a result of the intelligent operation of the systems.

Finally, some policies and measures that do not target energy efficiency directly, but for example target emissions reduction, lead to significant additional energy efficiency benefits. Among these policies are the ETS Directive (for details see section on ETS below), the Effort Sharing Decision (ESD), and the CO_2 standards for cars and vans. These policies drive energy efficiency improvements along with fuel switching as a means of achieving reduction of emissions. The ESD defines legally binding national GHG emission targets in 2020 compared with 2005 for sectors

[11] This incurs some rebound effects, e.g. houses connected to district heating generally consume more heat than houses which use individual (non-central) heating equipment, as district heating is more cost efficient; such features are automatically integrated in this price responsive energy modelling

not covered by the EU ETS, ranging between -20% and +20%, which shall lead to a EU-wide emission reduction by 10%. To achieve the targets, it also defines for each country a linear emission path between 2013 and 2020 which has to be satisfied each year but is subject to a number of important flexibility mechanisms, e.g. a carry-forward of emission allocations, transfers between Member States and use of international credits. It turned out that for the EU as a whole the -10% target is achieved without the need for modelling additional specific policy incentives. With regard to the national target trajectories, in general, flexibility both over time and between Member States via the use of transfers has been assumed to reflect the use of economically effective options to meet the targets while respecting the clear Member State indications on flexibility limitations[12].

For the CO_2 standards for cars and vans, it is assumed, based on current reduction trends, that the 2020 CO_2 targets for new vehicles set out in the regulations are achieved and remain constant afterwards (for cars 95gCO_2/km, for vans 147gCO_2/km).

Policies on promoting RES also indirectly lead to energy efficiency gains; in statistical terms many RES, such as hydro, wind and solar PV, have an efficiency factor of 1; thus, the penetration of RES in all sectors, in particular in power generation, induces energy savings. Other measures that foster energy efficiency are financial instruments, in particular excise type taxes (including those reflecting emissions); they are directly modelled in PRIMES allowing for the full reflection of the effects of energy taxation and other financial instruments on end user prices and energy consumption.

Overall, the energy savings achieved in the Reference 2013 scenario in 2020 amount to 16.8% (Table 3) using the metric defined for the 20% energy savings target. This figure is obtained through comparison with the primary energy consumption (defined as gross inland consumption minus non-energy use) projections of the Baseline 2007 scenario, which has been used as the base for the energy savings objective of the 20-20-20 climate and energy package. The projected decrease reflects the aggregate effect on energy consumption of all the policies that are included in the Reference 2013 scenario.

TABLE 3: EFFECT OF POLICIES ADOPTED IN THE REFERENCE 2013 SCENARIO ON ENERGY CONSUMPTION[13]

	2020	2030	2050
Primary energy consumption - % change from Baseline 2007*	-16.8%	-21.0%	
Primary energy consumption - % change from Reference 2011	-2.5%	-1.3%	1.2%
Gross inland consumption - % change from 2005**	-9.2%	-12.1%	-11.1%
Primary energy consumption - % change from 2005	-9.9%	-13.0%	-11.8%

* Time horizon of Baseline 2007 scenario was year 2030

** Year 2005 was the peak year for energy consumption in the EU

General overview of RES supporting measures and the evolution of RES indicators

The Reference 2013 scenario starts from the assumption that the EU energy system evolves so that the legally binding targets on RES (20% share of gross final energy consumption from RES by 2020 and 10% specifically in the transport sector) are achieved. In parallel, the framework for the penetration of RES significantly improves in the projection, as the Reference 2013 scenario incorporates known direct RES aids (e.g. feed-in tariffs) and other RES enabling policies, such as priority access, grid development and streamlined authorisation procedures. Obviously, RES penetration is also facilitated by the ETS (depending on carbon prices).

As indicated in the Member States' submissions to the EC, the national RES 2020 targets are generally expected to be achieved at the Member State level, including only very limited recourse to the co-operation mechanism for those few countries that have not excluded making use of it. Drawing on current Member States plans to meet their legal obligations, the Reference 2013 scenario takes into account the Member States projections on the trajectories of the RES shares by sector (RES-H&C for heat-

[12] Given the projected EU-wide compliance, it has been assumed that transfers between Member States will be available at very low prices just covering administrative costs, making it economically unattractive to resort to the permitted use of international credits. The relatively small costs and benefits of these emission transfers have been included in the total system costs for 2020.

[13] Primary energy consumption is defined as gross inland consumption minus non-energy use.

ing and cooling, RES-T for transport and RES-E for electricity) as expressed in the respective National Renewable Energy Action Plans (NREAPs).

The PRIMES model has included detailed modelling of Member State policies representing a variety of economic support schemes, including feed-in-tariffs. A survey has been conducted for the purpose of the Reference 2013 scenario to correctly represent current incentive schemes by Member State, including their budget limitations when these exist. The existing incentives have been then extrapolated to 2020 (if the Member State does not include provisions up to 2020) in a conservative manner. The RES investments resulting from the overall policy and economic context as well as incentives have been projected assuming that investors evaluate project specific Internal Rates of Return including the financial incentives and decide upon investing accordingly. The projected RES investments implied directly for the financial incentives are considered as given by the market model which decides upon the remaining potentially necessary investments (among all power generation technologies) based on pure economic considerations with a view to meeting the RES obligations.

Special fuel and electricity price elements (fees) are accounted for in the model to recover fully all the costs for the RES which are calculated through the incentives and the contracting obligations over time. The model further keeps track of the RES technology vintages as projected and the outstanding fee is raised throughout the economic lifetime of the thus built power capacity, therefore also beyond 2020. For Member States which do not achieve their RES target through direct incentive policies, an additional instrument is included in the modelling the so-called RES-value which is a dual variable for RES - introduced to meet the targets by Member State. The value represents yet unknown policies to provide incentives for RES such as further legislative facilitations, easier site availability or grid access, or even direct financial incentives, etc. The costs related to investments induced through the RES-value are fully recovered through electricity prices.

Overall, at the EU level, the RES share in gross final energy consumption in 2020 reaches 20.9% (Figure 10).

Beyond 2020, no additional RES targets are set. However, RES enabling policies, the ETS and some direct aids (depending on technologies and Member State) continue; the direct aids are assumed to phase out at a pace depending on RES technology. These assumptions - in combination with technology progress (capital cost reduction due to learning effects) - lead to further increase in RES penetration. In power generation particularly, the continuation of the ETS has a significant effect; until 2030, the share of RES in power generation reaches 43%, and 50% by 2050. In transport the increasing RES share is due to further penetration of biofuels and moderate electrification. Overall, RES in gross final energy consumption account for 24% and 29% in 2030 and 2050 respectively.

Although direct incentives are phased out, in power generation the investments in RES continue beyond 2020 due to three main factors: (1) continued learning by doing of technologies including continued RDI especially for innovative RES, (2) the ETS price and (3) extensions in the grid and improvement in market-based balancing of RES as well as streamlined authorization and priority access. The feed-in tariffs and other country specific financial incentives are assumed to be phased out beyond 2020 with the exception of incentives for innovative technologies such as tidal, geothermal, solar thermal, solar PV and remote off-shore wind where the phase out is more gradual. As to the RES-values, they steeply decrease beyond 2020, in the absence of specific RES obligations after 2020; therefore RES investments beyond 2020 are mainly driven by ETS carbon prices and are facilitated by non-financial supporting policies.

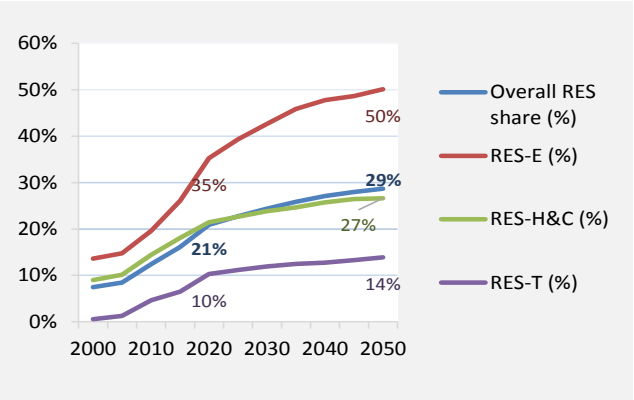
The learning by doing of RES technologies continues throughout the projection period and allows for some of the RES technologies to become economically competitive already after 2020.

The ETS prices, which rise considerably towards the end of the projection period (see next section), act as an incentive and as the model simulates perfect foresight, the investments are spread throughout the projection period.

A further important element concerns the changes in the electricity transmission system and the power market. Through the improvements in the grid and the Ten Years Network Development Plan of ENTSO-E the grid is better suited for up-taking higher shares of RES. Furthermore, it is assumed in the PRIMES modelling that the management of flows due to the implementation of the internal market changes. The EU target model is assumed to be successfully implemented. The Reference scenario modelling includes flow based allocation of interconnection capacities, assuming a market model purely basing trade on market forces throughout the EU internal energy market with perfectly operating market coupling across all participating countries. This market is assumed to operate successfully mainly beyond 2020. It implies that the balancing of RES occurs in a very cooperative and cost-efficient manner avoiding excessive investments in peak devices that would be resulting if national perspectives in balancing were persisting. Therefore the market improvements and the EU-wide market coupling allows for rather low balancing costs for RES, thus easing their market penetration.

Due to these changes in the system, the projected penetration of RES in power generation continues beyond 2020, albeit at a decelerated pace compared to the time period before 2020, and allows the share of RES in electricity (RES-E) to reach 50% by 2050.

FIGURE 10: RES INDICATORS AT THE EU LEVEL[14]



[14] Figures calculated according to the provision of RES Directive.

Overview of the EU ETS and projections on carbon prices

The EU ETS is modelled in its amended scope (third trading period from 2013 onwards), including also aviation, further industrial process emissions and certain industrial non-CO_2 GHGs. The latter are integrated based on results of GAINS non-CO_2 modelling (see section on non-CO_2 emission results) and PRIMES then ensures consistent modelling of the complete ETS. The annual volume of available EU ETS allowances (quoted as allowances hereafter) following the Directive provisions on the emissions cap, is assumed to decrease by 1.74% p.a. from 2013 throughout the projection period, except for aviation for which the cap remains stable from 2013 onwards at 95% of average 2004-6 emission levels. Aviation is modelled in the scope covered by EUROSTAT and therefore PRIMES based on fuels sold in the EU, which corresponds to domestic and outgoing international flights only.

International credits, priced at very low levels, are expected to be used in the period until 2020, and reaching the maximum permissible amount, preliminarily estimated for the modelling as around 1750 Mt CO_2 cumulatively.

The assumed cumulative emission cap 2008 to 2050 including the permissible international credits is around 69500 Mt. The different allowance allocation rules (auctioning, free allowances based on benchmarks) for the different sectors foreseen in the legislation, and including the provisions for sectors at risk of carbon leakage, are reflected in the modelling.

ETS prices are endogenously derived so as the cumulative ETS cap is met; the continuously decreasing number of available allowances combined with the significant allowance surplus which is only projected to decrease after 2020 (see below) suggest that the ETS price will follow only a slowly increasing trend until 2025 and stronger increases thereafter; it is projected to reach 10€'10/tCO_2 in 2020, 35€'10/tCO_2 in 2030 and 100€'10/tCO_2 in 2050 (Figure 11). The PRIMES model simulates emission reductions in ETS sectors as a response to current and future ETS prices (Figure 12), taking into account risk-averse behav-

ior of market agents which leads to banking of allowances; perfect foresight of the carbon price progression in the period 2020-50 and that no borrowing from the future is permitted. Increasing ETS prices induce a switch in power generation towards the use of low and zero carbon fuels or technologies (e.g. RES and CCS). Moreover, the increase in the cost of energy, reflecting the increasing ETS prices, supports energy efficiency and fuel switching in the ETS sectors. Finally, increasing ETS prices indirectly influence energy efficiency in demand side sectors as well, since expenditures for ETS allowances are passed through to consumer prices, notably in electricity prices.

With the current and projected low level of the ETS prices, the ETS emissions target for 2020 is achieved as there is also a large amount of additional policies implemented, particularly RES support policies but also the EED, which influence also the ETS sectors, and because the economic crisis substantially reduced the industrial production as well as power demand and thus GHG emissions. The projection of ETS prices is based on the assumptions that actors are risk-averse and have strong trust in the continuation of the ETS legislation; should this not to be the case, ETS prices would drop considerably below the projected levels in the short term.

In the longer term, the trend of very low carbon prices is reversed; beginning in 2030 and throughout the period to 2050, the level of the ETS price is increasing significantly. This is the consequence of decreasing allowances supply following the implementation of the linear reduction factor that reduces the cap substantially over time and a combination of energy supply factors, namely of the delayed technology developments of CCS, public acceptance problems with nuclear energy and CO_2 storage, the updated offshore wind cost assumptions and phasing out of RES support as well as the trends in world fuel prices, where a decoupling of oil and gas prices takes place, with gas prices remaining in the longer term at relatively stable levels.

FIGURE 11: PROJECTION OF THE ETS PRICE

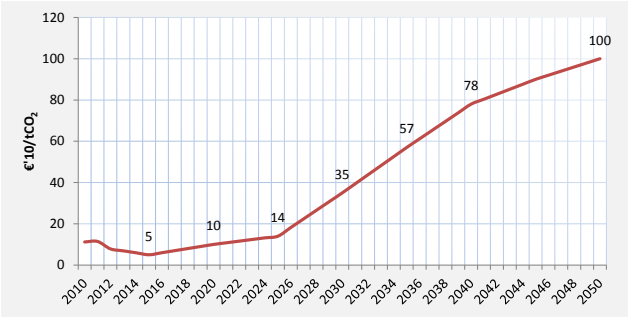


FIGURE 12: AVAILABLE ALLOWANCES[15] AND ETS GHG EMISSIONS PROJECTION

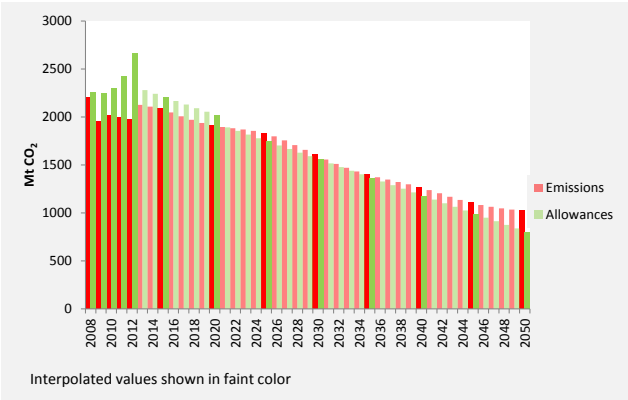
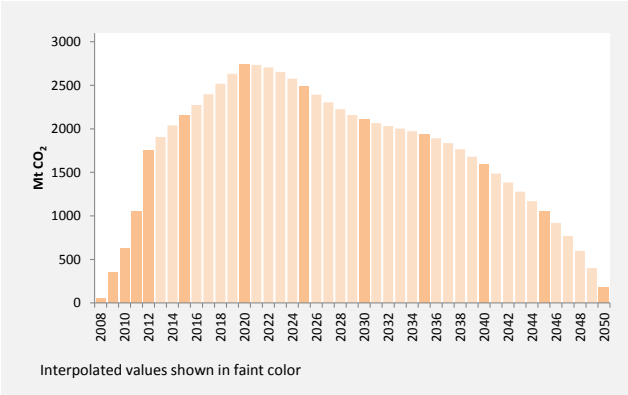


FIGURE 13: PROJECTION OF ALLOWANCES SURPLUS



Phase II of the ETS has seen a rapid build-up of an allowances surplus which is banked into phase III, resulting from lower than expected emissions caused by the economic crisis unfolding as of 2008 and the early use of international credits. This surplus of allowances continues to increase in the short term, although there is economic recovery in the time period up to 2020. Together with the indicated drivers and complementary policies, risk-averse behaviour contributes to further banking of allowances until 2020

[15] Allowances include the permissible use of international credits.

(Figure 13)[16]. Beyond this time period, the gradually increasing ETS prices lead to a progressive use of previously banked allowances, which results in an almost complete exhaustion of the projected surplus by 2050. As emitters perceive the future carbon prices (perfect foresight), banked allowances are used particularly in the end of the projection period where the ETS price has increased substantially[17].

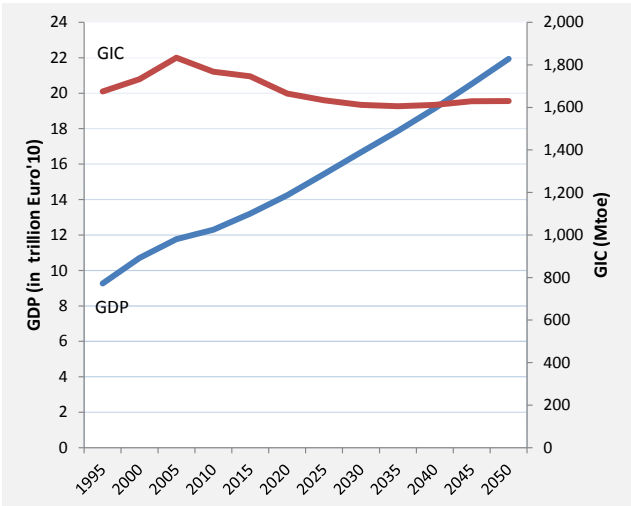
Energy consumption

The Reference 2013 scenario is characterized by accelerating energy efficiency improvements, in particular until 2020 and continuing throughout the remaining projection period – as demonstrated by the declining energy intensity of GDP. Gross inland consumption (GIC) and GDP growth decouple (Figure 14), a trend that is enhanced by the newly introduced legislation especially on energy efficiency and revised assumptions about economic growth. As becomes apparent in Figure 14, the shift from past increasing trends of energy consumption is occurring in the period 2005-10, where apart from relevant legislation, the economic crisis also has a downward effect on energy consumption. The downward trend on energy consumption commenced before the onset of the economic crisis, with EU energy consumption having peaked in 2006. Despite the gradual economic recovery after the crisis, GIC does not resume growth, instead it continuously decreases until 2035 and demonstrates a moderate increase thereafter, yet staying well below the 2010 level.

The projection indicates a shift in the fuel mix of GIC over time towards renewable energy forms (Figure 16). This also contributes towards lower energy intensity since many RES technologies (e.g. hydro, solar, wind) have, in statistical terms, an efficiency factor of 1 thus, the penetration of RES in all sectors, in particular in power generation, induces a further reduction in GIC, given that alternative fossil fuel or nuclear technologies would operate with lower efficiencies.

The main drivers of decreasing GIC are the developments in final energy demand. These reflect the implemented energy efficiency policies that include, among others, the Energy Efficiency Directive (EED), Energy Performance of Buildings Directive (EPBD), the Eco-design Directive and a host of implementing Regulations for specific products, CO_2 emissions standards for light duty vehicles etc. Following existing legislation until 2020, the assumed implementation of these measures is delivering significant energy efficiency improvements with effects going also beyond 2020. High international energy prices, as well as the relatively low growth rates projected for the energy-intensive industries, further reduce energy consumption. Beyond 2030, in the absence of additional policies on efficiency, final energy consumption follows an increasing pace, albeit slow. It is thus visible that the developments of the energy system in the decades 2010-20 and 2020-30 will have already set the ground for an economy with lower energy intensity. Finally, the ETS continues to indirectly support energy efficiency in the ETS sectors, throughout the projection period.

FIGURE 14: GIC IN RELATION TO GDP



[16] The absolute amount and time profile of the presented surplus is valid for the described and partly simplifying modelling assumptions taken, for example due to the cut-off date and given that the model proceeds in five year steps and the yearly data is based on interpolations and estimates. Other Commission analyses may therefore present different and more up to date results.

[17] ETS back-loading is not included in the modelling as no corresponding legislation exists at the time of this analysis.

FIGURE 15: ENERGY INTENSITY PROJECTIONS BY SECTOR[18]

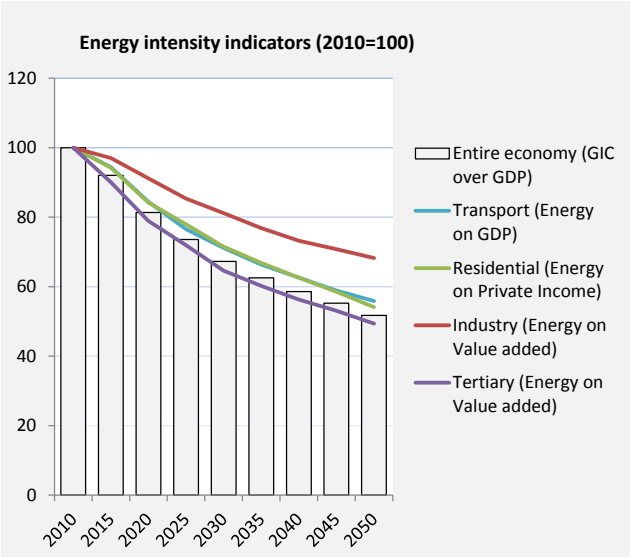


FIGURE 16: GROSS INLAND CONSUMPTION

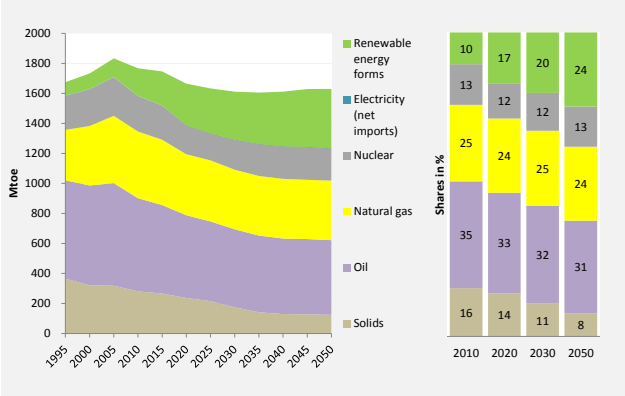
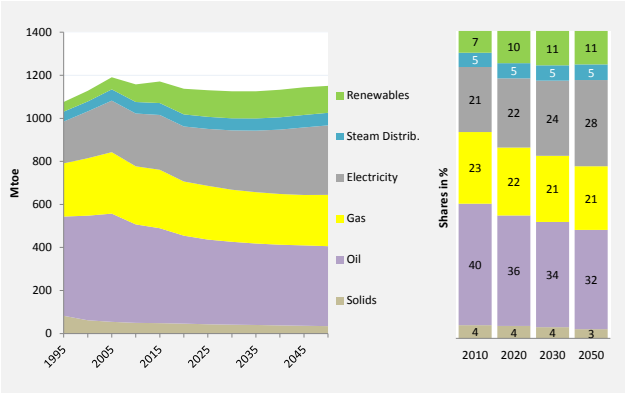
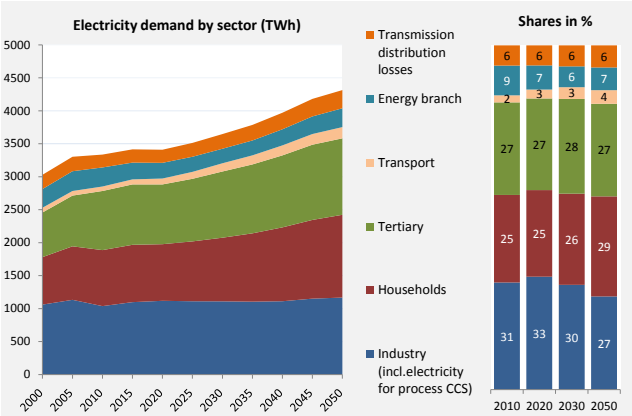


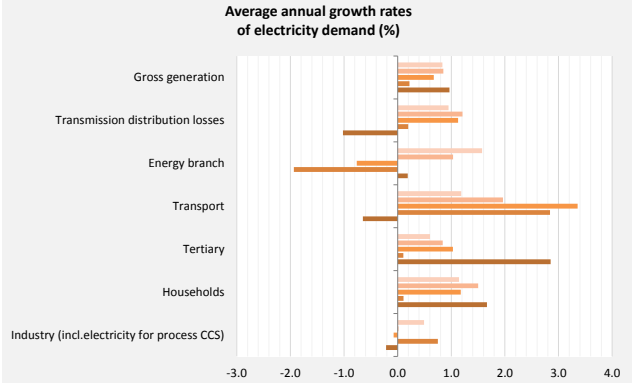
FIGURE 17: FINAL ENERGY CONSUMPTION



In addition to the considerable energy savings, the projection also indicates a switch in the fuel mix of final energy consumption over time, in favour of renewable energy forms (Figure 17). This shift is driven by the binding targets on RES and energy efficiency policies until 2020 with effects continuing until 2030, and by the ETS even beyond 2030. The share of oil decreases, but remains at a relatively high level as transportation is projected to remain dominated by oil. Consumption of solid fuels declines considerably throughout the projection period.

FIGURE 18: TRENDS IN ELECTRICITY DEMAND BY SECTOR





	Industry (incl.electricity for process CCS)	Households	Tertiary	Transport	Energy branch	Transmission distribution losses	Gross generation
'40-'50	0.5	1.1	0.6	1.2	1.6	0.9	0.8
'30-'40	0.0	1.5	0.8	2.0	1.0	1.2	0.9
'20-'30	-0.1	1.2	1.0	3.4	-0.8	1.1	0.7
'10-'20	0.7	0.1	0.1	2.8	-1.9	0.2	0.2
'00-'10	-0.2	1.7	2.9	-0.6	0.2	-1.0	1.0

In final energy demand, electrification is a persisting trend (Figure 18). This is due to two effects: a shift towards electricity for heating and cooling (due to higher demand for air conditioning and the introduction of electric heat pumps) and a continued increase of electric appliances in the residential and the tertiary sector (mainly IT, leisure and communication appliances). It is also the result of CO_2 standards for light duty vehicles and further electrification of rail – leading to higher uptake of electricity in the transport

[18] The ratio between the energy use and GDP is influenced not only by energy efficiency in transport but also by the evolution of the volume of transport activity to GDP. Therefore, in Figure 24 the relationship between transport energy consumption and transport activity is presented in addition to the relationship between transport energy consumption and GDP.

sector. In the period until 2020, when energy efficiency policies are being implemented, the growth rate of electricity demand is less than 0.5% per year up to 2020; thereafter, without specific energy efficiency policies the electricity demand growth rate becomes almost 1% per year.

In the following section, we present in detail the trends on final energy consumption by sector.

Industrial sector

The activity of the industrial sector is projected to recover from the current crisis and follow an increasing pace in the future, with the non-energy intensive sectors growing faster. This implies that energy consumption of the sector will grow at a slower rate relative to the activity of the sector. In parallel, following the trends of previous years, energy efficiency of production processes in the sector improves over time in order for the sector to remain globally competitive, with higher gains observed in the period until 2030 (Table 4) supported by the implementation of corresponding policies.

Overall, the trend on energy consumption is clearly upward for the period until 2015, following the recovery from the economic crisis; beyond 2015 and throughout the remaining projection period, energy efficiency improvements offset the effects from the growth of sectorial activity, and as a result energy consumption appears to change only moderately over time (Figure 19).

These trends are accompanied by a decline in the use of coal and oil, to the benefit of renewable energy forms (biomass and waste) and to a lesser extent electricity (Figure 20). This fuel shift is driven by the mandatory emission reductions that industrial activities should achieve in the context of the Integrated Pollution Prevention and Control (IPPC) and the Large Combustion Plant Directives (LCP), as well as because of national action for complying with the binding national targets of the Effort Sharing Decision (ESD) in the short-term (concerning the non-ETS industries) and the increasing ETS prices (concerning the ETS industries) mainly in the long-term. Switch to biomass and waste is also driven by the upward trajectory of fossil fuel prices and is compatible with the need for resource-efficiency, which will be one of the drivers of global competitiveness. Finally, the provisions on cogeneration in the EED in addition to the Cogeneration Directive promote the penetration of highly efficient cogeneration and the use of waste heat for steam generation in industrial sites.

TABLE 4: AVERAGE ANNUAL CHANGE OF ENERGY CONSUMPTION IN THE INDUSTRY SECTOR

Average annual change of energy consumption per unit of physical industrial output (%)				
per unit of physical industrial output (%)	*2010-00*	2020-10	2030-20	2050-30
Iron and steel	*-1.42*	-0.93	-0.53	-0.30
Non ferrous metals	*-2.02*	-0.54	-0.40	-0.39
Chemicals	*-3.30*	-0.68	-1.20	-0.77
Non metallic minerals	*-0.88*	-0.44	-0.46	-0.03
Paper and pulp	*0.50*	-0.79	-0.94	-0.54
Food, drink and tobacco	*-0.60*	-0.57	-0.99	-0.52
Engineering	*-1.40*	-0.51	-0.71	-0.46
Textiles	*-3.22*	-0.17	-0.89	-0.51
Other industries	*-0.98*	-0.74	-0.87	-0.49

FIGURE 19: FINAL ENERGY CONSUMPTION OF THE INDUSTRIAL SECTOR

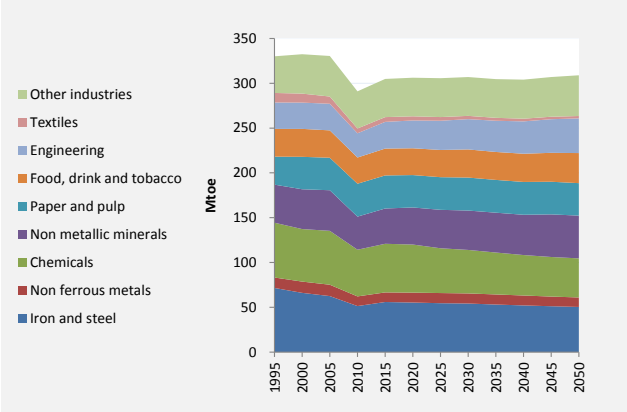
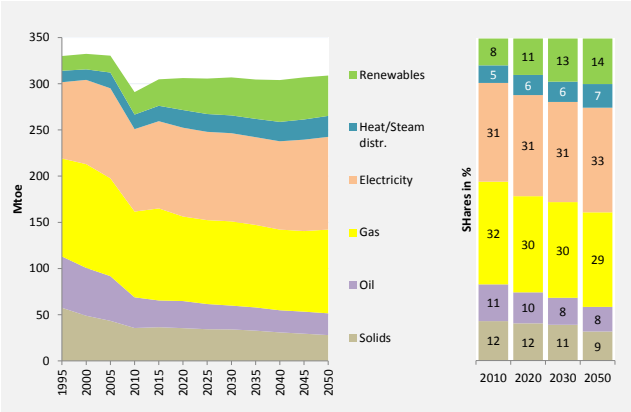


FIGURE 20: FINAL ENERGY CONSUMPTION OF THE INDUSTRIAL SECTOR BY ENERGY FORM



Residential sector

Energy demand in the residential sector is projected to stabilize in the short term. After 2015 and throughout the remaining projection period, final residential energy demand remains below the level of 2010. This is attributable to the fact that the portfolio of policies

and regulatory provisions (notably EPBD) for the residential sector that is assumed in the Reference 2013 scenario is very rich, and drives considerable energy efficiency savings.

In general, energy efficiency in the residential sector (as well as the tertiary sector) can be improved by:

- using more efficient energy equipment (e.g. lighting, electric appliances, heating and cooling appliances),

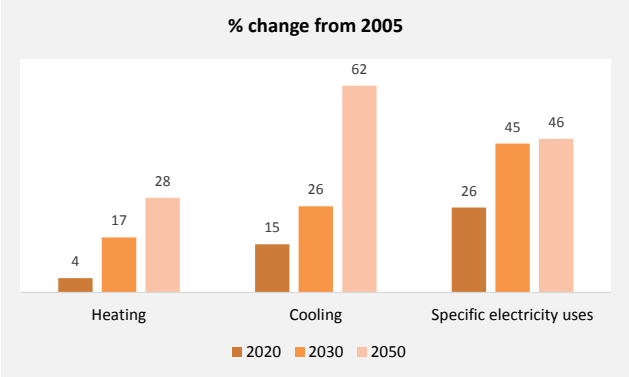
- upgrading energy characteristics of buildings (e.g. thermal integrity of buildings), or

- inducing changes in energy consuming behaviour.

In the Reference 2013 scenario, there is a general improvement in the efficiency of energy using equipment across the EU which is related to the effects of the implementation of relevant policies. These policies include notably the EED including the savings obligation on distribution companies and retail sellers, the provision on the exemplary role of public authorities as well as all the other provisions stimulating more energy efficient behaviour. In addition, eco-design standards as well as energy performance of buildings requirements as well as "soft" measures, such as public campaigns play a role along with measures improving transparency for allowing more energy efficient choices (Labelling Directives).

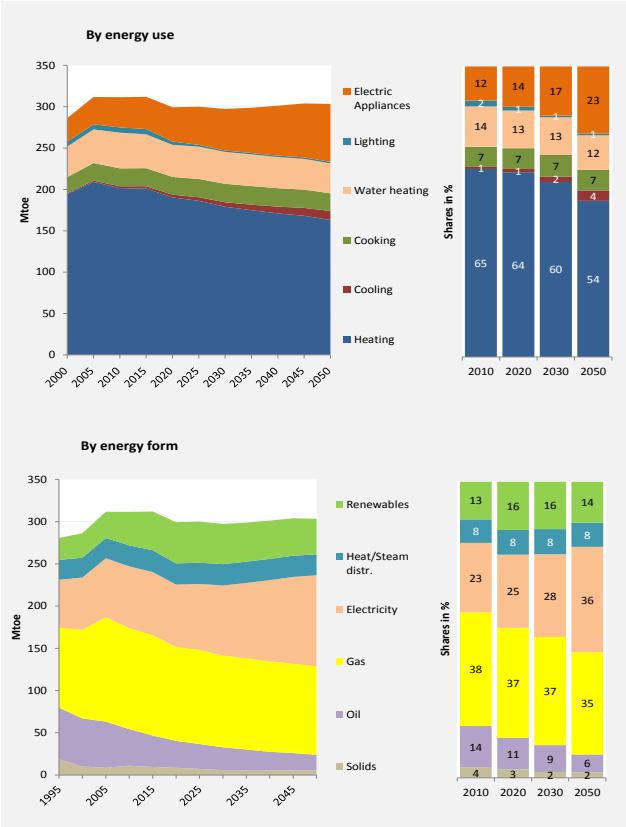
Regarding the energy efficiency obligations on buildings and strict building codes (included both in the EPBD and the EED), they drive investment choices improving thermal integrity of houses and efficiency of heating appliances, with overall final energy demand for heating and cooling purposes decreasing by 8% in 2020, 12% in 2030 and 17% in 2050 relative to 2005. Energy consumed for heating purposes drops to 2000 levels already by 2020 and further decreases thereafter (Figure 22). Regarding the use of different energy forms, increased efficiency requirements drive a shift towards the use of electric heat pumps, which is partly the reason of the increasing shares of electricity consumption in the residential sector. Additionally, the use of heating oil decreases to the benefit of gas, especially beyond 2030, in part because of the relatively low natural gas prices (in comparison to oil).

FIGURE 21: IMPROVEMENTS IN EFFICIENCY OF THE ENERGY EQUIPMENT IN THE RESIDENTIAL SECTOR COMPARED TO 2005



The main reason behind the continuous electrification of the sector, as demonstrated in Figure 22, is the increasing penetration of electric appliances and their quality improvements. This concerns mainly “black” appliances (mobile phones, TVs, PCs etc.). At the same time eco-design regulations drive significant energy savings in specific electricity uses; the average efficiency of appliances and lighting improves by approximately 25% in 2020 and by 45% in 2030, relative to 2005.

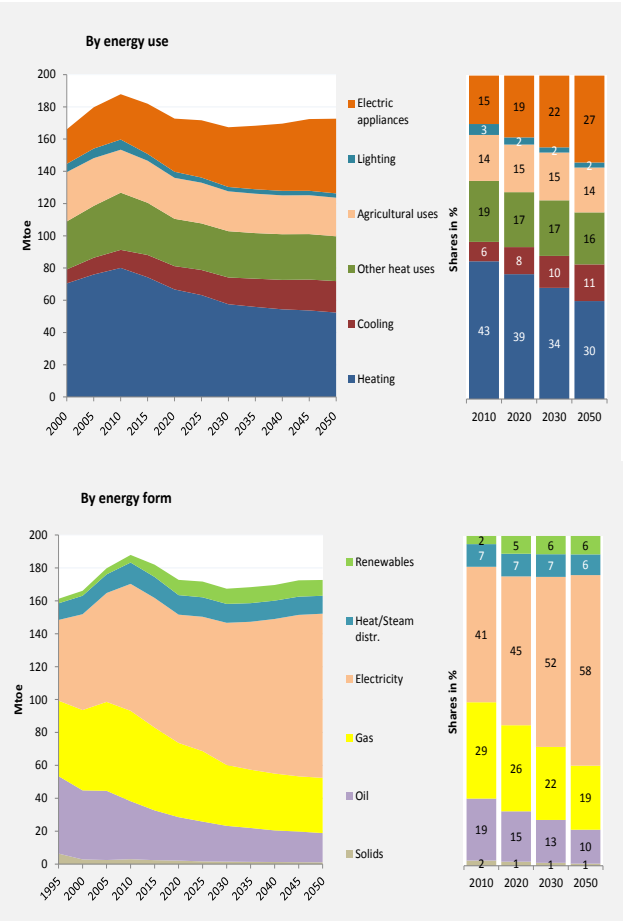
FIGURE 22: FINAL ENERGY DEMAND IN THE RESIDENTIAL SECTOR



Tertiary sector (services and agriculture)

Projections of final energy demand in the tertiary sector follow the same trends as for the residential sector; energy consumption decline strongly between 2010 and 2020, followed by a decade of moderate decrease and a slight increase after 2030. Energy efficiency gains brought about by eco-design policies, energy efficiency policies stemming notably from obligations under the EED and policies on the energy performance of buildings, are very significant, and over-compensate the effects of increasing sectorial activity up to 2030, driving final energy demand below 2010 peak levels throughout the entire projection period. Marked efficiency progress is observed both for heating and for specific electricity consumption, in particular in the medium term (2020-30), driving energy consumption downwards in the period 2010-30, contrasting past increasing trends (Figure 23). Beyond 2030, where no additional energy saving policies are implemented, energy consumption resumes an increasing, albeit slow, pace of growth.

FIGURE 23: FINAL ENERGY DEMAND IN THE TERTIARY SECTOR



Electrification of the tertiary sector is very significant. The considerable increase in electricity consumption concerns primarily the use of electric appliances and the use of electricity for heating and cooling purposes (heat pumps). The use of heating oil and gas follows a decreasing trend, which is steeper in the period up to 2030, attributable to energy efficiency policies. Throughout the projection period, gas substitutes oil for heating purposes.

Transport sector

The activity of the transport sector is growing significantly with the highest growth rates occurring from 2010 to 2030, driven by developments in economic activity. This concerns both passenger and freight transport. Freight transport in particular is growing at higher rates than passenger transport, following more closely the GDP developments.

Beyond 2030, the activity of passenger transport continues to grow albeit at slow rates, as a result of stagnant and after 2040 decreasing population, deceleration in GDP growth and saturation of passenger car demand.

Freight transport follows a similar trend to passenger activity after 2030, resulting from the slow-down of GDP growth as well as from the shift of economic activities towards services and limits to distant sourcing and off-shoring.

Road transport is expected to maintain its dominant role in passenger transport by 2050, despite growing at lower pace relative to other modes (0.6% p.a.). Passenger cars alone would represent about 67% of total passenger transport activity in 2050 although their modal share would decrease by about 7 percentage points between 2010 and 2050. As previously mentioned, the growth slowdown for passenger cars activity could be explained by the car ownership which is close to saturation levels in many EU15 Member States but also by the high congestion levels, the increase in fossil fuel prices and the ageing of the EU population. Transport activity of buses and coaches and powered 2-wheelers would grow at slightly higher rates than passenger cars activity by 2050, 0.7% p.a. and 1.1% p.a., respectively. Overall, the share of road transport (including buses and coaches and powered 2-wheelers in addition to passenger cars) in total passenger transport activity

would go down from about 84% in 2010 to 76% in 2050.

Air transport is projected to be the highest growing of all passenger transport modes, going up by 133% between 2010 and 2050 (2.1% p.a.), mainly due to the large increase of international trips (e.g. to emerging economies in Asia). Higher potential for air traffic growth (3.1% p.a. for 2010-2050), including for international holiday trips, is expected in EU12 MS due to their less mature markets and faster growing GDP per capita. Aviation activity in EU15 would increase at a lower rate compared to EU12 due to weaker growth of GDP per capita and the available capacity at the airports. Overall, air transport is expected to increase its modal share by about 5 percentage points, from 8% in 2010 to 13% in 2050, and become the second most important passenger mode after road transport.

Passenger rail activity is projected to increase by 79% during 2010-2050 (1.5% p.a.) and expand its modal share by 2 percentage points (from 8% in 2010 to 10% in 2050), driven in particular by the completion of the TEN-T core network by 2030 and of the comprehensive network by 2050. High-speed rail sees a significant increase in terms of volume (2.5% p.a. during 2010-2050) and share as a result of the infrastructure build-up and the upgrade of existing railway lines. About 37% of passenger rail traffic, expressed in passenger-kilometres, would be carried by high-speed rail by 2050.

Passenger rail competes with both road and air transport. In EU15 a relatively important share of additional demand would be covered by rail (in most cases high-speed rail where investments are foreseen), considering the saturation of passenger car demand. The increase of fossil fuel prices also shifts part of the passenger road traffic to rail. In addition, high-speed rail attracts demand from short-haul air travel.

Inland navigation[19] holds a small share of total passenger transport activity and projections show a moderate increase at EU level (0.7% p.a. between 2010 and 2050).

Freight transport activity showed steady growth between 2005 and 2007, continuing the 1995-2005 trend. However, the economic crisis led to a reduction of activity in the subsequent years resulting in lower levels in 2010 compared to 2005. The projections show an increase in the total freight transport activity by about 57% (1.1% p.a.) between 2010 and 2050. Notably, the strong growth in activity (1.7% p.a.) in the short-term (up to 2015), driven by GDP developments, allows the recovery of freight transport activity to pre-crisis levels.

Freight traffic shows strong correlation with GDP growth until 2030. The completion of the TEN-T core network by 2030 and of the comprehensive network by 2050 is expected to provide more adequate transport infrastructure coverage and support a concentration of trans-national traffic and long-distance flows. It is also expected to provide support for logistic functions and improve inter-modal integration (road, rail, and inland navigation), through the innovative information management systems which are part of the network, and reduce the time losses caused by road congestion. As already mentioned, beyond 2030, weaker growth prospects together with shifts in GDP composition towards services and information activities and limits to distant sourcing and off-shoring contribute to a certain weakening in freight transport activity.

Road freight traffic is projected to increase by about 55% between 2010 and 2050 (1.1% p.a.), but growth is unevenly distributed between the EU15 and EU12. The highest growth in road freight transport activity would take place in the EU12 (72% for 2010-2050, equivalent to 1.4% p.a.) where a strong correlation with GDP growth can be observed. Overall, road freight sees a slight reduction in its modal share, from 71% in 2010 to 70% in 2050.

By 2050, rail freight features the highest growth among the freight transport modes (79%, equivalent to 1.5% p.a.) and increases its modal share from almost 16% in 2010 to 18% in 2050. The significant increase in rail freight transport activity is mainly driv-

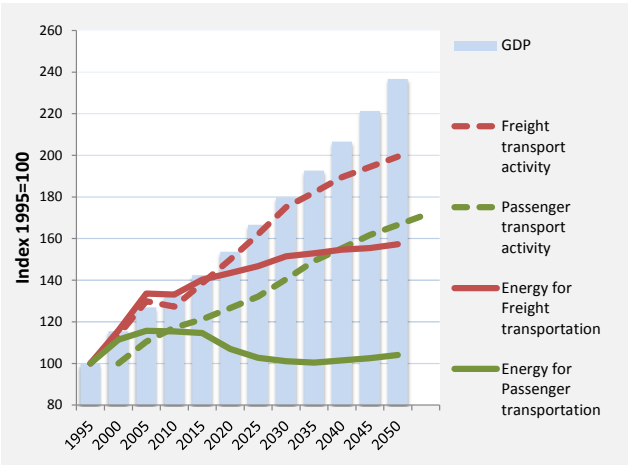
[19] Inland navigation includes inland waterways and national maritime transport.

en by the completion of the TEN-T core and comprehensive network; thus improving the competitiveness of the mode.

Inland navigation traffic also benefits from the recovery in GDP growth and the completion of the TEN-T core and comprehensive network, including support for the logistic functions and improved inter-modal integration, and is thus projected to grow by 41% between 2010 and 2050 (0.9% p.a.). However, the relatively stronger growth in road and rail traffic leads to a slight decrease in its modal share, from about 13% in 2010 to 12% in 2050.

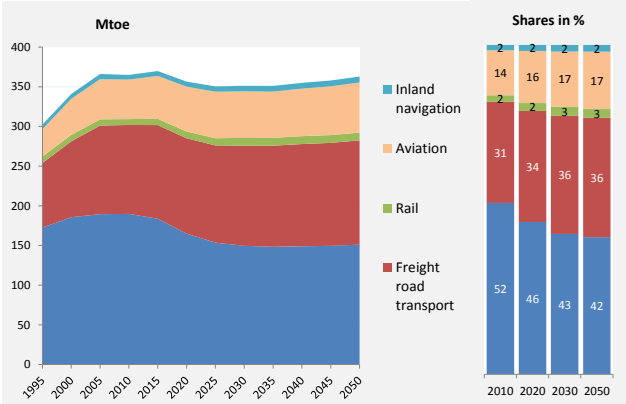
Historically, final energy demand in the transport sector has grown in line with the transport activity. However, despite the projected upward trends in transport activity beyond 2010, final energy demand stabilizes by 2050 to levels marginally lower than those observed in 2010. The projections show some weak growth in energy demand (0.3% p.a.) in the short-term (up to 2015), mainly driven by the strong recovery in the freight transport activity following the crisis. Beyond 2015 however, energy demand is decoupling from transport activity (Figure 24).

FIGURE 24: TRENDS IN TRANSPORT ACTIVITY AND ENERGY CONSUMPTION



The main driver of low final energy demand from transport relative to transport activity is the improvement in fuel efficiency driven by policies, in particular for passenger cars and light commercial vehicles (Figure 26) and the uptake of more efficient technologies for other transport means. In order to comply with the regulations on CO_2 emissions standards for Light Duty Vehicles (LDVs), covering passenger cars and light commercial vehicles (LCVs), manufacturers have to introduce more fuel efficient LDVs into the market. In particular, in passenger road transport energy efficiency of vehicles improves by 21% in 2020 and 35% in 2030 relative to 2005 (Figure 26), leading to a decline in energy demand in passenger road transport by 2030. Beyond 2030, energy demand of passenger road transport stabilizes. Efficiency gains, driven by increasing fuel prices and techno-economic developments, evolve at slower pace in lack of more stringent CO_2 emissions regulations.

FIGURE 25: FINAL ENERGY DEMAND IN TRANSPORT

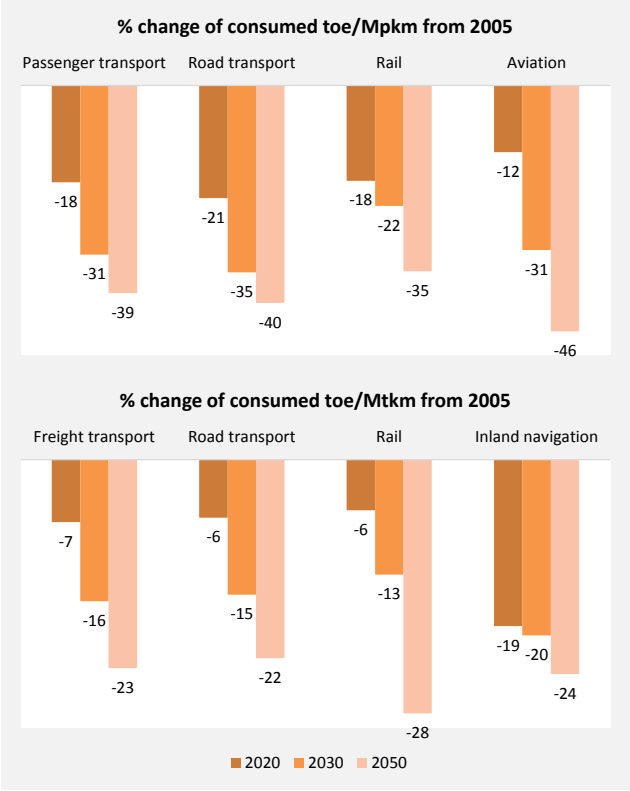


Other passenger transport modes also contribute to the decoupling between activity and final energy demand. However this contribution is more apparent in the longer term, from 2030 onwards. Aviation activity increases considerably throughout the projection period leading to increased energy demand. Nonetheless, energy demand grows less than activity as aviation experiences high efficiency gains owing to the introduction of more energy efficient aircrafts and the renewal of the fleet[20]. Efficiency improvements in aviation amount to 12% in 2020 relative to 2005, and 31% by 2030. Passenger rail features some relatively lower rates of improvement in efficiency by 2030 compared to road and aviation. In addition to the currently high efficiency of rail relative to other transport means, the long lifetime of the rolling stock delays its renewal and therefore the improvements in efficiency.

[20] The International Air Transport Association (IATA) has set ambitious targets to curb fuel consumption and mitigate GHG emissions from aviation in its Carbon Neutral Growth initiative, according to which the aviation industry has committed to an average improvement in fuel efficiency of 1.5% per year by 2020 and a cap on aviation CO_2 emissions from 2020 (carbon-neutral growth). By 2050 the CO_2 emissions from aviation should be reduced by 50% relative to 2005 levels. Source: http://www.iata.org/pressroom/facts_figures/fact_sheets/pages/environment.aspx.

The improvements would be mainly attributed to fuel substitution; in particular switching from diesel to electricity in areas where electrification is an economically viable option and in line with the provisions of specific initiatives by MS.

FIGURE 26: TRANSPORT EFFICIENCY IMPROVEMENT



Efficiency improvements also take place in freight transportation, and moderate the effect of the increasing activity (which is growing stronger than for passenger transport) on energy demand. Heavy goods vehicles (HGVs), which throughout the projection period account for more than 80% of energy consumed in freight transport, undergo improvements in specific fuel consumption driven in particular by the increasing fossil fuel prices. Fuel costs represent a considerable part of operational costs of HGVs and their minimization is among the main objectives of HGV manufacturers and fleet operators. Improvements in technology, related among others to vehicle design or vehicle powertrain, aim to reduce vehicle specific fuel consumption. The reductions in vehicle specific energy consumption of HGVs become more apparent in the long term, as the renewal rate of the HGV fleet is slow. LCVs on the other hand, show high efficiency gains already by 2020 as a result of CO_2 emissions regulations, but their effect on energy demand of freight road transportation is not significant due to their small share in energy demand. Overall, fuel consumption in road freight transport per Mtkm is projected to decrease by 6% in 2020, 15% in 2030 and 22% in 2050 relative to 2005.

Freight rail follows similar developments as passenger rail; it sees moderate improvements in specific energy consumption, partly driven by the substitution of diesel by electricity. However, by 2050 the efficiency gains in rail freight are somewhat higher than for road freight, in lack of specific policies for CO_2 emissions reduction or energy efficiency of newly registered HGVs. By 2050, improvements in specific fuel consumption for inland navigation amount to 24% relative to 2005, slightly lower than those achieved in rail freight.

The obligation to meet CO_2 standards for LDVs is reflected in the change of the transport fuel mix (Figure 27). Emissions performance standards for vehicles together with favourable taxation of diesel by some Member States result in wide scale substitution of petrol with diesel in conventional passenger cars, and favor the introduction of diesel hybrid vehicles (Figure 28)[21]. Consumption of petrol declines considerably until 2030 and stabilizes from thereon to 2050, as no more stringent requirements for fuel-efficiency are introduced. Consumption of diesel increases by 2015 and stabilizes in the period 2015 to 2050, becoming the dominant fuel in passenger cars and continuing to be the primary fuel for heavy duty vehicles (HGVs, buses and coaches). Heavy duty vehicles have little potential to switch to alternative fuels such as LNG as this would require significant investments in infrastructure build-up across the EU, which is not assumed to be the case in the Reference 2013 scenario[22].

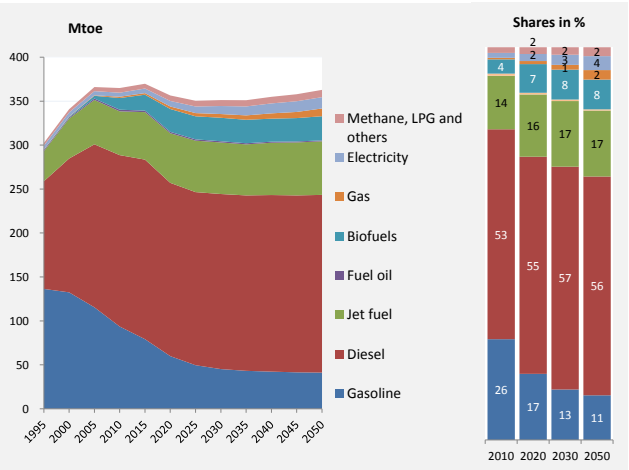
Consumption of jet fuels in aviation increases steadily by 2050 due to the increase in transport activity and despite improvements in efficiency; fossil fuels continue to dominate, and only after 2035 biofuels (biokerosene) slowly start penetrating the aviation fuel mix - driven by high ETS prices.

[21] Despite the relatively higher carbon intensity of diesel, diesel-fueled vehicles are more fuel economic than gasoline-fueled vehicles.

[22] The Clean Power for Transport package, adopted by the European Commission in January 2013, is not reflected in the Reference scenario 2013.

Biofuels in general, make significant inroads in transport by 2020, driven by the legally binding target of 10% renewable energy in the transport sector (RES-T target). In parallel with the shift towards diesel vehicles, the share of biodiesel consumption increases, also driven by its uptake in road freight transport. Beyond 2020, with no further tightening of the RES-T target, biofuels maintain their share as a result of improved economics of the biofuel supply side and the increasing fossil fuel prices.

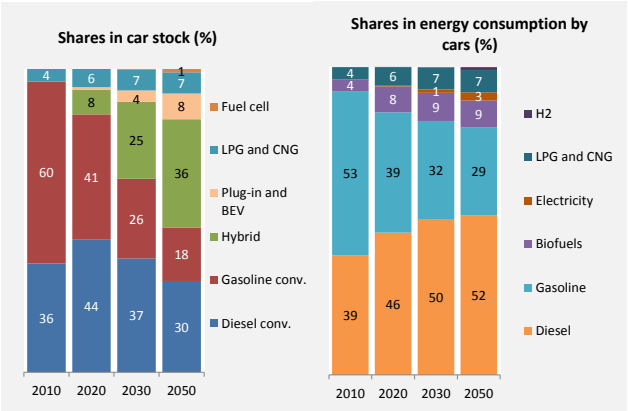
FIGURE 27: FINAL ENERGY DEMAND IN TRANSPORT BY FUEL TYPE



Electricity consumption in transport sees a steady increase as a result of rail electrification and the penetration of alternative electric powertrains in road transport. Electrically chargeable vehicles (EVs), in particular in the segment of passenger cars and LCVs, emerge around 2020 as a result of EU and national policies as well as incentive schemes aiming to boost their penetration. Plug-in hybrids (PHEVs) hold the largest share among EVs due to their ability to use both power-trains alternatively (internal combustion engine or electric motor) and they would represent two thirds of EVs in 2050. Some improvements in battery costs are assumed to occur allowing for a decrease in capital costs together with slow increase in infrastructure availability. The penetration of electric vehicles occurs mainly in niche markets, in urban areas for urban commuting and municipal fleets, due to limited range of vehicles, which is assumed to persist. By 2050 the share of electric vehicles in the total stock of cars reaches approximately 8% (Figure 28).

Finally, other energy forms such as LPG and natural gas maintain a rather small share in the final energy demand of the transport sector. Passenger cars running on LPG and CNG see a moderate increase especially stemming from countries with re-fuelling infrastructure already in place; in Member States where such infrastructure is currently not in place the uptake of CNG and LPG vehicles on a commercial basis is limited in the Reference 2013 scenario.

FIGURE 28: STRUCTURE OF PASSENGER CARS FLEET AND FUEL CONSUMPTION



Power generation

Developments in power generation in the Reference 2013 scenario are driven by the implementation of RES policies to the horizon of 2020 and by growing ETS carbon prices – also in the longer term, especially after 2030. Both induce high level of RES penetration in power generation throughout the projection period, in particular variable RES, which are demanding in terms of balancing services and system reserves. In order to support the penetration of RES, the requirements for capacity back-up by thermal plants are high, and are met in the projection by investments on flexible gas plants and by extensions of lifetime of old (typically open cycle) plants.

In the short term, in particular up to 2020, developments are characterized by two main aspects: 1) the necessity to achieve the RES targets, and 2) planned investments in existing and new power plants. The first necessity stimulates RES growth whereas the second determines to a large extent the developments in conventional power plants. Considering the very long lead times for large (in particular) conventional plants, investments that will take place up to 2020 are already known today. The PRIMES model

fully includes in its database all currently known planned investments, including lifetime extensions as well as planned decommissioning, based on commercial databases (e.g. Platts) and plans of large companies in all the Member States. The projections of large investments in this decade are strongly determined by such known investments and decommissioning plans.

The Reference 2013 scenario also considers country specific potentials for RES penetration in addition to the specificities by Member States in policies regarding nuclear and CCS options. Moreover, the scenario assumes completion of the internal energy market and the successful implementation of the 10-year network development plan of ENTSO-E (TYNDP), which entails considerable investments in electricity transmission systems. These infrastructure developments include refurbishment or construction of transmission and distribution power lines, the extension of the grid, enabling capacity additions and supporting the integration of the high levels of intermittent RES in the system. Moreover, they allow for a general increase of net transfer capacities (NTC) values, thus leading to a higher potential for trade within the internal energy market. The possibility to make more extensive use of interconnectors and new transmission grids allows for use of sites with lower costs, even when these are far away from consumption centres. As a result the fully interlinked system allows for better optimisation of resources and capacity expansion.

Regarding carbon capture and storage (CCS) the PRIMES model has been updated to take into account the difficulties that this technology has been encountering over the past years related to the development of demonstration plants and storage facilities. The cost of CCS power plants construction has been revised accordingly making the technology more expensive, in particular the storage cost-supply curves as well as the technology itself. In countries (e.g. Austria) with stringent legislation, the storage costs are extremely high, making investments in CCS storage uneconomical throughout the projection period.

Also the assumptions on nuclear have radically changed compared to previous projections based on recent policy developments, changed economic situation and detailed surveys into the possibilities of extending the lifetime of existing power plants. The possibilities of extension of lifetime for power plants have been analytically assessed through a plant by plant survey based on the age, construction type (generation) of the power plant and national legislation. The construction of new power plants on new sites (i.e. in locations where there are currently no power plants) has become considerably more expensive based also on issues related to public acceptance. The construction of new power plants on existing nuclear sites is limited based on surveys which assess the possibilities (e.g. based on spatial limitations) of expansion in existing locations. The model updates concerning limitations, the new national legislation and the higher costs lead to lower perspectives for nuclear than in past projections.

Electricity generation

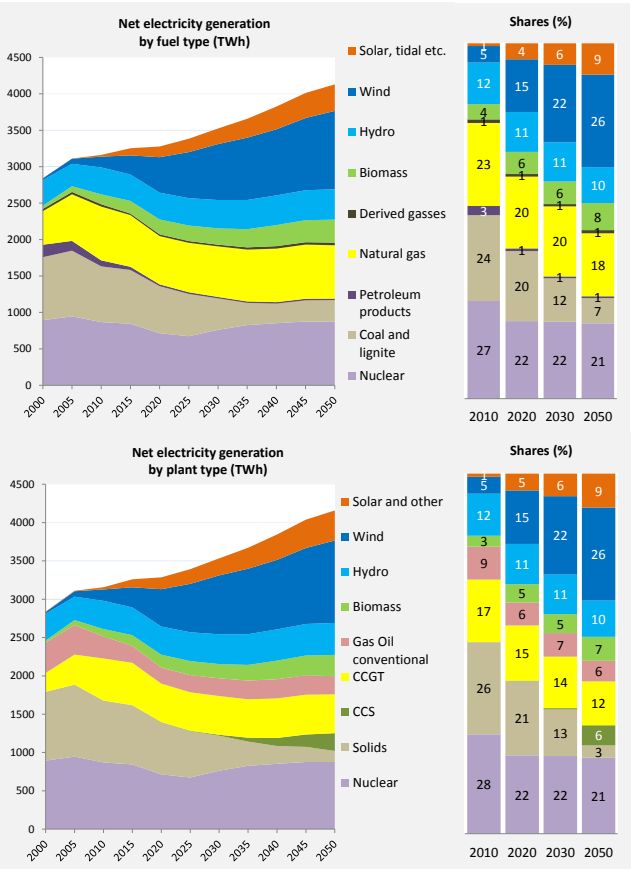
In the short term, the set of EU and national specific policies that promote RES (notably implementation of supportive financial instruments such as feed-in-tariffs) drive significant penetration of RES in power generation. The binding short-term RES targets are assumed to be achieved in the Reference 2013 scenario. RES expansion is also facilitated by the assumed developments of grids and new equipment for controlling grid operation, especially in the case of smart grids. Up to 2020, the share of RES in electricity generation (RES-E indicator[23]) reaches 35%, a significant increase from the 20% in 2010. Beyond 2020, no binding targets on RES are currently set, however the share of RES in electricity generation continues to increase attaining 43% in 2030 and 50% in 2050, driven by the increasing ETS prices, along with the continuation of some direct support schemes[24] and a continuation of enabling policies, such as streamlined authorization procedures, priority

[23] Calculated according to the definitions of the RES Directive used also for the pertinent provisions of EUROSTAT statistics

[24] After 2020, feed-in tariffs or equivalent support schemes are substantially reduced depending on the maturity of the technology and the MS.

access, where applicable, and the benefits that local population may have from investing in local RES.

FIGURE 29: ELECTRICITY GENERATION BY FUEL AND BY PLANT TYPE



While RES provide growing shares in electricity generation (up to 50% in 2050), the contribution of variable RES (solar, wind as well as tidal/wave in the definition used here) remains significantly lower. These variable RES combined account for 19% of total net electricity generation in 2020, up from only 5% in 2010. Their share is rising to 28% in 2030 and 35% in 2050.

Wind provides the largest contribution from RES supplying 15% of total net electricity generation in 2020, rising to 22% in 2030 and 26% by 2050. A share of 30% of total wind generation is produced from wind off-shore capacities from 2020 onwards. Total wind capacities increase to 205 GW in 2020, 305 GW in 2030 and 413 GW in 2050, up from 85 GW in 2010, of which around a quarter is installed off-shore in 2020 and beyond; higher full load hours of off-shore wind allow for the higher share in generation compared with capacity for off-shore wind.

Generation from PV contributes 4% in net generation by 2020. Beyond 2020, PV generation continues to increase up to 6% in 2030 and 9% in 2050; PV capacity is projected to reach 110 GW in 2020, up from 30 GW in 2010. Investment is mostly driven by support schemes and the decreasing costs of solar panels. While support schemes are being reduced, costs continue to fall and total PV capacities reach 149GW in 2030 and 231GW in 2050.

The use of biomass and waste combustion for power generation also increases over time, both in pure biomass plants (usually of relatively small size) and in co-firing applications in solid fuel plants; biomass attains a share in fuel input in thermal power plants of 16% in 2020, 19% in 2030 and 26% in 2050[25]. Biomass also becomes very significant in CHP, in which it contributes 33% in 2020, reaching 35% in 2030 and 41% in 2050. Biomass plant capacities reach 35 GW in 2020, up from 25 GW in 2010, 39GW in 2030 and 66 GW in 2050. Above 50% of biomass power plants use solid biomass; biogas use increases in the short term and reaches a share of approximately 25% by 2020, with a slight increase in the remainder of the projection period.

The relative contribution of hydro generation remains rather constant at 10-11% of total net generation, with small hydro slightly increasing. The share of geothermal electricity generation rises from 0.2% in 2020 to reach 0.6% in 2050. Tidal and wave, which mainly develop after 2020 in a few MS with such resources, represent 0.2% of total EU net generation by 2030, reaching 0.4% at the end of the projection period.

Generation from conventional thermal plants decreases continuously up to 2030 and stabilises thereon, supported by the introduction of CCS. The introduction of CCS starts with the demonstration plants

[25] Calculated following EUROSTAT definitions, i.e. excluding energy consumed by Industrial sectors and refineries for on site CHP steam generation.

built up to 2020,[26] but only minor additions occur in the projection until 2030. CCS develops mainly after 2030 reaching 1.7% of gross electricity generation in 2035 and rising further to 7% by 2050. In 2050, total net CCS generation capacity amounts to 38 GW. CCS power generation in this scenario requires a cumulative storage capacity of approximately 670Mt CO_2 up to 2050. The distribution of CCS by country is very uneven as the analysis is considering the specific policies as well as the availability of storage sites by MS[27].

Generation from solid fuels declines significantly throughout the projection period, in particular in the period 2030-50, as ETS prices increase considerably. Investment in non-CCS solid fuel plants after 2020 amount to 33.6 GW, whereas 32.4 GW are added in the decade 2011-20. Phasing out of solid generation is very intense, as availability of CCS technologies is relatively limited. By 2050, more than half of solid-fuelled generation is produced from facilities with installed CCS technologies.

Gas-fired generation slightly decreases until 2020, but increases thereafter, in 2050 reaching the same levels as in 2010. Total investment in gas-fired plants in the period 2011-50 amounts to net 335 GW (225 GW gas plants are operating in 2010). This strong increase in gas capacity despite rather stagnant generation from gas highlights the key role that gas is increasingly playing as a back-up technology for variable RES.

The interplay of continuously declining ETS allowance supply, RES policies and the demand levels stemming from the level and structure of energy consumption entails only limited gas investment given the existing plants and new investments (notably for coping with RES targets) and the effects of energy policies, especially on energy efficiency. The power plant investments have been modelled in each period taking account of all relevant factors, in particular of the ETS price, while the ETS price in turn is influenced by such investments. The increase in ETS prices therefore counteracts the increasing effect on emissions that would otherwise occur from the relatively low natural gas price.

Gas plays a crucial role in the context of emission reduction targets and increased penetration of intermittent RES. As a fuel it is less CO_2 emissions intensive relative to other fossil fuels, and gas units are flexible enough to serve the increased balancing requirements of RES. Overall, generation from gas power capacities provides around 20% of total net generation up to 2040, falling only 1 percentage point in the decade to 2050. The contribution of gas to total net thermal generation ranges between 45% and 55% throughout the projection period. Generation from CCGT in particular constitutes 35% and 42% of total thermal generation in 2020 and 2030 respectively, reaching 45% in 2050. Industrial gas technologies serve CHP purposes, while gas peak devices reach 7% of total thermal generation at the end of the projection period.

Cogeneration develops significantly in the Reference 2013 scenario, driven by the corresponding provisions of the EED. The share of gross electricity produced by CHP plants attains a level around 16% throughout the period from 2020 until 2050, significantly up from 13% in 2010.

Specific nuclear phase-out policies that have been adopted by some EU MS (Germany and Belgium), along with the higher cost induced by increased security requirements, drive electricity generation from nuclear downwards in the short term (up to 2025). Thereon, the projected level of investments surpasses decommissioning of nuclear capacity and by the end of the projection period installed nuclear capacities are almost equal to 2010 levels. Participation of nuclear in the generation mix remains, however, lower than today, reflecting rising electricity generation volume. The projected investments in nuclear capacity mainly occur on existing sites or are lifetime extensions through retrofitting; there are very few projected investments in nuclear capacities on new sites. Out of

[26] The included power plants are: UK (White Rose) 0.4478GW net capacity, coal CCS; Netherlands (Rotterdam Capture and Storage Demonstration Project-ROAD) 0.227GW net capacity, coal CCS; Poland (Belchatow) 0.2294 GW net capacity, coal CCS.

[27] In PRIMES it is assumed that no cross-border trade of CO_2 is possible therefore the CO_2 captured in a country must also be stored in the same country.

the 176GW of capacity additions, only 12GW are capacities constructed on new sites.

Considering the cumulative investments in the period 2011-50, retrofitting investments constitute approximately one third of overall investments. As the share of non-dispatchable generation (variable RES) in the system is increasing, profit margins of conventional generation are diminishing[28] thus undertaking large new investments in dispatchable capacities risks becoming increasingly uneconomic. Retrofitting investments, where possible, are desirable from an economic perspective, despite their short lifetime, due to their low capital intensity compared to the construction of new plants.

Following the retirement of obsolete thermal capacity and strong investment in modern thermal power plants there is an on-going trend towards higher efficiency of thermal electricity generation. This happens despite an increasing share of CHP, which optimises the combined generation of electricity and heat from the same input fuel. Overall, CHP contributes to greater energy efficiency. This feature is not present for CCS, which actually requires more energy for the same output, but delivers this electricity output almost carbon free. As can be seen from Table 5 the shares of zero (RES, nuclear), and low carbon technologies (here: CCS) are rising or at least remaining stable after 2020 (nuclear).

Finally, in the context of high intermittent RES power generation, the projection shows increasing volumes of electricity trade over time to cover balancing requirements (Table 6). This is possible under the assumption of higher potential of trade in the internal energy market, induced by the successful development of the TYNDP.

FIGURE 30: INSTALLED POWER CAPACITIES

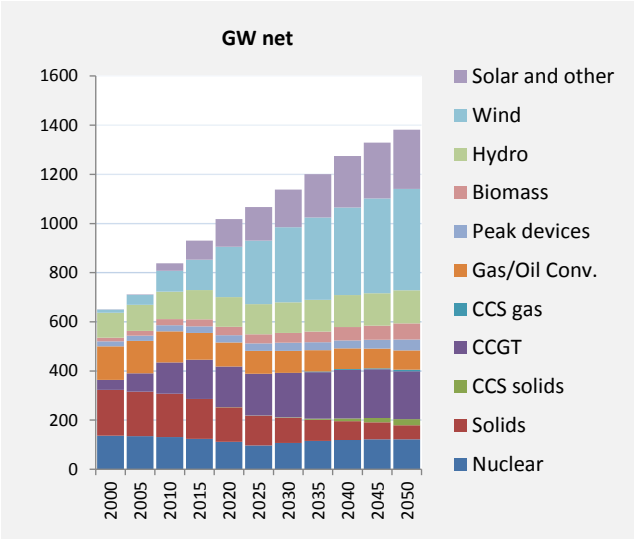
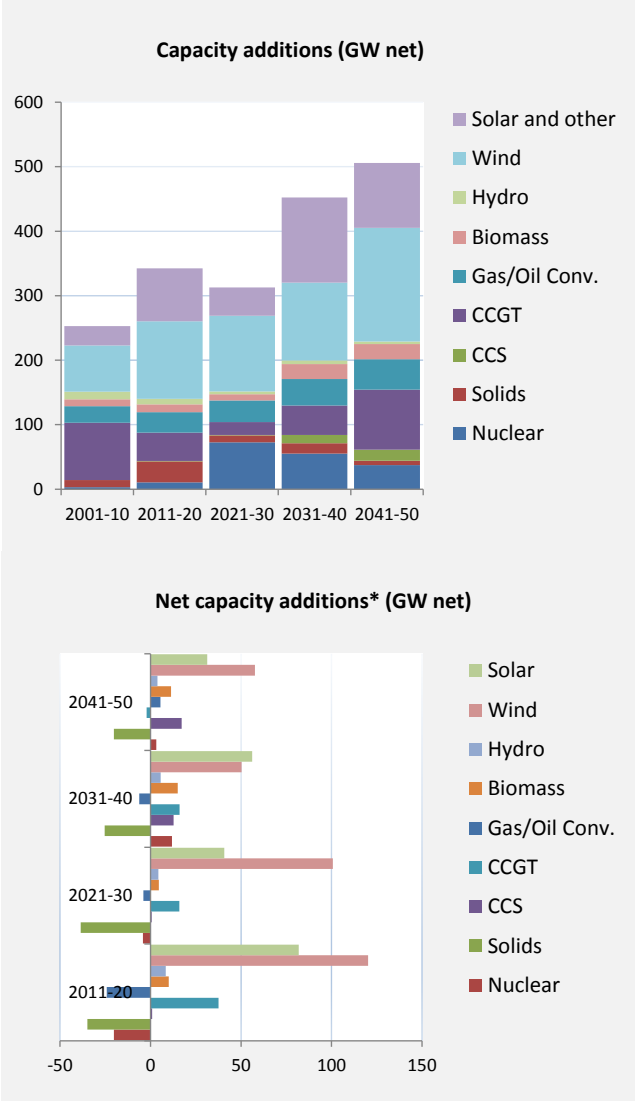


FIGURE 31: PROJECTED CAPACITY ADDITIONS



** capacity additions minus decommissioned capacity*

[28] Reflecting, among other things, lower wholesale prices following substantial supply from capacity with close to zero marginal costs over large parts of a typical day including around a noon peak of demand.

TABLE 5: INDICATORS OF POWER GENERATION

	2010	2020	2030	2050
Efficiency for thermal electricity production (%)	38.4	40.8	42.7	44.6
CHP indicator (% of electricity from CHP)	12.6	15.8	16.1	16.2
CCS indicator (% of gross electricity from CCS)	0.0	0.2	0.5	6.9
Non-fossil fuels in electricity generation (%)	48.5	58.0	66.3	72.8
- nuclear	27.5	21.9	21.8	21.3
- renewable energy forms and industrial waste	21.0	36.1	44.5	51.6

TABLE 6: VOLUME OF ELECTRICITY TRADE[29]

Sum of all export and import flows of electricity as simulated by the model				
	2010	2020	2030	2050
Nordic	21.6	45.4	57.8	93.6
British islands	5.2	22.9	16.1	14.6
North-West EU	54.8	94.4	137.2	110.9
Iberian	12.1	11.0	14.9	33.2
Central-South EU	60.4	63.8	62.9	93.8
Central-East EU	27.3	20.6	30.1	36.1
Baltic States	11.4	4.0	7.9	12.1
South East Europe	32.0	44.8	62.2	81.0
with outside Europe	23.4	10.7	15.5	9.9
Total	248.1	317.6	404.8	485.3

Steam and heat supply

Steam and heat demand continues to grow in the EU28 till 2020 and then stabilises. Main sources of demand are industry and households.

On the supply side, as explained above, the role of cogeneration develops significantly in the Reference 2013 scenario, driven by the corresponding provisions of the EED.

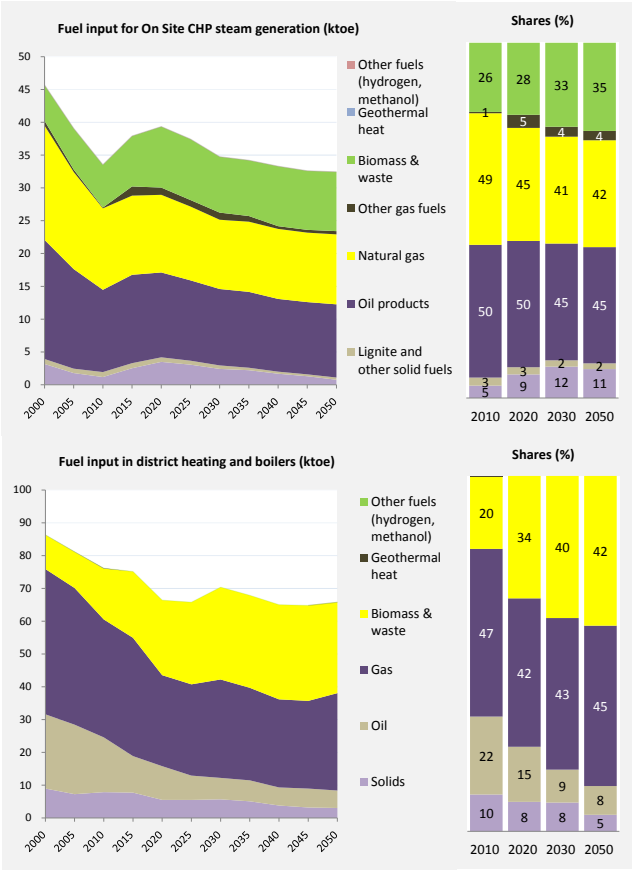
While electricity generation from CHP plants increases throughout the projection period, steam output increases up to 2020 and remains almost constant throughout the projection period.

The role of cogeneration in steam and heat supply grows from 73% in 2010 to 76% in 2030 and 80% in 2050. Production of steam from district heating units consequently decreases over time. Industrial boilers and industrial CHP plants decrease only slightly over the projection period due to increasing efficiency their steam output increases slightly.

[29] The modelling results for the statistical year 2010 appear to be lower than the corresponding published data from ENTSO-E. This is attributed to the limited time resolution of the load curves assumed in the model. The figures in Table 5 should be read as an indication of the trend that trade flows will follow, rather than as projections of their absolute level.

In terms of district heating fuel input, the share of solids and oil decreases considerably and the share of gas decreases as well but at a slower rate and only till 2030. Biomass is used increasingly representing almost 50% of fuel input in 2020 and 57% in 2050 (in comparison to 26% in 2010).

FIGURE 32: FUEL INPUT FOR STEAM GENERATION



Electricity costs and prices

The developments in the EU28 power sector have significant impacts on energy costs and electricity prices, in particular in the short term. Power generation costs significantly increase by 2020 relative to 2010, mainly as a consequence of higher investments due to the need for significant capital replacement and higher fuel costs (because of the large increase in international fossil fuel prices). Grid costs also increase to recover high investment costs in grid reinforcements and interconnectors, which are fully consistent with the provisions of the ENTSO-E TYNDP as well as the achievement of the RES 2020 target. Smaller components of the cost increase are national taxes and ETS allowance expenditures. In addition, there are the arithmetic effects of successful energy efficiency policies, which through curtailing

electricity demand reduce the denominator for sharing out the electricity costs while the numerator is less affected due to the high share of fixed costs in electricity generation and supply. As a result, average electricity price in the period 2010-20 increases by 31% (Table 7).

TABLE 7: EVOLUTION OF COST COMPONENTS OF ELECTRICITY PRICE IN 2010-20

€/MWh	diff. 2010-20	% contribution
Fixed and capital costs	14.2	34.5
Variable and fuel costs	4.5	11.1
Tax on fuels and ETS payments	3.8	9.1
Transmission, distribution and sales costs	7.5	18.3
Other costs (imports, recovery for RES*)	8.4	20.6
Excise and VAT taxes	2.6	6.4
Average price of electricity for final demand sectors (after tax)	41.0	

*RES supporting costs passed on to consumers

FIGURE 33: COST COMPONENTS OF AVERAGE ELECTRICITY PRICE

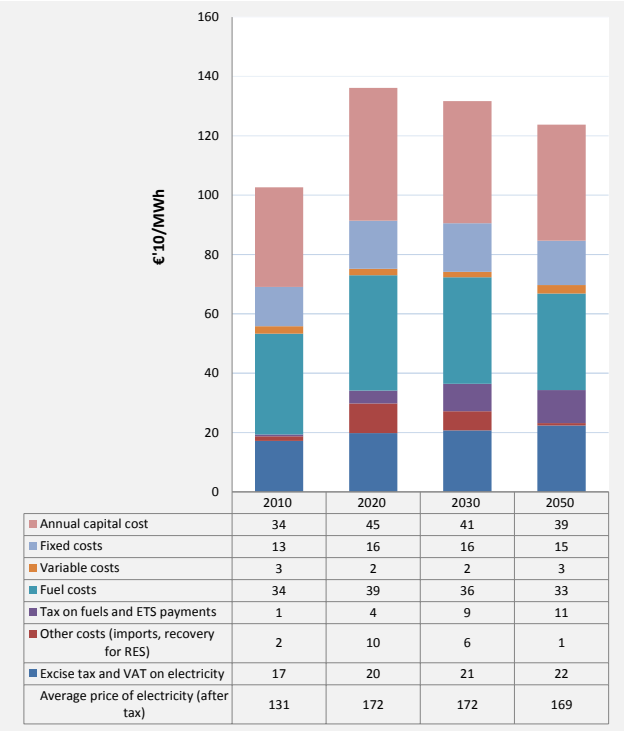
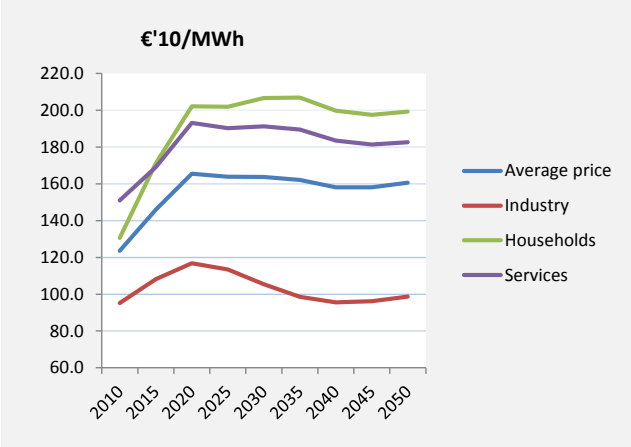


FIGURE 34: PRICE OF ELECTRICITY (PRE-TAX) BY SECTOR



Beyond 2020, average electricity prices remain broadly stable up to 2035 and then are projected to moderately decrease up to 2050 (Figure 33 and Figure 34), as the benefits, in terms of fuel cost savings, resulting from the enormous restructuring invest-

Calculation of electricity prices in PRIMES

The electricity prices in PRIMES are calculated in order to recuperate all costs including those related to renewables including feed-in-tariffs, grid costs, and investment costs including stranded investments, back-up and reserve costs, etc., and including some profit margin.

The process to determine the electricity prices in PRIMES can be divided into four steps:

i) Determination of total system costs under least cost unit commitment and least cost expansion conditions mimicking well-functioning markets. ii) Simulation of wholesale markets by country and estimation of marginal system prices reflecting long run marginal costs. iii) Matching of load profiles of customer-types with the duration curve of long term marginal prices with customers sorted in descending order of their load factor mimicking bilateral contracting. iv) Calculation of prices by sector based on price levels by customer type calculated in step (iii) and the recovery of total system budget including variable generation costs and annuity payments for capital costs, recovery of additional costs for RES and cost of grid differentiated by voltage type.

Grid cost recovery is based exclusively on load payments at average grid tariffs determined as levelised costs of regulated asset basis.

The pricing approach corresponds to the Ramsey-Boiteux methodology and allows for the differentiation of electricity prices by sector.

ments in electricity supply come increasingly to the fore. In addition, lower technology costs from technology progress and learning over time help contain electricity prices together with deceleration of gas price increase.

Over time, the structure of costs slightly changes; capital intensive investments (RES and CCS) and increasing grid costs bring a decrease of the share of variable cost components and a corresponding increase in the capital cost components.

Primary energy supply and import dependency

The trend in total primary energy supply is downward throughout the projection period, with a moderate increase after 2035; energy efficiency gains in final energy demand are the main factors behind this trend. In parallel, there is a shift in primary energy supply towards RES along with a decline in the supply of solid fuels as well as oil (Figure 35). Natural gas maintains an almost stable share in primary energy supply throughout the projection period. Nuclear energy sees a decline in the short term (attributable to the nuclear phase-out that is being pursued by some Member States) but is projected to resume a moderate increasing trend in the decades after 2020.

Recovery from the economic crisis brings an upward effect on energy demand, observed up to 2015, which is consequently reflected on primary supply and import dependence (mainly for natural gas and solids). This trend is reversed until 2020, as the shift towards the consumption of RES in parallel with the improvements in energy efficiency (which lowers the demand) have a positive effect on import dependency (Figure 37). Evolution of primary energy production follows the declining trend of primary energy supply, it is however steeper and continuous throughout the projection period (with a small increase in the period 2035-45), as it reflects the depletion of domestic fossil fuel reserves. The mix in primary energy production changes considerably over time, with RES (including biomass) becoming the dominant energy form (Figure 36).

FIGURE 35: PRIMARY ENERGY SUPPLY

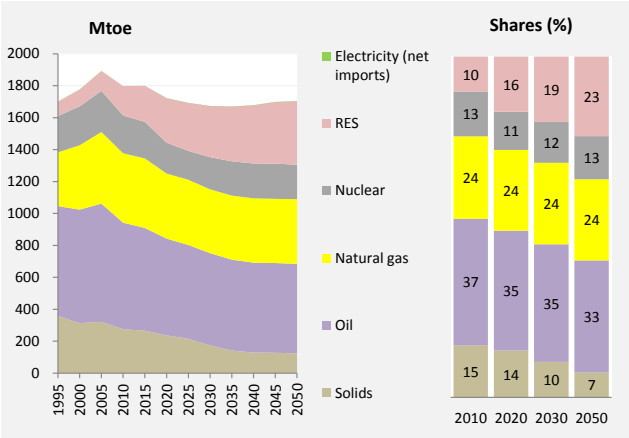
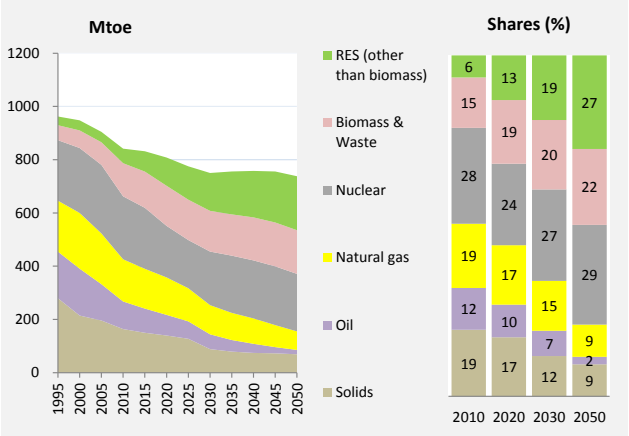


FIGURE 36: PRIMARY ENERGY PRODUCTION



The situation in imports evolves only moderately. Beyond 2020, despite the decreasing trend in final energy demand for fossil fuels, limited domestic resources result in an increase in imports of natural gas and oil products (Figure 38), which drive net imports as well as import dependence moderately upward. By 2030, import dependence reaches 55%, and by 2050 it is close to 57%.

FIGURE 37: PRIMARY ENERGY IMPORTS

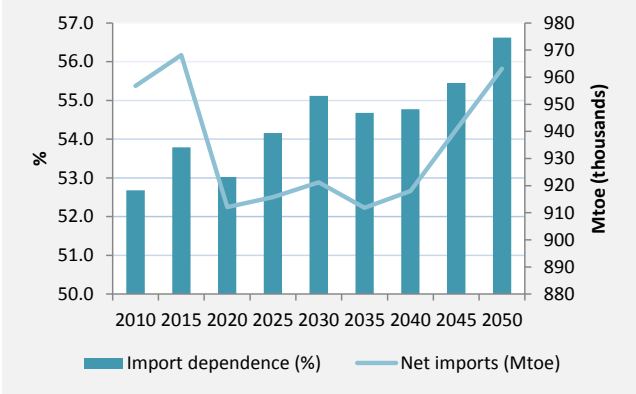
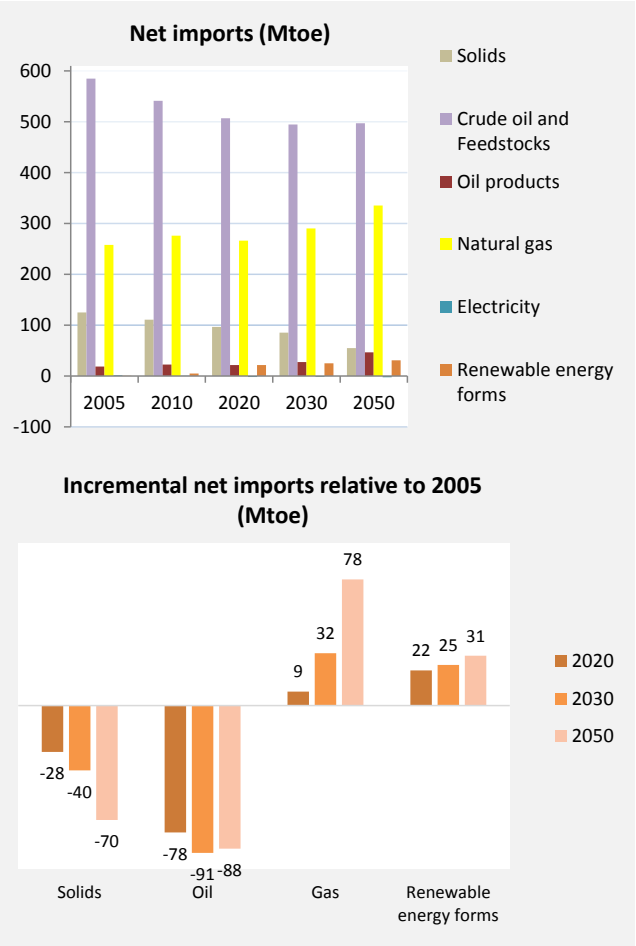


FIGURE 38: NET IMPORTS BY FUEL



The external fossil fuel bill of the EU is projected to rise in constant prices by around 50% from 2010 to 2030 and exceeds 2010 levels by around 80% in 2050, reaching around 500 bn €'10 and 600 bn €'10 in 2030 and 2050, respectively.

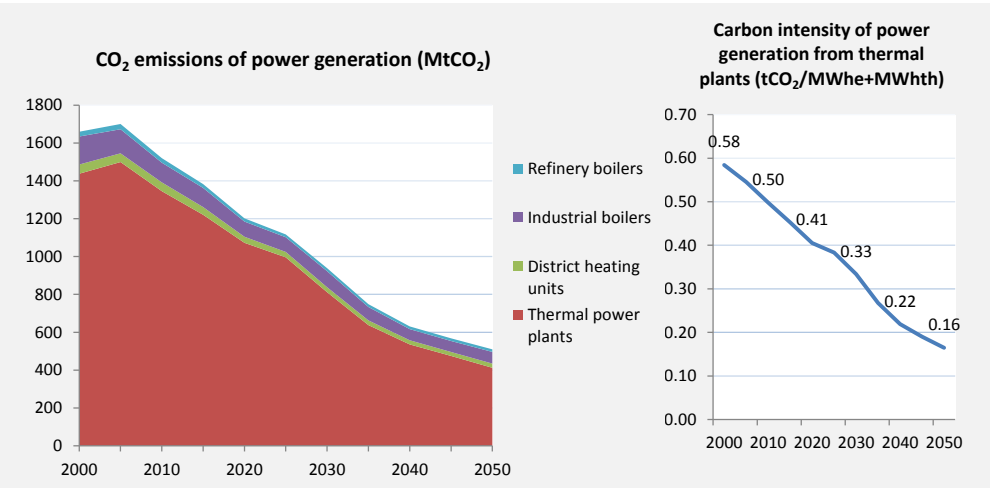
Biomass supply, which is projected to be mostly indigenous in the EU, increases significantly over time following the developments of domestic industry which is increasingly using advanced feedstock and technologies. Until 2020, the increase in the demand for biofuels is faster than the growth of the domestic production, resulting in a substantial increase in the share of imported biofuels relative to past levels. Beyond 2020, domestic production catches up, and the share of imported biofuels remains stable until the end of the projection period.

CO_2 emissions

The developments in the EU according to the Reference scenario energy projections that have been described so far, following the provisions of the EU ETS, the RES Directive, the ESD, the EED and other specific policies, result in reduced energy intensity of activities in parallel with reduced carbon intensity of power generation and energy demand. The combined effect of these developments is that CO_2 emissions in the EU are projected to decrease continuously until 2050. CO_2 emissions reduction is very significant, in particular in the power generation sector, resulting mainly from the ETS, in particular in the longer term. In other sectors, CO_2 emissions reduction is mainly driven by the energy intensity decreases that are induced by policies on energy efficiency.

The evolution of the generation mix implies a steady decrease in carbon intensity of power generation (Figure 39) and leads to significant emissions reductions from the sector. Carbon intensity of power generation from thermal plants decreases by 26% in 2020 relative to 2005. The corresponding figure in 2050 is 70%.

FIGURE 39: CO_2 EMISSIONS OF POWER GENERATION AND ENERGY TRANSFORMATION



A significant factor of emissions reduction in power generation is the higher CHP market penetration and the increasing use of biomass in cogeneration, which

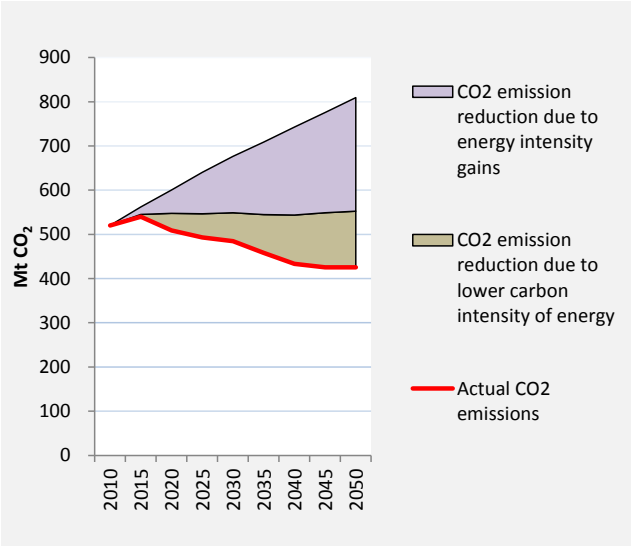
make steam generation less carbon intensive over time. In the longer term, the introduction of CCS technologies contributes to further emissions reduction; in 2030 the share of total CO_2 emissions from power generation that are captured is small, being slightly higher than 1%, however it is projected to rise to 48% of the remaining low emission level by 2050. Overall, in 2020, total CO_2 emissions of power generation are reduced by 29% relative to 2005; by 2030 and 2050, total emissions reduce by 45% and 70% respectively.

Also in the industrial sector, the ETS drives a shift towards less carbon intensive fuels, for both energy related and process related uses. In parallel, activity of the sector is projected to grow faster for non-energy intensive industries. Industry as a whole is also expected to make substantial efforts on energy efficiency as it is confronted with the increasing energy prices and the global competition.

The resulting effect on energy-related carbon intensity of the industrial sector is a 14% decrease by 2020 relative to 2005, which is projected to reach 19% until 2030 and 29% until 2050. As demonstrated in Figure 40: Energy-related CO2 emissions of the industrial sector

the impact of energy intensity decreases is driving the bulk of achieved emissions reduction.

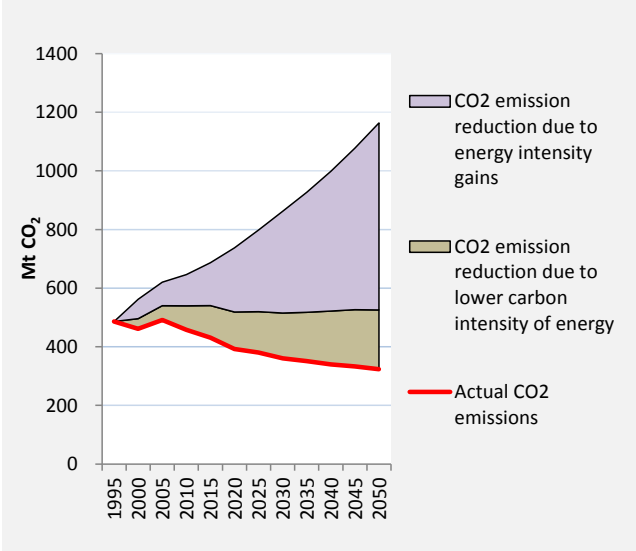
FIGURE 40: ENERGY-RELATED CO_2 EMISSIONS OF THE INDUSTRIAL SECTOR



Process related emissions[30] decrease only slightly in the short term (2% reduction in 2020 relative to 2005) but decrease becomes considerable in the long term (15% reduction in 2030), especially in the last decade of the projection (69% reduction in 2050) following the increasing trends of ETS prices, which make CCS for industrial processes an economically viable option.

The effect on emissions from energy intensity decrease is even more considerable for the residential sector (Figure 41), driven by increasing international fuel prices and policies on eco-design and performance of buildings, including the EED. The effect of these policies, in combination with renewables policies and national specific policies on reducing pollutants (thus driving a shift towards less carbon intensive fuels), drives a decrease of carbon intensity of the sector by 17%, 23% and 32% relative to 2005 in 2020, 2030 and 2050 respectively.

FIGURE 41: CO_2 EMISSIONS OF THE RESIDENTIAL SECTOR

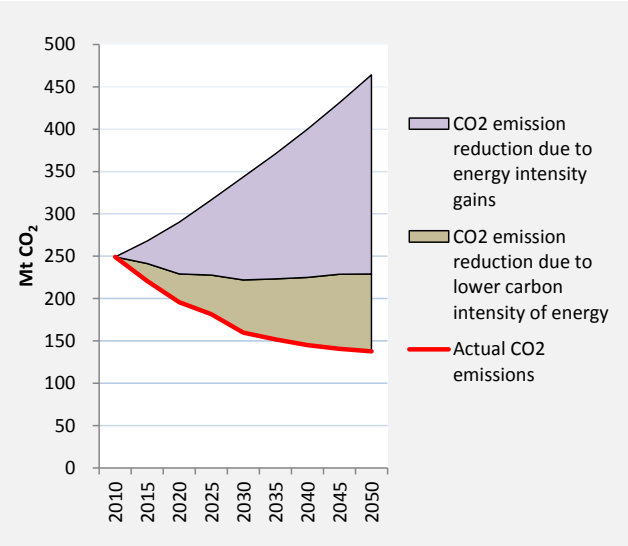


Similarly, in the tertiary sector (Figure 42), a significant progress occurs in terms of energy intensity decrease driven by rising fuel prices and energy efficiency policies, with projections showing a shift toward less carbon intensive fuels and electricity. Overall emissions decrease substantially throughout the projection period, achieving carbon intensity re-

[30] These include also the small amount of CO_2 emissions in the fugitive, solvent and waste sectors.

duction of 24%, 36% and 46% relative to 2005 in 2020, 2030 and 2050 respectively.

FIGURE 42: CO_2 EMISSIONS OF THE TERTIARY SECTOR

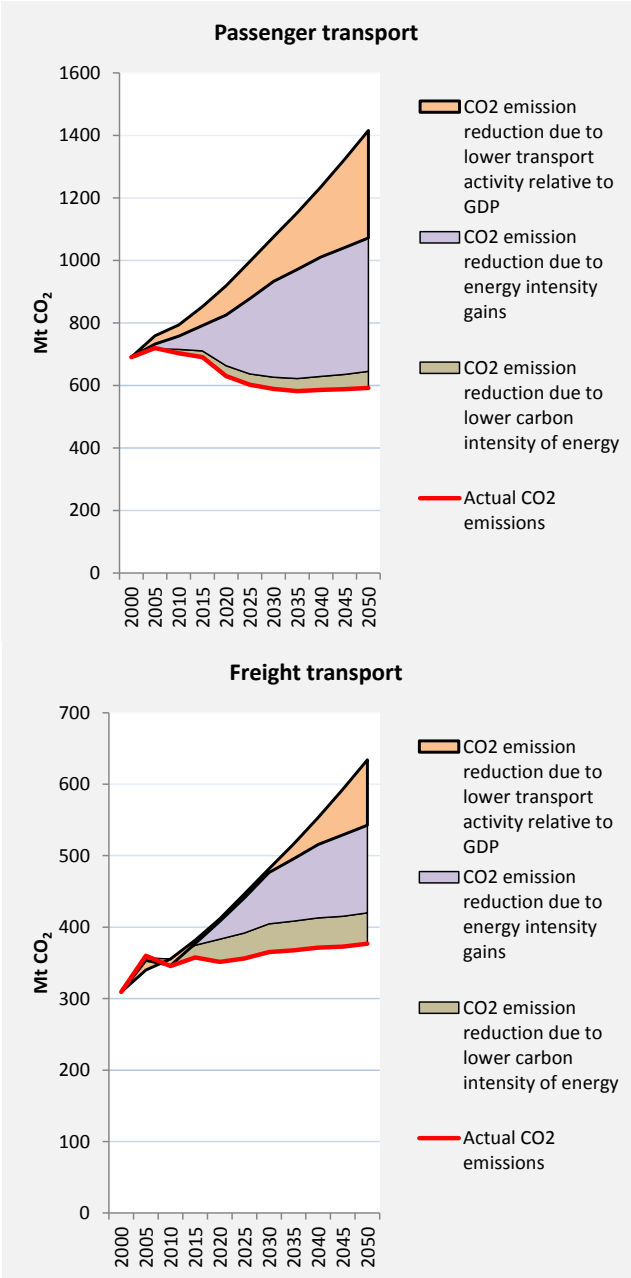


In transport, CO_2 emissions (excluding international maritime) go down by 8% between 2010 and 2050. CO_2 emissions decrease until 2035 and slightly increase thereafter primarily driven by CO_2 emissions growth in freight road transport and aviation (Figure 43). Fuel efficiency gains driven by CO_2 standards for LDVs as well as the increasing fossil fuel prices result in significant emission reductions relative to current trends. Decreases in carbon intensity of energy consumption are less pronounced as the projections do not show a significant shift towards alternative fuels. A shift to alternative fuels, including electricity, is mainly projected in the longer run for the passenger cars segment and in rail.

The main drivers of declining emissions are policies on CO_2 emissions from LDVs. These bring about a considerable decrease in emissions from passenger cars and light commercial vehicles, with the highest reduction taking place in the period 2010-20. Beyond 2035, CO_2 emissions from passenger road transport stabilize with no further tightening of CO_2 standards assumed.

Aviation emissions are increasing over the projection period, however at a slower rate than aviation activity, primarily due to the fuel efficiency improvements and the slow penetration of bio-kerosene beyond 2035, fostered by rising ETS prices. CO_2 emissions from passenger rail are decreasing as a result of switching from diesel to electricity and the shift from conventional passenger rail to high-speed rail.

FIGURE 43: CO_2 EMISSIONS OF THE TRANSPORT SECTOR



Regarding freight transport, CO_2 emissions steadily grow throughout the projection period. The main contributor to CO_2 emissions growth is road freight, where the increased activity surpasses improvements in specific fuel consumption, especially for HGVs. CO_2 emissions from other modes (rail and inland navigation) hold a small share in total freight emissions.

Figure 44 and Figure 45 depict the evolution of total CO_2 emissions and indicate two main characteristics[31]; the first one is that dedicated policies result in ETS CO_2 emissions reducing faster than overall emissions. Moreover, the trend in CO_2 emissions shows a very steep decrease in power generation, whereas emissions in the field of transport increase compared to 1990 and decrease at much slower pace between 2010 and 2050 due to the relatively high marginal abatement costs in this sector. In the long term, as power generation becomes almost completely carbon-free, the transport sector becomes the largest source of CO_2 emissions.

FIGURE 44: EVOLUTION OF CO_2 EMISSIONS

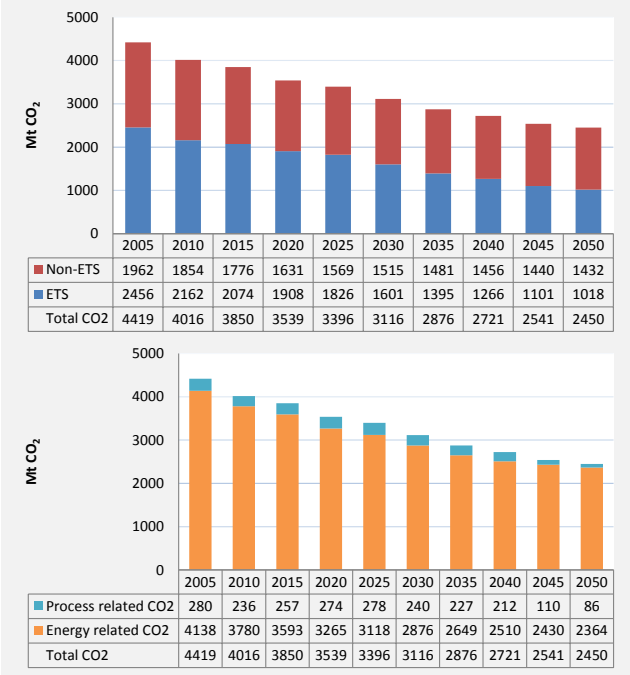
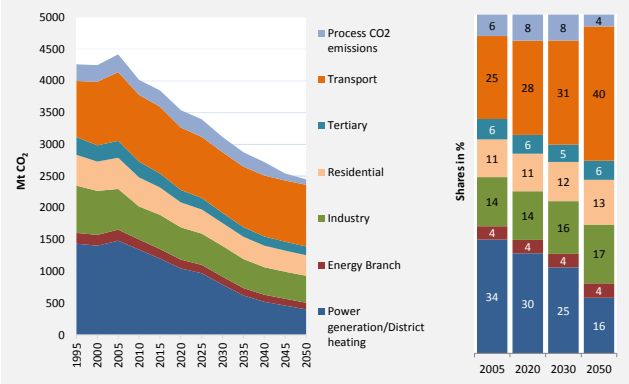


FIGURE 45: EVOLUTION OF CO_2 EMISSIONS BY SECTOR



Non-CO_2 emissions and their drivers

Current and future emissions of anthropogenic non-CO_2 greenhouse gases (GHGs) have been estimated for the Reference scenario using the GAINS model. The input of energy activity drivers was taken from PRIMES model results and agricultural activity drivers were derived from CAPRI model results (see box on the next page). Drivers for other relevant sectors (e.g., waste and F-gases) were developed within the GAINS model to be consistent with the macroeconomic projections as described in section 2. The non-CO_2 GHGs considered here are the ones targeted under the Kyoto protocol, i.e. methane (CH_4), nitrous oxide (N_2O) and three groups of fluorinated gases (F-gases) viz. hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6). Emissions of non-CO_2 GHGs have been expressed in terms of Mt CO_2eq adopting IPCC AR2 Global Warming Potentials (GWPs) over 100 years, i.e. on a weight-equivalent basis the CO_2 equivalent warming potential adopted for CH_4 is 21 (i.e. 1t CH_4 equals 21t CO_2eq), for N_2O it is 310 (i.e. 1t N_2O equals 310t CO_2eq) and for the different F-gases have a GWP which ranges between 140 and 23900 depending on the F-gas. The GAINS model estimates for CH_4 and N_2O emissions in year 2005 are aligned with the emissions reported by Member States to the UNFCCC (as of April 2012) by introducing country- and gas specific calibration residuals. These carry over as constants to all future years. The constants reflect differences in the methodological approaches taken by countries relative to the consistent GAINS model approach, as well as minor emission sources which countries report that are not captured in the GAINS

[31] For consistency reasons PRIMES calculates energy-related CO_2 emissions based on the fuel use reported in Eurostat energy balances and projected in PRIMES. The calculated emissions may therefore vary from energy-related CO_2 emissions reported to UNFCCC. Process related and other CO_2 emissions are projected starting from the emission inventories for 2005 and 2010 as reported to the UNFCCC in May 2012. Starting from this basis, PRIMES total CO_2 emissions are calibrated to total CO_2 emissions reported to UNFCCC in 2012 for 2005 to the extent reasonably possible. In particular, adjustments have been done for process-related emissions to avoid possible double counting of CO_2 emissions. PRIMES ETS sector coverage corresponds to the phase 3 ETS scope as valid since 2013. ETS emissions are calibrated to 2005 and 2010 ETS CO_2 emissions, with higher importance accorded to calibration for 2005, based on verified emissions and estimates for scope adjustments and additional sectors.

model structure[32]. No calibration was conducted for F-gas emissions, because of large variation between countries in the quality and completeness of the reported emissions.

Non-CO_2 GHGs are emitted from a variety of sources and sectors. Figure 46 shows the contribution of the major sectors to total non-CO_2 emissions in 2005 and the projected development to 2050 in the Reference scenario. Non-CO_2 GHG emissions in EU28 are expected to decline from 903 to 728 Mt CO_2eq between 2005 and 2030 and stabilize on that level throughout the remaining projection period. The agricultural sector is a major contributor to emissions, responsible for over 50% in 2005 and with only minimal decline expected in the future. The largest decline in emissions is expected to take place in the waste and industry sectors in response to existing control regulations.

FIGURE 46: NON-CO_2 GHGS BY MAJOR SECTORS IN EU28 2005 TO 2050

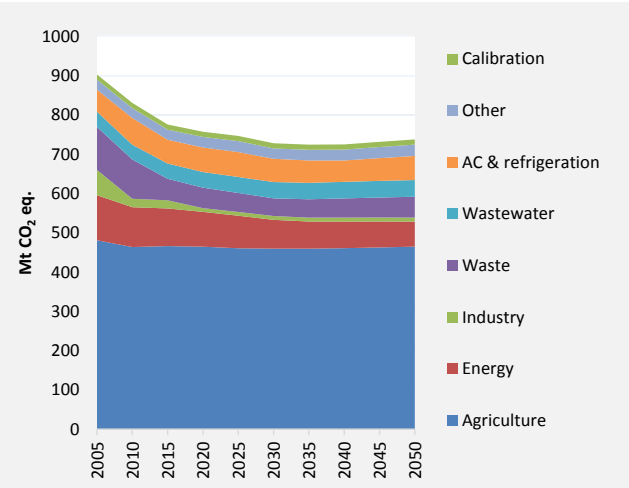


Table 8 provides an overview of the main national policies affecting the Reference scenario non-CO2 GHG emissions projections in EU28. The relevant EU level policies (see overview table in section 1.3) are in particular the EU Landfill Directive and the EU F-gas regulation, as well as the EU ETS. In the following sections, the emission projections are described by sector and in more detail - explaining drivers, current control and reasons for overall trends.

The Greenhouse Gas and Air Pollution Interactions and Synergies (GAINS) model is an integrated assessment model developed by the International Institute for Applied Systems Analysis (IIASA) for the purpose of describing policy-relevant pathways of atmospheric pollution from anthropogenic sources. Greenhouse gases (GHGs) and many of the traditional air pollutants have common sources, their emissions interact in the atmosphere, and separately or jointly they cause a variety of environmental effects at the local, regional and global scales. The GAINS model addresses emission control strategies that simultaneously address air pollutants and greenhouse gases.

The GAINS model was used to produce projections of EU28 non-CO_2 GHG emissions. The model includes information on emission factors, technical control potentials and costs which when combined with economic, energy and agricultural activity pathways from the PRIMES and CAPRI models, result in consistent projections of future non-CO_2 GHGs.

The Common Agricultural Policy Regional Impact (CAPRI) model is an agricultural sector model with a focus on Europe (disaggregation into 280 NUTS2 regions, detailed activity data and coverage of Common Agricultural policies), but embedded in a global market model to represent bilateral trade between 44 regions (countries or country aggregates). The main model outputs are market balance data, prices, income and economic welfare and, due to its high level of disaggregation in the activity data, also various environmental indicators like nutrient balances, erosion etc. (see www.capri-model.org).

The CAPRI outlook systematically merges the information in historical time series with external projections from other models or independent expert knowledge while imposing technical consistency. Key external information came from the models PRIMES, GLOBIOM and AGLINK, together with national expert information on specific items. The key outputs (to GAINS) were the activity data in the livestock sector plus mineral fertilizer use in the crop sector.

[32] A detailed description of the GAINS methodology for estimating non-CO_2 GHGs and projections for EU28 can be found in Höglund-Isaksson, L., W. Winiwarter, P. Purohit: Non-CO2 greenhouse gas emissions, mitigation potentials and costs in EU28 from 2005 to 2050, Part I: GAINS model methodology, International Institute for Applied Systems Analysis, Laxenburg, Austria.

TABLE 8 : MAIN NATIONAL POLICIES WITH SPECIFIC EFFECTS ON NON-CO_2 GHGS AND CONSIDERED IN THE REFERENCE SCENARIO

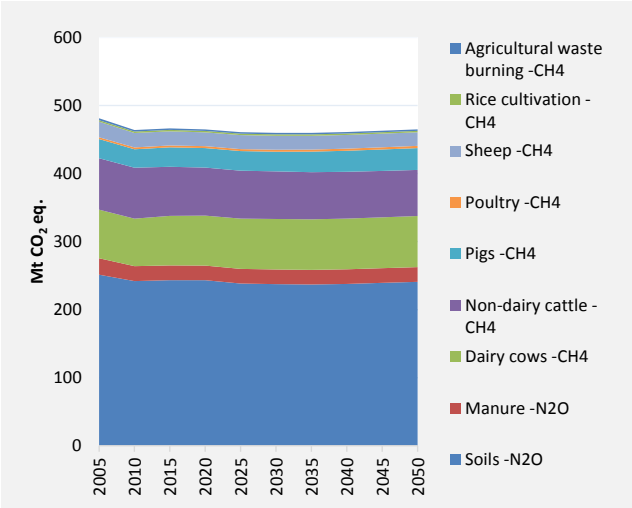
National policies		
1	Ban on landfill of biodegradable waste	Austria, Belgium, Denmark, Germany, Netherlands, Sweden
2	National F-gas policies	Austria, Belgium, Denmark, Germany, Netherlands, Sweden
3	Subsidy scheme for anaerobic digestion of manure	Netherlands

Decomposing non-CO_2 GHG emissions for the ETS and the non-ETS sectors reveals different trends for the two categories. Emissions from the ETS sectors demonstrate a very significant decrease as they fall 90% from 2005 already by 2020 and slightly decrease thereafter (see section on industry sectors below). These constitute however a small share of overall non-CO_2 GHGs (6% in 2005). The reduction of emissions of gases from the non-ETS sectors is less pronounced. In 2020 the reduction achieved is 11% relative to 2005. The trend continues to be decreasing reaching a 15% reduction in 2030. Beyond 2035, the trend is reversed and ultimately in 2050 the reduction relative to 2005 is projected to be 13%.

Agriculture sector

The main source of agricultural non-CO_2 GHGs are N_2O emissions from microbial processes in soils. They contribute to roughly half of agricultural non-CO_2 GHGs in EU28, as shown in Figure 47. The activity driver for soil emissions used in GAINS is nitrogen input on agricultural lands, which is the sum of the nitrogen contained in mineral fertilizers applied, animal manure spread and crop residues left on fields. Activity numbers used are Eurostat data, while future trends in mineral fertilizer input on lands and animal numbers are adopted from projections made by the CAPRI model. Country-specific information on crop residues and animal excretion rates are taken from national reporting to the UNFCCC (2012) and kept constant over time. N_2O emissions from soils are estimated at 251 Mt CO_2eq in 2005 with a slight decline of 5 percent to 2030 due to declining trends in mineral fertilizer use and cattle numbers (see Figure 47).

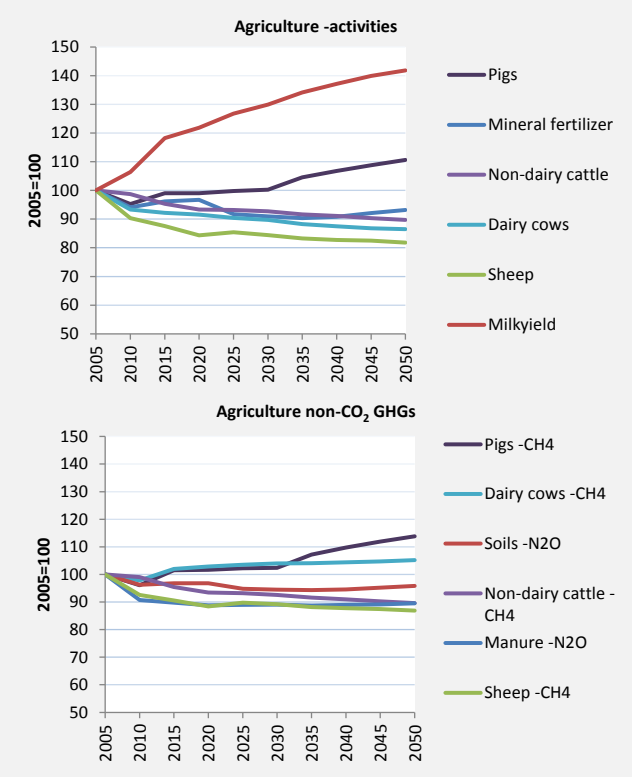
FIGURE 47: NON-CO_2 GHGS OF THE AGRICULTURE SECTOR IN EU28 BY SOURCE



The other major source of agricultural non-CO_2 GHGs is livestock rearing (dairy and non-dairy cattle, pigs, sheep and poultry) and accounts for 225 Mt CO_2eq in 2005 with a slight expected decline to 218 Mt CO_2eq in 2030. CH_4 emissions are released from enteric fermentation in ruminants as well as management of animal manure, which gives rise to anaerobic conditions during which microbial activity forms N_2O and CH_4 which are then released. Enteric fermentation and manure management emissions from dairy cows are driven by the development in animal numbers as well as by changes in metabolic activity: more productive cows (productivity expressed as milk yield per cow) tend to cause higher emissions per animal. The increase in CH_4 emissions from dairy cows in Figure 48 results from an increased milk production and the combined effect of a 10 percent decline in animal numbers and a 30 percent expected increase in the average milk yield per cow between 2005 and 2030.

For other animal categories, emissions are almost exclusively driven by animal numbers. CH_4 emissions mainly from large pig farms are about 2 Mt CO_2eq per year lower than would be expected on the basis of activity levels only due to the existing capacity to treat manure in anaerobic digesters with energy recovery. This is the result of national policies.

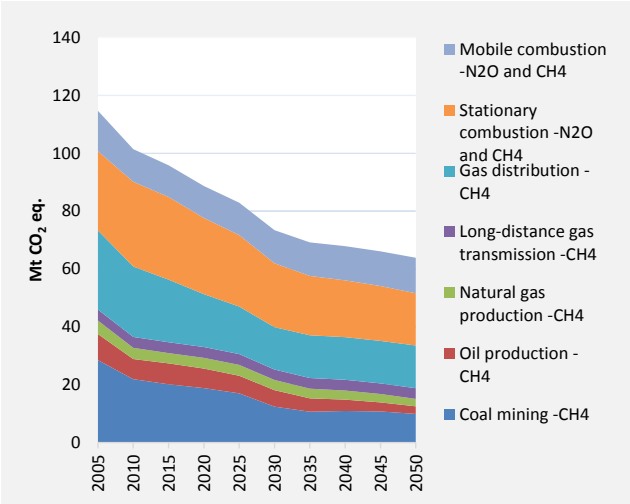
FIGURE 48: AGRICULTURE SECTOR ACTIVITY DRIVERS AND EMISSIONS OF NON-CO_2 GHGS IN EU28



Energy sector

Energy sector sources of non-CO_2 GHGs are fugitive leakage of CH_4 from fossil fuel extraction and transportation and CH_4 and N_2O emissions from fuel combustion, as shown in Figure 49. N_2O from combustion sources is partly a direct by-product of combustion as well as has been a side-effect of some NO_x control technologies on stationary and mobile combustion sources[33]. Some low-NO_x technologies like fluidized bed combustion or selective NO_x reduction technologies reduce NO_x emissions but may strongly increase N_2O emissions. The relative decline in N_2O emissions from combustion is stronger than the expected decline in total energy consumption, which is the result of a fuel use shift in stationary sources away from fluidized bed combustion of fossil solid fuels. CH_4 emissions from extraction of coal, natural gas and oil decline in line with the expected reduction of fossil fuel production in the EU. The driver for the projected leakage from long-distance gas transmission is the gas consumption in the respective country. Leakage from this source does not decline proportionately with gas consumption due to a relatively stronger increase in demand in countries which report higher leakage rates. CH_4 leakage from consumer gas distribution networks declines faster than gas consumption due to effects of an on-going replacement of old town gas networks in some EU countries expected to be completed in 2030.

FIGURE 49: NON-CO_2 GHGS OF THE ENERGY SECTOR IN EU28 BY SOURCE



Waste and wastewater sector

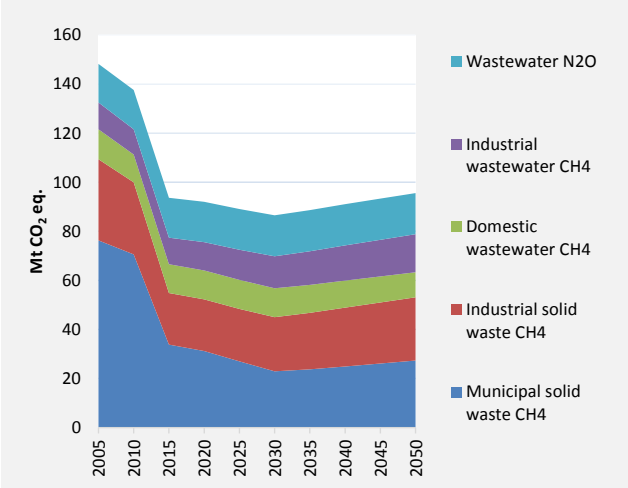
In 2005, the waste and wastewater sectors in EU28 are estimated to have released almost 150 Mt CO_2eq. Half of this amount comes from municipal solid waste as shown in Figure 50. CH_4 from solid waste is released when biodegradable matter decomposes under anaerobic conditions in landfills or during storage and handling of biodegradable waste in different waste treatment processes. Due to the slow decomposition of waste in landfills, GAINS models future emissions as driven by the gross (pre-treatment) amounts of waste generated ten to twenty years before. Further parameters include the fraction of the waste deposited on landfills and the effect on emissions of current recovery and control of landfill gas. The gross amounts of solid waste generated are driven by GDP and urbanization rate for municipal solid waste and by value added in the relevant manufacturing industries. The implementation of the EU Landfill Directive is expected to reduce CH_4 emissions from municipal and industrial solid waste by almost 60 percent between 2005 and 2030. A modest decline in emissions of 9 percent between 2005 and

[33] Mobile combustion sources refer to combustion in the transport sector. For mobile sources, this problem seems to be solved with today's technologies.

2010 result from landfill gas recovery becoming mandatory from 2009, while the deeper cuts in emissions between 2010 and 2030 are expected from the increased diversion of biodegradable waste away from landfills through separation and treatment. Taking into account the time lag between disposal and emission release from landfills, the full effect of the Landfill Directive on CH_4 emissions is achieved only in 2030. Thereafter emissions start rising slowly driven by the expected future growth in GDP and industry value added.

Wastewater from households and organic processes in industry contain nitrogen and organic compounds which wastewater treatment plants are decomposing before discharge. The main gaseous products are CO_2 and molecular nitrogen but during the process also CH_4 and N_2O are formed and released. Figure 50 shows that the release of CH_4 and N_2O from wastewater handling and treatment in EU28 is expected to remain at a level of about 40 Mt CO_2eq between 2005 and 2050. The activity driver for N2O emissions from wastewater is total population. Driver for CH_4 emissions from domestic wastewater is the number of people connected to centralised (urban) and decentralised (rural) collection of wastewater, respectively. The activity data used to estimate CH_4 emissions from industry wastewater is chemical oxygen demand (COD) in untreated wastewater from the manufacturing of food, pulp and paper, and organic chemical products. Projections of future emissions are driven by growth in value added in respective industry. The EU Urban Wastewater Treatment Directive regulates the release of waterborne pollutants in wastewater from urban households and food industry. “Appropriate treatment” must be in place by 2005. In GAINS, “appropriate treatment” is interpreted as a conversion from primary mechanical treatment to secondary/tertiary aerobic and/or anaerobic treatment. As a side-effect to improved water quality, such conversions also reduce the formation and release of CH_4. CH_4 emissions from domestic and industrial wastewater drop slightly between 2005 and 2010 primarily due to extensions of secondary/tertiary wastewater treatment in some new Member States but also as a result of more people being connected to centralized wastewater treatment. After 2030 CH_4 emissions from domestic wastewater treatment decline assuming that with the natural turnover of capital municipal wastewater treatment plants will become more effective in controlling CH_4 emissions. This assumption does not apply to the more small-scale treatment of industrial wastewater and therefore CH_4 emissions from industrial wastewater are expected to grow proportionately to value added in the relevant industries.

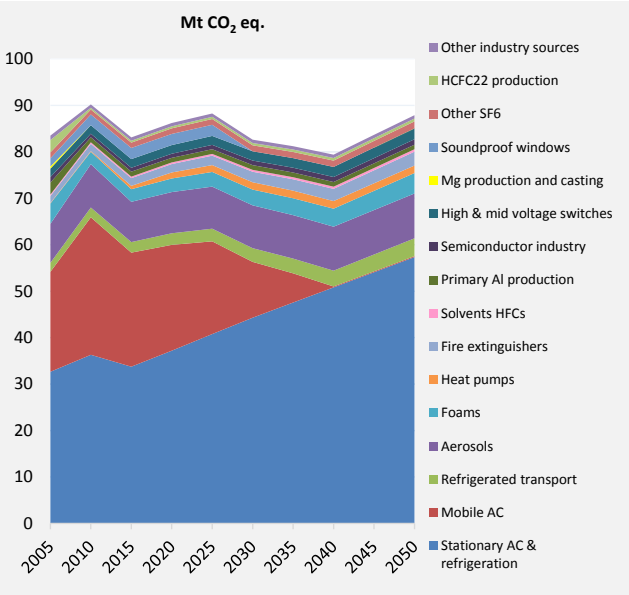
FIGURE 50: NON-CO_2 GHGS OF THE WASTE AND WASTEWATER SECTOR IN EU28



F-gas emissions

Emissions of fluorinated gases (F-gases) considered here are HFCs, PFCs and SF_6. HFCs are primarily used as cooling agent in air conditioners (AC) and refrigerators, but also as blowing agents in foams and propellants for aerosols. Sources of PFC emissions are primary aluminum production and semiconductor industry, while SF_6 serves a variety of uses in e.g., high and mid voltage switches, magnesium production and casting, soundproof windows, sports and military equipment. Although used in small quantities, the high warming potentials and long lifetimes in the atmosphere make the contribution of these gases to global warming significant in CO_2-eq terms. Figure 51 shows how F-gas emissions in EU28 are expected to fluctuate between 80 and 90 Mt CO_2eq over the period 2005 to 2050, which represents an increasing share of total non-CO_2 GHGs from 9 to 12 percent (due to the overall decline in CH_4 and N_2O emissions).

FIGURE 51: F-GAS EMISSIONS IN EU28 BY SOURCE

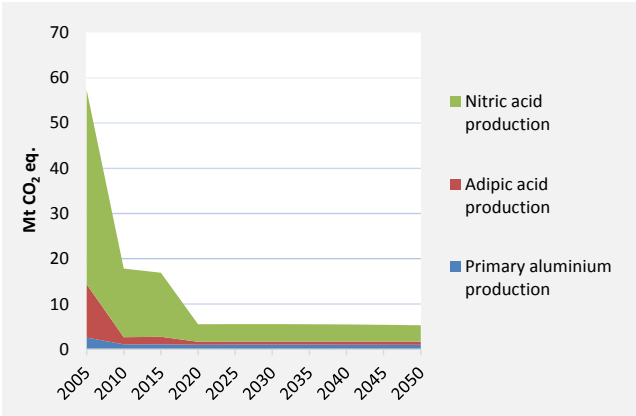


The fluctuating but relatively stable level of F-gas emissions is the combined result of a strong increase in demand for services offered by F-gases (e.g., cooling), replacement of the ozone-depleting substances CFCs and HCFCs with HFCs in order to comply with the Montreal Protocol, and effects of adopted regulations to control F-gas emissions. Demand for cooling and refrigeration in GAINS is primarily driven by economic growth along with cooling degree days, commercial floor space and assumptions about technology penetration and saturation rates[34] . The EU F-gas regulation came into effect in 2006 and the EU Directive on mobile air-conditioning systems in steps from 2008 onwards. Together with stricter national F-gas legislation in several member states (Austria, Belgium, Denmark, Germany, Netherlands and Sweden) these regulations account for the expected stabilization in future F-gas emissions after 2010 shown in Figure 51. The Reference projection does not take account of the ongoing revision of the EU F-gas regulation due to be adopted by 2014, aiming to significantly reduce emissions. Included in the Reference scenario is the prohibition of high GWP cooling agents in mobile air conditioners (MACs). It is assumed that the use of HFC-134a in MACs is replaced by HFO-1234yf with a GWP of 4 resulting in an almost complete phase-out of these emissions by 2040. The decline in F-gas emissions between 2010 and 2015 seen in Figure 51 is due to compliance with the EU F-gas regulation which requires leakage control and end-of-life recovery of HFCs from AC and refrigeration equipment, limitations on the use of F-gases as propellants for aerosols and foams and a ban on SF_6 use in various applications e.g., soundproof windows and sports equipment.

Industry sectors covered by the EU ETS

Emissions of non-CO_2 GHGs from sectors regulated under the EU Emissions Trading System (EU-ETS) since 2013 include N_2O emissions from nitric and adipic acid production and PFCs from primary aluminum production. In 2005 these emissions amounted to 57 Mt CO_2eq or 6 percent of total non-CO_2 GHGs in EU28. N_2O emissions from nitric and adipic acid production can be effectively controlled through installation of existing low cost technology. The marginal cost of these technologies is lower than the carbon price in the EU-ETS thereby making technology adoption profitable. This together with the anticipation of the ETS inclusion, related Joint Implementation projects and the economic crisis explain the sharp decline of 70 percent in reported emissions between 2005 and 2010 shown in Figure 52, as well as the further decline.

FIGURE 52: NON-CO_2 GHGS OF EU-ETS SECTORS IN EU28



By 2020 the expected decline in emissions is 90 percent due to full adoption of available and improved technologies. PFC emissions from primary aluminum production are linked to the use of older production technologies. With the natural turnover of capital the older technologies are expected to be replaced by the

[34] Please see Höglund-Isaksson et al. 2013 for details.

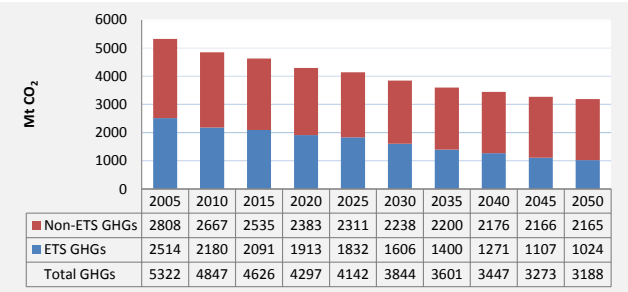
more efficient and less emitting point-feeder prebake (PFPB) technology.

Total GHG emissions (excluding LULUCF)

Overall, in 2020, the corresponding GHG emissions targets are projected to be overachieved; total reduction in GHG emissions relative to 1990 is 24%, resulting from 22% reduction of CO_2 emissions and 35% reduction of emissions from non-CO_2 gases. In the ETS sectors, total GHG emissions are reduced by 24% relative to 2005, surpassing the target of 21% due to the projected continuous build-up of an allowance surplus. Regarding non-ETS sectors, the target of the ESD is overachieved at the EU level, with total emissions reducing by 15% in 2020 relative to 2005, surpassing the 10% target. Respective national targets are achieved domestically in the majority of countries.

Until 2030, developments (in particular in the power sector) result in total GHG emissions reducing by 32% relative to 1990. Emissions of the ETS sectors reduce by 36% compared to 2005, with 47% being the corresponding figure for power generation alone. Non-ETS sectors also see a decrease in emissions but not as strong. Finally, in 2050 perspective, emissions continue to decrease, primarily driven by developments in power generation. Overall GHGs emissions are reduced by 44% relative to 1990 (46% for CO_2 emissions).

FIGURE 53: EVOLUTION OF GHG EMISSIONS[35]



	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Non-ETS GHGs	2808	2667	2535	2383	2311	2238	2200	2176	2166	2165
ETS GHGs	2514	2180	2091	1913	1832	1606	1400	1271	1107	1024
Total GHGs	5322	4847	4626	4297	4142	3844	3601	3447	3273	3188

The decreasing trend in emissions beyond 2020 is well pronounced, especially for the power generation sector, however it is not sufficiently intense in order to achieve the long-term objectives in the context of the Roadmaps to 2050. More specifically, in line with the EU's objective of -80 to -95% GHG emissions reduction in 2050 compared to 1990, the Roadmap for moving to a low carbon economy in 2050[36] sets a milestone for GHG emissions reductions in the EU of 40% in 2030 relative to 1990 and 80% in 2050, while the projections in the Reference 2013 scenario are 32% reduction in 2030 and 44% reduction in 2050.

LULUCF emissions and removals and their drivers

Current and future CO_2 emissions from the land use, land use change and forestry sector (LULUCF) have been estimated using the Global Biosphere Management Model (GLOBIOM) and the Global Forest Model (G4M) models. Basic drivers, such as: GDP, population development, energy demand, biomass energy supply and productivity changes are generated by PRIMES and GEM-E3 or provided by global databases[37]. These drivers are then used by the economic bottom-up land use model GLOBIOM. Demand is endogenously produced by the model and matched by supply of food, fodder, timber and energy. The information between models flows not only in one direction but is circulated between GLOBIOM and G4M models iteratively, where relevant. While G4M is used to estimate emissions from forest land, GLOBIOM estimates emissions from crop- and grassland. Remaining emissions from wetlands, settlements and other land (corresponding to UNFCCC accounts) are not modeled explicitly and kept constant at 2010 levels until 2050.

Table 9 gives a brief overview of the datasets and models used to estimate LULUCF areas and emission factors.

The EU28 LULUCF sector is at present a carbon sink as it sequesters more carbon than it emits. The EU LULUCF sink in the UNFCCC inventory was estimated between 288 Mt CO_2 in 2000 and 296 Mt CO_2 in 2010[38] which is around 20% above the projections

[35] Excluding LULUCF emissions and removals. For comparability reasons over time, ETS and non-ETS emissions for 2005 and 2010 are reported in ETS phase 3 scope as valid from 2013.

[36] COM(2011)112

[37] DG ECFIN publications are used for macro-economic projections.

[38] Please see: http://unfccc.int.

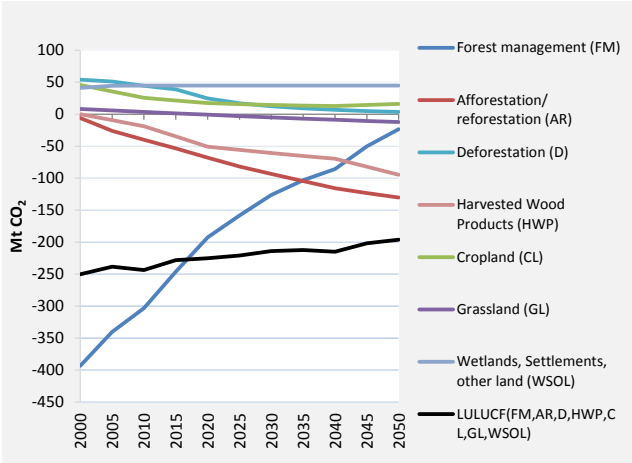
delivered by GLOBIOM and G4M. The difference is related to model and datasets uncertainties as well as different modeling and reporting approaches applied. The LULUCF sink is expected to be maintained until 2050, even though it is projected to decline from about -244 Mt CO_2 in 2010, to -214 Mt CO_2 in 2030 and -196 Mt CO_2 in 2050 in the Reference scenario, which corresponds to a decrease from 2010 levels of -12% by 2030 and -20% by 2050. This decline is the result of changes in different land use activities of which the forest sector changes are the most important. Figure 54 shows the projection of the total EU28 LULUCF sink in the Reference scenario until 2050 and the contribution from different activities.

TABLE 9: METHODOLOGY USED TO ESTIMATE LULUCF EMISSIONS

	Area/Supply estimate	Emission factor
Afforestation	G4M estimate, based on GLOBIOM drivers, calibrated to historic level (UNFCCC)	Internal forest growth model, simplified soil emission estimate based on literature
Deforestation	G4M estimate, based on GLOBIOM drivers, calibrated to historic level (UNFCCC)	Average biomass stock estimated by G4M, based on remote sensing map
Forest management	Based on country UNFCCC and Kyoto data or other data bases (MCPFE)	G4M estimate based on age class structure, initial biomass stock, management regime etc.
Cropland management	GLOBIOM estimate, calibrated to historic level (EUROSTAT)	Estimate of biophysical crop model (EPIC), depending on soil, climate and crop parameters
Grassland management	GLOBIOM estimate, calibrated to historic level (EUROSTAT)	Country level emission factor based on UNFCCC data
Settlements, wetlands and other land	UNFCCC data	UNFCCC data
Harvested wood products	GLOBIOM estimate, calibrated to historic level (FAO, country submission)	IPCC default values

In general, forest management emissions are driven by the balance of harvest removals and forest increment rates (the growth of the biomass stored in a forest as a result of the growth of the trees with the age). As harvesting removals increase over time related to growing demand for wood for products (such as furniture or paper), the carbon sink in managed forests declines significantly. Growing demand for wood as projected by GLOBIOM is driven by population and income growth as well as increasing wood demand for renewable energy production. The significant decline in the managed forests carbon sink can however be partially compensated by a rising carbon sink from afforestation, a decrease in deforestation and increasing carbon storage in harvested wood product. Since part of the harvested biomass is processed to final wood products which have a lifespan of several years, the carbon sink from harvested wood products increases (see Figure 54). Until 2050, emissions from deforestation continue to decrease in line with historic trends. In addition, carbon sequestration from afforested areas increases due to that fact that new forests are established but also young forests that were established over the last 20 years get into a phase of high biomass production.

FIGURE 54: EU28 LULUCF EMISSIONS UNTIL 2050 IN MT CO_2

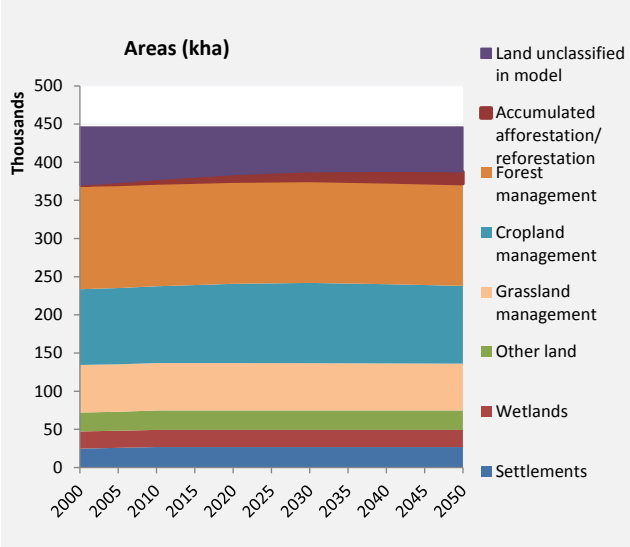


Activities in the agricultural sector have a smaller impact on the total LULUCF sink compared to the forest sector. Still, net carbon emissions from cropland are projected to decline by some 40% compared to 2010 due to the increasing cultivation of annual (e.g. miscanthus, switchgrass) and perennial lignocellulosic

crops (e.g. short rotation tree plantations) for renewable biomass based bioenergy production. Typically these plants provide more litter input into the soil and management activities are less disturbing the soil, leading to a reduced loss or even an accumulation of soil carbon. Similarly, total emissions from grasslands are expected to go down as more land is projected to be converted to grassland that typically tends to sequester additional carbon.

Figure 55 shows the EU28 LULUCF sector land balance until 2050. Over time, the forest area expands by 4% in 2030 and 7% in 2050 compared to 2010 at the expense of cropland and grassland taken out of production. Cropland and grassland areas remain at more or less constant levels. The area for perennial crops (including annual lignocellulosic crops) for renewable energy production grows significantly and by 2030 7% of total cropland is cultivated with perennials (9% in 2050).

FIGURE 55: EU28 LULUCF SECTOR LAND BALANCE IN 1.000 HA UNTIL 2050



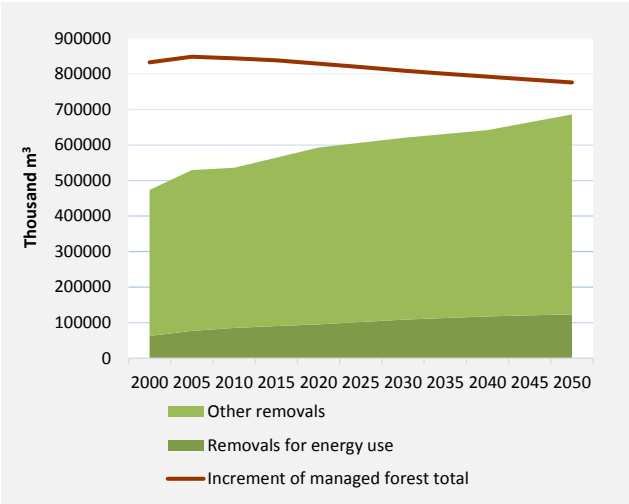
The following sections provide a more detailed overview of the drivers, emission projections and overall trends by the different LULUCF sectors.

Emissions from forest land

The current net forest sink (the sum of forest management, afforestation and deforestation) is projected to decrease from -299 Mt CO_2 in 2010, to -208 Mt CO_2 in 2030 and -150 Mt CO_2 in 2050 which corresponds to a decline by -31% and -50% in 2030 and 2050, respectively. This is the result of different, partly, opposing trends. Increasing wood demand and corresponding rising harvesting removals are important drivers, but also a projected decline in the forest growth rate due to ageing. Harvesting removals rise from 536 million m^3 in 2010, to 620 million m^3 in 2030 and 686 million m^3 in 2050. At the same time, the carbon sink in managed forests declines from -303 Mt CO_2 in 2010 to -127 Mt CO_2 in 2030 and -24 Mt CO_2 in 2050.

Total harvest removals in EU28 increase steadily over time as well as the share wood removed for energy use in the total harvest (see Figure 56). This share increases from 16% of total harvest in 2010, to 17% in 2030 and 18% in 2050 as demand for renewable energy production rises. Despite a decrease of forest increment over time, in 2050 the increment is with 777 million m^3 still well above the total wood removals which sum up to 686 million m^3. Reasons for the declining forest increment are a change in age class structure towards a higher share of older forest stands that grow at lower rates and a saturation of biomass accumulation. European forests get older but also thicker and therefore grow relatively slower in the future. This trend might be reversed after 2050 following the more intensive use of forest (resulting in reestablished younger forests stands) in the second half of the century.

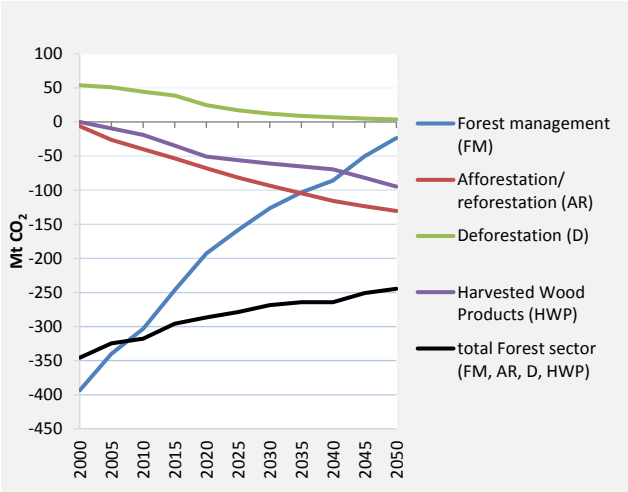
FIGURE 56: EU28 HARVEST REMOVALS AND INCREMENT IN 1.000 M3 UNTIL 2050



Simultaneously, the carbon sink in harvested wood products increases from-19 Mt CO_2 in 2010 to -61 Mt

CO_2 in 2030 and -95 Mt CO_2 in 2050 compensating the reduced sink in the managed forest to some degree. In addition, the carbon sink from afforested areas is also growing until 2050. Even though annual afforestation and reforestation rates decrease over time, 11 million ha (Mha) of land will be afforested until 2030, 16 Mha until 2050 (see Figure 55). In 2030, already 8% of the total forest area will be newly planted forests (10% in 2050). The total forest area is projected to increase from 140 Mha in 2010, to 146 Mha in 2030 and 150 Mha in 2050. In total, afforested areas are projected to sequester 94 Mt CO_2 in 2030 and 130 Mt CO_2 in 2050. With increasing age the new forests get more and more into a phase of high production and become gradually available for wood and biomass supply. Towards 2050 these forests are therefore also taking harvest pressure from older forests and thus help to keep the sink up in managed existing forests. Figure 57 shows the development of the carbon sink in the forest sector until 2050.

FIGURE 57: DEVELOPMENT OF THE EU28 CARBON SINK IN THE FOREST SECTOR UNTIL 2050



Emissions from deforestation continue to decrease from 45 Mt CO_2 in 2010, to 12 Mt CO_2 in 2030 and 4 Mt CO_2 in 2050 as deforestation drops from 74.000 ha in 2010 to 7.000 ha in 2050. This development is consistent with historic trends.

Emissions from cropland

Cropland is a net source of carbon dioxide emissions in EU28 at present. Over time, emissions are projected to decrease from 26 Mt CO_2 in 2010, to 14 Mt CO_2 in 2030 (44% decrease in comparison to 2010) and 16 Mt CO_2 in 2050 (38% decrease). The main driver for this decline is the projected establishment of short rotation tree plantations and lignocellulosic crops for renewable energy production which has a positive effect on the amount of carbon stored in the soil compared to conventional crops. Another important factor is the growing use of perennial crops such as miscanthus. The PRIMES biomass supply indicates that with growing demand the supply of these crops will grow because these are relatively cost-effective. In 2030, the area covered by perennial crops sums up to 7 Mha (7% of total cropland) and 9 Mha (9% of total cropland) in 2050. While carbon sequestration from perennials increases over time, emissions from conventional crops decrease as area declines. The conventional crop area is projected to decrease by 2 Mha until 2030 and 7 Mha until 2050.

Another important factor influencing soil carbon emissions from croplands is a saturation effect. Modeled soil carbon stocks converge towards equilibrium under a constant management regime. Disturbances of the equilibrium due to a change in management lead to a new equilibrium. The emissions or removals towards the equilibrium get smaller over time as the new management continues. This is especially true for more intense management changes such as the conversion of annual crops into perennial crop cultivation. Emissions from cropland remaining cropland decline from 16 Mt CO_2 in 2010 to -3 Mt CO_2 in 2030 and -5 Mt CO_2 in 2050. Emissions from land converted to cropland rise from 9 Mt CO_2 to 17 Mt CO_2 in 2030 and 21 Mt CO_2 in 2050 as land converted to cropland starts emitting carbon when being cultivated. As a result total cropland emissions are expected to decline over time (see Figure 54).

The total cropland area is projected to increase slightly from 101 Mha in 2010, to 105 Mha in 2030 and 102 Mha in 2050 related to the increase in perennial crop cultivation. Cropland remaining cropland declines from 96 Mha in 2010 to 95 Mha in 2030 and 87 Mha in 2050. Land converted to cropland increases from 5 Mha in 2010 to 10 and 15 Mha in 2030 and 2050 respectively.

Emissions from grassland

Grasslands are a net carbon source at present in the EU28. Over time, however, they turn from being a net source in 2010 with emissions of 4 Mt CO_2 to a net carbon sink of -5 Mt CO_2 in 2030 and -12 Mt CO_2 2050. This result is mainly driven by land converted to grassland as this land use change tends to sequester carbon after conversion. Even though total grassland area decreases marginally from 62 Mha to 61 Mha by 2050, land converted to grassland sequesters by 2030 14 Mt CO_2 and by 2050 21 Mt CO_2 and turns grasslands into a net carbon sink. Grassland remaining grassland declines from 60 Mha in 2010 to 56 Mha in 2030 and 53 Mha in 2050 due to afforestation and expansion of perennials. Land converted to grassland increases from 2 Mha in 2010 to 5 Mha in 2030 and 8 Mha in 2050 in order to compensate for the loss of grasslands and meet livestock feeding demand.

Emissions from other land

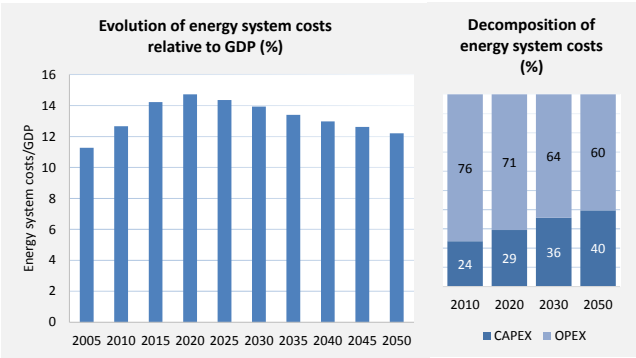
Emissions from other land, settlements and wetlands are not modeled explicitly in GLOBIOM and kept constant at 2010 levels as reported by UNFCCC[39]. Emissions from wetlands amount to 5 Mt CO_2, for settlements they amount to 39 Mt CO_2 and for other land 1 Mt CO_2. In EU28, around 22 Mha is covered by wetlands, 27 Mha by settlements and 26 Mha by other land according to UNFCCC reported data.

Total energy system and other mitigation costs

The considerable changes in the EU energy system and projected international fuel price developments drive strongly increasing energy system costs until 2020. This is attributable to direct capital expenditure payments both on the demand side (e.g. building insulation, replacing equipment with more efficient appliances, etc. triggered by energy efficiency policies) and on the supply side (refurbishment and new investments in power generation and transmission, needed to replace the existing capital stock). Additionally, increasing capital expenditures in power generation driven by the RES 2020 target are also reflected. Last but not least, strongly increasing international fossil fuel prices cause a significant further upward effect on energy system costs, both through direct fuel expenditures and indirectly through the electricity prices. Overall, in 2020 total system costs constitute 15% of the GDP, rising from 13% in 2010[40].

Beyond 2020 and throughout the remaining projection period, energy costs continue to increase in absolute terms but at a slower rate, below GDP growth, as the system reaps benefits from the investments undertaken in the previous decade (notably via fuel savings). In this period, the share of energy system costs in GDP is gradually decreasing, reaching 2010 levels in 2050.

FIGURE 58: EVOLUTION OF ENERGY SYSTEM COSTS[41]



Reflecting increasing capital intensiveness of the energy system, the share of CAPEX (capital costs and direct efficiency investments) in total system costs increases over time, reaching 40% in 2050 from 24% in 2010 (excluding ETS auction payments). Auction payments are very small compared to total energy system costs; it should be noted that auction payments do not represent an actual economic cost, as the revenues are recycled into the economy.

Regarding OPEX, overtime electrification of the residential and the tertiary sectors result in electricity costs becoming the main OPEX component for these sectors, instead of other fuel costs. The opposite ef-

[39] http://unfccc.int

[40] Total system costs include total energy system costs, costs related to process-CO_2 abatement and non-CO_2 GHG abatement. The energy system costs have been calculated on the basis of nominal discount rates, despite the use of lower discount rates for simulating economic decision making under framework conditions that strongly foster energy efficiency (see part on modelling of energy efficiency policies). Further modelling work will look into an alternative cost reporting methodology.

[41] Excluding ETS auction payments, given that they result in corresponding auction revenues.

fect is observed for the industrial sector, owing to decreasing long term electricity prices.

Conclusion

The portfolio of policies and binding targets that have been adopted so far in the EU are expected to bring about considerable changes in the energy system relative to past trends. Key policies that have been examined in the Reference scenario are GHG reduction policies like the EU ETS along with efforts to reach targeted RES shares and improve significantly energy efficiency, including CO_2 standards for vehicles. The latter two policy lines strongly support GHG reduction, involving a large number of synergies and also some overlaps, e.g. regarding the downward effect of RES electricity penetration and electricity savings on ETS prices. This has been addressed in modelling the binding 2020 GHG targets as effect of the EU ETS, the RES targets and other policies. An additional non-ETS target-related policy driver to ensure achievement turned out not to be necessary.

At the same time, competitive energy provision for businesses as well as affordability of energy use are key issues for economic and social development in the EU. Therefore this scenario analysis has also focused on relevant indicators in this respect, showing overall developments and potential trade-offs. Energy security issues have also been addressed, thereby giving a comprehensive picture on the possible implications of pursuing the adopted policies under the macro-economic and world energy framework conditions that have been modelled on the basis of the long term economic and demographic analyses undertaken in collaboration with Member States experts (notably the EPC/DG ECFIN Ageing Report).

GHG reduction is progressing in all sectors, but decarbonisation is particularly strong in power generation given the large number of options for decarbonisation in this sector and despite the move towards using more electricity. This higher electricity use reflects its convenience at use as well as the synergies from replacing CO_2 emitting fossil fuels (where CCS is not feasible or not economic) with electricity, which in turn is generated in a low carbon mode. Indeed, the main characteristic of the future EU energy system is a significant reduction of the carbon intensity of power generation. Another key feature is the decoupling of energy consumption from GDP growth, which is more limited for electricity due to the increasing shares of electricity in final energy consumption. Overall, despite significant economic growth making the EU economy 78% larger in 2050 than it was in 2010, there is a decline of total energy consumption by 8%.

The period until 2020 involves the most sweeping transitions due to the legally binding targets of the 20-20-20 Energy and Climate Package, the provisions of the EED and the CO_2 regulations for LDVs. The projection indicates that the measures contained in the EED combined with mandatory objectives on renewables, the EU ETS and other EU and national efficiency and climate policies, coupled with the steep increase in fossil fuel prices, induce energy savings of the order of 17% in 2020 relative to the benchmark (Baseline 2007 scenario). RES targets would be achieved, indeed slightly overachieved. Regarding GHG emissions, target levels (for all sectors combined and for the non-ETS sectors) would be even surpassed at the EU level. This is due to the economic crisis and a combination of policies that lead at an EU aggregate level to lower non-ETS emissions than resulting from the aggregate binding Member State targets in the Effort Sharing Decision and rising ETS surplus allowances until after 2020. Consequently, in 2020 GHG emissions fall by 24% compared to 1990, further decreasing to 32% below the 1990 level in 2030 and by 44% in 2050. However, this significant decrease falls still considerably short of the EU's 2050 GHG objective. The transitions of the 2010-20 decade set the ground for future developments. Beyond 2020, no RES targets have been agreed and no additional efficiency policies are defined, although efficiency measures continue to bear improvements in energy consumption until 2030 and beyond (notably the long term effects of more energy efficient investment brought about by different measures including eco-design, CO_2 standards for LDVs, etc. Energy consumption in 2030 is 21% lower than the 2030 energy consumption of the benchmark case (Baseline 2007). Moreover, the continuation of the ETS, leading to large decrease of ETS allowances throughout the projection period, constitutes a significant driver of continuing RES penetration, energy efficiency and further emissions reduction. In 2030, GHG emissions are projected to be reduced by 32% relative to 1990.

The changes that the power generation sector undergoes entail considerable capital intensive investments, as well as investments in the transmission and distribution system. These have an upward effect on electricity prices and energy system costs in the transitional period until 2020, enhanced further by the increased fossil fuel prices. Beyond 2020, however, electricity prices stabilize and even decrease. A general effect on total energy system costs is that they become more capital intensive over time. After having undergone all the structural adjustments to cope with the 2020 targets and policies, total energy system costs grow slower than GDP, leading to decreasing ratio of energy system costs to GDP in the period 2020-50.

Finally, the intense deployment of RES following notably the investment to achieve the 2020 targets results in sizeable decrease in external energy dependence. In the long run, however, the limited availability of indigenous fossil fuel resources (due to depletion of domestic resources) as well as limited additional biomass imports lead to total net energy imports increasing again (after 2035) This mainly concerns natural gas, which according to the projection will play a crucial role in the context of emission reduction targets and as back-up for variable RES.

GLOSSARY

Aviation: Aviation activity includes only intra-EU (domestic and EU international) air transportation. Energy consumption and CO_2 emissions in aviation reflects sales of fuels at the point of refuelling, irrespective of airplane destination. They approximately correspond to all outgoing domestic and international flights.

Biofuels: Biofuels include ethanol, biodiesel, bio-kerosene and bio heavy.

Carbon capture and storage (CCS): Carbon capture and geological storage is a technique for trapping carbon dioxide emitted from large point sources, compressing it, and transporting it to a suitable storage site where it is injected into the ground.

Carbon intensity: The amount of CO_2 emitted per unit of energy consumed or produced (t of CO_2/tonne of oil equivalent (toe) or MWh).

CO_2 Emissions to GDP: The amount of CO_2 emitted per unit of GDP (carbon intensity of GDP - t of CO_2/M Euro).

Cogeneration thermal plant: A system using a common energy source to produce both electricity and steam for other uses, resulting in increased fuel efficiency (see also: CHP).

Combined Cycle Gas Turbine plant (CCGT): A technology which combines gas turbines and steam turbines, connected to one or more electrical generators at the same plant. The gas turbine (usually fuelled by natural gas or oil) produces mechanical power, which drives the generator, and heat in the form of hot exhaust gases. These gases are fed to a boiler, where steam is raised at pressure to drive a conventional steam turbine, which is also connected to an electrical generator. This has the effect of producing additional electricity from the same fuel compared to an open cycle turbine.

Combined Heat and Power (CHP): This means co-generation of useful heat and power (electricity) in a single process. In contrast to conventional power plants that convert only a limited part of the primary energy into electricity with the remainder of this energy being discharged as waste heat, CHP makes use of a greater proportion of this energy for e.g. industrial processes, district heating, and space heating. CHP therefore improves energy efficiency (see also: cogeneration thermal plant).

Efficiency for thermal electricity production: A measure of the efficiency of fuel conversion into electricity and useful heat. It is calculated as heat and electricity output divided by the calorific value of input fuel.

Efficiency indicator in freight transport (activity related): Energy efficiency in freight transport is calculated on the basis of energy use per tonne-km. Given the existence of some methodological inconsistencies between transport and energy statistics, absolute numbers (especially at the level of individual Member States) might be misleading in some cases. For that reason, the numbers given are only illustrative of the trends in certain cases.

Efficiency indicator in passenger transport (activity related): Energy efficiency in passenger transport is calculated on the basis of energy use per passenger-km travelled. Issues related to consistency of transport and energy statistics also apply to passenger transport (see also: Efficiency indicator in freight transport).

Energy branch consumption: Energy consumed in refineries, electricity and steam generation and in other transformation processes.

Energy intensity: energy consumption/GDP or another indicator for economic activity.

Energy intensive industries: Iron and steel, non-ferrous metals, chemicals, non-metallic minerals, and paper and pulp industries.

Energy Service Company (ESCO): A company that implements a broad range of energy efficiency projects.

EU Emissions Trading System (EU-ETS): A scheme for greenhouse gas emissions allowance trading within the Community, established by Directive 2003/87/EC in order to promote reductions in greenhouse gas emissions in a cost-effective and economically efficient manner. Installations included in the scheme are combustion plants, oil refineries, coke ovens, iron and steel plants, and factories producing cement, glass, lime, brick, ceramics, pulp and paper. Recent amendments (2008/101/EC and 2009/29/EC) have enlarged its scope to include aviation and further process emissions.

Feed-in tariff: The price per unit (of electricity) that an eligible renewable electricity generator receives according to cost-based calculations for the specific resource used.

Final energy demand: Energy consumed in the transport, industrial, household, services and agriculture sectors; the latter two sectors are sometimes aggregated and named "tertiary". It excludes deliveries to the energy transformation sector (e.g. power plants) and to the energy branch. It includes electricity consumption in the above mentioned final demand sectors.

Freight transport activity: Covers goods transport by road, rail and inland navigation. Road transport activity is defined according to the nationality principle, in line with the available statistics from EUROSTAT.

Fuel cells: A fuel cell is an electrochemical energy conversion device converting hydrogen and oxygen into electricity and heat with the help of catalysts. The fuel cell provides a direct current voltage that can be used to power various electrical devices including motors.

Fuel input to power generation: Fuel use in power plants and CHP plants.

Gas: Includes natural gas, blast furnace gas, coke-oven gas and gasworks gas.

Generation capacity: The maximum rated output of a generator, prime mover, or other electric power production equipment under specific conditions designated by the manufacturer.

Geothermal plant: A plant in which the prime mover is a steam turbine, which is driven either by steam produced from naturally hot water or by natural steam that derives its energy from heat in rocks or fluids beneath the surface of the earth. The energy is extracted by drilling and/or pumping.

GINI coefficient: (or index) Measures distribution inequalities present in statistics, such as income distribution variation among EU Member States. A Gini coefficient of zero expresses an exactly equal income between MS.

Gross Inland Consumption (or primary energy consumption): Quantity of energy consumed within the borders of a country. It is calculated as primary production + recovered products + imports +/- stock changes – exports – bunkers (i.e. quantities supplied to international sea-shipping).

Gross Inland Consumption/GDP: Energy intensity indicator calculated as the ratio of total energy consumption to GDP – (toe/M Euro).

Hydro power plant: A plant that produces energy through the use of moving water. In this report, hydro excludes pumped storage plants that generate electricity during peak load periods by using water previously pumped into an elevated storage reservoir during off-peak periods when excess generating capacity is available. Energy losses in pumping are accounted for separately.

Inland navigation: Covers inland waterways and national maritime transport, for the purpose of ensuring consistency with the energy balances. International maritime is not included in the above category as, according to EUROSTAT energy balances, energy needs for international shipping are allocated to bunkers.

Import dependency: Demonstrates the extent to which a country relies upon imports in order to meet its energy needs.

Non-fossil fuels: Nuclear and renewable energy sources.

Non-energy uses: The use of petrochemicals and other energy carriers for purposes other than energy production, such as chemical feed-stocks, lubricants and asphalt for road construction.

Nuclear power plant: A plant in which a nuclear fission chain reaction can be initiated, controlled, and sustained at a specific rate for production of energy.

Oil: Includes crude oil, feed-stocks, refinery gas, liquefied petroleum gas, kerosene, gasoline, diesel oil, fuel oil, naphtha and other petroleum products.

Peak devices: Gas turbines, internal combustion engines and other small-scale thermal power plants which are usually used to supply electricity in peak hours.

Passenger transport activity: Passenger transport activity covers road transport (buses and coaches, passenger cars and vans, powered 2-wheelers), rail transport, aviation and inland navigation. Tram and metro activity is provided together with rail in the reporting by MS.

Primary production: Total indigenous production. In PRIMES result sheets (Appendix 2) it also includes recovered products.

Renewable energy sources: Energy resources which are naturally replenishing but flow-limited. These are virtually inexhaustible but limited in the amount of energy that is available per unit of time. Renewable energy resources include: biomass, waste energy, hydro, wind, geothermal, solar, wave and tidal energy.

Solar power plant: A plant producing energy with the use of radiant energy from the sun; includes solar thermal and photovoltaic (direct conversion of solar energy into electricity) plants.

Solids: Include both primary products (hard coal and lignite) and derived fuels (patent fuels, coke, tar, pitch and benzole).

Thermal power plants: Type of electricity generating plant in which the source of energy for the prime mover is heat (nuclear power plants are excluded).

Wind power plant: Typically, a group of wind turbines supplying electricity directly to a consumer, or interconnected to a common transmission or distribution system. Offshore wind includes windmills located at sea (coastal wind mills are usually included in onshore wind).

APPENDIX 1: DEMOGRAPHIC AND MACROECONOMIC ASSUMPTIONS

REFERENCE 2013

EU-28: Key Demographic and Economic Assumptions

	2000	2010	2020	2030	2040	2050	'00-'10	'10-'20	'20-'30	'30-'40	'40-'50
Main Demographic Assumptions											
Population (Million)	485.6	503.6	517.0	524.9	528.2	526.5	0.4	0.3	0.2	0.1	0.0
Average household size (persons)	2.5	2.4	2.4	2.3	2.3	2.2	-0.5	-0.2	-0.2	-0.2	-0.2
Gross Domestic Product (in 000 MEuro'10)	**10725.4**	**12301.4**	**14246.4**	**16667.7**	**19150.8**	**21944.1**	**1.4**	**1.5**	**1.6**	**1.4**	**1.4**
Household Expenditure (in Euro'10/capita)	**12814.2**	**14186.9**	**15773.9**	**18162.1**	**20901.3**	**24439.2**	**1.0**	**1.1**	**1.4**	**1.4**	**1.6**
SECTORAL VALUE ADDED (in 000 MEuro'10)		**11000.9**	**12738.2**	**14903.3**	**17103.5**	**19561.1**		**1.5**	**1.6**	**1.4**	**1.4**
Industry		1637.6	1888.6	2128.0	2336.3	2546.0		1.4	1.2	0.9	0.9
iron and steel		50.0	54.2	56.8	57.2	56.9		0.8	0.5	0.1	-0.1
non ferrous metals		18.7	21.3	22.1	22.3	22.1		1.3	0.4	0.1	-0.1
chemicals		196.6	233.1	260.6	284.8	306.9		1.7	1.1	0.9	0.7
non metallic minerals		68.6	78.3	88.4	94.1	98.3		1.3	1.2	0.6	0.4
paper pulp		98.4	106.6	116.6	124.3	128.6		0.8	0.9	0.6	0.3
food, drink and tobacco		221.6	247.7	283.7	316.3	350.1		1.1	1.4	1.1	1.0
engineering		652.1	789.2	920.6	1039.8	1158.3		1.9	1.6	1.2	1.1
textiles		63.6	56.4	48.4	42.5	38.7		-1.2	-1.5	-1.3	-0.9
other industries (incl. printing)		267.3	301.8	330.8	355.0	386.2		1.2	0.9	0.7	0.8
Construction		703.0	786.8	901.0	988.2	1067.5		1.1	1.4	0.9	0.8
Tertiary		8324.6	9696.5	11479.6	13361.4	15507.4		1.5	1.7	1.5	1.5
market services		4783.5	5686.6	6845.0	8111.4	9602.2		1.7	1.9	1.7	1.7
non market services		2147.8	2347.5	2676.6	2978.7	3301.3		0.9	1.3	1.1	1.0
trade		1210.5	1470.3	1759.9	2071.2	2402.5		2.0	1.8	1.6	1.5
agriculture		182.9	192.1	198.2	200.1	201.4		0.5	0.3	0.1	0.1
Energy sector and others		335.7	366.3	394.7	417.6	440.1		0.9	0.7	0.6	0.5

EU-27: Key Demographic and Economic Assumptions

	2000	2010	2020	2030	2040	2050	'00-'10	'10-'20	'20-'30	'30-'40	'40-'50
Main Demographic Assumptions											
Population (Million)	481.1	499.2	512.4	520.3	523.6	521.9	0.4	0.3	0.2	0.1	0.0
Average household size (persons)	2.5	2.4	2.4	2.3	2.3	2.2	-0.5	-0.2	-0.2	-0.2	-0.2
Gross Domestic Product (in 000 MEuro'10)	**10670.6**	**12256.0**	**14189.9**	**16600.1**	**19073.1**	**21858.7**	**1.4**	**1.5**	**1.6**	**1.4**	**1.4**
Household Expenditure (in Euro'10/capita)	**12891.8**	**14260.6**	**15850.5**	**18243.7**	**20990.5**	**24545.6**	**1.0**	**1.1**	**1.4**	**1.4**	**1.6**
SECTORAL VALUE ADDED (in 000 MEuro'10)		**10961.3**	**12689.8**	**14846.2**	**17039.7**	**19493.4**		**1.5**	**1.6**	**1.4**	**1.4**
Industry		1630.6	1880.8	2119.2	2326.6	2535.9		1.4	1.2	0.9	0.9
iron and steel		49.5	53.7	56.3	56.6	56.2		0.8	0.5	0.1	-0.1
non ferrous metals		18.7	21.3	22.1	22.3	22.1		1.3	0.4	0.1	-0.1
chemicals		195.9	232.4	259.7	283.8	305.8		1.7	1.1	0.9	0.8
non metallic minerals		68.2	77.9	87.9	93.6	97.7		1.3	1.2	0.6	0.4
paper pulp		98.0	106.1	116.0	123.6	127.8		0.8	0.9	0.6	0.3
food, drink and tobacco		220.1	246.0	281.8	314.2	348.0		1.1	1.4	1.1	1.0
engineering		651.4	788.2	919.4	1038.4	1156.9		1.9	1.6	1.2	1.1
textiles		63.3	56.2	48.1	42.2	38.5		-1.2	-1.5	-1.3	-0.9
other industries (incl. printing)		265.3	299.1	327.9	351.7	382.8		1.2	0.9	0.7	0.9
Construction		700.3	783.7	897.5	984.5	1063.6		1.1	1.4	0.9	0.8
Tertiary		8295.2	9659.6	11435.4	13311.6	15454.4		1.5	1.7	1.5	1.5
market services		4770.5	5669.6	6824.9	8088.8	9578.1		1.7	1.9	1.7	1.7
non market services		2140.4	2338.7	2665.7	2966.5	3288.3		0.9	1.3	1.1	1.0
trade		1203.6	1461.5	1749.0	2058.7	2389.1		2.0	1.8	1.6	1.5
agriculture		180.7	189.8	195.7	197.6	198.9		0.5	0.3	0.1	0.1
Energy sector and others		335.2	365.8	394.1	417.0	439.6		0.9	0.7	0.6	0.5

Source: GEM-E3

REFERENCE 2013

Austria: Key Demographic and Economic Assumptions

	2000	2010	2020	2030	2040	2050	'00-'10	'10-'20	'20-'30	'30-'40	'40-'50
Main Demographic Assumptions											
Population (Million)	8.0	8.4	8.6	8.8	9.0	9.0	0.5	0.3	0.3	0.1	0.0
Average household size (persons)	2.5	2.3	2.3	2.2	2.2	2.1	-0.9	-0.1	-0.2	-0.2	-0.2
Gross Domestic Product (in 000 MEuro'10)	**245.5**	**286.2**	**337.7**	**385.4**	**442.5**	**507.4**	**1.5**	**1.7**	**1.3**	**1.4**	**1.4**
Household Expenditure (in Euro'10/capita)	**17068.5**	**18640.0**	**21391.7**	**23858.8**	**27437.8**	**32265.1**	**0.9**	**1.4**	**1.1**	**1.4**	**1.6**
SECTORAL VALUE ADDED (in 000 MEuro'10)		**258.6**	**305.1**	**348.2**	**399.4**	**457.1**		**1.7**	**1.3**	**1.4**	**1.4**
Industry		45.6	55.0	61.2	65.4	71.6		1.9	1.1	0.7	0.9
iron and steel		2.9	3.1	3.2	3.2	3.1		0.7	0.2	0.0	-0.3
non ferrous metals		0.8	1.1	1.1	1.2	1.2		4.0	-0.2	0.7	0.1
chemicals		3.8	4.3	4.6	5.1	6.1		1.1	0.8	1.0	1.8
non metallic minerals		2.3	2.6	2.8	3.0	3.1		1.1	1.1	0.4	0.4
paper pulp		2.7	3.1	3.6	3.8	4.0		1.2	1.5	0.7	0.5
food, drink and tobacco		4.7	4.9	5.6	6.3	7.1		0.3	1.5	1.1	1.3
engineering		19.1	25.9	29.5	30.6	32.4		3.1	1.3	0.4	0.6
textiles		1.0	0.8	0.7	0.6	0.6		-1.8	-1.4	-1.5	-0.7
other industries (incl. printing)		8.3	9.3	10.0	11.7	14.1		1.2	0.7	1.6	1.9
Construction		17.7	19.7	21.5	23.5	25.2		1.1	0.9	0.9	0.7
Tertiary		188.5	223.0	257.7	302.2	351.7		1.7	1.5	1.6	1.5
market services		103.6	122.1	139.7	163.8	192.4		1.7	1.4	1.6	1.6
non market services		45.9	52.4	59.4	68.9	79.1		1.3	1.3	1.5	1.4
trade		35.1	44.4	54.5	65.3	75.9		2.4	2.1	1.8	1.5
agriculture		3.8	4.0	4.2	4.2	4.2		0.6	0.4	0.1	0.0
Energy sector and others		6.9	7.5	7.7	8.3	8.7		0.8	0.3	0.7	0.5

Belgium: Key Demographic and Economic Assumptions

	2000	2010	2020	2030	2040	2050	'00-'10	'10-'20	'20-'30	'30-'40	'40-'50
Main Demographic Assumptions											
Population (Million)	10.2	10.8	11.6	12.2	12.7	13.1	0.6	0.7	0.5	0.4	0.3
Average household size (persons)	2.4	2.3	2.3	2.2	2.2	2.2	-0.5	-0.1	-0.1	-0.1	-0.1
Gross Domestic Product (in 000 MEuro'10)	**308.9**	**354.7**	**409.2**	**474.6**	**563.4**	**668.8**	**1.4**	**1.4**	**1.5**	**1.7**	**1.7**
Household Expenditure (in Euro'10/capita)	**15914.2**	**17295.0**	**18178.4**	**20285.7**	**23397.8**	**27170.5**	**0.8**	**0.5**	**1.1**	**1.4**	**1.5**
SECTORAL VALUE ADDED (in 000 MEuro'10)		**315.8**	**364.3**	**422.5**	**501.0**	**593.8**		**1.4**	**1.5**	**1.7**	**1.7**
Industry		40.8	47.6	54.4	63.7	74.1		1.6	1.3	1.6	1.5
iron and steel		2.4	2.4	2.5	2.5	2.5		0.3	0.1	0.1	0.1
non ferrous metals		0.8	1.0	1.1	1.2	1.2		2.3	1.3	0.1	0.2
chemicals		10.0	12.0	13.3	14.8	16.4		1.8	1.0	1.1	1.1
non metallic minerals		2.6	3.0	3.5	3.9	4.2		1.7	1.5	1.2	0.7
paper pulp		3.3	3.9	4.9	5.7	6.4		1.7	2.2	1.6	1.1
food, drink and tobacco		6.4	7.1	8.0	9.5	11.3		1.0	1.3	1.7	1.7
engineering		9.4	12.0	14.7	19.0	24.1		2.4	2.1	2.6	2.4
textiles		1.9	1.7	1.4	1.2	1.2		-1.3	-1.9	-1.1	-0.5
other industries (incl. printing)		4.1	4.6	5.1	6.0	6.9		1.1	1.0	1.6	1.5
Construction		18.0	20.8	23.1	26.2	30.0		1.5	1.0	1.3	1.3
Tertiary		245.3	283.3	331.1	395.7	472.6		1.4	1.6	1.8	1.8
market services		133.1	159.9	192.2	234.6	286.9		1.9	1.9	2.0	2.0
non market services		69.8	76.3	84.9	97.6	111.4		0.9	1.1	1.4	1.3
trade		40.2	44.7	51.6	61.1	71.8		1.1	1.4	1.7	1.6
agriculture		2.3	2.4	2.4	2.5	2.5		0.4	0.1	0.1	0.0
Energy sector and others		11.7	12.7	13.8	15.4	17.1		0.8	0.9	1.1	1.1

Source: GEM-E3

REFERENCE 2013

Bulgaria: Key Demographic and Economic Assumptions

	2000	2010	2020	2030	2040	2050	'00-'10	'10-'20	'20-'30	'30-'40	'40-'50
Main Demographic Assumptions											
Population (Million)	8.2	7.6	7.1	6.6	6.2	5.9	-0.8	-0.6	-0.7	-0.6	-0.6
Average household size (persons)	2.7	2.6	2.5	2.4	2.3	2.2	-0.3	-0.3	-0.3	-0.4	-0.4
Gross Domestic Product (in 000 MEuro'10)	**24.2**	**36.1**	**45.1**	**51.5**	**59.2**	**64.9**	**4.1**	**2.3**	**1.3**	**1.4**	**0.9**
Household Expenditure (in Euro'10/capita)	**1778.1**	**2992.1**	**3996.8**	**5008.7**	**6306.6**	**7437.8**	**5.3**	**2.9**	**2.3**	**2.3**	**1.7**
SECTORAL VALUE ADDED (in 000 MEuro'10)		**31.0**	**38.8**	**44.4**	**50.9**	**55.7**		**2.3**	**1.3**	**1.4**	**0.9**
Industry		5.2	6.4	7.3	8.4	9.2		2.0	1.3	1.4	1.0
iron and steel		0.1	0.2	0.2	0.2	0.3		3.9	1.1	1.7	1.1
non ferrous metals		0.1	0.1	0.2	0.2	0.2		1.5	1.4	1.7	1.1
chemicals		0.3	0.4	0.5	0.5	0.5		1.9	1.0	0.5	0.3
non metallic minerals		0.3	0.4	0.4	0.5	0.5		2.0	1.5	1.6	0.8
paper pulp		0.2	0.3	0.3	0.4	0.5		2.1	2.4	2.2	1.7
food, drink and tobacco		0.7	0.9	0.9	1.0	1.1		1.7	0.6	1.1	0.7
engineering		1.5	2.0	2.6	3.2	3.6		2.9	2.4	2.1	1.2
textiles		0.8	0.9	0.8	0.7	0.6		0.5	-1.6	-0.8	-0.8
other industries (incl. printing)		1.0	1.3	1.4	1.7	1.9		1.9	1.5	1.4	1.6
Construction		2.2	2.6	2.8	3.1	3.4		1.6	0.7	1.1	0.7
Tertiary		21.8	27.7	32.0	36.8	40.4		2.4	1.4	1.4	0.9
market services		13.7	18.1	21.0	24.2	26.4		2.8	1.5	1.4	0.9
non market services		4.0	4.7	5.1	5.8	6.1		1.5	1.0	1.2	0.5
trade		2.5	3.3	4.1	5.1	6.3		2.8	2.3	2.2	2.0
agriculture		1.5	1.6	1.7	1.7	1.7		0.7	0.2	0.1	0.0
Energy sector and others		1.8	2.2	2.3	2.6	2.7		1.7	0.7	1.0	0.6

Croatia: Key Demographic and Economic Assumptions

	2000	2010	2020	2030	2040	2050	'00-'10	'10-'20	'20-'30	'30-'40	'40-'50
Main Demographic Assumptions											
Population (Million)	4.5	4.4	4.6	4.7	4.6	4.6	-0.2	0.5	0.1	-0.1	-0.1
Average household size (persons)	2.6	2.4	2.3	2.3	2.3	2.2	-0.9	-0.1	-0.2	-0.2	-0.1
Gross Domestic Product (in 000 MEuro'10)	**35.3**	**45.9**	**56.6**	**67.6**	**77.7**	**85.4**	**2.7**	**2.1**	**1.8**	**1.4**	**0.9**
Household Expenditure (in Euro'10/capita)	**4528.9**	**5875.4**	**7299.8**	**9046.7**	**10816.9**	**12291.1**	**2.6**	**2.2**	**2.2**	**1.8**	**1.3**
SECTORAL VALUE ADDED (in 000 MEuro'10)		**39.6**	**48.4**	**57.1**	**63.8**	**67.6**		**2.0**	**1.7**	**1.1**	**0.6**
Industry		7.0	7.8	8.8	9.7	10.1		1.1	1.2	1.0	0.4
iron and steel		0.5	0.5	0.6	0.6	0.6		0.7	0.9	0.5	0.2
non ferrous metals		0.0	0.0	0.0	0.0	0.0		0.6	0.7	0.4	0.2
chemicals		0.7	0.8	0.9	1.0	1.1		1.4	1.6	1.2	0.4
non metallic minerals		0.4	0.4	0.5	0.5	0.6		1.1	1.1	1.3	1.2
paper pulp		0.4	0.5	0.6	0.7	0.8		1.3	1.3	1.5	1.3
food, drink and tobacco		1.4	1.7	1.9	2.0	2.2		1.8	1.2	0.8	0.5
engineering		0.6	1.0	1.2	1.4	1.4		4.6	2.0	1.2	0.2
textiles		0.3	0.3	0.2	0.2	0.2		-0.1	-1.1	-1.2	-1.0
other industries (incl. printing)		2.0	2.7	3.0	3.3	3.4		2.7	1.1	1.0	0.3
Construction		2.6	3.1	3.4	3.7	3.9		1.5	1.1	0.8	0.6
Tertiary		29.4	36.9	44.3	49.8	53.0		2.3	1.8	1.2	0.6
market services		13.0	17.0	20.1	22.6	24.2		2.8	1.7	1.2	0.6
non market services		7.4	8.8	10.9	12.2	13.0		1.8	2.1	1.1	0.7
trade		6.9	8.8	10.9	12.5	13.4		2.5	2.1	1.4	0.7
agriculture		2.2	2.3	2.4	2.5	2.5		0.4	0.6	0.2	-0.1
Energy sector and others		0.5	0.5	0.6	0.6	0.5		0.9	0.7	0.0	-0.5

Source: GEM-E3

REFERENCE 2013

Cyprus: Key Demographic and Economic Assumptions

	2000	2010	2020	2030	2040	2050	'00-'10	'10-'20	'20-'30	'30-'40	'40-'50
Main Demographic Assumptions											
Population (Million)	0.7	0.8	0.9	1.0	1.0	1.1	1.5	1.0	1.0	0.6	0.5
Average household size (persons)	3.1	2.7	2.6	2.5	2.4	2.3	-1.4	-0.2	-0.3	-0.5	-0.3
Gross Domestic Product (in 000 MEuro'10)	**13.1**	**17.3**	**19.8**	**24.1**	**30.3**	**36.2**	**2.8**	**1.3**	**2.0**	**2.3**	**1.8**
Household Expenditure (in Euro'10/capita)	**12052.6**	**14352.5**	**15011.4**	**16844.6**	**19994.5**	**22729.6**	**1.8**	**0.4**	**1.2**	**1.7**	**1.3**
SECTORAL VALUE ADDED (in 000 MEuro'10)		**15.6**	**17.8**	**21.7**	**27.2**	**32.5**		**1.3**	**2.0**	**2.3**	**1.8**
Industry		1.1	1.1	1.3	1.6	1.8		0.6	1.4	2.0	1.3
iron and steel		0.0	0.0	0.0	0.0	0.0		-0.2	0.7	1.3	1.0
non ferrous metals		0.0	0.0	0.0	0.0	0.0					
chemicals		0.1	0.1	0.1	0.1	0.1		2.4	1.5	1.6	1.0
non metallic minerals		0.1	0.2	0.2	0.2	0.2		0.4	1.0	1.5	0.9
paper pulp		0.1	0.1	0.1	0.1	0.1		1.4	1.4	1.2	1.4
food, drink and tobacco		0.4	0.4	0.4	0.6	0.6		0.3	1.6	2.1	1.5
engineering		0.1	0.1	0.2	0.2	0.3		1.3	1.7	2.6	1.1
textiles		0.0	0.0	0.0	0.0	0.0		-1.1	-1.1	-0.2	-0.3
other industries (incl. printing)		0.2	0.2	0.3	0.3	0.4		0.6	1.4	2.2	1.8
Construction		1.4	1.5	1.7	2.1	2.4		0.3	1.2	2.1	1.7
Tertiary		12.9	14.9	18.5	23.3	27.9		1.5	2.2	2.3	1.8
market services		7.2	8.6	10.8	13.7	16.8		1.8	2.3	2.4	2.1
non market services		3.4	3.4	3.9	4.9	5.8		-0.1	1.6	2.3	1.6
trade		1.9	2.6	3.3	4.3	5.0		3.2	2.6	2.6	1.5
agriculture		0.4	0.4	0.4	0.4	0.4		0.1	0.1	0.0	0.1
Energy sector and others		0.3	0.3	0.3	0.4	0.4		0.5	1.0	1.1	0.8

Czech Republic: Key Demographic and Economic Assumptions

	2000	2010	2020	2030	2040	2050	'00-'10	'10-'20	'20-'30	'30-'40	'40-'50
Main Demographic Assumptions											
Population (Million)	10.3	10.5	10.8	10.8	10.7	10.7	0.2	0.3	0.0	-0.1	-0.1
Average household size (persons)	2.6	2.3	2.3	2.3	2.2	2.2	-1.1	-0.1	-0.2	-0.2	-0.2
Gross Domestic Product (in 000 MEuro'10)	**107.0**	**149.3**	**184.3**	**218.8**	**255.9**	**290.0**	**3.4**	**2.1**	**1.7**	**1.6**	**1.3**
Household Expenditure (in Euro'10/capita)	**5471.8**	**7150.8**	**8521.4**	**10163.0**	**12200.1**	**14231.3**	**2.7**	**1.8**	**1.8**	**1.8**	**1.6**
SECTORAL VALUE ADDED (in 000 MEuro'10)		**134.7**	**166.2**	**197.3**	**230.5**	**260.7**		**2.1**	**1.7**	**1.6**	**1.2**
Industry		31.5	38.1	46.1	54.3	61.5		1.9	1.9	1.7	1.2
iron and steel		1.0	1.1	1.3	1.4	1.4		1.5	1.3	0.9	-0.1
non ferrous metals		0.2	0.2	0.2	0.2	0.2		0.6	1.1	1.6	0.5
chemicals		1.7	2.1	2.3	2.6	2.8		2.0	1.0	1.4	0.8
non metallic minerals		1.8	1.9	2.1	2.3	2.4		0.8	1.0	0.8	0.7
paper pulp		1.2	1.3	1.4	1.6	1.8		0.8	1.1	1.2	1.0
food, drink and tobacco		3.3	3.8	4.2	4.8	5.4		1.3	1.2	1.3	1.1
engineering		15.2	19.8	25.8	31.7	36.9		2.7	2.7	2.1	1.5
textiles		1.0	1.0	0.8	0.8	0.7		0.0	-1.5	-1.0	-0.7
other industries (incl. printing)		6.2	7.0	7.9	8.9	9.8		1.2	1.2	1.2	1.0
Construction		9.7	11.3	12.5	13.9	15.3		1.5	1.0	1.1	0.9
Tertiary		85.7	108.2	129.4	152.4	174.2		2.4	1.8	1.7	1.3
market services		48.6	62.4	75.3	89.5	103.0		2.5	1.9	1.7	1.4
non market services		20.7	24.5	27.9	31.3	33.9		1.7	1.3	1.2	0.8
trade		14.2	18.9	23.8	29.1	34.8		2.9	2.3	2.0	1.8
agriculture		2.3	2.3	2.3	2.4	2.5		0.3	0.1	0.3	0.2
Energy sector and others		7.7	8.6	9.4	9.8	9.8		1.2	0.8	0.5	0.0

Source: GEM-E3

REFERENCE 2013

Denmark: Key Demographic and Economic Assumptions

	2000	2010	2020	2030	2040	2050	'00-'10	'10-'20	'20-'30	'30-'40	'40-'50
Main Demographic Assumptions											
Population (Million)	5.3	5.5	5.7	5.9	6.0	6.0	0.4	0.3	0.3	0.2	0.1
Average household size (persons)	2.2	2.1	2.1	2.1	2.1	2.1	-0.6	0.0	-0.1	0.0	-0.1
Gross Domestic Product (in 000 MEuro'10)	**222.7**	**235.6**	**270.4**	**314.9**	**364.1**	**430.5**	**0.6**	**1.4**	**1.5**	**1.5**	**1.7**
Household Expenditure (in Euro'10/capita)	**18517.2**	**20644.0**	**23144.3**	**26559.2**	**30797.8**	**37142.4**	**1.1**	**1.1**	**1.4**	**1.5**	**1.9**
SECTORAL VALUE ADDED (in 000 MEuro'10)		**202.8**	**232.8**	**271.0**	**313.1**	**369.5**		**1.4**	**1.5**	**1.5**	**1.7**
Industry		23.4	25.8	28.9	32.9	37.5		1.0	1.1	1.3	1.3
iron and steel		0.2	0.2	0.2	0.2	0.2		-0.1	0.0	-0.2	0.1
non ferrous metals		0.1	0.1	0.1	0.1	0.1		1.8	0.4	0.0	0.1
chemicals		3.6	4.1	5.0	6.1	7.4		1.2	2.1	2.0	1.8
non metallic minerals		0.8	0.9	0.9	1.0	1.2		1.0	0.5	0.9	1.6
paper pulp		0.9	1.0	1.0	1.1	1.3		0.6	0.6	0.8	1.2
food, drink and tobacco		4.2	4.5	5.0	5.5	6.5		0.8	0.9	1.1	1.6
engineering		9.3	10.3	11.4	13.0	14.5		1.1	1.0	1.3	1.1
textiles		0.3	0.3	0.2	0.2	0.2		-1.6	-1.7	-1.2	-0.2
other industries (incl. printing)		4.0	4.5	5.0	5.6	6.1		1.1	1.2	1.0	1.0
Construction		9.5	10.5	11.9	13.0	14.5		1.0	1.2	1.0	1.0
Tertiary		159.6	185.6	219.2	255.4	305.1		1.5	1.7	1.5	1.8
market services		83.4	95.0	111.0	129.5	157.2		1.3	1.6	1.6	2.0
non market services		50.0	57.4	67.7	77.8	90.7		1.4	1.7	1.4	1.6
trade		23.5	30.6	37.7	45.4	54.4		2.6	2.1	1.9	1.8
agriculture		2.6	2.7	2.7	2.8	2.8		0.3	0.1	0.2	0.1
Energy sector and others		10.4	10.8	11.0	11.7	12.4		0.4	0.3	0.5	0.7

Estonia: Key Demographic and Economic Assumptions

	2000	2010	2020	2030	2040	2050	'00-'10	'10-'20	'20-'30	'30-'40	'40-'50
Main Demographic Assumptions											
Population (Million)	1.4	1.3	1.3	1.3	1.2	1.2	-0.2	-0.1	-0.3	-0.3	-0.2
Average household size (persons)	2.4	2.1	2.1	2.1	2.1	2.1	-1.4	0.0	-0.1	-0.1	0.0
Gross Domestic Product (in 000 MEuro'10)	**10.1**	**14.3**	**19.4**	**24.1**	**28.8**	**32.2**	**3.5**	**3.1**	**2.2**	**1.8**	**1.1**
Household Expenditure (in Euro'10/capita)	**3731.5**	**5558.7**	**7912.2**	**10494.5**	**13346.5**	**15739.7**	**4.1**	**3.6**	**2.9**	**2.4**	**1.7**
SECTORAL VALUE ADDED (in 000 MEuro'10)		**12.5**	**17.0**	**21.0**	**25.1**	**28.1**		**3.1**	**2.2**	**1.8**	**1.1**
Industry		2.0	2.8	3.3	3.7	4.0		3.5	1.5	1.3	0.8
iron and steel		0.0	0.0	0.0	0.0	0.0		7.2	2.5	1.4	1.8
non ferrous metals		0.0	0.0	0.0	0.0	0.0		2.8	1.1	-0.3	-0.4
chemicals		0.1	0.1	0.1	0.1	0.1		1.4	1.5	1.2	0.4
non metallic minerals		0.1	0.1	0.2	0.2	0.2		5.3	1.3	0.7	0.4
paper pulp		0.1	0.1	0.2	0.2	0.2		2.9	2.0	1.2	1.0
food, drink and tobacco		0.3	0.4	0.4	0.5	0.5		2.9	1.9	1.4	0.9
engineering		0.7	1.2	1.3	1.6	1.7		4.7	1.3	1.6	0.9
textiles		0.1	0.1	0.1	0.1	0.1		1.3	-0.6	-0.7	-0.8
other industries (incl. printing)		0.6	0.8	0.9	1.0	1.1		2.6	1.7	1.2	0.7
Construction		0.7	0.9	1.0	1.2	1.4		2.2	1.7	1.7	1.0
Tertiary		9.1	12.4	15.8	19.1	21.7		3.2	2.4	1.9	1.3
market services		5.1	7.3	9.4	11.7	13.4		3.5	2.6	2.2	1.4
non market services		2.0	2.6	3.2	3.5	3.7		2.7	1.8	1.1	0.5
trade		1.5	2.1	2.7	3.4	4.1		3.5	2.7	2.2	1.8
agriculture		0.4	0.4	0.5	0.5	0.5		0.8	0.5	0.5	0.3
Energy sector and others		0.7	0.8	1.0	1.0	1.0		1.6	1.5	0.8	-0.1

Source: GEM-E3

REFERENCE 2013

Finland: Key Demographic and Economic Assumptions

	2000	2010	2020	2030	2040	2050	'00-'10	'10-'20	'20-'30	'30-'40	'40-'50
Main Demographic Assumptions											
Population (Million)	5.2	5.4	5.6	5.7	5.7	5.7	0.3	0.4	0.2	0.0	0.0
Average household size (persons)	2.3	2.1	2.1	2.1	2.1	2.1	-0.8	0.0	0.0	-0.1	-0.1
Gross Domestic Product (in 000 MEuro'10)	**150.5**	**179.7**	**211.9**	**243.5**	**284.2**	**329.4**	**1.8**	**1.7**	**1.4**	**1.6**	**1.5**
Household Expenditure (in Euro'10/capita)	**14733.0**	**18488.9**	**20939.6**	**23714.2**	**28035.5**	**33245.6**	**2.3**	**1.3**	**1.3**	**1.7**	**1.7**
SECTORAL VALUE ADDED (in 000 MEuro'10)		**156.6**	**184.6**	**212.0**	**247.3**	**286.1**		**1.7**	**1.4**	**1.5**	**1.5**
Industry		28.0	32.8	37.1	41.3	45.5		1.6	1.2	1.1	1.0
iron and steel		0.7	0.9	0.9	0.9	1.0		2.9	0.2	0.2	0.4
non ferrous metals		0.4	0.5	0.5	0.5	0.6		1.8	0.1	0.2	0.2
chemicals		2.5	2.7	3.0	3.2	3.4		0.8	1.0	0.7	0.7
non metallic minerals		1.0	1.2	1.4	1.5	1.6		1.9	1.6	1.0	0.3
paper pulp		3.8	3.9	4.2	4.4	4.6		0.2	0.8	0.5	0.4
food, drink and tobacco		2.7	3.0	3.4	4.1	4.6		1.0	1.5	1.7	1.3
engineering		11.9	15.0	17.3	19.5	21.5		2.3	1.4	1.2	1.0
textiles		0.4	0.4	0.3	0.3	0.3		-1.0	-1.5	-1.0	-0.8
other industries (incl. printing)		4.6	5.3	6.0	6.9	8.1		1.4	1.3	1.4	1.5
Construction		10.4	11.8	13.1	14.5	15.7		1.3	1.1	1.0	0.8
Tertiary		113.6	134.7	156.0	185.2	218.1		1.7	1.5	1.7	1.7
market services		60.1	72.3	83.8	100.7	121.1		1.9	1.5	1.9	1.9
non market services		33.1	38.2	43.2	49.6	56.4		1.4	1.2	1.4	1.3
trade		15.6	19.3	24.1	30.0	35.8		2.2	2.3	2.2	1.8
agriculture		4.8	4.9	4.9	4.9	4.8		0.2	0.1	0.0	-0.1
Energy sector and others		4.6	5.2	5.8	6.3	6.8		1.2	1.1	0.8	0.8

France: Key Demographic and Economic Assumptions

	2000	2010	2020	2030	2040	2050	'00-'10	'10-'20	'20-'30	'30-'40	'40-'50
Main Demographic Assumptions											
Population (Million)	58.9	62.8	65.8	68.2	70.1	71.0	0.6	0.5	0.4	0.3	0.1
Average household size (persons)	2.4	2.3	2.3	2.3	2.2	2.2	-0.3	-0.1	-0.1	-0.1	-0.1
Gross Domestic Product (in 000 MEuro'10)	**1726.6**	**1932.8**	**2256.9**	**2698.9**	**3163.4**	**3703.3**	**1.1**	**1.6**	**1.8**	**1.6**	**1.6**
Household Expenditure (in Euro'10/capita)	**16201.1**	**17903.9**	**19773.7**	**22675.5**	**25848.6**	**29918.6**	**1.0**	**1.0**	**1.4**	**1.3**	**1.5**
SECTORAL VALUE ADDED (in 000 MEuro'10)		**1738.0**	**2029.3**	**2426.3**	**2840.9**	**3320.0**		**1.6**	**1.8**	**1.6**	**1.6**
Industry		175.0	203.7	242.6	276.6	310.9		1.5	1.8	1.3	1.2
iron and steel		3.9	4.0	3.8	3.5	3.5		0.1	-0.6	-0.6	-0.1
non ferrous metals		1.4	1.7	1.8	1.8	1.8		1.8	0.7	0.3	-0.1
chemicals		18.1	20.8	23.1	25.0	26.5		1.4	1.0	0.8	0.6
non metallic minerals		7.7	8.8	10.1	11.3	12.6		1.3	1.4	1.1	1.1
paper pulp		7.3	8.6	10.1	11.8	13.7		1.6	1.6	1.6	1.5
food, drink and tobacco		29.4	34.2	40.7	46.8	54.7		1.5	1.7	1.4	1.6
engineering		61.9	73.7	97.6	114.4	127.8		1.8	2.8	1.6	1.1
textiles		5.0	4.5	3.8	3.2	3.0		-1.0	-1.7	-1.6	-0.8
other industries (incl. printing)		40.2	47.4	51.8	58.7	67.4		1.7	0.9	1.3	1.4
Construction		104.4	117.2	133.8	148.8	162.6		1.2	1.3	1.1	0.9
Tertiary		1428.3	1674.9	2015.1	2379.9	2810.3		1.6	1.9	1.7	1.7
market services		820.6	958.9	1156.4	1382.1	1663.5		1.6	1.9	1.8	1.9
non market services		393.1	456.5	542.9	622.9	710.1		1.5	1.7	1.4	1.3
trade		184.5	227.4	282.9	341.9	403.6		2.1	2.2	1.9	1.7
agriculture		30.1	32.1	32.8	33.0	33.1		0.7	0.2	0.1	0.0
Energy sector and others		30.3	33.5	34.8	35.7	36.2		1.0	0.4	0.3	0.2

Source: GEM-E3

REFERENCE 2013

Germany: Key Demographic and Economic Assumptions

	2000	2010	2020	2030	2040	2050	'00-'10	'10-'20	'20-'30	'30-'40	'40-'50
Main Demographic Assumptions											
Population (Million)	82.2	81.8	80.1	77.9	74.8	70.8	0.0	-0.2	-0.3	-0.4	-0.5
Average household size (persons)	2.2	2.1	2.1	2.1	2.1	2.1	-0.6	0.0	-0.1	-0.1	-0.1
Gross Domestic Product (in 000 MEuro'10)	**2257.7**	**2476.8**	**2801.8**	**2997.7**	**3185.2**	**3465.8**	**0.9**	**1.2**	**0.7**	**0.6**	**0.8**
Household Expenditure (in Euro'10/capita)	**16649.9**	**17395.9**	**19401.3**	**21234.4**	**23682.7**	**27991.8**	**0.4**	**1.1**	**0.9**	**1.1**	**1.7**
SECTORAL VALUE ADDED (in 000 MEuro'10)		**2216.5**	**2507.1**	**2682.1**	**2846.8**	**3092.3**		**1.2**	**0.7**	**0.6**	**0.8**
Industry		460.0	517.1	537.5	551.5	573.9		1.2	0.4	0.3	0.4
iron and steel		16.1	17.3	18.0	17.6	17.3		0.8	0.4	-0.2	-0.2
non ferrous metals		6.2	6.7	6.5	6.2	6.0		0.8	-0.3	-0.4	-0.4
chemicals		56.4	64.8	68.7	71.7	75.8		1.4	0.6	0.4	0.6
non metallic minerals		14.3	14.8	15.1	14.9	14.7		0.4	0.2	-0.1	-0.2
paper pulp		18.9	20.0	20.7	20.6	20.0		0.6	0.3	0.0	-0.3
food, drink and tobacco		38.3	40.0	42.3	43.5	45.1		0.4	0.6	0.3	0.3
engineering		238.3	281.2	292.9	307.9	327.1		1.7	0.4	0.5	0.6
textiles		6.8	5.5	4.2	3.3	2.8		-2.0	-2.6	-2.4	-1.8
other industries (incl. printing)		64.9	66.7	69.2	65.7	65.3		0.3	0.4	-0.5	-0.1
Construction		96.3	102.5	105.5	108.5	114.7		0.6	0.3	0.3	0.6
Tertiary		1596.3	1816.4	1964.5	2110.2	2323.6		1.3	0.8	0.7	1.0
market services		965.0	1131.0	1258.3	1381.1	1531.8		1.6	1.1	0.9	1.0
non market services		405.0	437.9	452.7	466.9	504.0		0.8	0.3	0.3	0.8
trade		207.6	228.3	233.7	242.9	269.3		1.0	0.2	0.4	1.0
agriculture		18.7	19.1	19.8	19.3	18.5		0.3	0.4	-0.3	-0.4
Energy sector and others		64.0	71.1	74.6	76.7	80.1		1.1	0.5	0.3	0.4

Greece: Key Demographic and Economic Assumptions

	2000	2010	2020	2030	2040	2050	'00-'10	'10-'20	'20-'30	'30-'40	'40-'50
Main Demographic Assumptions											
Population (Million)	10.9	11.3	11.5	11.6	11.6	11.6	0.4	0.2	0.0	0.0	0.0
Average household size (persons)	2.8	2.7	2.6	2.5	2.4	2.3	-0.5	-0.3	-0.4	-0.3	-0.3
Gross Domestic Product (in 000 MEuro'10)	**184.1**	**227.3**	**227.1**	**256.6**	**289.3**	**322.1**	**2.1**	**0.0**	**1.2**	**1.2**	**1.1**
Household Expenditure (in Euro'10/capita)	**11778.0**	**14981.1**	**14620.3**	**16014.1**	**17225.0**	**18255.4**	**2.4**	**-0.2**	**0.9**	**0.7**	**0.6**
SECTORAL VALUE ADDED (in 000 MEuro'10)		**200.6**	**200.4**	**226.4**	**255.0**	**283.5**		**0.0**	**1.2**	**1.2**	**1.1**
Industry		18.2	19.4	21.4	23.2	25.1		0.6	1.0	0.8	0.8
iron and steel		1.1	1.1	1.1	1.1	1.1		0.2	0.0	-0.1	0.0
non ferrous metals		0.7	0.8	0.8	0.9	0.9		0.8	0.4	0.6	0.5
chemicals		2.0	2.1	2.4	2.6	2.8		0.8	1.1	0.8	0.9
non metallic minerals		1.3	1.5	1.6	1.6	1.7		2.1	0.3	0.3	0.2
paper pulp		1.7	1.7	1.8	2.0	2.1		0.1	0.7	0.7	0.5
food, drink and tobacco		6.7	7.1	8.4	9.8	11.2		0.6	1.7	1.5	1.3
engineering		2.1	2.1	2.4	2.6	2.9		0.2	1.1	1.1	1.0
textiles		0.9	0.9	0.8	0.8	0.7		0.0	-1.3	-1.0	-0.7
other industries (incl. printing)		1.8	1.9	2.1	1.8	1.8		0.7	0.7	-1.1	-0.3
Construction		10.7	10.5	11.0	11.6	12.3		-0.2	0.4	0.5	0.6
Tertiary		165.1	163.9	187.3	213.4	239.2		-0.1	1.3	1.3	1.1
market services		96.5	99.8	116.0	132.7	151.7		0.3	1.5	1.4	1.4
non market services		37.2	32.8	36.1	41.4	43.9		-1.3	1.0	1.4	0.6
trade		25.1	24.9	28.8	32.8	37.0		-0.1	1.5	1.3	1.2
agriculture		6.3	6.4	6.4	6.5	6.6		0.1	0.1	0.2	0.1
Energy sector and others		6.6	6.7	6.7	6.8	6.9		0.1	0.1	0.1	0.1

Source: GEM-E3

REFERENCE 2013

Hungary: Key Demographic and Economic Assumptions

	2000	2010	2020	2030	2040	2050	'00-'10	'10-'20	'20-'30	'30-'40	'40-'50
Main Demographic Assumptions											
Population (Million)	10.2	10.0	9.9	9.7	9.4	9.2	-0.2	-0.1	-0.2	-0.3	-0.3
Average household size (persons)	2.5	2.3	2.3	2.2	2.2	2.1	-0.8	-0.1	-0.3	-0.2	-0.2
Gross Domestic Product (in 000 MEuro'10)	**79.9**	**97.1**	**106.6**	**127.3**	**146.5**	**162.0**	**2.0**	**0.9**	**1.8**	**1.4**	**1.0**
Household Expenditure (in Euro'10/capita)	**4233.0**	**5164.2**	**5708.5**	**6941.5**	**8236.3**	**9438.4**	**2.0**	**1.0**	**2.0**	**1.7**	**1.4**
SECTORAL VALUE ADDED (in 000 MEuro'10)		**82.1**	**90.1**	**107.6**	**123.7**	**136.6**		**0.9**	**1.8**	**1.4**	**1.0**
Industry		16.9	18.6	22.4	25.7	28.4		1.0	1.9	1.4	1.0
iron and steel		0.2	0.3	0.4	0.4	0.4		6.1	0.9	0.4	0.1
non ferrous metals		0.2	0.2	0.2	0.2	0.2		3.5	0.5	0.1	0.0
chemicals		1.6	1.9	2.2	2.5	2.6		1.3	1.7	1.3	0.4
non metallic minerals		0.5	0.6	0.7	0.8	0.8		0.9	1.6	1.0	0.7
paper pulp		0.6	0.6	0.7	0.8	0.9		0.9	1.5	1.2	0.9
food, drink and tobacco		1.9	2.0	2.3	2.6	2.9		0.3	1.6	1.3	0.9
engineering		9.1	10.2	12.6	14.7	16.7		1.1	2.2	1.6	1.3
textiles		0.4	0.3	0.3	0.2	0.2		-1.9	-1.8	-1.6	-1.4
other industries (incl. printing)		2.4	2.5	3.0	3.4	3.7		0.8	1.7	1.2	0.8
Construction		3.6	4.0	4.7	5.4	6.0		1.1	1.7	1.4	1.0
Tertiary		57.4	63.2	75.8	87.6	97.1		1.0	1.8	1.5	1.0
market services		31.8	35.0	42.3	49.6	56.1		0.9	1.9	1.6	1.2
non market services		14.5	15.4	17.9	19.9	20.8		0.6	1.6	1.0	0.4
trade		8.0	9.5	12.0	14.4	16.4		1.8	2.3	1.9	1.3
agriculture		3.1	3.4	3.6	3.7	3.8		0.8	0.8	0.2	0.2
Energy sector and others		4.1	4.3	4.6	4.9	5.0		0.4	0.7	0.6	0.2

Ireland: Key Demographic and Economic Assumptions

	2000	2010	2020	2030	2040	2050	'00-'10	'10-'20	'20-'30	'30-'40	'40-'50
Main Demographic Assumptions											
Population (Million)	3.8	4.5	4.8	5.3	5.8	6.2	1.7	0.8	0.9	0.9	0.8
Average household size (persons)	3.0	2.8	2.7	2.6	2.6	2.6	-0.6	-0.6	-0.1	-0.1	-0.1
Gross Domestic Product (in 000 MEuro'10)	**123.2**	**156.0**	**191.6**	**262.2**	**324.6**	**385.9**	**2.4**	**2.1**	**3.2**	**2.2**	**1.7**
Household Expenditure (in Euro'10/capita)	**16548.0**	**17747.3**	**18695.9**	**23044.2**	**25755.6**	**28220.3**	**0.7**	**0.5**	**2.1**	**1.1**	**0.9**
SECTORAL VALUE ADDED (in 000 MEuro'10)		**141.1**	**173.4**	**237.2**	**293.3**	**348.2**		**2.1**	**3.2**	**2.1**	**1.7**
Industry		36.7	46.0	60.5	72.8	84.6		2.3	2.8	1.9	1.5
iron and steel		0.1	0.2	0.2	0.2	0.2		0.6	1.8	1.0	0.9
non ferrous metals		0.1	0.1	0.1	0.1	0.1		1.2	1.1	0.3	0.3
chemicals		15.5	19.5	25.2	28.1	30.8		2.3	2.6	1.1	0.9
non metallic minerals		0.6	0.7	0.9	1.0	1.1		2.0	2.3	1.6	0.8
paper pulp		4.7	5.9	6.1	7.1	7.9		2.2	0.4	1.5	1.0
food, drink and tobacco		6.4	7.9	10.7	13.1	15.4		2.1	3.2	2.0	1.6
engineering		7.4	9.6	14.6	19.9	25.4		2.5	4.3	3.2	2.4
textiles		0.2	0.2	0.2	0.2	0.2		0.2	0.2	-0.6	-0.4
other industries (incl. printing)		1.7	2.1	2.6	3.1	3.5		2.1	2.2	1.8	1.4
Construction		4.5	6.0	7.5	8.9	10.2		3.0	2.2	1.8	1.4
Tertiary		97.6	118.6	165.3	207.0	248.2		2.0	3.4	2.3	1.8
market services		53.3	70.3	105.1	136.4	168.9		2.8	4.1	2.6	2.2
non market services		28.5	28.1	33.9	39.3	43.7		-0.2	1.9	1.5	1.1
trade		13.4	17.5	23.5	28.4	32.6		2.8	3.0	1.9	1.4
agriculture		2.4	2.6	2.8	2.9	3.0		0.7	0.6	0.4	0.3
Energy sector and others		2.3	2.8	3.9	4.6	5.2		2.1	3.3	1.6	1.1

Source: GEM-E3

REFERENCE 2013

Italy: Key Demographic and Economic Assumptions

	2000	2010	2020	2030	2040	2050	'00-'10	'10-'20	'20-'30	'30-'40	'40-'50
Main Demographic Assumptions											
Population (Million)	56.9	60.3	62.9	64.5	65.7	65.9	0.6	0.4	0.3	0.2	0.0
Average household size (persons)	2.6	2.4	2.4	2.3	2.3	2.2	-0.8	0.0	-0.2	-0.2	-0.2
Gross Domestic Product (in 000 MEuro'10)	**1496.6**	**1553.2**	**1691.3**	**1964.2**	**2225.2**	**2546.7**	**0.4**	**0.9**	**1.5**	**1.3**	**1.4**
Household Expenditure (in Euro'10/capita)	**15739.5**	**15602.4**	**16003.0**	**17952.1**	**20217.4**	**23899.1**	**-0.1**	**0.3**	**1.2**	**1.2**	**1.7**
SECTORAL VALUE ADDED (in 000 MEuro'10)		**1391.8**	**1515.5**	**1759.7**	**1991.4**	**2275.3**		**0.9**	**1.5**	**1.2**	**1.3**
Industry		223.9	240.8	266.5	285.1	305.8		0.7	1.0	0.7	0.7
iron and steel		6.7	6.8	6.9	7.1	7.2		0.1	0.2	0.2	0.2
non ferrous metals		2.1	2.3	2.5	2.6	2.6		1.0	0.7	0.5	0.0
chemicals		15.5	17.2	18.8	21.8	25.0		1.1	0.9	1.5	1.4
non metallic minerals		11.2	12.7	15.3	16.3	17.2		1.3	1.9	0.6	0.5
paper pulp		10.3	11.2	13.0	14.2	14.7		0.9	1.5	0.9	0.3
food, drink and tobacco		25.2	27.8	32.8	38.1	43.6		1.0	1.7	1.5	1.4
engineering		91.7	101.1	115.4	122.3	129.9		1.0	1.3	0.6	0.6
textiles		24.4	21.3	18.4	16.5	15.3		-1.3	-1.4	-1.1	-0.7
other industries (incl. printing)		36.9	40.3	43.3	46.2	50.2		0.9	0.7	0.6	0.8
Construction		84.5	89.3	103.9	114.1	124.0		0.5	1.5	0.9	0.8
Tertiary		1055.5	1155.5	1355.9	1556.3	1805.1		0.9	1.6	1.4	1.5
market services		636.6	707.7	840.9	983.3	1167.1		1.1	1.7	1.6	1.7
non market services		241.8	245.9	280.5	305.9	336.9		0.2	1.3	0.9	1.0
trade		150.7	175.0	206.3	238.3	271.2		1.5	1.7	1.4	1.3
agriculture		26.4	26.9	28.2	28.9	29.9		0.2	0.5	0.2	0.3
Energy sector and others		27.9	30.0	33.4	35.9	40.5		0.7	1.1	0.7	1.2

Latvia: Key Demographic and Economic Assumptions

	2000	2010	2020	2030	2040	2050	'00-'10	'10-'20	'20-'30	'30-'40	'40-'50
Main Demographic Assumptions											
Population (Million)	2.4	2.2	2.1	2.0	1.9	1.8	-0.6	-0.5	-0.6	-0.6	-0.6
Average household size (persons)	2.6	2.4	2.4	2.3	2.3	2.2	-0.6	-0.1	-0.2	-0.2	-0.1
Gross Domestic Product (in 000 MEuro'10)	**12.5**	**18.0**	**23.6**	**29.7**	**34.4**	**36.7**	**3.7**	**2.8**	**2.3**	**1.5**	**0.7**
Household Expenditure (in Euro'10/capita)	**3085.1**	**5035.8**	**7297.9**	**9905.9**	**12119.0**	**13649.5**	**5.0**	**3.8**	**3.1**	**2.0**	**1.2**
SECTORAL VALUE ADDED (in 000 MEuro'10)		**16.1**	**21.2**	**26.6**	**30.8**	**32.8**		**2.8**	**2.3**	**1.5**	**0.7**
Industry		2.2	2.9	3.2	3.5	3.5		2.6	1.3	0.7	0.2
iron and steel		0.1	0.1	0.1	0.1	0.1		6.1	0.2	-0.1	-0.1
non ferrous metals		0.0	0.0	0.0	0.0	0.0		8.8	1.4	0.3	-0.3
chemicals		0.2	0.3	0.3	0.3	0.3		3.1	1.4	0.4	0.2
non metallic minerals		0.1	0.1	0.2	0.2	0.2		1.8	1.0	0.6	0.2
paper pulp		0.1	0.1	0.1	0.1	0.2		0.0	1.4	0.9	0.5
food, drink and tobacco		0.5	0.7	0.8	0.8	0.8		2.7	1.1	0.7	0.0
engineering		0.3	0.5	0.7	0.7	0.8		4.5	2.3	1.2	0.8
textiles		0.1	0.1	0.1	0.1	0.1		0.2	-1.2	-1.2	-1.5
other industries (incl. printing)		0.7	0.8	0.9	1.0	1.0		1.8	1.2	0.8	0.0
Construction		1.0	1.2	1.4	1.5	1.6		2.3	1.5	1.1	0.4
Tertiary		12.3	16.4	21.3	25.0	27.0		2.9	2.6	1.6	0.8
market services		6.5	9.2	12.2	14.3	14.9		3.4	2.9	1.6	0.4
non market services		2.4	2.8	3.2	3.5	3.5		1.5	1.5	0.9	-0.1
trade		2.7	3.8	5.1	6.4	7.8		3.4	3.0	2.4	2.0
agriculture		0.7	0.8	0.8	0.8	0.8		0.5	0.3	0.2	0.2
Energy sector and others		0.6	0.7	0.7	0.7	0.7		0.5	0.8	0.3	-0.6

Source: GEM-E3

REFERENCE 2013

Lithuania: Key Demographic and Economic Assumptions

	2000	2010	2020	2030	2040	2050	'00-'10	'10-'20	'20-'30	'30-'40	'40-'50
Main Demographic Assumptions											
Population (Million)	3.5	3.3	3.2	3.0	2.9	2.8	-0.5	-0.5	-0.4	-0.4	-0.4
Average household size (persons)	2.8	2.6	2.5	2.4	2.3	2.3	-0.7	-0.4	-0.3	-0.3	-0.2
Gross Domestic Product (in 000 MEuro'10)	**18.0**	**27.5**	**35.1**	**41.8**	**49.3**	**55.6**	**4.4**	**2.4**	**1.8**	**1.7**	**1.2**
Household Expenditure (in Euro'10/capita)	**3300.3**	**5325.1**	**7357.5**	**9364.3**	**11685.8**	**13811.0**	**4.9**	**3.3**	**2.4**	**2.2**	**1.7**
SECTORAL VALUE ADDED (in 000 MEuro'10)		**24.7**	**31.5**	**37.5**	**44.2**	**49.7**		**2.4**	**1.8**	**1.7**	**1.2**
Industry		4.1	5.0	5.6	6.6	7.4		1.9	1.3	1.5	1.2
iron and steel		0.0	0.0	0.0	0.0	0.0		3.8	1.2	1.2	0.4
non ferrous metals		0.0	0.0	0.0	0.0	0.0		1.0	0.0	0.3	0.5
chemicals		0.5	0.6	0.7	0.7	0.7		1.2	0.7	0.7	0.5
non metallic minerals		0.2	0.3	0.3	0.4	0.5		6.0	2.4	1.9	1.1
paper pulp		0.2	0.2	0.3	0.4	0.4		1.2	2.9	2.3	1.5
food, drink and tobacco		1.1	1.4	1.6	1.9	2.2		1.9	1.5	1.8	1.5
engineering		0.6	0.8	0.9	1.1	1.3		2.3	1.6	2.0	1.5
textiles		0.4	0.4	0.3	0.3	0.3		0.3	-1.0	-0.3	-0.3
other industries (incl. printing)		1.1	1.3	1.4	1.7	1.9		1.8	1.1	1.5	1.2
Construction		1.5	1.8	1.9	2.1	2.1		1.8	0.9	0.6	0.4
Tertiary		17.6	23.1	28.1	33.5	38.1		2.7	2.0	1.8	1.3
market services		8.7	11.7	14.2	16.9	19.1		3.0	2.0	1.7	1.2
non market services		3.9	4.7	5.4	6.3	7.0		2.0	1.3	1.5	1.2
trade		4.2	5.8	7.6	9.5	11.1		3.3	2.8	2.2	1.6
agriculture		0.8	0.8	0.9	0.9	0.9		0.3	0.1	0.2	0.2
Energy sector and others		1.5	1.6	1.8	2.0	2.1		1.0	1.1	1.1	0.4

Luxembourg: Key Demographic and Economic Assumptions

	2000	2010	2020	2030	2040	2050	'00-'10	'10-'20	'20-'30	'30-'40	'40-'50
Main Demographic Assumptions											
Population (Million)	0.4	0.5	0.6	0.6	0.7	0.7	1.5	1.3	0.9	0.7	0.5
Average household size (persons)	2.6	2.5	2.5	2.4	2.3	2.2	-0.4	-0.1	-0.3	-0.4	-0.4
Gross Domestic Product (in 000 MEuro'10)	**30.8**	**40.3**	**48.6**	**58.3**	**69.3**	**82.1**	**2.7**	**1.9**	**1.8**	**1.8**	**1.7**
Household Expenditure (in Euro'10/capita)	**25151.4**	**26876.5**	**27830.0**	**30596.6**	**34728.6**	**40742.2**	**0.7**	**0.3**	**1.0**	**1.3**	**1.6**
SECTORAL VALUE ADDED (in 000 MEuro'10)		**36.6**	**44.1**	**52.9**	**62.8**	**74.3**		**1.9**	**1.8**	**1.7**	**1.7**
Industry		2.2	2.4	2.7	2.8	3.0		0.8	0.9	0.5	0.7
iron and steel		0.3	0.3	0.3	0.3	0.3		-0.1	0.0	-0.6	-0.5
non ferrous metals		0.0	0.1	0.1	0.1	0.1		2.7	0.2	-0.4	-0.3
chemicals		0.1	0.2	0.2	0.2	0.2		1.9	0.3	0.1	0.7
non metallic minerals		0.2	0.2	0.2	0.2	0.2		0.1	0.3	0.2	0.4
paper pulp		0.1	0.1	0.1	0.2	0.2		0.3	0.6	0.5	0.6
food, drink and tobacco		0.3	0.3	0.3	0.4	0.4		1.0	1.5	1.6	1.2
engineering		0.6	0.7	0.8	0.9	0.9		2.0	1.6	0.6	0.8
textiles		0.1	0.1	0.1	0.1	0.1		-1.8	-1.5	-1.0	-0.8
other industries (incl. printing)		0.5	0.5	0.5	0.6	0.7		0.1	1.1	0.9	1.4
Construction		2.0	2.1	2.2	2.3	2.5		0.5	0.3	0.3	0.9
Tertiary		31.9	39.1	47.6	57.4	68.3		2.1	2.0	1.9	1.8
market services		22.0	27.3	33.5	40.8	48.8		2.2	2.1	2.0	1.8
non market services		6.2	7.0	8.2	9.5	11.2		1.3	1.5	1.5	1.6
trade		3.6	4.6	5.8	7.0	8.3		2.6	2.3	1.8	1.7
agriculture		0.1	0.1	0.1	0.1	0.1		0.0	-0.3	-0.2	-0.3
Energy sector and others		0.4	0.4	0.4	0.4	0.5		0.3	-0.4	0.1	0.8

Source: GEM-E3

REFERENCE 2013

Malta: Key Demographic and Economic Assumptions

	2000	2010	2020	2030	2040	2050	'00-'10	'10-'20	'20-'30	'30-'40	'40-'50
Main Demographic Assumptions											
Population (Million)	0.4	0.4	0.4	0.4	0.4	0.4	0.9	0.0	0.0	-0.2	-0.3
Average household size (persons)	2.9	2.6	2.5	2.5	2.5	2.4	-1.0	-0.3	-0.2	-0.2	-0.1
Gross Domestic Product (in 000 MEuro'10)	**5.3**	**6.1**	**7.1**	**8.6**	**10.2**	**11.3**	**1.5**	**1.5**	**1.9**	**1.7**	**1.1**
Household Expenditure (in Euro'10/capita)	**8524.9**	**9099.6**	**10886.3**	**13449.1**	**16431.3**	**18794.7**	**0.7**	**1.8**	**2.1**	**2.0**	**1.4**
SECTORAL VALUE ADDED (in 000 MEuro'10)		**5.3**	**6.2**	**7.5**	**8.8**	**9.8**		**1.5**	**1.9**	**1.6**	**1.0**
Industry		0.7	0.8	0.9	1.0	1.1		1.2	1.4	1.2	0.5
iron and steel		0.0	0.0	0.0	0.0	0.0		-0.5	1.0	0.5	-0.4
non ferrous metals		0.0	0.0	0.0	0.0	0.0		-0.5	1.0	0.5	-0.4
chemicals		0.1	0.1	0.1	0.2	0.2		2.3	0.7	0.7	0.0
non metallic minerals		0.0	0.0	0.0	0.0	0.0		1.6	1.2	0.7	0.2
paper pulp		0.1	0.1	0.1	0.1	0.1		0.8	1.7	1.4	1.0
food, drink and tobacco		0.1	0.1	0.1	0.1	0.1		1.6	1.8	1.3	0.6
engineering		0.2	0.3	0.3	0.4	0.4		1.2	1.9	1.7	0.7
textiles		0.0	0.0	0.0	0.0	0.0		-0.3	-0.5	-0.6	-0.9
other industries (incl. printing)		0.2	0.2	0.2	0.2	0.2		0.6	1.0	0.9	0.1
Construction		0.2	0.2	0.3	0.3	0.3		1.1	1.2	1.1	0.3
Tertiary		4.3	5.1	6.2	7.4	8.3		1.6	2.0	1.8	1.2
market services		2.7	3.3	4.1	5.0	5.8		2.0	2.3	2.0	1.5
non market services		1.1	1.1	1.3	1.4	1.4		0.6	1.4	1.0	0.1
trade		0.5	0.6	0.7	0.9	1.0		1.8	1.9	1.7	1.2
agriculture		0.1	0.1	0.1	0.1	0.1		-0.1	0.1	0.0	0.0
Energy sector and others		0.1	0.1	0.1	0.1	0.1		-0.5	1.0	0.5	-0.4

Netherlands: Key Demographic and Economic Assumptions

	2000	2010	2020	2030	2040	2050	'00-'10	'10-'20	'20-'30	'30-'40	'40-'50
Main Demographic Assumptions											
Population (Million)	15.9	16.6	17.2	17.6	17.6	17.4	0.4	0.4	0.2	0.0	-0.1
Average household size (persons)	2.4	2.4	2.3	2.2	2.2	2.1	0.2	-0.5	-0.2	-0.4	-0.5
Gross Domestic Product (in 000 MEuro'10)	**513.6**	**588.4**	**688.1**	**767.2**	**866.0**	**994.4**	**1.4**	**1.6**	**1.1**	**1.2**	**1.4**
Household Expenditure (in Euro'10/capita)	**16012.0**	**16109.0**	**17740.8**	**19449.2**	**22469.1**	**27595.1**	**0.1**	**1.0**	**0.9**	**1.5**	**2.1**
SECTORAL VALUE ADDED (in 000 MEuro'10)		**525.9**	**615.0**	**685.6**	**773.1**	**886.1**		**1.6**	**1.1**	**1.2**	**1.4**
Industry		64.9	73.8	81.9	91.8	102.4		1.3	1.1	1.1	1.1
iron and steel		1.3	1.3	1.2	1.2	1.2		0.0	-0.5	-0.3	0.0
non ferrous metals		0.5	0.7	0.7	0.7	0.8		3.7	0.4	0.2	0.3
chemicals		12.8	15.1	16.1	17.4	18.5		1.7	0.6	0.8	0.6
non metallic minerals		2.1	2.5	2.6	2.8	3.1		1.7	0.2	0.8	1.2
paper pulp		3.7	3.8	4.1	4.5	5.0		0.4	0.7	1.1	1.0
food, drink and tobacco		14.3	16.2	17.5	19.4	22.0		1.3	0.8	1.0	1.3
engineering		17.2	20.3	24.2	28.1	30.8		1.7	1.7	1.5	0.9
textiles		1.2	1.0	0.8	0.6	0.5		-1.6	-2.7	-2.1	-1.1
other industries (incl. printing)		11.8	12.8	14.7	17.0	20.4		0.8	1.4	1.4	1.9
Construction		28.7	32.2	34.9	38.2	41.2		1.2	0.8	0.9	0.8
Tertiary		405.8	481.1	539.4	611.6	708.6		1.7	1.2	1.3	1.5
market services		211.3	252.3	284.0	323.6	379.5		1.8	1.2	1.3	1.6
non market services		117.2	132.3	146.3	164.0	185.5		1.2	1.0	1.2	1.2
trade		68.0	86.6	98.9	113.5	132.9		2.4	1.3	1.4	1.6
agriculture		9.4	9.9	10.3	10.4	10.7		0.6	0.3	0.2	0.2
Energy sector and others		26.6	28.0	29.4	31.6	33.9		0.5	0.5	0.7	0.7

Source: GEM-E3

REFERENCE 2013

Poland: Key Demographic and Economic Assumptions

	2000	2010	2020	2030	2040	2050	'00-'10	'10-'20	'20-'30	'30-'40	'40-'50
Main Demographic Assumptions											
Population (Million)	38.7	38.2	38.4	37.6	36.1	34.5	-0.1	0.1	-0.2	-0.4	-0.4
Average household size (persons)	3.2	2.9	2.7	2.6	2.5	2.4	-1.0	-0.8	-0.4	-0.4	-0.3
Gross Domestic Product (in 000 MEuro'10)	**241.9**	**354.6**	**474.3**	**564.2**	**646.1**	**697.2**	**3.9**	**3.0**	**1.7**	**1.4**	**0.8**
Household Expenditure (in Euro'10/capita)	**3978.1**	**5697.3**	**7798.8**	**9626.4**	**11582.8**	**13125.5**	**3.7**	**3.2**	**2.1**	**1.9**	**1.3**
SECTORAL VALUE ADDED (in 000 MEuro'10)		**312.3**	**417.6**	**496.8**	**568.3**	**612.2**		**2.9**	**1.8**	**1.4**	**0.7**
Industry		52.2	76.0	92.3	107.7	115.2		3.8	2.0	1.6	0.7
iron and steel		1.1	1.4	1.5	1.6	1.7		2.6	1.2	0.7	0.1
non ferrous metals		0.3	0.3	0.4	0.4	0.5		1.5	2.3	1.6	0.7
chemicals		3.5	5.1	5.9	6.6	6.7		3.7	1.5	1.2	0.2
non metallic minerals		3.6	4.7	5.6	6.5	7.0		2.7	1.8	1.6	0.7
paper pulp		2.6	3.5	4.4	5.2	5.7		3.2	2.2	1.8	0.9
food, drink and tobacco		9.8	12.9	15.2	17.3	18.6		2.7	1.7	1.3	0.7
engineering		15.8	27.4	34.8	43.1	47.5		5.6	2.4	2.1	1.0
textiles		2.1	2.2	2.2	2.0	1.9		0.6	-0.1	-0.7	-0.8
other industries (incl. printing)		13.5	18.6	22.4	25.0	25.7		3.3	1.9	1.1	0.3
Construction		25.7	34.0	38.5	42.3	45.5		2.8	1.2	1.0	0.7
Tertiary		216.4	285.9	341.4	391.8	423.8		2.8	1.8	1.4	0.8
market services		100.0	135.6	163.8	187.9	204.8		3.1	1.9	1.4	0.9
non market services		43.9	55.2	66.0	76.7	81.2		2.3	1.8	1.5	0.6
trade		60.7	81.6	97.6	112.8	123.3		3.0	1.8	1.5	0.9
agriculture		11.7	13.5	14.1	14.4	14.5		1.4	0.4	0.2	0.1
Energy sector and others		17.9	21.8	24.6	26.5	27.7		2.0	1.2	0.7	0.4

Portugal: Key Demographic and Economic Assumptions

	2000	2010	2020	2030	2040	2050	'00-'10	'10-'20	'20-'30	'30-'40	'40-'50
Main Demographic Assumptions											
Population (Million)	10.2	10.6	10.7	10.8	10.8	10.6	0.4	0.1	0.0	0.0	-0.2
Average household size (persons)	2.8	2.6	2.5	2.4	2.3	2.3	-0.6	-0.3	-0.4	-0.4	-0.3
Gross Domestic Product (in 000 MEuro'10)	**162.1**	**172.7**	**182.0**	**219.4**	**255.6**	**287.9**	**0.6**	**0.5**	**1.9**	**1.5**	**1.2**
Household Expenditure (in Euro'10/capita)	**9914.1**	**10708.5**	**11223.0**	**13558.0**	**15866.7**	**18178.8**	**0.8**	**0.5**	**1.9**	**1.6**	**1.4**
SECTORAL VALUE ADDED (in 000 MEuro'10)		**151.1**	**159.3**	**192.0**	**223.4**	**251.2**		**0.5**	**1.9**	**1.5**	**1.2**
Industry		19.6	20.5	22.3	24.5	26.5		0.5	0.9	0.9	0.8
iron and steel		0.2	0.2	0.2	0.3	0.3		3.4	0.4	0.6	0.5
non ferrous metals		0.1	0.1	0.2	0.2	0.2		3.4	0.5	0.4	0.2
chemicals		1.3	1.4	1.5	1.6	1.9		1.1	0.5	0.9	1.7
non metallic minerals		1.7	1.8	2.0	2.1	2.1		0.7	1.0	0.5	0.0
paper pulp		1.3	1.4	1.6	1.8	1.8		0.9	1.5	0.8	0.1
food, drink and tobacco		3.0	3.0	3.4	3.9	4.3		0.1	1.0	1.4	1.0
engineering		5.3	5.7	6.8	7.8	8.9		0.8	1.7	1.4	1.3
textiles		3.2	2.6	2.3	2.3	2.2		-1.9	-1.1	-0.4	-0.5
other industries (incl. printing)		3.6	4.1	4.3	4.6	4.9		1.3	0.5	0.6	0.8
Construction		10.1	10.0	11.4	12.1	12.3		-0.1	1.3	0.6	0.2
Tertiary		117.5	124.3	152.8	180.8	205.9		0.6	2.1	1.7	1.3
market services		59.8	63.8	80.8	97.2	113.2		0.7	2.4	1.9	1.5
non market services		32.8	31.7	37.3	43.1	47.3		-0.3	1.6	1.5	0.9
trade		21.4	25.2	31.3	37.0	41.8		1.6	2.2	1.7	1.2
agriculture		3.4	3.5	3.5	3.5	3.5		0.3	0.0	0.0	0.1
Energy sector and others		4.0	4.5	5.5	6.0	6.5		1.3	1.8	1.0	0.7

Source: GEM-E3

REFERENCE 2013

Romania: Key Demographic and Economic Assumptions

	2000	2010	2020	2030	2040	2050	'00-'10	'10-'20	'20-'30	'30-'40	'40-'50
Main Demographic Assumptions											
Population (Million)	22.5	21.5	21.0	20.3	19.4	18.5	-0.5	-0.2	-0.4	-0.4	-0.5
Average household size (persons)	3.2	2.9	2.7	2.6	2.5	2.4	-1.0	-0.8	-0.4	-0.4	-0.3
Gross Domestic Product (in 000 MEuro'10)	**83.1**	**124.1**	**157.3**	**178.7**	**201.4**	**216.0**	**4.1**	**2.4**	**1.3**	**1.2**	**0.7**
Household Expenditure (in Euro'10/capita)	**1790.5**	**3698.9**	**4990.1**	**5973.3**	**7070.8**	**7983.4**	**7.5**	**3.0**	**1.8**	**1.7**	**1.2**
SECTORAL VALUE ADDED (in 000 MEuro'10)		**112.0**	**142.0**	**161.3**	**181.6**	**194.4**		**2.4**	**1.3**	**1.2**	**0.7**
Industry		25.0	33.9	38.8	43.0	44.0		3.1	1.4	1.0	0.2
iron and steel		0.5	0.7	0.7	0.7	0.7		3.4	0.8	0.3	0.0
non ferrous metals		0.1	0.2	0.2	0.2	0.2		2.5	0.0	-0.2	0.0
chemicals		1.0	1.3	1.4	1.5	1.5		2.4	0.9	0.5	0.0
non metallic minerals		1.0	1.2	1.4	1.5	1.4		1.5	1.4	0.4	-0.1
paper pulp		0.9	1.1	1.4	1.5	1.5		2.2	2.1	0.8	0.3
food, drink and tobacco		6.2	7.4	8.1	9.0	9.3		1.8	0.8	1.0	0.4
engineering		9.9	16.0	19.5	22.4	22.9		4.9	2.0	1.4	0.3
textiles		1.9	1.9	1.6	1.5	1.3		0.1	-1.5	-1.0	-1.2
other industries (incl. printing)		3.4	4.1	4.5	4.9	5.1		1.9	0.8	1.0	0.3
Construction		12.4	13.0	14.9	15.9	17.3		0.5	1.3	0.7	0.8
Tertiary		68.4	87.7	100.0	114.8	125.2		2.5	1.3	1.4	0.9
market services		36.4	49.7	57.4	66.7	73.0		3.2	1.4	1.5	0.9
non market services		12.5	14.7	15.6	16.7	16.6		1.7	0.6	0.7	-0.1
trade		12.1	15.4	18.8	22.8	26.9		2.5	2.1	1.9	1.6
agriculture		7.5	7.8	8.1	8.5	8.8		0.5	0.3	0.5	0.3
Energy sector and others		6.3	7.4	7.7	7.9	7.9		1.7	0.3	0.3	0.0

Slovakia: Key Demographic and Economic Assumptions

	2000	2010	2020	2030	2040	2050	'00-'10	'10-'20	'20-'30	'30-'40	'40-'50
Main Demographic Assumptions											
Population (Million)	5.4	5.4	5.6	5.6	5.5	5.3	0.0	0.3	0.0	-0.2	-0.3
Average household size (persons)	3.2	3.1	2.9	2.8	2.7	2.7	-0.3	-0.5	-0.4	-0.3	-0.2
Gross Domestic Product (in 000 MEuro'10)	**41.3**	**65.7**	**83.9**	**105.8**	**119.0**	**127.4**	**4.8**	**2.5**	**2.3**	**1.2**	**0.7**
Household Expenditure (in Euro'10/capita)	**4726.2**	**7086.1**	**8922.4**	**11409.6**	**13223.3**	**14617.1**	**4.1**	**2.3**	**2.5**	**1.5**	**1.0**
SECTORAL VALUE ADDED (in 000 MEuro'10)		**59.8**	**76.3**	**96.1**	**108.1**	**115.5**		**2.5**	**2.3**	**1.2**	**0.7**
Industry		13.8	17.4	22.3	25.1	25.6		2.3	2.5	1.2	0.2
iron and steel		0.8	1.0	1.1	1.1	1.1		1.9	0.7	0.2	-0.3
non ferrous metals		0.3	0.3	0.3	0.3	0.3		1.6	0.9	0.2	-0.4
chemicals		0.7	0.8	0.9	1.0	0.9		1.1	1.1	0.3	-0.1
non metallic minerals		0.7	0.8	1.0	1.0	1.1		1.8	1.8	0.5	0.3
paper pulp		0.6	0.6	0.8	0.8	0.9		1.1	1.9	0.7	0.5
food, drink and tobacco		1.2	1.4	1.8	1.9	2.0		1.6	2.3	0.9	0.3
engineering		6.4	8.8	12.2	14.5	14.9		3.2	3.3	1.7	0.3
textiles		0.5	0.5	0.5	0.4	0.4		0.2	-0.3	-1.3	-1.4
other industries (incl. printing)		2.6	3.0	3.7	4.0	4.0		1.6	2.0	0.6	0.0
Construction		5.7	6.9	8.6	9.4	9.6		1.9	2.2	0.9	0.3
Tertiary		36.3	47.7	60.0	68.1	75.0		2.8	2.3	1.3	1.0
market services		18.7	25.3	31.9	36.5	40.9		3.1	2.4	1.4	1.1
non market services		8.4	10.1	12.4	13.2	13.1		1.8	2.1	0.6	-0.1
trade		7.4	10.3	13.5	16.2	18.9		3.4	2.7	1.8	1.6
agriculture		1.9	2.0	2.1	2.2	2.2		0.8	0.5	0.2	-0.1
Energy sector and others		3.8	4.2	5.3	5.5	5.2		1.0	2.2	0.4	-0.5

Source: GEM-E3

REFERENCE 2013

Slovenia: Key Demographic and Economic Assumptions

	2000	2010	2020	2030	2040	2050	'00-'10	'10-'20	'20-'30	'30-'40	'40-'50
Main Demographic Assumptions											
Population (Million)	2.0	2.0	2.1	2.2	2.1	2.1	0.3	0.5	0.1	-0.1	-0.1
Average household size (persons)	2.9	2.6	2.5	2.4	2.4	2.3	-1.0	-0.5	-0.2	-0.2	-0.2
Gross Domestic Product (in 000 MEuro'10)	**27.1**	**35.4**	**41.8**	**48.8**	**55.2**	**60.7**	**2.7**	**1.7**	**1.6**	**1.2**	**0.9**
Household Expenditure (in Euro'10/capita)	**7784.1**	**9692.5**	**11079.2**	**13177.2**	**15408.6**	**17624.2**	**2.2**	**1.3**	**1.7**	**1.6**	**1.4**
SECTORAL VALUE ADDED (in 000 MEuro'10)		**30.8**	**36.4**	**42.5**	**47.9**	**52.6**		**1.7**	**1.6**	**1.2**	**0.9**
Industry		6.0	7.3	8.4	9.4	10.4		2.0	1.4	1.2	0.9
iron and steel		0.2	0.2	0.2	0.3	0.2		2.5	1.4	0.0	-0.1
non ferrous metals		0.1	0.1	0.2	0.2	0.2		8.5	1.4	0.0	0.1
chemicals		0.9	1.2	1.3	1.4	1.5		1.9	0.9	0.8	0.6
non metallic minerals		0.3	0.3	0.3	0.3	0.3		1.0	1.3	0.5	0.2
paper pulp		0.3	0.3	0.3	0.3	0.3		-0.3	0.7	0.4	0.7
food, drink and tobacco		0.5	0.5	0.6	0.7	0.7		1.1	1.6	1.0	0.8
engineering		2.5	3.3	4.1	4.9	5.6		2.9	2.0	1.8	1.4
textiles		0.2	0.2	0.2	0.2	0.2		-1.1	-1.2	-1.3	-1.0
other industries (incl. printing)		1.1	1.2	1.3	1.3	1.4		0.8	0.7	0.6	0.4
Construction		2.0	2.2	2.4	2.5	2.6		1.1	1.0	0.5	0.2
Tertiary		21.9	25.9	30.6	34.8	38.4		1.7	1.7	1.3	1.0
market services		11.8	14.4	17.3	20.0	22.4		2.0	1.8	1.5	1.2
non market services		5.5	5.7	6.3	6.7	7.0		0.3	1.1	0.7	0.4
trade		3.9	5.0	6.2	7.3	8.2		2.6	2.2	1.6	1.2
agriculture		0.8	0.8	0.8	0.8	0.8		0.3	0.3	0.1	0.1
Energy sector and others		0.9	1.0	1.1	1.1	1.2		0.8	0.4	0.5	0.5

Spain: Key Demographic and Economic Assumptions

	2000	2010	2020	2030	2040	2050	'00-'10	'10-'20	'20-'30	'30-'40	'40-'50
Main Demographic Assumptions											
Population (Million)	40.0	46.0	48.0	50.0	51.7	52.7	1.4	0.4	0.4	0.3	0.2
Average household size (persons)	2.9	2.7	2.7	2.6	2.5	2.5	-0.5	-0.2	-0.4	-0.2	-0.2
Gross Domestic Product (in 000 MEuro'10)	**856.8**	**1051.3**	**1227.4**	**1583.3**	**1835.6**	**2045.3**	**2.1**	**1.6**	**2.6**	**1.5**	**1.1**
Household Expenditure (in Euro'10/capita)	**12378.6**	**13196.9**	**14773.3**	**18367.0**	**20668.2**	**22726.0**	**0.6**	**1.1**	**2.2**	**1.2**	**1.0**
SECTORAL VALUE ADDED (in 000 MEuro'10)		**961.6**	**1122.5**	**1447.8**	**1676.7**	**1865.1**		**1.6**	**2.6**	**1.5**	**1.1**
Industry		124.5	148.5	183.2	204.8	225.8		1.8	2.1	1.1	1.0
iron and steel		4.9	5.3	6.8	7.2	7.0		0.8	2.4	0.6	-0.2
non ferrous metals		2.4	2.5	2.8	2.9	2.9		0.5	1.1	0.5	0.0
chemicals		13.5	16.6	19.1	21.3	23.5		2.1	1.4	1.1	1.0
non metallic minerals		7.8	9.7	11.9	12.3	12.2		2.1	2.0	0.4	-0.1
paper pulp		7.0	7.4	8.6	9.5	9.6		0.4	1.6	1.0	0.1
food, drink and tobacco		23.8	27.9	34.1	37.6	41.1		1.6	2.0	1.0	0.9
engineering		38.9	48.7	66.7	79.3	92.5		2.3	3.2	1.7	1.5
textiles		5.3	4.8	4.4	3.7	3.4		-0.9	-0.9	-1.5	-1.1
other industries (incl. printing)		20.8	25.6	28.9	31.0	33.5		2.1	1.2	0.7	0.8
Construction		114.8	125.8	157.0	169.7	176.4		0.9	2.2	0.8	0.4
Tertiary		700.3	824.7	1078.6	1271.2	1431.9		1.6	2.7	1.7	1.2
market services		380.4	461.2	619.9	754.6	874.1		1.9	3.0	2.0	1.5
non market services		177.4	189.4	242.6	263.0	269.9		0.7	2.5	0.8	0.3
trade		117.0	147.5	188.6	226.5	260.8		2.3	2.5	1.8	1.4
agriculture		25.5	26.6	27.4	27.1	27.1		0.5	0.3	-0.1	0.0
Energy sector and others		22.1	23.5	29.1	31.0	31.0		0.7	2.1	0.6	0.0

Source: GEM-E3

REFERENCE 2013

Sweden: Key Demographic and Economic Assumptions

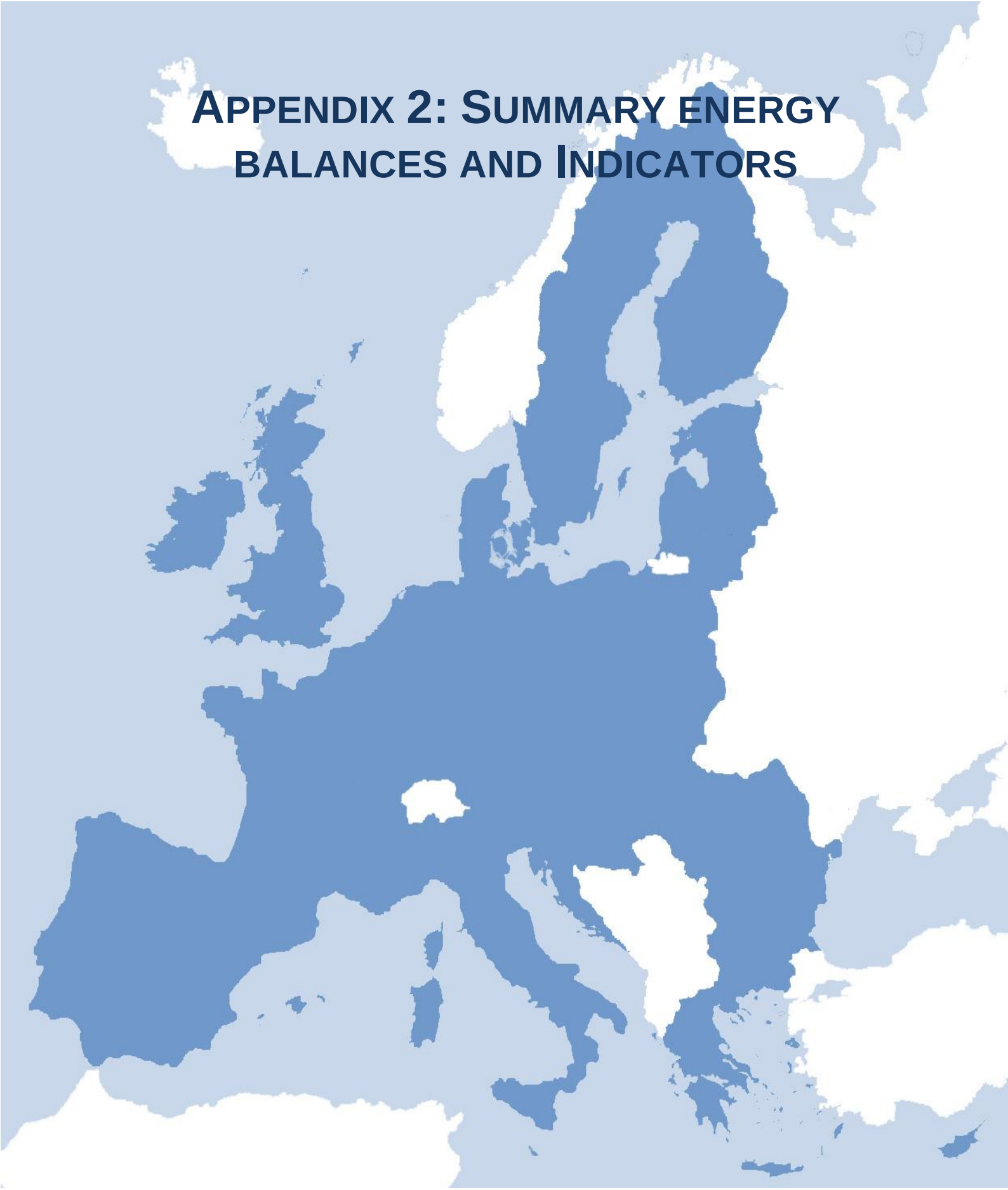
	2000	2010	2020	2030	2040	2050	'00-'10	'10-'20	'20-'30	'30-'40	'40-'50
Main Demographic Assumptions											
Population (Million)	8.9	9.3	10.1	10.6	10.9	11.2	0.5	0.8	0.5	0.3	0.3
Average household size (persons)	2.1	2.1	2.1	2.1	2.1	2.1	-0.2	0.0	0.0	0.0	0.0
Gross Domestic Product (in 000 MEuro'10)	**283.3**	**349.2**	**423.6**	**505.2**	**603.1**	**717.0**	**2.1**	**2.0**	**1.8**	**1.8**	**1.7**
Household Expenditure (in Euro'10/capita)	**15496.3**	**18081.4**	**20797.2**	**24127.3**	**28609.9**	**33791.3**	**1.6**	**1.4**	**1.5**	**1.7**	**1.7**
SECTORAL VALUE ADDED (in 000 MEuro'10)		**304.8**	**369.8**	**440.9**	**525.8**	**624.0**		**1.9**	**1.8**	**1.8**	**1.7**
Industry		50.8	60.4	68.6	78.0	90.8		1.7	1.3	1.3	1.5
iron and steel		1.8	2.4	2.7	2.7	2.8		2.9	0.9	0.2	0.3
non ferrous metals		0.6	0.9	0.9	0.9	0.8		4.6	0.2	-0.5	-0.3
chemicals		7.7	8.5	9.8	11.3	12.1		1.0	1.4	1.5	0.7
non metallic minerals		1.0	1.4	1.4	1.5	1.6		2.6	0.6	0.6	0.7
paper pulp		4.1	4.3	4.8	5.2	5.7		0.4	1.2	0.9	0.8
food, drink and tobacco		4.1	4.7	5.5	6.3	7.0		1.3	1.7	1.3	1.1
engineering		22.1	26.7	30.9	35.8	43.8		1.9	1.5	1.5	2.0
textiles		0.5	0.4	0.4	0.3	0.3		-0.8	-1.1	-1.1	-0.8
other industries (incl. printing)		9.0	11.2	12.2	13.9	16.7		2.3	0.9	1.3	1.8
Construction		16.7	19.5	22.1	24.8	27.3		1.5	1.3	1.1	1.0
Tertiary		226.0	277.3	336.9	409.0	490.9		2.1	2.0	2.0	1.8
market services		113.8	139.7	170.7	211.0	260.5		2.1	2.0	2.1	2.1
non market services		71.4	86.0	100.1	116.0	134.0		1.9	1.5	1.5	1.5
trade		35.8	46.3	60.6	76.5	90.8		2.6	2.7	2.4	1.7
agriculture		5.0	5.3	5.4	5.6	5.6		0.5	0.2	0.2	0.1
Energy sector and others		11.3	12.6	13.2	14.0	15.1		1.0	0.5	0.5	0.8

United Kingdom: Key Demographic and Economic Assumptions

	2000	2010	2020	2030	2040	2050	'00-'10	'10-'20	'20-'30	'30-'40	'40-'50
Main Demographic Assumptions											
Population (Million)	58.8	62.0	66.3	70.2	73.4	76.4	0.5	0.7	0.6	0.5	0.4
Average household size (persons)	2.4	2.4	2.3	2.2	2.1	2.1	-0.1	-0.3	-0.4	-0.3	-0.3
Gross Domestic Product (in 000 MEuro'10)	**1444.8**	**1706.3**	**2023.8**	**2445.4**	**2965.4**	**3581.8**	**1.7**	**1.7**	**1.9**	**1.9**	**1.9**
Household Expenditure (in Euro'10/capita)	**15784.6**	**17704.5**	**19238.0**	**21741.9**	**25333.1**	**29977.1**	**1.2**	**0.8**	**1.2**	**1.5**	**1.7**
SECTORAL VALUE ADDED (in 000 MEuro'10)		**1522.5**	**1805.7**	**2181.4**	**2642.6**	**3186.4**		**1.7**	**1.9**	**1.9**	**1.9**
Industry		156.3	176.7	198.6	222.2	246.3		1.2	1.2	1.1	1.0
iron and steel		3.0	3.0	2.8	2.7	2.7		0.0	-0.6	-0.2	-0.2
non ferrous metals		1.5	1.3	1.3	1.2	1.1		-1.3	-0.3	-0.8	-0.9
chemicals		22.2	29.2	33.2	36.2	37.4		2.7	1.3	0.9	0.3
non metallic minerals		5.0	5.7	6.0	6.2	6.4		1.2	0.6	0.3	0.3
paper pulp		21.2	21.4	21.2	20.0	18.4		0.1	-0.1	-0.6	-0.8
food, drink and tobacco		24.7	25.7	27.5	29.0	29.5		0.4	0.7	0.5	0.2
engineering		53.6	64.6	79.2	98.8	121.8		1.9	2.1	2.2	2.1
textiles		4.7	3.9	3.1	2.5	2.1		-1.8	-2.3	-2.0	-1.9
other industries (incl. printing)		20.3	22.0	24.3	25.7	27.0		0.8	1.0	0.6	0.5
Construction		106.0	126.2	148.0	168.5	187.3		1.8	1.6	1.3	1.1
Tertiary		1199.8	1439.2	1768.9	2181.6	2677.8		1.8	2.1	2.1	2.1
market services		739.6	927.8	1172.9	1481.5	1864.6		2.3	2.4	2.4	2.3
non market services		308.8	321.9	361.4	410.6	464.1		0.4	1.2	1.3	1.2
trade		142.7	180.4	225.3	280.1	339.4		2.4	2.2	2.2	1.9
agriculture		8.8	9.1	9.3	9.5	9.6		0.4	0.3	0.2	0.1
Energy sector and others		60.4	63.5	66.0	70.2	75.0		0.5	0.4	0.6	0.7

Source: GEM-E3

APPENDIX 2: SUMMARY ENERGY BALANCES AND INDICATORS



EU28: Reference scenario												SUMMARY ENERGY BALANCE AND INDICATORS (A)			
ktoe	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**	**'00-'10**	**'10-'20**	**'20-'30**	**'30-'50**
												Annual % Change			
Production (incl.recovery of products)	**947932**	**904640**	**841485**	**831739**	**808126**	**775146**	**750168**	**755836**	**757922**	**755763**	**737913**	**-1.2**	**-0.4**	**-0.7**	**-0.1**
Solids	214627	196059	163855	149960	139654	127408	88528	79202	74288	72768	69144	-2.7	-1.6	-4.5	-1.2
Oil	176084	136469	103565	90871	77509	65363	55596	43537	34213	23257	16347	-5.2	-2.9	-3.3	-5.9
Natural gas	209437	190678	158525	149395	140735	124505	109610	101917	95373	82682	69668	-2.7	-1.2	-2.5	-2.2
Nuclear	243841	257516	236563	229122	193490	180877	201194	214924	217916	220665	215930	-0.3	-2.0	0.4	0.4
Renewable energy sources	103944	123918	178977	212391	256738	276993	295241	316256	336132	356390	366824	5.6	3.7	1.4	1.1
Hydro	30818	26817	32208	31687	32181	32953	34088	35117	35702	36021	36568	0.4	0.0	0.6	0.4
Biomass & Waste	66071	84883	124361	136029	150677	151650	152957	155036	161613	164815	164084	6.5	1.9	0.2	0.4
Wind	1913	6058	12829	22662	41928	54362	66069	73559	78008	85278	92481	21.0	12.6	4.7	1.7
Solar and others	430	806	3691	14040	22705	28575	32035	37343	41520	44813	45911	24.0	19.9	3.5	1.8
Geothermal	4712	5354	5888	7974	9248	9453	10092	15202	19288	25464	27779	2.3	4.6	0.9	5.2
Net Imports	**829314**	**988719**	**956735**	**968177**	**912060**	**915743**	**921181**	**911821**	**917955**	**940644**	**963104**	**1.4**	**-0.5**	**0.1**	**0.2**
Solids	98273	125211	110927	116302	96769	88251	85336	62203	54550	54960	54873	1.2	-1.4	-1.2	-2.2
Oil	535238	604030	563977	551969	528622	521323	521986	525813	528660	538605	544042	0.5	-0.6	-0.1	0.2
- Crude oil and Feedstocks	518046	585121	541240	527936	507046	498075	494522	494867	493650	497877	497143	0.4	-0.7	-0.2	0.0
- Oil products	17192	18909	22737	24033	21577	23248	27464	30946	35010	40728	46899	2.8	-0.5	2.4	2.7
Natural gas	193432	257849	276001	286044	266444	284343	290114	299138	307780	319195	335472	3.6	-0.4	0.9	0.7
Electricity	2029	1412	707	-128	-1601	-1508	-1489	-1740	-1818	-1880	-2095	-10.0	0.0	0.0	0.0
Gross Inland Consumption	**1732712**	**1833269**	**1767474**	**1746442**	**1664663**	**1633220**	**1611470**	**1605249**	**1611435**	**1628802**	**1630018**	**0.2**	**-0.6**	**-0.3**	**0.1**
Solids	321277	317986	280653	266262	236423	215659	173864	141405	128839	127728	124018	-1.3	-1.7	-3.0	-1.7
Oil	665142	683909	620735	589584	551528	530942	520209	510991	503915	501344	497898	-0.7	-1.2	-0.6	-0.2
Natural gas	396145	448380	444428	435221	406259	406923	397218	397005	397669	394790	396632	1.2	-0.9	-0.2	0.0
Nuclear	243841	257516	236563	229122	193490	180877	201194	214924	217916	220665	215930	-0.3	-2.0	0.4	0.4
Electricity	2029	1412	707	-128	-1601	-1508	-1489	-1740	-1818	-1880	-2095	-10.0	0.0	0.0	0.0
Renewable energy forms	104278	124065	184389	226382	278563	300327	320475	342663	364915	386154	397635	5.9	4.2	1.4	1.1
as % in Gross Inland Consumption															
Solids	18.5	17.3	15.9	15.2	14.2	13.2	10.8	8.8	8.0	7.8	7.6				
Oil	38.4	37.3	35.1	33.8	33.1	32.5	32.3	31.8	31.3	30.8	30.5				
Natural gas	22.9	24.5	25.1	24.9	24.4	24.9	24.6	24.7	24.7	24.2	24.3				
Nuclear	14.1	14.0	13.4	13.1	11.6	11.1	12.5	13.4	13.5	13.5	13.2				
Renewable energy forms	6.0	6.8	10.4	13.0	16.7	18.4	19.9	21.3	22.6	23.7	24.4				
Gross Electricity Generation in GWh_e	**3006692**	**3286660**	**3327452**	**3416910**	**3428487**	**3530642**	**3664473**	**3806113**	**3991697**	**4202590**	**4338637**	**1.0**	**0.3**	**0.7**	**0.8**
Self consumption and grid losses	396970	407042	377767	369108	354745	360436	367526	384851	414250	447802	473642	-0.5	-0.6	0.4	1.3
Fuel Inputs to Thermal Power Generation	**384957**	**426995**	**417273**	**383090**	**352461**	**338048**	**299413**	**282783**	**288580**	**299341**	**299175**	**0.8**	**-1.7**	**-1.6**	**0.0**
Solids	223038	228941	197605	186948	160009	143969	105545	77176	68351	70308	68306	-1.2	-2.1	-4.1	-2.2
Oil (including refinery gas)	40042	33244	20532	10850	5924	5272	4564	4034	4151	4144	4107	-6.5	-11.7	-2.6	-0.5
Gas (including derived gases)	102844	133713	149190	131949	124810	126275	124806	127067	129771	128423	125172	3.8	-1.8	0.0	0.0
Biomass & Waste	14918	26452	45117	47367	54922	55679	57154	62251	70151	74298	77085	11.7	2.0	0.4	1.5
Geothermal heat	4114	4645	4828	5976	6796	6853	7345	12254	16157	22167	24506	1.6	3.5	0.8	6.2
Hydrogen - Methanol	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Fuel Input to other conversion processes	**1076346**	**1110121**	**1001515**	**971670**	**910149**	**873505**	**879495**	**877552**	**866854**	**862355**	**851255**	**-0.7**	**-1.0**	**-0.3**	**-0.2**
Refineries	740500	763156	670015	646957	615082	594427	582078	571408	561252	555092	547329	-1.0	-0.9	-0.5	-0.3
Biofuels and hydrogen production	705	3101	13296	18237	26224	26522	27227	27464	27421	28231	29476	34.1	7.0	0.4	0.4
District heating	18667	19517	20813	22512	20814	19831	19702	18586	17323	17656	18478	1.1	0.0	-0.5	-0.3
Derived gases, cokeries etc.	316475	324348	297391	283964	248029	232725	250488	260094	260858	261377	255973	-0.6	-1.8	0.1	0.1
Energy Branch Consumption	**86990**	**91952**	**88327**	**82471**	**77246**	**73943**	**71067**	**69188**	**68575**	**68919**	**69052**	**0.2**	**-1.3**	**-0.8**	**-0.1**
Non-Energy Uses	**117117**	**120718**	**114884**	**119316**	**122296**	**121539**	**121547**	**121156**	**119757**	**119350**	**119927**	**-0.2**	**0.6**	**-0.1**	**-0.1**
Final Energy Demand	**1127687**	**1190674**	**1157570**	**1171067**	**1137297**	**1130470**	**1125536**	**1125533**	**1132629**	**1144095**	**1150707**	**0.3**	**-0.2**	**-0.1**	**0.1**
by sector															
Industry	332412	330448	290978	304838	306198	305662	306929	304625	304043	306949	308922	-1.3	0.5	0.0	0.0
- energy intensive industries	217920	216886	187894	197139	197546	195178	194763	192159	189881	190112	188534	-1.5	0.5	-0.1	-0.2
- other industrial sectors	114492	113563	103085	107699	108652	110484	112166	112465	114162	116837	120388	-1.0	0.5	0.3	0.4
Residential	286291	311793	311545	312012	299377	300041	297328	298793	301234	303983	303395	0.8	-0.4	-0.1	0.1
Tertiary	166083	179768	187856	181948	172717	171685	167352	168292	169602	172439	172664	1.2	-0.8	-0.3	0.2
Transport	342901	368665	367191	372270	359006	353083	353927	353824	357751	360723	365726	0.7	-0.2	-0.1	0.2
by fuel															
Solids	61779	54424	49673	48390	46140	43134	41358	39901	37926	36212	34487	-2.2	-0.7	-1.1	-0.9
Oil	485890	502788	457366	440945	408539	393484	384945	378414	374817	373351	371479	-0.6	-1.1	-0.6	-0.2
Gas	266925	285438	269920	271579	251719	249695	241968	238545	235764	234302	238409	0.1	-0.7	-0.4	-0.1
Electricity	217599	239418	245271	254567	255699	264355	275584	285884	298901	313732	322774	1.2	0.4	0.8	0.8
Heat (from CHP and District Heating)	46015	52355	53515	55369	56068	56188	55942	56410	57261	58018	58348	1.5	0.5	0.0	0.2
Renewable energy forms	49480	56250	81825	100150	118868	123187	125118	125536	126758	126907	123322	5.2	3.8	0.5	-0.1
Other fuels (hydrogen, ethanol)	0	0	0	67	264	427	620	843	1202	1571	1887	0.0	0.0	8.9	5.7
RES in Gross Final Energy Consumption [(A)]	**88147**	**104692**	**149354**	**194777**	**244433**	**264581**	**282698**	**300378**	**316888**	**331107**	**342063**	**5.4**	**5.0**	**1.5**	**1.0**
TOTAL GHG emissions (Mt of CO2 eq.)	**5215.6**	**5321.9**	**4846.8**	**4626.1**	**4296.7**	**4142.4**	**3843.9**	**3600.6**	**3446.7**	**3272.6**	**3188.2**	**-0.7**	**-1.2**	**-1.1**	**-0.9**
of which ETS sectors (2013 scope) GHG emissions		2513.8	2180.0	2091.0	1913.4	1831.8	1606.1	1400.4	1271.0	1106.6	1023.7		-1.3	-1.7	-2.2
of which non ETS sectors GHG emissions		2808.1	2666.7	2535.1	2383.3	2310.6	2237.8	2200.2	2175.7	2166.0	2164.5		-1.1	-0.6	-0.2
CO_2 Emissions (energy related)	**3985.8**	**4138.3**	**3779.7**	**3593.1**	**3265.4**	**3117.7**	**2876.1**	**2649.1**	**2509.9**	**2430.4**	**2363.9**	**-0.5**	**-1.5**	**-1.3**	**-1.0**
Power generation/District heating	1404.5	1483.1	1341.6	1201.1	1045.2	970.8	790.0	619.1	520.0	461.0	401.9	-0.5	-2.5	-2.8	-3.3
Energy Branch	170.1	174.2	159.8	150.0	139.7	131.2	125.1	117.0	111.3	107.0	103.9	-0.6	-1.3	-1.1	-0.9
Industry	693.6	640.7	520.3	539.6	508.6	492.9	484.3	458.1	433.4	425.5	425.2	-2.8	-0.2	-0.5	-0.6
Residential	461.0	491.2	457.9	430.7	392.6	380.3	360.3	350.9	340.0	332.9	323.8	-0.1	-1.5	-0.9	-0.5
Tertiary	255.7	266.4	249.2	220.7	195.5	181.5	159.6	151.8	145.1	140.5	137.6	-0.3	-2.4	-2.0	-0.7
Transport	1001.0	1082.7	1050.9	1051.0	983.7	961.2	956.7	952.2	960.2	963.4	971.5	0.5	-0.7	-0.3	0.1
CO_2 Emissions (non energy related)	**262.3**	**280.3**	**236.1**	**257.0**	**273.7**	**277.8**	**239.5**	**226.8**	**211.5**	**110.4**	**86.3**	**-1.0**	**1.5**	**-1.3**	**-5.0**
Non-CO_2 GHG emissions	**967.4**	**903.3**	**830.9**	**775.9**	**757.5**	**746.9**	**728.2**	**724.7**	**725.2**	**731.8**	**738.0**	**-1.5**	**-0.9**	**-0.4**	**0.1**
TOTAL GHG emissions Index (1990=100)	**91.8**	**93.6**	**85.3**	**81.4**	**75.6**	**72.9**	**67.6**	**63.3**	**60.6**	**57.6**	**56.1**				

Source: PRIMES

SUMMARY ENERGY BALANCE AND INDICATORS (B)															EU28: Reference scenario
	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050	'00-'10	'10-'20	'20-'30	'30-'50
												Annual % Change			
Main Energy System Indicators															
Population (Million)	485.587	493.791	503.626	510.817	516.986	521.721	524.921	527.075	528.203	528.090	526.472	0.4	0.3	0.2	0.0
GDP (in 000 M€10)	10725.4	11777.0	12301.4	13210.2	14246.4	15448.3	16667.7	17866.6	19150.8	20517.0	21944.1	1.4	1.5	1.6	1.4
Gross Inl. Cons./GDP (toe/M€10)	161.6	155.7	143.7	132.2	116.8	105.7	96.7	89.8	84.1	79.4	74.3	-1.2	-2.0	-1.9	-1.3
Carbon intensity (t of CO_2/toe of GIC)	2.30	2.26	2.14	2.06	1.96	1.91	1.78	1.65	1.56	1.49	1.45	-0.7	-0.9	-0.9	-1.0
Import Dependency %	46.7	52.5	52.7	53.8	53.0	54.2	55.1	54.7	54.8	55.4	56.6				
Total energy-rel. and other mitigation costs [B] (in 000 M€10)	1092.1	1338.5	1569.4	1892.2	2112.4	2233.1	2338.3	2410.8	2504.6	2608.5	2699.6	3.7	3.0	1.0	0.7
as % of GDP	10.2	11.4	12.8	14.3	14.8	14.5	14.0	13.5	13.1	12.7	12.3				
Energy intensity indicators															
Industry (Energy on Value added, index 2000=100)			100.0	97.0	91.2	85.4	81.1	76.9	73.2	70.8	68.3		-0.9	-1.2	-0.9
Residential (Energy on Private Income, index 2000=100)	105.6	104.3	100.0	94.2	84.2	77.9	71.5	66.9	62.6	58.5	54.1	-0.5	-1.7	-1.6	-1.4
Tertiary (Energy on Value added, index 2000=100)	0.0	0.0	100.0	90.1	78.9	71.9	64.6	60.2	56.2	53.0	49.3	0.0	-2.3	-2.0	-1.3
Passenger transport (toe/Mpkm)	40.0	39.2	37.8	35.9	32.1	29.0	26.9	25.6	24.9	24.4	24.1	-0.6	-1.6	-1.8	-0.5
Freight transport (toe/Mtkm)	47.1	47.5	48.4	46.8	44.2	41.9	40.0	38.8	37.7	37.0	36.5	0.3	-0.9	-1.0	-0.5
Carbon Intensity indicators															
Electricity and Steam production (t of CO_2/MWh)	0.39	0.37	0.33	0.29	0.25	0.23	0.18	0.14	0.11	0.09	0.08	-1.6	-2.8	-3.3	-4.0
Final energy demand (t of CO_2/toe)	2.14	2.08	1.97	1.91	1.83	1.78	1.74	1.70	1.66	1.63	1.61	-0.8	-0.7	-0.5	-0.4
Industry	2.09	1.94	1.79	1.77	1.66	1.61	1.58	1.50	1.43	1.39	1.38	-1.5	-0.7	-0.5	-0.7
Residential	1.61	1.58	1.47	1.38	1.31	1.27	1.21	1.17	1.13	1.10	1.07	-0.9	-1.1	-0.8	-0.6
Tertiary	1.54	1.48	1.33	1.21	1.13	1.06	0.95	0.90	0.86	0.81	0.80	-1.5	-1.6	-1.7	-0.9
Transport [C]	2.92	2.94	2.86	2.82	2.74	2.72	2.70	2.69	2.68	2.67	2.66	-0.2	-0.4	-0.1	-0.1
Indicators for renewables															
Share of RES in Gross Final Energy Consumption [D] (%)	7.5	8.4	12.4	16.1	20.9	22.7	24.4	25.9	27.1	28.0	28.7				
RES in transport (%)	0.6	1.2	4.7	6.5	10.3	11.2	12.0	12.5	12.7	13.3	13.9				
Gross Electricity generation by source (in GWh_e) [E]	**3007267**	**3287285**	**3328110**	**3416910**	**3428487**	**3530642**	**3664473**	**3806113**	**3991697**	**4202590**	**4338637**	**1.0**	**0.3**	**0.7**	**0.8**
Nuclear energy	945027	997733	916685	887261	749295	705996	799389	868122	896436	922451	923898	-0.3	-2.0	0.6	0.7
Solids	933660	974939	830048	804369	706358	637739	475702	343302	313974	349630	362710	-1.2	-1.6	-3.9	-1.3
Oil (including refinery gas)	181203	141358	86851	45900	26245	24658	20658	20977	21545	22478	22176	-7.1	-11.3	-2.4	0.4
Gas (including derived gases)	514392	699743	795653	753663	708895	723849	738362	764991	791462	798815	793169	4.5	-1.1	0.4	0.4
Biomass-waste	46848	83787	145901	188902	221059	231132	243292	271722	314588	328910	343434	12.0	4.2	1.0	1.7
Hydro (pumping excluded)	358408	311883	374576	368453	374203	383179	396372	408332	415145	418844	425214	0.4	0.0	0.6	0.4
Wind	22253	70453	149202	263506	487529	632113	768244	855332	907067	991599	1075357	21.0	12.6	4.7	1.7
Solar	118	1459	22363	96144	142787	177015	206378	251189	304009	328694	347363	68.9	20.4	3.8	2.6
Geothermal and other renewables	5358	5930	6831	8712	12116	14959	16077	22146	27472	41168	45316	2.5	5.9	2.9	5.3
Other fuels (hydrogen, methanol)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Net Generation Capacity in MW_e	**650058**	**711660**	**838114**	**930128**	**1017923**	**1067357**	**1138323**	**1201184**	**1274366**	**1328626**	**1382012**	**2.6**	**2.0**	**1.1**	**1.0**
Nuclear energy	136924	134494	131323	123150	111162	96912	107006	115171	118838	122076	121993	-0.4	-1.7	-0.4	0.7
Renewable energy	114281	147780	226757	318900	437092	517020	582765	639395	693700	741307	785504	7.1	6.8	2.9	1.5
Hydro (pumping excluded)	101207	105529	112159	118306	120602	122416	124904	128871	130562	132244	134453	1.0	0.7	0.4	0.4
Wind	12893	40510	84512	123698	204726	258081	305395	335743	355654	385234	413394	20.7	9.3	4.1	1.5
Solar	180	1740	29846	76309	110110	133723	149432	171589	203942	217561	230791	66.7	13.9	3.1	2.2
Other renewables (tidal etc.)	0	0	240	586	1655	2800	3033	3193	3542	6268	6865	0.0	21.3	6.2	4.2
Thermal power	398853	429386	480034	488079	469669	453425	448552	446618	461828	465243	474514	1.9	-0.2	-0.5	0.3
of which cogeneration units	92439	98998	101203	103103	113668	114259	115758	120668	127236	135974	138054	0.9	1.2	0.2	0.9
of which CCS units	0	0	0	0	904	904	1610	7630	18271	34464	38410	0.0	0.0	5.9	17.2
Solids fired	186470	180630	175756	163211	141800	121501	103961	90682	88121	86837	81632	-0.6	-2.1	-3.1	-1.2
Gas fired	129190	169054	224922	253142	258836	266000	280581	291299	295982	297331	301988	5.7	1.4	0.8	0.4
Oil fired	67499	59434	54039	42299	33495	27775	23784	20062	21343	20242	22106	-2.2	-4.7	-3.4	-0.4
Biomass-waste fired	15128	19615	24590	28633	34635	37238	39250	42948	54237	57890	65535	5.0	3.5	1.3	2.6
Hydrogen plants	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Geothermal heat	567	652	726	794	903	910	975	1627	2145	2943	3253	2.5	2.2	0.8	6.2
Avg. Load factor of net power capacity [F] (%)	50.0	50.0	43.1	40.0	36.8	36.3	35.4	34.9	34.4	34.7	34.3				
Electricity indicators															
Efficiency of gross thermal power generation (%)	37.5	38.4	38.4	40.4	40.8	41.4	42.7	43.1	43.5	43.8	44.6				
% of gross electricity from CHP	11.5	11.8	12.6	14.3	15.8	16.4	16.1	16.4	16.7	16.7	16.2				
% of electricity from CCS	0.0	0.0	0.0	0.0	0.2	0.2	0.5	1.7	3.4	5.0	6.9				
Carbon free gross electricity generation (%)	45.8	44.8	48.5	53.1	58.0	60.7	66.3	70.3	71.8	72.1	72.8				
- nuclear	31.4	30.4	27.5	26.0	21.9	20.0	21.8	22.8	22.5	21.9	21.3				
- renewable energy forms	14.4	14.4	21.0	27.1	36.1	40.7	44.5	47.5	49.3	50.2	51.6				
Transport sector															
Passenger transport activity (Gpkm)	**5894.2**	**6251.6**	**6466.4**	**6755.8**	**7045.6**	**7491.4**	**7962.2**	**8288.2**	**8629.0**	**8885.6**	**9148.2**	**0.9**	**0.9**	**1.2**	**0.7**
Public road transport	519.6	527.2	512.8	531.5	551.0	575.5	602.4	623.2	644.5	659.3	674.6	-0.1	0.7	0.9	0.6
Private cars and motorcycles	4425.4	4694.5	4893.4	5052.9	5195.6	5455.5	5713.7	5884.8	6057.0	6182.6	6309.0	1.0	0.6	1.0	0.5
Rail	447.8	459.7	496.4	536.7	581.1	643.0	714.0	763.3	816.2	852.9	890.2	1.0	1.6	2.1	1.1
Aviation	459.7	530.7	525.6	595.2	677.0	774.7	887.5	970.7	1063.8	1141.8	1224.2	1.4	2.6	2.7	1.6
Inland navigation	41.7	39.5	38.1	39.5	40.9	42.7	44.7	46.2	47.7	48.9	50.2	-0.9	0.7	0.9	0.6
Freight transport activity (Gtkm)	**2227.6**	**2545.3**	**2493.4**	**2714.3**	**2938.5**	**3174.5**	**3430.2**	**3568.7**	**3713.1**	**3809.7**	**3907.6**	**1.1**	**1.7**	**1.6**	**0.7**
Trucks	1522.0	1803.3	1764.4	1923.1	2076.4	2232.6	2399.4	2495.2	2594.8	2661.2	2729.6	1.5	1.6	1.5	0.6
Rail	405.5	416.0	392.5	435.5	485.8	540.5	602.3	632.2	663.9	684.3	704.0	-0.3	2.2	2.2	0.8
Inland navigation	300.1	325.9	336.6	355.7	376.2	401.4	428.5	441.2	454.4	464.2	474.0	1.2	1.1	1.3	0.5
Energy demand in transport (ktoe) [G]	**340814**	**366066**	**364944**	**369793**	**356476**	**350461**	**351233**	**351069**	**354945**	**357888**	**362851**	**0.7**	**-0.2**	**-0.1**	**0.2**
Public road transport	7580	7663	7522	7717	7802	7852	7928	8009	8135	8186	8270	-0.1	0.4	0.2	0.2
Private cars and motorcycles	178015	181818	182270	176038	157091	145721	141680	140423	140890	141428	142783	0.2	-1.5	-1.0	0.0
Trucks	95660	111643	112043	117949	120195	122455	126128	127299	128780	129671	131469	1.6	0.7	0.5	0.2
Rail	8093	7855	7399	7948	8539	9162	9805	9925	9976	9821	9625	-0.9	1.4	1.4	-0.1
Aviation	45492	50512	49820	54002	56470	58568	58655	58250	59878	61433	63310	0.9	1.3	0.4	0.4
Inland navigation	5973	6575	5892	6140	6379	6702	7037	7164	7287	7349	7394	-0.1	0.8	0.1	0.2

Source: PRIMES

EU27: Reference scenario												SUMMARY ENERGY BALANCE AND INDICATORS (A)			
ktoe	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**	**'00-'10**	**'10-'20**	**'20-'30**	**'30-'50**
												Annual % Change			
Production (incl.recovery of products)	**944342**	**900832**	**837269**	**828717**	**805878**	**772881**	**747783**	**753374**	**755340**	**753106**	**735318**	**-1.2**	**-0.4**	**-0.7**	**-0.1**
Solids	214627	196059	163855	149960	139654	127408	88528	79202	74288	72768	69144	-2.7	-1.6	-4.5	-1.2
Oil	174729	135432	102804	90236	76958	64882	55168	43158	33881	22973	16113	-5.2	-2.9	-3.3	-6.0
Natural gas	208082	188813	156311	148399	140735	124505	109610	101917	95373	82682	69668	-2.8	-1.0	-2.5	-2.2
Nuclear	243841	257516	236563	229122	193490	180877	201194	214924	217916	220665	215930	-0.3	-2.0	0.4	0.4
Renewable energy sources	103064	123012	177738	211000	255042	275209	293284	314173	333881	354017	364463	5.6	3.7	1.4	1.1
Hydro	30312	26273	31492	31099	31582	32336	33413	34427	34978	35279	35816	0.4	0.0	0.6	0.3
Biomass & Waste	65696	84522	123862	135363	149828	150803	152022	154005	160523	163680	162971	6.5	1.9	0.1	0.3
Wind	1913	6057	12817	22594	41816	54240	65944	73433	77838	85089	92284	20.9	12.6	4.7	1.7
Solar and others	430	806	3686	13983	22583	28390	31822	37117	41265	44517	45624	24.0	19.9	3.5	1.8
Geothermal	4712	5354	5881	7961	9233	9441	10083	15192	19277	25452	27767	2.2	4.6	0.9	5.2
Net Imports	**825138**	**983457**	**952254**	**962484**	**905697**	**909485**	**914961**	**905605**	**911730**	**934342**	**956654**	**1.4**	**-0.5**	**0.1**	**0.2**
Solids	97795	124587	110227	115797	96286	87928	85074	61859	54208	54715	54644	1.2	-1.3	-1.2	-2.2
Oil	532790	600393	560977	549056	525822	518548	519130	522940	525756	535671	541074	0.5	-0.6	-0.1	0.2
- Crude oil and Feedstocks	514059	580747	537578	524410	503630	494705	491120	491490	490288	494530	493810	0.4	-0.7	-0.3	0.0
- Oil products	18730	19646	23399	24645	22192	23843	28010	31450	35468	41141	47264	2.3	-0.5	2.4	2.7
Natural gas	192527	257287	275525	284075	263726	281544	287422	296573	305137	316319	332519	3.6	-0.4	0.9	0.7
Electricity	1685	972	297	-548	-2087	-1986	-2021	-2313	-2304	-2265	-2534	-15.9	0.0	0.0	0.0
Gross Inland Consumption	**1724865**	**1824307**	**1758899**	**1737735**	**1656059**	**1624704**	**1602873**	**1596577**	**1602634**	**1619850**	**1620981**	**0.2**	**-0.6**	**-0.3**	**0.1**
Solids	320845	317303	279970	265757	235940	215336	173602	141061	128496	127483	123788	-1.4	-1.7	-3.0	-1.7
Oil	661160	679353	617021	586043	548184	527692	516932	507745	500686	498134	494703	-0.7	-1.2	-0.6	-0.2
Natural gas	393935	446003	441796	432258	403541	404124	394526	394440	395026	391914	393679	1.2	-0.9	-0.2	0.0
Nuclear	243841	257516	236563	229122	193490	180877	201194	214924	217916	220665	215930	-0.3	-2.0	0.4	0.4
Electricity	1685	972	297	-548	-2087	-1986	-2021	-2313	-2304	-2265	-2534	-15.9	0.0	0.0	0.0
Renewable energy forms	103398	123159	183251	225103	276991	298660	318640	340720	362814	383919	395414	5.9	4.2	1.4	1.1
as % in Gross Inland Consumption															
Solids	18.6	17.4	15.9	15.3	14.2	13.3	10.8	8.8	8.0	7.9	7.6				
Oil	38.3	37.2	35.1	33.7	33.1	32.5	32.3	31.8	31.2	30.8	30.5				
Natural gas	22.8	24.4	25.1	24.9	24.4	24.9	24.6	24.7	24.6	24.2	24.3				
Nuclear	14.1	14.1	13.4	13.2	11.7	11.1	12.6	13.5	13.6	13.6	13.3				
Renewable energy forms	6.0	6.8	10.4	13.0	16.7	18.4	19.9	21.3	22.6	23.7	24.4				
Gross Electricity Generation in GWh_e	**2996104**	**3274309**	**3313455**	**3402657**	**3413997**	**3516471**	**3649690**	**3790687**	**3974224**	**4182474**	**4318132**	**1.0**	**0.3**	**0.7**	**0.8**
Self consumption and grid losses	394494	404404	375229	366716	352276	357998	364937	382104	411365	444776	470483	-0.5	-0.6	0.4	1.3
Fuel Inputs to Thermal Power Generation	**383708**	**425514**	**416002**	**381831**	**351334**	**337023**	**298398**	**281799**	**287496**	**298037**	**297858**	**0.8**	**-1.7**	**-1.6**	**0.0**
Solids	222681	228404	197074	186584	159666	143772	105411	76961	68138	70192	68205	-1.2	-2.1	-4.1	-2.2
Oil (including refinery gas)	39647	32795	20411	10813	5892	5241	4532	4005	4102	4089	4051	-6.4	-11.7	-2.6	-0.6
Gas (including derived gases)	102348	133223	148579	131136	124086	125571	124119	126513	129143	127555	124256	3.8	-1.8	0.0	0.0
Biomass & Waste	14918	26447	45111	47322	54894	55586	56992	62066	69955	74033	76839	11.7	2.0	0.4	1.5
Geothermal heat	4114	4645	4828	5976	6796	6853	7345	12254	16157	22167	24506	1.6	3.5	0.8	6.2
Hydrogen - Methanol	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Fuel Input to other conversion processes	**1070906**	**1104746**	**997096**	**967473**	**905985**	**869474**	**875489**	**873609**	**862979**	**858566**	**847511**	**-0.7**	**-1.0**	**-0.3**	**-0.2**
Refineries	735155	757897	665701	642900	611217	590680	578358	567760	557664	551566	543864	-1.0	-0.9	-0.6	-0.3
Biofuels and hydrogen production	705	3101	13293	18195	26044	26354	27061	27299	27263	28082	29324	34.1	7.0	0.4	0.4
District heating	18583	19414	20716	22414	20696	19715	19583	18457	17196	17543	18353	1.1	0.0	-0.6	-0.3
Derived gases, cokeries etc.	316463	324334	297386	283964	248029	232725	250487	260093	260857	261375	255971	-0.6	-1.8	0.1	0.1
Energy Branch Consumption	**86159**	**91120**	**87583**	**81858**	**76734**	**73445**	**70575**	**68704**	**68096**	**68447**	**68588**	**0.2**	**-1.3**	**-0.8**	**-0.1**
Non-Energy Uses	**116435**	**120003**	**114288**	**118704**	**121702**	**120941**	**120958**	**120573**	**119179**	**118779**	**119364**	**-0.2**	**0.6**	**-0.1**	**-0.1**
Final Energy Demand	**1122342**	**1184339**	**1151237**	**1164352**	**1130486**	**1123692**	**1118669**	**1118521**	**1125525**	**1136865**	**1143392**	**0.3**	**-0.2**	**-0.1**	**0.1**
by sector															
Industry	331020	328869	289602	303343	304636	304062	305330	302974	302354	305188	307133	-1.3	0.5	0.0	0.0
- energy intensive industries	217073	215974	187141	196349	196731	194351	193921	191287	188976	189124	187519	-1.5	0.5	-0.1	-0.2
- other industrial sectors	113947	112895	102460	106994	107905	109710	111409	111687	113378	116063	119613	-1.1	0.5	0.3	0.4
Residential	284627	309867	309652	310012	297387	298054	295351	296789	299231	301964	301377	0.8	-0.4	-0.1	0.1
Tertiary	165325	178847	186849	180916	171626	170601	166207	167105	168378	171175	171368	1.2	-0.8	-0.3	0.2
Transport	341371	366756	365133	370082	356837	350975	351781	351653	355562	358538	363514	0.7	-0.2	-0.1	0.2
by fuel															
Solids	61705	54278	49523	48249	46002	43008	41230	39771	37795	36083	34358	-2.2	-0.7	-1.1	-0.9
Oil	483224	499695	454477	438055	405818	390845	382280	375771	372181	370727	368863	-0.6	-1.1	-0.6	-0.2
Gas	265916	284196	268632	270154	250372	248241	240576	237136	234343	232867	236942	0.1	-0.7	-0.4	-0.1
Electricity	216590	238178	243907	253155	254202	262890	274025	284243	297183	311900	320867	1.2	0.4	0.8	0.8
Heat (from CHP and District Heating)	45802	52098	53270	55094	55787	55900	55655	56123	56980	57734	58063	1.5	0.5	0.0	0.2
Renewable energy forms	49105	55894	81428	99580	118042	122382	124282	124635	125842	125986	122416	5.2	3.8	0.5	-0.1
Other fuels (hydrogen, ethanol)	0	0	0	67	264	426	619	841	1200	1569	1884	0.0	0.0	8.9	5.7
RES in Gross Final Energy Consumption [(A)]	**87331**	**103846**	**148412**	**193514**	**242889**	**262990**	**280995**	**298554**	**314930**	**329030**	**340005**	**5.4**	**5.0**	**1.5**	**1.0**
TOTAL GHG emissions (Mt of CO2 eq.)	**5189.9**	**5291.8**	**4818.9**	**4599.3**	**4271.7**	**4118.1**	**3820.4**	**3577.4**	**3423.4**	**3250.9**	**3166.5**	**-0.7**	**-1.2**	**-1.1**	**-0.9**
of which ETS sectors (2013 scope) GHG emissions		2501.2	2169.3	2080.8	1904.2	1823.2	1598.2	1392.4	1262.8	1099.9	1017.0		-1.3	-1.7	-2.2
of which non ETS sectors GHG emissions		2790.5	2649.6	2518.5	2367.5	2294.9	2222.2	2185.0	2160.5	2150.9	2149.5		-1.1	-0.6	-0.2
CO_2 Emissions (energy related)	**3968.9**	**4118.1**	**3761.2**	**3575.1**	**3248.6**	**3101.7**	**2860.4**	**2633.5**	**2494.1**	**2414.4**	**2347.9**	**-0.5**	**-1.5**	**-1.3**	**-1.0**
Power generation/District heating	1400.3	1478.0	1337.3	1197.4	1041.8	968.0	787.5	616.6	517.3	458.2	399.0	-0.5	-2.5	-2.8	-3.3
Energy Branch	168.1	172.2	158.0	148.5	138.4	129.9	123.9	115.9	110.1	105.9	102.8	-0.6	-1.3	-1.1	-0.9
Industry	690.7	637.1	517.5	536.6	505.7	489.9	481.5	455.3	430.6	422.7	422.3	-2.8	-0.2	-0.5	-0.7
Residential	459.1	488.8	455.7	428.7	390.7	378.2	358.2	348.8	338.0	330.9	321.8	-0.1	-1.5	-0.9	-0.5
Tertiary	254.2	265.0	247.8	219.3	194.2	180.2	158.4	150.6	143.9	139.3	136.4	-0.3	-2.4	-2.0	-0.7
Transport	996.5	1077.0	1044.8	1044.6	977.8	955.4	950.9	946.3	954.2	957.5	965.5	0.5	-0.7	-0.3	0.1
CO_2 Emissions (non energy related)	**259.7**	**277.2**	**233.6**	**254.3**	**270.9**	**274.9**	**237.1**	**224.5**	**209.2**	**109.9**	**85.9**	**-1.1**	**1.5**	**-1.3**	**-5.0**
Non-CO_2 GHG emissions	**961.3**	**896.4**	**824.2**	**769.8**	**752.3**	**741.5**	**722.8**	**719.5**	**720.0**	**726.5**	**732.7**	**-1.5**	**-0.9**	**-0.4**	**0.1**
TOTAL GHG emissions Index (1990=100)	**91.8**	**93.6**	**85.3**	**81.4**	**75.6**	**72.9**	**67.6**	**63.3**	**60.6**	**57.5**	**56.0**				

Source: PRIMES

SUMMARY ENERGY BALANCE AND INDICATORS (B)															EU27: Reference scenario
	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050	'00-'10	'10-'20	'20-'30	'30-'50
												Annual % Change			
Main Energy System Indicators															
Population (Million)	481.081	489.325	499.201	506.264	512.354	517.061	520.263	522.430	523.573	523.481	521.899	0.4	0.3	0.2	0.0
GDP (in 000 M€10)	10670.6	11722.3	12256.0	13159.1	14189.9	15386.1	16600.1	17793.2	19073.1	20435.2	21858.7	1.4	1.5	1.6	1.4
Gross Inl. Cons./GDP (toe/M€10)	161.6	155.6	143.5	132.1	116.7	105.6	96.6	89.7	84.0	79.3	74.2	-1.2	-2.0	-1.9	-1.3
Carbon intensity (t of CO_2/toe of GIC)	2.30	2.26	2.14	2.06	1.96	1.91	1.78	1.65	1.56	1.49	1.45	-0.7	-0.9	-0.9	-1.0
Import Dependency %	46.7	52.5	52.7	53.7	52.9	54.1	55.0	54.6	54.7	55.4	56.5				
Total energy-rel. and other mitigation costs [B] (in 000 M€10)	1087.9	1332.4	1560.5	1880.9	2099.8	2219.4	2323.6	2395.3	2488.5	2591.6	2682.3	3.7	3.0	1.0	0.7
as % of GDP	10.2	11.4	12.7	14.3	14.8	14.4	14.0	13.5	13.0	12.7	12.3				
Energy intensity indicators															
Industry (Energy on Value added, index 2000=100)	100.0	93.2	83.7	81.1	76.3	71.4	67.9	64.3	61.2	59.2	57.0	-1.8	-0.9	-1.2	-0.9
Residential (Energy on Private Income, index 2000=100)	100.0	98.7	94.7	89.2	79.7	73.8	67.7	63.3	59.3	55.4	51.2	-0.5	-1.7	-1.6	-1.4
Tertiary (Energy on Value added, index 2000=100)	100.0	97.4	94.8	85.3	74.7	68.1	61.1	57.0	53.2	50.2	46.6	-0.5	-2.3	-2.0	-1.3
Passenger transport (toe/Mpkm)	40.0	39.2	37.8	35.9	32.1	29.0	26.9	25.6	24.9	24.4	24.1	-0.6	-1.6	-1.8	-0.5
Freight transport (toe/Mtkm)	47.1	47.6	48.3	46.8	44.2	41.9	40.0	38.8	37.7	37.0	36.4	0.3	-0.9	-1.0	-0.5
Carbon Intensity indicators															
Electricity and Steam production (t of CO_2/MWh)	0.39	0.37	0.33	0.29	0.25	0.23	0.18	0.14	0.11	0.09	0.08	-1.6	-2.8	-3.3	-4.0
Final energy demand (t of CO_2/toe)	2.14	2.08	1.97	1.91	1.83	1.78	1.74	1.70	1.66	1.63	1.61	-0.8	-0.7	-0.5	-0.4
Industry	2.09	1.94	1.79	1.77	1.66	1.61	1.58	1.50	1.42	1.39	1.38	-1.5	-0.7	-0.5	-0.7
Residential	1.61	1.58	1.47	1.38	1.31	1.27	1.21	1.18	1.13	1.10	1.07	-0.9	-1.1	-0.8	-0.6
Tertiary	1.54	1.48	1.33	1.21	1.13	1.06	0.95	0.90	0.85	0.81	0.80	-1.5	-1.6	-1.7	-0.9
Transport [C]	2.92	2.94	2.86	2.82	2.74	2.72	2.70	2.69	2.68	2.67	2.66	-0.2	-0.4	-0.1	-0.1
Indicators for renewables															
Share of RES in Gross Final Energy Consumption [D] (%)	7.5	8.4	12.4	16.1	20.9	22.7	24.4	25.9	27.1	28.0	28.7				
RES in transport (%)	0.6	1.3	4.7	6.5	10.3	11.2	12.0	12.5	12.7	13.3	13.9				
Gross Electricity generation by source (in GWh_e) [E]	**2996677**	**3274931**	**3314111**	**3402657**	**3413997**	**3516471**	**3649690**	**3790687**	**3974224**	**4182474**	**4318132**	**1.0**	**0.3**	**0.7**	**0.8**
Nuclear energy	945027	997733	916685	887261	749295	705996	799389	868122	896436	922451	923898	-0.3	-2.0	0.6	0.7
Solids	932109	972611	827663	803081	705123	637045	475234	342551	313245	349227	362360	-1.2	-1.6	-3.9	-1.3
Oil (including refinery gas)	179609	139503	86291	45708	26060	24477	20476	20793	21249	22141	21840	-7.1	-11.3	-2.4	0.3
Gas (including derived gases)	512821	697929	793100	748722	704250	719829	734499	761045	786904	792473	786463	4.5	-1.2	0.4	0.3
Biomass-waste	46848	83773	145868	188714	220932	230724	242597	270927	313747	327621	342281	12.0	4.2	0.9	1.7
Hydro (pumping excluded)	352534	305550	366247	361611	367238	376000	388519	400310	406715	410219	416470	0.4	0.0	0.6	0.3
Wind	22253	70443	149063	262722	486230	630696	766793	853875	905093	989403	1073065	20.9	12.6	4.7	1.7
Solar	118	1459	22363	96127	142752	176745	206106	250918	303363	327771	346440	68.9	20.4	3.7	2.6
Geothermal and other renewables	5358	5930	6831	8712	12116	14959	16077	22146	27472	41168	45316	2.5	5.9	2.9	5.3
Other fuels (hydrogen, methanol)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Net Generation Capacity in MW_e	**646747**	**708073**	**834264**	**925354**	**1012725**	**1061915**	**1132393**	**1194810**	**1267489**	**1321250**	**1374366**	**2.6**	**2.0**	**1.1**	**1.0**
Nuclear energy	136924	134494	131323	123150	111162	96912	107006	115171	118838	122076	121993	-0.4	-1.7	-0.4	0.7
Renewable energy	112494	145938	224768	316443	434378	514107	579666	636263	690015	737329	781473	7.2	6.8	2.9	1.5
Hydro (pumping excluded)	99421	103693	110259	116259	118555	120380	122700	126636	128250	129913	132107	1.0	0.7	0.3	0.4
Wind	12893	40504	84423	123304	204086	257384	304682	335027	354707	384193	412315	20.7	9.2	4.1	1.5
Solar	180	1740	29845	76293	110082	133542	149251	171407	203516	216954	230185	66.7	13.9	3.1	2.2
Other renewables (tidal etc.)	0	0	240	586	1655	2800	3033	3193	3542	6268	6865	0.0	21.3	6.2	4.2
Thermal power	397328	427641	478173	485761	467185	450896	445720	443377	458636	461845	470900	1.9	-0.2	-0.5	0.3
of which cogeneration units	91881	98483	100717	102587	113107	113752	115255	120028	126663	134995	136995	0.9	1.2	0.2	0.9
of which CCS units	0	0	0	0	904	904	1610	7630	18271	34464	38410	0.0	0.0	5.9	17.2
Solids fired	186157	180309	175431	162895	141596	121297	103771	90492	87932	86647	81529	-0.6	-2.1	-3.1	-1.2
Gas fired	128409	168068	223825	251589	256995	264095	278350	288333	293082	294453	298817	5.7	1.4	0.8	0.4
Oil fired	67112	59040	53643	41899	33104	27415	23424	20018	21281	20185	22040	-2.2	-4.7	-3.4	-0.3
Biomass-waste fired	15084	19571	24548	28584	34587	37179	39200	42907	54197	57616	65261	5.0	3.5	1.3	2.6
Hydrogen plants	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Geothermal heat	567	652	726	794	903	910	975	1627	2145	2943	3253	2.5	2.2	0.8	6.2
Avg. Load factor of net power capacity [F] (%)	50.0	50.1	43.2	40.0	36.9	36.3	35.5	34.9	34.5	34.7	34.4				
Electricity indicators															
Efficiency of gross thermal power generation (%)	37.6	38.4	38.4	40.4	40.7	41.3	42.7	43.0	43.5	43.8	44.5				
% of gross electricity from CHP	11.4	11.7	12.6	14.3	15.8	16.4	16.1	16.4	16.6	16.7	16.1				
% of electricity from CCS	0.0	0.0	0.0	0.0	0.2	0.2	0.5	1.7	3.4	5.0	6.9				
Carbon free gross electricity generation (%)	45.8	44.7	48.5	53.1	58.0	60.7	66.3	70.3	71.8	72.2	72.9				
- nuclear	31.5	30.5	27.7	26.1	21.9	20.1	21.9	22.9	22.6	22.1	21.4				
- renewable energy forms	14.3	14.3	20.8	27.0	36.0	40.6	44.4	47.4	49.2	50.1	51.5				
Transport sector															
Passenger transport activity (Gpkm)	**5866.2**	**6218.8**	**6431.5**	**6717.6**	**7003.9**	**7446.6**	**7913.9**	**8237.5**	**8576.0**	**8830.8**	**9091.6**	**0.9**	**0.9**	**1.2**	**0.7**
Public road transport	516.2	523.8	509.5	527.8	547.0	571.3	597.9	618.6	639.7	654.5	669.7	-0.1	0.7	0.9	0.6
Private cars and motorcycles	4405.3	4670.3	4867.4	5024.8	5165.3	5423.4	5679.6	5849.7	6020.9	6146.3	6272.6	1.0	0.6	1.0	0.5
Rail	446.1	457.9	494.1	534.2	578.4	640.1	710.9	760.2	813.0	849.6	886.8	1.0	1.6	2.1	1.1
Aviation	456.9	527.3	522.5	591.3	672.3	769.1	880.8	962.9	1054.7	1131.4	1212.4	1.4	2.6	2.7	1.6
Inland navigation	41.7	39.5	38.1	39.4	40.9	42.7	44.7	46.1	47.6	48.9	50.1	-0.9	0.7	0.9	0.6
Freight transport activity (Gtkm)	**2222.9**	**2533.0**	**2481.9**	**2701.7**	**2924.8**	**3159.5**	**3413.8**	**3551.4**	**3694.9**	**3790.9**	**3888.2**	**1.1**	**1.7**	**1.6**	**0.7**
Trucks	1519.1	1794.0	1755.6	1913.5	2065.9	2221.1	2386.7	2481.9	2580.7	2646.5	2714.4	1.5	1.6	1.5	0.6
Rail	403.7	413.2	389.9	432.7	482.8	537.2	598.7	628.5	660.0	680.4	700.1	-0.3	2.2	2.2	0.8
Inland navigation	300.1	325.8	336.4	355.6	376.1	401.2	428.3	441.0	454.2	463.9	473.8	1.2	1.1	1.3	0.5
Energy demand in transport (ktoe) [G]	**339288**	**364165**	**362888**	**367610**	**354311**	**348358**	**349092**	**348902**	**352761**	**355707**	**360644**	**0.7**	**-0.2**	**-0.1**	**0.2**
Public road transport	7526	7609	7468	7660	7742	7791	7867	7949	8074	8125	8210	-0.1	0.4	0.2	0.2
Private cars and motorcycles	176833	180606	181000	174730	155832	144537	140525	139292	139768	140323	141691	0.2	-1.5	-1.0	0.0
Trucks	95514	111182	111506	117343	119585	121853	125482	126617	128090	128985	130764	1.6	0.7	0.5	0.2
Rail	8052	7809	7349	7904	8495	9119	9760	9880	9931	9778	9583	-0.9	1.5	1.4	-0.1
Aviation	45418	50416	49712	53873	56322	58404	58472	58054	59665	61202	63059	0.9	1.3	0.4	0.4
Inland navigation	5945	6542	5854	6099	6335	6655	6986	7111	7232	7293	7337	-0.2	0.8	1.0	0.2

Source: PRIMES

Austria: Reference scenario												SUMMARY ENERGY BALANCE AND INDICATORS (A)			
ktoe	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**	**'00-'10**	**'10-'20**	**'20-'30**	**'30-'50**
												Annual % Change			
Production (incl.recovery of products)	**9799**	**9992**	**11837**	**12068**	**11850**	**11667**	**11793**	**11421**	**11173**	**11178**	**11248**	**1.9**	**0.0**	**0.0**	**-0.2**
Solids	293	0	0	0	0	0	0	0	0	0	0	-51.5	-100.0	0.0	0.0
Oil	1114	1007	1107	965	694	302	251	167	11	0	0	-0.1	-4.6	-9.7	-100.0
Natural gas	1533	1404	1486	1414	969	918	738	575	307	14	0	-0.3	-4.2	-2.7	-100.0
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Renewable energy sources	6859	7580	9244	9689	10186	10447	10804	10679	10856	11163	11248	3.0	1.0	0.6	0.2
Hydro	3597	3154	3302	3552	3705	3789	3910	3968	4006	4026	4100	-0.9	1.2	0.5	0.2
Biomass & Waste	3169	4189	5559	5506	5471	5344	5193	4911	4880	5024	5018	5.8	-0.2	-0.5	-0.2
Wind	6	114	177	288	617	870	1149	1149	1298	1319	1328	40.9	13.3	6.4	0.7
Solar and others	63	93	171	324	367	420	518	627	643	771	774	10.6	7.9	3.5	2.0
Geothermal	25	30	35	20	26	25	34	25	29	23	28	3.4	-2.8	2.7	-1.0
Net Imports	**19132**	**24570**	**21400**	**23534**	**22337**	**21799**	**20997**	**20785**	**21071**	**21271**	**21537**	**1.1**	**0.4**	**-0.6**	**0.1**
Solids	3019	3969	2981	3701	3048	2533	2292	1929	1581	1522	1440	-0.1	0.2	-2.8	-2.3
Oil	11012	13257	11638	12035	11951	11411	11112	10953	11007	11005	10969	0.6	0.3	-0.7	-0.1
- Crude oil and Feedstocks	7962	8170	7061	7284	7396	7207	7058	7006	7095	7099	7076	-1.2	0.5	-0.5	0.0
- Oil products	3050	5088	4577	4750	4555	4205	4054	3947	3912	3906	3893	4.1	0.0	-1.2	-0.2
Natural gas	5253	7153	6114	7075	6332	6647	6261	6568	7099	7275	7578	1.5	0.4	-0.1	1.0
Electricity	-118	229	200	13	104	84	86	91	98	74	58	0.0	-6.3	-1.9	-1.9
Gross Inland Consumption	**29179**	**34398**	**34618**	**35602**	**34187**	**33466**	**32790**	**32207**	**32244**	**32449**	**32785**	**1.7**	**-0.1**	**-0.4**	**0.0**
Solids	3597	3999	3397	3701	3048	2533	2292	1929	1581	1522	1440	-0.6	-1.1	-2.8	-2.3
Oil	12356	14480	13091	12999	12646	11714	11363	11120	11017	11005	10969	0.6	-0.3	-1.1	-0.2
Natural gas	6519	8159	8214	8489	7301	7565	6999	7142	7405	7289	7578	2.3	-1.2	-0.4	0.4
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Electricity	-118	229	200	13	104	84	86	91	98	74	58	0.0	-6.3	-1.9	-1.9
Renewable energy forms	6825	7531	9715	10399	11089	11571	12052	11924	12143	12559	12740	3.6	1.3	0.8	0.3
as % in Gross Inland Consumption															
Solids	12.3	11.6	9.8	10.4	8.9	7.6	7.0	6.0	4.9	4.7	4.4				
Oil	42.3	42.1	37.8	36.5	37.0	35.0	34.7	34.5	34.2	33.9	33.5				
Natural gas	22.3	23.7	23.7	23.8	21.4	22.6	21.3	22.2	23.0	22.5	23.1				
Nuclear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Renewable energy forms	23.4	21.9	28.1	29.2	32.4	34.6	36.8	37.0	37.7	38.7	38.9				
Gross Electricity Generation in GWh_e	**59863**	**64054**	**67925**	**71196**	**70632**	**73628**	**76369**	**78451**	**81667**	**84906**	**88377**	**1.3**	**0.4**	**0.8**	**0.7**
Self consumption and grid losses	5961	7321	7594	8147	7748	7977	8255	8460	8851	9239	9615	2.5	0.2	0.6	0.8
Fuel Inputs to Thermal Power Generation	**3877**	**5425**	**5647**	**6005**	**4739**	**4509**	**4104**	**4037**	**4128**	**4380**	**4544**	**3.8**	**-1.7**	**-1.4**	**0.5**
Solids	1216	1512	1019	1142	346	94	82	164	0	0	0	-1.8	-10.2	-13.4	-100.0
Oil (including refinery gas)	278	262	177	92	311	71	59	58	68	72	82	-4.4	5.8	-15.3	1.6
Gas (including derived gases)	1961	2836	2871	3125	2448	2703	2333	2426	2492	2515	2565	3.9	-1.6	-0.5	0.5
Biomass & Waste	421	814	1580	1639	1627	1634	1623	1381	1560	1785	1890	14.1	0.3	0.0	0.8
Geothermal heat	0	2	1	7	7	7	7	8	8	8	8	0.0	19.1	0.0	0.7
Hydrogen - Methanol	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Fuel Input to other conversion processes	**11542**	**12016**	**11623**	**11822**	**11567**	**10799**	**10256**	**9611**	**9386**	**9315**	**9284**	**0.1**	**0.0**	**-1.2**	**-0.5**
Refineries	9060	9349	8155	8251	8103	7534	7336	7205	7143	7137	7114	-1.0	-0.1	-1.0	-0.2
Biofuels and hydrogen production	16	45	472	556	586	587	595	607	630	668	716	40.5	2.2	0.2	0.9
District heating	557	613	931	862	757	760	738	656	630	588	600	5.3	-2.1	-0.3	-1.0
Derived gases, cokeries etc.	1910	2009	2065	2153	2122	1918	1587	1143	983	924	853	0.8	0.3	-2.9	-3.1
Energy Branch Consumption	**1348**	**1615**	**1763**	**1832**	**1705**	**1570**	**1465**	**1342**	**1278**	**1253**	**1261**	**2.7**	**-0.3**	**-1.5**	**-0.7**
Non-Energy Uses	**1718**	**1716**	**1865**	**1968**	**2148**	**2098**	**2047**	**2022**	**2028**	**2061**	**2156**	**0.8**	**1.4**	**-0.5**	**0.3**
Final Energy Demand	**23670**	**28141**	**27933**	**28470**	**27749**	**27316**	**26969**	**26727**	**26810**	**26968**	**27221**	**1.7**	**-0.1**	**-0.3**	**0.0**
by sector															
Industry	7236	8762	8843	9147	9056	8833	8780	8622	8585	8632	8762	2.0	0.2	-0.3	0.0
- energy intensive industries	5276	6088	6004	6192	6132	5929	5882	5718	5612	5543	5507	1.3	0.2	-0.4	-0.3
- other industrial sectors	1960	2674	2839	2955	2925	2904	2898	2904	2974	3089	3255	3.8	0.3	-0.1	0.6
Residential	6322	6817	6896	6911	6509	6534	6442	6371	6338	6332	6299	0.9	-0.6	-0.1	-0.1
Tertiary	3066	3445	3396	3142	2959	3100	3043	3059	3138	3199	3253	1.0	-1.4	0.3	0.3
Transport	7046	9118	8797	9270	9223	8849	8704	8675	8748	8806	8907	2.2	0.5	-0.6	0.1
by fuel															
Solids	1367	1416	1133	1256	1385	1246	1281	1169	1087	1049	995	-1.9	2.0	-0.8	-1.3
Oil	9832	12095	10647	10783	10123	9537	9255	9062	9023	8987	8954	0.8	-0.5	-0.9	-0.2
Gas	4464	5125	4989	5022	4634	4605	4300	4125	4229	4075	4179	1.1	-0.7	-0.7	-0.1
Electricity	4432	5013	5274	5320	5402	5628	5848	6023	6274	6494	6742	1.8	0.2	0.8	0.7
Heat (from CHP and District Heating)	1020	1353	1744	1792	1725	1698	1701	1706	1699	1742	1730	5.5	-0.1	-0.1	0.1
Renewable energy forms	2555	3140	4145	4296	4475	4595	4575	4631	4484	4604	4599	5.0	0.8	0.2	0.0
Other fuels (hydrogen, ethanol)	0	0	0	1	4	7	9	10	13	17	21	-100.0	0.0	8.0	4.3
RES in Gross Final Energy Consumption [(A)]	**6126**	**7090**	**8554**	**9041**	**9895**	**10233**	**10918**	**11061**	**11228**	**11607**	**11775**	**3.4**	**1.5**	**1.0**	**0.4**
TOTAL GHG emissions (Mt of CO2 eq.)	**84.8**	**97.0**	**89.7**	**92.2**	**85.0**	**80.3**	**74.9**	**70.6**	**68.7**	**68.0**	**67.9**	**0.6**	**-0.5**	**-1.3**	**-0.5**
of which ETS sectors (2013 scope) GHG emissions		38.1	34.9	37.7	33.0	30.5	27.1	24.6	23.2	22.9	22.8		-0.5	-1.9	-0.9
of which non ETS sectors GHG emissions		58.9	54.9	54.5	52.0	49.9	47.8	46.1	45.5	45.1	45.2		-0.5	-0.8	-0.3
CO_2 Emissions (energy related)	**65.6**	**78.6**	**71.9**	**73.9**	**66.8**	**62.2**	**57.4**	**53.9**	**52.3**	**51.6**	**51.6**	**0.9**	**-0.7**	**-1.5**	**-0.5**
Power generation/District heating	12.5	17.0	15.5	15.5	11.7	10.3	8.1	7.1	6.3	6.4	6.6	2.1	-2.8	-3.6	-1.1
Energy Branch	3.4	3.9	4.3	4.5	4.3	3.9	3.4	2.8	2.5	2.4	2.3	2.2	0.0	-2.4	-1.8
Industry	16.6	18.3	16.9	19.0	17.6	16.3	15.4	14.1	13.8	13.4	13.3	0.2	0.4	-1.3	-0.7
Residential	8.9	8.6	7.6	6.9	5.9	5.7	5.4	5.1	4.9	4.7	4.4	-1.5	-2.6	-0.9	-0.9
Tertiary	3.9	4.4	3.2	2.5	2.1	2.1	1.7	1.6	1.6	1.5	1.5	-1.9	-4.1	-1.8	-0.7
Transport	20.2	26.6	24.3	25.5	25.2	24.0	23.4	23.2	23.3	23.3	23.4	1.9	0.4	-0.7	0.0
CO_2 Emissions (non energy related)	**4.7**	**5.0**	**5.5**	**5.7**	**6.0**	**6.0**	**5.6**	**5.1**	**4.9**	**4.9**	**4.8**	**1.6**	**0.9**	**-0.7**	**-0.8**
Non-CO_2 GHG emissions	**14.5**	**13.4**	**12.4**	**12.6**	**12.2**	**12.2**	**11.9**	**11.6**	**11.5**	**11.5**	**11.6**	**-1.5**	**-0.2**	**-0.3**	**-0.1**
TOTAL GHG emissions Index (1990=100)	**107.2**	**122.7**	**113.5**	**116.7**	**107.5**	**101.6**	**94.8**	**89.4**	**86.9**	**86.0**	**86.0**				

Source: PRIMES

SUMMARY ENERGY BALANCE AND INDICATORS (B)															Austria: Reference scenario
	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050	'00-'10	'10-'20	'20-'30	'30-'50
												Annual % Change			
Main Energy System Indicators															
Population (Million)	8.002	8.201	8.375	8.470	8.591	8.730	8.850	8.934	8.978	8.987	8.969	0.5	0.3	0.3	0.1
GDP (in 000 M€10)	245.5	266.8	286.2	312.5	337.7	361.3	385.4	412.5	442.5	474.2	507.4	1.5	1.7	1.3	1.4
Gross Inl. Cons./GDP (toe/M€10)	118.9	128.9	121.0	113.9	101.2	92.6	85.1	78.1	72.9	68.4	64.6	0.2	-1.8	-1.7	-1.4
Carbon intensity (t of CO_2/toe of GIC)	2.25	2.29	2.08	2.08	1.95	1.86	1.75	1.67	1.62	1.59	1.57	-0.8	-0.6	-1.1	-0.5
Import Dependency %	65.6	71.4	61.8	66.1	65.3	65.1	64.0	64.5	65.3	65.6	65.7				
Total energy-rel. and other mitigation costs [B] (in 000 M€10)	22.2	29.6	35.0	41.3	47.2	49.4	51.7	53.3	55.6	57.7	59.6	4.7	3.0	0.9	0.7
as % of GDP	9.0	11.1	12.2	13.2	14.0	13.7	13.4	12.9	12.6	12.2	11.7				
Energy intensity indicators															
Industry (Energy on Value added, index 2000=100)	100.0	111.3	108.2	101.0	91.8	84.3	80.0	76.2	73.2	70.6	68.3	0.8	-1.6	-1.4	-0.8
Residential (Energy on Private Income, index 2000=100)	100.0	99.6	95.4	87.8	76.5	71.6	65.9	60.5	55.6	51.2	47.0	-0.5	-2.2	-1.5	-1.7
Tertiary (Energy on Value added, index 2000=100)	100.0	102.7	92.4	78.2	68.1	66.3	60.5	56.2	53.3	50.2	47.4	-0.8	-3.0	-1.2	-1.2
Passenger transport (toe/Mpkm)	44.5	47.6	47.7	44.9	38.3	33.6	31.5	30.7	30.2	29.8	29.4	0.7	-2.2	-1.9	-0.3
Freight transport (toe/Mtkm)	46.9	68.2	67.6	65.8	62.6	59.1	55.0	51.9	49.6	48.1	47.0	3.7	-0.8	-1.3	-0.8
Carbon Intensity indicators															
Electricity and Steam production (t of CO_2/MWh)	0.17	0.21	0.17	0.16	0.13	0.11	0.08	0.07	0.06	0.06	0.06	0.0	-3.1	-4.1	-1.7
Final energy demand (t of CO_2/toe)	2.10	2.05	1.86	1.90	1.83	1.76	1.70	1.65	1.62	1.59	1.57	-1.2	-0.2	-0.7	-0.4
Industry	2.30	2.08	1.92	2.08	1.95	1.85	1.75	1.63	1.60	1.55	1.52	-1.8	0.2	-1.0	-0.7
Residential	1.41	1.26	1.11	1.01	0.90	0.87	0.83	0.80	0.77	0.74	0.71	-2.4	-2.0	-0.8	-0.8
Tertiary	1.26	1.26	0.94	0.81	0.71	0.67	0.57	0.54	0.51	0.48	0.47	-2.9	-2.7	-2.1	-1.0
Transport [C]	2.87	2.91	2.76	2.75	2.73	2.71	2.69	2.67	2.66	2.64	2.62	-0.4	-0.1	-0.2	-0.1
Indicators for renewables															
Share of RES in Gross Final Energy Consumption [D] (%)	25.1	24.4	29.6	30.7	34.5	36.1	39.0	39.8	40.2	41.3	41.4				
RES in transport (%)	3.0	3.0	5.4	8.0	10.7	11.9	13.2	14.0	14.9	15.8	16.5				
Gross Electricity generation by source (in GWh_e) [E]	**59874**	**64066**	**67937**	**71196**	**70632**	**73628**	**76369**	**78451**	**81667**	**84906**	**88377**	**1.3**	**0.4**	**0.8**	**0.7**
Nuclear energy	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Solids	5727	7165	4918	6392	1821	467	408	300	0	0	0	-1.5	-9.5	-13.9	-100.0
Oil (including refinery gas)	1702	1641	1275	390	416	383	329	314	392	401	473	-2.8	-10.6	-2.3	1.8
Gas (including derived gases)	8864	14347	16132	12019	10092	10363	7712	9359	9253	9696	11460	6.2	-4.6	-2.7	2.0
Biomass-waste	1675	2882	5052	7277	7138	7183	7122	6114	7268	8488	9193	11.7	3.5	0.0	1.3
Hydro (pumping excluded)	41836	36677	38406	41300	43084	44055	45467	46136	46586	46810	47669	-0.9	1.2	0.5	0.2
Wind	67	1331	2064	3346	7171	10114	13359	13359	15088	15343	15443	40.9	13.3	6.4	0.7
Solar	3	21	89	459	899	1053	1961	2858	3068	4156	4126	39.3	26.1	8.1	3.8
Geothermal and other renewables	0	2	1	11	11	11	11	12	12	12	12	0.0	25.0	0.0	0.5
Other fuels (hydrogen, methanol)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Net Generation Capacity in MW_e	**15729**	**16866**	**19497**	**20951**	**23378**	**24148**	**26360**	**27311**	**28379**	**28854**	**27824**	**2.2**	**1.8**	**1.2**	**0.3**
Nuclear energy	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Renewable energy	9585	10399	11867	12950	15106	16721	19177	19861	20931	21939	22304	2.2	2.4	2.4	0.8
Hydro (pumping excluded)	9503	9558	10773	11021	11205	11340	11661	11797	11925	11943	12275	1.3	0.4	0.4	0.3
Wind	77	819	1014	1529	3114	4507	6051	6051	6873	6994	7042	29.4	11.9	6.9	0.8
Solar	5	22	80	400	787	874	1466	2014	2133	3002	2987	32.0	25.7	6.4	3.6
Other renewables (tidal etc.)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Thermal power	6144	6467	7630	8001	8272	7426	7182	7450	7447	6914	5520	2.2	0.8	-1.4	-1.3
of which cogeneration units	2632	3383	4597	2709	2953	3021	2804	3283	3283	3469	3685	5.7	-4.3	-0.5	1.4
of which CCS units	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Solids fired	1713	1589	1380	1360	1352	313	305	305	68	68	68	-2.1	-0.2	-13.8	-7.2
Gas fired	3221	3570	5048	5232	5390	5786	5624	5929	6041	5459	3854	4.6	0.7	0.4	-1.9
Oil fired	708	723	439	413	411	207	123	132	122	117	137	-4.7	-0.7	-11.4	0.5
Biomass-waste fired	501	584	761	995	1118	1118	1130	1082	1216	1270	1459	4.3	3.9	0.1	1.3
Hydrogen plants	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Geothermal heat	1	1	1	1	1	1	1	1	1	1	1	0.0	0.0	0.0	0.5
Avg. Load factor of net power capacity [F] (%)	41.9	41.5	38.2	36.9	33.0	33.4	31.8	31.6	31.6	32.4	34.9				
Electricity indicators															
Efficiency of gross thermal power generation (%)	39.9	41.3	41.7	37.4	35.3	35.1	32.7	34.3	35.3	36.5	40.0				
% of gross electricity from CHP	10.4	15.4	15.4	16.1	17.5	19.6	16.8	18.9	19.1	20.3	23.0				
% of electricity from CCS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Carbon free gross electricity generation (%)	72.8	63.9	67.1	73.6	82.5	84.8	88.9	87.3	88.2	88.1	86.5				
- nuclear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
- renewable energy forms	72.8	63.9	67.1	73.6	82.5	84.8	88.9	87.3	88.2	88.1	86.5				
Transport sector															
Passenger transport activity (Gpkm)	**95.6**	**101.5**	**106.4**	**112.0**	**117.7**	**123.4**	**129.3**	**134.4**	**139.6**	**143.8**	**148.1**	**1.1**	**1.0**	**0.9**	**0.7**
Public road transport	9.2	9.3	9.9	10.3	10.8	11.1	11.5	11.8	12.2	12.4	12.7	0.7	0.9	0.7	0.5
Private cars and motorcycles	67.8	71.9	74.6	77.4	80.0	82.8	85.4	88.1	90.8	93.1	95.5	1.0	0.7	0.7	0.6
Rail	12.3	13.3	14.8	15.9	17.1	18.1	19.1	19.9	20.8	21.7	22.5	1.9	1.5	1.1	0.8
Aviation	6.1	7.0	7.1	8.3	9.8	11.4	13.2	14.4	15.7	16.5	17.4	1.4	3.3	3.0	1.4
Inland navigation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-1.2	0.9	0.7	0.6
Freight transport activity (Gtkm)	**54.2**	**58.4**	**50.9**	**59.9**	**70.4**	**74.3**	**78.4**	**81.3**	**84.5**	**86.9**	**89.4**	**-0.6**	**3.3**	**1.1**	**0.7**
Trucks	35.1	37.0	28.7	36.4	45.4	47.7	50.0	51.5	53.0	54.1	55.1	-2.0	4.7	1.0	0.5
Rail	16.6	19.0	19.8	21.0	22.3	23.8	25.4	26.8	28.3	29.5	30.8	1.8	1.2	1.3	1.0
Inland navigation	2.4	2.4	2.4	2.5	2.7	2.8	3.0	3.1	3.2	3.3	3.4	-0.3	1.4	0.9	0.7
Energy demand in transport (ktoe) [G]	**6795**	**8822**	**8518**	**8963**	**8917**	**8534**	**8385**	**8347**	**8411**	**8465**	**8559**	**2.3**	**0.5**	**-0.6**	**0.1**
Public road transport	123	122	132	137	141	141	141	141	143	143	143	0.7	0.7	0.0	0.1
Private cars and motorcycles	3514	4011	4219	4084	3542	3146	2995	2996	3030	3063	3111	1.8	-1.7	-1.7	0.2
Trucks	2326	3774	3240	3739	4205	4174	4092	4000	3974	3970	3991	3.4	2.6	-0.3	-0.1
Rail	235	214	210	211	219	224	228	228	228	224	221	-1.2	0.4	0.4	-0.2
Aviation	590	679	706	780	797	835	916	967	1022	1050	1077	1.8	1.2	1.4	0.8
Inland navigation	6	21	11	12	13	13	14	14	14	14	15	6.2	1.4	0.6	0.3

Source: PRIMES

Belgium: Reference scenario												SUMMARY ENERGY BALANCE AND INDICATORS (A)			
ktoe	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**	**'00-'10**	**'10-'20**	**'20-'30**	**'30-'50**
												Annual % Change			
Production (incl.recovery of products)	**13606**	**13717**	**16357**	**14316**	**14330**	**7650**	**6637**	**6837**	**7062**	**7792**	**8407**	**1.9**	**-1.3**	**-7.4**	**1.2**
Solids	206	57	0	0	0	0	0	0	0	0	0	-96.7	-100.0	0.0	0.0
Oil	0	6	1241	1241	1241	1241	1241	1241	1241	1241	1241	254.2	0.0	0.0	0.0
Natural gas	2	0	0	0	0	0	0	0	0	0	0	0.0	-100.0	0.0	0.0
Nuclear	12422	12277	12367	9721	8538	1249	0	0	0	0	0	0.0	-3.6	-100.0	0.0
Renewable energy sources	976	1377	2748	3353	4550	5160	5395	5596	5820	6550	7165	10.9	5.2	1.7	1.4
Hydro	40	25	27	45	46	48	46	46	46	47	48	-3.8	5.6	-0.1	0.3
Biomass & Waste	931	1327	2545	2584	2953	3017	3017	3042	3059	3250	3293	10.6	1.5	0.2	0.4
Wind	1	20	111	410	1038	1309	1512	1627	1752	2122	2553	55.1	25.0	3.8	2.7
Solar and others	1	3	60	314	491	744	774	830	912	1081	1219	50.3	23.3	4.7	2.3
Geothermal	3	3	4	1	21	42	47	50	51	51	51	3.1	17.3	8.2	0.4
Net Imports	**50407**	**53362**	**53093**	**52536**	**50645**	**52563**	**53027**	**54197**	**55481**	**55869**	**56520**	**0.5**	**-0.5**	**0.5**	**0.3**
Solids	7159	5093	3131	2082	2001	1916	1891	1433	1371	1312	1243	-7.9	-4.4	-0.6	-2.1
Oil	29493	32628	32552	31339	30423	29962	30255	30641	30639	31309	31744	1.0	-0.7	-0.1	0.2
- Crude oil and Feedstocks	34069	32211	29849	29153	28335	27919	27989	28127	28026	28344	28519	-1.3	-0.5	-0.1	0.1
- Oil products	-4576	417	2703	2186	2088	2043	2265	2514	2613	2965	3224	0.0	-2.5	0.8	1.8
Natural gas	13278	14817	16791	17873	16857	18358	17932	19131	20694	20487	20790	2.4	0.0	0.6	0.7
Electricity	372	542	47	474	283	1181	1807	1832	1654	1694	1799	-18.6	19.6	20.4	0.0
Gross Inland Consumption	**59212**	**58981**	**61503**	**58457**	**56163**	**51053**	**50028**	**50825**	**52024**	**52468**	**53135**	**0.4**	**-0.9**	**-1.2**	**0.3**
Solids	7861	5024	3186	2082	2001	1916	1891	1433	1371	1312	1243	-8.6	-4.5	-0.6	-2.1
Oil	24107	24752	25630	24229	23034	22424	22371	22477	22479	22752	22830	0.6	-1.1	-0.3	0.1
Natural gas	13369	14728	16960	17830	16675	17976	17422	18327	19577	19093	19154	2.4	-0.2	0.4	0.5
Nuclear	12422	12277	12367	9721	8538	1249	0	0	0	0	0	0.0	-3.6	-100.0	0.0
Electricity	372	542	47	474	283	1181	1807	1832	1654	1694	1799	-18.6	19.6	20.4	0.0
Renewable energy forms	1081	1658	3313	4120	5632	6306	6537	6756	6942	7617	8110	11.9	5.4	1.5	1.1
as % in Gross Inland Consumption															
Solids	13.3	8.5	5.2	3.6	3.6	3.8	3.8	2.8	2.6	2.5	2.3				
Oil	40.7	42.0	41.7	41.4	41.0	43.9	44.7	44.2	43.2	43.4	43.0				
Natural gas	22.6	25.0	27.6	30.5	29.7	35.2	34.8	36.1	37.6	36.4	36.0				
Nuclear	21.0	20.8	20.1	16.6	15.2	2.4	0.0	0.0	0.0	0.0	0.0				
Renewable energy forms	1.8	2.8	5.4	7.0	10.0	12.4	13.1	13.3	13.3	14.5	15.3				
Gross Electricity Generation in GWh_e	**82758**	**85694**	**93748**	**89940**	**90551**	**78958**	**75446**	**78778**	**87198**	**93230**	**95927**	**1.3**	**-0.3**	**-1.8**	**1.2**
Self consumption and grid losses	7932	8243	8395	8157	7706	6709	6675	6918	7425	7930	8086	0.6	-0.9	-1.4	1.0
Fuel Inputs to Thermal Power Generation	**7098**	**7677**	**8360**	**8016**	**7681**	**9110**	**8595**	**8434**	**8959**	**8947**	**8288**	**1.7**	**-0.8**	**1.1**	**-0.2**
Solids	2629	1833	936	414	415	415	415	0	0	0	0	-9.8	-7.8	0.0	-100.0
Oil (including refinery gas)	187	411	33	96	118	241	201	169	162	176	175	-15.9	13.5	5.5	-0.7
Gas (including derived gases)	3790	4612	5669	5842	5330	6418	6001	6294	6953	6855	6353	4.1	-0.6	1.2	0.3
Biomass & Waste	492	821	1722	1664	1799	1998	1937	1926	1798	1871	1715	13.4	0.4	0.7	-0.6
Geothermal heat	0	0	0	0	19	38	41	45	45	45	45	0.0	0.0	8.2	0.4
Hydrogen - Methanol	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Fuel Input to other conversion processes	**54601**	**52924**	**50598**	**45690**	**43967**	**36076**	**34860**	**34926**	**34797**	**35111**	**35288**	**-0.8**	**-1.4**	**-2.3**	**0.1**
Refineries	38493	37443	35526	33819	33068	32629	32711	32857	32771	33134	33357	-0.8	-0.7	-0.1	0.1
Biofuels and hydrogen production	0	0	362	444	739	741	785	793	824	870	920	0.0	7.4	0.6	0.8
District heating	44	29	6	17	78	54	28	38	67	69	72	-17.9	29.0	-9.7	4.8
Derived gases, cokeries etc.	16064	15452	14704	11409	10082	2652	1336	1238	1134	1038	939	-0.9	-3.7	-18.3	-1.7
Energy Branch Consumption	**2313**	**2124**	**3279**	**3155**	**3055**	**2869**	**2867**	**2887**	**2907**	**2930**	**2936**	**3.6**	**-0.7**	**-0.6**	**0.1**
Non-Energy Uses	**6739**	**7516**	**7593**	**7520**	**7896**	**7879**	**7884**	**7965**	**8001**	**8074**	**8238**	**1.2**	**0.4**	**0.0**	**0.2**
Final Energy Demand	**37358**	**36585**	**36427**	**36226**	**34867**	**34456**	**34667**	**35503**	**36310**	**37022**	**37775**	**-0.3**	**-0.4**	**-0.1**	**0.4**
by sector															
Industry	14059	11711	11182	11021	10872	10649	10694	10985	11350	11484	11856	-2.3	-0.3	-0.2	0.5
- energy intensive industries	10570	9049	8227	8014	7908	7724	7696	7814	7921	7899	7997	-2.5	-0.4	-0.3	0.2
- other industrial sectors	3489	2662	2956	3007	2964	2926	2997	3171	3429	3585	3860	-1.6	0.0	0.1	1.3
Residential	9474	9920	8970	9019	8572	8560	8307	8396	8406	8516	8518	-0.5	-0.5	-0.3	0.1
Tertiary	4164	5028	5976	5865	5614	5542	5661	5867	5938	6140	6251	3.7	-0.6	0.1	0.5
Transport	9661	9927	10299	10321	9809	9704	10006	10256	10616	10883	11150	0.6	-0.5	0.2	0.5
by fuel															
Solids	3343	1962	1180	945	918	886	883	874	849	824	792	-9.9	-2.5	-0.4	-0.5
Oil	16312	16523	14935	14469	13108	12764	12773	12930	13040	13190	13258	-0.9	-1.3	-0.3	0.2
Gas	10010	10009	11069	11060	10304	10215	10030	10464	10803	10488	10824	1.0	-0.7	-0.3	0.4
Electricity	6667	6896	7163	7284	7188	7176	7495	7772	8257	8752	9058	0.7	0.0	0.4	1.0
Heat (from CHP and District Heating)	492	428	668	636	914	945	957	857	687	987	990	3.1	3.2	0.5	0.2
Renewable energy forms	533	767	1411	1831	2431	2461	2515	2583	2635	2727	2786	10.2	5.6	0.3	0.5
Other fuels (hydrogen, ethanol)	0	0	0	1	4	8	14	23	38	54	67	0.0	0.0	13.0	8.2
RES in Gross Final Energy Consumption [(A)]	**500**	**858**	**1908**	**3011**	**4870**	**5396**	**5719**	**5858**	**5882**	**6673**	**7108**	**14.3**	**9.8**	**1.6**	**1.1**
TOTAL GHG emissions (Mt of CO2 eq.)	**150.3**	**146.6**	**134.1**	**127.4**	**120.2**	**121.4**	**118.8**	**118.8**	**121.9**	**121.7**	**121.9**	**-1.1**	**-1.1**	**-0.1**	**0.1**
of which ETS sectors (2013 scope) GHG emissions		70.5	58.9	55.9	53.6	56.3	54.3	54.2	57.3	56.7	56.2		-0.9	0.1	0.2
of which non ETS sectors GHG emissions		76.1	75.2	71.5	66.5	65.1	64.4	64.6	64.6	65.0	65.7		-1.2	-0.3	0.1
CO_2 Emissions (energy related)	**121.3**	**113.3**	**105.4**	**99.8**	**92.0**	**92.9**	**91.3**	**91.5**	**94.1**	**93.3**	**92.8**	**-1.4**	**-1.4**	**-0.1**	**0.1**
Power generation/District heating	25.1	24.0	20.3	16.8	15.4	18.2	16.9	15.4	16.7	16.5	15.3	-2.1	-2.8	0.9	-0.5
Energy Branch	4.9	4.0	6.9	6.6	6.2	5.7	5.8	5.9	6.1	6.0	6.1	3.4	-1.0	-0.7	0.3
Industry	34.0	24.5	19.5	18.8	17.4	17.0	17.1	18.0	18.9	18.1	18.4	-5.4	-1.1	-0.2	0.4
Residential	20.2	20.5	18.8	18.6	17.5	17.2	16.2	16.0	15.6	15.4	15.0	-0.7	-0.7	-0.8	-0.4
Tertiary	8.2	10.6	10.1	9.4	8.5	8.1	8.0	8.3	7.9	7.8	7.9	2.1	-1.7	-0.6	-0.1
Transport	28.9	29.8	29.9	29.7	27.1	26.6	27.3	28.0	28.9	29.5	30.1	0.3	-1.0	0.1	0.5
CO_2 Emissions (non energy related)	**7.8**	**14.7**	**11.8**	**12.4**	**13.4**	**13.7**	**12.9**	**12.9**	**13.5**	**14.0**	**14.5**	**4.2**	**1.3**	**-0.4**	**0.6**
Non-CO_2 GHG emissions	**21.2**	**18.6**	**16.9**	**15.1**	**14.8**	**14.8**	**14.6**	**14.3**	**14.3**	**14.4**	**14.6**	**-2.3**	**-1.3**	**-0.1**	**0.0**
TOTAL GHG emissions Index (1990=100)	**102.7**	**100.2**	**91.6**	**87.0**	**82.1**	**82.9**	**81.1**	**81.2**	**83.3**	**83.1**	**83.3**				

Source: PRIMES

SUMMARY ENERGY BALANCE AND INDICATORS (B)															Belgium: Reference scenario
	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050	'00-'10	'10-'20	'20-'30	'30-'50
												Annual % Change			
Main Energy System Indicators															
Population (Million)	10.239	10.446	10.840	11.239	11.593	11.911	12.204	12.473	12.718	12.936	13.126	0.6	0.7	0.5	0.4
GDP (in 000 M€10)	308.9	334.4	354.7	382.1	409.2	439.2	474.6	516.3	563.4	614.4	668.8	1.4	1.4	1.5	1.7
Gross Inl. Cons./GDP (toe/M€10)	191.7	176.4	173.4	153.0	137.2	116.2	105.4	98.4	92.3	85.4	79.4	-1.0	-2.3	-2.6	-1.4
Carbon intensity (t of CO_2/toe of GIC)	2.05	1.92	1.71	1.71	1.64	1.82	1.82	1.80	1.81	1.78	1.75	-1.8	-0.5	1.1	-0.2
Import Dependency %	78.1	80.1	76.8	78.6	77.9	87.3	88.9	88.8	88.7	87.8	87.1				
Total energy-rel. and other mitigation costs [B] (in 000 M€10)	34.0	39.5	47.8	60.3	67.7	71.0	74.9	77.4	81.0	85.5	89.5	3.5	3.5	1.0	0.9
as % of GDP	11.0	11.8	13.5	15.8	16.5	16.2	15.8	15.0	14.4	13.9	13.4				
Energy intensity indicators															
Industry (Energy on Value added, index 2000=100)	100.0	82.3	89.3	80.2	74.4	68.5	64.1	60.8	58.1	54.4	52.2	-1.1	-1.8	-1.5	-1.0
Residential (Energy on Private Income, index 2000=100)	100.0	99.1	82.3	79.4	70.0	64.7	57.7	53.3	48.6	44.9	41.1	-1.9	-1.6	-1.9	-1.7
Tertiary (Energy on Value added, index 2000=100)	100.0	110.1	121.2	110.7	98.6	90.3	85.1	80.8	74.7	70.6	65.8	1.9	-2.0	-1.5	-1.3
Passenger transport (toe/Mpkm)	47.7	43.8	47.8	44.9	38.4	34.6	32.8	32.1	31.5	31.1	30.6	0.0	-2.2	-1.6	-0.3
Freight transport (toe/Mtkm)	47.1	58.4	63.3	58.2	55.9	52.2	50.0	48.2	47.1	46.0	45.2	3.0	-1.2	-1.1	-0.5
Carbon Intensity indicators															
Electricity and Steam production (t of CO_2/MWh)	0.28	0.26	0.20	0.17	0.15	0.20	0.19	0.17	0.17	0.15	0.14	-3.5	-2.8	2.4	-1.5
Final energy demand (t of CO_2/toe)	2.44	2.33	2.15	2.11	2.02	2.00	1.98	1.98	1.96	1.91	1.89	-1.3	-0.6	-0.2	-0.2
Industry	2.42	2.09	1.74	1.71	1.60	1.60	1.60	1.64	1.67	1.57	1.55	-3.2	-0.8	0.0	-0.1
Residential	2.13	2.06	2.09	2.07	2.04	2.00	1.95	1.90	1.85	1.81	1.76	-0.2	-0.2	-0.5	-0.5
Tertiary	1.98	2.11	1.69	1.59	1.51	1.47	1.42	1.41	1.33	1.27	1.27	-1.6	-1.1	-0.6	-0.6
Transport [C]	2.99	3.00	2.90	2.87	2.76	2.74	2.73	2.73	2.72	2.71	2.70	-0.3	-0.5	-0.1	-0.1
Indicators for renewables															
Share of RES in Gross Final Energy Consumption [D] (%)	1.3	2.3	5.1	8.2	13.7	15.4	16.2	16.2	15.9	17.7	18.5				
RES in transport (%)	0.0	0.0	4.2	5.5	10.1	10.9	11.3	11.2	11.4	11.9	12.4				
Gross Electricity generation by source (in GWh_e) [E]	**82773**	**85709**	**93764**	**89940**	**90551**	**78958**	**75446**	**78778**	**87198**	**93230**	**95927**	**1.3**	**-0.3**	**-1.8**	**1.2**
Nuclear energy	48157	47595	47944	37679	33094	4852	0	0	0	0	0	0.0	-3.6	-100.0	0.0
Solids	12916	8199	4190	1883	1883	1883	1882	0	0	0	0	-10.6	-7.7	0.0	-100.0
Oil (including refinery gas)	797	1740	406	488	611	1227	987	819	906	988	936	-6.5	4.2	4.9	-0.3
Gas (including derived gases)	19091	25143	33178	35547	31866	41545	40229	44064	49330	48938	45429	5.7	-0.4	2.4	0.6
Biomass-waste	1336	2516	5882	7129	7807	8789	8779	8769	9107	9548	8953	16.0	2.9	1.2	0.1
Hydro (pumping excluded)	460	288	312	519	539	560	534	533	539	548	563	-3.8	5.6	-0.1	0.3
Wind	16	227	1292	4766	12075	15220	17582	18919	20369	24669	29690	55.1	25.0	3.8	2.7
Solar	0	1	560	1930	2654	4837	5405	5620	6895	8466	10275	0.0	16.8	7.4	3.3
Geothermal and other renewables	0	0	0	0	22	44	48	53	53	72	81	0.0	0.0	8.2	2.7
Other fuels (hydrogen, methanol)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Net Generation Capacity in MW_e	**13891**	**14651**	**17015**	**20031**	**23556**	**24844**	**27061**	**28404**	**31069**	**34850**	**38790**	**2.0**	**3.3**	**1.4**	**1.8**
Nuclear energy	5801	5817	5941	4596	4037	590	0	0	0	0	0	0.2	-3.8	-100.0	0.0
Renewable energy	116	273	1933	3971	7378	10336	12068	13025	14869	17863	21152	32.5	14.3	5.0	2.8
Hydro (pumping excluded)	103	104	117	165	177	178	186	187	188	190	196	1.3	4.2	0.5	0.3
Wind	13	167	912	1966	4772	5864	7068	7849	8581	10141	11728	53.0	18.0	4.0	2.6
Solar	0	2	904	1840	2429	4295	4813	4989	6100	7522	9213	0.0	10.4	7.1	3.3
Other renewables (tidal etc.)	0	0	0	0	0	0	0	0	0	10	15	0.0	0.0	0.0	0.0
Thermal power	7975	8561	9141	11464	12141	13918	14993	15379	16200	16987	17638	1.4	2.9	2.1	0.8
of which cogeneration units	1112	1631	2309	2634	3188	3825	4120	2888	2526	4486	4878	7.6	3.3	2.6	0.8
of which CCS units	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Solids fired	1785	1667	1176	245	246	246	246	0	0	0	0	-4.1	-14.5	0.0	-100.0
Gas fired	4951	5618	6451	9326	9397	11453	12896	13532	13619	14225	14879	2.7	3.8	3.2	0.7
Oil fired	702	690	426	572	617	439	365	343	360	269	205	-4.9	3.8	-5.1	-2.8
Biomass-waste fired	537	587	1088	1320	1878	1775	1480	1498	2216	2487	2549	7.3	5.6	-2.4	2.8
Hydrogen plants	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Geothermal heat	0	0	0	0	3	5	6	6	6	6	6	0.0	0.0	8.2	0.4
Avg. Load factor of net power capacity [F] (%)	64.9	64.0	60.4	49.3	42.4	35.3	31.1	31.0	31.4	29.9	27.7				
Electricity indicators															
Efficiency of gross thermal power generation (%)	41.4	42.1	44.9	48.3	47.2	50.5	52.0	54.8	57.0	57.2	57.5				
% of gross electricity from CHP	6.5	8.5	16.0	17.1	18.1	22.0	24.4	20.9	16.9	24.4	24.1				
% of electricity from CCS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Carbon free gross electricity generation (%)	60.4	59.1	59.7	57.8	62.1	43.4	42.9	43.0	42.4	46.4	51.7				
- nuclear	58.2	55.5	51.1	41.9	36.5	6.1	0.0	0.0	0.0	0.0	0.0				
- renewable energy forms	2.2	3.5	8.6	15.9	25.5	37.3	42.9	43.0	42.4	46.4	51.7				
Transport sector															
Passenger transport activity (Gpkm)	**137.1**	**145.6**	**149.4**	**156.7**	**162.8**	**172.7**	**182.9**	**192.4**	**202.5**	**211.8**	**221.5**	**0.9**	**0.9**	**1.2**	**1.0**
Public road transport	13.3	17.5	18.9	19.8	21.0	21.9	22.8	23.9	24.9	25.8	26.7	3.6	1.0	0.9	0.8
Private cars and motorcycles	106.5	110.1	110.5	114.8	117.5	123.6	129.4	135.2	141.4	147.4	153.5	0.4	0.6	1.0	0.9
Rail	8.6	10.1	11.1	12.0	13.0	14.3	15.9	16.9	18.0	18.9	19.7	2.6	1.6	2.1	1.1
Aviation	8.4	7.6	8.6	9.7	11.0	12.6	14.5	16.0	17.7	19.4	21.2	0.3	2.4	2.8	1.9
Inland navigation	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	-0.8	0.9	0.9	0.9
Freight transport activity (Gtkm)	**66.3**	**60.9**	**49.9**	**56.4**	**63.7**	**71.4**	**80.0**	**84.7**	**89.7**	**93.0**	**96.3**	**-2.8**	**2.5**	**2.3**	**0.9**
Trucks	51.0	43.8	35.0	39.6	44.6	49.7	55.2	58.4	61.8	63.9	66.1	-3.7	2.5	2.1	0.9
Rail	7.7	8.1	6.3	7.5	9.0	10.4	12.1	12.8	13.6	14.2	14.8	-2.0	3.7	3.0	1.0
Inland navigation	7.6	8.9	8.6	9.3	10.0	11.3	12.7	13.5	14.3	14.8	15.4	1.2	1.5	2.4	1.0
Energy demand in transport (ktoe) [G]	**9660**	**9926**	**10293**	**10312**	**9800**	**9695**	**9997**	**10246**	**10607**	**10873**	**11140**	**0.6**	**-0.5**	**0.2**	**0.5**
Public road transport	216	279	317	329	334	335	337	344	352	359	367	3.9	0.5	0.1	0.4
Private cars and motorcycles	4690	4712	5199	4955	4134	3796	3822	3916	4026	4149	4292	1.0	-2.3	-0.8	0.6
Trucks	2837	3250	2903	3008	3253	3388	3617	3688	3816	3868	3942	0.2	1.1	1.1	0.4
Rail	184	186	177	188	211	235	261	269	276	278	277	-0.4	1.8	2.2	0.3
Aviation	1530	1281	1546	1671	1695	1753	1753	1817	1914	1991	2029	0.1	0.9	0.3	0.7
Inland navigation	203	218	151	161	172	188	206	214	223	228	233	-3.0	1.4	1.8	0.6

Source: PRIMES

Bulgaria: Reference scenario												SUMMARY ENERGY BALANCE AND INDICATORS (A)			
ktoe	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**	**'00-'10**	**'10-'20**	**'20-'30**	**'30-'50**
												Annual % Change			
Production (incl.recovery of products)	**9868**	**10630**	**10437**	**11045**	**11030**	**11434**	**10647**	**10283**	**11398**	**12082**	**12922**	**0.6**	**0.6**	**-0.4**	**1.0**
Solids	4295	4178	4942	5214	4810	5025	3994	3890	1757	2175	2818	1.4	-0.3	-1.8	-1.7
Oil	70	60	46	46	46	46	46	46	46	46	46	-4.1	0.0	0.0	0.0
Natural gas	12	384	0	0	0	0	0	0	0	0	0	-96.6	-100.0	0.0	0.0
Nuclear	4699	4826	3956	4015	4042	4042	4042	3574	6474	6474	6474	-1.7	0.2	0.0	2.4
Renewable energy sources	792	1182	1493	1771	2133	2321	2565	2774	3121	3388	3584	6.5	3.6	1.9	1.7
Hydro	230	373	435	403	400	394	398	402	406	410	414	6.6	-0.8	-0.1	0.2
Biomass & Waste	562	776	955	1054	1383	1478	1512	1624	1843	1986	2151	5.5	3.8	0.9	1.8
Wind	0	0	59	115	120	124	231	231	328	335	336	0.0	7.4	6.8	1.9
Solar and others	0	0	12	155	182	267	377	421	454	569	592	0.0	31.8	7.6	2.3
Geothermal	0	33	33	43	48	59	47	95	90	89	91	0.0	3.9	-0.1	3.3
Net Imports	**8725**	**9589**	**7230**	**7228**	**7012**	**6799**	**6710**	**6910**	**6499**	**6225**	**6254**	**-1.9**	**-0.3**	**-0.4**	**-0.4**
Solids	2258	2553	1700	1213	1202	1116	1364	1220	1050	1187	1421	-2.8	-3.4	1.3	0.2
Oil	4125	5257	4180	3832	3639	3510	3510	3534	3562	3547	3544	0.1	-1.4	-0.4	0.0
- Crude oil and Feedstocks	5396	6457	6071	5729	5445	5188	5020	4870	4731	4555	4388	1.2	-1.1	-0.8	-0.7
- Oil products	-1271	-1201	-1891	-1897	-1806	-1679	-1511	-1336	-1169	-1008	-844	4.1	-0.5	-1.8	-2.9
Natural gas	2742	2458	2131	3163	3318	3400	3518	3930	3784	3518	3424	-2.5	4.5	0.6	-0.1
Electricity	-397	-652	-726	-883	-960	-967	-1356	-1363	-1366	-1386	-1373	6.2	2.8	3.5	0.1
Gross Inland Consumption	**18707**	**20077**	**17831**	**18136**	**17877**	**18050**	**17162**	**16991**	**17688**	**18089**	**18949**	**-0.5**	**0.0**	**-0.4**	**0.5**
Solids	6433	6895	6887	6427	6012	6141	5358	5110	2807	3361	4240	0.7	-1.3	-1.1	-1.2
Oil	4252	5047	4027	3741	3520	3375	3364	3383	3405	3380	3370	-0.5	-1.3	-0.5	0.0
Natural gas	2932	2804	2241	3162	3317	3398	3515	3925	3779	3512	3418	-2.7	4.0	0.6	-0.1
Nuclear	4699	4826	3956	4015	4042	4042	4042	3574	6474	6474	6474	-1.7	0.2	0.0	2.4
Electricity	-397	-652	-726	-883	-960	-967	-1356	-1363	-1366	-1386	-1373	6.2	2.8	3.5	0.1
Renewable energy forms	788	1157	1446	1674	1946	2061	2239	2363	2589	2748	2821	6.3	3.0	1.4	1.2
as % in Gross Inland Consumption															
Solids	34.4	34.3	38.6	35.4	33.6	34.0	31.2	30.1	15.9	18.6	22.4				
Oil	22.7	25.1	22.6	20.6	19.7	18.7	19.6	19.9	19.2	18.7	17.8				
Natural gas	15.7	14.0	12.6	17.4	18.6	18.8	20.5	23.1	21.4	19.4	18.0				
Nuclear	25.1	24.0	22.2	22.1	22.6	22.4	23.5	21.0	36.6	35.8	34.2				
Renewable energy forms	4.2	5.8	8.1	9.2	10.9	11.4	13.0	13.9	14.6	15.2	14.9				
Gross Electricity Generation in GWh_e	**40639**	**43964**	**46009**	**50140**	**51374**	**52206**	**58405**	**60581**	**62802**	**66106**	**71088**	**1.2**	**1.1**	**1.3**	**1.0**
Self consumption and grid losses	10533	9116	9220	8340	7953	8001	8278	8656	8435	9036	11601	-1.3	-1.5	0.4	1.7
Fuel Inputs to Thermal Power Generation	**5986**	**6689**	**7552**	**7041**	**6692**	**6921**	**6410**	**6726**	**4292**	**4706**	**5534**	**2.4**	**-1.2**	**-0.4**	**-0.7**
Solids	4928	5817	6611	5899	5500	5682	4935	4726	2442	3014	3907	3.0	-1.8	-1.1	-1.2
Oil (including refinery gas)	171	174	218	25	29	31	92	39	43	44	45	2.5	-18.1	12.0	-3.5
Gas (including derived gases)	884	697	719	1079	1121	1168	1330	1700	1460	1214	1042	-2.0	4.5	1.7	-1.2
Biomass & Waste	3	2	4	38	42	40	53	204	291	374	478	1.4	27.1	2.5	11.6
Geothermal heat	0	0	0	0	0	0	0	56	56	61	62	0.0	0.0	0.0	0.0
Hydrogen - Methanol	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Fuel Input to other conversion processes	**12382**	**13822**	**11449**	**10360**	**10286**	**9850**	**9664**	**9055**	**11863**	**11728**	**11563**	**-0.8**	**-1.1**	**-0.6**	**0.9**
Refineries	5479	6738	6205	5844	5560	5303	5135	4986	4847	4671	4504	1.3	-1.1	-0.8	-0.7
Biofuels and hydrogen production	0	0	13	47	214	202	209	202	191	189	178	0.0	31.9	-0.2	-0.8
District heating	324	368	304	409	430	274	258	275	336	380	396	-0.6	3.5	-5.0	2.2
Derived gases, cokeries etc.	6579	6717	4927	4060	4081	4071	4062	3592	6489	6487	6486	-2.9	-1.9	0.0	2.4
Energy Branch Consumption	**1062**	**1015**	**1002**	**880**	**832**	**827**	**831**	**849**	**805**	**846**	**1048**	**-0.6**	**-1.8**	**0.0**	**1.2**
Non-Energy Uses	**1265**	**1069**	**443**	**619**	**785**	**799**	**810**	**812**	**811**	**797**	**807**	**-10.0**	**5.9**	**0.3**	**0.0**
Final Energy Demand	**8640**	**9814**	**8842**	**9387**	**9461**	**9552**	**9676**	**9876**	**10205**	**10422**	**10680**	**0.2**	**0.7**	**0.2**	**0.5**
by sector															
Industry	3523	3714	2541	2695	2774	2836	2868	2926	3031	3053	3120	-3.2	0.9	0.3	0.4
- energy intensive industries	2681	2839	1768	1842	1896	1957	1974	2014	2086	2093	2122	-4.1	0.7	0.4	0.4
- other industrial sectors	842	875	772	853	878	878	894	912	945	960	998	-0.9	1.3	0.2	0.6
Residential	2155	2117	2246	2426	2435	2507	2543	2664	2809	2957	3077	0.4	0.8	0.4	1.0
Tertiary	969	1126	1175	1309	1352	1371	1381	1341	1359	1381	1402	1.9	1.4	0.2	0.1
Transport	1993	2856	2880	2957	2901	2839	2884	2945	3006	3031	3081	3.8	0.1	-0.1	0.3
by fuel															
Solids	879	978	470	486	468	433	398	361	347	328	312	-6.1	0.0	-1.6	-1.2
Oil	3003	3665	3142	3105	2899	2789	2791	2818	2850	2836	2839	0.5	-0.8	-0.4	0.1
Gas	1238	1243	981	1188	1130	1304	1198	1277	1314	1214	1267	-2.3	1.4	0.6	0.3
Electricity	2085	2211	2330	2615	2684	2743	2872	3021	3240	3448	3663	1.1	1.4	0.7	1.2
Heat (from CHP and District Heating)	879	939	963	1000	1033	957	1093	1177	1221	1332	1385	0.9	0.7	0.6	1.2
Renewable energy forms	555	777	956	993	1249	1327	1323	1222	1232	1263	1214	5.6	2.7	0.6	-0.4
Other fuels (hydrogen, ethanol)	0	0	0	0	0	0	0	0	0	1	1	0.0	0.0	13.0	8.4
RES in Gross Final Energy Consumption [(A)]	**679**	**1008**	**1336**	**1598**	**1871**	**1986**	**2137**	**2195**	**2427**	**2573**	**2621**	**7.0**	**3.4**	**1.3**	**1.0**
TOTAL GHG emissions (Mt of CO2 eq.)	**62.7**	**66.4**	**61.2**	**57.3**	**55.0**	**55.3**	**52.1**	**52.5**	**42.3**	**43.3**	**37.8**	**-0.2**	**-1.1**	**-0.5**	**-1.6**
of which ETS sectors (2013 scope) GHG emissions		40.6	35.8	33.3	31.8	32.5	29.7	29.7	19.8	21.0	15.6		-1.2	-0.7	-3.2
of which non ETS sectors GHG emissions		25.8	25.4	24.0	23.1	22.8	22.4	22.7	22.5	22.3	22.2		-0.9	-0.3	0.0
CO_2 Emissions (energy related)	**43.5**	**48.5**	**45.9**	**43.6**	**41.2**	**41.6**	**38.5**	**38.5**	**28.6**	**29.5**	**24.5**	**0.5**	**-1.1**	**-0.7**	**-2.2**
Power generation/District heating	24.6	27.9	31.2	28.5	26.9	27.4	24.6	24.5	14.4	15.7	10.7	2.4	-1.5	-0.9	-4.1
Energy Branch	2.5	1.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.6	-10.3	-1.3	-0.7	-0.3
Industry	8.3	8.2	3.8	4.1	4.0	4.3	4.0	4.0	4.1	3.8	3.7	-7.6	0.6	0.1	-0.4
Residential	1.4	1.2	1.0	1.0	1.0	0.9	0.7	0.7	0.7	0.6	0.6	-3.1	0.2	-3.2	-1.3
Tertiary	1.2	1.1	0.8	0.8	0.8	0.7	0.7	0.7	0.6	0.6	0.6	-3.9	-0.5	-1.1	-0.6
Transport	5.7	8.2	8.3	8.4	7.8	7.6	7.7	7.9	8.1	8.1	8.2	3.9	-0.6	-0.1	0.3
CO_2 Emissions (non energy related)	**3.9**	**4.6**	**3.1**	**3.1**	**3.7**	**3.7**	**3.8**	**4.1**	**4.3**	**4.3**	**3.9**	**-2.3**	**1.7**	**0.4**	**0.1**
Non-CO_2 GHG emissions	**15.3**	**13.3**	**12.2**	**10.6**	**10.1**	**10.0**	**9.8**	**9.8**	**9.4**	**9.5**	**9.5**	**-2.2**	**-1.9**	**-0.3**	**-0.2**
TOTAL GHG emissions Index (1990=100)	**54.5**	**57.7**	**53.2**	**49.8**	**47.8**	**48.1**	**45.3**	**45.6**	**36.8**	**37.7**	**32.9**				

Source: PRIMES

SUMMARY ENERGY BALANCE AND INDICATORS (B)															Bulgaria: Reference scenario
	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050	'00-'10	'10-'20	'20-'30	'30-'50
												Annual % Change			
Main Energy System Indicators															
Population (Million)	8.191	7.761	7.564	7.362	7.121	6.856	6.611	6.406	6.235	6.070	5.899	-0.8	-0.6	-0.7	-0.6
GDP (in 000 M€10)	24.2	31.6	36.1	40.9	45.1	48.0	51.5	55.4	59.2	62.3	64.9	4.1	2.3	1.3	1.2
Gross Inl. Cons./GDP (toe/M€10)	774.0	636.2	494.6	443.5	396.3	376.4	333.1	306.8	298.9	290.2	291.9	-4.4	-2.2	-1.7	-0.7
Carbon intensity (t of CO_2/toe of GIC)	2.33	2.41	2.57	2.40	2.31	2.30	2.24	2.27	1.61	1.63	1.29	1.0	-1.1	-0.3	-2.7
Import Dependency %	46.5	47.5	40.3	39.6	38.9	37.3	38.7	40.2	36.3	34.0	32.6				
Total energy-rel. and other mitigation costs [B] (in 000 M€10)	5.3	7.6	9.2	11.8	13.7	15.0	16.1	16.8	18.6	19.5	20.8	5.7	4.1	1.6	1.3
as % of GDP	21.7	24.0	25.5	28.9	30.3	31.3	31.2	30.3	31.4	31.3	32.1				
Energy intensity indicators															
Industry (Energy on Value added, index 2000=100)	100.0	78.7	40.5	38.3	36.2	35.0	32.8	31.3	30.2	28.9	28.2	-8.6	-1.1	-1.0	-0.8
Residential (Energy on Private Income, index 2000=100)	100.0	71.6	67.1	63.9	57.8	55.6	51.9	49.8	48.3	47.5	47.4	-3.9	-1.5	-1.1	-0.5
Tertiary (Energy on Value added, index 2000=100)	100.0	89.1	83.8	81.7	75.8	71.7	67.1	60.4	57.3	55.2	53.9	-1.8	-1.0	-1.2	-1.1
Passenger transport (toe/Mpkm)	26.2	26.8	23.8	23.1	20.8	19.1	18.4	17.9	17.6	17.5	17.4	-0.9	-1.3	-1.2	-0.3
Freight transport (toe/Mtkm)	46.9	55.8	49.5	47.9	46.2	43.2	41.5	40.6	39.7	38.7	38.3	0.5	-0.7	-1.1	-0.4
Carbon Intensity indicators															
Electricity and Steam production (t of CO_2/MWh)	0.46	0.49	0.51	0.44	0.40	0.41	0.33	0.32	0.18	0.18	0.12	1.2	-2.4	-2.0	-5.0
Final energy demand (t of CO_2/toe)	1.91	1.91	1.57	1.53	1.43	1.42	1.36	1.35	1.32	1.26	1.23	-1.9	-0.9	-0.5	-0.5
Industry	2.35	2.22	1.48	1.50	1.44	1.50	1.40	1.38	1.35	1.23	1.20	-4.5	-0.3	-0.3	-0.8
Residential	0.63	0.58	0.44	0.43	0.42	0.35	0.29	0.27	0.23	0.21	0.18	-3.5	-0.6	-3.6	-2.3
Tertiary	1.24	0.97	0.69	0.60	0.57	0.54	0.50	0.49	0.46	0.45	0.43	-5.7	-1.9	-1.3	-0.7
Transport [C]	2.84	2.87	2.88	2.85	2.69	2.69	2.68	2.68	2.68	2.67	2.68	0.1	-0.7	0.0	0.0
Indicators for renewables															
Share of RES in Gross Final Energy Consumption [D] (%)	6.8	9.1	13.2	15.6	18.2	19.2	20.3	20.4	21.9	22.7	22.1				
RES in transport (%)	0.1	0.2	0.8	2.5	10.1	10.1	10.6	10.5	10.2	10.4	10.0				
Gross Electricity generation by source (in GWh_e) [E]	**40646**	**43972**	**46017**	**50140**	**51374**	**52206**	**58405**	**60581**	**62802**	**66106**	**71088**	**1.2**	**1.1**	**1.3**	**1.0**
Nuclear energy	18178	18653	15249	15310	15310	15310	15310	15450	28197	28197	28197	-1.7	0.0	0.0	3.1
Solids	16941	18458	22606	22209	21343	22026	24062	23239	12612	15771	21005	2.9	-0.6	1.2	-0.7
Oil (including refinery gas)	661	606	393	101	101	81	473	218	101	178	204	-5.1	-12.7	16.7	-4.1
Gas (including derived gases)	2178	1896	1967	4913	6868	6892	8611	10789	9285	7800	6737	-1.0	13.3	2.3	-1.2
Biomass-waste	15	17	49	172	187	179	260	1025	1499	1948	2520	12.6	14.3	3.3	12.0
Hydro (pumping excluded)	2673	4337	5057	4686	4657	4585	4631	4680	4723	4762	4810	6.6	-0.8	-0.1	0.2
Wind	0	5	681	1337	1395	1440	2684	2684	3813	3892	3908	0.0	7.4	6.8	1.9
Solar	0	0	15	1414	1515	1693	2375	2430	2506	3488	3634	0.0	58.8	4.6	2.2
Geothermal and other renewables	0	0	0	0	0	0	0	65	65	70	72	0.0	-93.4	-100.0	0.0
Other fuels (hydrogen, methanol)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Net Generation Capacity in MW_e	**9723**	**9899**	**8665**	**10234**	**11232**	**11922**	**13355**	**12888**	**14946**	**15645**	**16385**	**-1.1**	**2.6**	**1.7**	**1.0**
Nuclear energy	3473	2678	1885	1910	1923	1923	1923	1939	3539	3539	3539	-5.9	0.2	0.0	3.1
Renewable energy	977	1977	2607	4194	4323	4412	5333	5360	6227	6868	6972	10.3	5.2	2.1	1.3
Hydro (pumping excluded)	977	1967	2207	2284	2284	2284	2284	2284	2284	2284	2284	8.5	0.3	0.0	0.0
Wind	0	10	375	850	923	923	1515	1515	2346	2346	2354	0.0	9.4	5.1	2.2
Solar	0	0	25	1060	1116	1205	1534	1561	1598	2238	2334	0.0	46.2	3.2	2.1
Other renewables (tidal etc.)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Thermal power	5273	5244	4174	4130	4986	5587	6099	5588	5180	5238	5874	-2.3	1.8	2.0	-0.2
of which cogeneration units	1129	1177	970	1093	1510	2020	2368	2503	2553	2769	2892	-1.5	4.5	4.6	1.0
of which CCS units	0	0	0	0	0	0	0	0	0	104	1235	0.0	0.0	0.0	0.0
Solids fired	4426	4375	3285	2711	2891	2866	3518	2943	2563	2631	3762	-2.9	-1.3	2.0	0.3
Gas fired	578	600	615	1105	1803	2346	2283	2384	2308	2292	1773	0.6	11.4	2.4	-1.3
Oil fired	235	234	262	264	237	320	239	192	195	158	158	1.1	-1.0	0.1	-2.1
Biomass-waste fired	35	35	11	50	55	55	59	62	106	149	174	-11.1	17.6	0.7	5.6
Hydrogen plants	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Geothermal heat	0	0	0	0	0	0	0	7	7	8	8	0.0	0.0	0.0	0.0
Avg. Load factor of net power capacity [F] (%)	43.0	46.0	54.8	52.3	49.3	47.1	47.2	50.6	45.6	45.6	45.4				
Electricity indicators															
Efficiency of gross thermal power generation (%)	28.4	27.0	28.5	33.5	36.6	36.3	44.8	45.2	47.2	47.1	47.5				
% of gross electricity from CHP	7.8	6.1	8.0	12.1	17.0	19.3	22.9	24.5	23.4	24.1	23.7				
% of electricity from CCS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	18.4				
Carbon free gross electricity generation (%)	51.3	52.3	45.7	45.7	44.9	44.5	43.2	43.5	65.0	64.1	60.7				
- nuclear	44.7	42.4	33.1	30.5	29.8	29.3	26.2	25.5	44.9	42.7	39.7				
- renewable energy forms	6.6	9.9	12.6	15.2	15.1	15.1	17.0	18.0	20.1	21.4	21.0				
Transport sector															
Passenger transport activity (Gpkm)	**47.7**	**56.0**	**65.5**	**68.3**	**71.0**	**73.8**	**76.8**	**79.4**	**82.0**	**83.7**	**85.5**	**3.2**	**0.8**	**0.8**	**0.5**
Public road transport	14.6	13.7	10.6	10.9	11.2	11.5	11.9	12.2	12.5	12.6	12.7	-3.1	0.6	0.6	0.4
Private cars and motorcycles	27.5	35.8	47.9	49.1	50.0	50.9	51.8	52.9	53.7	54.0	54.1	5.7	0.4	0.4	0.2
Rail	3.9	2.8	3.0	3.4	3.8	4.1	4.4	4.5	4.7	4.8	4.9	-2.5	2.4	1.4	0.6
Aviation	1.7	3.6	3.9	4.8	6.0	7.2	8.7	9.8	11.1	12.3	13.7	8.9	4.5	3.8	2.3
Inland navigation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-2.4	0.6	0.4	0.2
Freight transport activity (Gtkm)	**12.3**	**20.3**	**23.7**	**25.4**	**27.3**	**29.3**	**31.5**	**33.4**	**35.3**	**36.5**	**37.7**	**6.8**	**1.4**	**1.5**	**0.9**
Trucks	6.4	14.4	19.4	20.6	21.8	23.1	24.5	26.0	27.5	28.4	29.3	11.7	1.1	1.2	0.9
Rail	5.5	5.2	3.1	3.5	4.0	4.6	5.2	5.5	5.8	6.0	6.2	-5.7	2.7	2.7	0.9
Inland navigation	0.3	0.8	1.2	1.4	1.5	1.6	1.8	1.9	2.0	2.1	2.1	14.3	2.4	1.6	0.9
Energy demand in transport (ktoe) [G]	**1822**	**2632**	**2730**	**2792**	**2738**	**2678**	**2722**	**2778**	**2843**	**2875**	**2929**	**4.1**	**0.0**	**-0.1**	**0.4**
Public road transport	142	131	99	99	101	99	99	99	100	98	98	-3.6	0.2	-0.1	-0.1
Private cars and motorcycles	987	1156	1270	1246	1119	1023	993	982	972	961	953	2.6	-1.3	-1.2	-0.2
Trucks	513	1075	1129	1171	1207	1213	1248	1296	1341	1356	1388	8.2	0.7	0.3	0.5
Rail	78	65	46	49	53	57	61	61	60	58	55	-5.2	1.6	1.3	-0.5
Aviation	101	201	182	220	250	279	313	331	362	394	426	6.1	3.2	2.3	1.6
Inland navigation	2	4	6	7	7	8	8	9	9	9	9	13.8	2.1	1.3	0.6

Source: PRIMES

Croatia: Reference scenario												SUMMARY ENERGY BALANCE AND INDICATORS (A)			
ktoe	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**	**'00-'10**	**'10-'20**	**'20-'30**	**'30-'50**
												Annual % Change			
Production (incl.recovery of products)	**3590**	**3808**	**4216**	**3021**	**2248**	**2265**	**2385**	**2463**	**2583**	**2657**	**2595**	**1.6**	**-6.1**	**0.6**	**0.4**
Solids	0	0	0	0	0	0	0	0	0	0	0	-91.0	-100.0	0.0	0.0
Oil	1355	1037	761	634	552	482	428	380	332	284	234	-5.6	-3.2	-2.5	-3.0
Natural gas	1355	1865	2215	995	0	0	0	0	0	0	0	5.0	-100.0	0.0	0.0
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Renewable energy sources	880	906	1239	1392	1696	1783	1957	2083	2251	2374	2361	3.5	3.2	1.4	0.9
Hydro	505	545	716	588	599	617	675	690	725	742	752	3.6	-1.8	1.2	0.5
Biomass & Waste	375	360	499	666	849	847	934	1031	1090	1135	1113	2.9	5.4	1.0	0.9
Wind	0	1	12	67	112	122	125	125	170	189	197	0.0	25.0	1.1	2.3
Solar and others	0	0	5	57	122	185	213	226	255	296	286	0.0	37.1	5.7	1.5
Geothermal	0	0	7	13	15	12	10	10	11	12	12	0.0	8.1	-4.1	1.1
Net Imports	**4176**	**5262**	**4481**	**5693**	**6363**	**6258**	**6220**	**6217**	**6225**	**6302**	**6450**	**0.7**	**3.6**	**-0.2**	**0.2**
Solids	478	624	699	505	483	323	262	345	343	245	229	3.9	-3.6	-5.9	-0.7
Oil	2448	3637	3000	2914	2800	2775	2856	2873	2904	2934	2968	2.1	-0.7	0.2	0.2
- Crude oil and Feedstocks	3987	4374	3662	3526	3416	3370	3402	3377	3362	3347	3332	-0.8	-0.7	0.0	-0.1
- Oil products	-1539	-737	-662	-613	-615	-595	-546	-504	-458	-413	-364	-8.1	-0.7	-1.2	-2.0
Natural gas	905	562	475	1969	2718	2799	2692	2566	2643	2877	2953	-6.2	19.0	-0.1	0.5
Electricity	344	440	410	419	486	478	532	573	486	385	439	1.8	1.7	0.9	-1.0
Gross Inland Consumption	**7847**	**8961**	**8575**	**8707**	**8604**	**8516**	**8598**	**8672**	**8800**	**8952**	**9037**	**0.9**	**0.0**	**0.0**	**0.2**
Solids	431	683	683	505	483	323	262	345	343	245	229	4.7	-3.4	-5.9	-0.7
Oil	3983	4556	3713	3541	3345	3250	3277	3246	3229	3210	3195	-0.7	-1.0	-0.2	-0.1
Natural gas	2209	2377	2632	2964	2718	2799	2692	2565	2643	2876	2953	1.8	0.3	-0.1	0.5
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Electricity	344	440	410	419	486	478	532	573	486	385	439	1.8	1.7	0.9	-1.0
Renewable energy forms	880	906	1137	1278	1571	1667	1835	1943	2101	2235	2221	2.6	3.3	1.6	1.0
as % in Gross Inland Consumption															
Solids	5.5	7.6	8.0	5.8	5.6	3.8	3.0	4.0	3.9	2.7	2.5				
Oil	50.8	50.8	43.3	40.7	38.9	38.2	38.1	37.4	36.7	35.9	35.4				
Natural gas	28.2	26.5	30.7	34.0	31.6	32.9	31.3	29.6	30.0	32.1	32.7				
Nuclear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Renewable energy forms	11.2	10.1	13.3	14.7	18.3	19.6	21.3	22.4	23.9	25.0	24.6				
Gross Electricity Generation in GWh_e	**10588**	**12352**	**13997**	**14253**	**14490**	**14171**	**14783**	**15426**	**17474**	**20116**	**20504**	**2.8**	**0.3**	**0.2**	**1.6**
Self consumption and grid losses	2476	2639	2538	2391	2469	2438	2589	2747	2886	3026	3158	0.2	-0.3	0.5	1.0
Fuel Inputs to Thermal Power Generation	**1249**	**1481**	**1271**	**1259**	**1127**	**1026**	**1015**	**983**	**1085**	**1303**	**1317**	**0.2**	**-1.2**	**-1.0**	**1.3**
Solids	357	537	532	364	343	197	134	215	213	116	100	4.1	-4.3	-9.0	-1.4
Oil (including refinery gas)	395	450	121	37	32	31	31	29	48	55	55	-11.1	-12.5	-0.2	2.9
Gas (including derived gases)	497	490	611	813	724	705	687	554	628	868	916	2.1	1.7	-0.5	1.4
Biomass & Waste	0	4	7	44	28	93	163	185	196	265	246	38.4	15.1	19.4	2.1
Geothermal heat	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Hydrogen - Methanol	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Fuel Input to other conversion processes	**5440**	**5375**	**4419**	**4198**	**4163**	**4031**	**4006**	**3943**	**3875**	**3789**	**3744**	**-2.1**	**-0.6**	**-0.4**	**-0.3**
Refineries	5345	5259	4314	4057	3865	3747	3720	3648	3588	3526	3465	-2.1	-1.1	-0.4	-0.4
Biofuels and hydrogen production	0	0	3	43	180	167	166	165	158	149	152	0.0	51.3	-0.8	-0.4
District heating	83	104	97	98	118	115	119	128	127	113	125	1.6	2.0	0.0	0.3
Derived gases, cokeries etc.	12	13	4	0	0	1	1	1	1	1	2	-9.8	-21.8	11.4	1.7
Energy Branch Consumption	**831**	**832**	**744**	**612**	**512**	**498**	**491**	**484**	**479**	**473**	**464**	**-1.1**	**-3.7**	**-0.4**	**-0.3**
Non-Energy Uses	**682**	**715**	**596**	**612**	**594**	**599**	**589**	**584**	**578**	**571**	**564**	**-1.3**	**0.0**	**-0.1**	**-0.2**
Final Energy Demand	**5345**	**6335**	**6333**	**6715**	**6811**	**6778**	**6867**	**7013**	**7104**	**7230**	**7315**	**1.7**	**0.7**	**0.1**	**0.3**
by sector															
Industry	1392	1580	1377	1495	1562	1600	1599	1650	1689	1761	1790	-0.1	1.3	0.2	0.6
- energy intensive industries	847	911	752	790	815	827	843	872	905	987	1015	-1.2	0.8	0.3	0.9
- other industrial sectors	545	668	624	705	747	773	757	778	784	774	775	1.4	1.8	0.1	0.1
Residential	1664	1926	1892	2000	1989	1987	1977	2004	2002	2019	2018	1.3	0.5	-0.1	0.1
Tertiary	758	921	1006	1032	1091	1084	1145	1187	1224	1264	1296	2.9	0.8	0.5	0.6
Transport	1531	1908	2058	2188	2169	2107	2146	2171	2188	2186	2212	3.0	0.5	-0.1	0.2
by fuel															
Solids	74	146	150	141	138	126	128	130	130	129	129	7.3	-0.9	-0.7	0.0
Oil	2665	3093	2888	2891	2721	2639	2665	2642	2636	2624	2616	0.8	-0.6	-0.2	-0.1
Gas	1009	1243	1288	1425	1346	1454	1392	1409	1421	1435	1467	2.5	0.4	0.3	0.3
Electricity	1009	1240	1364	1412	1498	1465	1559	1642	1718	1832	1908	3.1	0.9	0.4	1.0
Heat (from CHP and District Heating)	213	257	245	276	281	288	287	287	281	285	285	1.4	1.4	0.2	0.0
Renewable energy forms	375	356	398	570	827	806	836	901	916	922	906	0.6	7.6	0.1	0.4
Other fuels (hydrogen, ethanol)	0	0	0	0	0	1	1	1	2	3	3	0.0	51.2	12.1	5.3
RES in Gross Final Energy Consumption [(A)]	**815**	**847**	**942**	**1263**	**1544**	**1591**	**1703**	**1824**	**1958**	**2077**	**2057**	**1.5**	**5.1**	**1.0**	**1.0**
TOTAL GHG emissions (Mt of CO2 eq.)	**25.7**	**30.1**	**27.9**	**26.8**	**24.9**	**24.3**	**23.4**	**23.2**	**23.3**	**21.7**	**21.7**	**0.8**	**-1.1**	**-0.6**	**-0.4**
of which ETS sectors (2013 scope) GHG emissions		12.6	10.7	10.2	9.2	8.5	7.9	8.0	8.2	6.7	6.7		-1.6	-1.5	-0.8
of which non ETS sectors GHG emissions		17.6	17.1	16.6	15.8	15.8	15.5	15.2	15.1	15.0	15.0		-0.8	-0.1	-0.2
CO_2 Emissions (energy related)	**16.9**	**20.2**	**18.5**	**18.0**	**16.8**	**16.1**	**15.7**	**15.7**	**15.8**	**15.9**	**16.0**	**0.9**	**-1.0**	**-0.7**	**0.1**
Power generation/District heating	4.1	5.1	4.3	3.7	3.5	2.8	2.5	2.5	2.7	2.8	2.9	0.3	-2.1	-3.2	0.8
Energy Branch	2.0	2.0	1.8	1.5	1.3	1.2	1.2	1.2	1.2	1.1	1.1	-1.1	-3.2	-0.6	-0.6
Industry	2.9	3.5	2.8	3.0	2.9	2.9	2.9	2.8	2.8	2.8	2.8	-0.2	0.2	-0.1	0.0
Residential	1.9	2.4	2.1	2.0	1.9	2.0	2.0	2.1	2.0	2.0	2.0	1.0	-0.9	0.5	-0.2
Tertiary	1.5	1.5	1.4	1.4	1.3	1.3	1.2	1.2	1.2	1.2	1.2	-0.6	-0.4	-1.0	-0.1
Transport	4.5	5.7	6.1	6.4	5.9	5.7	5.8	5.9	6.0	6.0	6.0	3.1	-0.4	-0.1	0.2
CO_2 Emissions (non energy related)	**2.6**	**3.1**	**2.5**	**2.7**	**2.9**	**2.9**	**2.4**	**2.3**	**2.3**	**0.5**	**0.4**	**-0.3**	**1.2**	**-1.8**	**-8.6**
Non-CO_2 GHG emissions	**6.2**	**6.9**	**6.8**	**6.1**	**5.2**	**5.3**	**5.4**	**5.2**	**5.2**	**5.3**	**5.3**	**1.0**	**-2.6**	**0.3**	**-0.1**
TOTAL GHG emissions Index (1990=100)	**80.8**	**94.8**	**87.6**	**84.2**	**78.4**	**76.4**	**73.7**	**72.8**	**73.3**	**68.2**	**68.2**				

Source: PRIMES

SUMMARY ENERGY BALANCE AND INDICATORS (B)															Croatia: Reference scenario
	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050	'00-'10	'10-'20	'20-'30	'30-'50
												Annual % Change			
Main Energy System Indicators															
Population (Million)	4.506	4.466	4.426	4.554	4.632	4.659	4.658	4.646	4.629	4.609	4.573	-0.2	0.5	0.1	-0.1
GDP (in 000 M€10)	35.3	43.9	45.9	51.0	56.6	62.2	67.6	73.4	77.7	81.8	85.4	2.7	2.1	1.8	1.2
Gross Inl. Cons./GDP (toe/M€10)	222.5	204.3	186.8	170.7	152.0	136.9	127.2	118.1	113.2	109.4	105.8	-1.7	-2.0	-1.8	-0.9
Carbon intensity (t of CO_2/toe of GIC)	2.16	2.25	2.16	2.07	1.96	1.89	1.82	1.81	1.80	1.78	1.77	0.0	-1.0	-0.7	-0.1
Import Dependency %	53.1	58.6	52.2	65.3	73.9	73.4	72.3	71.6	70.7	70.3	71.3				
Total energy-rel. and other mitigation costs [B] (in 000 M€10)	4.2	6.1	9.0	11.3	12.6	13.7	14.7	15.5	16.2	16.9	17.3	7.9	3.4	1.6	0.8
as % of GDP	11.9	14.0	19.6	22.1	22.2	22.0	21.8	21.1	20.8	20.7	20.2				
Energy intensity indicators															
Industry (Energy on Value added, index 2000=100)	0.0	0.0	100.0	98.2	91.8	86.3	83.5	81.5	80.1	81.7	81.2	0.0	-0.8	-0.9	-0.1
Residential (Energy on Private Income, index 2000=100)	112.1	102.7	100.0	92.5	80.9	71.8	64.5	59.0	54.9	52.0	49.3	-1.1	-2.1	-2.2	-1.3
Tertiary (Energy on Value added, index 2000=100)	0.0	0.0	100.0	89.6	86.3	77.5	75.5	73.0	71.8	71.5	71.4	0.0	-1.5	-1.3	-0.3
Passenger transport (toe/Mpkm)	47.4	41.7	41.6	39.6	35.6	31.8	29.4	27.8	26.7	25.9	25.2	-1.3	-1.5	-1.9	-0.8
Freight transport (toe/Mtkm)	42.1	43.1	52.5	53.4	49.5	44.9	43.9	43.9	42.2	40.7	40.4	2.2	-0.6	-1.2	-0.4
Carbon Intensity indicators															
Electricity and Steam production (t of CO_2/MWh)	0.31	0.32	0.25	0.21	0.19	0.16	0.13	0.13	0.13	0.12	0.12	-2.2	-2.6	-3.4	-0.6
Final energy demand (t of CO_2/toe)	2.01	2.06	1.97	1.90	1.77	1.77	1.74	1.70	1.68	1.65	1.64	-0.2	-1.1	-0.2	-0.3
Industry	2.07	2.22	2.06	2.00	1.85	1.82	1.79	1.69	1.66	1.59	1.58	0.0	-1.1	-0.3	-0.6
Residential	1.15	1.25	1.12	1.02	0.97	1.03	1.03	1.02	1.00	0.99	0.98	-0.3	-1.4	0.6	-0.3
Tertiary	1.94	1.59	1.38	1.31	1.22	1.21	1.06	1.00	0.96	0.94	0.91	-3.3	-1.2	-1.4	-0.8
Transport [C]	2.94	2.97	2.97	2.92	2.72	2.72	2.72	2.72	2.72	2.73	2.72	0.1	-0.9	0.0	0.0
Indicators for renewables															
Share of RES in Gross Final Energy Consumption [D] (%)	14.5	12.8	14.2	18.1	21.9	22.6	23.9	25.0	26.5	27.6	27.0				
RES in transport (%)	0.4	0.4	0.4	1.7	10.3	10.4	10.6	10.8	10.9	11.0	11.3				
Gross Electricity generation by source (in GWh_e) [E]	**10590**	**12354**	**13999**	**14253**	**14490**	**14171**	**14783**	**15426**	**17474**	**20116**	**20504**	**2.8**	**0.3**	**0.2**	**1.6**
Nuclear energy	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Solids	1551	2328	2385	1288	1235	695	468	751	729	403	351	4.4	-6.4	-9.2	-1.4
Oil (including refinery gas)	1594	1855	560	192	185	181	182	184	296	337	336	-9.9	-10.5	-0.2	3.1
Gas (including derived gases)	1571	1814	2553	4941	4645	4020	3863	3945	4558	6342	6706	5.0	6.2	-1.8	2.8
Biomass-waste	0	14	33	188	126	409	695	795	842	1289	1153	0.0	14.4	18.6	2.6
Hydro (pumping excluded)	5874	6333	8329	6842	6965	7179	7853	8022	8430	8625	8744	3.6	-1.8	1.2	0.5
Wind	0	10	139	785	1299	1417	1451	1456	1974	2196	2291	0.0	25.0	1.1	2.3
Solar	0	0	0	17	35	269	272	272	646	923	923	0.0	76.8	22.8	6.3
Geothermal and other renewables	0	0	0	0	0	0	0	0	0	0	0	0.0	-100.0	0.0	0.0
Other fuels (hydrogen, methanol)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Net Generation Capacity in MW_e	**3310**	**3587**	**3850**	**4774**	**5198**	**5442**	**5931**	**6373**	**6877**	**7376**	**7646**	**1.5**	**3.0**	**1.3**	**1.3**
Nuclear energy	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Renewable energy	1786	1842	1989	2457	2714	2913	3099	3132	3685	3978	4031	1.1	3.2	1.3	1.3
Hydro (pumping excluded)	1786	1836	1900	2047	2047	2036	2204	2235	2312	2331	2346	0.6	0.7	0.7	0.3
Wind	0	6	89	394	640	697	713	715	948	1040	1079	0.0	21.8	1.1	2.1
Solar	0	0	0	16	27	180	182	182	426	606	606	0.0	70.3	20.9	6.2
Other renewables (tidal etc.)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Thermal power	1524	1745	1861	2317	2485	2529	2831	3241	3192	3398	3615	2.0	2.9	1.3	1.2
of which cogeneration units	558	515	486	515	561	507	503	640	573	979	1060	-1.4	1.4	-1.1	3.8
of which CCS units	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Solids fired	313	321	325	316	204	204	190	190	190	190	102	0.4	-4.6	-0.7	-3.0
Gas fired	781	986	1097	1553	1841	1906	2231	2966	2900	2878	3172	3.5	5.3	1.9	1.8
Oil fired	387	394	396	400	391	361	361	45	62	56	66	0.2	-0.1	-0.8	-8.1
Biomass-waste fired	44	44	43	48	48	59	50	41	41	274	274	-0.2	1.2	0.5	8.9
Hydrogen plants	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Geothermal heat	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Avg. Load factor of net power capacity [F] (%)	35.0	37.8	40.1	33.3	31.2	29.0	27.8	27.0	28.4	30.5	30.0				
Electricity indicators															
Efficiency of gross thermal power generation (%)	32.5	34.9	37.4	45.1	47.2	44.5	44.1	49.6	50.9	55.2	55.8				
% of gross electricity from CHP	17.0	16.8	14.3	18.5	19.1	17.0	16.2	23.8	20.2	24.2	22.5				
% of electricity from CCS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Carbon free gross electricity generation (%)	55.5	51.5	60.7	54.9	58.1	65.4	69.5	68.4	68.1	64.8	63.9				
- nuclear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
- renewable energy forms	55.5	51.5	60.7	54.9	58.1	65.4	69.5	68.4	68.1	64.8	63.9				
Transport sector															
Passenger transport activity (Gpkm)	**28.0**	**32.9**	**34.9**	**38.2**	**41.7**	**44.9**	**48.3**	**50.6**	**53.1**	**54.8**	**56.6**	**2.2**	**1.8**	**1.5**	**0.8**
Public road transport	3.3	3.4	3.4	3.7	4.0	4.2	4.5	4.6	4.7	4.8	4.9	0.1	1.8	1.0	0.4
Private cars and motorcycles	20.2	24.2	26.0	28.1	30.2	32.1	34.1	35.1	36.0	36.3	36.4	2.6	1.5	1.2	0.3
Rail	1.8	1.8	2.3	2.5	2.7	2.8	3.0	3.1	3.2	3.3	3.4	2.7	1.6	1.2	0.6
Aviation	2.8	3.4	3.1	3.9	4.8	5.7	6.7	7.8	9.1	10.4	11.8	1.3	4.3	3.5	2.9
Inland navigation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	210.3	1.6	1.4	0.6
Freight transport activity (Gtkm)	**4.7**	**12.3**	**11.5**	**12.6**	**13.7**	**15.0**	**16.4**	**17.3**	**18.2**	**18.8**	**19.4**	**9.4**	**1.7**	**1.8**	**0.8**
Trucks	2.9	9.3	8.8	9.6	10.5	11.5	12.6	13.4	14.1	14.7	15.2	11.9	1.8	1.9	0.9
Rail	1.8	2.8	2.6	2.8	3.0	3.3	3.6	3.7	3.8	3.9	3.9	3.9	1.4	1.7	0.4
Inland navigation	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	8.5	1.7	1.8	0.8
Energy demand in transport (ktoe) [G]	**1525**	**1901**	**2056**	**2184**	**2165**	**2103**	**2141**	**2167**	**2184**	**2182**	**2208**	**3.0**	**0.5**	**-0.1**	**0.2**
Public road transport	54	54	54	57	60	61	61	60	61	60	60	0.0	1.2	0.1	0.0
Private cars and motorcycles	1182	1212	1270	1307	1259	1184	1155	1130	1122	1105	1093	0.7	-0.1	-0.9	-0.3
Trucks	147	461	537	606	610	602	646	682	690	685	705	13.9	1.3	0.6	0.4
Rail	41	47	49	44	44	44	45	45	45	44	43	1.9	-1.2	0.3	-0.3
Aviation	74	96	108	129	148	165	183	196	213	231	251	3.9	3.2	2.2	1.6
Inland navigation	28	33	38	41	44	47	51	53	55	56	57	2.8	1.6	1.5	0.5

Source: PRIMES

Cyprus: Reference scenario												SUMMARY ENERGY BALANCE AND INDICATORS (A)			
ktoe	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**	**'00-'10**	**'10-'20**	**'20-'30**	**'30-'50**
												Annual % Change			
Production (incl.recovery of products)	**44**	**51**	**85**	**146**	**1071**	**2939**	**4993**	**5834**	**6911**	**7430**	**7338**	**6.7**	**28.9**	**16.6**	**1.9**
Solids	0	0	0	0	0	0	0	0	0	0	0	-13.2	-100.0	0.0	0.0
Oil	0	0	1	1	1	1	1	1	1	1	1	95.5	0.0	0.0	0.0
Natural gas	0	0	0	0	864	2646	4626	5412	6474	6972	6880	0.0	0.0	18.3	2.0
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Renewable energy sources	44	51	84	146	206	292	366	421	436	456	457	6.6	9.4	5.9	1.1
Hydro	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Biomass & Waste	9	10	19	35	44	57	63	63	64	61	56	8.2	8.6	3.6	-0.6
Wind	0	0	3	27	53	63	73	87	87	87	87	0.0	34.7	3.4	0.9
Solar and others	35	41	61	82	106	167	224	264	279	304	311	5.6	5.6	7.7	1.7
Geothermal	0	0	1	2	3	5	7	6	5	4	4	0.0	16.1	7.3	-3.1
Net Imports	**2545**	**2822**	**2924**	**2904**	**1759**	**-145**	**-2102**	**-2943**	**-3922**	**-4374**	**-4240**	**1.4**	**-5.0**	**0.0**	**3.6**
Solids	33	43	11	15	13	11	11	10	11	10	10	-10.4	1.7	-2.0	-0.2
Oil	2511	2773	2890	2832	1679	1613	1656	1667	1711	1726	1748	1.4	-5.3	-0.1	0.3
- Crude oil and Feedstocks	1153	0	0	-1	-1	-1	-1	-1	-1	-1	-1	-100.0	0.0	0.0	0.0
- Oil products	1358	2773	2890	2833	1680	1614	1657	1668	1711	1727	1749	7.8	-5.3	-0.1	0.3
Natural gas	0	0	0	1	-48	-1883	-3893	-4761	-5809	-6293	-6199	0.0	0.0	55.3	2.4
Electricity	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	-4.0	-3.4
Gross Inland Consumption	**2393**	**2518**	**2717**	**2834**	**2593**	**2545**	**2625**	**2609**	**2686**	**2728**	**2740**	**1.3**	**-0.5**	**0.1**	**0.2**
Solids	32	36	17	15	13	11	11	10	11	10	10	-6.4	-2.5	-2.0	-0.2
Oil	2315	2426	2592	2617	1447	1373	1401	1401	1426	1421	1418	1.1	-5.7	-0.3	0.1
Natural gas	0	0	0	0	813	756	723	636	647	658	653	0.0	0.0	-1.2	-0.5
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Electricity	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	-7.8	0.0
Renewable energy forms	46	57	108	201	320	406	491	561	601	639	658	9.0	11.5	4.4	1.5
as % in Gross Inland Consumption															
Solids	1.4	1.4	0.6	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4				
Oil	96.7	96.3	95.4	92.4	55.8	53.9	53.4	53.7	53.1	52.1	51.8				
Natural gas	0.0	0.0	0.0	0.0	31.3	29.7	27.5	24.4	24.1	24.1	23.8				
Nuclear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Renewable energy forms	1.9	2.3	4.0	7.1	12.4	15.9	18.7	21.5	22.4	23.4	24.0				
Gross Electricity Generation in GWh_e	**3369**	**4376**	**5344**	**5655**	**6482**	**6679**	**7162**	**7177**	**7570**	**8029**	**8314**	**4.7**	**1.9**	**1.0**	**0.7**
Self consumption and grid losses	357	414	460	493	416	404	415	401	419	439	455	2.6	-1.0	0.0	0.5
Fuel Inputs to Thermal Power Generation	**881**	**1077**	**1176**	**1114**	**863**	**781**	**754**	**671**	**695**	**708**	**709**	**2.9**	**-3.1**	**-1.3**	**-0.3**
Solids	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Oil (including refinery gas)	881	1077	1176	1089	30	5	6	0	0	0	0	2.9	-30.7	-15.5	-100.0
Gas (including derived gases)	0	0	0	0	805	748	715	629	639	650	641	0.0	0.0	-1.2	-0.5
Biomass & Waste	0	0	0	25	28	28	33	42	56	58	68	0.0	0.0	1.8	3.6
Geothermal heat	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Hydrogen - Methanol	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Fuel Input to other conversion processes	**1171**	**0**	**15**	**20**	**73**	**69**	**67**	**66**	**66**	**66**	**69**	**-35.3**	**17.1**	**-0.9**	**0.2**
Refineries	1171	0	0	0	0	0	0	0	0	0	0	-100.0	0.0	0.0	0.0
Biofuels and hydrogen production	0	0	15	19	71	65	62	61	62	61	64	0.0	16.8	-1.3	0.1
District heating	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Derived gases, cokeries etc.	0	0	0	0	2	4	4	4	4	4	5	-9.0	0.0	8.8	0.5
Energy Branch Consumption	**54**	**22**	**21**	**23**	**13**	**11**	**10**	**9**	**10**	**10**	**11**	**-9.0**	**-4.8**	**-2.0**	**0.1**
Non-Energy Uses	**84**	**70**	**83**	**84**	**82**	**81**	**85**	**90**	**96**	**102**	**108**	**-0.1**	**-0.2**	**0.3**	**1.2**
Final Energy Demand	**1632**	**1816**	**1921**	**2043**	**2089**	**2098**	**2186**	**2200**	**2258**	**2295**	**2313**	**1.6**	**0.8**	**0.5**	**0.3**
by sector															
Industry	441	319	236	262	255	253	268	283	304	321	325	-6.1	0.8	0.5	1.0
- energy intensive industries	237	204	174	202	197	195	208	218	235	248	248	-3.0	1.2	0.6	0.9
- other industrial sectors	204	115	61	60	58	58	60	65	69	74	77	-11.3	-0.5	0.3	1.2
Residential	227	329	373	377	381	381	376	363	361	357	348	5.1	0.2	-0.1	-0.4
Tertiary	114	195	273	311	365	387	422	419	424	448	461	9.1	3.0	1.5	0.4
Transport	850	972	1039	1093	1089	1078	1119	1136	1169	1169	1179	2.0	0.5	0.3	0.3
by fuel															
Solids	32	36	18	15	13	11	11	10	11	10	10	-5.7	-3.2	-2.0	-0.2
Oil	1300	1386	1375	1445	1335	1287	1311	1311	1330	1318	1310	0.6	-0.3	-0.2	0.0
Gas	0	0	0	0	8	8	8	7	8	8	12	0.0	0.0	0.2	2.1
Electricity	258	341	420	444	521	539	580	582	614	651	674	5.0	2.2	1.1	0.8
Heat (from CHP and District Heating)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	5.0	3.1
Renewable energy forms	42	54	107	139	210	250	272	285	291	301	300	9.8	7.0	2.6	0.5
Other fuels (hydrogen, ethanol)	0	0	0	0	2	4	4	5	5	5	6	7.2	0.0	9.0	1.5
RES in Gross Final Energy Consumption [(A)]	**42**	**51**	**103**	**169**	**281**	**355**	**425**	**481**	**498**	**522**	**529**	**9.4**	**10.6**	**4.2**	**1.1**
TOTAL GHG emissions (Mt of CO2 eq.)	**10.9**	**10.3**	**10.1**	**9.8**	**8.0**	**7.8**	**7.8**	**7.6**	**7.8**	**7.9**	**7.9**	**-0.7**	**-2.3**	**-0.3**	**0.1**
of which ETS sectors (2013 scope) GHG emissions		6.0	5.8	5.8	4.3	4.1	4.0	3.8	4.0	4.0	4.0		-2.9	-0.7	-0.1
of which non ETS sectors GHG emissions		4.3	4.4	4.0	3.7	3.7	3.8	3.8	3.9	3.9	3.9		-1.6	0.1	0.2
CO_2 Emissions (energy related)	**7.1**	**7.9**	**8.1**	**8.0**	**6.2**	**5.8**	**5.8**	**5.6**	**5.7**	**5.6**	**5.6**	**1.3**	**-2.7**	**-0.6**	**-0.2**
Power generation/District heating	2.8	3.5	3.8	3.5	2.0	1.8	1.7	1.5	1.5	1.5	1.5	2.9	-6.2	-1.6	-0.6
Energy Branch	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-100.0	0.0	0.0	0.0
Industry	1.4	1.0	0.6	0.7	0.6	0.5	0.5	0.5	0.5	0.5	0.5	-7.5	-0.4	-1.5	0.1
Residential	0.2	0.5	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.1	0.1	6.7	-2.8	-2.8	-3.6
Tertiary	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.0	2.5	-1.9	-1.6
Transport	2.6	2.9	3.1	3.2	3.0	3.0	3.2	3.2	3.3	3.3	3.3	1.8	-0.1	0.4	0.3
CO_2 Emissions (non energy related)	**0.8**	**0.9**	**0.6**	**0.7**	**0.7**	**0.7**	**0.6**	**0.6**	**0.6**	**0.7**	**0.7**	**-3.2**	**1.5**	**-1.6**	**0.6**
Non-CO_2 GHG emissions	**3.0**	**1.4**	**1.5**	**1.1**	**1.2**	**1.3**	**1.4**	**1.5**	**1.5**	**1.6**	**1.6**	**-6.9**	**-2.2**	**1.9**	**0.7**
TOTAL GHG emissions Index (1990=100)	**151.1**	**142.2**	**140.3**	**136.5**	**111.2**	**107.6**	**107.8**	**105.7**	**108.4**	**109.5**	**109.2**				

Source: PRIMES

SUMMARY ENERGY BALANCE AND INDICATORS (B)															Cyprus: Reference scenario
	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050	'00-'10	'10-'20	'20-'30	'30-'50
												Annual % Change			
Main Energy System Indicators															
Population (Million)	0.690	0.749	0.803	0.839	0.885	0.933	0.973	1.007	1.036	1.064	1.090	1.5	1.0	1.0	0.6
GDP (in 000 M€10)	13.1	15.4	17.3	18.3	19.8	21.7	24.1	27.1	30.3	33.3	36.2	2.8	1.3	2.0	2.0
Gross Inl. Cons./GDP (toe/M€10)	182.0	163.5	156.7	155.0	131.1	117.6	108.8	96.2	88.7	81.8	75.7	-1.5	-1.8	-1.9	-1.8
Carbon intensity (t of CO_2/toe of GIC)	2.98	3.15	2.97	2.84	2.38	2.27	2.20	2.13	2.10	2.07	2.05	0.0	-2.2	-0.8	-0.4
Import Dependency %	98.6	100.7	100.9	95.2	62.2	-5.2	-72.7	-101.8	-131.2	-143.2	-136.9				
Total energy-rel. and other mitigation costs [B] (in 000 M€10)	1.1	2.0	2.8	3.4	3.4	3.8	4.3	4.5	4.8	5.0	5.2	9.8	2.2	2.1	1.0
as % of GDP	8.3	12.8	16.0	18.9	17.4	17.7	17.6	16.5	15.8	15.0	14.4				
Energy intensity indicators															
Industry (Energy on Value added, index 2000=100)	100.0	70.3	55.4	59.7	56.2	52.9	51.5	49.0	48.0	47.1	44.9	-5.7	0.1	-0.9	-0.7
Residential (Energy on Private Income, index 2000=100)	100.0	121.8	118.5	113.0	104.9	95.3	84.1	71.8	63.9	57.2	51.3	1.7	-1.2	-2.2	-2.4
Tertiary (Energy on Value added, index 2000=100)	100.0	146.5	174.3	187.1	200.8	192.9	188.0	165.4	149.8	143.5	135.9	5.7	1.4	-0.7	-1.6
Passenger transport (toe/Mpkm)	49.2	52.4	56.9	53.4	46.9	40.4	36.8	34.7	33.3	32.2	31.4	1.5	-1.9	-2.4	-0.8
Freight transport (toe/Mtkm)	191.9	174.4	195.0	190.0	184.0	176.4	170.3	165.4	161.5	158.2	155.4	0.2	-0.6	-0.8	-0.5
Carbon Intensity indicators															
Electricity and Steam production (t of CO_2/MWh)	0.85	0.80	0.71	0.62	0.31	0.27	0.24	0.21	0.20	0.19	0.18	-1.8	-8.0	-2.5	-1.3
Final energy demand (t of CO_2/toe)	2.56	2.45	2.24	2.21	2.00	1.92	1.87	1.86	1.84	1.79	1.77	-1.3	-1.1	-0.7	-0.3
Industry	3.16	3.10	2.72	2.71	2.41	2.12	1.97	1.87	1.78	1.71	1.66	-1.5	-1.2	-2.0	-0.8
Residential	1.00	1.38	1.17	1.00	0.86	0.74	0.66	0.59	0.50	0.42	0.35	1.6	-3.0	-2.7	-3.2
Tertiary	0.00	0.44	0.55	0.68	0.53	0.45	0.38	0.33	0.29	0.26	0.25	0.0	-0.4	-3.4	-2.0
Transport [C]	3.01	3.00	2.95	2.94	2.80	2.81	2.82	2.82	2.82	2.83	2.82	-0.2	-0.5	0.1	0.0
Indicators for renewables															
Share of RES in Gross Final Energy Consumption [D] (%)	2.9	3.1	5.8	9.2	15.2	19.3	22.5	25.5	25.7	26.4	26.7				
RES in transport (%)	0.0	0.0	2.0	2.6	10.1	10.1	10.0	10.0	10.0	9.9	10.3				
Gross Electricity generation by source (in GWh_e) [E]	**3370**	**4377**	**5326**	**5655**	**6482**	**6679**	**7162**	**7177**	**7570**	**8029**	**8314**	**4.7**	**2.0**	**1.0**	**0.7**
Nuclear energy	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Solids	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Oil (including refinery gas)	3370	4376	5288	5116	154	26	30	0	1	0	0	4.6	-29.8	-15.2	-100.0
Gas (including derived gases)	0	0	0	0	5265	5082	4876	4313	4400	4554	4655	0.0	0.0	-0.8	-0.2
Biomass-waste	0	0	0	108	125	125	152	193	260	280	337	0.0	0.0	2.0	4.1
Hydro (pumping excluded)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Wind	0	0	31	309	611	736	850	1009	1009	1009	1008	0.0	34.7	3.4	0.9
Solar	0	1	6	122	327	710	1254	1661	1901	2186	2314	0.0	48.2	14.4	3.1
Geothermal and other renewables	0	0	1	0	0	0	0	0	0	0	0	0.0	-95.0	0.0	-100.0
Other fuels (hydrogen, methanol)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Net Generation Capacity in MW_e	**988**	**1126**	**1577**	**1941**	**2585**	**2943**	**3209**	**3501**	**3358**	**3251**	**3378**	**4.8**	**5.1**	**2.2**	**0.3**
Nuclear energy	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Renewable energy	0	1	89	224	443	674	987	1232	1325	1429	1480	0.0	17.4	8.3	2.0
Hydro (pumping excluded)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Wind	0	0	82	145	249	291	329	405	405	405	405	0.0	11.7	2.8	1.0
Solar	0	1	7	79	194	383	658	828	920	1024	1075	0.0	39.4	13.0	2.5
Other renewables (tidal etc.)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Thermal power	988	1125	1488	1717	2142	2269	2221	2269	2033	1822	1898	4.2	3.7	0.4	-0.8
of which cogeneration units	0	0	1	17	15	27	28	20	14	19	33	0.0	28.5	6.4	0.8
of which CCS units	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Solids fired	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Gas fired	0	0	0	0	721	921	981	1137	1165	1323	1557	0.0	0.0	3.1	2.3
Oil fired	988	1125	1481	1703	1404	1332	1218	1104	823	447	276	4.1	-0.5	-1.4	-7.2
Biomass-waste fired	0	0	7	14	16	16	22	28	45	52	65	0.0	8.0	3.3	5.4
Hydrogen plants	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Geothermal heat	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Avg. Load factor of net power capacity [F] (%)	37.0	41.9	37.0	31.7	28.0	25.4	25.1	23.1	25.4	27.8	27.7				
Electricity indicators															
Efficiency of gross thermal power generation (%)	32.9	34.9	38.8	40.3	55.3	57.6	57.7	57.7	57.7	58.7	60.6				
% of gross electricity from CHP	0.0	0.3	1.0	0.9	1.4	1.7	1.7	1.3	1.3	1.4	2.5				
% of electricity from CCS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Carbon free gross electricity generation (%)	0.0	0.0	0.7	9.5	16.4	23.5	31.5	39.9	41.9	43.3	44.0				
- nuclear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
- renewable energy forms	0.0	0.0	0.7	9.5	16.4	23.5	31.5	39.9	41.9	43.3	44.0				
Transport sector															
Passenger transport activity (Gpkm)	**12.1**	**13.9**	**14.5**	**16.5**	**18.6**	**21.3**	**24.3**	**26.1**	**28.1**	**29.0**	**29.9**	**1.8**	**2.5**	**2.7**	**1.0**
Public road transport	1.1	1.3	1.3	1.4	1.4	1.5	1.6	1.6	1.7	1.7	1.7	1.4	1.0	0.9	0.5
Private cars and motorcycles	4.1	4.9	6.0	6.4	6.6	7.2	7.7	8.1	8.5	8.7	8.8	4.0	0.9	1.6	0.7
Rail	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Aviation	6.9	7.7	7.2	8.8	10.6	12.6	15.0	16.4	17.9	18.6	19.4	0.4	4.0	3.5	1.3
Inland navigation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Freight transport activity (Gtkm)	**1.3**	**1.4**	**1.1**	**1.1**	**1.2**	**1.2**	**1.3**	**1.4**	**1.5**	**1.5**	**1.5**	**-1.8**	**0.7**	**1.2**	**0.8**
Trucks	1.3	1.4	1.1	1.1	1.2	1.2	1.3	1.4	1.5	1.5	1.5	-1.8	0.7	1.2	0.8
Rail	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Inland navigation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Energy demand in transport (ktoe) [G]	**848**	**969**	**1039**	**1093**	**1089**	**1078**	**1119**	**1136**	**1169**	**1169**	**1179**	**2.1**	**0.5**	**0.3**	**0.3**
Public road transport	29	32	35	36	37	37	37	37	38	38	38	2.0	0.4	0.1	0.1
Private cars and motorcycles	292	395	514	518	474	439	433	433	443	440	439	5.8	-0.8	-0.9	0.1
Trucks	251	243	212	214	214	218	224	229	235	236	239	-1.7	0.1	0.5	0.3
Rail	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Aviation	275	299	277	325	364	383	425	437	453	454	462	0.1	2.8	1.6	0.4
Inland navigation	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0

Source: PRIMES

Czech Republic: Reference scenario												SUMMARY ENERGY BALANCE AND INDICATORS (A)			
ktoe	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050	'00-'10	'10-'20	'20-'30	'30-'50
												Annual % Change			
Production (incl.recovery of products)	**30628**	**32868**	**31554**	**28043**	**27656**	**27636**	**28916**	**30184**	**31476**	**32240**	**32245**	**0.3**	**-1.3**	**0.4**	**0.5**
Solids	25049	23570	20730	16268	15287	15121	12882	11084	12153	12960	12757	-1.9	-3.0	-1.7	0.0
Oil	389	597	308	286	276	271	274	227	148	21	0	-2.3	-1.1	-0.1	-100.0
Natural gas	169	154	167	184	197	207	200	209	196	97	0	-0.1	1.7	0.2	-100.0
Nuclear	3506	6405	7248	8008	8024	8024	11367	14354	14422	14490	14720	7.5	1.0	3.5	1.3
Renewable energy sources	1515	2142	3102	3298	3872	4013	4193	4310	4558	4673	4768	7.4	2.2	0.8	0.6
Hydro	151	205	240	284	291	294	296	298	321	350	356	4.7	2.0	0.2	0.9
Biomass & Waste	1364	1933	2772	2704	3173	3168	3273	3274	3493	3539	3640	7.3	1.4	0.3	0.5
Wind	0	2	29	39	43	50	54	56	58	59	60	0.0	4.1	2.4	0.5
Solar and others	0	2	62	270	365	501	570	682	686	724	712	0.0	19.5	4.6	1.1
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	-1.2	0.2
Net Imports	**9495**	**12795**	**11461**	**14571**	**14725**	**14339**	**14363**	**15096**	**14527**	**14825**	**15325**	**1.9**	**2.5**	**-0.2**	**0.3**
Solids	-4721	-3270	-2968	-2626	-2807	-3432	-3422	-3103	-4070	-4338	-4620	-4.5	-0.6	2.0	1.5
Oil	7593	9803	8988	9219	9096	8988	9155	9370	9562	9756	9782	1.7	0.1	0.1	0.3
- Crude oil and Feedstocks	5656	7855	7854	8016	7920	7815	7915	8072	8212	8373	8384	3.3	0.1	0.0	0.3
- Oil products	1937	1948	1134	1204	1176	1173	1240	1297	1350	1383	1398	-5.2	0.4	0.5	0.6
Natural gas	7482	7535	6846	8125	8258	8578	8337	8828	9104	9390	9971	-0.9	1.9	0.1	0.9
Electricity	-861	-1086	-1285	-621	-560	-612	-660	-1023	-1225	-1259	-1222	4.1	-8.0	1.7	3.1
Gross Inland Consumption	**41270**	**45279**	**44771**	**42614**	**42381**	**41975**	**43279**	**45280**	**46004**	**47066**	**47571**	**0.8**	**-0.5**	**0.2**	**0.5**
Solids	21643	20248	18474	13642	12479	11689	9460	7981	8083	8622	8137	-1.6	-3.8	-2.7	-0.8
Oil	7965	10054	9335	9505	9372	9258	9429	9597	9710	9777	9782	1.6	0.0	0.1	0.2
Natural gas	7500	7703	8019	8308	8455	8785	8537	9037	9300	9487	9971	0.7	0.5	0.1	0.8
Nuclear	3506	6405	7248	8008	8024	8024	11367	14354	14422	14490	14720	7.5	1.0	3.5	1.3
Electricity	-861	-1086	-1285	-621	-560	-612	-660	-1023	-1225	-1259	-1222	4.1	-8.0	1.7	3.1
Renewable energy forms	1518	1955	2981	3772	4612	4831	5147	5334	5714	5948	6183	7.0	4.5	1.1	0.9
as % in Gross Inland Consumption															
Solids	52.4	44.7	41.3	32.0	29.4	27.8	21.9	17.6	17.6	18.3	17.1				
Oil	19.3	22.2	20.9	22.3	22.1	22.1	21.8	21.2	21.1	20.8	20.6				
Natural gas	18.2	17.0	17.9	19.5	19.9	20.9	19.7	20.0	20.2	20.2	21.0				
Nuclear	8.5	14.1	16.2	18.8	18.9	19.1	26.3	31.7	31.4	30.8	30.9				
Renewable energy forms	3.7	4.3	6.7	8.9	10.9	11.5	11.9	11.8	12.4	12.6	13.0				
Gross Electricity Generation in GWh_e	**72898**	**81917**	**85303**	**76298**	**75945**	**78639**	**81420**	**89244**	**96399**	**101684**	**106722**	**1.6**	**-1.2**	**0.7**	**1.4**
Self consumption and grid losses	10600	11631	11114	9210	9019	9591	9263	9811	12054	13620	14483	0.5	-2.1	0.3	2.3
Fuel Inputs to Thermal Power Generation	**15886**	**15702**	**15321**	**10649**	**10100**	**10125**	**8123**	**6814**	**7299**	**7943**	**8253**	**-0.4**	**-4.1**	**-2.2**	**0.1**
Solids	13945	14025	13595	9076	8192	7908	5666	4297	4618	5212	4891	-0.3	-4.9	-3.6	-0.7
Oil (including refinery gas)	311	161	78	1	2	2	5	7	9	10	11	-12.9	-30.9	10.3	3.6
Gas (including derived gases)	1236	1292	1108	704	890	1100	1232	1275	1464	1511	1848	-1.1	-2.2	3.3	2.0
Biomass & Waste	395	224	540	867	1015	1114	1219	1234	1208	1210	1504	3.2	6.5	1.8	1.1
Geothermal heat	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Hydrogen - Methanol	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Fuel Input to other conversion processes	**15076**	**19896**	**20111**	**20599**	**20783**	**20207**	**23722**	**26808**	**26802**	**27000**	**27064**	**2.9**	**0.3**	**1.3**	**0.7**
Refineries	6219	8276	8372	8490	8391	8284	8390	8503	8567	8608	8599	3.0	0.0	0.0	0.1
Biofuels and hydrogen production	64	3	231	305	587	584	607	618	635	628	641	13.8	9.8	0.3	0.3
District heating	948	922	815	930	956	538	451	388	343	315	268	-1.5	1.6	-7.2	-2.6
Derived gases, cokeries etc.	7846	10696	10693	10874	10849	10802	14274	17299	17257	17450	17555	3.1	0.1	2.8	1.0
Energy Branch Consumption	**1772**	**1807**	**1774**	**1485**	**1446**	**1474**	**1443**	**1470**	**1635**	**1759**	**1789**	**0.0**	**-2.0**	**0.0**	**1.1**
Non-Energy Uses	**2188**	**3004**	**2767**	**2901**	**2989**	**2951**	**2986**	**3060**	**3098**	**3132**	**3145**	**2.4**	**0.8**	**0.0**	**0.3**
Final Energy Demand	**24709**	**25999**	**25618**	**26863**	**27137**	**27124**	**27404**	**28187**	**28796**	**29431**	**29864**	**0.4**	**0.6**	**0.1**	**0.4**
by sector															
Industry	10119	9682	8755	9412	9570	9605	10117	10549	10881	11250	11432	-1.4	0.9	0.6	0.6
- energy intensive industries	6380	6749	5741	6154	6090	5970	6249	6445	6579	6701	6686	-1.1	0.6	0.3	0.3
- other industrial sectors	3740	2934	3015	3259	3480	3635	3868	4104	4303	4549	4745	-2.1	1.4	1.1	1.0
Residential	6023	6216	6619	6852	6879	6885	6698	6866	6945	7031	7125	0.9	0.4	-0.3	0.3
Tertiary	4162	3910	3949	3992	3972	3931	3694	3723	3756	3870	3950	-0.5	0.1	-0.7	0.3
Transport	4405	6191	6295	6607	6715	6703	6895	7050	7213	7280	7357	3.6	0.6	0.3	0.3
by fuel															
Solids	5007	3640	3081	3302	3075	2664	2664	2561	2417	2296	2182	-4.7	0.0	-1.4	-1.0
Oil	5386	6926	6631	6670	6447	6393	6522	6640	6742	6784	6803	2.1	-0.3	0.1	0.2
Gas	6491	6741	6688	7199	7125	7436	7202	7701	7745	7978	8099	0.3	0.6	0.1	0.6
Electricity	4246	4754	4919	5003	5056	5188	5412	5678	5893	6173	6567	1.5	0.3	0.7	1.0
Heat (from CHP and District Heating)	2624	2478	2249	2434	2528	2284	2268	2110	2141	2162	2226	-1.5	1.2	-1.1	-0.1
Renewable energy forms	955	1462	2048	2255	2900	3149	3324	3484	3845	4025	3970	7.9	3.5	1.4	0.9
Other fuels (hydrogen, ethanol)	0	0	0	1	5	10	12	12	13	15	17	14.0	90.4	9.9	1.9
RES in Gross Final Energy Consumption [(A)]	**1233**	**1666**	**2484**	**3079**	**3931**	**4079**	**4371**	**4542**	**5052**	**5278**	**5462**	**7.3**	**4.7**	**1.1**	**1.1**
TOTAL GHG emissions (Mt of CO2 eq.)	**150.9**	**148.7**	**139.8**	**120.1**	**114.3**	**111.5**	**101.1**	**95.3**	**91.6**	**88.5**	**83.2**	**-0.8**	**-2.0**	**-1.2**	**-1.0**
of which ETS sectors (2013 scope) GHG emissions		87.3	79.3	61.9	58.0	55.7	46.1	40.4	36.7	33.6	28.8		-3.1	-2.3	-2.3
of which non ETS sectors GHG emissions		61.4	60.4	58.2	56.3	55.8	55.1	54.9	54.9	54.9	54.4		-0.7	-0.2	-0.1
CO_2 Emissions (energy related)	**125.4**	**124.1**	**117.0**	**98.7**	**93.4**	**90.7**	**81.1**	**76.4**	**72.1**	**69.5**	**67.4**	**-0.7**	**-2.2**	**-1.4**	**-0.9**
Power generation/District heating	66.8	66.2	63.8	43.1	40.6	38.9	29.1	23.9	21.1	18.3	16.5	-0.5	-4.4	-3.3	-2.8
Energy Branch	2.6	2.3	1.8	1.8	1.7	1.5	1.5	1.5	1.5	1.5	1.5	-3.4	-0.6	-1.5	0.0
Industry	28.4	24.8	20.7	21.8	20.0	19.9	21.0	21.0	19.6	19.9	19.6	-3.1	-0.3	0.5	-0.3
Residential	8.3	7.9	8.1	8.6	8.1	7.7	7.1	7.2	6.9	6.5	6.5	-0.2	0.0	-1.3	-0.5
Tertiary	6.8	5.0	4.9	5.1	5.2	5.1	4.3	4.2	4.3	4.3	4.3	-3.2	0.7	-1.8	0.0
Transport	12.6	18.1	17.7	18.3	17.8	17.7	18.1	18.4	18.8	18.9	19.0	3.5	0.0	0.2	0.3
CO_2 Emissions (non energy related)	**5.6**	**5.3**	**4.8**	**5.8**	**5.8**	**5.7**	**5.2**	**4.7**	**4.7**	**3.9**	**0.6**	**-1.7**	**2.0**	**-1.0**	**-10.4**
Non-CO_2 GHG emissions	**19.9**	**19.3**	**18.0**	**15.6**	**15.1**	**15.1**	**14.8**	**14.3**	**14.8**	**15.0**	**15.3**	**-1.0**	**-1.8**	**-0.2**	**0.2**
TOTAL GHG emissions Index (1990=100)	**76.9**	**75.7**	**71.2**	**61.2**	**58.2**	**56.8**	**51.5**	**48.6**	**46.6**	**45.0**	**42.4**				

Source: PRIMES

SUMMARY ENERGY BALANCE AND INDICATORS (B)															Czech Republic: Reference scenario
	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050	'00-'10	'10-'20	'20-'30	'30-'50
												Annual % Change			
Main Energy System Indicators															
Population (Million)	10.278	10.221	10.507	10.691	10.816	10.864	10.840	10.782	10.740	10.715	10.668	0.2	0.3	0.0	-0.1
GDP (in 000 M€10)	107.0	130.7	149.3	165.0	184.3	200.5	218.8	237.3	255.9	274.0	290.0	3.4	2.1	1.7	1.4
Gross Inl. Cons./GDP (toe/M€10)	385.8	346.4	299.8	258.3	230.0	209.3	197.8	190.8	179.8	171.8	164.0	-2.5	-2.6	-1.5	-0.9
Carbon intensity (t of CO_2/toe of GIC)	3.04	2.74	2.61	2.32	2.20	2.16	1.87	1.69	1.57	1.48	1.42	-1.5	-1.7	-1.6	-1.4
Import Dependency %	23.0	28.3	25.6	34.2	34.7	34.2	33.2	33.3	31.6	31.5	32.2				
Total energy-rel. and other mitigation costs [B] (in 000 M€10)	15.6	21.4	29.4	35.5	39.6	42.3	44.6	47.0	49.9	52.9	54.9	6.6	3.0	1.2	1.0
as % of GDP	14.6	16.4	19.7	21.5	21.5	21.1	20.4	19.8	19.5	19.3	18.9				
Energy intensity indicators															
Industry (Energy on Value added, index 2000=100)	100.0	68.9	46.0	45.8	41.6	38.5	36.3	34.6	33.1	31.9	30.8	-7.5	-1.0	-1.3	-0.8
Residential (Energy on Private Income, index 2000=100)	100.0	86.6	82.3	77.4	69.7	64.0	56.8	53.2	49.5	46.3	43.8	-1.9	-1.6	-2.0	-1.3
Tertiary (Energy on Value added, index 2000=100)	100.0	81.3	76.4	68.8	60.9	55.0	47.4	43.8	40.9	39.2	37.6	-2.7	-2.2	-2.5	-1.1
Passenger transport (toe/Mpkm)	26.8	29.2	27.9	26.8	24.4	22.1	21.1	20.4	19.8	19.2	18.6	0.4	-1.3	-1.5	-0.6
Freight transport (toe/Mtkm)	27.5	48.0	47.3	45.6	43.9	41.2	39.2	37.8	36.4	35.4	34.6	5.6	-0.8	-1.1	-0.6
Carbon Intensity indicators															
Electricity and Steam production (t of CO_2/MWh)	0.60	0.55	0.53	0.38	0.35	0.34	0.25	0.19	0.16	0.13	0.12	-1.3	-4.0	-3.4	-3.7
Final energy demand (t of CO_2/toe)	2.26	2.14	2.00	2.00	1.88	1.86	1.84	1.81	1.72	1.69	1.65	-1.2	-0.6	-0.2	-0.5
Industry	2.80	2.56	2.37	2.31	2.09	2.08	2.07	1.99	1.80	1.77	1.71	-1.7	-1.2	-0.1	-0.9
Residential	1.37	1.26	1.22	1.25	1.18	1.12	1.06	1.05	0.99	0.93	0.91	-1.2	-0.4	-1.0	-0.8
Tertiary	1.63	1.27	1.24	1.28	1.31	1.29	1.18	1.14	1.13	1.12	1.10	-2.7	0.6	-1.1	-0.4
Transport [C]	2.85	2.92	2.81	2.78	2.64	2.64	2.62	2.61	2.60	2.60	2.58	-0.1	-0.6	-0.1	-0.1
Indicators for renewables															
Share of RES in Gross Final Energy Consumption [D] (%)	4.7	5.9	9.0	10.9	13.8	14.3	15.2	15.4	16.7	17.0	17.3				
RES in transport (%)	1.3	0.2	4.2	5.5	10.3	10.6	10.9	10.9	11.0	10.9	11.1				
Gross Electricity generation by source (in GWh_e) [E]	**72911**	**81931**	**85319**	**76298**	**75945**	**78639**	**81420**	**89244**	**96399**	**101684**	**106722**	**1.6**	**-1.2**	**0.7**	**1.4**
Nuclear energy	13590	24728	27998	30765	30692	30692	45074	57814	58100	58399	61813	7.5	0.9	3.9	1.6
Solids	52561	49522	47113	32031	30181	31802	18520	13812	20646	24745	23478	-1.1	-4.4	-4.8	1.2
Oil (including refinery gas)	372	326	159	6	11	14	13	20	37	43	62	-8.1	-23.6	2.2	8.0
Gas (including derived gases)	3907	4215	4121	3825	4555	5092	6444	6288	6294	6834	8786	0.5	1.0	3.5	1.6
Biomass-waste	723	739	2188	3817	4483	4839	5069	4947	4647	4609	5411	11.7	7.4	1.2	0.3
Hydro (pumping excluded)	1758	2380	2789	3307	3388	3422	3446	3465	3728	4067	4138	4.7	2.0	0.2	0.9
Wind	0	21	335	458	498	582	632	655	677	690	703	0.0	4.1	2.4	0.5
Solar	0	0	616	2090	2138	2198	2223	2243	2270	2297	2331	0.0	13.3	0.4	0.2
Geothermal and other renewables	0	0	0	0	0	0	0	0	0	0	0	0.0	-100.0	0.0	0.0
Other fuels (hydrogen, methanol)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Net Generation Capacity in MW_e	**13312**	**15607**	**18071**	**18930**	**18395**	**16811**	**17998**	**20437**	**21630**	**22191**	**22755**	**3.1**	**0.2**	**-0.2**	**1.2**
Nuclear energy	1706	3621	3636	3820	3827	3827	5597	7162	7197	7233	7624	7.9	0.5	3.9	1.6
Renewable energy	947	1044	3251	3475	3509	3586	3649	3698	3804	3917	3978	13.1	0.8	0.4	0.4
Hydro (pumping excluded)	947	1016	1077	1188	1192	1192	1194	1195	1248	1318	1330	1.3	1.0	0.0	0.5
Wind	0	28	215	277	307	352	387	414	438	453	468	0.0	3.6	2.4	0.9
Solar	0	1	1960	2011	2011	2042	2068	2089	2117	2145	2180	0.0	0.3	0.3	0.3
Other renewables (tidal etc.)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Thermal power	10659	10943	11184	11635	11059	9397	8752	9577	10629	11040	11152	0.5	-0.1	-2.3	1.2
of which cogeneration units	3733	3808	2889	3359	3601	3697	3644	3458	3681	3911	4134	-2.5	2.2	0.1	0.6
of which CCS units	0	0	0	0	0	0	0	0	846	1504	1609	0.0	0.0	0.0	0.0
Solids fired	8972	8871	8866	8253	7633	5908	5326	6144	7167	7443	7524	-0.1	-1.5	-3.5	1.7
Gas fired	1286	1525	1703	2394	2417	2497	2418	2436	2452	2715	2848	2.9	3.6	0.0	0.8
Oil fired	129	276	279	414	342	326	322	311	297	293	158	8.0	2.1	-0.6	-3.5
Biomass-waste fired	272	271	336	575	666	666	686	686	714	589	624	2.2	7.1	0.3	-0.5
Hydrogen plants	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Geothermal heat	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Avg. Load factor of net power capacity [F] (%)	57.9	55.3	49.8	43.2	44.4	50.1	48.9	47.3	47.4	48.3	49.4				
Electricity indicators															
Efficiency of gross thermal power generation (%)	31.2	30.0	30.1	32.0	33.4	35.5	31.8	31.6	37.3	39.2	39.3				
% of gross electricity from CHP	17.9	16.8	14.2	16.8	20.5	23.0	20.9	19.1	18.9	18.6	18.4				
% of electricity from CCS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.7	14.2	14.3				
Carbon free gross electricity generation (%)	22.0	34.0	39.8	53.0	54.2	53.1	69.3	77.5	72.0	68.9	69.7				
- nuclear	18.6	30.2	32.8	40.3	40.4	39.0	55.4	64.8	60.3	57.4	57.9				
- renewable energy forms	3.4	3.8	6.9	12.7	13.8	14.0	14.0	12.7	11.7	11.5	11.8				
Transport sector															
Passenger transport activity (Gpkm)	**103.4**	**111.9**	**108.6**	**118.3**	**128.2**	**138.2**	**149.4**	**159.2**	**169.1**	**176.7**	**184.6**	**0.5**	**1.7**	**1.5**	**1.1**
Public road transport	16.2	15.6	17.4	18.6	19.9	21.0	22.0	22.9	23.8	24.6	25.4	0.8	1.3	1.0	0.7
Private cars and motorcycles	66.8	71.8	67.1	72.4	77.2	82.5	88.4	94.1	99.5	103.4	107.6	0.0	1.4	1.4	1.0
Rail	15.4	14.6	15.6	17.3	19.2	20.8	22.5	23.9	25.5	26.7	28.0	0.1	2.1	1.6	1.1
Aviation	5.0	9.9	8.5	10.0	11.8	14.0	16.5	18.3	20.3	21.9	23.7	5.4	3.4	3.4	1.8
Inland navigation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Freight transport activity (Gtkm)	**54.9**	**58.4**	**65.7**	**71.2**	**77.2**	**83.3**	**90.0**	**94.6**	**99.6**	**102.7**	**106.0**	**1.8**	**1.6**	**1.5**	**0.8**
Trucks	37.3	43.4	51.8	55.9	60.2	64.6	69.3	72.8	76.4	78.8	81.3	3.3	1.5	1.4	0.8
Rail	17.5	14.9	13.8	15.3	16.9	18.6	20.6	21.8	23.1	23.8	24.6	-2.4	2.1	2.0	0.9
Inland navigation	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-5.0	1.9	1.9	1.0
Energy demand in transport (ktoe) [G]	**4280**	**6066**	**6132**	**6422**	**6519**	**6496**	**6677**	**6821**	**6975**	**7034**	**7102**	**3.7**	**0.6**	**0.2**	**0.3**
Public road transport	200	189	210	224	236	239	242	244	248	251	255	0.5	1.2	0.3	0.3
Private cars and motorcycles	2286	2653	2393	2476	2381	2254	2280	2340	2398	2420	2438	0.5	-0.1	-0.4	0.3
Trucks	1383	2684	2998	3130	3262	3309	3391	3443	3500	3518	3556	8.0	0.8	0.4	0.2
Rail	209	193	186	203	220	230	240	244	243	236	228	-1.2	1.7	0.9	-0.3
Aviation	197	342	341	384	416	459	517	544	580	603	617	5.6	2.0	2.2	0.9
Inland navigation	5	5	4	4	5	5	6	6	6	7	7	-2.2	1.8	1.7	0.8

Source: PRIMES

Denmark: Reference scenario												SUMMARY ENERGY BALANCE AND INDICATORS (A)			
ktoe	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**	**'00-'10**	**'10-'20**	**'20-'30**	**'30-'50**
												Annual % Change			
Production (incl.recovery of products)	**28093**	**31314**	**23335**	**24411**	**20066**	**17487**	**14616**	**13781**	**12298**	**8050**	**6856**	**-1.8**	**-1.5**	**-3.1**	**-3.7**
Solids	0	0	0	0	0	0	0	0	0	0	0	0.0	-100.0	0.0	0.0
Oil	18600	19011	12479	10422	8631	7193	4992	4377	3498	1522	526	-3.9	-3.6	-5.3	-10.6
Natural gas	7428	9397	7357	10300	7177	5725	4888	4558	3634	1164	457	-0.1	-0.2	-3.8	-11.2
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Renewable energy sources	2065	2906	3498	3689	4258	4570	4736	4846	5166	5364	5874	5.4	2.0	1.1	1.1
Hydro	3	2	2	2	2	2	2	2	3	3	2	-3.5	0.7	0.0	-0.1
Biomass & Waste	1687	2317	2798	2673	2813	2860	2829	2844	2938	3015	3246	5.2	0.1	0.1	0.7
Wind	365	569	671	913	1270	1504	1679	1753	1972	2076	2352	6.3	6.6	2.8	1.7
Solar and others	8	10	16	101	172	204	227	246	253	271	274	7.1	26.7	2.8	1.0
Geothermal	3	8	10	0	0	0	0	0	0	0	0	13.9	-43.9	1.0	0.6
Net Imports	**-7447**	**-10454**	**-3648**	**-4787**	**-1612**	**498**	**3579**	**4443**	**6250**	**11031**	**12701**	**-6.9**	**-7.8**	**0.0**	**6.5**
Solids	3783	3505	2642	2854	1680	904	155	119	45	42	41	-3.5	-4.4	-21.2	-6.5
Oil	-8463	-9392	-3957	-2587	-1162	62	2200	2689	3569	5733	6788	-7.3	-11.5	0.0	5.8
- Crude oil and Feedstocks	-8856	-11255	-5214	-3715	-2368	-1217	778	1207	1984	3930	4901	-5.2	-7.6	0.0	9.6
- Oil products	393	1863	1257	1128	1206	1279	1422	1482	1585	1803	1887	12.3	-0.4	1.7	1.4
Natural gas	-2882	-5010	-3022	-6097	-3485	-1934	-265	118	1065	3634	4109	0.5	1.4	-22.7	0.0
Electricity	57	118	-98	-78	-103	-82	-79	-79	-78	-85	-95	0.0	0.6	-2.6	0.9
Gross Inland Consumption	**19792**	**19765**	**19317**	**18851**	**17618**	**17101**	**17248**	**17252**	**17537**	**18021**	**18438**	**-0.2**	**-0.9**	**-0.2**	**0.3**
Solids	3985	3713	3809	2854	1680	904	155	119	45	42	41	-0.5	-7.9	-21.2	-6.5
Oil	9160	8289	6886	7065	6645	6394	6275	6168	6174	6337	6363	-2.8	-0.4	-0.6	0.1
Natural gas	4465	4413	4437	4201	3680	3768	4593	4602	4580	4656	4397	-0.1	-1.9	2.2	-0.2
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Electricity	57	118	-98	-78	-103	-82	-79	-79	-78	-85	-95	0.0	0.6	-2.6	0.9
Renewable energy forms	2124	3232	4283	4809	5717	6118	6305	6443	6816	7070	7733	7.3	2.9	1.0	1.0
as % in Gross Inland Consumption															
Solids	20.1	18.8	19.7	15.1	9.5	5.3	0.9	0.7	0.3	0.2	0.2				
Oil	46.3	41.9	35.6	37.5	37.7	37.4	36.4	35.8	35.2	35.2	34.5				
Natural gas	22.6	22.3	23.0	22.3	20.9	22.0	26.6	26.7	26.1	25.8	23.8				
Nuclear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Renewable energy forms	10.7	16.4	22.2	25.5	32.4	35.8	36.6	37.3	38.9	39.2	41.9				
Gross Electricity Generation in GWh_e	**36047**	**36240**	**38778**	**36243**	**33667**	**33686**	**34521**	**36759**	**39342**	**43020**	**46114**	**0.7**	**-1.4**	**0.3**	**1.5**
Self consumption and grid losses	4045	3848	5260	3977	3232	3168	3004	3187	3325	3585	3919	2.7	-4.8	-0.7	1.3
Fuel Inputs to Thermal Power Generation	**7834**	**7127**	**7595**	**5794**	**4872**	**4213**	**4084**	**4278**	**4349**	**4615**	**4763**	**-0.3**	**-4.3**	**-1.7**	**0.8**
Solids	3669	3444	3760	2771	1604	833	88	62	0	0	0	0.2	-8.2	-25.2	-100.0
Oil (including refinery gas)	1354	346	216	45	48	40	37	41	48	61	60	-16.8	-14.0	-2.5	2.4
Gas (including derived gases)	2112	1996	1809	1614	1394	1520	2400	2410	2437	2638	2363	-1.5	-2.6	5.6	-0.1
Biomass & Waste	699	1341	1811	1365	1826	1820	1560	1765	1864	1916	2341	10.0	0.1	-1.6	2.0
Geothermal heat	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Hydrogen - Methanol	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Fuel Input to other conversion processes	**9033**	**8460**	**8105**	**8146**	**7796**	**7762**	**7868**	**7482**	**7370**	**7412**	**7301**	**-1.1**	**-0.4**	**0.1**	**-0.4**
Refineries	8496	7928	7277	6670	6233	5949	5745	5561	5461	5433	5410	-1.5	-1.5	-0.8	-0.3
Biofuels and hydrogen production	0	0	0	206	356	349	350	359	348	383	431	0.0	0.0	-0.1	1.0
District heating	520	519	815	1268	1204	1459	1767	1555	1553	1587	1451	4.6	4.0	3.9	-1.0
Derived gases, cokeries etc.	17	13	13	2	4	5	6	7	8	9	10	-2.9	-11.9	5.5	2.2
Energy Branch Consumption	**1150**	**1247**	**1195**	**1105**	**895**	**779**	**655**	**621**	**559**	**427**	**385**	**0.4**	**-2.8**	**-3.1**	**-2.6**
Non-Energy Uses	**301**	**289**	**265**	**275**	**279**	**283**	**286**	**288**	**292**	**298**	**307**	**-1.3**	**0.5**	**0.3**	**0.3**
Final Energy Demand	**14719**	**15497**	**15535**	**15072**	**14336**	**14027**	**14064**	**14207**	**14519**	**15034**	**15502**	**0.5**	**-0.8**	**-0.2**	**0.5**
by sector															
Industry	2932	2863	2434	2336	2352	2307	2310	2356	2417	2565	2691	-1.8	-0.3	-0.2	0.8
- energy intensive industries	1156	1107	823	773	794	792	789	812	839	895	958	-3.3	-0.4	-0.1	1.0
- other industrial sectors	1777	1756	1611	1563	1557	1515	1521	1544	1578	1670	1733	-1.0	-0.3	-0.2	0.7
Residential	4160	4451	4900	4587	4210	4065	4135	4222	4387	4603	4802	1.6	-1.5	-0.2	0.8
Tertiary	2805	2856	3029	2854	2660	2699	2719	2735	2768	2806	2817	0.8	-1.3	0.2	0.2
Transport	4821	5327	5172	5296	5115	4956	4901	4895	4948	5060	5193	0.7	-0.1	-0.4	0.3
by fuel															
Solids	290	253	136	80	72	66	62	53	41	39	38	-7.3	-6.2	-1.5	-2.4
Oil	7059	7291	6751	6260	5848	5597	5461	5374	5393	5539	5575	-0.4	-1.4	-0.7	0.1
Gas	1667	1707	1793	1594	1521	1524	1531	1604	1637	1656	1743	0.7	-1.6	0.1	0.6
Electricity	2791	2877	2757	2670	2488	2517	2603	2776	2981	3262	3483	-0.1	-1.0	0.5	1.5
Heat (from CHP and District Heating)	2255	2424	2833	2819	2677	2619	2693	2676	2722	2736	2789	2.3	-0.6	0.1	0.2
Renewable energy forms	657	944	1265	1648	1727	1699	1706	1712	1726	1778	1845	6.8	3.2	-0.1	0.4
Other fuels (hydrogen, ethanol)	0	0	0	1	3	4	8	12	18	25	30	0.0	75.6	11.5	7.1
RES in Gross Final Energy Consumption [(A)]	**1669**	**2674**	**3741**	**4006**	**5042**	**5487**	**5547**	**5730**	**6084**	**6285**	**6963**	**8.4**	**3.0**	**1.0**	**1.1**
TOTAL GHG emissions (Mt of CO2 eq.)	**70.3**	**65.1**	**62.6**	**55.0**	**47.8**	**44.0**	**42.1**	**41.4**	**40.9**	**41.0**	**40.4**	**-1.2**	**-2.7**	**-1.3**	**-0.2**
of which ETS sectors (2013 scope) GHG emissions		29.2	27.8	23.0	17.4	14.5	13.3	13.1	12.8	12.5	11.8		-4.6	-2.6	-0.6
of which non ETS sectors GHG emissions		35.9	34.7	32.1	30.4	29.5	28.7	28.3	28.1	28.5	28.6		-1.3	-0.6	0.0
CO_2 Emissions (energy related)	**53.4**	**50.0**	**48.6**	**41.6**	**34.4**	**30.6**	**29.1**	**28.7**	**28.3**	**29.0**	**28.5**	**-0.9**	**-3.4**	**-1.6**	**-0.1**
Power generation/District heating	24.5	20.3	21.1	16.3	10.9	8.2	7.3	7.1	6.8	7.3	6.5	-1.5	-6.4	-3.8	-0.6
Energy Branch	2.2	2.3	2.1	2.1	1.7	1.5	1.2	1.2	1.0	0.7	0.6	-0.4	-1.9	-3.3	-3.8
Industry	5.4	5.1	3.9	3.1	3.1	2.8	2.6	2.6	2.6	2.9	3.0	-3.1	-2.5	-1.4	0.6
Residential	3.9	3.6	3.2	2.5	2.2	2.2	2.1	2.1	2.1	2.1	2.1	-2.0	-3.7	-0.4	0.0
Tertiary	3.0	2.7	2.7	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	-0.8	-2.0	0.0	0.0
Transport	14.4	15.9	15.5	15.3	14.3	13.8	13.6	13.5	13.6	13.8	14.0	0.8	-0.8	-0.5	0.2
CO_2 Emissions (non energy related)	**2.5**	**2.2**	**1.3**	**1.2**	**1.3**	**1.3**	**1.0**	**1.0**	**1.0**	**0.4**	**0.3**	**-6.7**	**0.1**	**-2.0**	**-5.9**
Non-CO_2 GHG emissions	**14.4**	**12.9**	**12.7**	**12.2**	**12.1**	**12.1**	**11.9**	**11.7**	**11.6**	**11.6**	**11.6**	**-1.3**	**-0.4**	**-0.2**	**-0.1**
TOTAL GHG emissions Index (1990=100)	**100.0**	**92.6**	**89.0**	**78.3**	**67.9**	**62.5**	**59.8**	**58.8**	**58.2**	**58.3**	**57.5**				

Source: PRIMES

SUMMARY ENERGY BALANCE AND INDICATORS (B)															Denmark: Reference scenario
	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050	'00-'10	'10-'20	'20-'30	'30-'50
												Annual % Change			
Main Energy System Indicators															
Population (Million)	5.330	5.411	5.535	5.629	5.720	5.811	5.893	5.954	5.992	6.017	6.038	0.4	0.3	0.3	0.1
GDP (in 000 M€10)	222.7	237.0	235.6	252.8	270.4	292.4	314.9	338.1	364.1	395.4	430.5	0.6	1.4	1.5	1.6
Gross Inl. Cons./GDP (toe/M€10)	88.9	83.4	82.0	74.6	65.1	58.5	54.8	51.0	48.2	45.6	42.8	-0.8	-2.3	-1.7	-1.2
Carbon intensity (t of CO_2/toe of GIC)	2.70	2.53	2.52	2.21	1.95	1.79	1.69	1.66	1.62	1.61	1.54	-0.7	-2.5	-1.4	-0.4
Import Dependency %	-35.3	-50.9	-18.2	-24.4	-8.7	2.8	19.7	24.4	33.7	57.8	64.9				
Total energy-rel. and other mitigation costs (B) (in 000 M€10)	16.5	22.7	25.3	27.4	30.7	32.5	34.0	35.7	37.9	40.4	43.5	4.4	2.0	1.0	1.2
as % of GDP	7.4	9.6	10.7	10.8	11.4	11.1	10.8	10.6	10.4	10.2	10.1				
Energy intensity indicators															
Industry (Energy on Value added, index 2000=100)	100.0	101.9	91.8	83.7	80.3	74.4	70.5	67.2	64.8	64.5	63.3	-0.9	-1.3	-1.3	-0.5
Residential (Energy on Private Income, index 2000=100)	100.0	95.9	101.7	88.4	75.4	66.9	62.7	59.1	56.4	53.8	50.8	0.2	-2.9	-1.8	-1.0
Tertiary (Energy on Value added, index 2000=100)	100.0	95.4	97.9	85.4	73.9	68.8	64.0	59.7	55.8	51.9	47.6	-0.2	-2.8	-1.4	-1.5
Passenger transport (toe/Mpkm)	50.4	49.3	49.2	47.1	41.8	37.8	35.2	33.8	32.8	32.2	31.9	-0.2	-1.6	-1.7	-0.5
Freight transport (toe/Mtkm)	40.1	59.2	68.4	67.0	63.8	60.9	58.1	55.6	53.9	52.9	51.9	5.5	-0.7	-0.9	-0.6
Carbon Intensity indicators															
Electricity and Steam production (t of CO_2/MWh)	0.36	0.28	0.26	0.21	0.15	0.11	0.10	0.09	0.09	0.09	0.08	-2.9	-5.6	-4.0	-1.4
Final energy demand (t of CO_2/toe)	1.81	1.76	1.63	1.54	1.52	1.49	1.46	1.44	1.41	1.40	1.38	-1.0	-0.7	-0.4	-0.3
Industry	1.85	1.79	1.62	1.33	1.30	1.20	1.14	1.11	1.07	1.14	1.10	-1.3	-2.2	-1.2	-0.2
Residential	0.94	0.80	0.66	0.54	0.52	0.54	0.51	0.50	0.48	0.45	0.44	-3.6	-2.2	-0.3	-0.8
Tertiary	1.05	0.95	0.90	0.81	0.84	0.83	0.82	0.82	0.80	0.79	0.80	-1.6	-0.7	-0.2	-0.1
Transport (C)	2.98	2.99	3.00	2.88	2.79	2.78	2.77	2.76	2.75	2.73	2.70	0.1	-0.7	-0.1	-0.1
Indicators for renewables															
Share of RES in Gross Final Energy Consumption (D) (%)	10.6	16.1	22.1	24.6	32.8	36.6	37.0	37.8	39.4	39.4	42.4				
RES in transport (%)	0.1	0.2	0.3	3.0	10.2	11.1	11.9	12.6	13.2	14.5	16.4				
Gross Electricity generation by source (in GWh_e) (E)	**36053**	**36246**	**38785**	**36243**	**33667**	**33686**	**34521**	**36759**	**39342**	**43020**	**46114**	**0.7**	**-1.4**	**0.3**	**1.5**
Nuclear energy	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Solids	16673	15463	16976	11928	5474	2603	276	169	0	0	0	0.2	-10.7	-25.8	-100.0
Oil (including refinery gas)	4439	1375	750	202	201	197	186	201	247	353	353	-16.3	-12.3	-0.8	3.3
Gas (including derived gases)	8774	8780	7908	8114	6769	6964	8824	9358	8950	10909	8889	-1.0	-1.5	2.7	0.0
Biomass-waste	1895	3989	5315	5080	6084	5829	4908	5833	6404	6803	8714	10.9	1.4	-2.1	2.9
Hydro (pumping excluded)	30	23	21	29	23	22	23	29	29	29	22	-3.5	0.7	0.0	-0.1
Wind	4241	6614	7809	10617	14770	17488	19521	20386	22927	24139	27347	6.3	6.6	2.8	1.7
Solar	1	2	6	272	347	584	784	784	785	787	788	17.5	50.0	8.5	0.0
Geothermal and other renewables	0	0	0	0	0	0	0	0	0	0	0	-19.3	-100.0	0.0	0.0
Other fuels (hydrogen, methanol)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Net Generation Capacity in MW_e	**12444**	**12992**	**13596**	**14049**	**13983**	**13772**	**14229**	**13580**	**14988**	**16394**	**18453**	**0.9**	**0.3**	**0.2**	**1.3**
Nuclear energy	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Renewable energy	2428	3142	3765	4784	6333	7450	8195	8369	9230	9725	10989	4.5	5.3	2.6	1.5
Hydro (pumping excluded)	10	11	9	12	12	12	12	12	12	12	12	-1.0	3.3	0.0	0.0
Wind	2417	3128	3749	4489	5960	6858	7420	7594	8454	8947	10210	4.5	4.7	2.2	1.6
Solar	1	3	7	282	360	579	762	763	763	766	767	21.5	48.3	7.8	0.0
Other renewables (tidal etc.)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Thermal power	10016	9850	9831	9265	7650	6322	6034	5211	5757	6669	7464	-0.2	-2.5	-2.3	1.1
of which cogeneration units	5578	4738	4839	4255	3844	3455	2974	3269	3378	4280	4686	-1.4	-2.3	-2.5	2.3
of which CCS units	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Solids fired	6173	5166	4967	4423	3308	2050	1231	91	0	0	0	-2.1	-4.0	-9.4	-100.0
Gas fired	2103	2683	2709	2715	2693	2806	3360	3522	4080	4840	5120	2.6	-0.1	2.2	2.1
Oil fired	1164	1107	1134	1105	505	321	299	292	245	207	543	-0.3	-7.8	-5.1	3.0
Biomass-waste fired	577	893	1021	1022	1144	1144	1146	1307	1432	1621	1802	5.9	1.1	0.0	2.3
Hydrogen plants	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Geothermal heat	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Avg. Load factor of net power capacity (F) (%)	31.6	30.2	30.9	28.2	26.6	27.1	27.1	30.2	29.4	29.4	27.9				
Electricity indicators															
Efficiency of gross thermal power generation (%)	34.9	35.7	35.0	37.6	32.7	31.8	29.9	31.3	30.8	33.7	32.4				
% of gross electricity from CHP	52.6	52.1	49.2	61.6	50.7	45.0	38.7	41.4	39.5	40.8	38.1				
% of electricity from CCS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Carbon free gross electricity generation (%)	17.1	29.3	33.9	44.1	63.0	71.0	73.1	73.5	76.6	73.8	80.0				
- nuclear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
- renewable energy forms	17.1	29.3	33.9	44.1	63.0	71.0	73.1	73.5	76.6	73.8	80.0				
Transport sector															
Passenger transport activity (Gpkm)	**73.5**	**75.0**	**77.7**	**81.0**	**84.6**	**88.8**	**93.2**	**97.1**	**101.2**	**105.3**	**109.5**	**0.6**	**0.9**	**1.0**	**0.8**
Public road transport	5.5	6.0	6.3	6.6	6.8	7.1	7.4	7.7	8.0	8.3	8.6	1.4	0.7	0.8	0.8
Private cars and motorcycles	51.2	50.6	51.6	52.8	53.9	55.3	56.4	57.6	58.8	60.1	61.4	0.1	0.4	0.5	0.4
Rail	5.5	6.1	6.6	6.9	7.3	7.7	8.2	8.6	9.1	9.6	10.1	1.8	1.0	1.1	1.1
Aviation	7.9	9.3	10.2	11.7	13.4	15.5	17.9	19.7	21.7	23.5	25.5	2.6	2.8	2.9	1.8
Inland navigation	3.3	3.0	2.9	3.0	3.1	3.2	3.3	3.4	3.6	3.7	3.9	-1.3	0.7	0.7	0.7
Freight transport activity (Gtkm)	**27.8**	**27.5**	**19.7**	**22.1**	**24.8**	**26.2**	**27.8**	**29.0**	**30.2**	**31.5**	**32.9**	**-3.4**	**2.3**	**1.2**	**0.8**
Trucks	24.0	23.3	15.0	17.1	19.4	20.6	21.7	22.6	23.5	24.5	25.6	-4.6	2.6	1.1	0.8
Rail	2.0	2.0	2.2	2.4	2.6	2.9	3.1	3.3	3.6	3.7	3.9	1.0	1.7	1.8	1.1
Inland navigation	1.7	2.2	2.4	2.5	2.7	2.8	3.0	3.1	3.2	3.2	3.3	3.5	1.0	1.1	0.5
Energy demand in transport (ktoe) (G)	**4821**	**5327**	**5172**	**5295**	**5114**	**4955**	**4900**	**4894**	**4947**	**5059**	**5192**	**0.7**	**-0.1**	**-0.4**	**0.3**
Public road transport	106	114	126	129	131	132	133	135	137	140	143	1.7	0.4	0.1	0.4
Private cars and motorcycles	2562	2422	2648	2536	2183	1956	1845	1810	1786	1788	1802	0.3	-1.9	-1.7	-0.1
Trucks	1031	1538	1254	1386	1488	1503	1519	1517	1536	1578	1618	2.0	1.7	0.2	0.3
Rail	103	107	113	114	116	118	121	122	120	117	116	0.9	0.2	0.5	-0.2
Aviation	856	955	875	968	1030	1076	1107	1132	1187	1252	1325	0.2	1.6	0.7	0.9
Inland navigation	163	191	155	161	166	170	174	178	181	184	188	-0.4	0.7	0.5	0.4

Source: PRIMES

Estonia: Reference scenario												SUMMARY ENERGY BALANCE AND INDICATORS (A)			
ktoe	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**	**'00-'10**	**'10-'20**	**'20-'30**	**'30-'50**
												Annual % Change			
Production (incl.recovery of products)	**3435**	**4250**	**5467**	**6764**	**8842**	**8682**	**8438**	**8269**	**8202**	**8110**	**7960**	**4.8**	**4.9**	**-0.5**	**-0.3**
Solids	2669	3176	3943	4432	5259	5022	4687	4466	4281	4141	4054	4.0	2.9	-1.1	-0.7
Oil	249	375	532	1089	2080	2120	2174	2228	2276	2282	2275	7.9	14.6	0.4	0.2
Natural gas	5	7	5	0	0	0	0	0	0	0	0	-1.7	-100.0	0.0	0.0
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Renewable energy sources	512	692	988	1243	1503	1540	1577	1575	1645	1687	1631	6.8	4.3	0.5	0.2
Hydro	0	2	2	5	7	8	10	11	12	12	12	18.4	11.7	3.7	0.9
Biomass & Waste	512	686	961	1165	1394	1350	1335	1292	1303	1250	1141	6.5	3.8	-0.4	-0.8
Wind	0	5	24	70	98	177	225	263	321	414	466	0.0	15.2	8.6	3.7
Solar and others	0	0	0	3	4	6	7	9	10	12	12	0.0	0.0	5.3	2.8
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.5	0.8
Net Imports	**1619**	**1435**	**813**	**354**	**-833**	**-749**	**-615**	**-449**	**-320**	**-238**	**-82**	**-6.7**	**0.0**	**-3.0**	**-9.6**
Solids	270	27	-22	-6	-2	4	5	5	9	10	8	0.0	-23.1	0.0	2.3
Oil	777	859	710	237	-763	-765	-734	-690	-625	-522	-407	-0.9	0.0	-0.4	-2.9
- Crude oil and Feedstocks	-125	-225	-394	-774	-1415	-1378	-1348	-1315	-1275	-1209	-1138	12.2	13.6	-0.5	-0.8
- Oil products	902	1085	1104	1011	653	613	614	625	650	687	731	2.0	-5.1	-0.6	0.9
Natural gas	657	792	558	725	515	477	412	398	376	230	148	-1.6	-0.8	-2.2	-5.0
Electricity	-80	-138	-280	-330	-149	-85	35	113	135	174	189	13.4	-6.1	0.0	8.8
Gross Inland Consumption	**4970**	**5569**	**6106**	**6881**	**7767**	**7688**	**7578**	**7570**	**7627**	**7609**	**7609**	**2.1**	**2.4**	**-0.2**	**0.0**
Solids	2968	3194	3917	4426	5257	5026	4692	4470	4290	4151	4062	2.8	3.0	-1.1	-0.7
Oil	908	1126	1060	1090	1081	1120	1208	1309	1424	1531	1640	1.6	0.2	1.1	1.5
Natural gas	662	800	563	723	509	466	398	378	348	195	107	-1.6	-1.0	-2.4	-6.3
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Electricity	-80	-138	-280	-330	-149	-85	35	113	135	174	189	13.4	-6.1	0.0	8.8
Renewable energy forms	513	589	847	971	1069	1161	1245	1300	1430	1558	1610	5.1	2.4	1.5	1.3
as % in Gross Inland Consumption															
Solids	59.7	57.3	64.2	64.3	67.7	65.4	61.9	59.0	56.3	54.6	53.4				
Oil	18.3	20.2	17.4	15.8	13.9	14.6	15.9	17.3	18.7	20.1	21.6				
Natural gas	13.3	14.4	9.2	10.5	6.6	6.1	5.2	5.0	4.6	2.6	1.4				
Nuclear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Renewable energy forms	10.3	10.6	13.9	14.1	13.8	15.1	16.4	17.2	18.7	20.5	21.2				
Gross Electricity Generation in GWh_e	**8507**	**10203**	**12962**	**15162**	**13346**	**12791**	**11658**	**11007**	**10917**	**11022**	**11482**	**4.3**	**0.3**	**-1.3**	**-0.1**
Self consumption and grid losses	2183	2194	2292	2690	2367	2277	2164	2095	2023	2049	2130	0.5	0.3	-0.9	-0.1
Fuel Inputs to Thermal Power Generation	**2442**	**2600**	**3115**	**3152**	**2362**	**2042**	**1666**	**1461**	**1325**	**1167**	**1089**	**2.5**	**-2.7**	**-3.4**	**-2.1**
Solids	2199	2353	2715	2668	1978	1673	1255	942	689	533	441	2.1	-3.1	-4.4	-5.1
Oil (including refinery gas)	16	10	11	32	4	0	0	0	0	0	0	-3.0	-10.7	-35.6	0.0
Gas (including derived gases)	226	227	209	289	217	209	222	287	372	337	359	-0.8	0.4	0.2	2.4
Biomass & Waste	2	10	179	162	163	160	189	232	265	297	289	55.4	-0.9	1.5	2.1
Geothermal heat	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Hydrogen - Methanol	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Fuel Input to other conversion processes	**968**	**1296**	**1564**	**2106**	**3567**	**3647**	**3734**	**3811**	**3900**	**3931**	**3930**	**4.9**	**8.6**	**0.5**	**0.3**
Refineries	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Biofuels and hydrogen production	0	0	0	28	74	70	69	65	64	63	64	0.0	0.0	-0.7	-0.4
District heating	455	489	446	429	356	370	364	347	352	361	356	-0.2	-2.2	0.2	-0.1
Derived gases, cokeries etc.	514	807	1117	1649	3137	3206	3301	3398	3484	3507	3511	8.1	10.9	0.5	0.3
Energy Branch Consumption	**165**	**193**	**201**	**231**	**226**	**208**	**187**	**171**	**159**	**149**	**144**	**2.0**	**1.2**	**-1.9**	**-1.3**
Non-Energy Uses	**180**	**182**	**37**	**39**	**43**	**45**	**45**	**48**	**49**	**50**	**51**	**-14.6**	**1.6**	**0.4**	**0.6**
Final Energy Demand	**2423**	**2867**	**2905**	**3091**	**3151**	**3198**	**3241**	**3273**	**3317**	**3358**	**3393**	**1.8**	**0.8**	**0.3**	**0.2**
by sector															
Industry	571	719	570	665	726	725	740	749	767	770	782	0.0	2.4	0.2	0.3
- energy intensive industries	245	273	231	285	329	328	333	337	341	339	336	-0.6	3.6	0.1	0.1
- other industrial sectors	326	446	339	380	396	397	408	412	426	431	446	0.4	1.6	0.3	0.5
Residential	929	890	1028	1044	1040	1078	1078	1081	1080	1097	1109	1.0	0.1	0.4	0.1
Tertiary	345	494	522	561	571	593	607	618	628	645	654	4.2	0.9	0.6	0.4
Transport	578	765	786	822	815	801	815	825	842	846	848	3.1	0.4	0.0	0.2
by fuel															
Solids	118	119	83	85	116	118	108	111	106	102	100	-3.4	3.3	-0.7	-0.4
Oil	763	971	945	950	884	863	874	885	898	900	895	2.2	-0.7	-0.1	0.1
Gas	177	263	207	218	228	245	246	252	251	246	252	1.6	1.0	0.8	0.1
Electricity	429	519	593	686	717	743	778	806	829	875	924	3.3	1.9	0.8	0.9
Heat (from CHP and District Heating)	511	547	532	552	544	553	554	557	560	579	556	0.4	0.2	0.2	0.0
Renewable energy forms	425	447	546	599	661	674	677	655	666	650	661	2.5	1.9	0.2	-0.1
Other fuels (hydrogen, ethanol)	0	0	0	0	1	2	5	6	7	7	6	6.3	89.1	14.5	1.5
RES in Gross Final Energy Consumption [(A)]	**489**	**548**	**775**	**925**	**929**	**1010**	**1119**	**1160**	**1254**	**1390**	**1457**	**4.7**	**1.8**	**1.9**	**1.3**
TOTAL GHG emissions (Mt of CO2 eq.)	**16.9**	**18.6**	**19.3**	**19.2**	**16.0**	**14.8**	**12.9**	**11.7**	**10.8**	**10.0**	**9.6**	**1.3**	**-1.9**	**-2.1**	**-1.5**
of which ETS sectors (2013 scope) GHG emissions		13.0	13.9	14.0	10.9	9.7	7.8	6.6	5.6	4.9	4.5		-2.4	-3.3	-2.7
of which non ETS sectors GHG emissions		5.6	5.4	5.3	5.1	5.1	5.1	5.1	5.1	5.1	5.1		-0.5	0.0	0.0
CO_2 Emissions (energy related)	**14.2**	**15.7**	**16.7**	**16.7**	**13.3**	**12.0**	**10.2**	**9.1**	**8.1**	**7.3**	**7.0**	**1.6**	**-2.2**	**-2.6**	**-1.9**
Power generation/District heating	10.9	11.5	12.9	12.9	9.5	8.2	6.4	5.2	4.3	3.5	3.1	1.7	-3.0	-3.8	-3.5
Energy Branch	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-0.5	1.3	-1.0	-0.5
Industry	0.9	1.0	0.8	0.8	0.9	0.9	0.8	0.9	0.8	0.8	0.8	-1.7	1.6	-0.5	-0.3
Residential	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-4.2	-2.7	-0.4	-0.1
Tertiary	0.3	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.6	2.2	1.4	1.0	0.6
Transport	1.7	2.3	2.4	2.4	2.2	2.2	2.2	2.2	2.3	2.3	2.2	3.3	-0.6	-0.1	0.1
CO_2 Emissions (non energy related)	**0.7**	**0.7**	**0.4**	**0.4**	**0.6**	**0.6**	**0.5**	**0.5**	**0.5**	**0.5**	**0.4**	**-6.0**	**4.6**	**-1.4**	**-0.3**
Non-CO_2 GHG emissions	**2.1**	**2.2**	**2.2**	**2.1**	**2.1**	**2.2**	**2.1**	**2.2**	**2.2**	**2.2**	**2.2**	**0.8**	**-0.6**	**0.2**	**0.0**
TOTAL GHG emissions Index (1990=100)	**41.3**	**45.5**	**47.1**	**46.9**	**39.0**	**36.1**	**31.4**	**28.6**	**26.3**	**24.3**	**23.4**				

Source: PRIMES

SUMMARY ENERGY BALANCE AND INDICATORS (B)															Estonia: Reference scenario
	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050	'00-'10	'10-'20	'20-'30	'30-'50
												Annual % Change			
Main Energy System Indicators															
Population (Million)	1.372	1.348	1.340	1.335	1.324	1.304	1.280	1.259	1.243	1.229	1.213	-0.2	-0.1	-0.3	-0.3
GDP (in 000 M€10)	10.1	14.3	14.3	17.3	19.4	21.5	24.1	26.4	28.8	30.7	32.2	3.5	3.1	2.2	1.5
Gross Inl. Cons./GDP (toe/M€10)	490.7	389.2	426.8	396.8	399.6	357.0	314.4	286.4	265.2	247.6	236.1	-1.4	-0.7	-2.4	-1.4
Carbon intensity (t of CO_2/toe of GIC)	2.86	2.82	2.73	2.43	1.71	1.56	1.35	1.20	1.07	0.96	0.92	-0.5	-4.6	-2.4	-1.9
Import Dependency %	31.9	25.2	12.9	5.0	-10.4	-9.4	-7.9	-5.7	-4.1	-3.0	-1.0				
Total energy-rel. and other mitigation costs [B] (in 000 M€10)	1.4	2.2	2.9	3.6	4.3	4.7	5.1	5.5	5.9	6.3	6.6	7.5	3.9	1.8	1.3
as % of GDP	13.9	15.3	20.3	20.8	21.9	21.9	21.2	20.8	20.6	20.6	20.6				
Energy intensity indicators															
Industry (Energy on Value added, index 2000=100)	100.0	84.7	70.0	65.3	63.3	59.2	55.9	53.3	51.1	48.8	48.3	-3.5	-1.0	-1.2	-0.7
Residential (Energy on Private Income, index 2000=100)	100.0	63.3	76.0	62.4	54.7	50.4	44.2	39.8	35.9	33.6	32.0	-2.7	-3.2	-2.1	-1.6
Tertiary (Energy on Value added, index 2000=100)	100.0	104.6	107.8	94.5	85.9	79.7	72.0	66.3	61.5	58.8	56.5	0.8	-2.2	-1.7	-1.2
Passenger transport (toe/Mpkm)	40.4	32.5	33.9	32.9	29.5	26.1	24.3	23.0	22.2	21.9	21.5	-1.7	-1.4	-1.9	-0.6
Freight transport (toe/Mtkm)	12.8	18.0	26.1	25.0	23.8	22.3	21.1	20.3	19.4	18.5	17.7	7.4	-0.9	-1.2	-0.9
Carbon Intensity indicators															
Electricity and Steam production (t of CO_2/MWh)	0.68	0.65	0.64	0.57	0.46	0.40	0.34	0.28	0.23	0.18	0.17	-0.6	-3.3	-3.1	-3.5
Final energy demand (t of CO_2/toe)	1.33	1.42	1.27	1.21	1.18	1.16	1.14	1.15	1.14	1.12	1.10	-0.4	-0.8	-0.3	-0.2
Industry	1.58	1.44	1.33	1.24	1.23	1.21	1.15	1.15	1.08	1.03	1.01	-1.7	-0.8	-0.7	-0.6
Residential	0.32	0.27	0.19	0.15	0.14	0.13	0.13	0.13	0.13	0.13	0.13	-5.2	-2.8	-0.7	-0.2
Tertiary	0.92	1.04	0.75	0.70	0.79	0.83	0.82	0.85	0.86	0.86	0.86	-2.0	0.5	0.4	0.2
Transport [C]	2.95	2.98	3.00	2.90	2.72	2.72	2.70	2.70	2.69	2.67	2.65	0.2	-1.0	-0.1	-0.1
Indicators for renewables															
Share of RES in Gross Final Energy Consumption [D] (%)	17.5	16.9	23.6	27.2	27.1	29.1	31.9	32.8	35.1	38.3	39.8				
RES in transport (%)	0.0	0.0	0.1	2.0	10.2	10.4	10.9	11.1	11.5	12.3	12.9				
Gross Electricity generation by source (in GWh_e) [E]	**8509**	**10205**	**12964**	**15162**	**13346**	**12791**	**11658**	**11007**	**10917**	**11022**	**11482**	**4.3**	**0.3**	**-1.3**	**-0.1**
Nuclear energy	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Solids	7678	9302	11167	12228	9881	8478	6449	4664	3171	2278	1885	3.8	-1.2	-4.2	-6.0
Oil (including refinery gas)	56	32	41	133	18	0	0	0	0	0	0	-3.1	-8.2	-35.6	0.0
Gas (including derived gases)	757	760	712	1216	1519	1475	1576	2066	2652	2400	2570	-0.6	7.9	0.4	2.5
Biomass-waste	13	35	740	705	707	693	902	1094	1225	1395	1474	49.8	-0.5	2.5	2.5
Hydro (pumping excluded)	5	22	27	62	82	89	118	128	136	138	140	18.4	11.7	3.7	0.9
Wind	0	54	277	817	1140	2056	2613	3056	3733	4810	5413	0.0	15.2	8.6	3.7
Solar	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Geothermal and other renewables	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Other fuels (hydrogen, methanol)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Net Generation Capacity in MW_e	**2736**	**2780**	**2739**	**3187**	**2853**	**2968**	**3275**	**3583**	**3841**	**4274**	**4843**	**0.0**	**0.4**	**1.4**	**2.0**
Nuclear energy	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Renewable energy	2	37	114	371	516	828	1084	1241	1479	1931	2160	49.8	16.3	7.7	3.5
Hydro (pumping excluded)	2	5	6	17	21	22	28	31	33	34	34	11.6	13.6	2.6	1.1
Wind	0	32	108	354	495	807	1056	1209	1446	1896	2125	0.0	16.4	7.9	3.6
Solar	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Other renewables (tidal etc.)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Thermal power	2734	2743	2625	2816	2337	2140	2191	2343	2362	2343	2683	-0.4	-1.2	-0.6	1.0
of which cogeneration units	452	446	402	428	423	430	443	497	501	573	644	-1.2	0.5	0.5	1.9
of which CCS units	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Solids fired	2476	2469	2305	2153	1376	1376	1369	1369	1369	1369	1369	-0.7	-5.0	-0.1	0.0
Gas fired	191	196	197	476	723	566	617	758	771	682	893	0.3	13.9	-1.6	1.9
Oil fired	41	41	42	84	134	94	93	93	93	93	93	0.3	12.1	-3.6	0.0
Biomass-waste fired	26	37	81	104	104	104	112	123	129	199	328	11.9	2.5	0.7	5.5
Hydrogen plants	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Geothermal heat	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Avg. Load factor of net power capacity [F] (%)	31.7	37.4	48.9	48.9	48.8	45.4	37.9	33.0	30.9	28.3	26.2				
Electricity indicators															
Efficiency of gross thermal power generation (%)	29.9	33.5	34.9	39.0	44.2	44.8	46.1	46.1	45.7	44.7	46.8				
% of gross electricity from CHP	11.0	10.2	10.3	14.9	23.0	25.0	28.5	34.1	34.8	38.2	36.4				
% of electricity from CCS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Carbon free gross electricity generation (%)	0.2	1.1	8.1	10.5	14.5	22.2	31.2	38.9	46.7	57.6	61.2				
- nuclear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
- renewable energy forms	0.2	1.1	8.1	10.5	14.5	22.2	31.2	38.9	46.7	57.6	61.2				
Transport sector															
Passenger transport activity (Gpkm)	**10.3**	**14.2**	**13.6**	**14.5**	**15.4**	**16.4**	**17.6**	**18.5**	**19.4**	**19.9**	**20.4**	**2.8**	**1.3**	**1.3**	**0.8**
Public road transport	2.6	2.7	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.7	2.8	-2.4	1.2	0.8	0.4
Private cars and motorcycles	6.8	10.0	10.3	10.9	11.4	12.1	12.8	13.4	13.9	14.1	14.2	4.3	1.1	1.1	0.5
Rail	0.4	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.7	-1.3	2.3	2.3	1.4
Aviation	0.2	0.7	0.6	0.7	0.8	1.0	1.3	1.5	1.7	2.0	2.3	12.2	4.1	4.3	2.9
Inland navigation	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	-0.9	1.2	1.1	0.9
Freight transport activity (Gtkm)	**12.1**	**16.5**	**12.3**	**13.5**	**14.9**	**16.4**	**18.1**	**19.4**	**20.7**	**21.7**	**22.6**	**0.2**	**2.0**	**2.0**	**1.1**
Trucks	3.9	5.8	5.6	6.0	6.4	6.8	7.3	7.8	8.4	8.7	9.1	3.6	1.3	1.4	1.1
Rail	8.1	10.6	6.6	7.5	8.5	9.6	10.8	11.5	12.4	12.9	13.5	-2.0	2.5	2.3	1.1
Inland navigation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-3.0	0.8	1.8	1.0
Energy demand in transport (ktoe) [G]	**572**	**757**	**781**	**817**	**809**	**795**	**808**	**818**	**833**	**837**	**839**	**3.2**	**0.3**	**0.0**	**0.2**
Public road transport	22	22	17	18	19	19	19	20	20	20	20	-2.5	1.2	0.3	0.0
Private cars and motorcycles	365	386	397	406	374	340	329	320	318	315	309	0.8	-0.6	-1.3	-0.3
Trucks	112	255	270	282	293	300	311	321	333	339	347	9.2	0.8	0.6	0.5
Rail	45	44	51	58	64	69	73	74	72	65	57	1.3	2.3	1.3	-1.3
Aviation	21	42	38	44	50	57	65	72	80	88	96	6.3	2.7	2.7	2.0
Inland navigation	7	8	8	9	9	9	10	10	11	11	11	1.3	1.1	0.7	0.5

Source: PRIMES

Finland: Reference scenario												SUMMARY ENERGY BALANCE AND INDICATORS (A)			
ktoe	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**	**'00-'10**	**'10-'20**	**'20-'30**	**'30-'50**
												Annual % Change			
Production (incl.recovery of products)	**15043**	**16886**	**17485**	**22359**	**22848**	**24479**	**26678**	**26748**	**26935**	**28107**	**29125**	**1.5**	**2.7**	**1.6**	**0.4**
Solids	1088	2136	1806	2250	1851	1913	1548	1044	949	901	716	5.2	0.2	-1.8	-3.8
Oil	343	481	622	339	339	339	339	339	339	339	339	6.1	-5.9	0.0	0.0
Natural gas	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Nuclear	5799	6003	5881	9225	9507	11582	14442	14704	13725	14159	14453	0.1	4.9	4.3	0.0
Renewable energy sources	7814	8267	9175	10546	11151	10644	10348	10660	11922	12708	13617	1.6	2.0	-0.7	1.4
Hydro	1261	1185	1111	1221	1173	1185	1218	1230	1286	1324	1365	-1.3	0.5	0.4	0.6
Biomass & Waste	6546	7066	8038	9224	9610	8942	8501	8783	9633	10223	10883	2.1	1.8	-1.2	1.2
Wind	7	15	25	87	342	478	577	594	945	1103	1311	14.2	29.8	5.4	4.2
Solar and others	1	1	1	14	26	39	52	54	58	58	58	9.8	34.7	7.2	0.6
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.4	1.4
Net Imports	**18570**	**19278**	**17900**	**18356**	**17059**	**16159**	**15338**	**15251**	**14666**	**14028**	**13750**	**-0.4**	**-0.5**	**-1.1**	**-0.5**
Solids	3532	3338	3976	3844	3283	3039	3052	3113	2054	1623	1024	1.2	-1.9	-0.7	-5.3
Oil	10594	10956	9151	9131	8850	8634	8343	8174	8013	7987	7930	-1.5	-0.3	-0.6	-0.3
- Crude oil and Feedstocks	12159	11068	11522	11487	11007	10636	10283	10050	9809	9677	9526	-0.5	-0.5	-0.7	-0.4
- Oil products	-1565	-112	-2370	-2356	-2158	-2002	-1940	-1876	-1796	-1690	-1596	4.2	-0.9	-1.1	-1.0
Natural gas	3422	3598	3837	4136	3519	3732	3719	3716	4344	4348	4762	1.2	-0.9	0.6	1.2
Electricity	1021	1463	903	782	806	-92	-639	-662	-716	-939	-1014	-1.2	-1.1	0.0	2.3
Gross Inland Consumption	**32917**	**35057**	**36978**	**40500**	**39694**	**40429**	**41811**	**41790**	**41393**	**41915**	**42652**	**1.2**	**0.7**	**0.5**	**0.1**
Solids	5124	4934	6878	6093	5134	4952	4601	4157	3003	2524	1740	3.0	-2.9	-1.1	-4.7
Oil	9736	10870	10271	9256	8979	8770	8486	8315	8159	8135	8080	0.5	-1.3	-0.6	-0.2
Natural gas	3422	3598	3837	4135	3515	3725	3712	3705	4330	4319	4729	1.2	-0.9	0.5	1.2
Nuclear	5799	6003	5881	9225	9507	11582	14442	14704	13725	14159	14453	0.1	4.9	4.3	0.0
Electricity	1021	1463	903	782	806	-92	-639	-662	-716	-939	-1014	-1.2	-1.1	0.0	2.3
Renewable energy forms	7814	8189	9208	11009	11753	11491	11209	11571	12892	13717	14665	1.7	2.5	-0.5	1.4
as % in Gross Inland Consumption															
Solids	15.6	14.1	18.6	15.0	12.9	12.2	11.0	9.9	7.3	6.0	4.1				
Oil	29.6	31.0	27.8	22.9	22.6	21.7	20.3	19.9	19.7	19.4	18.9				
Natural gas	10.4	10.3	10.4	10.2	8.9	9.2	8.9	8.9	10.5	10.3	11.1				
Nuclear	17.6	17.1	15.9	22.8	23.9	28.6	34.5	35.2	33.2	33.8	33.9				
Renewable energy forms	23.7	23.4	24.9	27.2	29.6	28.4	26.8	27.7	31.1	32.7	34.4				
Gross Electricity Generation in GWh_e	**69921**	**70525**	**80577**	**80001**	**80083**	**91554**	**100382**	**104941**	**110154**	**117468**	**123273**	**1.4**	**-0.1**	**2.3**	**1.0**
Self consumption and grid losses	5390	5801	6398	6169	6020	6947	7505	8214	8764	9470	9908	1.7	-0.6	2.2	1.4
Fuel Inputs to Thermal Power Generation	**7136**	**7744**	**10211**	**10213**	**9232**	**9130**	**8517**	**9121**	**9500**	**9563**	**9401**	**3.6**	**-1.0**	**-0.8**	**0.5**
Solids	3177	2995	5101	4416	3393	3256	2928	2755	1661	1201	414	4.8	-4.0	-1.5	-9.3
Oil (including refinery gas)	122	97	99	10	7	4	4	14	11	10	21	-2.1	-23.4	-4.6	8.3
Gas (including derived gases)	2093	2349	2264	2478	2108	2391	2447	2316	2940	2927	3221	0.8	-0.7	1.5	1.4
Biomass & Waste	1744	2302	2747	3309	3725	3478	3138	4036	4887	5426	5744	4.6	3.1	-1.7	3.1
Geothermal heat	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Hydrogen - Methanol	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Fuel Input to other conversion processes	**21406**	**21839**	**23446**	**26916**	**26937**	**28625**	**30988**	**30177**	**28866**	**29426**	**30035**	**0.9**	**1.4**	**1.4**	**-0.2**
Refineries	13249	13247	14629	14624	14149	13801	13398	13140	12878	12754	12600	1.0	-0.3	-0.5	-0.3
Biofuels and hydrogen production	0	0	142	222	380	354	333	322	314	308	320	0.0	10.3	-1.3	-0.2
District heating	1053	1266	1605	1698	1653	1663	1639	1188	1155	1427	1893	4.3	0.3	-0.1	0.7
Derived gases, cokeries etc.	7103	7326	7069	10372	10756	12807	15618	15527	14518	14936	15222	0.0	4.3	3.8	-0.1
Energy Branch Consumption	**1112**	**1109**	**1477**	**1435**	**1383**	**1417**	**1411**	**1409**	**1414**	**1433**	**1439**	**2.9**	**-0.7**	**0.2**	**0.1**
Non-Energy Uses	**1113**	**1328**	**1579**	**1599**	**1697**	**1720**	**1724**	**1727**	**1727**	**1727**	**1740**	**3.6**	**0.7**	**0.2**	**0.0**
Final Energy Demand	**24629**	**25487**	**26484**	**26276**	**25879**	**25363**	**25059**	**25047**	**25275**	**25504**	**25980**	**0.7**	**-0.2**	**-0.3**	**0.2**
by sector															
Industry	12329	11997	11604	11810	11982	11846	11876	11760	11791	11773	12029	-0.6	0.3	-0.1	0.1
- energy intensive industries	10317	9873	9472	9621	9789	9611	9610	9435	9357	9244	9350	-0.9	0.3	-0.2	-0.1
- other industrial sectors	2012	2124	2132	2189	2193	2236	2266	2325	2434	2528	2680	0.6	0.3	0.3	0.8
Residential	4547	5049	5787	5482	5116	4872	4789	4829	4945	5091	5227	2.4	-1.2	-0.7	0.4
Tertiary	3400	3705	4125	4018	3934	3981	3897	3997	4036	4118	4155	2.0	-0.5	-0.1	0.3
Transport	4353	4735	4969	4965	4847	4663	4497	4460	4503	4523	4568	1.3	-0.2	-0.7	0.1
by fuel															
Solids	1108	943	878	820	869	875	905	905	894	870	858	-2.3	-0.1	0.4	-0.3
Oil	7976	8295	7918	6974	6637	6459	6191	6098	5994	5969	5901	-0.1	-1.8	-0.7	-0.2
Gas	1204	1077	1009	1197	1028	959	904	845	846	842	886	-1.8	0.2	-1.3	-0.1
Electricity	6507	6942	7178	7027	7072	7083	7250	7558	7905	8250	8635	1.0	-0.1	0.2	0.9
Heat (from CHP and District Heating)	3335	3971	4663	4891	4805	4752	4659	4701	4674	4755	4873	3.4	0.3	-0.3	0.2
Renewable energy forms	4499	4259	4838	5366	5464	5229	5143	4930	4953	4806	4812	0.7	1.2	-0.6	-0.3
Other fuels (hydrogen, ethanol)	0	0	0	1	3	6	7	8	10	12	14	6.7	0.0	9.1	3.0
RES in Gross Final Energy Consumption [(A)]	**7253**	**7497**	**8794**	**9331**	**10388**	**10244**	**9922**	**10316**	**11528**	**12230**	**13108**	**1.9**	**1.7**	**-0.5**	**1.4**
TOTAL GHG emissions (Mt of CO2 eq.)	**72.1**	**71.9**	**78.7**	**71.6**	**65.4**	**64.6**	**61.5**	**57.9**	**53.9**	**51.8**	**49.4**	**0.9**	**-1.8**	**-0.6**	**-1.1**
of which ETS sectors (2013 scope) GHG emissions		38.8	46.3	42.4	37.4	37.5	35.4	32.3	28.9	27.0	24.7		-2.1	-0.5	-1.8
of which non ETS sectors GHG emissions		33.1	32.4	29.2	28.0	27.1	26.1	25.6	25.0	24.8	24.6		-1.5	-0.7	-0.3
CO_2 Emissions (energy related)	**58.2**	**58.3**	**65.6**	**59.2**	**52.8**	**51.9**	**49.4**	**46.0**	**42.3**	**40.3**	**37.8**	**1.2**	**-2.1**	**-0.7**	**-1.3**
Power generation/District heating	22.4	22.9	31.7	27.6	22.5	22.4	21.1	18.5	15.2	13.4	11.1	3.5	-3.4	-0.6	-3.2
Energy Branch	2.3	2.2	2.6	2.5	2.4	2.4	2.3	2.1	2.1	2.1	2.0	1.3	-0.5	-0.8	-0.6
Industry	14.3	13.0	11.4	10.8	10.6	10.4	9.8	9.4	9.2	9.1	9.2	-2.2	-0.7	-0.9	-0.3
Residential	2.4	2.3	1.9	1.3	1.2	1.2	1.2	1.1	1.1	1.1	1.0	-2.2	-4.5	-0.3	-0.8
Tertiary	3.9	3.8	3.6	2.9	2.8	2.8	2.8	2.7	2.4	2.3	2.2	-0.8	-2.5	0.0	-1.2
Transport	12.9	14.1	14.4	14.1	13.3	12.8	12.3	12.2	12.3	12.3	12.4	1.1	-0.8	-0.8	0.0
CO_2 Emissions (non energy related)	**1.5**	**1.6**	**2.2**	**2.4**	**2.6**	**2.7**	**2.4**	**2.2**	**2.2**	**2.1**	**2.1**	**3.9**	**1.9**	**-1.0**	**-0.6**
Non-CO_2 GHG emissions	**12.4**	**12.0**	**10.9**	**9.9**	**9.9**	**9.9**	**9.8**	**9.6**	**9.5**	**9.4**	**9.4**	**-1.3**	**-1.0**	**-0.2**	**-0.2**
TOTAL GHG emissions Index (1990=100)	**101.0**	**100.7**	**110.3**	**100.3**	**91.6**	**90.4**	**86.2**	**81.1**	**75.6**	**72.6**	**69.2**				

Source: PRIMES

SUMMARY ENERGY BALANCE AND INDICATORS (B)															Finland: Reference scenario
	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050	'00-'10	'10-'20	'20-'30	'30-'50
												Annual % Change			
Main Energy System Indicators															
Population (Million)	5.171	5.237	5.351	5.475	5.577	5.655	5.704	5.725	5.727	5.724	5.727	0.3	0.4	0.2	0.0
GDP (in 000 M€10)	150.5	171.4	179.7	197.7	211.9	227.6	243.5	262.7	284.2	306.5	329.4	1.8	1.7	1.4	1.5
Gross Inl. Cons./GDP (toe/M€10)	218.7	204.5	205.8	204.9	187.3	177.6	171.7	159.1	145.6	136.7	129.5	-0.6	-0.9	-0.9	-1.4
Carbon intensity (t of CO_2/toe of GIC)	1.77	1.66	1.78	1.46	1.33	1.28	1.18	1.10	1.02	0.96	0.89	0.0	-2.8	-1.2	-1.4
Import Dependency %	55.3	54.2	48.1	45.1	42.7	39.8	36.5	36.3	35.3	33.3	32.1				
Total energy-rel. and other mitigation costs (B) (in 000 M€10)	17.4	21.4	27.8	32.5	36.4	39.1	41.7	44.2	46.9	49.3	51.2	4.8	2.7	1.4	1.0
as % of GDP	11.5	12.5	15.5	16.5	17.2	17.2	17.1	16.8	16.5	16.1	15.6				
Energy intensity indicators															
Industry (Energy on Value added, index 2000=100)	100.0	81.0	79.4	72.5	70.0	64.6	61.3	57.4	54.7	52.3	50.7	-2.3	-1.3	-1.3	-1.0
Residential (Energy on Private Income, index 2000=100)	100.0	94.2	98.0	84.4	73.4	64.8	59.3	55.0	51.6	48.7	46.0	-0.2	-2.8	-2.1	-1.3
Tertiary (Energy on Value added, index 2000=100)	100.0	99.8	104.6	92.6	84.1	79.0	71.9	67.9	62.7	58.8	54.8	0.4	-2.2	-1.5	-1.3
Passenger transport (toe/Mpkm)	38.0	37.8	39.2	37.5	34.3	31.3	28.7	27.3	26.7	26.1	25.7	0.3	-1.3	-1.8	-0.5
Freight transport (toe/Mtkm)	28.5	32.1	32.6	30.5	29.3	27.7	26.0	25.0	24.3	23.6	23.0	1.4	-1.1	-1.2	-0.6
Carbon Intensity indicators															
Electricity and Steam production (t of CO_2/MWh)	0.20	0.19	0.23	0.19	0.16	0.15	0.13	0.11	0.09	0.08	0.06	1.3	-3.5	-1.9	-3.9
Final energy demand (t of CO_2/toe)	1.36	1.30	1.18	1.11	1.08	1.07	1.04	1.01	0.99	0.97	0.95	-1.4	-0.9	-0.4	-0.4
Industry	1.16	1.09	0.98	0.91	0.89	0.88	0.82	0.80	0.78	0.78	0.77	-1.6	-1.0	-0.8	-0.4
Residential	0.52	0.45	0.33	0.24	0.24	0.25	0.24	0.24	0.22	0.21	0.19	-4.5	-3.3	0.4	-1.2
Tertiary	1.16	1.02	0.88	0.72	0.71	0.70	0.72	0.68	0.60	0.57	0.52	-2.7	-2.1	0.1	-1.6
Transport (C)	2.97	2.97	2.89	2.84	2.74	2.74	2.73	2.73	2.73	2.72	2.71	-0.3	-0.5	0.0	0.0
Indicators for renewables															
Share of RES in Gross Final Energy Consumption (D) (%)	28.4	28.3	31.8	34.1	38.5	38.6	37.7	39.2	43.3	45.5	47.8				
RES in transport (%)	0.3	0.4	3.9	6.1	10.8	11.2	11.4	11.6	12.2	12.5	13.5				
Gross Electricity generation by source (in GWh_e) (E)	**69968**	**70572**	**80667**	**80001**	**80083**	**91554**	**100382**	**104941**	**110154**	**117468**	**123273**	**1.4**	**-0.1**	**2.3**	**1.0**
Nuclear energy	22513	23305	22875	36692	37782	46634	59443	61454	58155	61092	62393	0.2	5.1	4.6	0.2
Solids	12452	10998	20827	7304	4995	5174	4452	4066	2624	2010	857	5.3	-13.3	-1.1	-7.9
Oil (including refinery gas)	587	500	484	49	34	22	22	71	65	55	126	-1.9	-23.4	-4.1	9.1
Gas (including derived gases)	10816	11921	11847	9547	8084	9165	6043	5450	5726	5936	5632	0.9	-3.7	-2.9	-0.4
Biomass-waste	8860	9891	11413	11196	11523	11168	9501	12633	17582	20081	23081	2.6	0.1	-1.9	4.5
Hydro (pumping excluded)	14660	13784	12922	14199	13640	13782	14157	14307	14952	15397	15874	-1.3	0.5	0.4	0.6
Wind	78	170	294	1008	3978	5561	6706	6902	10984	12830	15243	14.2	29.8	5.4	4.2
Solar	2	3	5	6	48	48	58	58	67	67	67	11.1	26.7	1.8	0.8
Geothermal and other renewables	0	0	0	0	0	0	0	0	0	0	0	1.6	0.0	0.0	-100.0
Other fuels (hydrogen, methanol)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Net Generation Capacity in MW_e	**16417**	**16650**	**16817**	**18612**	**19970**	**20766**	**22245**	**23355**	**24667**	**26025**	**28496**	**0.2**	**1.7**	**1.1**	**1.2**
Nuclear energy	2687	2690	2691	4320	4321	5349	6843	7095	6733	7096	7247	0.0	4.9	4.7	0.3
Renewable energy	2883	3080	3280	3763	4949	5575	6057	6195	7731	8434	9321	1.3	4.2	2.0	2.2
Hydro (pumping excluded)	2841	2994	3102	3345	3361	3372	3441	3499	3647	3718	3796	0.9	0.8	0.2	0.5
Wind	39	82	171	411	1538	2153	2556	2636	4015	4646	5456	15.9	24.6	5.2	3.9
Solar	3	4	7	7	50	50	60	60	70	70	70	8.8	21.6	1.9	0.8
Other renewables (tidal etc.)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Thermal power	10846	10880	10847	10529	10701	9842	9346	10066	10203	10496	11928	0.0	-0.1	-1.3	1.2
of which cogeneration units	8280	7745	8587	8355	8321	7745	7425	8139	7596	7629	7134	0.4	-0.3	-1.1	-0.2
of which CCS units	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Solids fired	5041	4797	4379	3972	3800	3014	3014	2833	1917	1379	615	-1.4	-1.4	-2.3	-7.6
Gas fired	2807	2771	2866	2759	2538	2475	2427	2438	3008	3421	4808	0.2	-1.2	-0.4	3.5
Oil fired	978	907	970	907	777	765	616	609	425	83	17	-0.1	-2.2	-2.3	-16.5
Biomass-waste fired	2021	2405	2632	2890	3586	3588	3288	4186	4853	5613	6488	2.7	3.1	-0.9	3.5
Hydrogen plants	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Geothermal heat	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Avg. Load factor of net power capacity (F) (%)	46.8	46.5	52.4	46.9	43.9	48.0	49.2	48.8	48.5	49.0	47.0				
Electricity indicators															
Efficiency of gross thermal power generation (%)	39.4	37.0	37.5	23.7	22.9	24.0	20.2	21.0	23.5	25.3	27.2				
% of gross electricity from CHP	36.4	38.9	36.2	26.7	27.1	26.4	19.3	20.9	23.4	23.8	23.9				
% of electricity from CCS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Carbon free gross electricity generation (%)	65.9	66.8	58.9	78.9	83.6	84.3	89.5	90.9	92.4	93.2	94.6				
- nuclear	32.2	33.0	28.4	45.9	47.2	50.9	59.2	58.6	52.8	52.0	50.6				
- renewable energy forms	33.7	33.8	30.5	33.0	36.4	33.4	30.3	32.3	39.6	41.2	44.0				
Transport sector															
Passenger transport activity (Gpkm)	**80.0**	**87.0**	**89.9**	**93.8**	**97.8**	**101.3**	**104.9**	**108.1**	**111.4**	**114.0**	**116.7**	**1.2**	**0.8**	**0.7**	**0.5**
Public road transport	7.7	7.5	7.5	7.8	8.0	8.2	8.3	8.4	8.6	8.6	8.7	-0.2	0.6	0.3	0.3
Private cars and motorcycles	56.6	62.8	65.7	67.8	69.7	70.8	71.7	72.9	73.9	74.7	75.4	1.5	0.6	0.3	0.3
Rail	3.9	4.0	4.5	4.8	5.1	5.4	5.8	6.0	6.3	6.5	6.6	1.4	1.4	1.1	0.7
Aviation	7.7	8.8	8.5	9.7	11.1	12.9	15.1	16.7	18.5	20.0	21.6	1.1	2.7	3.1	1.8
Inland navigation	4.2	3.8	3.7	3.8	3.9	4.0	4.1	4.1	4.2	4.3	4.3	-1.2	0.6	0.3	0.3
Freight transport activity (Gtkm)	**45.5**	**44.4**	**43.9**	**46.9**	**50.1**	**53.3**	**56.6**	**59.3**	**62.2**	**64.6**	**67.1**	**-0.4**	**1.3**	**1.2**	**0.9**
Trucks	32.0	31.9	29.5	31.2	33.0	34.9	36.8	38.4	40.0	41.4	42.7	-0.8	1.1	1.1	0.8
Rail	10.1	9.7	9.8	10.8	11.9	12.8	13.9	14.7	15.7	16.5	17.4	-0.4	2.0	1.6	1.1
Inland navigation	3.5	2.8	4.6	4.9	5.2	5.6	5.9	6.2	6.5	6.8	7.0	2.8	1.3	1.2	0.9
Energy demand in transport (ktoe) (G)	**4335**	**4712**	**4954**	**4948**	**4829**	**4645**	**4479**	**4442**	**4484**	**4504**	**4549**	**1.3**	**-0.3**	**-0.7**	**0.1**
Public road transport	91	89	89	91	92	91	90	89	89	88	88	-0.2	0.3	-0.3	-0.1
Private cars and motorcycles	2270	2460	2584	2496	2277	2021	1847	1774	1740	1721	1713	1.3	-1.3	-2.1	-0.4
Trucks	1203	1332	1328	1323	1350	1349	1342	1353	1379	1392	1413	1.0	0.2	-0.1	0.3
Rail	90	92	90	96	104	109	113	115	116	114	112	0.0	1.5	0.8	0.0
Aviation	509	569	679	752	811	878	887	909	956	983	1016	2.9	1.8	0.9	0.7
Inland navigation	172	170	183	189	195	198	200	203	205	206	207	0.6	0.6	0.3	0.2

Source: PRIMES

France: Reference scenario												SUMMARY ENERGY BALANCE AND INDICATORS (A)			
ktoe	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**	**'00-'10**	**'10-'20**	**'20-'30**	**'30-'50**
												Annual % Change			
Production (incl.recovery of products)	**129847**	**136034**	**134775**	**136586**	**132493**	**131307**	**133213**	**135099**	**135408**	**137900**	**133396**	**0.4**	**-0.2**	**0.1**	**0.0**
Solids	2482	383	162	87	0	0	0	0	0	0	0	-23.9	-100.0	0.0	0.0
Oil	2013	1544	1467	0	0	0	0	0	0	0	0	-3.1	-100.0	0.0	0.0
Natural gas	1505	909	646	0	0	0	0	0	0	0	0	-8.1	-100.0	0.0	0.0
Nuclear	107093	116474	110539	111401	99077	94132	94071	93566	91144	92144	87863	0.3	-1.1	-0.5	-0.3
Renewable energy sources	16754	16724	21962	25098	33416	37174	39142	41533	44264	45756	45533	2.7	4.3	1.6	0.8
Hydro	5773	4449	5332	5528	5567	5623	5831	6566	6701	6727	6784	-0.8	0.4	0.5	0.8
Biomass & Waste	10831	12040	15574	15966	19326	19291	18463	17785	18358	17931	16491	3.7	2.2	-0.5	-0.6
Wind	7	83	857	1942	5697	8876	10769	11505	12096	13503	14409	62.6	20.9	6.6	1.5
Solar and others	17	22	108	1292	2472	3038	3739	4240	5270	5579	5639	20.3	36.8	4.2	2.1
Geothermal	126	130	91	370	353	347	340	1436	1839	2016	2210	-3.2	14.5	-0.4	9.8
Net Imports	**134424**	**144391**	**133605**	**131778**	**118838**	**114567**	**109307**	**106427**	**104731**	**105862**	**108113**	**-0.1**	**-1.2**	**-0.8**	**-0.1**
Solids	13005	13511	12162	9833	6728	5796	4842	3858	3687	5436	6372	-0.7	-5.7	-3.2	1.4
Oil	91607	95403	84371	80073	74138	71662	69954	68203	67296	67015	66867	-0.8	-1.3	-0.6	-0.2
- Crude oil and Feedstocks	85671	85568	65651	63937	60152	58470	57542	56627	56164	56156	56275	-2.6	-0.9	-0.4	-0.1
- Oil products	5936	9835	18720	16137	13986	13192	12411	11576	11132	10859	10592	12.2	-2.9	-1.2	-0.8
Natural gas	35778	40720	39553	43254	38605	36606	33312	32213	30857	30704	31702	1.0	-0.2	-1.5	-0.2
Electricity	-5974	-5187	-2644	-4739	-5049	-4418	-3676	-2768	-2181	-2107	-1636	-7.8	6.7	-3.1	-4.0
Gross Inland Consumption	**257777**	**276545**	**268530**	**265645**	**248480**	**242947**	**239553**	**238536**	**237092**	**240620**	**238241**	**0.4**	**-0.8**	**-0.4**	**0.0**
Solids	15048	14303	12046	9920	6728	5796	4842	3858	3687	5436	6372	-2.2	-5.7	-3.2	1.4
Oil	89084	93261	83925	77368	71346	68858	67140	65440	64562	64253	64059	-0.6	-1.6	-0.6	-0.2
Natural gas	35766	41025	42540	43240	38546	36485	33159	31987	30545	30323	31241	1.7	-1.0	-1.5	-0.3
Nuclear	107093	116474	110539	111401	99077	94132	94071	93566	91144	92144	87863	0.3	-1.1	-0.5	-0.3
Electricity	-5974	-5187	-2644	-4739	-5049	-4418	-3676	-2768	-2181	-2107	-1636	-7.8	6.7	-3.1	-4.0
Renewable energy forms	16761	16669	22124	28456	37832	42095	44018	46454	49336	50571	50341	2.8	5.5	1.5	0.7
as % in Gross Inland Consumption															
Solids	5.8	5.2	4.5	3.7	2.7	2.4	2.0	1.6	1.6	2.3	2.7				
Oil	34.6	33.7	31.3	29.1	28.7	28.3	28.0	27.4	27.2	26.7	26.9				
Natural gas	13.9	14.8	15.8	16.3	15.5	15.0	13.8	13.4	12.9	12.6	13.1				
Nuclear	41.5	42.1	41.2	41.9	39.9	38.7	39.3	39.2	38.4	38.3	36.9				
Renewable energy forms	6.5	6.0	8.2	10.7	15.2	17.3	18.4	19.5	20.8	21.0	21.1				
Gross Electricity Generation in GWh_e	**535958**	**571395**	**564088**	**591166**	**583539**	**605085**	**631997**	**649190**	**671005**	**711403**	**724782**	**0.5**	**0.3**	**0.8**	**0.7**
Self consumption and grid losses	56172	60388	61728	62283	58064	60378	63638	67116	70584	76942	79391	0.9	-0.6	0.9	1.1
Fuel Inputs to Thermal Power Generation	**13379**	**17097**	**16920**	**16487**	**13937**	**12851**	**10747**	**10524**	**11262**	**13091**	**13354**	**2.4**	**-1.9**	**-2.6**	**1.1**
Solids	6559	6402	4717	3825	1113	727	0	0	0	1845	2119	-3.2	-13.4	-100.0	0.0
Oil (including refinery gas)	1241	2185	1638	749	80	127	158	139	109	141	198	2.8	-26.1	7.1	1.1
Gas (including derived gases)	4034	6298	8178	7883	8070	6634	4938	3101	2558	2135	1948	7.3	-0.1	-4.8	-4.5
Biomass & Waste	1545	2212	2387	3881	4524	5211	5500	6033	6934	7131	7041	4.4	6.6	2.0	1.2
Geothermal heat	0	0	0	151	151	151	151	1251	1661	1839	2049	0.0	0.0	0.0	13.9
Hydrogen - Methanol	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Fuel Input to other conversion processes	**205489**	**211643**	**191882**	**187680**	**171550**	**164609**	**163373**	**160582**	**157311**	**158158**	**155165**	**-0.7**	**-1.1**	**-0.5**	**-0.3**
Refineries	91164	88602	74262	68737	64177	62465	61518	60497	59931	59873	59966	-2.0	-1.4	-0.4	-0.1
Biofuels and hydrogen production	329	400	2420	2826	3596	3674	3828	3879	3871	4017	4296	22.1	4.0	0.6	0.6
District heating	312	271	261	456	828	949	941	970	829	667	581	-1.8	12.2	1.3	-2.4
Derived gases, cokeries etc.	113684	122371	114939	115661	102949	97521	97087	95235	92681	93601	90322	0.1	-1.1	-0.6	-0.4
Energy Branch Consumption	**10830**	**9975**	**10242**	**8311**	**7581**	**7321**	**7339**	**7109**	**7144**	**7452**	**7693**	**-0.6**	**-3.0**	**-0.3**	**0.2**
Non-Energy Uses	**16225**	**14528**	**11996**	**11920**	**12023**	**12194**	**12351**	**12346**	**12047**	**11958**	**11946**	**-3.0**	**0.0**	**0.3**	**-0.2**
Final Energy Demand	**154489**	**162383**	**158771**	**158093**	**151406**	**150106**	**147937**	**147181**	**147692**	**149698**	**150949**	**0.3**	**-0.5**	**-0.2**	**0.1**
by sector															
Industry	37170	36628	31242	32919	33187	32835	33561	32948	33228	34356	35234	-1.7	0.6	0.1	0.2
- energy intensive industries	21437	22084	18407	19741	19567	18499	18667	17932	17628	17998	18026	-1.5	0.6	-0.5	-0.2
- other industrial sectors	15733	14544	12834	13178	13620	14337	14893	15016	15600	16358	17208	-2.0	0.6	0.9	0.7
Residential	39680	46584	46298	45651	43207	42618	40703	40077	39468	38854	37552	1.6	-0.7	-0.6	-0.4
Tertiary	26957	28648	30914	28648	26621	27313	26416	26993	27326	28287	29124	1.4	-1.5	-0.1	0.5
Transport	50682	50522	50317	50875	48392	47340	47258	47163	47671	48200	49038	-0.1	-0.4	-0.2	0.2
by fuel															
Solids	5775	5219	4496	3899	3600	3287	3264	3100	2983	2916	2883	-2.5	-2.2	-1.0	-0.6
Oil	72354	73261	66723	62220	57112	54806	53054	51504	51067	50870	50807	-0.8	-1.5	-0.7	-0.2
Gas	30907	33744	32478	32561	27963	27091	25267	25417	24526	24679	26101	0.5	-1.5	-1.0	0.2
Electricity	33096	36352	38185	39892	39377	41691	44446	46497	48606	51540	52915	1.4	0.3	1.2	0.9
Heat (from CHP and District Heating)	3236	4163	3654	3520	3312	3392	3198	2998	2918	2767	2649	1.2	-1.0	-0.3	-0.9
Renewable energy forms	9123	9644	13236	16000	20036	19828	18678	17602	17476	16760	15389	3.8	4.2	-0.7	-1.0
Other fuels (hydrogen, ethanol)	0	0	0	2	6	11	30	62	116	167	205	0.0	0.0	17.8	10.1
RES in Gross Final Energy Consumption [(A)]	**15207**	**15818**	**21137**	**27317**	**36520**	**41288**	**42954**	**44027**	**46263**	**47289**	**47136**	**3.3**	**5.6**	**1.6**	**0.5**
TOTAL GHG emissions (Mt of CO2 eq.)	**571.5**	**572.5**	**532.2**	**499.9**	**454.6**	**435.0**	**411.3**	**393.7**	**386.4**	**371.1**	**374.3**	**-0.7**	**-1.6**	**-1.0**	**-0.5**
of which ETS sectors (2013 scope) GHG emissions		174.8	147.1	143.8	124.5	116.6	103.3	90.2	87.5	73.4	73.3		-1.7	-1.8	-1.7
of which non ETS sectors GHG emissions		397.8	385.1	356.1	330.1	318.5	308.0	303.5	298.9	297.7	301.0		-1.5	-0.7	-0.1
CO_2 Emissions (energy related)	**389.0**	**400.2**	**368.1**	**343.4**	**300.8**	**283.9**	**266.1**	**250.4**	**244.1**	**242.9**	**246.4**	**-0.6**	**-2.0**	**-1.2**	**-0.4**
Power generation/District heating	46.8	53.7	48.1	42.1	29.2	23.8	15.7	7.7	5.6	4.9	4.2	0.3	-4.9	-6.0	-6.4
Energy Branch	19.9	16.3	16.5	15.0	13.4	12.7	12.5	10.9	10.7	10.7	11.9	-1.8	-2.0	-0.7	-0.2
Industry	76.4	73.7	61.5	57.4	50.6	46.9	46.9	44.4	43.1	44.5	48.5	-2.1	-1.9	-0.7	0.2
Residential	53.5	64.9	57.5	51.6	44.4	42.8	40.2	37.9	34.4	31.4	28.2	0.7	-2.5	-1.0	-1.8
Tertiary	43.5	42.6	42.0	34.6	31.1	30.0	25.0	24.7	24.5	24.7	25.6	-0.3	-3.0	-2.1	0.1
Transport	149.0	149.0	142.6	142.8	132.2	127.7	125.8	124.8	125.8	126.6	128.0	-0.4	-0.8	-0.5	0.1
CO_2 Emissions (non energy related)	**28.7**	**27.9**	**23.4**	**26.8**	**27.5**	**27.1**	**22.0**	**20.8**	**20.1**	**4.8**	**2.9**	**-2.0**	**1.6**	**-2.2**	**-9.6**
Non-CO_2 GHG emissions	**153.8**	**144.4**	**140.8**	**129.6**	**126.3**	**124.0**	**123.2**	**122.5**	**122.2**	**123.4**	**125.0**	**-0.9**	**-1.1**	**-0.2**	**0.1**
TOTAL GHG emissions Index (1990=100)	**100.7**	**100.9**	**93.8**	**88.1**	**80.1**	**76.7**	**72.5**	**69.4**	**68.1**	**65.4**	**65.9**				

Source: PRIMES

SUMMARY ENERGY BALANCE AND INDICATORS (B)													France: Reference scenario		
	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050	'00-'10	'10-'20	'20-'30	'30-'50
												Annual % Change			
Main Energy System Indicators															
Population (Million)	58.858	60.963	62.791	64.387	65.808	67.077	68.223	69.237	70.056	70.628	71.029	0.6	0.5	0.4	0.2
GDP (in 000 M€10)	1726.6	1869.7	1932.8	2081.3	2256.9	2483.4	2698.9	2918.6	3163.4	3425.8	3703.3	1.1	1.6	1.8	1.6
Gross Inl. Cons./GDP (toe/M€10)	149.3	147.9	138.9	127.6	110.1	97.8	88.8	81.7	74.9	70.2	64.3	-0.7	-2.3	-2.1	-1.6
Carbon intensity (t of CO_2/toe of GIC)	1.51	1.45	1.37	1.29	1.21	1.17	1.11	1.05	1.03	1.01	1.03	-1.0	-1.2	-0.9	-0.4
Import Dependency %	51.6	51.7	49.3	49.1	47.3	46.6	45.1	44.1	43.6	43.4	44.8				
Total energy-rel. and other mitigation costs (B) (in 000 M€10)	159.7	185.6	214.2	255.8	286.4	303.1	312.9	323.8	337.3	351.4	367.8	3.0	2.9	0.9	0.8
as % of GDP	9.2	9.9	11.1	12.3	12.7	12.2	11.6	11.1	10.7	10.3	9.9				
Energy intensity indicators															
Industry (Energy on Value added, index 2000=100)	100.0	93.9	84.5	82.7	77.1	69.0	65.4	60.3	56.9	55.1	53.6	-1.7	-0.9	-1.6	-1.0
Residential (Energy on Private Income, index 2000=100)	100.0	106.1	99.0	91.0	79.8	71.8	63.2	57.6	52.4	47.6	42.5	-0.1	-2.1	-2.3	-2.0
Tertiary (Energy on Value added, index 2000=100)	100.0	98.2	99.5	85.5	73.1	68.0	60.3	56.7	52.8	50.3	47.7	0.0	-3.0	-1.9	-1.2
Passenger transport (toe/Mpkm)	40.6	40.6	39.9	37.7	33.6	30.1	27.4	26.0	25.2	24.8	24.4	-0.2	-1.7	-2.0	-0.6
Freight transport (toe/Mtkm)	46.2	42.5	42.3	41.8	39.0	36.3	34.9	33.9	32.9	32.1	31.7	-0.9	-0.8	-1.1	-0.5
Carbon Intensity indicators															
Electricity and Steam production (t of CO_2/MWh)	0.08	0.09	0.08	0.07	0.05	0.04	0.02	0.01	0.01	0.01	0.01	-0.3	-5.1	-6.7	-7.0
Final energy demand (t of CO_2/toe)	2.09	2.03	1.91	1.81	1.71	1.65	1.61	1.57	1.54	1.52	1.53	-0.9	-1.1	-0.6	-0.3
Industry	2.05	2.01	1.97	1.74	1.52	1.43	1.40	1.35	1.30	1.30	1.38	-0.4	-2.5	-0.9	-0.1
Residential	1.35	1.39	1.24	1.13	1.03	1.00	0.99	0.95	0.87	0.81	0.75	-0.8	-1.9	-0.4	-1.4
Tertiary	1.61	1.49	1.36	1.21	1.17	1.10	0.95	0.92	0.90	0.87	0.88	-1.7	-1.5	-2.1	-0.4
Transport (C)	2.94	2.95	2.83	2.81	2.73	2.70	2.66	2.65	2.64	2.63	2.61	-0.4	-0.4	-0.3	-0.1
Indicators for renewables															
Share of RES in Gross Final Energy Consumption (D) (%)	9.4	9.3	12.7	16.6	23.2	26.4	27.8	28.5	29.8	30.0	29.6				
RES in transport (%)	1.2	1.3	6.0	7.1	10.2	11.5	12.6	13.1	13.4	13.8	14.6				
Gross Electricity generation by source (in GWh_e) (E)	**536054**	**571497**	**564190**	**591166**	**583539**	**605085**	**631997**	**649190**	**671005**	**711403**	**724782**	**0.5**	**0.3**	**0.8**	**0.7**
Nuclear energy	415162	451529	428521	431786	384218	365240	369072	371113	369140	377857	374092	0.3	-1.1	-0.4	0.1
Solids	27004	27515	23359	15150	4761	3104	0	0	0	11087	12713	-1.4	-14.7	-100.0	0.0
Oil (including refinery gas)	7165	7925	5821	1134	408	474	411	728	556	619	725	-2.1	-23.3	0.1	2.9
Gas (including derived gases)	15370	26259	26614	39019	36002	31132	24040	9148	6649	7694	7758	5.6	3.1	-4.0	-5.5
Biomass-waste	3561	5016	6800	10740	15704	20336	21100	27599	32583	31400	33342	6.7	8.7	3.0	2.3
Hydro (pumping excluded)	67137	51747	62013	64278	64736	65386	67806	76347	77919	78225	78887	-0.8	0.4	0.5	0.8
Wind	77	962	9969	22584	66248	103204	125218	133784	140649	157006	167548	62.6	20.9	6.6	1.5
Solar	5	11	564	5703	10281	14465	22385	27164	39585	42329	44219	59.7	33.7	8.1	3.5
Geothermal and other renewables	573	534	529	772	1181	1743	1965	3307	3924	5186	5499	-0.8	8.4	5.2	5.3
Other fuels (hydrogen, methanol)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Net Generation Capacity in MW_e	**107928**	**107789**	**116297**	**126380**	**142781**	**148630**	**163303**	**170373**	**184242**	**198911**	**205431**	**0.7**	**2.1**	**1.4**	**1.2**
Nuclear energy	63235	63258	63258	63258	62857	54670	54021	54294	53958	55204	54573	0.0	-0.1	-1.5	0.1
Renewable energy	20641	21412	28037	36371	54827	71194	83757	91137	101021	108307	112542	3.1	6.9	4.3	1.5
Hydro (pumping excluded)	20568	20642	20934	21260	21260	21260	21760	24018	24131	24161	24333	0.2	0.2	0.2	0.6
Wind	66	757	5970	10238	25687	39363	47354	50230	52764	58470	61781	56.9	15.7	6.3	1.3
Solar	7	13	893	4630	7470	9931	13913	16134	23313	24433	25157	62.4	23.7	6.4	3.0
Other renewables (tidal etc.)	0	0	240	243	410	639	730	755	812	1242	1271	0.0	5.5	5.9	2.8
Thermal power	24052	23119	25002	26751	25096	22766	25525	24942	29263	35401	38316	0.4	0.0	0.2	2.1
of which cogeneration units	7013	6766	5178	5934	6474	6967	6467	6322	7228	7727	6962	-3.0	2.3	0.0	0.4
of which CCS units	0	0	0	0	0	0	0	0	258	1386	1795	0.0	0.0	0.0	0.0
Solids fired	9300	7871	6918	5237	3438	2378	0	0	0	1128	1297	-2.9	-6.8	-100.0	0.0
Gas fired	5102	5784	8548	11786	11690	11573	17503	18081	17731	20670	21164	5.3	3.2	4.1	1.0
Oil fired	8244	7903	7869	7686	6689	4535	3743	2141	5465	6946	8719	-0.5	-1.6	-5.6	4.3
Biomass-waste fired	1406	1561	1667	2023	3258	4260	4260	4554	5847	6413	6863	1.7	6.9	2.7	2.4
Hydrogen plants	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Geothermal heat	0	0	0	20	20	20	20	166	220	244	272	0.0	0.0	0.0	13.9
Avg. Load factor of net power capacity (F) (%)	54.2	57.8	53.0	51.2	44.9	44.9	42.7	42.0	40.2	39.3	38.8				
Electricity indicators															
Efficiency of gross thermal power generation (%)	34.1	33.6	31.8	34.5	35.2	37.0	36.6	31.8	31.9	34.8	36.7				
% of gross electricity from CHP	3.0	4.0	2.8	3.2	3.2	5.0	3.6	4.2	4.2	4.0	4.3				
% of electricity from CCS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.8	2.3				
Carbon free gross electricity generation (%)	90.8	89.2	90.1	90.6	92.9	94.3	96.1	98.5	98.9	97.3	97.1				
- nuclear	77.4	79.0	76.0	73.0	65.8	60.4	58.4	57.2	55.0	53.1	51.6				
- renewable energy forms	13.3	10.2	14.2	17.6	27.1	33.9	37.7	41.3	43.9	44.2	45.5				
Transport sector															
Passenger transport activity (Gpkm)	**895.5**	**930.0**	**959.3**	**998.6**	**1033.9**	**1102.3**	**1173.1**	**1226.7**	**1282.3**	**1325.5**	**1369.8**	**0.7**	**0.8**	**1.3**	**0.8**
Public road transport	43.0	44.0	49.9	52.6	55.6	58.8	62.3	65.1	67.9	70.0	72.1	1.5	1.1	1.1	0.7
Private cars and motorcycles	699.2	732.7	741.2	764.9	782.6	825.4	867.2	896.9	926.7	950.6	974.9	0.6	0.5	1.0	0.6
Rail	80.7	88.6	99.3	104.6	110.3	123.1	137.6	150.7	164.9	175.5	186.6	2.1	1.1	2.2	1.5
Aviation	69.1	61.5	65.9	73.3	82.1	91.6	102.4	110.2	118.9	125.4	131.9	-0.5	2.2	2.2	1.3
Inland navigation	3.5	3.1	3.0	3.1	3.2	3.4	3.6	3.8	3.9	4.0	4.2	-1.4	0.7	1.1	0.7
Freight transport activity (Gtkm)	**304.6**	**292.9**	**277.1**	**307.9**	**342.2**	**380.3**	**422.6**	**437.6**	**453.3**	**465.9**	**478.6**	**-0.9**	**2.1**	**2.1**	**0.6**
Trucks	204.0	205.3	182.2	201.9	223.0	246.1	271.0	280.9	291.2	299.8	308.7	-1.1	2.0	2.0	0.7
Rail	57.7	40.7	30.0	37.5	47.0	57.5	70.2	73.4	76.8	79.3	81.7	-6.3	4.6	4.1	0.8
Inland navigation	42.9	46.9	65.0	68.5	72.2	76.6	81.4	83.3	85.4	86.8	88.3	4.2	1.1	1.2	0.4
Energy demand in transport (ktoe) (G)	**50435**	**50234**	**49996**	**50538**	**48039**	**46970**	**46870**	**46764**	**47260**	**47781**	**48610**	**-0.1**	**-0.4**	**-0.2**	**0.2**
Public road transport	693	710	806	841	867	888	909	926	949	964	982	1.5	0.7	0.5	0.4
Private cars and motorcycles	28504	29780	30321	29238	25919	24102	23517	23572	23864	24166	24610	0.6	-1.6	-1.0	0.2
Trucks	13082	11666	10969	11966	12251	12556	13275	13347	13374	13415	13649	-1.7	1.1	0.8	0.1
Rail	1132	979	931	1062	1231	1410	1614	1648	1678	1679	1668	-1.9	2.8	2.7	0.2
Aviation	6683	6794	6659	7110	7438	7664	7188	6894	7012	7168	7311	0.0	1.1	-0.3	0.1
Inland navigation	342	306	308	320	333	350	368	375	383	387	391	-1.0	0.8	1.0	0.3

Source: PRIMES

Germany: Reference scenario												SUMMARY ENERGY BALANCE AND INDICATORS (A)			
ktoe	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**	**'00-'10**	**'10-'20**	**'20-'30**	**'30-'50**
												Annual % Change			
Production (incl.recovery of products)	**135698**	**137004**	**132514**	**117145**	**99062**	**89767**	**77803**	**76462**	**71446**	**74819**	**76965**	**-0.2**	**-2.9**	**-2.4**	**-0.1**
Solids	60629	56488	45125	37417	30754	27058	13658	11582	7454	4520	3679	-2.9	-3.8	-7.8	-6.3
Oil	4719	5877	4846	3896	3107	2749	2485	1269	616	0	0	0.3	-4.3	-2.2	-100.0
Natural gas	15825	14241	9694	8597	8875	7240	5961	4480	2635	2395	2058	-4.8	-0.9	-3.9	-5.2
Nuclear	43750	42061	36257	24144	8074	0	0	0	0	0	0	-1.9	-13.9	-100.0	0.0
Renewable energy sources	10775	18338	36593	43091	48253	52719	55699	59130	60741	67904	71228	13.0	2.8	1.4	1.2
Hydro	1869	1684	1756	1927	1966	2075	2229	2254	2329	2402	2501	-0.6	1.1	1.3	0.6
Biomass & Waste	7864	13811	29606	30417	30939	30820	30774	31206	31788	33376	33343	14.2	0.4	-0.1	0.4
Wind	804	2341	3250	5380	8153	11385	14023	15431	15326	17173	18654	15.0	9.6	5.6	1.4
Solar and others	115	353	1452	4247	5874	7070	7238	7810	8598	9226	9543	28.8	15.0	2.1	1.4
Geothermal	123	148	529	1119	1320	1368	1435	2428	2701	5727	7187	15.7	9.6	0.8	8.4
Net Imports	**205785**	**213142**	**202567**	**198540**	**187615**	**178113**	**175486**	**166767**	**166894**	**163303**	**159464**	**-0.2**	**-0.8**	**-0.7**	**-0.5**
Solids	21663	25734	31842	28844	28258	26100	27584	19087	16399	14736	13581	3.9	-1.2	-0.2	-3.5
Oil	126994	122840	112090	105465	96558	89582	84163	80857	77685	76423	74887	-1.2	-1.5	-1.4	-0.6
- Crude oil and Feedstocks	102682	113690	93969	89044	82001	76725	72850	70929	68839	68190	67154	-0.9	-1.4	-1.2	-0.4
- Oil products	24312	9150	18120	16422	14557	12857	11313	9928	8846	8232	7733	-2.9	-2.2	-2.5	-1.9
Natural gas	56865	65734	60114	63884	61876	60989	61573	64852	70676	69500	68371	0.6	0.3	0.0	0.5
Electricity	263	-393	-1286	-114	135	475	884	1079	1479	2174	2204	0.0	0.0	20.7	4.7
Gross Inland Consumption	**343625**	**345999**	**336101**	**312657**	**283454**	**264597**	**249915**	**239790**	**234846**	**234560**	**232805**	**-0.2**	**-1.7**	**-1.3**	**-0.4**
Solids	84802	81731	77120	66261	59012	53158	41242	30670	23854	19257	17260	-0.9	-2.6	-3.5	-4.3
Oil	132158	124162	114204	106344	96492	89150	83410	78885	75079	73388	71875	-1.4	-1.7	-1.4	-0.7
Natural gas	71878	80873	73406	72470	70700	68128	67399	69133	73037	71368	69817	0.2	-0.4	-0.5	0.2
Nuclear	43750	42061	36257	24144	8074	0	0	0	0	0	0	-1.9	-13.9	-100.0	0.0
Electricity	263	-393	-1286	-114	135	475	884	1079	1479	2174	2204	0.0	0.0	20.7	4.7
Renewable energy forms	10775	17564	36400	43552	49041	53686	56980	60023	61397	68374	71649	12.9	3.0	1.5	1.2
as % in Gross Inland Consumption															
Solids	24.7	23.6	22.9	21.2	20.8	20.1	16.5	12.8	10.2	8.2	7.4				
Oil	38.5	35.9	34.0	34.0	34.0	33.7	33.4	32.9	32.0	31.3	30.9				
Natural gas	20.9	23.4	21.8	23.2	24.9	25.7	27.0	28.8	31.1	30.4	30.0				
Nuclear	12.7	12.2	10.8	7.7	2.8	0.0	0.0	0.0	0.0	0.0	0.0				
Renewable energy forms	3.1	5.1	10.8	13.9	17.3	20.3	22.8	25.0	26.1	29.1	30.8				
Gross Electricity Generation in GWh_e	**572210**	**613328**	**620878**	**603045**	**586628**	**583111**	**590722**	**593513**	**600618**	**613420**	**631337**	**0.8**	**-0.6**	**0.1**	**0.3**
Self consumption and grid losses	73946	70749	62205	59216	54095	51809	50424	49892	49590	50859	51780	-1.7	-1.4	-0.7	0.1
Fuel Inputs to Thermal Power Generation	**84557**	**88631**	**94600**	**80615**	**77615**	**73708**	**63772**	**59465**	**58769**	**58102**	**57197**	**1.1**	**-2.0**	**-1.9**	**-0.5**
Solids	67101	65728	59887	50029	44093	39458	28080	18859	13021	9296	7780	-1.1	-3.0	-4.4	-6.2
Oil (including refinery gas)	1407	2035	802	184	271	446	270	260	269	264	384	-5.5	-10.3	0.0	1.8
Gas (including derived gases)	12891	15930	19263	16716	19409	20099	20813	24677	29410	28261	26574	4.1	0.1	0.7	1.2
Biomass & Waste	3158	4938	14625	13266	13404	13263	14128	14241	14421	15631	16314	16.6	-0.9	0.5	0.7
Geothermal heat	0	0	24	420	439	441	481	1429	1648	4649	6145	0.0	33.8	0.9	13.6
Hydrogen - Methanol	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Fuel Input to other conversion processes	**181613**	**190786**	**164954**	**143980**	**118556**	**103136**	**98641**	**95383**	**91617**	**90046**	**88915**	**-1.0**	**-3.2**	**-1.8**	**-0.5**
Refineries	120741	127817	105667	98872	90919	85197	81046	78670	76330	75468	74386	-1.3	-1.5	-1.1	-0.4
Biofuels and hydrogen production	225	1941	2960	3503	3930	3788	3883	3990	4060	4296	4505	29.4	2.9	-0.1	0.7
District heating	1198	4323	4781	4367	3556	2956	2767	2481	1811	1895	1923	14.8	-2.9	-2.5	-1.8
Derived gases, cokeries etc.	59450	56704	51545	37239	20151	11196	10945	10242	9416	8386	8101	-1.4	-9.0	-5.9	-1.5
Energy Branch Consumption	**14565**	**14389**	**12920**	**11968**	**10572**	**9604**	**8827**	**8259**	**7726**	**7441**	**7253**	**-1.2**	**-2.0**	**-1.8**	**-1.0**
Non-Energy Uses	**31195**	**31327**	**29737**	**30940**	**30990**	**30223**	**29426**	**28597**	**27917**	**27488**	**27550**	**-0.5**	**0.4**	**-0.5**	**-0.3**
Final Energy Demand	**219083**	**222407**	**217362**	**214610**	**201105**	**192650**	**187218**	**181703**	**178909**	**178575**	**176937**	**-0.1**	**-0.8**	**-0.7**	**-0.3**
by sector															
Industry	57553	59012	60541	61024	59669	57172	55327	52929	50938	49832	49151	0.5	-0.1	-0.8	-0.6
- energy intensive industries	39352	40503	41407	41847	40826	38856	37514	35893	34364	33493	32904	0.5	-0.1	-0.8	-0.7
- other industrial sectors	18200	18509	19134	19177	18843	18315	17814	17036	16574	16339	16246	0.5	-0.2	-0.6	-0.5
Residential	63023	67784	62041	61070	56837	55630	55363	54783	55404	56743	56815	-0.2	-0.9	-0.3	0.1
Tertiary	32572	33238	32886	31505	27653	26276	25146	24409	23880	23746	22839	0.1	-1.7	-0.9	-0.5
Transport	65936	62373	61894	61011	56946	53573	51383	49581	48687	48254	48133	-0.6	-0.8	-1.0	-0.3
by fuel															
Solids	10958	9857	9620	9288	8948	8366	8136	7215	6697	6367	6003	-1.3	-0.7	-0.9	-1.5
Oil	98722	88873	82458	76438	67246	61483	56856	53454	50743	49650	48466	-1.8	-2.0	-1.7	-0.8
Gas	56064	59919	54053	54133	50217	46678	45274	43054	41749	40672	40298	-0.4	-0.7	-1.0	-0.6
Electricity	41569	44794	45482	45527	44933	45246	46560	46973	47917	49498	50870	0.9	-0.1	0.4	0.4
Heat (from CHP and District Heating)	6831	10735	11303	12069	11714	11592	11394	11419	11186	11093	10802	5.2	0.4	-0.3	-0.3
Renewable energy forms	4939	8228	14445	17138	17998	19195	18830	19315	20188	20714	19787	11.3	2.2	0.5	0.2
Other fuels (hydrogen, ethanol)	0	0	0	17	48	90	168	273	430	581	712	-7.5	171.1	13.3	7.5
RES in Gross Final Energy Consumption [(A)]	**8828**	**13949**	**24372**	**35026**	**40002**	**44830**	**48166**	**51710**	**53132**	**57602**	**60242**	**10.7**	**5.1**	**1.9**	**1.1**
TOTAL GHG emissions (Mt of CO2 eq.)	**1059.7**	**1030.3**	**958.9**	**878.3**	**806.7**	**750.1**	**669.4**	**593.0**	**557.3**	**513.1**	**482.1**	**-1.0**	**-1.7**	**-1.8**	**-1.6**
of which ETS sectors (2013 scope) GHG emissions		543.8	507.9	459.6	427.8	399.6	342.4	283.9	259.5	221.9	199.8		-1.7	-2.2	-2.7
of which non ETS sectors GHG emissions		486.5	451.0	418.7	378.9	350.6	327.0	309.1	297.8	291.2	282.3		-1.7	-1.5	-0.7
CO_2 Emissions (energy related)	**848.5**	**838.5**	**780.8**	**706.0**	**640.5**	**589.3**	**521.7**	**455.9**	**423.8**	**394.5**	**378.1**	**-0.8**	**-2.0**	**-2.0**	**-1.6**
Power generation/District heating	330.6	342.5	322.4	263.2	243.7	224.9	176.9	138.1	124.0	103.6	93.8	-0.3	-2.8	-3.2	-3.1
Energy Branch	28.1	27.9	24.8	22.4	19.9	18.4	17.6	16.1	14.9	13.9	13.4	-1.3	-2.2	-1.2	-1.3
Industry	130.1	115.2	112.3	116.3	105.6	96.5	94.4	81.5	72.6	68.7	67.2	-1.5	-0.6	-1.1	-1.7
Residential	119.0	123.2	102.1	92.8	82.1	76.1	72.6	68.9	66.4	66.2	65.0	-1.5	-2.2	-1.2	-0.6
Tertiary	53.2	52.5	46.2	42.7	34.8	29.5	23.7	20.8	18.7	17.1	14.6	-1.4	-2.8	-3.8	-2.4
Transport	187.4	177.2	172.9	168.7	154.4	144.1	136.6	130.4	127.2	125.1	124.1	-0.8	-1.1	-1.2	-0.5
CO_2 Emissions (non energy related)	**63.8**	**61.7**	**56.7**	**60.6**	**60.7**	**59.5**	**52.7**	**43.9**	**41.7**	**27.5**	**13.6**	**-1.2**	**0.7**	**-1.4**	**-6.5**
Non-CO_2 GHG emissions	**147.4**	**130.0**	**121.4**	**111.8**	**105.6**	**101.3**	**95.0**	**93.2**	**91.8**	**91.1**	**90.4**	**-1.9**	**-1.4**	**-1.1**	**-0.2**
TOTAL GHG emissions Index (1990=100)	**84.2**	**81.9**	**76.2**	**69.8**	**64.1**	**59.6**	**53.2**	**47.1**	**44.3**	**40.8**	**38.3**				

Source: PRIMES

SUMMARY ENERGY BALANCE AND INDICATORS (B)															Germany: Reference scenario
	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050	'00-'10	'10-'20	'20-'30	'30-'50
												Annual % Change			
Main Energy System Indicators															
Population (Million)	82.163	82.501	81.802	80.954	80.098	79.078	77.872	76.478	74.815	72.914	70.807	0.0	-0.2	-0.3	-0.5
GDP (in 000 M€10)	2257.7	2325.9	2476.8	2673.6	2801.8	2915.1	2997.7	3074.3	3185.2	3326.6	3465.8	0.9	1.2	0.7	0.7
Gross Inl. Cons./GDP (toe/M€10)	152.2	148.8	135.7	116.9	101.2	90.8	83.4	78.0	73.7	70.5	67.2	-1.1	-2.9	-1.9	-1.1
Carbon intensity (t of CO_2/toe of GIC)	2.47	2.42	2.32	2.26	2.26	2.23	2.09	1.90	1.80	1.68	1.62	-0.6	-0.3	-0.8	-1.2
Import Dependency %	59.5	61.2	59.8	62.9	65.4	66.5	69.3	68.6	70.0	68.6	67.4				
Total energy-rel. and other mitigation costs [B] (in 000 M€10)	226.4	298.6	313.9	373.2	408.3	411.7	418.4	419.0	424.5	437.2	447.2	3.3	2.7	0.2	0.3
as % of GDP	10.0	12.8	12.7	14.0	14.6	14.1	14.0	13.6	13.3	13.1	12.9				
Energy intensity indicators															
Industry (Energy on Value added, index 2000=100)	100.0	95.7	101.8	94.7	89.3	83.6	79.6	75.5	71.4	68.6	66.2	0.2	-1.3	-1.1	-0.9
Residential (Energy on Private Income, index 2000=100)	100.0	105.9	94.6	88.5	79.4	75.1	72.7	70.0	67.9	65.8	62.2	-0.5	-1.7	-0.9	-0.8
Tertiary (Energy on Value added, index 2000=100)	100.0	96.9	86.6	76.7	64.0	58.1	53.8	50.7	47.6	45.0	41.3	-1.4	-3.0	-1.7	-1.3
Passenger transport (toe/Mpkm)	43.2	41.2	40.0	37.9	33.8	30.7	28.4	26.7	25.8	25.4	25.1	-0.8	-1.7	-1.7	-0.6
Freight transport (toe/Mtkm)	46.3	36.5	34.9	33.5	31.1	28.8	27.3	26.4	25.4	24.7	24.3	-2.8	-1.2	-1.3	-0.6
Carbon Intensity indicators															
Electricity and Steam production (t of CO_2/MWh)	0.50	0.46	0.42	0.35	0.33	0.31	0.24	0.19	0.17	0.14	0.12	-1.7	-2.4	-3.1	-3.3
Final energy demand (t of CO_2/toe)	2.24	2.10	1.99	1.96	1.87	1.80	1.75	1.66	1.59	1.55	1.53	-1.1	-0.6	-0.7	-0.7
Industry	2.26	1.95	1.86	1.91	1.77	1.69	1.71	1.54	1.42	1.38	1.37	-2.0	-0.5	-0.4	-1.1
Residential	1.89	1.82	1.65	1.52	1.44	1.37	1.31	1.26	1.20	1.17	1.14	-1.4	-1.3	-1.0	-0.7
Tertiary	1.63	1.58	1.41	1.36	1.26	1.12	0.94	0.85	0.78	0.72	0.64	-1.5	-1.1	-2.9	-1.9
Transport [C]	2.84	2.84	2.79	2.76	2.71	2.69	2.66	2.63	2.61	2.59	2.58	-0.2	-0.3	-0.2	-0.2
Indicators for renewables															
Share of RES in Gross Final Energy Consumption [D] (%)	3.9	6.0	10.8	15.8	19.3	22.6	25.0	27.6	28.8	31.2	33.0				
RES in transport (%)	0.7	3.3	6.1	7.8	10.4	11.8	13.3	14.3	14.7	15.7	16.5				
Gross Electricity generation by source (in GWh_e) [E]	**572313**	**613438**	**620989**	**603045**	**586628**	**583111**	**590722**	**593513**	**600618**	**613420**	**631337**	**0.8**	**-0.6**	**0.1**	**0.3**
Nuclear energy	169606	163055	140556	93583	31294	0	0	0	0	0	0	-1.9	-13.9	-100.0	0.0
Solids	296687	297517	262573	228036	202629	179599	135186	84108	47995	34618	31031	-1.2	-2.6	-4.0	-7.1
Oil (including refinery gas)	4785	10583	8361	1145	1643	2706	1616	1599	1684	1721	2462	5.7	-15.0	-0.2	2.1
Gas (including derived gases)	59970	77602	96744	104747	124457	131121	144061	175436	207233	200457	191051	4.9	2.6	1.5	1.4
Biomass-waste	10121	16589	42825	54454	57456	57861	64423	66123	67845	70416	74454	15.5	3.0	1.2	0.7
Hydro (pumping excluded)	21732	19581	20427	22411	22860	24132	25917	26213	27082	27931	29086	-0.6	1.1	1.3	0.6
Wind	9352	27229	37793	62564	94798	132385	163062	179435	178204	199690	216911	15.0	9.6	5.6	1.4
Solar	60	1282	11681	35617	50981	54794	55897	58937	68660	73182	79197	69.4	15.9	0.9	1.8
Geothermal and other renewables	0	0	29	488	510	513	560	1661	1916	5406	7145	119.0	33.0	0.9	13.6
Other fuels (hydrogen, methanol)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Net Generation Capacity in MW_e	**112920**	**123274**	**149666**	**169056**	**192877**	**199865**	**210791**	**220607**	**230711**	**241298**	**258109**	**2.9**	**2.6**	**0.9**	**1.0**
Nuclear energy	21339	20718	20379	12015	6808	0	0	0	0	0	0	-0.5	-10.4	-100.0	0.0
Renewable energy	10495	24081	48769	75907	103239	118432	129281	137979	146943	158277	170859	16.6	7.8	2.3	1.4
Hydro (pumping excluded)	4268	4158	4258	4949	5195	5503	5748	6085	6417	6877	7193	0.0	2.0	1.0	1.1
Wind	6113	18415	27191	35600	48956	60343	69949	75556	75584	83149	89394	16.1	6.1	3.6	1.2
Solar	114	1508	17320	35357	49089	52585	53584	56338	64943	68251	74272	65.3	11.0	0.9	1.6
Other renewables (tidal etc.)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Thermal power	81086	78475	80518	81135	82830	81433	81510	82628	83768	83021	87250	-0.1	0.3	-0.2	0.3
of which cogeneration units	14369	16511	18551	21674	25283	25152	25119	25879	25862	25154	26429	2.6	3.1	-0.1	0.3
of which CCS units	0	0	0	0	0	0	0	1111	1285	1291	1291	0.0	0.0	0.0	0.0
Solids fired	51950	50207	48405	47038	45041	40616	33929	29993	25776	21046	19419	-0.7	-0.7	-2.8	-2.8
Gas fired	20352	19208	23623	26473	29422	31846	38591	43169	46745	49773	52145	1.5	2.2	2.7	1.5
Oil fired	6909	6623	5164	3796	3470	3044	2180	1851	1826	1663	2224	-2.9	-3.9	-4.5	0.1
Biomass-waste fired	1875	2436	3318	3772	4839	5869	6747	7425	9202	9922	12646	5.9	3.8	3.4	3.2
Hydrogen plants	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Geothermal heat	0	1	8	56	58	59	64	190	219	617	816	0.0	22.0	0.9	13.6
Avg. Load factor of net power capacity [F] (%)	54.0	53.2	44.8	38.5	33.1	31.9	30.9	29.8	28.9	28.3	27.3				
Electricity indicators															
Efficiency of gross thermal power generation (%)	37.8	39.0	37.3	41.5	42.8	43.4	46.6	47.6	47.8	46.3	46.0				
% of gross electricity from CHP	10.6	12.6	13.2	21.9	24.8	25.6	25.2	26.1	24.0	23.8	23.4				
% of electricity from CCS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	1.8	1.7	1.7				
Carbon free gross electricity generation (%)	36.8	37.1	40.8	44.6	44.0	46.2	52.5	56.0	57.2	61.4	64.4				
- nuclear	29.6	26.6	22.6	15.5	5.3	0.0	0.0	0.0	0.0	0.0	0.0				
- renewable energy forms	7.2	10.5	18.2	29.1	38.6	46.2	52.5	56.0	57.2	61.4	64.4				
Transport sector															
Passenger transport activity (Gpkm)	**1065.5**	**1096.9**	**1126.3**	**1162.6**	**1199.2**	**1226.9**	**1251.4**	**1269.4**	**1288.6**	**1302.0**	**1314.7**	**0.6**	**0.6**	**0.4**	**0.2**
Public road transport	69.0	67.1	61.8	64.1	66.5	67.7	69.2	70.9	72.6	73.2	73.9	-1.1	0.7	0.4	0.3
Private cars and motorcycles	849.6	875.7	904.7	920.2	933.8	940.8	942.3	944.5	946.6	948.1	949.4	0.6	0.3	0.1	0.0
Rail	90.0	90.4	99.4	109.7	121.0	130.7	141.4	149.4	158.1	165.2	172.0	1.0	2.0	1.6	1.0
Aviation	54.7	61.7	58.5	66.5	76.0	85.6	96.5	102.5	109.1	113.2	117.2	0.7	2.6	2.4	1.0
Inland navigation	2.2	2.0	2.0	2.0	2.1	2.1	2.1	2.1	2.2	2.2	2.2	-1.4	0.5	0.2	0.2
Freight transport activity (Gtkm)	**431.2**	**470.5**	**483.4**	**505.7**	**529.1**	**554.1**	**580.1**	**593.4**	**607.2**	**615.7**	**623.8**	**1.2**	**0.9**	**0.9**	**0.4**
Trucks	280.7	310.1	313.1	322.8	332.5	344.1	355.8	361.8	367.8	372.4	377.2	1.1	0.6	0.7	0.3
Rail	82.7	95.4	107.3	117.0	127.6	137.7	148.7	154.2	160.1	162.8	165.0	2.6	1.7	1.5	0.5
Inland navigation	67.8	64.9	63.0	65.9	69.0	72.3	75.7	77.5	79.3	80.4	81.6	-0.7	0.9	0.9	0.4
Energy demand in transport (ktoe) [G]	**65928**	**62373**	**61896**	**61010**	**56945**	**53572**	**51382**	**49580**	**48686**	**48253**	**48132**	**-0.6**	**-0.8**	**-1.0**	**-0.3**
Public road transport	1040	992	893	919	931	911	894	892	895	887	881	-1.5	0.4	-0.4	-0.1
Private cars and motorcycles	37017	35410	34934	33025	28663	25416	23608	22764	22311	22016	21800	-0.6	-2.0	-1.9	-0.4
Trucks	18303	15555	15272	15229	14611	14034	13872	13649	13440	13338	13339	-1.8	-0.4	-0.5	-0.2
Rail	1943	1830	1818	1947	2056	2162	2247	2266	2252	2181	2100	-0.7	1.2	0.9	-0.3
Aviation	7345	8265	8719	9619	10402	10757	10461	9707	9485	9528	9710	1.7	1.8	0.1	-0.4
Inland navigation	281	321	260	271	282	291	299	302	304	303	301	-0.7	0.8	0.6	0.0

Source: PRIMES

Greece: Reference scenario												SUMMARY ENERGY BALANCE AND INDICATORS (A)			
ktoe	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**	**'00-'10**	**'10-'20**	**'20-'30**	**'30-'50**
												Annual % Change			
Production (incl.recovery of products)	**10011**	**10323**	**9473**	**9493**	**8937**	**7147**	**5612**	**6574**	**7702**	**7869**	**8165**	**-0.6**	**-0.6**	**-4.5**	**1.9**
Solids	8222	8538	7315	6759	5646	3526	1454	434	285	233	98	-1.2	-2.6	-12.7	-12.6
Oil	281	101	133	95	62	0	0	0	0	0	0	-7.2	-7.4	-100.0	0.0
Natural gas	42	18	7	0	0	0	0	0	0	0	0	-16.4	-100.0	0.0	0.0
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Renewable energy sources	1466	1666	2017	2638	3229	3621	4158	6140	7417	7636	8067	3.2	4.8	2.6	3.4
Hydro	318	431	641	501	598	697	775	826	853	861	865	7.3	-0.7	2.6	0.6
Biomass & Waste	1009	1015	919	982	1094	1224	1186	1337	1408	1475	1504	-0.9	1.8	0.8	1.2
Wind	39	109	233	451	755	831	838	1296	1689	1717	1795	19.7	12.5	1.0	3.9
Solar and others	99	101	197	659	728	807	884	1183	1376	1384	1465	7.1	14.0	2.0	2.6
Geothermal	2	10	27	45	55	63	475	1498	2092	2199	2437	32.7	7.4	24.0	8.5
Net Imports	**22119**	**23473**	**21805**	**21037**	**20760**	**20942**	**21528**	**21020**	**20148**	**20148**	**20224**	**-0.1**	**-0.5**	**0.4**	**-0.3**
Solids	769	364	401	268	268	240	216	203	192	182	177	-6.3	-4.0	-2.1	-1.0
Oil	19663	20451	17511	17308	16303	15311	14712	14358	14145	13893	13764	-1.2	-0.7	-1.0	-0.3
- Crude oil and Feedstocks	20561	19474	20726	21334	20289	19309	18667	18238	17932	17605	16659	0.1	-0.2	-0.8	-0.6
- Oil products	-898	977	-3215	-4026	-3986	-3998	-3955	-3879	-3787	-3712	-2895	13.6	2.2	-0.1	-1.5
Natural gas	1689	2332	3231	2617	3084	4091	5233	4964	4299	4641	4940	6.7	-0.5	5.4	-0.3
Electricity	-1	325	491	452	361	469	546	541	509	448	395	0.0	-3.0	4.2	-1.6
Gross Inland Consumption	**28265**	**31387**	**28841**	**27660**	**26707**	**25025**	**24078**	**24467**	**24650**	**24778**	**25104**	**0.2**	**-0.8**	**-1.0**	**0.2**
Solids	9038	8944	7863	7027	5914	3766	1670	637	477	414	274	-1.4	-2.8	-11.9	-8.6
Oil	16058	18098	15064	14544	13416	12336	11759	11389	11128	10867	10730	-0.6	-1.2	-1.3	-0.5
Natural gas	1705	2354	3234	2606	3041	4002	5123	4806	4115	4429	4689	6.6	-0.6	5.4	-0.4
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Electricity	-1	325	491	452	361	469	546	541	509	448	395	0.0	-3.0	4.2	-1.6
Renewable energy forms	1466	1666	2190	3031	3974	4453	4979	7093	8421	8620	9016	4.1	6.1	2.3	3.0
as % in Gross Inland Consumption															
Solids	32.0	28.5	27.3	25.4	22.1	15.0	6.9	2.6	1.9	1.7	1.1				
Oil	56.8	57.7	52.2	52.6	50.2	49.3	48.8	46.5	45.1	43.9	42.7				
Natural gas	6.0	7.5	11.2	9.4	11.4	16.0	21.3	19.6	16.7	17.9	18.7				
Nuclear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Renewable energy forms	5.2	5.3	7.6	11.0	14.9	17.8	20.7	29.0	34.2	34.8	35.9				
Gross Electricity Generation in GWh_e	**53415**	**59416**	**57356**	**56439**	**59454**	**57755**	**57480**	**60777**	**63733**	**66524**	**69511**	**0.7**	**0.4**	**-0.3**	**1.0**
Self consumption and grid losses	8430	10124	7796	6925	6787	6088	5562	5470	5555	5812	6026	-0.8	-1.4	-2.0	0.4
Fuel Inputs to Thermal Power Generation	**11606**	**12532**	**11075**	**9138**	**8071**	**6615**	**5892**	**5559**	**5260**	**5564**	**5813**	**-0.5**	**-3.1**	**-3.1**	**-0.1**
Solids	8170	8694	7567	6745	5627	3471	1376	428	289	238	103	-0.8	-2.9	-13.1	-12.1
Oil (including refinery gas)	2092	2180	1369	1118	716	584	480	328	265	213	201	-4.2	-6.3	-3.9	-4.3
Gas (including derived gases)	1280	1605	2061	1188	1580	2421	3493	3073	2347	2647	2829	4.9	-2.6	8.3	-1.0
Biomass & Waste	64	52	79	86	142	133	129	295	330	329	302	2.2	6.0	-0.9	4.4
Geothermal heat	0	0	0	1	6	6	414	1435	2030	2137	2378	0.0	0.0	52.0	9.1
Hydrogen - Methanol	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Fuel Input to other conversion processes	**22535**	**21614**	**22768**	**22323**	**21639**	**20551**	**19877**	**19438**	**19100**	**18757**	**17830**	**0.1**	**-0.5**	**-0.8**	**-0.5**
Refineries	22474	21521	22640	22016	21048	20003	19361	18927	18599	18242	17275	0.1	-0.7	-0.8	-0.6
Biofuels and hydrogen production	0	0	128	307	589	545	513	507	497	511	550	0.0	16.5	-1.4	0.4
District heating	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Derived gases, cokeries etc.	61	93	0	1	1	2	3	3	4	4	5	0.0	0.0	9.7	1.9
Energy Branch Consumption	**1518**	**1629**	**1726**	**1601**	**1490**	**1308**	**1153**	**1117**	**1125**	**1104**	**1066**	**1.3**	**-1.5**	**-2.5**	**-0.4**
Non-Energy Uses	**719**	**761**	**1108**	**1157**	**1295**	**1234**	**1222**	**1227**	**1211**	**1203**	**1229**	**4.4**	**1.6**	**-0.6**	**0.0**
Final Energy Demand	**18563**	**20821**	**19158**	**19029**	**18963**	**18672**	**18489**	**18672**	**18725**	**18763**	**18911**	**0.3**	**-0.1**	**-0.3**	**0.1**
by sector															
Industry	4447	4158	3602	3718	4097	4138	4028	4063	4023	3992	4027	-2.1	1.3	-0.2	0.0
- energy intensive industries	2736	2588	2357	2476	2780	2825	2711	2724	2707	2670	2654	-1.5	1.7	-0.3	-0.1
- other industrial sectors	1711	1570	1245	1242	1317	1313	1317	1339	1317	1322	1373	-3.1	0.6	0.0	0.2
Residential	4486	5497	4632	4638	4494	4537	4653	4763	4780	4791	4800	0.3	-0.3	0.4	0.2
Tertiary	2419	3079	2746	2517	2516	2539	2475	2549	2585	2588	2565	1.3	-0.9	-0.2	0.2
Transport	7212	8087	8177	8156	7857	7458	7333	7297	7337	7392	7518	1.3	-0.4	-0.7	0.1
by fuel															
Solids	891	458	301	265	265	239	216	200	188	176	171	-10.3	-1.3	-2.0	-1.1
Oil	12631	14278	12125	11638	10912	10141	9765	9525	9283	9159	9074	-0.4	-1.0	-1.1	-0.4
Gas	257	586	781	786	779	909	961	1048	1083	1025	1077	11.7	0.0	2.1	0.6
Electricity	3710	4377	4568	4534	4731	4781	4903	5199	5408	5560	5743	2.1	0.4	0.4	0.8
Heat (from CHP and District Heating)	28	49	177	223	247	273	322	257	206	206	206	20.3	3.4	2.7	-2.2
Renewable energy forms	1046	1073	1205	1582	2027	2327	2317	2435	2541	2615	2615	1.4	5.3	1.3	0.6
Other fuels (hydrogen, ethanol)	0	0	0	1	1	4	6	8	16	21	25	17.7	0.0	14.4	7.6
RES in Gross Final Energy Consumption [(A)]	**1371**	**1517**	**1851**	**2865**	**3653**	**3865**	**3979**	**5113**	**5923**	**6074**	**6237**	**3.0**	**7.0**	**0.9**	**2.3**
TOTAL GHG emissions (Mt of CO2 eq.)	**130.6**	**137.0**	**118.9**	**105.9**	**97.8**	**85.1**	**72.7**	**65.6**	**62.3**	**61.9**	**61.3**	**-0.9**	**-1.9**	**-2.9**	**-0.8**
of which ETS sectors (2013 scope) GHG emissions		77.3	65.2	57.7	52.6	42.7	32.2	25.4	22.9	23.0	22.5		-2.1	-4.8	-1.8
of which non ETS sectors GHG emissions		59.7	53.7	48.1	45.2	42.3	40.5	40.2	39.4	38.9	38.8		-1.7	-1.1	-0.2
CO_2 Emissions (energy related)	**98.0**	**106.0**	**92.1**	**83.3**	**74.8**	**62.7**	**52.7**	**45.5**	**42.3**	**42.0**	**41.4**	**-0.6**	**-2.1**	**-3.4**	**-1.2**
Power generation/District heating	52.4	56.2	48.7	41.5	35.3	25.6	16.9	10.4	7.8	8.0	7.7	-0.7	-3.1	-7.1	-3.8
Energy Branch	2.7	2.8	3.2	3.1	2.9	2.7	2.5	2.3	2.5	2.5	2.4	1.8	-1.1	-1.4	-0.1
Industry	10.4	8.9	6.7	6.2	6.6	6.0	5.7	5.6	5.1	4.7	4.7	-4.3	-0.2	-1.5	-1.0
Residential	7.5	9.8	6.7	6.6	6.1	5.6	5.3	5.0	4.7	4.4	4.0	-1.2	-0.9	-1.4	-1.3
Tertiary	3.4	4.2	2.8	2.4	2.1	2.1	1.9	1.9	1.8	1.8	1.8	-2.0	-2.8	-0.8	-0.2
Transport	21.5	24.1	24.1	23.5	21.8	20.8	20.5	20.3	20.4	20.5	20.7	1.1	-1.0	-0.6	0.1
CO_2 Emissions (non energy related)	**8.8**	**9.5**	**6.6**	**6.0**	**7.3**	**7.4**	**5.6**	**5.5**	**5.4**	**5.2**	**5.0**	**-2.8**	**0.9**	**-2.6**	**-0.6**
Non-CO_2 GHG emissions	**23.8**	**21.6**	**20.2**	**16.5**	**15.7**	**14.9**	**14.4**	**14.6**	**14.6**	**14.8**	**14.9**	**-1.7**	**-2.5**	**-0.9**	**0.2**
TOTAL GHG emissions Index (1990=100)	**121.6**	**127.5**	**110.7**	**98.5**	**91.0**	**79.2**	**67.7**	**61.1**	**58.0**	**57.6**	**57.0**				

Source: PRIMES

SUMMARY ENERGY BALANCE AND INDICATORS (B)															Greece: Reference scenario
	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050	'00-'10	'10-'20	'20-'30	'30-'50
												Annual % Change			
Main Energy System Indicators															
Population (Million)	10.904	11.083	11.305	11.445	11.526	11.562	11.578	11.605	11.630	11.629	11.576	0.4	0.2	0.0	0.0
GDP (in 000 M€10)	184.1	224.4	227.3	213.4	227.1	240.6	256.6	273.8	289.3	304.3	322.1	2.1	0.0	1.2	1.1
Gross Inl. Cons./GDP (toe/M€10)	153.6	139.9	126.9	129.6	117.6	104.0	93.8	89.4	85.2	81.4	77.9	-1.9	-0.8	-2.2	-0.9
Carbon intensity (t of CO_2/toe of GIC)	3.47	3.38	3.19	3.01	2.80	2.51	2.19	1.86	1.72	1.69	1.65	-0.8	-1.3	-2.4	-1.4
Import Dependency %	69.5	68.6	69.1	68.9	69.9	74.6	79.3	76.2	72.3	71.9	71.2				
Total energy-rel. and other mitigation costs [B] (in 000 M€10)	16.5	21.4	28.8	35.2	37.4	39.0	40.8	42.1	44.2	45.9	47.8	5.7	2.7	0.9	0.8
as % of GDP	9.0	9.5	12.7	16.5	16.4	16.2	15.9	15.4	15.3	15.1	14.8				
Energy intensity indicators															
Industry (Energy on Value added, index 2000=100)	100.0	85.4	81.5	87.0	87.2	84.2	77.6	74.5	71.6	68.8	66.0	-2.0	0.7	-1.2	-0.8
Residential (Energy on Private Income, index 2000=100)	100.0	99.5	78.3	83.3	76.3	73.5	71.9	70.4	68.3	66.6	65.0	-2.4	-0.3	-0.6	-0.5
Tertiary (Energy on Value added, index 2000=100)	100.0	100.4	86.7	85.1	80.0	75.8	68.8	66.1	63.1	59.8	55.9	-1.4	-0.8	-1.5	-1.0
Passenger transport (toe/Mpkm)	41.8	40.5	38.4	36.8	33.8	30.2	27.9	26.5	25.6	25.0	24.6	-0.9	-1.3	-1.9	-0.6
Freight transport (toe/Mtkm)	46.9	45.6	54.8	53.8	51.9	48.1	45.9	44.7	43.1	41.7	41.0	1.6	-0.5	-1.2	-0.6
Carbon Intensity indicators															
Electricity and Steam production (t of CO_2/MWh)	0.98	0.94	0.82	0.70	0.57	0.42	0.28	0.16	0.12	0.12	0.11	-1.7	-3.6	-7.0	-4.6
Final energy demand (t of CO_2/toe)	2.31	2.26	2.10	2.03	1.93	1.85	1.80	1.75	1.71	1.67	1.65	-1.0	-0.8	-0.7	-0.4
Industry	2.35	2.14	1.86	1.68	1.61	1.46	1.40	1.37	1.26	1.18	1.16	-2.3	-1.4	-1.4	-0.9
Residential	1.68	1.78	1.44	1.42	1.36	1.24	1.14	1.05	0.98	0.92	0.84	-1.5	-0.6	-1.7	-1.5
Tertiary	1.41	1.38	1.01	0.93	0.83	0.81	0.78	0.73	0.71	0.71	0.72	-3.2	-2.0	-0.6	-0.4
Transport [C]	2.98	2.98	2.94	2.88	2.77	2.78	2.79	2.78	2.78	2.77	2.75	-0.1	-0.6	0.1	-0.1
Indicators for renewables															
Share of RES in Gross Final Energy Consumption [D] (%)	7.0	6.9	9.2	14.6	18.7	20.2	21.1	27.0	31.3	32.1	32.8				
RES in transport (%)	0.0	0.0	2.0	4.9	10.1	10.5	10.6	11.3	11.8	12.5	13.6				
Gross Electricity generation by source (in GWh_e) [E]	**53425**	**59427**	**57367**	**56439**	**59454**	**57755**	**57480**	**60777**	**63733**	**66524**	**69511**	**0.7**	**0.4**	**-0.3**	**1.0**
Nuclear energy	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Solids	34313	35543	30797	27311	24447	15701	7065	1715	1222	1050	536	-1.1	-2.3	-11.7	-12.1
Oil (including refinery gas)	8885	9207	6089	5482	3626	3114	2604	1858	1532	1229	1179	-3.7	-5.1	-3.3	-3.9
Gas (including derived gases)	5920	8171	9830	7512	9981	15436	22261	20622	16520	19340	20582	5.2	0.2	8.4	-0.4
Biomass-waste	163	222	319	377	626	588	585	1441	1516	1413	1278	6.9	7.0	-0.7	4.0
Hydro (pumping excluded)	3693	5017	7460	5829	6950	8100	9012	9602	9920	10015	10059	7.3	-0.7	2.6	0.6
Wind	451	1266	2714	5246	8779	9659	9742	15068	19641	19970	20877	19.7	12.5	1.0	3.9
Solar	0	1	158	4679	5038	5150	5729	8802	11022	11022	12236	0.0	41.4	1.3	3.9
Geothermal and other renewables	0	0	0	2	7	7	482	1668	2360	2485	2765	0.0	38.6	52.0	9.1
Other fuels (hydrogen, methanol)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Net Generation Capacity in MW_e	**10208**	**11812**	**15061**	**20978**	**22407**	**20448**	**20362**	**23743**	**26685**	**27872**	**29450**	**4.0**	**4.1**	**-1.0**	**1.9**
Nuclear energy	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Renewable energy	2548	2970	3961	8003	9868	10250	10577	13849	16457	16768	17653	4.5	9.6	0.7	2.6
Hydro (pumping excluded)	2359	2396	2436	2756	3149	3171	3192	3192	3192	3192	3192	0.3	2.6	0.1	0.0
Wind	189	573	1323	2195	3433	3720	3745	5533	7068	7379	7677	21.5	10.0	0.9	3.7
Solar	0	1	202	3052	3286	3359	3640	5125	6198	6198	6784	0.0	32.2	1.0	3.2
Other renewables (tidal etc.)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Thermal power	7659	8841	11099	12975	12539	10197	9785	9894	10228	11104	11798	3.8	1.2	-2.4	0.9
of which cogeneration units	195	312	373	489	528	633	1029	788	880	1375	1188	6.7	3.5	6.9	0.7
of which CCS units	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Solids fired	4425	4708	4781	4462	4334	1897	1347	1181	1181	1181	1007	0.8	-1.0	-11.0	-1.4
Gas fired	1172	1826	3416	5979	5589	5587	5688	6014	6526	7515	8374	11.3	5.0	0.2	2.0
Oil fired	2034	2249	2809	2443	2458	2555	2521	2127	1737	1647	1611	3.3	-1.3	0.3	-2.2
Biomass-waste fired	28	59	94	91	157	157	174	381	514	478	490	13.0	5.3	1.0	5.3
Hydrogen plants	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Geothermal heat	0	0	0	0	1	1	55	190	269	284	316	0.0	0.0	52.0	9.1
Avg. Load factor of net power capacity [F] (%)	55.3	53.3	40.4	29.0	28.8	31.0	31.4	28.8	27.0	27.0	26.7				
Electricity indicators															
Efficiency of gross thermal power generation (%)	36.5	36.5	36.5	38.3	41.2	45.3	48.2	42.2	37.9	39.4	39.0				
% of gross electricity from CHP	2.1	1.7	4.3	5.2	4.8	6.1	8.6	6.2	5.0	5.7	6.9				
% of electricity from CCS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Carbon free gross electricity generation (%)	8.1	10.9	18.6	28.6	36.0	40.7	44.4	60.2	69.8	67.5	67.9				
- nuclear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
- renewable energy forms	8.1	10.9	18.6	28.6	36.0	40.7	44.4	60.2	69.8	67.5	67.9				
Transport sector															
Passenger transport activity (Gpkm)	**128.7**	**152.9**	**160.2**	**166.0**	**172.1**	**181.3**	**191.1**	**199.3**	**207.7**	**214.8**	**222.0**	**2.2**	**0.7**	**1.1**	**0.8**
Public road transport	21.7	21.7	21.1	21.7	22.3	22.9	23.5	24.0	24.5	24.8	25.1	-0.3	0.5	0.5	0.3
Private cars and motorcycles	66.7	89.7	105.4	106.6	107.3	109.9	111.9	114.3	116.6	118.6	120.5	4.7	0.2	0.4	0.4
Rail	3.1	3.4	3.0	3.2	3.3	3.6	3.8	4.2	4.5	4.8	5.0	-0.2	0.9	1.4	1.4
Aviation	29.9	31.1	23.8	27.6	32.1	37.7	44.3	48.8	53.9	58.1	62.6	-2.2	3.0	3.3	1.7
Inland navigation	7.3	7.1	6.8	6.9	7.0	7.3	7.7	7.9	8.2	8.5	8.8	-0.7	0.3	0.8	0.7
Freight transport activity (Gtkm)	**38.7**	**41.6**	**36.7**	**37.9**	**39.2**	**41.0**	**43.0**	**44.7**	**46.4**	**48.0**	**49.6**	**-0.5**	**0.6**	**0.9**	**0.7**
Trucks	29.0	32.5	29.8	30.6	31.3	32.6	33.8	35.1	36.3	37.5	38.7	0.3	0.5	0.8	0.7
Rail	0.4	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.8	0.9	3.7	0.6	1.0	0.9
Inland navigation	9.3	8.5	6.3	6.7	7.2	7.8	8.4	8.8	9.3	9.6	10.0	-3.8	1.3	1.7	0.9
Energy demand in transport (ktoe) [G]	**7201**	**8080**	**8166**	**8143**	**7842**	**7443**	**7316**	**7280**	**7319**	**7374**	**7499**	**1.3**	**-0.4**	**-0.7**	**0.1**
Public road transport	284	283	280	284	285	281	276	273	273	272	272	-0.1	0.2	-0.3	-0.1
Private cars and motorcycles	3338	4143	4300	4131	3755	3292	3046	2932	2868	2826	2818	2.6	-1.3	-2.1	-0.4
Trucks	1712	1775	1925	1947	1935	1873	1868	1885	1888	1885	1917	1.2	0.1	-0.4	0.1
Rail	49	53	24	24	24	24	25	25	25	24	23	-6.8	-0.1	0.5	-0.5
Aviation	1325	1181	919	1023	1098	1203	1306	1353	1441	1525	1619	-3.6	1.8	1.7	1.1
Inland navigation	493	645	717	733	745	770	795	812	825	842	851	3.8	0.4	0.7	0.3

Source: PRIMES

Hungary: Reference scenario											SUMMARY ENERGY BALANCE AND INDICATORS (A)				
ktoe	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**	**'00-'10**	**'10-'20**	**'20-'30**	**'30-'50**
												Annual % Change			
Production (incl.recovery of products)	**11598**	**10385**	**11088**	**10954**	**10375**	**12349**	**13607**	**13415**	**12124**	**12678**	**12637**	**-0.4**	**-0.7**	**2.7**	**-0.4**
Solids	2893	1748	1593	1725	503	480	379	320	983	865	998	-5.8	-10.9	-2.8	5.0
Oil	1698	1470	1172	844	814	757	715	518	272	14	0	-3.6	-3.6	-1.3	-100.0
Natural gas	2475	2331	2235	1773	1871	1749	1676	1818	1781	698	270	-1.0	-1.8	-1.1	-8.7
Nuclear	3672	3585	4078	4465	4585	6549	8008	6128	3826	6022	6168	1.1	1.2	5.7	-1.3
Renewable energy sources	859	1252	2010	2148	2601	2814	2830	4631	5262	5079	5202	8.9	2.6	0.8	3.1
Hydro	15	17	16	21	22	22	22	22	22	22	22	0.5	3.1	0.1	0.0
Biomass & Waste	758	1145	1844	1911	2227	2328	2259	2419	2717	2481	2611	9.3	1.9	0.1	0.7
Wind	0	1	46	66	155	196	196	223	226	235	241	0.0	12.9	2.4	1.0
Solar and others	0	2	5	56	111	175	253	364	363	399	384	0.0	35.2	8.6	2.1
Geothermal	86	87	99	92	86	93	100	1602	1934	1941	1943	1.4	-1.4	1.5	16.0
Net Imports	**13960**	**17501**	**15135**	**14675**	**14443**	**14198**	**14004**	**14878**	**15739**	**16363**	**16821**	**0.8**	**-0.5**	**-0.3**	**0.9**
Solids	1087	1299	1143	1007	1023	1137	910	837	962	840	811	0.5	-1.1	-1.2	-0.6
Oil	5295	5859	5749	5638	5494	5756	6093	6335	6553	6768	6713	0.8	-0.5	1.0	0.5
- Crude oil and Feedstocks	5883	6071	5952	5927	5860	6098	6401	6666	6918	7167	7148	0.1	-0.2	0.9	0.6
- Oil products	-589	-212	-203	-289	-366	-342	-308	-331	-365	-399	-435	-10.1	6.1	-1.7	1.7
Natural gas	7283	9807	7726	7382	7331	6799	6520	7114	7651	8223	8732	0.6	-0.5	-1.2	1.5
Electricity	296	535	447	560	492	400	377	482	448	418	444	4.2	1.0	-2.6	0.8
Gross Inland Consumption	**25300**	**27704**	**25978**	**25629**	**24817**	**26547**	**27612**	**28293**	**27863**	**29041**	**29458**	**0.3**	**-0.5**	**1.1**	**0.3**
Solids	3850	3031	2730	2731	1526	1617	1289	1157	1945	1705	1809	-3.4	-5.6	-1.7	1.7
Oil	6966	7208	6832	6483	6308	6513	6808	6853	6825	6782	6713	-0.2	-0.8	0.8	-0.1
Natural gas	9657	12094	9815	9155	9203	8548	8195	8932	9433	8921	9002	0.2	-0.6	-1.2	0.5
Nuclear	3672	3585	4078	4465	4585	6549	8008	6128	3826	6022	6168	1.1	1.2	5.7	-1.3
Electricity	296	535	447	560	492	400	377	482	448	418	444	4.2	1.0	-2.6	0.8
Renewable energy forms	859	1252	2077	2235	2704	2921	2934	4742	5387	5193	5322	9.2	2.7	0.8	3.0
as % in Gross Inland Consumption															
Solids	15.2	10.9	10.5	10.7	6.2	6.1	4.7	4.1	7.0	5.9	6.1				
Oil	27.5	26.0	26.3	25.3	25.4	24.5	24.7	24.2	24.5	23.4	22.8				
Natural gas	38.2	43.7	37.8	35.7	37.1	32.2	29.7	31.6	33.9	30.7	30.6				
Nuclear	14.5	12.9	15.7	17.4	18.5	24.7	29.0	21.7	13.7	20.7	20.9				
Renewable energy forms	3.4	4.5	8.0	8.7	10.9	11.0	10.6	16.8	19.3	17.9	18.1				
Gross Electricity Generation in GWh_e	**35185**	**35750**	**37364**	**35383**	**36250**	**40959**	**44627**	**44883**	**48109**	**52694**	**54884**	**0.6**	**-0.3**	**2.1**	**1.0**
Self consumption and grid losses	7771	6477	6558	5595	5290	6085	6614	6765	8188	8867	9345	-1.7	-2.1	2.3	1.7
Fuel Inputs to Thermal Power Generation	**6009**	**5692**	**5265**	**4518**	**3811**	**3024**	**2446**	**4670**	**6740**	**5696**	**5786**	**-1.3**	**-3.2**	**-4.3**	**4.4**
Solids	2755	1924	1646	1915	693	675	481	410	1075	858	994	-5.0	-8.3	-3.6	3.7
Oil (including refinery gas)	1052	155	138	138	107	56	66	74	81	84	87	-18.4	-2.5	-4.7	1.4
Gas (including derived gases)	2140	3078	2704	1642	2015	1245	970	1504	2168	1589	1422	2.4	-2.9	-7.0	1.9
Biomass & Waste	61	534	777	823	996	1049	928	1191	1602	1351	1469	28.9	2.5	-0.7	2.3
Geothermal heat	0	0	0	0	0	0	0	1491	1814	1814	1814	0.0	0.0	0.0	0.0
Hydrogen - Methanol	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Fuel Input to other conversion processes	**12948**	**13248**	**14604**	**14366**	**14579**	**16980**	**18544**	**16581**	**14508**	**16661**	**16724**	**1.2**	**0.0**	**2.4**	**-0.5**
Refineries	7634	8200	8590	8317	8225	8482	8822	8914	8927	8919	8882	1.2	-0.4	0.7	0.0
Biofuels and hydrogen production	0	3	175	214	396	399	419	430	446	448	458	0.0	8.5	0.6	0.5
District heating	470	627	474	415	368	407	417	381	348	347	358	0.1	-2.5	1.3	-0.8
Derived gases, cokeries etc.	4843	4418	5365	5419	5591	7690	8887	6857	4788	6946	7027	1.0	0.4	4.7	-1.2
Energy Branch Consumption	**1164**	**1062**	**1105**	**948**	**890**	**985**	**1014**	**982**	**1087**	**1129**	**1149**	**-0.5**	**-2.1**	**1.3**	**0.6**
Non-Energy Uses	**1579**	**2162**	**1977**	**1982**	**2176**	**2480**	**2746**	**2815**	**2803**	**2773**	**2726**	**2.3**	**1.0**	**2.4**	**0.0**
Final Energy Demand	**16098**	**18173**	**16660**	**16917**	**16573**	**17001**	**17189**	**17462**	**17609**	**17877**	**18187**	**0.3**	**-0.1**	**0.4**	**0.3**
by sector															
Industry	3513	3372	2912	2769	2835	3056	3087	3177	3146	3236	3328	-1.9	-0.3	0.9	0.4
- energy intensive industries	2517	2271	1853	1711	1785	1942	1920	1954	1946	1967	1986	-3.0	-0.4	0.7	0.2
- other industrial sectors	996	1102	1058	1057	1050	1114	1167	1222	1200	1269	1342	0.6	-0.1	1.1	0.7
Residential	5603	6464	5719	5886	5530	5703	5746	5873	5923	6015	6105	0.2	-0.3	0.4	0.3
Tertiary	3710	4071	3628	3800	3829	3836	3806	3799	3839	3901	3977	-0.2	0.5	-0.1	0.2
Transport	3272	4266	4401	4462	4380	4407	4550	4614	4701	4725	4776	3.0	0.0	0.4	0.2
by fuel															
Solids	665	690	481	392	378	433	433	454	453	438	431	-3.2	-2.4	1.4	0.0
Oil	4176	4859	4703	4652	4365	4416	4503	4533	4608	4593	4586	1.2	-0.7	0.3	0.1
Gas	6503	7852	6261	6440	6179	6190	5994	6069	5935	5982	6161	-0.4	-0.1	-0.3	0.1
Electricity	2531	2781	2941	2968	3026	3247	3479	3612	3741	4028	4197	1.5	0.3	1.4	0.9
Heat (from CHP and District Heating)	1447	1308	1090	1165	1149	1172	1174	1163	1272	1205	1169	-2.8	0.5	0.2	0.0
Renewable energy forms	774	683	1184	1300	1474	1541	1603	1626	1592	1618	1628	4.3	2.2	0.8	0.1
Other fuels (hydrogen, ethanol)	0	0	0	0	1	2	3	5	9	12	16	0.9	93.7	15.0	8.6
RES in Gross Final Energy Consumption [(A)]	**814**	**839**	**1490**	**1798**	**2274**	**2500**	**2592**	**2942**	**3232**	**3144**	**3265**	**6.2**	**4.3**	**1.3**	**1.2**
TOTAL GHG emissions (Mt of CO2 eq.)	**77.4**	**79.1**	**67.9**	**63.7**	**57.5**	**56.3**	**53.3**	**54.4**	**55.1**	**51.6**	**51.2**	**-1.3**	**-1.6**	**-0.8**	**-0.2**
of which ETS sectors (2013 scope) GHG emissions		30.1	23.7	21.2	17.0	16.0	13.5	14.3	15.0	11.7	11.0		-3.3	-2.3	-1.0
of which non ETS sectors GHG emissions		49.0	44.1	42.5	40.5	40.3	39.8	40.1	40.0	39.8	40.2		-0.8	-0.2	0.0
CO_2 Emissions (energy related)	**54.9**	**56.3**	**49.2**	**46.7**	**40.7**	**39.5**	**37.1**	**38.0**	**38.6**	**36.4**	**36.4**	**-1.1**	**-1.9**	**-0.9**	**-0.1**
Power generation/District heating	22.1	18.3	16.0	13.9	9.5	7.5	5.5	6.1	6.9	4.7	4.2	-3.2	-5.2	-5.2	-1.3
Energy Branch	1.5	1.2	1.5	1.2	1.2	1.3	1.2	1.3	1.2	1.2	1.3	-0.2	-2.6	0.6	0.2
Industry	6.8	6.7	5.4	4.7	4.8	5.3	5.1	5.3	5.0	5.2	5.4	-2.3	-1.2	0.6	0.3
Residential	8.8	10.7	8.6	8.8	8.0	8.1	8.0	8.2	8.2	8.1	8.2	-0.2	-0.7	0.0	0.1
Tertiary	6.1	6.7	5.2	5.5	5.6	5.5	5.1	4.8	4.9	4.7	4.8	-1.6	0.6	-0.8	-0.4
Transport	9.5	12.5	12.5	12.5	11.7	11.8	12.1	12.2	12.4	12.4	12.6	2.7	-0.6	0.3	0.2
CO_2 Emissions (non energy related)	**4.0**	**4.3**	**3.3**	**3.1**	**3.2**	**3.5**	**3.2**	**3.3**	**3.3**	**2.2**	**1.8**	**-1.9**	**-0.2**	**-0.2**	**-2.7**
Non-CO_2 GHG emissions	**18.5**	**18.6**	**15.3**	**13.9**	**13.6**	**13.3**	**13.0**	**13.1**	**13.2**	**12.9**	**13.0**	**-1.9**	**-1.2**	**-0.5**	**0.0**
TOTAL GHG emissions Index (1990=100)	**79.2**	**80.9**	**69.4**	**65.1**	**58.8**	**57.5**	**54.5**	**55.6**	**56.3**	**52.7**	**52.3**				

Source: PRIMES

SUMMARY ENERGY BALANCE AND INDICATORS (B)															Hungary: Reference scenario
	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050	'00-'10	'10-'20	'20-'30	'30-'50
												Annual % Change			
Main Energy System Indicators															
Population (Million)	10.222	10.098	10.014	9.958	9.901	9.820	9.704	9.575	9.443	9.316	9.177	-0.2	-0.1	-0.2	-0.3
GDP (in 000 M€10)	79.9	98.0	97.1	101.7	106.6	115.9	127.3	137.5	146.5	154.4	162.0	2.0	0.9	1.8	1.2
Gross Inl. Cons./GDP (toe/M€10)	316.5	282.6	267.6	252.1	232.8	229.1	216.9	205.7	190.2	188.1	181.8	-1.7	-1.4	-0.7	-0.9
Carbon intensity (t of CO_2/toe of GIC)	2.17	2.03	1.90	1.82	1.64	1.49	1.34	1.34	1.38	1.25	1.24	-1.3	-1.4	-2.0	-0.4
Import Dependency %	55.2	63.2	58.3	57.3	58.2	53.5	50.7	52.6	56.5	56.3	57.1				
Total energy-rel. and other mitigation costs (B) (in 000 M€10)	12.2	17.2	21.6	24.8	27.7	30.5	33.5	35.6	37.9	39.3	40.3	5.8	2.5	1.9	0.9
as % of GDP	15.3	17.5	22.2	24.3	26.0	26.3	26.3	25.9	25.9	25.4	24.9				
Energy intensity indicators															
Industry (Energy on Value added, index 2000=100)	100.0	74.8	64.8	58.8	57.3	56.5	51.9	49.5	46.1	45.0	44.1	-4.2	-1.2	-1.0	-0.8
Residential (Energy on Private Income, index 2000=100)	100.0	90.3	85.4	84.2	75.6	71.8	65.9	62.2	58.8	56.5	54.4	-1.6	-1.2	-1.4	-0.9
Tertiary (Energy on Value added, index 2000=100)	100.0	90.0	81.9	81.8	78.6	72.3	65.1	59.9	56.8	54.7	53.1	-2.0	-0.4	-1.9	-1.0
Passenger transport (toe/Mpkm)	28.4	29.9	27.8	27.0	24.8	22.5	21.1	20.3	19.6	19.1	18.8	-0.2	-1.2	-1.6	-0.6
Freight transport (toe/Mtkm)	34.4	48.0	46.1	45.1	43.6	41.1	39.5	38.4	37.2	36.3	35.5	3.0	-0.6	-1.0	-0.5
Carbon Intensity indicators															
Electricity and Steam production (t of CO_2/MWh)	0.41	0.34	0.31	0.27	0.18	0.13	0.09	0.10	0.10	0.07	0.06	-2.7	-5.3	-6.7	-2.1
Final energy demand (t of CO_2/toe)	1.94	2.02	1.90	1.87	1.81	1.81	1.77	1.75	1.73	1.70	1.70	-0.2	-0.5	-0.3	-0.2
Industry	1.92	2.00	1.85	1.71	1.68	1.74	1.64	1.67	1.60	1.61	1.61	-0.4	-1.0	-0.2	-0.1
Residential	1.57	1.66	1.50	1.49	1.45	1.42	1.40	1.39	1.38	1.35	1.34	-0.4	-0.3	-0.4	-0.2
Tertiary	1.65	1.65	1.44	1.46	1.45	1.44	1.35	1.28	1.27	1.20	1.20	-1.3	0.1	-0.7	-0.6
Transport (C)	2.92	2.94	2.84	2.81	2.68	2.67	2.66	2.65	2.64	2.63	2.63	-0.3	-0.6	-0.1	-0.1
Indicators for renewables															
Share of RES in Gross Final Energy Consumption (D) (%)	4.8	4.4	8.5	10.3	13.3	14.2	14.5	16.2	17.5	16.8	17.1				
RES in transport (%)	0.0	0.1	4.4	5.3	10.1	10.4	10.6	11.1	11.6	11.6	11.8				
Gross Electricity generation by source (in GWh_e) (E)	**35191**	**35756**	**37371**	**35383**	**36250**	**40959**	**44627**	**44883**	**48109**	**52694**	**54884**	**0.6**	**-0.3**	**2.1**	**1.0**
Nuclear energy	14180	13834	15761	16989	17323	25911	32289	25440	16744	26426	27068	1.1	0.9	6.4	-0.9
Solids	9590	7023	6234	6678	1997	2011	1354	1134	5445	4825	5803	-4.2	-10.8	-3.8	7.5
Oil (including refinery gas)	4404	455	490	639	473	259	267	351	466	486	502	-19.7	-0.3	-5.6	3.2
Gas (including derived gases)	6719	12502	11714	7732	10651	5508	3791	7456	12573	8321	8119	5.7	-0.9	-9.8	3.9
Biomass-waste	120	1730	2449	2326	3637	4177	3589	4850	6762	6119	6804	35.2	4.0	-0.1	3.3
Hydro (pumping excluded)	178	202	188	249	255	254	258	258	255	258	258	0.5	3.1	0.1	0.0
Wind	0	10	534	768	1799	2281	2281	2598	2625	2733	2804	0.0	12.9	2.4	1.0
Solar	0	0	1	4	114	558	798	1063	1128	1415	1415	0.0	63.2	21.5	2.9
Geothermal and other renewables	0	0	0	0	0	0	0	1733	2109	2109	2109	0.0	-100.0	0.0	0.0
Other fuels (hydrogen, methanol)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Net Generation Capacity in MW_e	**8237**	**8301**	**9135**	**9092**	**8258**	**8951**	**10167**	**10293**	**10753**	**11806**	**12338**	**1.0**	**-1.0**	**2.1**	**1.0**
Nuclear energy	1706	1728	1992	2017	2030	3029	4035	3019	2000	3125	3200	1.6	0.2	7.1	-1.2
Renewable energy	44	65	353	478	1059	1793	2012	2379	2446	2731	2765	23.1	11.6	6.6	1.6
Hydro (pumping excluded)	44	48	56	63	64	64	64	64	64	64	64	2.4	1.4	0.0	0.1
Wind	0	18	295	413	903	1236	1236	1387	1400	1452	1485	0.0	11.8	3.2	0.9
Solar	0	0	2	3	93	493	712	928	981	1215	1215	0.0	46.8	22.6	2.7
Other renewables (tidal etc.)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Thermal power	6487	6508	6791	6596	5168	4129	4119	4894	6307	5950	6373	0.5	-2.7	-2.2	2.2
of which cogeneration units	1464	1608	1462	1292	1501	1655	1625	1599	2122	2155	1963	0.0	0.3	0.8	0.9
of which CCS units	0	0	0	0	0	0	0	0	605	605	722	0.0	0.0	0.0	0.0
Solids fired	1515	1324	1247	882	301	291	291	238	709	521	588	-1.9	-13.2	-0.3	3.6
Gas fired	3722	4316	4678	4899	4172	3114	3114	3719	4268	4068	4221	2.3	-1.1	-2.9	1.5
Oil fired	957	514	515	433	147	133	104	107	137	139	126	-6.0	-11.8	-3.4	1.0
Biomass-waste fired	293	354	350	382	549	591	610	633	953	981	1198	1.8	4.6	1.1	3.4
Hydrogen plants	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Geothermal heat	0	0	0	0	0	0	0	198	241	241	241	0.0	0.0	0.0	0.0
Avg. Load factor of net power capacity (F) (%)	44.7	45.7	43.3	42.2	48.1	49.8	47.7	47.5	47.6	47.5	47.3				
Electricity indicators															
Efficiency of gross thermal power generation (%)	29.8	32.8	34.1	33.1	37.8	34.0	31.6	28.6	34.9	33.0	34.7				
% of gross electricity from CHP	13.5	19.1	19.6	21.8	23.9	21.0	18.1	20.0	27.6	23.6	22.9				
% of electricity from CCS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.0	10.9	11.8				
Carbon free gross electricity generation (%)	41.1	44.1	50.7	57.5	63.8	81.0	87.9	80.1	61.6	74.1	73.7				
- nuclear	40.3	38.7	42.2	48.0	47.8	63.3	72.4	56.7	34.8	50.1	49.3				
- renewable energy forms	0.8	5.4	8.5	9.5	16.0	17.8	15.5	23.4	26.8	24.0	24.4				
Transport sector															
Passenger transport activity (Gpkm)	**80.1**	**84.2**	**83.6**	**87.4**	**91.4**	**100.3**	**110.0**	**116.5**	**123.3**	**127.6**	**131.9**	**0.4**	**0.9**	**1.9**	**0.9**
Public road transport	18.7	17.8	16.0	16.6	17.2	18.1	19.0	19.6	20.2	20.6	21.0	-1.6	0.7	1.0	0.5
Private cars and motorcycles	47.0	50.5	53.8	55.7	57.5	63.0	69.0	72.8	76.7	78.7	80.7	1.4	0.7	1.9	0.8
Rail	12.3	12.2	10.2	10.8	11.4	12.8	14.4	15.4	16.5	17.2	17.9	-1.9	1.2	2.3	1.1
Aviation	2.1	3.7	3.6	4.4	5.3	6.4	7.7	8.7	9.9	11.0	12.2	5.7	3.9	3.8	2.4
Inland navigation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Freight transport activity (Gtkm)	**28.8**	**36.4**	**44.9**	**46.7**	**48.5**	**52.3**	**56.3**	**58.8**	**61.4**	**62.9**	**64.6**	**4.5**	**0.8**	**1.5**	**0.7**
Trucks	19.1	25.2	33.7	34.6	35.4	37.8	40.4	42.1	43.9	45.1	46.2	5.8	0.5	1.3	0.7
Rail	8.8	9.1	8.8	9.6	10.4	11.4	12.6	13.2	13.9	14.3	14.6	0.0	1.7	1.9	0.8
Inland navigation	0.9	2.1	2.4	2.6	2.7	3.0	3.3	3.4	3.6	3.6	3.7	10.4	1.3	1.9	0.6
Energy demand in transport (ktoe) (G)	**3270**	**4262**	**4401**	**4461**	**4379**	**4406**	**4549**	**4613**	**4700**	**4724**	**4775**	**3.0**	**-0.1**	**0.4**	**0.2**
Public road transport	340	318	278	286	289	289	290	291	294	295	294	-2.0	0.4	0.1	0.1
Private cars and motorcycles	1665	1904	1791	1773	1644	1607	1628	1622	1641	1640	1651	0.7	-0.9	-0.1	0.1
Trucks	864	1625	1949	1972	1977	2004	2071	2101	2133	2138	2156	8.5	0.1	0.5	0.2
Rail	171	153	151	161	170	179	189	192	192	187	180	-1.2	1.2	1.1	-0.2
Aviation	230	261	230	268	299	324	369	406	439	463	492	0.0	2.7	2.1	1.4
Inland navigation	0	1	1	1	1	1	1	1	1	1	1	0.0	1.3	1.7	0.4

Source: PRIMES

Ireland: Reference scenario												SUMMARY ENERGY BALANCE AND INDICATORS (A)			
ktoe	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**	**'00-'10**	**'10-'20**	**'20-'30**	**'30-'50**
												Annual % Change			
Production (incl.recovery of products)	**2190**	**1671**	**1994**	**2412**	**2886**	**3412**	**3757**	**3797**	**3923**	**3998**	**4192**	**-0.9**	**3.8**	**2.7**	**0.5**
Solids	997	847	1040	653	643	447	281	68	62	59	58	0.4	-4.7	-7.9	-7.6
Oil	0	0	9	9	9	9	9	9	9	9	9	0.0	0.0	0.0	0.0
Natural gas	958	461	316	642	537	519	661	761	736	656	639	-10.5	5.4	2.1	-0.2
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Renewable energy sources	235	364	628	1107	1698	2436	2806	2958	3116	3274	3485	10.3	10.4	5.2	1.1
Hydro	73	54	52	68	84	85	88	93	104	117	126	-3.4	5.0	0.4	1.8
Biomass & Waste	141	213	329	493	622	719	915	1004	1091	1135	1178	8.8	6.6	3.9	1.3
Wind	21	96	242	494	872	1418	1498	1517	1544	1570	1658	27.7	13.7	5.6	0.5
Solar and others	0	0	6	52	119	213	302	341	374	448	519	46.8	35.8	9.8	2.7
Geothermal	0	0	0	0	1	2	3	3	3	3	3	0.0	0.0	10.6	0.7
Net Imports	**12156**	**13715**	**13001**	**12984**	**12211**	**11422**	**11437**	**11994**	**12359**	**12833**	**13339**	**0.7**	**-0.6**	**-0.7**	**0.8**
Solids	1693	2016	1038	2053	1921	1208	398	412	413	412	419	-4.8	6.4	-14.6	0.3
Oil	7977	8514	7496	7656	7361	7426	7573	7724	7864	7975	8195	-0.6	-0.2	0.3	0.4
- Crude oil and Feedstocks	2994	3316	2981	3057	2897	2865	2844	2811	2785	2777	2793	0.0	-0.3	-0.2	-0.1
- Oil products	4982	5198	4514	4599	4464	4561	4729	4913	5079	5199	5403	-1.0	-0.1	0.6	0.7
Natural gas	2478	3010	4386	2789	2170	2027	2614	3004	3168	3480	3727	5.9	-6.8	1.9	1.8
Electricity	8	176	40	240	235	260	294	293	303	326	329	17.0	19.3	2.3	0.6
Gross Inland Consumption	**14249**	**15235**	**15100**	**15294**	**14988**	**14718**	**15070**	**15664**	**16149**	**16690**	**17380**	**0.6**	**-0.1**	**0.1**	**0.7**
Solids	2646	2789	2095	2706	2564	1655	679	481	475	471	476	-2.3	2.0	-12.4	-1.8
Oil	7924	8437	7604	7563	7263	7322	7461	7610	7744	7849	8060	-0.4	-0.5	0.3	0.4
Natural gas	3436	3470	4696	3431	2706	2544	3272	3761	3900	4131	4361	3.2	-5.4	1.9	1.4
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Electricity	8	176	40	240	235	260	294	293	303	326	329	17.0	19.3	2.3	0.6
Renewable energy forms	235	364	666	1354	2220	2937	3364	3519	3727	3913	4154	11.0	12.8	4.2	1.1
as % in Gross Inland Consumption															
Solids	18.6	18.3	13.9	17.7	17.1	11.2	4.5	3.1	2.9	2.8	2.7				
Oil	55.6	55.4	50.4	49.5	48.5	49.8	49.5	48.6	48.0	47.0	46.4				
Natural gas	24.1	22.8	31.1	22.4	18.1	17.3	21.7	24.0	24.1	24.8	25.1				
Nuclear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Renewable energy forms	1.6	2.4	4.4	8.9	14.8	20.0	22.3	22.5	23.1	23.4	23.9				
Gross Electricity Generation in GWh_e	**23669**	**25621**	**28429**	**27355**	**27686**	**29853**	**32358**	**35596**	**38015**	**40478**	**43333**	**1.8**	**-0.3**	**1.6**	**1.5**
Self consumption and grid losses	3467	3422	3406	3335	3204	3265	3233	3493	3733	3994	4267	-0.2	-0.6	0.1	1.4
Fuel Inputs to Thermal Power Generation	**4747**	**4742**	**4592**	**3875**	**3164**	**2214**	**2088**	**2350**	**2526**	**2718**	**2892**	**-0.3**	**-3.7**	**-4.1**	**1.6**
Solids	1902	1906	1363	2087	1956	1161	218	8	5	5	5	-3.3	3.7	-19.7	-17.4
Oil (including refinery gas)	996	766	135	13	14	16	18	20	22	24	26	-18.1	-20.4	2.6	1.9
Gas (including derived gases)	1825	2040	3017	1642	976	797	1474	1925	2020	2182	2329	5.2	-10.7	4.2	2.3
Biomass & Waste	24	30	77	132	219	240	378	396	479	508	533	12.6	11.0	5.6	1.7
Geothermal heat	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Hydrogen - Methanol	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Fuel Input to other conversion processes	**3480**	**3495**	**3179**	**3359**	**3416**	**3363**	**3339**	**3308**	**3291**	**3300**	**3341**	**-0.9**	**0.7**	**-0.2**	**0.0**
Refineries	3317	3354	2943	3066	2907	2874	2853	2820	2794	2786	2802	-1.2	-0.1	-0.2	-0.1
Biofuels and hydrogen production	0	1	90	182	402	412	419	421	433	454	480	0.0	16.1	0.4	0.7
District heating	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Derived gases, cokeries etc.	162	139	146	111	108	77	67	67	63	61	59	-1.1	-3.0	-4.6	-0.6
Energy Branch Consumption	**254**	**296**	**257**	**240**	**225**	**204**	**174**	**165**	**168**	**171**	**176**	**0.1**	**-1.3**	**-2.5**	**0.1**
Non-Energy Uses	**552**	**308**	**265**	**301**	**332**	**348**	**373**	**395**	**412**	**429**	**450**	**-7.1**	**2.3**	**1.2**	**0.9**
Final Energy Demand	**10688**	**12515**	**11790**	**12379**	**12407**	**12691**	**13279**	**13861**	**14336**	**14813**	**15471**	**1.0**	**0.5**	**0.7**	**0.8**
by sector															
Industry	2497	2631	1921	2335	2441	2650	2867	3046	3197	3364	3582	-2.6	2.4	1.6	1.1
- energy intensive industries	1242	1344	895	1056	1105	1190	1239	1274	1290	1298	1307	-3.2	2.1	1.2	0.3
- other industrial sectors	1256	1287	1026	1278	1337	1460	1628	1772	1907	2066	2276	-2.0	2.7	2.0	1.7
Residential	2503	2907	3241	3213	3107	3129	3209	3336	3403	3483	3592	2.6	-0.4	0.3	0.6
Tertiary	1670	1980	1961	1924	1896	1881	1911	1964	1995	2055	2138	1.6	-0.3	0.1	0.6
Transport	4018	4997	4667	4907	4963	5031	5291	5516	5742	5910	6159	1.5	0.6	0.6	0.8
by fuel															
Solids	707	758	606	589	579	473	446	463	461	458	463	-1.5	-0.5	-2.6	0.2
Oil	6918	8019	7111	7102	6773	6829	6933	7071	7189	7270	7458	0.3	-0.5	0.2	0.4
Gas	1200	1461	1614	1736	1694	1706	1761	1786	1831	1908	1995	3.0	0.5	0.4	0.6
Electricity	1744	2094	2163	2293	2328	2535	2788	3043	3239	3450	3673	2.2	0.7	1.8	1.4
Heat (from CHP and District Heating)	0	0	0	0	0	18	64	121	189	248	355	0.0	0.0	316.8	8.9
Renewable energy forms	118	184	295	659	1032	1128	1282	1373	1422	1472	1518	9.6	13.3	2.2	0.8
Other fuels (hydrogen, ethanol)	0	0	0	0	1	2	3	4	6	8	9	0.0	74.9	13.2	6.4
RES in Gross Final Energy Consumption [(A)]	**217**	**355**	**658**	**1227**	**2074**	**2783**	**3177**	**3313**	**3500**	**3644**	**3866**	**11.7**	**12.2**	**4.4**	**1.0**
TOTAL GHG emissions (Mt of CO2 eq.)	**69.2**	**71.5**	**63.3**	**63.7**	**60.8**	**57.4**	**55.0**	**56.0**	**57.1**	**58.4**	**60.0**	**-0.9**	**-0.4**	**-1.0**	**0.4**
of which ETS sectors (2013 scope) GHG emissions		25.4	20.0	19.9	17.7	14.4	12.0	12.2	12.5	12.9	13.2		-1.2	-3.9	0.5
of which non ETS sectors GHG emissions		46.1	43.3	43.8	43.0	43.0	43.1	43.8	44.7	45.5	46.8		-0.1	0.0	0.4
CO_2 Emissions (energy related)	**42.9**	**46.9**	**41.6**	**41.2**	**37.9**	**34.0**	**31.9**	**32.6**	**33.3**	**34.1**	**35.2**	**-0.3**	**-0.9**	**-1.7**	**0.5**
Power generation/District heating	15.5	15.3	13.3	12.6	10.5	6.8	4.5	4.6	4.8	5.2	5.5	-1.5	-2.3	-8.2	1.1
Energy Branch	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	1.1	-1.0	-1.6	-0.8
Industry	5.3	5.6	3.5	3.9	3.7	4.0	4.1	4.0	4.0	4.1	4.2	-4.3	0.8	0.9	0.1
Residential	6.3	7.0	7.6	7.0	6.6	6.4	6.1	6.2	6.1	6.1	6.1	1.8	-1.4	-0.9	0.0
Tertiary	3.3	3.5	3.1	3.0	2.9	2.5	2.3	2.2	2.2	2.1	2.2	-0.7	-0.7	-2.2	-0.3
Transport	12.1	15.0	13.8	14.3	13.8	14.0	14.7	15.4	16.0	16.4	17.0	1.3	0.0	0.7	0.7
CO_2 Emissions (non energy related)	**2.9**	**2.6**	**1.4**	**1.6**	**1.7**	**1.9**	**1.7**	**1.8**	**1.8**	**1.8**	**1.7**	**-7.1**	**2.1**	**0.0**	**0.1**
Non-CO_2 GHG emissions	**23.5**	**22.0**	**20.3**	**20.9**	**21.2**	**21.5**	**21.4**	**21.6**	**22.1**	**22.6**	**23.1**	**-1.4**	**0.4**	**0.1**	**0.4**
TOTAL GHG emissions Index (1990=100)	**123.1**	**127.1**	**112.5**	**113.2**	**108.1**	**102.0**	**97.9**	**99.6**	**101.6**	**103.9**	**106.7**				

Source: PRIMES

SUMMARY ENERGY BALANCE AND INDICATORS (B)															Ireland: Reference scenario
	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050	'00-'10	'10-'20	'20-'30	'30-'50
												Annual % Change			
Main Energy System Indicators															
Population (Million)	3.778	4.112	4.468	4.605	4.815	5.052	5.276	5.513	5.758	5.995	6.207	1.7	0.8	0.9	0.8
GDP (in 000 M€10)	123.2	156.7	156.0	170.7	191.6	225.3	262.2	294.8	324.6	353.2	385.9	2.4	2.1	3.2	2.0
Gross Inl. Cons./GDP (toe/M€10)	115.7	97.2	96.8	89.6	78.2	65.3	57.5	53.1	49.7	47.3	45.0	-1.8	-2.1	-3.0	-1.2
Carbon intensity (t of CO_2/toe of GIC)	3.01	3.08	2.75	2.69	2.53	2.31	2.12	2.08	2.06	2.04	2.03	-0.9	-0.8	-1.8	-0.2
Import Dependency %	84.4	89.4	85.6	84.3	80.9	77.0	75.3	76.0	75.9	76.2	76.1				
Total energy-rel. and other mitigation costs [B] (in 000 M€10)	10.1	13.9	16.3	20.0	22.0	23.8	26.1	27.9	29.7	31.4	33.6	5.0	3.0	1.7	1.3
as % of GDP	8.2	8.9	10.5	11.7	11.5	10.6	10.0	9.5	9.2	8.9	8.7				
Energy intensity indicators															
Industry (Energy on Value added, index 2000=100)	100.0	82.2	45.5	49.5	46.2	43.7	41.2	39.5	38.2	37.3	36.9	-7.6	0.1	-1.1	-0.6
Residential (Energy on Private Income, index 2000=100)	100.0	94.0	102.1	98.9	86.2	74.2	65.9	61.4	57.3	54.3	51.2	0.2	-1.7	-2.6	-1.3
Tertiary (Energy on Value added, index 2000=100)	100.0	99.1	97.6	88.6	77.7	64.8	56.2	51.1	46.8	44.2	41.9	-0.2	-2.3	-3.2	-1.5
Passenger transport (toe/Mpkm)	50.1	48.4	47.7	45.3	40.7	36.3	33.7	32.4	31.4	30.5	30.0	-0.5	-1.6	-1.9	-0.6
Freight transport (toe/Mtkm)	101.1	103.8	130.9	130.4	127.1	120.5	117.5	115.3	111.5	109.1	108.5	2.6	-0.3	-0.8	-0.4
Carbon Intensity indicators															
Electricity and Steam production (t of CO_2/MWh)	0.65	0.60	0.47	0.46	0.38	0.23	0.13	0.12	0.12	0.12	0.12	-3.3	-2.0	-9.9	-0.7
Final energy demand (t of CO_2/toe)	2.53	2.49	2.37	2.28	2.18	2.12	2.05	2.00	1.97	1.93	1.90	-0.7	-0.8	-0.6	-0.4
Industry	2.14	2.14	1.80	1.65	1.54	1.50	1.43	1.32	1.25	1.21	1.16	-1.7	-1.5	-0.7	-1.0
Residential	2.53	2.43	2.35	2.19	2.14	2.04	1.89	1.85	1.79	1.74	1.69	-0.8	-0.9	-1.2	-0.5
Tertiary	1.99	1.76	1.58	1.58	1.53	1.35	1.22	1.12	1.08	1.03	1.02	-2.3	-0.3	-2.3	-0.9
Transport [C]	3.00	3.01	2.95	2.91	2.78	2.78	2.78	2.79	2.78	2.77	2.76	-0.2	-0.6	0.0	0.0
Indicators for renewables															
Share of RES in Gross Final Energy Consumption [D] (%)	2.0	2.8	5.4	9.7	16.4	21.6	23.6	23.6	24.1	24.2	24.6				
RES in transport (%)	0.0	0.0	2.3	4.5	10.0	10.4	10.5	10.4	10.7	11.1	11.4				
Gross Electricity generation by source (in GWh_e) [E]	**23673**	**25626**	**28434**	**27355**	**27686**	**29853**	**32358**	**35596**	**38015**	**40478**	**43333**	**1.8**	**-0.3**	**1.6**	**1.5**
Nuclear energy	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Solids	8587	8839	6384	10272	9610	5804	985	36	22	22	22	-2.9	4.2	-20.4	-17.4
Oil (including refinery gas)	4638	3340	605	58	36	20	73	81	100	92	137	-18.4	-24.6	7.3	3.2
Gas (including derived gases)	9263	11574	17714	9921	5847	4781	9919	13561	14678	15917	16733	6.7	-10.5	5.4	2.6
Biomass-waste	95	130	317	564	929	1019	1604	1605	2023	2016	2038	12.8	11.4	5.6	1.2
Hydro (pumping excluded)	846	631	599	795	980	986	1025	1081	1210	1357	1471	-3.4	5.0	0.4	1.8
Wind	244	1112	2815	5745	10143	16493	17418	17641	17956	18261	19280	27.7	13.7	5.6	0.5
Solar	0	0	0	0	0	379	735	810	851	1200	1200	0.0	0.0	0.0	2.5
Geothermal and other renewables	0	0	0	0	141	371	600	781	1176	1614	2452	0.0	0.0	15.6	7.3
Other fuels (hydrogen, methanol)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Net Generation Capacity in MW_e	**4398**	**5775**	**8269**	**8454**	**9793**	**11984**	**12648**	**13894**	**14712**	**15893**	**16996**	**6.5**	**1.7**	**2.6**	**1.5**
Nuclear energy	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Renewable energy	351	729	1665	2334	3914	6487	7222	7457	7853	8433	9117	16.8	8.9	6.3	1.2
Hydro (pumping excluded)	233	233	237	246	296	301	312	332	375	418	454	0.2	2.2	0.5	1.9
Wind	118	496	1428	2088	3561	5688	5992	6059	6212	6252	6559	28.3	9.6	5.3	0.5
Solar	0	0	0	0	0	346	674	748	786	1104	1104	0.0	0.0	0.0	2.5
Other renewables (tidal etc.)	0	0	0	0	58	151	244	319	479	658	1000	0.0	0.0	15.6	7.3
Thermal power	4047	5046	6604	6120	5879	5497	5426	6437	6859	7460	7879	5.0	-1.2	-0.8	1.9
of which cogeneration units	77	173	246	331	422	578	749	1003	960	1076	1129	12.3	5.6	5.9	2.1
of which CCS units	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Solids fired	1386	1370	1370	1370	1268	1234	351	351	240	240	240	-0.1	-0.8	-12.0	-1.9
Gas fired	1834	2820	4340	4545	4341	3993	4569	5427	5892	6435	6793	9.0	0.0	0.5	2.0
Oil fired	772	780	783	43	45	29	179	184	186	192	229	0.1	-24.8	14.7	1.2
Biomass-waste fired	55	77	111	162	225	241	326	475	542	593	617	7.4	7.3	3.8	3.2
Hydrogen plants	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Geothermal heat	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Avg. Load factor of net power capacity [F] (%)	58.1	48.3	37.7	35.5	31.2	27.7	28.8	28.9	29.1	28.7	28.7				
Electricity indicators															
Efficiency of gross thermal power generation (%)	40.9	43.3	46.8	46.2	44.6	45.1	51.8	55.9	57.3	57.1	56.3				
% of gross electricity from CHP	2.4	2.4	6.7	5.0	6.0	7.4	10.4	12.1	13.6	11.9	11.2				
% of electricity from CCS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Carbon free gross electricity generation (%)	5.0	7.3	13.1	26.0	44.0	64.5	66.1	61.6	61.1	60.4	61.0				
- nuclear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
- renewable energy forms	5.0	7.3	13.1	26.0	44.0	64.5	66.1	61.6	61.1	60.4	61.0				
Transport sector															
Passenger transport activity (Gpkm)	**53.5**	**63.4**	**66.4**	**70.6**	**75.1**	**81.9**	**89.5**	**95.5**	**101.9**	**107.1**	**112.5**	**2.2**	**1.2**	**1.8**	**1.2**
Public road transport	6.1	6.7	6.9	7.1	7.2	7.7	8.2	8.6	9.1	9.4	9.8	1.2	0.5	1.3	0.9
Private cars and motorcycles	38.8	43.8	46.5	49.0	51.7	56.2	61.1	64.9	69.0	72.3	75.8	1.8	1.1	1.7	1.1
Rail	1.4	1.9	1.8	1.9	2.0	2.1	2.3	2.4	2.5	2.6	2.7	2.7	0.9	1.3	0.9
Aviation	6.3	10.1	10.3	11.6	13.1	14.8	16.6	18.2	19.9	21.3	22.7	5.1	2.4	2.4	1.6
Inland navigation	0.9	1.0	1.0	1.0	1.0	1.1	1.2	1.3	1.4	1.5	1.6	0.3	0.9	1.7	1.3
Freight transport activity (Gtkm)	**13.2**	**18.6**	**11.4**	**13.1**	**14.9**	**17.0**	**19.3**	**21.0**	**22.8**	**24.2**	**25.6**	**-1.5**	**2.7**	**2.6**	**1.4**
Trucks	12.3	17.9	10.9	12.5	14.4	16.3	18.6	20.2	21.9	23.3	24.7	-1.1	2.8	2.6	1.4
Rail	0.5	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-15.4	1.4	1.3	0.9
Inland navigation	0.5	0.3	0.4	0.4	0.5	0.5	0.6	0.7	0.7	0.7	0.8	-1.6	2.1	2.4	1.2
Energy demand in transport (ktoe) [G]	**4016**	**4994**	**4664**	**4902**	**4958**	**5025**	**5285**	**5509**	**5735**	**5904**	**6152**	**1.5**	**0.6**	**0.6**	**0.8**
Public road transport	74	79	96	98	100	104	109	113	118	121	125	2.7	0.4	0.8	0.7
Private cars and motorcycles	1965	2126	2292	2252	2070	1973	1950	1966	2011	2061	2130	1.6	-1.0	-0.6	0.4
Trucks	1299	1893	1466	1672	1867	2014	2238	2382	2501	2599	2748	1.2	2.4	1.8	1.0
Rail	40	42	43	45	47	49	50	51	50	48	45	0.8	0.9	0.7	-0.6
Aviation	613	836	748	814	852	863	913	970	1025	1045	1073	2.0	1.3	0.7	0.8
Inland navigation	25	18	20	21	22	24	25	27	29	30	31	-2.1	0.9	1.5	1.0

Source: PRIMES

Italy: Reference scenario												SUMMARY ENERGY BALANCE AND INDICATORS (A)			
ktoe	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**	**'00-'10**	**'10-'20**	**'20-'30**	**'30-'50**
												Annual % Change			
Production (incl.recovery of products)	**28491**	**28116**	**30583**	**43259**	**50276**	**49500**	**49909**	**47215**	**48881**	**48506**	**46431**	**0.7**	**5.1**	**-0.1**	**-0.4**
Solids	4	60	64	0	0	0	0	0	0	0	0	33.7	-100.0	0.0	0.0
Oil	5004	6527	6362	12467	13180	12678	12564	9135	7752	5843	4563	2.4	7.6	-0.5	-4.9
Natural gas	13627	9886	6885	8738	10139	7985	6795	5468	4371	2342	1463	-6.6	3.9	-3.9	-7.4
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Renewable energy sources	9856	11642	17272	22053	26957	28837	30550	32612	36758	40321	40405	5.8	4.6	1.3	1.4
Hydro	3801	3101	4395	4225	4205	4279	4385	4434	4412	4389	4361	1.5	-0.4	0.4	0.0
Biomass & Waste	1736	3518	7033	7820	9482	9276	9667	9503	10424	10690	10050	15.0	3.0	0.2	0.2
Wind	48	202	785	1061	1802	3054	3803	4209	4545	4845	5181	32.1	8.7	7.8	1.6
Solar and others	12	30	298	3144	4897	5684	6179	7892	9310	9760	9780	37.4	32.3	2.4	2.3
Geothermal	4259	4791	4762	5804	6571	6544	6516	6574	8068	10637	11033	1.1	3.3	-0.1	2.7
Net Imports	**153560**	**161019**	**149536**	**130612**	**120982**	**119001**	**118263**	**119800**	**120932**	**125204**	**128919**	**-0.3**	**-2.1**	**-0.2**	**0.4**
Solids	13133	16367	14301	15347	15095	13947	14012	10101	10053	12521	12478	0.9	0.5	-0.7	-0.6
Oil	89091	79934	68108	53183	49383	47583	47160	49902	50607	51853	52162	-2.6	-3.2	-0.5	0.5
- Crude oil and Feedstocks	90943	95086	85163	70454	65573	63054	61721	63551	63392	63813	63395	-0.7	-2.6	-0.6	0.1
- Oil products	-1852	-15153	-17056	-17271	-16190	-15471	-14560	-13649	-12785	-11961	-11233	24.9	-0.5	-1.1	-1.3
Natural gas	47008	59840	61600	56864	50758	51966	51506	54247	53968	53920	57131	2.7	-1.9	0.1	0.5
Electricity	3813	4227	3797	3070	2854	2394	2215	2028	1882	1819	1739	0.0	-2.8	-2.5	-1.2
Gross Inland Consumption	**175798**	**188523**	**175515**	**170589**	**167799**	**164862**	**164293**	**163100**	**165905**	**169704**	**171237**	**0.0**	**-0.4**	**-0.2**	**0.2**
Solids	12550	16461	14170	15347	15095	13947	14012	10101	10053	12521	12478	1.2	0.6	-0.7	-0.6
Oil	91119	84889	70513	62381	59156	56732	55995	55330	54690	53972	52954	-2.5	-1.7	-0.5	-0.3
Natural gas	57945	70651	68057	65591	60845	59839	58152	59507	58099	55979	58252	1.6	-1.1	-0.5	0.0
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Electricity	3813	4227	3797	3070	2854	2394	2215	2028	1882	1819	1739	0.0	-2.8	-2.5	-1.2
Renewable energy forms	10371	12295	18977	24200	29849	31949	33919	36134	41181	45414	45815	6.2	4.6	1.3	1.5
as % in Gross Inland Consumption															
Solids	7.1	8.7	8.1	9.0	9.0	8.5	8.5	6.2	6.1	7.4	7.3				
Oil	51.8	45.0	40.2	36.6	35.3	34.4	34.1	33.9	33.0	31.8	30.9				
Natural gas	33.0	37.5	38.8	38.4	36.3	36.3	35.4	36.5	35.0	33.0	34.0				
Nuclear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Renewable energy forms	5.9	6.5	10.8	14.2	17.8	19.4	20.6	22.2	24.8	26.8	26.8				
Gross Electricity Generation in GWh_e	**269898**	**296786**	**298718**	**319241**	**320696**	**333722**	**350221**	**369286**	**403151**	**434790**	**455481**	**1.0**	**0.7**	**0.9**	**1.3**
Self consumption and grid losses	34969	36143	33042	32343	32590	33226	36712	37601	45716	54348	58190	-0.6	-0.1	1.2	2.3
Fuel Inputs to Thermal Power Generation	**49150**	**58911**	**53965**	**47466**	**45335**	**43045**	**42588**	**40412**	**42722**	**46314**	**48238**	**0.9**	**-1.7**	**-0.6**	**0.6**
Solids	6045	10399	9484	11789	12357	11527	11796	8044	8096	10664	10693	4.6	2.7	-0.5	-0.5
Oil (including refinery gas)	18954	12079	7365	938	757	713	870	832	832	924	910	-9.0	-20.3	1.4	0.2
Gas (including derived gases)	19668	29585	28966	25790	21747	20347	18889	20456	18685	16104	17661	3.9	-2.8	-1.4	-0.3
Biomass & Waste	438	2270	3527	3754	4545	4530	5103	5152	7769	8814	8790	23.2	2.6	1.2	2.8
Geothermal heat	4046	4578	4622	5194	5929	5929	5929	5929	7339	9807	10185	1.3	2.5	0.0	2.7
Hydrogen - Methanol	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Fuel Input to other conversion processes	**103181**	**107863**	**98336**	**89690**	**85774**	**82503**	**80979**	**79166**	**77371**	**75810**	**74039**	**-0.5**	**-1.4**	**-0.6**	**-0.4**
Refineries	97473	102914	92366	84432	80330	77271	75822	74239	72690	71226	69530	-0.5	-1.4	-0.6	-0.4
Biofuels and hydrogen production	0	176	1466	1900	2933	3020	3146	3070	3018	3029	3040	0.0	7.2	0.7	-0.2
District heating	0	0	95	96	96	118	117	119	35	34	32	0.0	0.1	2.0	-6.3
Derived gases, cokeries etc.	5709	4773	4408	3262	2415	2094	1894	1738	1628	1522	1437	-2.6	-5.8	-2.4	-1.4
Energy Branch Consumption	**7696**	**10052**	**9539**	**9106**	**8860**	**8552**	**8618**	**8328**	**8647**	**9005**	**9004**	**2.2**	**-0.7**	**-0.3**	**0.2**
Non-Energy Uses	**8429**	**8608**	**9560**	**9570**	**9796**	**9735**	**9816**	**9900**	**9977**	**10237**	**10491**	**1.3**	**0.2**	**0.0**	**0.3**
Final Energy Demand	**126142**	**134621**	**124769**	**125072**	**123585**	**122645**	**122251**	**122905**	**124437**	**125704**	**126375**	**-0.1**	**-0.1**	**-0.1**	**0.2**
by sector															
Industry	41069	39858	31059	32376	32361	32439	32207	32074	32219	32660	32992	-2.8	0.4	0.0	0.1
- energy intensive industries	26005	25613	19287	19889	20009	20025	19824	19731	19816	20090	20074	-2.9	0.4	-0.1	0.1
- other industrial sectors	15064	14245	11772	12487	12352	12414	12383	12343	12402	12570	12918	-2.4	0.5	0.0	0.2
Residential	27528	31232	31395	31639	31881	31425	31119	31105	31530	31883	31568	1.3	0.2	-0.2	0.1
Tertiary	15026	18668	20358	19065	18438	18378	18202	18815	19201	19514	19625	3.1	-1.0	-0.1	0.4
Transport	42519	44863	41957	41992	40905	40403	40724	40911	41488	41647	42190	-0.1	-0.3	0.0	0.2
by fuel															
Solids	3586	3980	2910	2299	1851	1672	1548	1443	1376	1309	1263	-2.1	-4.4	-1.8	-1.0
Oil	57838	59032	48910	47088	44187	42217	41514	40927	40408	39599	38574	-1.7	-1.0	-0.6	-0.4
Gas	38022	40609	38499	38372	37401	37702	37378	37217	37608	38035	38707	0.1	-0.3	0.0	0.2
Electricity	23472	25871	25736	26849	26763	27390	28331	29716	31784	33702	35074	0.9	0.4	0.6	1.1
Heat (from CHP and District Heating)	1424	3082	3332	2718	2785	3084	2931	2940	3326	3111	3232	8.9	-1.8	0.5	0.5
Renewable energy forms	1799	2046	5381	7745	10595	10576	10541	10646	9908	9908	9474	11.6	7.0	-0.1	-0.5
Other fuels (hydrogen, ethanol)	0	0	0	1	2	4	9	16	27	39	51	-16.5	140.9	14.8	9.0
RES in Gross Final Energy Consumption [(A)]	**5958**	**7312**	**12871**	**17715**	**22185**	**23382**	**24753**	**26981**	**30083**	**31460**	**32206**	**8.0**	**5.6**	**1.1**	**1.3**
TOTAL GHG emissions (Mt of CO2 eq.)	**552.6**	**591.7**	**502.0**	**467.5**	**446.2**	**432.1**	**415.1**	**393.0**	**365.7**	**342.3**	**337.9**	**-1.0**	**-1.2**	**-0.7**	**-1.0**
of which ETS sectors (2013 scope) GHG emissions		262.6	213.7	185.1	176.9	172.0	160.6	144.1	118.8	96.5	92.5		-1.9	-1.0	-2.7
of which non ETS sectors GHG emissions		329.1	288.3	282.4	269.3	260.1	254.5	248.9	247.0	245.8	245.4		-0.7	-0.6	-0.2
CO_2 Emissions (energy related)	**434.9**	**470.5**	**404.7**	**374.4**	**351.8**	**337.8**	**326.6**	**306.7**	**286.1**	**271.8**	**267.1**	**-0.7**	**-1.4**	**-0.7**	**-1.0**
Power generation/District heating	137.1	158.5	135.9	115.7	106.5	99.2	91.8	74.9	55.8	43.7	41.2	-0.1	-2.4	-1.5	-3.9
Energy Branch	15.9	18.4	16.4	14.9	14.1	13.3	12.8	12.4	11.9	11.5	11.0	0.4	-1.5	-1.0	-0.8
Industry	79.9	72.5	49.5	48.8	47.5	44.6	43.8	42.6	42.6	43.4	43.3	-4.7	-0.4	-0.8	-0.1
Residential	53.4	59.9	53.6	51.9	50.1	49.7	48.0	46.8	45.1	43.2	41.5	0.0	-0.7	-0.4	-0.7
Tertiary	24.4	29.3	30.2	25.3	22.8	22.5	21.5	21.1	20.8	20.3	19.8	2.2	-2.8	-0.6	-0.4
Transport	124.3	131.9	119.1	117.7	110.9	108.5	108.6	108.8	109.9	109.7	110.3	-0.4	-0.7	-0.2	0.1
CO_2 Emissions (non energy related)	**28.6**	**30.8**	**24.4**	**21.5**	**24.2**	**26.0**	**21.6**	**21.6**	**15.1**	**5.4**	**4.7**	**-1.6**	**-0.1**	**-1.1**	**-7.3**
Non-CO_2 GHG emissions	**89.1**	**90.3**	**72.9**	**71.5**	**70.2**	**68.3**	**66.9**	**64.8**	**64.6**	**65.1**	**66.0**	**-2.0**	**-0.4**	**-0.5**	**-0.1**
TOTAL GHG emissions Index (1990=100)	**105.6**	**113.0**	**95.9**	**89.3**	**85.3**	**82.6**	**79.3**	**75.1**	**69.9**	**65.4**	**64.6**				

Source: PRIMES

SUMMARY ENERGY BALANCE AND INDICATORS (B)															Italy: Reference scenario
	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050	'00-'10	'10-'20	'20-'30	'30-'50
												Annual % Change			
Main Energy System Indicators															
Population (Million)	56.924	58.462	60.340	61.788	62.877	63.737	64.491	65.166	65.694	65.968	65.915	0.6	0.4	0.3	0.1
GDP (in 000 M€10)	1496.6	1571.6	1553.2	1605.3	1691.3	1824.6	1964.2	2093.8	2225.2	2374.1	2546.7	0.4	0.9	1.5	1.3
Gross Inl. Cons./GDP (toe/M€10)	117.5	120.0	113.0	106.3	99.2	90.4	83.6	77.9	74.6	71.5	67.2	-0.4	-1.3	-1.7	-1.1
Carbon intensity (t of CO_2/toe of GIC)	2.47	2.50	2.31	2.19	2.10	2.05	1.99	1.88	1.72	1.60	1.56	-0.7	-0.9	-0.5	-1.2
Import Dependency %	86.5	84.4	83.8	75.1	70.6	70.6	70.3	71.7	71.2	72.1	73.5				
Total energy-rel. and other mitigation costs [B] (in 000 M€10)	144.3	162.0	191.5	229.0	249.9	267.8	280.8	286.7	300.7	309.9	316.7	2.9	2.7	1.2	0.6
as % of GDP	9.6	10.3	12.3	14.3	14.8	14.7	14.3	13.7	13.5	13.1	12.4				
Energy intensity indicators															
Industry (Energy on Value added, index 2000=100)	100.0	98.9	83.3	84.6	80.7	76.2	72.6	70.0	67.9	66.6	64.8	-1.8	-0.3	-1.1	-0.6
Residential (Energy on Private Income, index 2000=100)	100.0	109.3	108.5	106.8	103.1	95.0	87.5	81.7	77.3	72.2	65.2	0.8	-0.5	-1.6	-1.5
Tertiary (Energy on Value added, index 2000=100)	100.0	116.8	125.3	113.2	103.7	95.3	87.2	84.0	80.2	75.9	70.7	2.3	-1.9	-1.7	-1.0
Passenger transport (toe/Mpkm)	30.5	29.7	27.3	26.3	24.2	22.4	21.0	20.4	20.0	19.7	19.3	-1.1	-1.2	-1.4	-0.4
Freight transport (toe/Mtkm)	54.4	58.6	63.8	62.0	59.9	56.3	54.0	52.7	51.6	50.5	50.5	1.6	-0.6	-1.0	-0.3
Carbon Intensity indicators															
Electricity and Steam production (t of CO_2/MWh)	0.47	0.45	0.38	0.31	0.29	0.26	0.23	0.18	0.12	0.09	0.08	-2.0	-2.8	-2.3	-5.1
Final energy demand (t of CO_2/toe)	2.23	2.18	2.02	1.95	1.87	1.84	1.82	1.78	1.75	1.72	1.70	-1.0	-0.8	-0.3	-0.3
Industry	1.94	1.82	1.59	1.51	1.47	1.38	1.36	1.33	1.32	1.33	1.31	-2.0	-0.8	-0.7	-0.2
Residential	1.94	1.92	1.71	1.64	1.57	1.58	1.54	1.50	1.43	1.36	1.32	-1.3	-0.8	-0.2	-0.8
Tertiary	1.62	1.57	1.49	1.33	1.24	1.22	1.18	1.12	1.08	1.04	1.01	-0.9	-1.8	-0.5	-0.8
Transport [C]	2.92	2.94	2.84	2.80	2.71	2.69	2.67	2.66	2.65	2.63	2.61	-0.3	-0.5	-0.2	-0.1
Indicators for renewables															
Share of RES in Gross Final Energy Consumption [D] (%)	4.6	5.3	10.0	13.8	17.5	18.6	19.7	21.4	23.4	24.1	24.5				
RES in transport (%)	0.3	0.9	4.7	6.4	10.2	11.2	12.0	12.4	13.0	13.4	13.9				
Gross Electricity generation by source (in GWh_e) [E]	**269947**	**296839**	**298772**	**319241**	**320696**	**333722**	**350221**	**369286**	**403151**	**434790**	**455481**	**1.0**	**0.7**	**0.9**	**1.3**
Nuclear energy	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Solids	26272	43606	39734	54109	59925	57251	60029	44013	50548	70382	70419	4.2	4.2	0.0	0.8
Oil (including refinery gas)	85878	47124	21713	4929	4014	4065	4896	4662	4668	5305	5255	-12.8	-15.5	2.0	0.4
Gas (including derived gases)	106398	156191	158215	154337	130647	121304	115587	126217	114993	111744	128288	4.0	-1.9	-1.2	0.5
Biomass-waste	1908	6152	11586	14623	19632	20122	22864	23266	38882	42384	40636	19.8	5.4	1.5	2.9
Hydro (pumping excluded)	44205	36067	51116	49127	48893	49751	50983	51556	51298	51030	50713	1.5	-0.4	0.4	0.0
Wind	563	2344	9126	12333	20954	35514	44223	48940	52844	56337	60243	32.1	8.7	7.8	1.6
Solar	18	31	1905	23407	29397	38484	44408	63398	81045	85865	87745	59.4	31.5	4.2	3.5
Geothermal and other renewables	4705	5324	5377	6377	7232	7232	7232	7232	8872	11742	12181	1.3	3.0	0.0	2.6
Other fuels (hydrogen, methanol)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Net Generation Capacity in MW_e	**67866**	**78649**	**104353**	**116633**	**119980**	**132074**	**139254**	**144420**	**157462**	**157465**	**153310**	**4.4**	**1.4**	**1.5**	**0.5**
Nuclear energy	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Renewable energy	13658	15960	27098	42001	49300	62175	69979	80970	92590	96516	99067	7.1	6.2	3.6	1.8
Hydro (pumping excluded)	13212	14209	17834	18426	18547	18827	19175	19439	19503	19567	19631	3.0	0.4	0.3	0.1
Wind	427	1717	5793	7371	11200	18005	22598	25258	27517	29205	30931	29.8	6.8	7.3	1.6
Solar	19	34	3470	16204	19553	25343	28206	36273	45570	47744	48505	68.3	18.9	3.7	2.7
Other renewables (tidal etc.)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Thermal power	54207	62689	77255	74632	70680	69898	69275	63450	64872	60950	54244	3.6	-0.9	-0.2	-1.2
of which cogeneration units	6476	7547	8435	7931	8405	9696	9915	9803	10512	10520	10923	2.7	0.0	1.7	0.5
of which CCS units	0	0	0	0	0	0	706	1343	3937	6894	9351	0.0	0.0	0.0	13.8
Solids fired	8749	7864	8676	8950	8688	7087	7733	5244	7833	10790	10811	-0.1	0.0	-1.2	1.7
Gas fired	23807	36671	54126	55374	53894	54950	54695	51611	47118	40027	32017	8.6	0.0	0.1	-2.6
Oil fired	20233	16046	10546	6221	3706	3461	2394	2069	1959	1683	1927	-6.3	-9.9	-4.3	-1.1
Biomass-waste fired	868	1472	3217	3397	3604	3614	3667	3740	6988	7148	8137	14.0	1.1	0.2	4.1
Hydrogen plants	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Geothermal heat	551	636	689	689	787	787	787	787	974	1302	1352	2.3	1.3	0.0	2.7
Avg. Load factor of net power capacity [F] (%)	43.2	41.2	31.5	30.2	29.5	27.9	27.7	28.2	27.9	29.8	31.9				
Electricity indicators															
Efficiency of gross thermal power generation (%)	39.4	37.7	37.7	42.5	42.0	42.0	42.5	43.7	43.9	44.9	45.8				
% of gross electricity from CHP	8.3	9.0	11.5	12.2	14.2	16.2	16.6	16.2	15.6	15.0	14.5				
% of electricity from CCS	0.0	0.0	0.0	0.0	0.0	0.0	2.0	3.6	9.5	15.5	19.2				
Carbon free gross electricity generation (%)	19.0	16.8	26.5	33.2	39.3	45.3	48.5	52.6	57.8	56.9	55.2				
- nuclear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
- renewable energy forms	19.0	16.8	26.5	33.2	39.3	45.3	48.5	52.6	57.8	56.9	55.2				
Transport sector															
Passenger transport activity (Gpkm)	**943.0**	**931.4**	**952.9**	**971.6**	**990.7**	**1041.4**	**1094.8**	**1128.9**	**1164.1**	**1192.6**	**1221.3**	**0.1**	**0.4**	**1.0**	**0.5**
Public road transport	93.4	101.0	102.9	104.3	105.2	108.8	113.0	115.8	118.6	120.4	122.2	1.0	0.2	0.7	0.4
Private cars and motorcycles	755.9	726.5	740.5	747.8	754.7	786.3	818.0	837.8	857.8	874.4	890.9	-0.2	0.2	0.8	0.4
Rail	55.2	56.5	55.6	58.2	60.7	67.3	74.8	78.9	83.1	86.0	88.8	0.1	0.9	2.1	0.9
Aviation	33.5	42.7	49.4	56.6	65.5	74.1	83.9	91.1	99.2	106.4	113.9	3.9	2.9	2.5	1.5
Inland navigation	5.0	4.7	4.5	4.6	4.7	4.9	5.1	5.2	5.3	5.4	5.5	-0.9	0.2	0.9	0.4
Freight transport activity (Gtkm)	**245.8**	**285.5**	**241.8**	**256.1**	**271.2**	**292.0**	**314.5**	**325.7**	**337.4**	**345.6**	**353.9**	**-0.2**	**1.2**	**1.5**	**0.6**
Trucks	185.1	211.8	175.8	186.6	197.9	213.6	230.6	239.1	248.0	254.0	260.2	-0.5	1.2	1.5	0.6
Rail	22.8	22.8	18.6	20.0	21.4	23.3	25.4	26.4	27.5	28.3	29.1	-2.0	1.4	1.7	0.7
Inland navigation	37.9	50.9	47.4	49.5	51.8	55.1	58.6	60.2	61.8	63.3	64.7	2.3	0.9	1.2	0.5
Energy demand in transport (ktoe) [G]	**42174**	**44403**	**41415**	**41386**	**40273**	**39742**	**40033**	**40200**	**40756**	**40897**	**41421**	**-0.2**	**-0.3**	**-0.1**	**0.2**
Public road transport	1484	1642	1643	1659	1643	1636	1638	1646	1661	1655	1663	1.0	0.0	0.0	0.1
Private cars and motorcycles	22919	21483	19791	18953	17259	16355	15874	15609	15629	15702	15877	-1.5	-1.4	-0.8	0.0
Trucks	12485	15699	14551	14967	15301	15424	15945	16110	16345	16385	16799	1.5	0.5	0.4	0.3
Rail	526	492	439	456	473	503	533	544	550	543	533	-1.8	0.7	1.2	0.0
Aviation	3491	3700	3863	4189	4406	4581	4747	4979	5243	5278	5213	1.0	1.3	0.7	0.5
Inland navigation	1269	1387	1128	1162	1192	1245	1296	1312	1327	1333	1337	-1.2	0.6	0.8	0.2

Source: PRIMES

Latvia: Reference scenario												SUMMARY ENERGY BALANCE AND INDICATORS (A)			
ktoe	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**	**'00-'10**	**'10-'20**	**'20-'30**	**'30-'50**
												Annual % Change			
Production (incl.recovery of products)	**1411**	**1868**	**2116**	**2336**	**2643**	**2502**	**2527**	**2638**	**2518**	**2742**	**2767**	**4.1**	**2.2**	**-0.4**	**0.5**
Solids	16	3	2	3	3	3	3	0	0	0	0	-17.4	1.5	-0.9	-100.0
Oil	2	7	2	3	2	2	2	-1	-1	-1	-1	0.6	2.2	-1.2	0.0
Natural gas	0	0	0	0	0	0	0	0	0	0	0	-89.9	-100.0	0.0	0.0
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Renewable energy sources	1393	1858	2111	2330	2637	2498	2522	2639	2519	2743	2768	4.2	2.3	-0.4	0.5
Hydro	242	286	303	270	277	287	287	287	287	287	287	2.2	-0.9	0.4	0.0
Biomass & Waste	1150	1568	1804	2031	2279	2102	2096	2199	2062	2270	2266	4.6	2.4	-0.8	0.4
Wind	0	4	4	28	80	107	137	149	167	182	211	28.5	34.2	5.6	2.2
Solar and others	0	0	0	1	1	1	2	3	3	4	4	0.0	0.0	7.2	3.3
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	2.0	0.2
Net Imports	**2239**	**2989**	**1993**	**2868**	**2687**	**2929**	**2991**	**2980**	**3132**	**2911**	**2876**	**-1.2**	**3.0**	**1.1**	**-0.2**
Solids	61	77	112	107	92	76	73	75	71	63	48	6.3	-2.0	-2.3	-2.1
Oil	1113	1676	1443	1824	1797	1850	1914	1947	1968	1982	1982	2.6	2.2	0.6	0.2
- Crude oil and Feedstocks	87	4	2	1	1	1	1	1	1	1	1	-31.9	-6.7	0.0	0.0
- Oil products	1026	1672	1442	1823	1796	1849	1913	1946	1967	1981	1981	3.5	2.2	0.6	0.2
Natural gas	1113	1434	903	1461	1306	1405	1429	1374	1451	1275	1267	-2.1	3.8	0.9	-0.6
Electricity	154	185	75	29	58	75	67	95	112	111	92	-6.9	-2.6	1.5	1.6
Gross Inland Consumption	**3742**	**4484**	**4538**	**4920**	**5028**	**5111**	**5179**	**5261**	**5271**	**5257**	**5236**	**1.9**	**1.0**	**0.3**	**0.1**
Solids	132	82	109	110	94	79	75	75	71	63	48	-1.9	-1.4	-2.2	-2.2
Oil	1173	1379	1293	1544	1503	1541	1590	1609	1616	1617	1612	1.0	1.5	0.6	0.1
Natural gas	1092	1358	1462	1460	1301	1395	1417	1354	1423	1241	1228	3.0	-1.2	0.9	-0.7
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Electricity	154	185	75	29	58	75	67	95	112	111	92	-6.9	-2.6	1.5	1.6
Renewable energy forms	1191	1481	1599	1776	2072	2020	2031	2127	2049	2225	2255	3.0	2.6	-0.2	0.5
as % in Gross Inland Consumption															
Solids	3.5	1.8	2.4	2.2	1.9	1.5	1.5	1.4	1.3	1.2	0.9				
Oil	31.4	30.8	28.5	31.4	29.9	30.2	30.7	30.6	30.7	30.8	30.8				
Natural gas	29.2	30.3	32.2	29.7	25.9	27.3	27.3	25.7	27.0	23.6	23.4				
Nuclear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Renewable energy forms	31.8	33.0	35.2	36.1	41.2	39.5	39.2	40.4	38.9	42.3	43.1				
Gross Electricity Generation in GWh_e	**4135**	**4905**	**6626**	**7642**	**7651**	**8171**	**8714**	**9048**	**9773**	**10180**	**10582**	**4.8**	**1.4**	**1.3**	**1.0**
Self consumption and grid losses	1438	1325	1285	1019	1010	1103	1159	1286	1413	1481	1510	-1.1	-2.4	1.4	1.3
Fuel Inputs to Thermal Power Generation	**545**	**602**	**815**	**970**	**916**	**921**	**986**	**1054**	**1077**	**1145**	**1111**	**4.1**	**1.2**	**0.7**	**0.6**
Solids	53	0	9	14	22	21	20	20	19	15	2	-15.9	9.0	-0.9	-10.1
Oil (including refinery gas)	84	18	10	9	14	10	15	13	0	0	0	-19.3	3.3	0.7	-100.0
Gas (including derived gases)	408	562	767	771	661	671	731	647	733	590	561	6.5	-1.5	1.0	-1.3
Biomass & Waste	0	21	29	175	219	220	220	375	324	540	548	0.0	22.4	0.1	4.7
Geothermal heat	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Hydrogen - Methanol	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Fuel Input to other conversion processes	**570**	**478**	**382**	**433**	**506**	**558**	**532**	**538**	**515**	**471**	**515**	**-3.9**	**2.8**	**0.5**	**-0.2**
Refineries	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Biofuels and hydrogen production	0	3	27	47	95	90	84	87	87	84	91	0.0	13.4	-1.2	0.4
District heating	569	476	355	386	410	467	444	447	425	384	422	-4.6	1.4	0.8	-0.3
Derived gases, cokeries etc.	1	0	0	0	1	2	3	4	3	3	3	-95.9	2264.8	15.1	-0.7
Energy Branch Consumption	**39**	**42**	**48**	**18**	**15**	**16**	**16**	**20**	**21**	**23**	**24**	**2.1**	**-10.8**	**0.4**	**2.0**
Non-Energy Uses	**75**	**97**	**73**	**78**	**89**	**95**	**94**	**96**	**95**	**93**	**93**	**-0.3**	**2.0**	**0.5**	**0.0**
Final Energy Demand	**3255**	**4021**	**4271**	**4371**	**4434**	**4495**	**4548**	**4575**	**4617**	**4590**	**4566**	**2.8**	**0.4**	**0.3**	**0.0**
by sector															
Industry	576	699	774	761	804	816	820	825	819	808	790	3.0	0.4	0.2	-0.2
- energy intensive industries	229	282	305	310	339	354	341	346	345	337	334	2.9	1.1	0.1	-0.1
- other industrial sectors	347	417	469	451	465	462	478	479	474	470	456	3.0	-0.1	0.3	-0.2
Residential	1327	1504	1511	1547	1559	1568	1577	1562	1560	1540	1530	1.3	0.3	0.1	-0.2
Tertiary	603	749	773	793	786	789	771	772	773	764	748	2.5	0.2	-0.2	-0.2
Transport	750	1069	1213	1269	1285	1323	1380	1416	1465	1478	1498	4.9	0.6	0.7	0.4
by fuel															
Solids	62	74	94	92	69	55	52	53	50	47	45	4.2	-3.1	-2.7	-0.8
Oil	1057	1325	1456	1448	1391	1426	1471	1490	1515	1519	1515	3.3	-0.5	0.6	0.1
Gas	329	508	498	492	472	509	503	514	515	506	508	4.2	-0.5	0.6	0.0
Electricity	385	493	534	599	629	683	716	763	831	858	872	3.3	1.6	1.3	1.0
Heat (from CHP and District Heating)	598	603	579	619	611	658	673	685	680	680	677	-0.3	0.5	1.0	0.0
Renewable energy forms	824	1018	1110	1120	1262	1162	1130	1067	1022	976	946	3.0	1.3	-1.1	-0.9
Other fuels (hydrogen, ethanol)	0	0	0	0	1	2	3	4	3	3	3	0.0	0.0	15.3	0.0
RES in Gross Final Energy Consumption [(A)]	**1180**	**1378**	**1456**	**1595**	**1849**	**1782**	**1781**	**1805**	**1774**	**1916**	**1931**	**2.1**	**2.4**	**-0.4**	**0.4**
TOTAL GHG emissions (Mt of CO2 eq.)	**10.2**	**11.6**	**12.5**	**12.1**	**11.5**	**12.0**	**12.1**	**12.0**	**12.3**	**11.9**	**11.8**	**2.1**	**-0.9**	**0.6**	**-0.1**
of which ETS sectors (2013 scope) GHG emissions		3.0	3.8	3.7	3.5	3.8	3.9	3.7	3.9	3.5	3.4		-0.7	1.0	-0.6
of which non ETS sectors GHG emissions		8.5	8.7	8.3	7.9	8.2	8.2	8.3	8.4	8.4	8.4		-0.9	0.4	0.1
CO_2 Emissions (energy related)	**6.8**	**7.7**	**8.4**	**8.3**	**7.8**	**8.0**	**8.2**	**8.1**	**8.3**	**7.8**	**7.7**	**2.0**	**-0.7**	**0.6**	**-0.3**
Power generation/District heating	2.6	2.2	2.4	2.4	2.1	2.2	2.3	2.1	2.2	1.8	1.7	-0.9	-1.2	0.9	-1.5
Energy Branch	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Industry	1.0	1.1	1.0	1.0	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.0	-1.5	-0.3	-0.5
Residential	0.3	0.4	0.6	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.5	6.5	-1.8	0.7	0.3
Tertiary	0.7	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	2.0	-1.1	-0.1	-0.5
Transport	2.2	3.2	3.6	3.7	3.5	3.6	3.8	3.9	4.0	4.0	4.0	5.0	0.0	0.7	0.3
CO_2 Emissions (non energy related)	**0.2**	**0.3**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.5**	**0.5**	**0.5**	**0.5**	**10.0**	**0.1**	**0.3**	**-0.9**
Non-CO_2 GHG emissions	**3.2**	**3.6**	**3.6**	**3.2**	**3.1**	**3.3**	**3.3**	**3.4**	**3.5**	**3.5**	**3.6**	**1.3**	**-1.4**	**0.6**	**0.4**
TOTAL GHG emissions Index (1990=100)	**38.1**	**43.2**	**46.8**	**45.0**	**42.8**	**44.8**	**45.3**	**44.8**	**45.8**	**44.3**	**44.1**				

Source: PRIMES

SUMMARY ENERGY BALANCE AND INDICATORS (B)															Latvia: Reference scenario
	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050	'00-'10	'10-'20	'20-'30	'30-'50
												Annual % Change			
Main Energy System Indicators															
Population (Million)	2.382	2.306	2.248	2.194	2.141	2.083	2.022	1.963	1.909	1.854	1.797	-0.6	-0.5	-0.6	-0.6
GDP (in 000 M€10)	12.5	18.6	18.0	21.0	23.6	26.4	29.7	32.1	34.4	36.0	36.7	3.7	2.8	2.3	1.1
Gross Inl. Cons./GDP (toe/M€10)	298.6	241.0	252.5	233.8	213.1	193.3	174.5	163.9	153.4	146.2	142.5	-1.7	-1.7	-2.0	-1.0
Carbon intensity (t of CO_2/toe of GIC)	1.82	1.72	1.84	1.70	1.54	1.57	1.58	1.54	1.57	1.49	1.47	0.1	-1.8	0.3	-0.4
Import Dependency %	59.7	63.0	41.6	55.1	50.4	53.9	54.2	53.0	55.4	51.5	51.0				
Total energy-rel. and other mitigation costs [B] (in 000 M€10)	2.0	3.2	4.6	5.7	6.6	7.2	7.9	8.4	8.8	9.3	9.7	8.6	3.6	1.9	1.1
as % of GDP	16.1	17.0	25.6	26.9	27.8	27.1	26.6	26.2	25.6	25.8	26.4				
Energy intensity indicators															
Industry (Energy on Value added, index 2000=100)	100.0	87.7	107.1	86.1	86.1	82.8	77.5	74.9	72.0	69.3	68.1	0.7	-2.2	-1.0	-0.6
Residential (Energy on Private Income, index 2000=100)	100.0	74.7	73.9	62.6	55.3	49.0	43.6	39.9	37.4	35.4	34.6	-3.0	-2.9	-2.3	-1.2
Tertiary (Energy on Value added, index 2000=100)	100.0	83.0	83.4	72.8	63.6	56.2	48.3	44.4	41.1	38.7	36.9	-1.8	-2.7	-2.7	-1.3
Passenger transport (toe/Mpkm)	34.5	34.2	30.4	29.0	26.7	24.9	23.3	22.3	21.9	21.6	21.4	-1.2	-1.3	-1.4	-0.4
Freight transport (toe/Mtkm)	11.6	16.6	19.5	19.4	18.7	17.8	17.2	16.6	15.9	15.4	15.0	5.4	-0.4	-0.9	-0.7
Carbon Intensity indicators															
Electricity and Steam production (t of CO_2/MWh)	0.21	0.17	0.16	0.15	0.13	0.13	0.13	0.12	0.12	0.09	0.09	-2.2	-2.1	-0.3	-2.0
Final energy demand (t of CO_2/toe)	1.29	1.37	1.40	1.36	1.27	1.29	1.30	1.31	1.31	1.31	1.32	0.8	-1.0	0.2	0.1
Industry	1.80	1.55	1.34	1.25	1.11	1.13	1.05	1.06	1.02	0.99	0.99	-2.9	-1.9	-0.5	-0.3
Residential	0.22	0.29	0.37	0.35	0.29	0.28	0.31	0.33	0.34	0.34	0.34	5.1	-2.1	0.6	0.5
Tertiary	1.14	1.10	1.08	1.01	0.96	0.99	0.97	0.95	0.92	0.91	0.91	-0.5	-1.3	0.1	-0.3
Transport [C]	2.93	2.97	2.93	2.88	2.76	2.76	2.75	2.73	2.72	2.71	2.68	0.0	-0.6	0.0	-0.1
Indicators for renewables															
Share of RES in Gross Final Energy Consumption [D] (%)	33.2	32.1	32.2	35.0	40.0	38.0	37.4	37.6	36.6	39.7	40.3				
RES in transport (%)	0.7	0.8	3.0	5.2	10.4	10.6	10.7	11.8	12.0	12.7	14.2				
Gross Electricity generation by source (in GWh_e) [E]	**4136**	**4906**	**6627**	**7642**	**7651**	**8171**	**8714**	**9048**	**9773**	**10180**	**10582**	**4.8**	**1.4**	**1.3**	**1.0**
Nuclear energy	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Solids	78	0	2	68	84	98	81	75	78	56	10	-30.7	45.2	-0.3	-9.8
Oil (including refinery gas)	107	6	2	53	50	50	50	46	0	0	0	-32.8	38.0	0.0	-100.0
Gas (including derived gases)	1128	1486	2988	3258	2383	2459	2681	2114	2839	2390	2483	10.2	-2.2	1.2	-0.4
Biomass-waste	0	41	66	792	982	986	963	1734	1578	2275	2293	0.0	31.0	-0.2	4.4
Hydro (pumping excluded)	2819	3326	3520	3144	3224	3336	3342	3342	3334	3337	3339	2.2	-0.9	0.4	0.0
Wind	4	47	49	326	927	1241	1594	1735	1942	2121	2455	28.5	34.2	5.6	2.2
Solar	0	0	0	1	1	1	1	2	2	2	2	0.0	0.0	0.4	0.5
Geothermal and other renewables	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Other fuels (hydrogen, methanol)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Net Generation Capacity in MW_e	**1944**	**2053**	**2504**	**3113**	**3577**	**3754**	**3927**	**4108**	**4154**	**4281**	**4468**	**2.6**	**3.6**	**0.9**	**0.6**
Nuclear energy	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Renewable energy	1499	1544	1587	1791	2101	2280	2415	2458	2525	2583	2715	0.6	2.8	1.4	0.6
Hydro (pumping excluded)	1497	1517	1557	1635	1672	1733	1733	1733	1733	1733	1733	0.4	0.7	0.4	0.0
Wind	2	27	30	155	428	545	681	723	790	848	980	29.4	30.5	4.7	1.8
Solar	0	0	0	1	1	1	1	2	2	2	2	0.0	0.0	0.4	0.5
Other renewables (tidal etc.)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Thermal power	444	509	917	1322	1476	1474	1511	1650	1629	1697	1753	7.5	4.9	0.2	0.7
of which cogeneration units	254	400	1079	1133	1140	1140	1159	1178	1185	1343	1395	15.6	0.5	0.2	0.9
of which CCS units	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Solids fired	31	30	40	16	18	16	16	16	16	16	16	2.4	-7.4	-1.3	0.1
Gas fired	331	412	773	1070	1167	1167	1204	1229	1215	1235	1269	8.8	4.2	0.3	0.3
Oil fired	79	49	51	53	66	66	67	67	37	37	13	-4.4	2.6	0.1	-7.7
Biomass-waste fired	3	18	54	183	225	225	225	338	361	409	454	35.8	15.3	0.0	3.6
Hydrogen plants	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Geothermal heat	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Avg. Load factor of net power capacity [F] (%)	21.7	24.6	27.7	27.3	23.8	24.3	24.8	24.5	26.2	26.4	26.3				
Electricity indicators															
Efficiency of gross thermal power generation (%)	20.7	21.9	32.3	37.0	32.9	33.5	32.9	32.4	35.9	35.5	37.1				
% of gross electricity from CHP	31.4	30.7	45.0	48.6	31.0	32.6	32.2	30.6	37.1	36.2	33.9				
% of electricity from CCS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Carbon free gross electricity generation (%)	68.3	69.6	54.9	55.8	67.1	68.1	67.7	75.3	70.1	76.0	76.4				
- nuclear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
- renewable energy forms	68.3	69.6	54.9	55.8	67.1	68.1	67.7	75.3	70.1	76.0	76.4				
Transport sector															
Passenger transport activity (Gpkm)	**15.4**	**17.3**	**21.8**	**23.1**	**24.5**	**26.4**	**28.4**	**30.3**	**32.1**	**33.3**	**34.5**	**3.5**	**1.2**	**1.5**	**1.0**
Public road transport	2.3	2.9	2.0	2.1	2.2	2.3	2.5	2.6	2.7	2.8	2.9	-1.7	1.0	1.2	0.7
Private cars and motorcycles	11.8	12.4	16.9	17.6	18.2	19.0	19.8	20.6	21.1	21.3	21.4	3.7	0.7	0.8	0.4
Rail	1.0	1.2	0.9	1.0	1.1	1.2	1.4	1.5	1.6	1.8	1.9	-1.2	2.2	2.4	1.6
Aviation	0.3	0.8	2.0	2.5	3.1	3.9	4.8	5.7	6.6	7.4	8.4	20.5	4.5	4.6	2.8
Inland navigation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Freight transport activity (Gtkm)	**18.1**	**28.2**	**27.8**	**30.3**	**33.1**	**36.8**	**41.0**	**43.8**	**46.8**	**48.1**	**49.4**	**4.4**	**1.7**	**2.2**	**0.9**
Trucks	4.8	8.4	10.6	11.5	12.6	14.0	15.5	16.5	17.6	18.0	18.4	8.3	1.7	2.1	0.9
Rail	13.3	19.8	17.2	18.7	20.4	22.7	25.3	27.1	29.1	30.0	30.9	2.6	1.7	2.2	1.0
Inland navigation	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	202.9	1.7	3.0	0.9
Energy demand in transport (ktoe) [G]	**740**	**1060**	**1206**	**1259**	**1274**	**1311**	**1367**	**1402**	**1449**	**1462**	**1481**	**5.0**	**0.6**	**0.7**	**0.4**
Public road transport	24	29	20	21	22	23	24	25	26	26	27	-1.6	0.8	0.9	0.5
Private cars and motorcycles	479	505	524	505	461	432	415	405	403	398	392	0.9	-1.3	-1.0	-0.3
Trucks	141	380	467	509	538	570	616	636	655	653	657	12.7	1.4	1.4	0.3
Rail	69	87	71	72	73	75	77	79	79	77	74	0.2	0.3	0.6	-0.2
Aviation	27	59	118	144	172	202	224	245	273	295	320	15.9	3.9	2.7	1.8
Inland navigation	0	0	7	8	8	9	11	12	12	12	13	0.0	1.5	2.7	0.7

Source: PRIMES

Lithuania: Reference scenario												SUMMARY ENERGY BALANCE AND INDICATORS (A)			
ktoe	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**	**'00-'10**	**'10-'20**	**'20-'30**	**'30-'50**
												Annual % Change			
Production (incl.recovery of products)	**3275**	**3903**	**1318**	**1325**	**1489**	**3123**	**4144**	**4251**	**4387**	**4436**	**4468**	**-8.7**	**1.2**	**10.8**	**0.4**
Solids	12	20	9	8	6	5	5	5	5	5	5	-3.0	-3.8	-1.3	-0.6
Oil	358	269	125	89	65	51	41	35	26	8	0	-10.0	-6.3	-4.6	-100.0
Natural gas	0	0	0	0	0	0	0	0	0	0	0	0.0	-100.0	0.0	0.0
Nuclear	2223	2713	0	0	0	1802	2597	2610	2636	2636	2636	-100.0	0.0	0.0	0.1
Renewable energy sources	682	902	1185	1228	1418	1265	1501	1602	1720	1787	1828	5.7	1.8	0.6	1.0
Hydro	29	39	46	41	50	51	53	66	68	68	69	4.7	0.8	0.5	1.3
Biomass & Waste	653	860	1114	1158	1337	1179	1409	1476	1513	1568	1595	5.5	1.8	0.5	0.6
Wind	0	0	19	28	28	30	34	53	132	143	155	0.0	3.9	1.7	8.0
Solar and others	0	0	0	1	2	4	6	7	7	8	8	0.0	0.0	10.7	2.0
Geothermal	0	3	5	0	0	0	0	0	0	0	0	0.0	-29.5	2.2	-0.1
Net Imports	**4337**	**5101**	**5737**	**5866**	**5714**	**4920**	**4570**	**4564**	**4563**	**4605**	**4677**	**2.8**	**0.0**	**-2.2**	**0.1**
Solids	87	191	182	205	160	163	163	169	177	179	178	7.6	-1.2	0.1	0.4
Oil	2307	2681	2691	2468	2509	2389	2424	2420	2407	2408	2455	1.6	-0.7	-0.3	0.1
- Crude oil and Feedstocks	4842	9082	9347	8784	8435	7949	7602	7220	6833	6458	6126	6.8	-1.0	-1.0	-1.1
- Oil products	-2535	-6401	-6656	-6316	-5926	-5560	-5178	-4800	-4426	-4050	-3671	10.1	-1.2	-1.3	-1.7
Natural gas	2065	2492	2484	3092	3039	2506	2497	2507	2588	2619	2625	1.9	2.0	-1.9	0.2
Electricity	-115	-255	515	227	117	-43	-387	-395	-470	-462	-443	0.0	-13.8	0.0	0.7
Gross Inland Consumption	**7160**	**8790**	**6864**	**7044**	**7053**	**7890**	**8563**	**8661**	**8794**	**8880**	**8977**	**-0.4**	**0.3**	**2.0**	**0.2**
Solids	98	202	205	213	166	168	168	174	182	184	182	7.6	-2.1	0.1	0.4
Oil	2214	2773	2587	2411	2427	2294	2323	2313	2294	2277	2312	1.6	-0.6	-0.4	0.0
Natural gas	2064	2476	2492	3091	3035	2499	2489	2495	2571	2598	2600	1.9	2.0	-2.0	0.2
Nuclear	2223	2713	0	0	0	1802	2597	2610	2636	2636	2636	-100.0	0.0	0.0	0.1
Electricity	-115	-255	515	227	117	-43	-387	-395	-470	-462	-443	0.0	-13.8	0.0	0.7
Renewable energy forms	675	882	1065	1102	1307	1171	1373	1464	1581	1648	1690	4.7	2.1	0.5	1.0
as % in Gross Inland Consumption															
Solids	1.4	2.3	3.0	3.0	2.4	2.1	2.0	2.0	2.1	2.1	2.0				
Oil	30.9	31.5	37.7	34.2	34.4	29.1	27.1	26.7	26.1	25.6	25.8				
Natural gas	28.8	28.2	36.3	43.9	43.0	31.7	29.1	28.8	29.2	29.3	29.0				
Nuclear	31.1	30.9	0.0	0.0	0.0	22.8	30.3	30.1	30.0	29.7	29.4				
Renewable energy forms	9.4	10.0	15.5	15.6	18.5	14.8	16.0	16.9	18.0	18.6	18.8				
Gross Electricity Generation in GWh_e	**11119**	**14412**	**4993**	**8739**	**9969**	**12697**	**18086**	**18981**	**20858**	**21623**	**22081**	**-7.7**	**7.2**	**6.1**	**1.0**
Self consumption and grid losses	3076	2783	2003	1778	1656	2131	2533	2564	2709	2836	2937	-4.2	-1.9	4.3	0.7
Fuel Inputs to Thermal Power Generation	**917**	**1227**	**1282**	**1810**	**2058**	**1437**	**1700**	**1672**	**1764**	**1816**	**1791**	**3.4**	**4.8**	**-1.9**	**0.3**
Solids	0	0	0	0	0	0	0	0	0	0	0	-100.0	0.0	0.0	0.0
Oil (including refinery gas)	200	178	100	8	15	15	21	26	30	31	33	-6.7	-17.5	3.4	2.4
Gas (including derived gases)	716	1044	1117	1700	1934	1334	1397	1343	1404	1436	1425	4.5	5.6	-3.2	0.1
Biomass & Waste	1	5	65	101	109	87	282	303	329	348	333	59.8	5.3	10.0	0.8
Geothermal heat	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Hydrogen - Methanol	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Fuel Input to other conversion processes	**8007**	**12723**	**9999**	**9504**	**9305**	**10745**	**11209**	**11045**	**10822**	**10569**	**10386**	**2.2**	**-0.7**	**1.9**	**-0.4**
Refineries	5120	9471	9454	8978	8748	8363	8049	7775	7547	7292	7069	6.3	-0.8	-0.8	-0.6
Biofuels and hydrogen production	0	4	45	55	131	125	124	120	119	118	120	0.0	11.3	-0.5	-0.2
District heating	653	519	498	469	425	454	437	540	518	522	559	-2.7	-1.6	0.3	1.2
Derived gases, cokeries etc.	2235	2730	2	2	1	1802	2598	2611	2637	2637	2637	-49.9	-7.2	118.2	0.1
Energy Branch Consumption	**613**	**854**	**722**	**675**	**655**	**649**	**669**	**653**	**651**	**647**	**643**	**1.6**	**-1.0**	**0.2**	**-0.2**
Non-Energy Uses	**662**	**804**	**714**	**626**	**584**	**566**	**558**	**554**	**553**	**548**	**547**	**0.8**	**-2.0**	**-0.4**	**-0.1**
Final Energy Demand	**3772**	**4614**	**4751**	**4976**	**4940**	**4912**	**4946**	**5020**	**5126**	**5209**	**5293**	**2.3**	**0.4**	**0.0**	**0.3**
by sector															
Industry	780	995	897	1048	1037	1060	1087	1117	1166	1211	1227	1.4	1.5	0.5	0.6
- energy intensive industries	363	443	487	571	581	593	608	623	644	656	655	3.0	1.8	0.5	0.4
- other industrial sectors	417	552	410	477	456	468	479	493	523	555	572	-0.2	1.1	0.5	0.9
Residential	1369	1512	1584	1615	1584	1559	1563	1590	1615	1634	1700	1.5	0.0	-0.1	0.4
Tertiary	568	677	720	725	712	702	706	710	707	709	688	2.4	-0.1	-0.1	-0.1
Transport	1055	1431	1548	1588	1607	1591	1590	1603	1638	1655	1679	3.9	0.4	-0.1	0.3
by fuel															
Solids	88	192	199	205	157	160	159	165	174	176	174	8.5	-2.4	0.1	0.5
Oil	1355	1614	1609	1620	1607	1588	1573	1572	1560	1565	1598	1.7	0.0	-0.2	0.1
Gas	363	519	567	558	459	517	487	503	527	535	548	4.6	-2.1	0.6	0.6
Electricity	533	686	716	771	779	813	899	965	1039	1101	1150	3.0	0.8	1.4	1.2
Heat (from CHP and District Heating)	828	905	922	1021	1016	1034	1044	1046	1047	1045	1014	1.1	1.0	0.3	-0.1
Renewable energy forms	605	698	737	801	922	800	783	767	778	785	807	2.0	2.3	-1.6	0.2
Other fuels (hydrogen, ethanol)	0	0	0	0	0	0	1	1	1	2	2	-5.7	41.7	16.9	6.1
RES in Gross Final Energy Consumption [(A)]	**754**	**864**	**995**	**1058**	**1248**	**1098**	**1185**	**1254**	**1361**	**1429**	**1442**	**2.8**	**2.3**	**-0.5**	**1.0**
TOTAL GHG emissions (Mt of CO2 eq.)	**19.2**	**23.1**	**21.0**	**21.8**	**21.7**	**20.0**	**19.6**	**19.7**	**19.8**	**19.8**	**20.0**	**0.9**	**0.3**	**-1.0**	**0.1**
of which ETS sectors (2013 scope) GHG emissions		10.6	8.3	9.7	9.8	8.3	8.2	8.2	8.4	8.4	8.4		1.7	-1.8	0.1
of which non ETS sectors GHG emissions		12.6	12.7	12.1	11.8	11.7	11.5	11.5	11.4	11.4	11.6		-0.7	-0.3	0.1
CO_2 Emissions (energy related)	**10.3**	**12.5**	**12.2**	**13.4**	**13.2**	**11.6**	**11.7**	**11.7**	**11.9**	**11.9**	**12.1**	**1.7**	**0.8**	**-1.2**	**0.2**
Power generation/District heating	4.0	3.9	3.7	4.8	5.1	3.8	3.9	3.9	4.0	4.0	4.0	-0.7	3.4	-2.8	0.2
Energy Branch	1.1	1.7	1.6	1.5	1.5	1.2	1.3	1.3	1.3	1.3	1.2	3.8	-0.5	-1.4	-0.3
Industry	1.1	1.4	1.2	1.2	1.2	1.4	1.4	1.4	1.4	1.5	1.5	0.7	0.7	1.1	0.5
Residential	0.6	0.7	0.7	0.7	0.5	0.5	0.5	0.5	0.5	0.5	0.5	2.9	-3.4	-0.7	0.1
Tertiary	0.5	0.6	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	1.8	-3.1	-1.3	-0.2
Transport	3.1	4.2	4.5	4.6	4.4	4.3	4.3	4.3	4.4	4.4	4.4	3.7	-0.3	-0.2	0.2
CO_2 Emissions (non energy related)	**1.6**	**1.7**	**1.6**	**1.9**	**2.1**	**2.1**	**1.7**	**1.7**	**1.7**	**1.7**	**1.6**	**0.2**	**3.0**	**-2.2**	**-0.3**
Non-CO_2 GHG emissions	**7.3**	**8.9**	**7.2**	**6.5**	**6.3**	**6.3**	**6.2**	**6.3**	**6.2**	**6.2**	**6.4**	**-0.2**	**-1.3**	**-0.2**	**0.1**
TOTAL GHG emissions Index (1990=100)	**38.4**	**46.5**	**42.2**	**43.8**	**43.5**	**40.1**	**39.4**	**39.5**	**39.8**	**39.8**	**40.2**				

Source: PRIMES

SUMMARY ENERGY BALANCE AND INDICATORS (B)															Lithuania: Reference scenario
	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050	'00-'10	'10-'20	'20-'30	'30-'50
												Annual % Change			
Main Energy System Indicators															
Population (Million)	3.512	3.425	3.329	3.246	3.180	3.115	3.044	2.977	2.922	2.869	2.812	-0.5	-0.5	-0.4	-0.4
GDP (in 000 M€10)	18.0	26.2	27.5	32.4	35.1	38.1	41.8	45.3	49.3	53.0	55.6	4.4	2.4	1.8	1.4
Gross Inl. Cons./GDP (toe/M€10)	398.1	335.9	249.3	217.5	201.2	207.0	204.9	191.4	178.5	167.5	161.5	-4.6	-2.1	0.2	-1.2
Carbon intensity (t of CO_2/toe of GIC)	1.44	1.42	1.78	1.90	1.87	1.47	1.37	1.35	1.35	1.34	1.34	2.2	0.5	-3.1	-0.1
Import Dependency %	59.8	57.1	81.9	81.6	79.3	61.2	52.4	51.8	51.0	50.9	51.1				
Total energy-rel. and other mitigation costs [B] (in 000 M€10)	2.9	4.2	6.1	7.4	8.4	9.4	9.9	10.2	10.6	11.0	11.4	7.9	3.3	1.6	0.7
as % of GDP	15.9	16.0	22.2	22.8	24.1	24.6	23.7	22.6	21.6	20.8	20.6				
Energy intensity indicators															
Industry (Energy on Value added, index 2000=100)	100.0	80.3	61.3	61.0	58.8	57.4	54.4	52.2	50.0	48.2	46.8	-4.8	-0.4	-0.8	-0.7
Residential (Energy on Private Income, index 2000=100)	100.0	72.3	75.7	64.0	57.3	51.3	46.4	43.3	40.0	37.4	37.0	-2.8	-2.7	-2.1	-1.1
Tertiary (Energy on Value added, index 2000=100)	100.0	88.2	87.1	73.1	65.8	58.9	53.6	49.4	45.0	41.7	38.5	-1.4	-2.8	-2.0	-1.6
Passenger transport (toe/Mpkm)	23.8	20.5	23.1	21.9	20.4	18.4	16.9	16.1	15.8	15.7	15.6	-0.3	-1.2	-1.9	-0.4
Freight transport (toe/Mtkm)	20.1	20.6	21.7	21.1	20.3	19.3	18.3	17.7	17.1	16.5	16.0	0.8	-0.7	-1.0	-0.7
Carbon Intensity indicators															
Electricity and Steam production (t of CO_2/MWh)	0.17	0.14	0.21	0.21	0.22	0.14	0.12	0.11	0.11	0.11	0.11	2.5	0.2	-5.9	-0.3
Final energy demand (t of CO_2/toe)	1.39	1.48	1.47	1.41	1.33	1.35	1.32	1.31	1.30	1.29	1.29	0.5	-1.0	-0.1	-0.1
Industry	1.38	1.37	1.28	1.18	1.20	1.33	1.28	1.29	1.23	1.21	1.24	-0.7	-0.7	0.6	-0.1
Residential	0.41	0.43	0.47	0.43	0.33	0.33	0.31	0.30	0.30	0.29	0.30	1.4	-3.4	-0.5	-0.3
Tertiary	0.91	0.87	0.85	0.75	0.63	0.60	0.56	0.54	0.54	0.54	0.55	-0.6	-3.0	-1.2	-0.1
Transport [C]	2.94	2.94	2.89	2.87	2.71	2.70	2.68	2.67	2.66	2.65	2.64	-0.2	-0.6	-0.1	-0.1
Indicators for renewables															
Share of RES in Gross Final Energy Consumption [D] (%)	17.1	16.8	19.5	20.0	23.8	20.8	22.2	23.2	24.6	25.4	25.3				
RES in transport (%)	0.1	0.3	3.5	4.3	10.2	10.1	10.5	10.4	10.8	10.8	11.1				
Gross Electricity generation by source (in GWh_e) [E]	**11121**	**14415**	**4994**	**8739**	**9969**	**12697**	**18086**	**18981**	**20858**	**21623**	**22081**	**-7.7**	**7.2**	**6.1**	**1.0**
Nuclear energy	8419	10337	0	0	0	7684	11076	11130	11240	11240	11240	-100.0	0.0	0.0	0.1
Solids	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Oil (including refinery gas)	655	401	647	53	86	13	15	151	176	184	194	-0.1	-18.3	-15.8	13.6
Gas (including derived gases)	1707	3217	3436	7456	8507	3676	4608	4842	5486	6079	6345	7.2	9.5	-5.9	1.6
Biomass-waste	0	7	147	428	464	380	1383	1479	1628	1665	1694	0.0	12.2	11.5	1.0
Hydro (pumping excluded)	340	451	540	474	582	593	614	768	791	793	800	4.7	0.8	0.5	1.3
Wind	0	2	224	327	329	351	390	611	1536	1663	1807	0.0	3.9	1.7	8.0
Solar	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Geothermal and other renewables	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Other fuels (hydrogen, methanol)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Net Generation Capacity in MW_e	**4222**	**3419**	**2544**	**3173**	**2624**	**3572**	**3762**	**3907**	**4526**	**4610**	**4689**	**-4.9**	**0.3**	**3.7**	**1.1**
Nuclear energy	2291	1200	0	0	0	1326	1326	1326	1339	1339	1339	-100.0	0.0	0.0	0.0
Renewable energy	99	121	267	351	378	388	407	549	990	1042	1088	10.4	3.5	0.7	5.0
Hydro (pumping excluded)	99	114	113	130	156	156	156	193	199	206	206	1.3	3.2	0.0	1.4
Wind	0	6	154	221	222	233	251	356	791	836	882	0.0	3.7	1.2	6.5
Solar	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Other renewables (tidal etc.)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Thermal power	1832	2098	2276	2822	2246	1858	2030	2033	2198	2229	2263	2.2	-0.1	-1.0	0.5
of which cogeneration units	650	829	961	888	926	969	1020	978	1142	1172	1157	4.0	-0.4	1.0	0.6
of which CCS units	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Solids fired	5	6	6	7	7	0	0	0	0	0	0	3.4	1.2	-100.0	0.0
Gas fired	1506	1685	1816	2421	1836	1740	1792	1820	1963	1963	1988	1.9	0.1	-0.2	0.5
Oil fired	298	372	413	334	338	57	57	20	23	24	26	3.3	-2.0	-16.3	-3.9
Biomass-waste fired	24	35	41	60	65	60	181	192	211	241	249	5.5	4.8	10.8	1.6
Hydrogen plants	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Geothermal heat	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Avg. Load factor of net power capacity [F] (%)	26.3	44.2	20.7	29.7	41.8	38.7	52.2	52.8	50.3	51.2	51.5				
Electricity indicators															
Efficiency of gross thermal power generation (%)	22.2	25.4	28.4	37.7	37.9	24.4	30.4	33.3	35.6	37.5	39.5				
% of gross electricity from CHP	15.5	15.5	34.6	57.5	51.2	32.3	27.8	28.0	29.3	31.8	31.2				
% of electricity from CCS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Carbon free gross electricity generation (%)	78.8	74.9	18.2	14.1	13.8	70.9	74.4	73.7	72.9	71.0	70.4				
- nuclear	75.7	71.7	0.0	0.0	0.0	60.5	61.2	58.6	53.9	52.0	50.9				
- renewable energy forms	3.1	3.2	18.2	14.1	13.8	10.4	13.2	15.1	19.0	19.1	19.5				
Transport sector															
Passenger transport activity (Gpkm)	**30.0**	**40.1**	**34.9**	**36.7**	**38.7**	**40.6**	**42.4**	**43.7**	**45.1**	**46.1**	**46.9**	**1.5**	**1.0**	**0.9**	**0.5**
Public road transport	2.8	3.7	2.7	2.8	2.9	3.0	3.1	3.2	3.2	3.2	3.3	-0.2	0.8	0.7	0.2
Private cars and motorcycles	26.3	35.1	30.6	31.9	33.3	34.6	35.7	36.4	37.1	37.4	37.5	1.5	0.9	0.7	0.2
Rail	0.6	0.4	0.4	0.4	0.5	0.5	0.6	0.6	0.7	0.7	0.8	-4.8	2.1	2.5	1.5
Aviation	0.3	0.8	1.2	1.5	1.9	2.4	2.9	3.4	4.1	4.6	5.3	14.3	4.5	4.2	3.0
Inland navigation	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-0.2	1.0	0.9	0.6
Freight transport activity (Gtkm)	**16.7**	**28.4**	**32.8**	**35.6**	**38.7**	**42.2**	**46.0**	**49.1**	**52.4**	**54.7**	**57.0**	**7.0**	**1.6**	**1.8**	**1.1**
Trucks	7.8	15.9	19.4	20.7	22.1	23.9	25.9	27.4	29.1	30.2	31.3	9.6	1.3	1.6	1.0
Rail	8.9	12.5	13.4	14.9	16.6	18.2	20.1	21.6	23.3	24.5	25.6	4.2	2.1	1.9	1.2
Inland navigation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.9	1.9	1.1
Energy demand in transport (ktoe) [G]	**1049**	**1407**	**1520**	**1555**	**1575**	**1560**	**1560**	**1572**	**1607**	**1624**	**1648**	**3.8**	**0.4**	**-0.1**	**0.3**
Public road transport	17	22	16	17	17	17	18	17	17	17	17	-0.5	0.7	0.3	-0.2
Private cars and motorcycles	664	749	737	722	697	644	609	587	579	575	573	1.0	-0.6	-1.3	-0.3
Trucks	266	510	652	686	719	745	771	794	819	828	841	9.4	1.0	0.7	0.4
Rail	72	75	61	65	67	69	72	74	76	75	74	-1.6	1.0	0.6	0.1
Aviation	27	46	48	59	69	78	83	93	108	121	136	6.1	3.6	1.9	2.5
Inland navigation	3	5	6	6	7	7	7	7	7	7	7	7.2	0.9	0.6	0.2

Source: PRIMES

Luxembourg: Reference scenario														SUMMARY ENERGY BALANCE AND INDICATORS (A)
ktoe	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**	**'00-'10**	**'10-'20**	**'20-'30**	**'30-'50**
												Annual % Change			
Production (incl.recovery of products)	**64**	**107**	**130**	**178**	**237**	**301**	**321**	**325**	**354**	**391**	**402**	**7.4**	**6.2**	**3.1**	**1.1**
Solids	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Oil	0	0	0	0	0	0	0	0	0	0	0	0.0	-100.0	0.0	0.0
Natural gas	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Renewable energy sources	64	107	130	178	237	301	321	325	354	391	402	7.4	6.2	3.1	1.1
Hydro	11	8	9	10	11	11	12	12	13	13	13	-1.4	1.9	0.7	0.4
Biomass & Waste	51	93	113	144	165	201	205	196	198	197	194	8.4	3.9	2.2	-0.3
Wind	2	4	5	10	32	35	40	41	41	50	58	7.4	21.1	2.1	2.0
Solar and others	0	2	3	14	29	53	64	76	102	130	136	97.3	26.7	8.4	3.8
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	-0.2	0.1
Net Imports	**3613**	**4685**	**4510**	**4462**	**4278**	**4231**	**4256**	**4272**	**4269**	**4258**	**4319**	**2.2**	**-0.5**	**-0.1**	**0.1**
Solids	108	77	66	38	31	30	28	26	24	23	22	-4.8	-7.3	-0.9	-1.4
Oil	2342	3150	2857	2887	2713	2658	2695	2711	2761	2810	2865	2.0	-0.5	-0.1	0.3
- Crude oil and Feedstocks	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
- Oil products	2342	3150	2857	2887	2713	2658	2695	2711	2761	2810	2865	2.0	-0.5	-0.1	0.3
Natural gas	671	1176	1197	1005	868	893	855	853	788	705	698	5.9	-3.2	-0.2	-1.0
Electricity	491	280	349	381	389	395	409	413	413	424	424	-3.3	1.1	0.5	0.2
Gross Inland Consumption	**3627**	**4810**	**4658**	**4640**	**4515**	**4532**	**4577**	**4597**	**4623**	**4649**	**4721**	**2.5**	**-0.3**	**0.1**	**0.2**
Solids	108	77	66	38	31	30	28	26	24	23	22	-4.8	-7.3	-0.9	-1.4
Oil	2293	3169	2875	2887	2713	2658	2695	2711	2761	2810	2865	2.3	-0.6	-0.1	0.3
Natural gas	671	1176	1197	1005	868	893	855	853	788	705	698	5.9	-3.2	-0.2	-1.0
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Electricity	491	280	349	381	389	395	409	413	413	424	424	-3.3	1.1	0.5	0.2
Renewable energy forms	64	107	171	329	514	555	590	594	637	688	713	10.3	11.7	1.4	1.0
as % in Gross Inland Consumption															
Solids	3.0	1.6	1.4	0.8	0.7	0.7	0.6	0.6	0.5	0.5	0.5				
Oil	63.2	65.9	61.7	62.2	60.1	58.7	58.9	59.0	59.7	60.4	60.7				
Natural gas	18.5	24.5	25.7	21.7	19.2	19.7	18.7	18.6	17.1	15.2	14.8				
Nuclear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Renewable energy forms	1.8	2.2	3.7	7.1	11.4	12.3	12.9	12.9	13.8	14.8	15.1				
Gross Electricity Generation in GWh_e	**422**	**3346**	**3232**	**2813**	**2787**	**3035**	**3337**	**3448**	**3487**	**3561**	**3707**	**22.6**	**-1.5**	**1.8**	**0.5**
Self consumption and grid losses	341	462	706	765	763	798	846	865	856	872	886	7.5	0.8	1.0	0.2
Fuel Inputs to Thermal Power Generation	**95**	**577**	**566**	**443**	**365**	**379**	**396**	**400**	**359**	**301**	**300**	**19.5**	**-4.3**	**0.8**	**-1.4**
Solids	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Oil (including refinery gas)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Gas (including derived gases)	67	545	521	371	280	293	296	311	266	203	206	22.8	-6.0	0.5	-1.8
Biomass & Waste	29	32	45	72	84	86	100	89	93	99	94	4.8	6.4	1.8	-0.3
Geothermal heat	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Hydrogen - Methanol	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Fuel Input to other conversion processes	**0**	**1**	**42**	**114**	**215**	**222**	**230**	**230**	**240**	**251**	**267**	**96.7**	**17.8**	**0.7**	**0.8**
Refineries	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Biofuels and hydrogen production	0	1	41	113	213	221	228	229	238	250	266	0.0	18.1	0.7	0.8
District heating	0	1	1	1	1	1	1	1	1	1	0	36.8	0.0	-2.3	-5.4
Derived gases, cokeries etc.	0	0	0	0	0	0	0	1	1	1	0	42.8	1846.5	-0.4	0.0
Energy Branch Consumption	**26**	**30**	**50**	**55**	**55**	**57**	**60**	**61**	**60**	**61**	**62**	**6.9**	**0.9**	**0.9**	**0.1**
Non-Energy Uses	**12**	**21**	**17**	**17**	**17**	**17**	**16**	**16**	**16**	**16**	**16**	**4.1**	**0.1**	**-0.6**	**-0.1**
Final Energy Demand	**3517**	**4443**	**4302**	**4358**	**4274**	**4283**	**4326**	**4352**	**4404**	**4467**	**4540**	**2.0**	**-0.1**	**0.1**	**0.2**
by sector															
Industry	714	721	748	685	683	689	668	649	632	616	613	0.5	-0.9	-0.2	-0.4
- energy intensive industries	603	597	642	587	586	591	572	554	536	518	511	0.6	-0.9	-0.2	-0.6
- other industrial sectors	110	123	106	98	98	97	96	95	96	98	102	-0.4	-0.8	-0.2	0.3
Residential	469	525	486	543	530	535	529	530	525	526	519	0.4	0.9	0.0	-0.1
Tertiary	404	400	446	437	424	423	427	432	430	434	434	1.0	-0.5	0.1	0.1
Transport	1930	2797	2622	2692	2637	2636	2702	2741	2818	2890	2975	3.1	0.1	0.2	0.5
by fuel															
Solids	108	77	66	38	31	30	28	26	24	23	22	-4.8	-7.3	-0.9	-1.4
Oil	2278	3123	2856	2870	2695	2641	2679	2695	2745	2795	2849	2.3	-0.6	-0.1	0.3
Gas	605	631	676	634	587	600	559	542	522	502	492	1.1	-1.4	-0.5	-0.6
Electricity	497	529	568	557	563	587	623	634	638	653	664	1.3	-0.1	1.0	0.3
Heat (from CHP and District Heating)	8	22	28	29	30	33	36	40	45	48	50	14.0	0.7	1.7	1.6
Renewable energy forms	22	61	108	229	367	391	401	413	428	444	462	17.2	13.0	0.9	0.7
Other fuels (hydrogen, ethanol)	0	0	0	0	1	0	1	1	1	2	2	-11.0	61.5	2.4	6.9
RES in Gross Final Energy Consumption [(A)]	**27**	**62**	**120**	**218**	**391**	**428**	**456**	**471**	**516**	**561**	**583**	**15.8**	**12.6**	**1.5**	**1.2**
TOTAL GHG emissions (Mt of CO2 eq.)	**10.6**	**14.3**	**13.5**	**12.9**	**12.0**	**11.9**	**11.8**	**11.8**	**11.8**	**11.7**	**11.8**	**2.4**	**-1.2**	**-0.2**	**0.0**
of which ETS sectors (2013 scope) GHG emissions		4.2	3.9	3.5	3.3	3.4	3.3	3.2	3.1	2.9	2.9		-1.5	-0.2	-0.5
of which non ETS sectors GHG emissions		10.1	9.7	9.3	8.7	8.5	8.5	8.5	8.7	8.8	8.9		-1.1	-0.2	0.2
CO_2 Emissions (energy related)	**8.9**	**12.6**	**11.8**	**11.3**	**10.4**	**10.3**	**10.3**	**10.4**	**10.4**	**10.3**	**10.5**	**2.9**	**-1.2**	**-0.1**	**0.1**
Power generation/District heating	0.2	1.3	1.2	0.9	0.7	0.7	0.7	0.7	0.6	0.5	0.5	22.8	-6.0	0.5	-1.8
Energy Branch	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Industry	1.2	1.1	1.1	0.8	0.7	0.7	0.7	0.7	0.6	0.6	0.6	-1.4	-3.6	-0.6	-1.0
Residential	1.1	1.2	1.0	1.2	1.1	1.1	1.0	1.0	0.9	0.9	0.9	-0.2	0.6	-0.9	-0.8
Tertiary	0.6	0.5	0.6	0.6	0.6	0.5	0.4	0.4	0.4	0.4	0.4	-0.4	-1.2	-2.3	-0.8
Transport	5.8	8.5	7.9	7.8	7.4	7.3	7.5	7.6	7.8	8.0	8.2	3.1	-0.6	0.2	0.4
CO_2 Emissions (non energy related)	**0.7**	**0.7**	**0.6**	**0.5**	**0.6**	**0.6**	**0.5**	**0.5**	**0.4**	**0.4**	**0.4**	**-2.1**	**0.0**	**-2.1**	**-0.8**
Non-CO_2 GHG emissions	**1.0**	**1.1**	**1.1**	**1.0**	**1.0**	**0.9**	**0.9**	**0.9**	**0.9**	**1.0**	**1.0**	**1.4**	**-1.2**	**-0.6**	**0.1**
TOTAL GHG emissions Index (1990=100)	**80.4**	**108.4**	**102.3**	**97.2**	**90.8**	**89.7**	**88.9**	**88.9**	**88.8**	**88.4**	**89.5**				

Source: PRIMES

SUMMARY ENERGY BALANCE AND INDICATORS (B)															Luxembourg: Reference scenario
	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050	'00-'10	'10-'20	'20-'30	'30-'50
												Annual % Change			
Main Energy System Indicators															
Population (Million)	0.434	0.461	0.502	0.541	0.573	0.600	0.626	0.649	0.670	0.688	0.704	1.5	1.3	0.9	0.6
GDP (in 000 M€10)	30.8	36.7	40.3	44.1	48.6	53.3	58.3	63.6	69.3	75.4	82.1	2.7	1.9	1.8	1.7
Gross Inl. Cons./GDP (toe/M€10)	117.8	131.0	115.7	105.3	93.0	85.0	78.6	72.3	66.7	61.6	57.5	-0.2	-2.2	-1.7	-1.5
Carbon intensity (t of CO_2/toe of GIC)	2.46	2.62	2.54	2.44	2.31	2.28	2.26	2.26	2.24	2.22	2.22	0.3	-0.9	-0.2	-0.1
Import Dependency %	99.6	97.4	96.8	96.2	94.8	93.4	93.0	92.9	92.3	91.6	91.5				
Total energy-rel. and other mitigation costs [B] (in 000 M€10)	3.1	4.3	4.8	5.8	6.1	6.4	6.7	6.9	7.3	7.7	8.0	4.6	2.6	0.8	0.9
as % of GDP	9.9	11.8	11.8	13.1	12.7	12.0	11.5	10.9	10.6	10.2	9.8				
Energy intensity indicators															
Industry (Energy on Value added, index 2000=100)	100.0	97.5	142.2	127.5	120.2	114.9	107.3	101.4	96.4	91.2	86.8	3.6	-1.7	-1.1	-1.1
Residential (Energy on Private Income, index 2000=100)	100.0	103.1	83.8	86.7	77.4	71.3	64.3	58.6	52.5	47.5	42.1	-1.8	-0.8	-1.8	-2.1
Tertiary (Energy on Value added, index 2000=100)	100.0	81.9	78.9	70.0	61.1	55.2	50.6	46.5	42.3	39.1	35.8	-2.3	-2.5	-1.9	-1.7
Passenger transport (toe/Mpkm)	157.3	160.5	143.2	132.2	113.7	104.7	99.5	95.6	93.1	91.5	90.6	-0.9	-2.3	-1.3	-0.5
Freight transport (toe/Mtkm)	90.6	156.1	151.7	146.6	137.2	129.0	123.4	119.3	116.8	115.2	113.7	5.3	-1.0	-1.1	-0.4
Carbon Intensity indicators															
Electricity and Steam production (t of CO_2/MWh)	0.31	0.36	0.34	0.28	0.21	0.20	0.18	0.19	0.16	0.12	0.11	1.1	-4.8	-1.3	-2.4
Final energy demand (t of CO_2/toe)	2.49	2.55	2.46	2.39	2.28	2.25	2.23	2.22	2.21	2.20	2.20	-0.1	-0.7	-0.2	-0.1
Industry	1.71	1.54	1.43	1.20	1.08	1.09	1.04	1.01	0.97	0.94	0.93	-1.8	-2.8	-0.4	-0.6
Residential	2.30	2.28	2.16	2.14	2.10	1.99	1.92	1.83	1.76	1.70	1.65	-0.6	-0.3	-0.9	-0.7
Tertiary	1.61	1.31	1.39	1.38	1.31	1.15	1.03	0.97	0.94	0.89	0.86	-1.4	-0.7	-2.4	-0.9
Transport [C]	3.01	3.04	2.99	2.91	2.79	2.78	2.77	2.77	2.77	2.76	2.75	-0.1	-0.7	-0.1	0.0
Indicators for renewables															
Share of RES in Gross Final Energy Consumption [D] (%)	0.8	1.4	2.9	5.2	9.5	10.3	10.9	11.2	12.1	13.0	13.4				
RES in transport (%)	0.0	0.0	1.9	5.1	10.1	10.5	10.7	10.5	10.7	11.1	11.5				
Gross Electricity generation by source (in GWh_e) [E]	**422**	**3347**	**3232**	**2813**	**2787**	**3035**	**3337**	**3448**	**3487**	**3561**	**3707**	**22.6**	**-1.5**	**1.8**	**0.5**
Nuclear energy	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Solids	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Oil (including refinery gas)	0	1	1	0	0	0	0	0	0	0	0	0.0	-100.0	0.0	0.0
Gas (including derived gases)	215	3106	2918	2190	1708	1770	1881	2001	1728	1431	1453	29.8	-5.2	1.0	-1.3
Biomass-waste	56	76	129	313	359	367	439	389	439	458	432	8.7	10.8	2.0	-0.1
Hydro (pumping excluded)	124	94	108	113	130	133	140	142	146	148	150	-1.4	1.9	0.7	0.4
Wind	27	52	55	121	372	411	459	474	479	585	680	7.4	21.1	2.1	2.0
Solar	0	18	21	76	218	355	418	440	696	938	992	89.8	26.3	6.7	4.4
Geothermal and other renewables	0	0	0	0	0	0	0	0	0	0	0	14.9	-94.6	7.2	3.5
Other fuels (hydrogen, methanol)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Net Generation Capacity in MW_e	**153**	**621**	**630**	**762**	**1083**	**1241**	**1374**	**1384**	**1603**	**1679**	**1797**	**15.2**	**5.6**	**2.4**	**1.3**
Nuclear energy	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Renewable energy	42	93	106	194	497	653	745	777	1024	1360	1504	9.6	16.7	4.1	3.6
Hydro (pumping excluded)	32	34	34	38	45	46	47	48	49	50	51	0.4	2.9	0.5	0.4
Wind	10	35	43	78	226	256	290	301	304	392	480	15.8	18.0	2.5	2.5
Solar	0	24	29	78	226	350	409	429	671	918	973	93.3	22.8	6.1	4.4
Other renewables (tidal etc.)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Thermal power	111	528	524	568	586	588	629	606	579	320	293	16.8	1.1	0.7	-3.7
of which cogeneration units	63	66	84	71	92	95	125	122	114	121	115	2.9	0.8	3.2	-0.4
of which CCS units	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Solids fired	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Gas fired	95	506	505	501	497	497	513	484	439	208	204	18.2	-0.2	0.3	-4.5
Oil fired	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Biomass-waste fired	16	22	19	67	89	91	116	122	140	111	89	1.8	16.6	2.6	-1.3
Hydrogen plants	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Geothermal heat	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Avg. Load factor of net power capacity [F] (%)	29.7	61.2	58.2	40.7	28.5	27.1	27.0	27.7	24.3	23.7	23.1				
Electricity indicators															
Efficiency of gross thermal power generation (%)	24.4	47.4	46.3	48.6	48.7	48.5	50.4	51.4	51.9	53.9	54.1				
% of gross electricity from CHP	17.7	10.1	9.6	14.7	15.9	14.1	18.9	18.6	18.7	17.9	17.6				
% of electricity from CCS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Carbon free gross electricity generation (%)	49.1	7.2	9.7	22.1	38.7	41.7	43.6	42.0	50.5	59.8	60.8				
- nuclear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
- renewable energy forms	49.1	7.2	9.7	22.1	38.7	41.7	43.6	42.0	50.5	59.8	60.8				
Transport sector															
Passenger transport activity (Gpkm)	**7.3**	**8.1**	**8.5**	**9.2**	**10.0**	**10.5**	**11.1**	**11.6**	**12.2**	**12.6**	**13.1**	**1.5**	**1.6**	**1.1**	**0.8**
Public road transport	0.6	0.8	0.9	1.0	1.1	1.1	1.2	1.3	1.3	1.4	1.4	4.2	1.4	1.1	0.7
Private cars and motorcycles	5.7	6.5	6.7	7.2	7.7	8.1	8.5	8.8	9.2	9.5	9.7	1.5	1.5	0.9	0.7
Rail	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.4	1.7	1.5	1.0
Aviation	0.6	0.6	0.6	0.6	0.7	0.8	1.0	1.1	1.2	1.3	1.4	-0.9	2.5	2.7	1.8
Inland navigation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Freight transport activity (Gtkm)	**8.6**	**9.5**	**9.2**	**10.1**	**11.0**	**11.9**	**12.9**	**13.6**	**14.4**	**15.0**	**15.7**	**0.7**	**1.7**	**1.7**	**1.0**
Trucks	7.6	8.8	8.7	9.5	10.3	11.2	12.1	12.8	13.5	14.1	14.7	1.3	1.7	1.7	1.0
Rail	0.6	0.4	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.5	-11.3	3.8	2.2	1.4
Inland navigation	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	-0.5	1.1	1.0	0.9
Energy demand in transport (ktoe) [G]	**1930**	**2797**	**2622**	**2691**	**2636**	**2635**	**2701**	**2740**	**2817**	**2889**	**2974**	**3.1**	**0.1**	**0.2**	**0.5**
Public road transport	11	15	17	19	20	20	21	22	22	23	23	4.7	1.1	0.7	0.5
Private cars and motorcycles	816	859	770	725	628	592	583	591	604	609	617	-0.6	-2.0	-0.7	0.3
Trucks	766	1476	1387	1458	1482	1512	1571	1602	1656	1707	1761	6.1	0.7	0.6	0.6
Rail	12	11	13	15	18	19	21	22	23	23	23	0.9	3.0	1.4	0.6
Aviation	321	432	431	470	484	486	501	499	507	523	543	3.0	1.2	0.3	0.4
Inland navigation	4	3	4	4	4	4	4	4	5	5	5	-1.0	1.1	0.8	0.6

Source: PRIMES

Malta: Reference scenario												SUMMARY ENERGY BALANCE AND INDICATORS (A)			
ktoe	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**	**'00-'10**	**'10-'20**	**'20-'30**	**'30-'50**
												Annual % Change			
Production (incl.recovery of products)	**0**	**0**	**0**	**4**	**31**	**58**	**91**	**102**	**106**	**117**	**125**	**0.0**	**180.9**	**11.5**	**1.6**
Solids	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Oil	0	0	0	0	0	0	0	0	0	0	0	0.0	-100.0	0.0	0.0
Natural gas	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Renewable energy sources	0	0	0	4	31	58	91	102	106	117	125	0.0	0.0	11.5	1.6
Hydro	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Biomass & Waste	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Wind	0	0	0	0	17	20	37	37	35	44	48	0.0	0.0	7.8	1.3
Solar and others	0	0	0	4	13	38	54	65	71	73	77	0.0	0.0	15.2	1.8
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.9	1.1
Net Imports	**1454**	**1626**	**2388**	**2332**	**2018**	**1976**	**1984**	**2035**	**2106**	**2179**	**2227**	**5.1**	**-1.7**	**-0.2**	**0.6**
Solids	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	-5.1	-2.4
Oil	1454	1626	2388	2317	1715	1682	1703	1756	1807	1872	1913	5.1	-3.3	-0.1	0.6
- Crude oil and Feedstocks	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
- Oil products	1454	1626	2388	2317	1715	1682	1703	1756	1807	1872	1913	5.1	-3.3	-0.1	0.6
Natural gas	0	0	0	4	264	250	239	209	237	248	260	0.0	0.0	-1.0	0.4
Electricity	0	0	0	10	16	21	17	40	30	25	19	0.0	0.0	1.1	0.6
Gross Inland Consumption	**799**	**969**	**911**	**897**	**668**	**659**	**664**	**648**	**675**	**685**	**690**	**1.3**	**-3.1**	**-0.1**	**0.2**
Solids	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	-5.1	-2.4
Oil	799	969	911	880	348	334	327	321	327	329	332	1.3	-9.2	-0.6	0.1
Natural gas	0	0	0	1	250	222	202	156	180	180	179	0.0	0.0	-2.1	-0.6
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Electricity	0	0	0	10	16	21	17	40	30	25	19	0.0	0.0	1.1	0.6
Renewable energy forms	0	0	0	6	54	81	116	131	138	151	159	0.0	0.0	7.9	1.6
as % in Gross Inland Consumption															
Solids	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Oil	100.0	100.0	100.0	98.2	52.1	50.8	49.3	49.5	48.4	48.1	48.2				
Natural gas	0.0	0.0	0.0	0.1	37.4	33.8	30.5	24.1	26.6	26.3	26.0				
Nuclear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Renewable energy forms	0.0	0.0	0.0	0.7	8.1	12.3	17.5	20.2	20.4	22.0	23.1				
Gross Electricity Generation in GWh_e	**1917**	**2240**	**2113**	**2088**	**2199**	**2116**	**2302**	**2077**	**2320**	**2492**	**2623**	**1.0**	**0.4**	**0.5**	**0.7**
Self consumption and grid losses	350	282	507	453	489	469	486	480	501	513	522	3.8	-0.4	0.0	0.4
Fuel Inputs to Thermal Power Generation	**465**	**657**	**578**	**540**	**281**	**242**	**214**	**167**	**193**	**192**	**188**	**2.2**	**-6.9**	**-2.7**	**-0.7**
Solids	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Oil (including refinery gas)	465	657	578	540	26	17	5	1	1	1	0	2.2	-26.5	-14.7	-100.0
Gas (including derived gases)	0	0	0	0	247	218	198	151	173	172	168	0.0	0.0	-2.2	-0.8
Biomass & Waste	0	0	0	0	8	8	11	14	18	19	19	0.0	0.0	3.6	2.8
Geothermal heat	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Hydrogen - Methanol	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Fuel Input to other conversion processes	**0**	**0**	**0**	**2**	**16**	**15**	**15**	**15**	**14**	**15**	**15**	**0.0**	**0.0**	**-0.8**	**0.0**
Refineries	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Biofuels and hydrogen production	0	0	0	2	16	15	15	15	14	14	15	0.0	0.0	-0.9	0.0
District heating	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Derived gases, cokeries etc.	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	13.5	3.0
Energy Branch Consumption	**10**	**2**	**10**	**3**	**4**	**3**	**3**	**2**	**3**	**3**	**3**	**0.5**	**-9.5**	**-3.0**	**0.2**
Non-Energy Uses	**0**	**20**	**10**	**10**	**10**	**10**	**11**	**11**	**11**	**11**	**11**	**0.0**	**0.6**	**0.3**	**0.1**
Final Energy Demand	**469**	**460**	**451**	**486**	**499**	**509**	**524**	**527**	**542**	**554**	**565**	**-0.4**	**1.0**	**0.5**	**0.4**
by sector															
Industry	71	59	51	50	51	51	52	53	53	54	53	-3.3	0.0	0.2	0.1
- energy intensive industries	11	18	13	13	14	14	14	14	14	14	14	1.6	0.2	0.1	0.1
- other industrial sectors	60	41	38	38	37	37	38	39	39	40	39	-4.6	0.0	0.2	0.2
Residential	76	76	64	75	76	76	79	84	90	96	100	-1.7	1.7	0.5	1.1
Tertiary	56	85	65	73	83	91	97	95	97	99	102	1.4	2.5	1.6	0.2
Transport	265	239	271	288	290	291	296	296	301	305	310	0.2	0.7	0.2	0.2
by fuel															
Solids	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	-5.1	-2.4
Oil	334	291	313	330	312	308	311	309	315	317	322	-0.6	0.0	0.0	0.2
Gas	0	0	0	1	2	5	5	5	6	8	11	0.0	0.0	6.9	4.2
Electricity	135	168	138	150	163	163	173	177	187	195	200	0.2	1.6	0.6	0.7
Heat (from CHP and District Heating)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	5.6	3.1
Renewable energy forms	0	0	0	5	23	34	35	36	34	33	32	0.0	0.0	4.3	-0.4
Other fuels (hydrogen, ethanol)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	15.2	7.8
RES in Gross Final Energy Consumption [(A)]	**0**	**0**	**0**	**5**	**51**	**76**	**111**	**122**	**128**	**138**	**147**	**0.0**	**79.6**	**8.1**	**1.4**
TOTAL GHG emissions (Mt of CO2 eq.)	**2.8**	**3.3**	**3.1**	**3.0**	**1.9**	**1.8**	**1.7**	**1.6**	**1.6**	**1.6**	**1.7**	**1.3**	**-5.0**	**-1.1**	**-0.1**
of which ETS sectors (2013 scope) GHG emissions		2.4	2.2	2.1	1.1	1.0	0.9	0.8	0.9	0.9	0.9		-7.0	-1.4	-0.3
of which non ETS sectors GHG emissions		0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8		-1.3	-0.7	0.1
CO_2 Emissions (energy related)	**2.5**	**3.0**	**2.8**	**2.7**	**1.6**	**1.5**	**1.4**	**1.3**	**1.4**	**1.4**	**1.4**	**1.1**	**-5.4**	**-1.1**	**-0.1**
Power generation/District heating	1.5	2.1	1.9	1.7	0.7	0.6	0.5	0.4	0.4	0.4	0.4	2.2	-9.8	-3.2	-1.0
Energy Branch	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Industry	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-9.5	-0.4	0.3	0.2
Residential	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	-2.4	-1.0	-3.8	-1.4
Tertiary	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-5.0	1.5	1.1	2.0
Transport	0.8	0.7	0.8	0.9	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.3	0.1	0.3	0.2
CO_2 Emissions (non energy related)	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**1.8**	**-14.9**	**-1.1**	**-0.1**
Non-CO_2 GHG emissions	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**2.9**	**-2.1**	**-0.7**	**0.0**
TOTAL GHG emissions Index (1990=100)	**122.7**	**147.8**	**139.8**	**133.0**	**84.0**	**79.3**	**75.4**	**69.5**	**72.7**	**73.2**	**73.7**				

Source: PRIMES

SUMMARY ENERGY BALANCE AND INDICATORS (B)															Malta: Reference scenario
	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050	'00-'10	'10-'20	'20-'30	'30-'50
												Annual % Change			
Main Energy System Indicators															
Population (Million)	0.380	0.403	0.414	0.413	0.415	0.418	0.417	0.413	0.408	0.402	0.397	0.9	0.0	0.0	-0.2
GDP (in 000 M€10)	5.3	5.5	6.1	6.6	7.1	7.8	8.6	9.4	10.2	10.8	11.3	1.5	1.5	1.9	1.4
Gross Inl. Cons./GDP (toe/M€10)	151.7	175.9	148.8	135.9	93.7	84.1	77.0	68.7	66.4	63.5	61.1	-0.2	-4.5	-1.9	-1.1
Carbon intensity (t of CO_2/toe of GIC)	3.13	3.08	3.07	3.05	2.41	2.28	2.16	2.01	2.04	2.02	2.02	-0.2	-2.4	-1.1	-0.3
Import Dependency %	100.3	100.0	100.8	99.8	98.5	97.2	95.6	95.2	95.2	94.9	94.7				
Total energy-rel. and other mitigation costs [B] (in 000 M€10)	0.4	0.6	0.8	1.0	1.0	1.1	1.2	1.3	1.4	1.4	1.5	7.1	2.2	2.1	0.9
as % of GDP	7.9	10.2	13.4	15.0	14.2	14.5	14.4	13.8	13.6	13.2	13.2				
Energy intensity indicators															
Industry (Energy on Value added, index 2000=100)	100.0	116.1	100.0	92.0	89.2	84.9	79.3	75.5	72.6	70.6	69.2	0.0	-1.1	-1.2	-0.7
Residential (Energy on Private Income, index 2000=100)	100.0	91.9	72.4	77.6	71.4	64.1	60.4	57.8	57.4	57.4	56.9	-3.2	-0.1	-1.7	-0.3
Tertiary (Energy on Value added, index 2000=100)	100.0	141.9	87.2	90.5	94.7	93.9	90.6	81.1	76.3	73.3	71.2	-1.4	0.8	-0.4	-1.2
Passenger transport (toe/Mpkm)	47.3	38.0	38.6	37.5	34.0	30.8	28.3	26.3	25.1	24.4	23.9	-2.0	-1.3	-1.8	-0.8
Freight transport (toe/Mtkm)	159.2	227.6	257.7	252.6	243.6	237.7	234.1	228.8	222.1	217.6	214.9	4.9	-0.6	-0.4	-0.4
Carbon Intensity indicators															
Electricity and Steam production (t of CO_2/MWh)	0.78	0.94	0.88	0.83	0.30	0.27	0.21	0.17	0.18	0.16	0.15	1.2	-10.1	-3.6	-1.6
Final energy demand (t of CO_2/toe)	2.14	1.90	2.07	2.03	1.88	1.84	1.81	1.79	1.78	1.77	1.77	-0.3	-0.9	-0.4	-0.1
Industry	1.27	0.96	0.65	0.63	0.63	0.63	0.63	0.63	0.64	0.64	0.63	-6.4	-0.5	0.1	0.0
Residential	1.02	0.80	0.95	0.90	0.73	0.56	0.47	0.38	0.33	0.30	0.28	-0.7	-2.7	-4.3	-2.5
Tertiary	0.71	0.43	0.37	0.37	0.34	0.33	0.32	0.34	0.36	0.40	0.46	-6.3	-0.9	-0.4	1.8
Transport [C]	3.00	3.00	3.01	2.99	2.85	2.86	2.87	2.87	2.87	2.87	2.87	0.0	-0.5	0.1	0.0
Indicators for renewables															
Share of RES in Gross Final Energy Consumption [D] (%)	0.0	0.0	0.0	1.3	11.7	17.5	25.0	27.4	28.0	29.7	31.1				
RES in transport (%)	0.0	0.0	0.0	0.5	10.0	10.1	10.1	10.4	10.2	10.6	11.0				
Gross Electricity generation by source (in GWh_e) [E]	**1917**	**2240**	**2115**	**2088**	**2199**	**2116**	**2302**	**2077**	**2320**	**2492**	**2623**	**1.0**	**0.4**	**0.5**	**0.7**
Nuclear energy	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Solids	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Oil (including refinery gas)	1917	2240	2113	2073	125	78	26	6	6	5	0	1.0	-24.6	-14.6	-100.0
Gas (including derived gases)	0	0	0	0	1761	1551	1403	1073	1236	1258	1278	0.0	0.0	-2.2	-0.5
Biomass-waste	0	0	0	0	34	34	49	65	83	89	89	0.0	0.0	3.8	3.0
Hydro (pumping excluded)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Wind	0	0	0	2	203	234	429	429	408	513	560	0.0	0.0	7.8	1.3
Solar	0	0	0	13	76	218	394	503	587	628	696	0.0	0.0	17.9	2.9
Geothermal and other renewables	0	0	2	0	0	0	0	0	0	0	0	0.0	-100.0	0.0	0.0
Other fuels (hydrogen, methanol)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Net Generation Capacity in MW_e	**513**	**592**	**593**	**737**	**845**	**919**	**1106**	**1161**	**1217**	**1146**	**1240**	**1.5**	**3.6**	**2.7**	**0.6**
Nuclear energy	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Renewable energy	0	0	1	9	134	217	402	455	495	554	601	0.0	66.3	11.6	2.0
Hydro (pumping excluded)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Wind	0	0	0	1	86	99	191	191	191	225	240	0.0	0.0	8.3	1.2
Solar	0	0	1	8	48	119	211	264	304	329	361	0.0	50.0	16.1	2.7
Other renewables (tidal etc.)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Thermal power	513	592	592	729	711	701	704	706	722	592	639	1.4	1.8	-0.1	-0.5
of which cogeneration units	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
of which CCS units	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Solids fired	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Gas fired	0	0	0	0	247	247	247	247	260	339	575	0.0	0.0	0.0	4.3
Oil fired	513	592	592	729	460	450	450	450	450	240	51	1.4	-2.5	-0.2	-10.3
Biomass-waste fired	0	0	0	0	5	5	7	9	12	13	13	0.0	0.0	3.8	3.0
Hydrogen plants	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Geothermal heat	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Avg. Load factor of net power capacity [F] (%)	40.1	42.7	38.4	31.8	29.1	25.8	23.4	20.2	21.5	24.5	23.8				
Electricity indicators															
Efficiency of gross thermal power generation (%)	35.5	29.3	31.4	33.0	58.7	59.1	59.4	59.1	59.2	60.4	62.7				
% of gross electricity from CHP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
% of electricity from CCS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Carbon free gross electricity generation (%)	0.0	0.0	0.1	0.7	14.2	23.0	37.9	48.1	46.4	49.3	51.3				
- nuclear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
- renewable energy forms	0.0	0.0	0.1	0.7	14.2	23.0	37.9	48.1	46.4	49.3	51.3				
Transport sector															
Passenger transport activity (Gpkm)	**4.8**	**4.8**	**5.4**	**5.9**	**6.6**	**7.2**	**8.0**	**8.5**	**9.1**	**9.5**	**9.9**	**1.2**	**2.1**	**2.0**	**1.1**
Public road transport	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.8	0.3	0.2	0.2
Private cars and motorcycles	1.9	2.1	2.3	2.3	2.3	2.4	2.4	2.5	2.5	2.6	2.6	2.0	0.3	0.3	0.4
Rail	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Aviation	2.5	2.3	2.6	3.1	3.7	4.3	5.0	5.5	6.1	6.4	6.7	0.6	3.7	3.1	1.5
Inland navigation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Freight transport activity (Gtkm)	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.0**	**0.9**	**1.0**	**0.6**
Trucks	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.9	1.0	0.6
Rail	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Inland navigation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Energy demand in transport (ktoe) [G]	**265**	**239**	**271**	**288**	**290**	**291**	**296**	**296**	**301**	**305**	**310**	**0.2**	**0.7**	**0.2**	**0.2**
Public road transport	9	9	10	10	9	9	9	9	9	8	8	0.7	-0.3	-0.7	-0.2
Private cars and motorcycles	94	86	96	94	85	77	71	69	67	67	67	0.2	-1.2	-1.8	-0.3
Trucks	40	57	64	66	66	68	70	72	72	73	73	4.9	0.3	0.6	0.2
Rail	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Aviation	122	87	102	119	129	137	146	147	153	157	161	-1.8	2.4	1.2	0.5
Inland navigation	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0

Source: PRIMES

Netherlands: Reference scenario												SUMMARY ENERGY BALANCE AND INDICATORS (A)			
ktoe	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**	**'00-'10**	**'10-'20**	**'20-'30**	**'30-'50**
												Annual % Change			
Production (incl.recovery of products)	**57578**	**62233**	**70173**	**70173**	**68825**	**58087**	**51504**	**54669**	**56471**	**53930**	**48460**	**2.0**	**-0.2**	**-2.9**	**-0.3**
Solids	7	8	6	0	0	0	0	0	0	0	0	-2.0	-100.0	0.0	0.0
Oil	2429	2341	1989	813	0	0	0	0	0	0	0	-2.0	-100.0	0.0	0.0
Natural gas	52203	56276	63534	63717	61130	49737	42446	43638	44997	41634	35079	2.0	-0.4	-3.6	-0.9
Nuclear	1013	1031	1024	1023	1024	1047	1249	2786	2786	2661	2661	0.1	0.0	2.0	3.9
Renewable energy sources	1926	2577	3621	4620	6671	7303	7809	8245	8689	9636	10720	6.5	6.3	1.6	1.6
Hydro	12	8	9	9	9	9	9	9	9	9	9	-3.0	0.0	0.0	0.0
Biomass & Waste	1831	2371	3232	3475	3901	3837	3977	4144	4237	4448	4792	5.8	1.9	0.2	0.9
Wind	71	178	343	983	2342	2800	2970	3092	3499	4152	4926	17.0	21.2	2.4	2.6
Solar and others	11	21	29	145	369	608	807	956	901	985	954	9.9	28.9	8.1	0.8
Geothermal	0	0	8	7	49	48	47	45	43	42	40	0.0	20.6	-0.6	-0.8
Net Imports	**34732**	**38102**	**30894**	**33853**	**31177**	**39665**	**45859**	**42730**	**41294**	**44942**	**52318**	**-1.2**	**0.1**	**3.9**	**0.7**
Solids	7998	8312	9228	10584	10163	9891	8432	6114	5397	5121	4945	1.4	1.0	-1.9	-2.6
Oil	42398	48863	45569	47655	47567	46644	47152	46985	46619	47319	48093	0.7	0.4	-0.1	0.1
- Crude oil and Feedstocks	61909	62185	60912	58283	55558	53321	51288	49276	47406	45891	44497	-0.2	-0.9	-0.8	-0.7
- Oil products	-19512	-13322	-15344	-10628	-7991	-6678	-4136	-2291	-788	1428	3597	-2.4	-6.3	-6.4	0.0
Natural gas	-17191	-20941	-24211	-25680	-28301	-18535	-11214	-11875	-12273	-9106	-2176	3.5	1.6	-8.8	-7.9
Electricity	1626	1573	239	9	-81	-161	-313	-364	-324	-179	-191	-17.5	0.0	14.4	-2.4
Gross Inland Consumption	**76571**	**82525**	**86924**	**89364**	**84810**	**81704**	**80276**	**79340**	**78759**	**78528**	**78807**	**1.3**	**-0.2**	**-0.5**	**-0.1**
Solids	7852	8195	7596	10584	10163	9891	8432	6114	5397	5121	4945	-0.3	3.0	-1.9	-2.6
Oil	29244	33520	35067	33876	32664	31211	30871	30176	29395	29216	28927	1.8	-0.7	-0.6	-0.3
Natural gas	35009	35334	39309	37967	32539	30586	30426	30513	30942	30286	30098	1.2	-1.9	-0.7	-0.1
Nuclear	1013	1031	1024	1023	1024	1047	1249	2786	2786	2661	2661	0.1	0.0	2.0	3.9
Electricity	1626	1573	239	9	-81	-161	-313	-364	-324	-179	-191	-17.5	0.0	14.4	-2.4
Renewable energy forms	1827	2872	3690	5904	8500	9129	9611	10115	10564	11423	12368	7.3	8.7	1.2	1.3
as % in Gross Inland Consumption															
Solids	10.3	9.9	8.7	11.8	12.0	12.1	10.5	7.7	6.9	6.5	6.3				
Oil	38.2	40.6	40.3	37.9	38.5	38.2	38.5	38.0	37.3	37.2	36.7				
Natural gas	45.7	42.8	45.2	42.5	38.4	37.4	37.9	38.5	39.3	38.6	38.2				
Nuclear	1.3	1.2	1.2	1.1	1.2	1.3	1.6	3.5	3.5	3.4	3.4				
Renewable energy forms	2.4	3.5	4.2	6.6	10.0	11.2	12.0	12.7	13.4	14.5	15.7				
Gross Electricity Generation in GWh_e	**89615**	**100201**	**118119**	**132991**	**130483**	**131124**	**136192**	**139862**	**144878**	**148270**	**151196**	**2.8**	**1.0**	**0.4**	**0.5**
Self consumption and grid losses	7683	8519	8244	10394	10514	10535	10868	11301	10841	10913	10952	0.7	2.5	0.3	0.0
Fuel Inputs to Thermal Power Generation	**17483**	**19476**	**21201**	**23350**	**19991**	**18941**	**18810**	**17680**	**17855**	**17200**	**16726**	**1.9**	**-0.6**	**-0.6**	**-0.6**
Solids	4998	4958	4669	7835	7455	7351	6010	3884	3197	3006	2948	-0.7	4.8	-2.1	-3.5
Oil (including refinery gas)	634	553	342	422	485	517	562	593	619	652	685	-6.0	3.6	1.5	1.0
Gas (including derived gases)	10638	11913	13730	12403	9077	7972	9071	9725	10473	9800	9153	2.6	-4.1	0.0	0.0
Biomass & Waste	1213	2052	2460	2691	2974	3101	3168	3479	3566	3742	3939	7.3	1.9	0.6	1.1
Geothermal heat	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Hydrogen - Methanol	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Fuel Input to other conversion processes	**87355**	**91889**	**64643**	**65178**	**64076**	**61591**	**60210**	**59774**	**57881**	**56280**	**54749**	**-3.0**	**-0.1**	**-0.6**	**-0.5**
Refineries	83133	87341	59909	60132	58746	56655	55232	53506	51669	50303	48886	-3.2	-0.2	-0.6	-0.6
Biofuels and hydrogen production	0	0	229	548	1027	1005	995	990	991	1027	1075	0.0	16.2	-0.3	0.4
District heating	398	436	499	684	589	404	416	398	412	385	366	2.3	1.7	-3.4	-0.6
Derived gases, cokeries etc.	3824	4113	4007	3814	3714	3527	3568	4880	4808	4566	4421	0.5	-0.8	-0.4	1.1
Energy Branch Consumption	**5386**	**6376**	**5130**	**5278**	**5165**	**4885**	**4722**	**4622**	**4458**	**4336**	**4170**	**-0.5**	**0.1**	**-0.9**	**-0.6**
Non-Energy Uses	**10491**	**13013**	**17579**	**19188**	**18818**	**18033**	**18000**	**17912**	**17395**	**17309**	**17282**	**5.3**	**0.7**	**-0.4**	**-0.2**
Final Energy Demand	**50483**	**52293**	**51879**	**52226**	**50047**	**48683**	**47575**	**46820**	**46878**	**47305**	**47811**	**0.3**	**-0.4**	**-0.5**	**0.0**
by sector															
Industry	14829	15506	12206	13009	12882	12495	12214	11821	11790	12019	12195	-1.9	0.5	-0.5	0.0
- energy intensive industries	10303	10622	8224	8989	8775	8282	7953	7661	7590	7649	7601	-2.2	0.7	-1.0	-0.2
- other industrial sectors	4526	4884	3982	4020	4107	4213	4261	4160	4200	4370	4594	-1.3	0.3	0.4	0.4
Residential	10299	10143	11518	11174	10495	10397	10385	10458	10597	10818	11257	1.1	-0.9	-0.1	0.4
Tertiary	11099	11494	13120	12773	11768	11254	10671	10418	10297	10134	9821	1.7	-1.1	-1.0	-0.4
Transport	14256	15151	15036	15270	14901	14538	14305	14123	14193	14334	14539	0.5	-0.1	-0.4	0.1
by fuel															
Solids	1330	1515	1270	1258	1258	1197	1159	1079	1078	1051	1004	-0.5	-0.1	-0.8	-0.7
Oil	16482	18021	16158	15810	14806	14321	14046	13729	13734	13796	13872	-0.2	-0.9	-0.5	-0.1
Gas	21011	20346	22378	21045	19248	18292	17018	16175	15644	15497	15633	0.6	-1.5	-1.2	-0.4
Electricity	8408	8986	9189	10045	9742	9759	10029	10239	10715	11126	11356	0.9	0.6	0.3	0.6
Heat (from CHP and District Heating)	2893	2981	2106	2439	2461	2372	2329	2490	2632	2689	2770	-3.1	1.6	-0.6	0.9
Renewable energy forms	358	445	779	1626	2517	2719	2958	3059	3000	3044	3049	8.1	12.4	1.6	0.2
Other fuels (hydrogen, ethanol)	0	0	0	4	14	23	36	48	76	103	127	-6.9	141.5	10.3	6.5
RES in Gross Final Energy Consumption [(A)]	**684**	**1231**	**2071**	**4726**	**7338**	**7998**	**8536**	**8946**	**9339**	**10240**	**11141**	**11.7**	**13.5**	**1.5**	**1.3**
TOTAL GHG emissions (Mt of CO2 eq.)	**218.8**	**221.2**	**212.6**	**213.5**	**195.1**	**186.3**	**176.3**	**159.9**	**144.1**	**138.6**	**137.1**	**-0.3**	**-0.9**	**-1.0**	**-1.3**
of which ETS sectors (2013 scope) GHG emissions		107.0	96.6	107.5	95.7	90.7	84.9	71.3	56.7	51.7	49.8		-0.1	-1.2	-2.6
of which non ETS sectors GHG emissions		114.2	116.0	106.0	99.4	95.7	91.4	88.5	87.3	86.9	87.2		-1.5	-0.8	-0.2
CO_2 Emissions (energy related)	**168.4**	**178.4**	**175.2**	**180.4**	**162.4**	**154.5**	**146.6**	**130.4**	**114.9**	**113.4**	**111.9**	**0.4**	**-0.8**	**-1.0**	**-1.3**
Power generation/District heating	51.8	55.4	57.6	66.3	55.9	52.3	49.3	37.6	23.6	22.5	21.0	1.1	-0.3	-1.3	-4.2
Energy Branch	11.2	12.4	8.9	8.8	8.5	8.0	7.7	7.4	7.1	6.9	6.6	-2.2	-0.5	-0.9	-0.8
Industry	26.7	29.3	22.9	24.3	23.2	22.8	21.5	19.4	18.7	18.7	18.7	-1.5	0.2	-0.8	-0.7
Residential	18.9	17.9	20.6	18.6	17.2	16.1	15.4	15.1	14.9	14.9	15.2	0.9	-1.8	-1.1	-0.1
Tertiary	17.5	18.2	21.1	18.5	16.2	15.0	13.2	12.2	11.6	11.1	10.8	1.9	-2.6	-2.1	-1.0
Transport	42.3	45.1	44.1	43.9	41.3	40.2	39.5	38.9	39.0	39.2	39.6	0.4	-0.7	-0.4	0.0
CO_2 Emissions (non energy related)	**7.1**	**7.9**	**7.9**	**7.9**	**7.9**	**7.6**	**6.1**	**5.9**	**5.6**	**1.6**	**1.4**	**1.0**	**0.0**	**-2.5**	**-7.2**
Non-CO_2 GHG emissions	**43.3**	**35.0**	**29.5**	**25.2**	**24.9**	**24.3**	**23.6**	**23.5**	**23.6**	**23.7**	**23.7**	**-3.8**	**-1.7**	**-0.5**	**0.0**
TOTAL GHG emissions Index (1990=100)	**101.0**	**102.2**	**98.2**	**98.6**	**90.1**	**86.0**	**81.4**	**73.8**	**66.5**	**64.0**	**63.3**				

Source: PRIMES

SUMMARY ENERGY BALANCE AND INDICATORS (B)															Netherlands: Reference scenario
	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050	'00-'10	'10-'20	'20-'30	'30-'50
												Annual % Change			
Main Energy System Indicators															
Population (Million)	15.864	16.306	16.575	16.951	17.219	17.424	17.578	17.650	17.620	17.504	17.358	0.4	0.4	0.2	-0.1
GDP (in 000 M€10)	513.6	548.4	588.4	636.8	688.1	727.5	767.2	811.6	866.0	927.4	994.4	1.4	1.6	1.1	1.3
Gross Inl. Cons./GDP (toe/M€10)	149.1	150.5	147.7	140.3	123.3	112.3	104.6	97.8	90.9	84.7	79.3	-0.1	-1.8	-1.6	-1.4
Carbon intensity (t of CO_2/toe of GIC)	2.20	2.16	2.02	2.02	1.91	1.89	1.83	1.64	1.46	1.44	1.42	-0.9	-0.5	-0.5	-1.2
Import Dependency %	38.7	38.4	30.7	32.5	31.2	40.6	47.1	43.9	42.2	45.5	51.9				
Total energy-rel. and other mitigation costs [B] (in 000 M€10)	48.1	61.6	71.7	91.1	102.4	104.3	108.0	110.1	112.5	116.9	121.1	4.1	3.6	0.5	0.6
as % of GDP	9.4	11.2	12.2	14.3	14.9	14.3	14.1	13.6	13.0	12.6	12.2				
Energy intensity indicators															
Industry (Energy on Value added, index 2000=100)	100.0	100.1	75.0	74.9	69.6	64.4	59.4	54.3	51.2	49.4	47.4	-2.8	-0.7	-1.6	-1.1
Residential (Energy on Private Income, index 2000=100)	100.0	94.1	106.4	96.8	84.7	79.4	74.9	70.7	66.0	61.5	58.0	0.6	-2.3	-1.2	-1.3
Tertiary (Energy on Value added, index 2000=100)	100.0	95.7	99.0	88.5	74.9	67.5	60.6	55.8	51.6	47.2	42.5	-0.1	-2.7	-2.1	-1.8
Passenger transport (toe/Mpkm)	51.3	50.0	49.6	47.4	42.0	38.0	35.0	33.3	32.4	32.2	32.1	-0.3	-1.7	-1.8	-0.4
Freight transport (toe/Mtkm)	38.2	40.8	42.6	41.1	40.2	38.5	36.6	35.4	34.6	33.9	33.3	1.1	-0.6	-0.9	-0.5
Carbon Intensity indicators															
Electricity and Steam production (t of CO_2/MWh)	0.40	0.38	0.37	0.38	0.33	0.31	0.28	0.21	0.13	0.12	0.11	-0.6	-1.4	-1.5	-4.7
Final energy demand (t of CO_2/toe)	2.09	2.11	2.09	2.02	1.96	1.93	1.88	1.83	1.80	1.78	1.76	0.0	-0.7	-0.4	-0.3
Industry	1.80	1.89	1.87	1.87	1.80	1.82	1.76	1.64	1.59	1.56	1.53	0.4	-0.4	-0.2	-0.7
Residential	1.84	1.77	1.79	1.66	1.64	1.55	1.48	1.44	1.41	1.38	1.35	-0.2	-0.9	-1.0	-0.5
Tertiary	1.58	1.59	1.61	1.45	1.38	1.34	1.23	1.17	1.12	1.09	1.10	0.2	-1.5	-1.1	-0.6
Transport [C]	2.97	2.98	2.93	2.87	2.77	2.77	2.76	2.75	2.75	2.74	2.73	-0.1	-0.6	0.0	-0.1
Indicators for renewables															
Share of RES in Gross Final Energy Consumption [D] (%)	1.3	2.3	3.9	8.8	14.3	16.0	17.5	18.6	19.5	21.2	22.8				
RES in transport (%)	0.0	0.1	2.2	5.1	10.1	10.5	10.8	11.1	11.2	11.8	12.6				
Gross Electricity generation by source (in GWh_e) [E]	**89631**	**100219**	**118140**	**132991**	**130483**	**131124**	**136192**	**139862**	**144878**	**148270**	**151196**	**2.8**	**1.0**	**0.4**	**0.5**
Nuclear energy	3926	3997	3969	3967	3971	4094	4973	11527	11527	11475	11475	0.1	0.0	2.3	4.3
Solids	24276	23500	22588	38199	37703	38259	32034	20315	13664	12747	12487	-0.7	5.3	-1.6	-4.6
Oil (including refinery gas)	2641	2262	1253	1068	1164	1307	1488	2427	2514	2765	2617	-7.2	-0.7	2.5	2.9
Gas (including derived gases)	54606	61588	77566	66776	46594	40193	48336	53209	60491	55106	49151	3.6	-5.0	0.4	0.1
Biomass-waste	3203	6683	8606	11322	12956	13582	13689	15273	14765	16154	16289	10.4	4.2	0.6	0.9
Hydro (pumping excluded)	142	88	105	105	105	106	106	106	106	106	106	-3.0	0.0	0.0	0.0
Wind	829	2067	3993	11431	27233	32563	34532	35950	40683	48281	57276	17.0	21.2	2.4	2.6
Solar	8	34	60	123	756	1021	1034	1056	1129	1197	1264	22.8	28.9	3.2	1.0
Geothermal and other renewables	0	0	0	0	0	0	0	0	0	440	530	-10.8	0.0	-100.0	0.0
Other fuels (hydrogen, methanol)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Net Generation Capacity in MW_e	**20499**	**22491**	**25815**	**32456**	**38110**	**40750**	**40379**	**41945**	**43487**	**44902**	**46633**	**2.3**	**4.0**	**0.6**	**0.7**
Nuclear energy	485	486	486	486	486	481	586	1367	1367	1367	1367	0.0	0.0	1.9	4.3
Renewable energy	496	1307	2394	4788	10450	12856	13434	13956	15573	18250	21088	17.0	15.9	2.5	2.3
Hydro (pumping excluded)	37	37	37	37	37	37	37	37	37	37	37	0.0	0.1	0.0	0.0
Wind	446	1219	2269	4619	9624	11793	12359	12862	14403	16866	19605	17.7	15.5	2.5	2.3
Solar	13	51	88	131	788	1025	1037	1057	1132	1202	1272	21.1	24.5	2.8	1.0
Other renewables (tidal etc.)	0	0	0	0	0	0	0	0	0	144	173	0.0	0.0	0.0	0.0
Thermal power	19518	20698	22935	27182	27175	27413	26359	26622	26547	25286	24178	1.6	1.7	-0.3	-0.4
of which cogeneration units	7372	10754	10394	9993	10042	9206	8955	9969	12032	12635	12928	3.5	-0.3	-1.1	1.9
of which CCS units	0	0	0	0	227	227	227	585	2775	2376	2459	0.0	0.0	0.0	12.7
Solids fired	4200	4195	4183	5191	6014	6014	5615	5348	3471	3471	3471	0.0	3.7	-0.7	-2.4
Gas fired	13645	14706	16896	19707	18390	18307	17650	18208	19642	18427	16925	2.2	0.9	-0.4	-0.2
Oil fired	688	674	655	515	692	981	978	963	899	1025	1400	-0.5	0.6	3.5	1.8
Biomass-waste fired	985	1123	1201	1769	2078	2111	2117	2104	2535	2363	2382	2.0	5.6	0.2	0.6
Hydrogen plants	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Geothermal heat	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Avg. Load factor of net power capacity [F] (%)	47.9	48.8	50.6	44.9	37.3	35.1	36.9	36.5	36.7	36.4	35.8				
Electricity indicators															
Efficiency of gross thermal power generation (%)	41.7	41.5	44.6	43.2	42.3	42.4	43.7	44.4	44.0	43.4	41.4				
% of gross electricity from CHP	37.6	29.4	33.2	33.0	34.1	33.4	32.3	36.7	46.7	44.6	40.0				
% of electricity from CCS	0.0	0.0	0.0	0.0	1.1	1.3	1.7	3.8	3.6	3.5	3.4				
Carbon free gross electricity generation (%)	9.0	12.8	14.2	20.3	34.5	39.2	39.9	45.7	47.1	52.4	57.5				
- nuclear	4.4	4.0	3.4	3.0	3.0	3.1	3.7	8.2	8.0	7.7	7.6				
- renewable energy forms	4.7	8.9	10.8	17.3	31.5	36.1	36.2	37.5	39.1	44.6	49.9				
Transport sector															
Passenger transport activity (Gpkm)	**184.4**	**194.8**	**197.7**	**204.2**	**211.0**	**220.1**	**229.5**	**236.7**	**244.1**	**249.8**	**255.5**	**0.7**	**0.7**	**0.8**	**0.5**
Public road transport	11.2	11.8	12.1	12.7	13.3	13.7	14.1	14.7	15.2	15.7	16.1	0.8	0.9	0.6	0.7
Private cars and motorcycles	143.3	151.5	154.0	157.1	160.0	164.7	169.2	172.2	175.1	177.6	179.9	0.7	0.4	0.6	0.3
Rail	16.1	16.7	17.0	18.1	19.3	20.6	22.1	23.8	25.6	26.6	27.5	0.5	1.3	1.4	1.1
Aviation	13.0	14.2	13.9	15.7	17.7	20.3	23.3	25.2	27.3	29.1	31.1	0.7	2.5	2.8	1.5
Inland navigation	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.9	0.9	0.9	0.9	-0.5	0.9	1.2	0.4
Freight transport activity (Gtkm)	**125.5**	**132.4**	**122.6**	**135.8**	**150.6**	**160.7**	**171.5**	**176.4**	**181.4**	**186.0**	**190.5**	**-0.2**	**2.1**	**1.3**	**0.5**
Trucks	79.6	84.2	76.3	85.8	96.3	101.8	107.6	110.6	113.7	116.4	119.2	-0.4	2.4	1.1	0.5
Rail	4.5	5.9	5.9	6.6	7.4	8.1	8.9	9.1	9.4	9.7	9.9	2.7	2.2	1.9	0.6
Inland navigation	41.4	42.4	40.3	43.5	46.9	50.8	55.0	56.7	58.4	59.9	61.4	-0.3	1.5	1.6	0.6
Energy demand in transport (ktoe) [G]	**14255**	**15151**	**15036**	**15269**	**14900**	**14537**	**14304**	**14121**	**14192**	**14332**	**14537**	**0.5**	**-0.1**	**-0.4**	**0.1**
Public road transport	244	250	257	263	264	261	259	263	268	271	276	0.6	0.3	-0.2	0.3
Private cars and motorcycles	5741	5720	6036	5707	4973	4506	4226	4150	4086	4053	4046	0.5	-1.9	-1.6	-0.2
Trucks	4380	5091	4941	5284	5728	5840	5917	5883	5910	5936	5983	1.2	1.5	0.3	0.1
Rail	183	171	182	192	203	216	224	224	221	217	213	-0.1	1.1	1.0	-0.3
Aviation	3382	3712	3463	3653	3550	3518	3466	3386	3487	3631	3792	0.2	0.2	-0.2	0.5
Inland navigation	326	206	158	170	182	196	210	215	220	224	227	-7.0	1.4	1.5	0.4

Source: PRIMES

Poland: Reference scenario												SUMMARY ENERGY BALANCE AND INDICATORS (A)			
ktoe	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**	**'00-'10**	**'10-'20**	**'20-'30**	**'30-'50**
												Annual % Change			
Production (incl.recovery of products)	**79969**	**78943**	**67824**	**67942**	**75877**	**81247**	**77845**	**80276**	**83391**	**84597**	**82764**	**-1.6**	**1.1**	**0.3**	**0.3**
Solids	71299	68857	55381	53720	55964	50502	37771	37252	36490	36803	34603	-2.5	0.1	-3.9	-0.4
Oil	1096	1181	1172	1016	990	907	839	616	326	21	0	0.7	-1.7	-1.6	-100.0
Natural gas	3317	3887	3695	3613	7477	13245	13018	12170	12851	13270	13242	1.1	7.3	5.7	0.1
Nuclear	0	0	0	0	0	2985	11158	14133	16958	16958	16958	0.0	0.0	0.0	2.1
Renewable energy sources	4257	5019	7576	9592	11447	13609	15060	16105	16766	17545	17962	5.9	4.2	2.8	0.9
Hydro	181	189	251	298	335	331	414	434	454	469	491	3.3	2.9	2.1	0.9
Biomass & Waste	4073	4806	7166	8855	9844	11574	12655	13372	13841	14474	14754	5.8	3.2	2.5	0.8
Wind	0	12	143	371	1116	1375	1469	1610	1694	1750	1867	78.7	22.8	2.8	1.2
Solar and others	0	0	2	27	64	165	239	351	387	417	408	0.0	38.8	14.2	2.7
Geothermal	3	11	13	41	89	164	282	338	390	436	442	16.3	20.8	12.2	2.3
Net Imports	**9585**	**16437**	**32114**	**41586**	**37817**	**35889**	**39891**	**39100**	**37442**	**37879**	**40050**	**12.9**	**1.6**	**0.5**	**0.0**
Solids	-16353	-13039	-2814	2342	249	2986	5207	2403	865	631	2204	-16.1	0.0	35.5	-4.2
Oil	19879	21971	25735	27473	27848	27412	27288	27205	27045	27457	27206	2.6	0.8	-0.2	0.0
- Crude oil and Feedstocks	18450	18412	23567	24827	25090	24615	24460	24343	24134	24501	24259	2.5	0.6	-0.3	0.0
- Oil products	1429	3559	2168	2646	2758	2797	2828	2862	2910	2956	2947	4.3	2.4	0.3	0.2
Natural gas	6607	8531	8874	11495	7929	4522	5979	7792	7643	7872	8653	3.0	-1.1	-2.8	1.9
Electricity	-548	-962	-116	-386	-273	-251	-223	-179	-30	-83	-53	-14.3	8.9	-2.0	-6.9
Gross Inland Consumption	**89818**	**93076**	**101704**	**109270**	**113399**	**116816**	**117402**	**119024**	**120465**	**122094**	**122419**	**1.3**	**1.1**	**0.3**	**0.2**
Solids	56291	54612	54608	56062	56214	53488	42978	39655	37355	37433	36806	-0.3	0.3	-2.6	-0.8
Oil	19862	22233	26400	28234	28548	28009	27806	27490	27032	27151	26875	2.9	0.8	-0.3	-0.2
Natural gas	9964	12237	12807	15107	15400	17756	18984	19941	20465	21087	21831	2.5	1.9	2.1	0.7
Nuclear	0	0	0	0	0	2985	11158	14133	16958	16958	16958	0.0	0.0	0.0	2.1
Electricity	-548	-962	-116	-386	-273	-251	-223	-179	-30	-83	-53	-14.3	8.9	-2.0	-6.9
Renewable energy forms	4250	4956	8006	10254	13510	14828	16699	17984	18685	19547	20002	6.5	5.4	2.1	0.9
as % in Gross Inland Consumption															
Solids	62.7	58.7	53.7	51.3	49.6	45.8	36.6	33.3	31.0	30.7	30.1				
Oil	22.1	23.9	26.0	25.8	25.2	24.0	23.7	23.1	22.4	22.2	22.0				
Natural gas	11.1	13.1	12.6	13.8	13.6	15.2	16.2	16.8	17.0	17.3	17.8				
Nuclear	0.0	0.0	0.0	0.0	0.0	2.6	9.5	11.9	14.1	13.9	13.9				
Renewable energy forms	4.7	5.3	7.9	9.4	11.9	12.7	14.2	15.1	15.5	16.0	16.3				
Gross Electricity Generation in GWh_e	**143148**	**155331**	**157061**	**180512**	**204760**	**214708**	**219831**	**233340**	**246030**	**267113**	**280114**	**0.9**	**2.7**	**0.7**	**1.2**
Self consumption and grid losses	27978	28523	26896	28573	32148	33577	33624	40220	44356	50666	59524	-0.4	1.8	0.5	2.9
Fuel Inputs to Thermal Power Generation	**36485**	**38634**	**38214**	**39565**	**41078**	**39999**	**31975**	**29516**	**28239**	**30586**	**30565**	**0.5**	**0.7**	**-2.5**	**-0.2**
Solids	35108	36212	34213	36062	36890	35363	26656	23155	22043	23359	23548	-0.3	0.8	-3.2	-0.6
Oil (including refinery gas)	245	184	171	184	137	74	55	111	111	171	90	-3.5	-2.2	-8.8	2.6
Gas (including derived gases)	975	1692	2065	1091	1720	2062	2314	2562	2759	3174	2911	7.8	-1.8	3.0	1.2
Biomass & Waste	158	546	1766	2228	2331	2500	2951	3689	3326	3882	4016	27.3	2.8	2.4	1.6
Geothermal heat	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Hydrogen - Methanol	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Fuel Input to other conversion processes	**33708**	**31669**	**39240**	**41185**	**42962**	**45713**	**53102**	**55790**	**57359**	**56748**	**56486**	**1.5**	**0.9**	**2.1**	**0.3**
Refineries	19825	19521	24892	26295	26581	26012	25798	25459	24943	25005	24718	2.3	0.7	-0.3	-0.2
Biofuels and hydrogen production	0	54	886	1136	1702	1767	1790	1805	1748	1744	1775	0.0	6.7	0.5	0.0
District heating	4179	3465	3712	4315	4277	4923	5139	5314	5088	5008	5514	-1.2	1.4	1.9	0.4
Derived gases, cokeries etc.	9705	8629	9750	9439	10402	13011	20376	23212	25581	24992	24479	0.0	0.6	7.0	0.9
Energy Branch Consumption	**6664**	**6111**	**6618**	**6949**	**7538**	**7621**	**7191**	**7551**	**7721**	**8074**	**8632**	**-0.1**	**1.3**	**-0.5**	**0.9**
Non-Energy Uses	**4357**	**4545**	**4775**	**5477**	**6045**	**6225**	**6375**	**6524**	**6624**	**6641**	**6583**	**0.9**	**2.4**	**0.5**	**0.2**
Final Energy Demand	**55586**	**58199**	**66319**	**72977**	**75857**	**77244**	**78116**	**79620**	**80624**	**81433**	**81474**	**1.8**	**1.4**	**0.3**	**0.2**
by sector															
Industry	18984	16593	15384	18521	20014	20943	21599	22477	22863	23409	23578	-2.1	2.7	0.8	0.4
- energy intensive industries	13512	11400	10540	12573	13575	13932	14312	14933	15068	15533	15588	-2.5	2.6	0.5	0.4
- other industrial sectors	5472	5193	4844	5948	6439	7011	7286	7544	7795	7876	7990	-1.2	2.9	1.2	0.5
Residential	17191	18343	21009	21792	21788	22506	22694	23329	23618	23660	23530	2.0	0.4	0.4	0.2
Tertiary	9623	10825	12336	13133	13723	13466	13239	13124	13137	13315	13200	2.5	1.1	-0.4	0.0
Transport	9789	12439	17589	19531	20332	20329	20584	20690	21006	21049	21165	6.0	1.5	0.1	0.1
by fuel															
Solids	13466	11474	13393	13142	12752	11697	10232	10482	10104	9475	8870	-0.1	-0.5	-2.2	-0.7
Oil	15341	17711	20488	22711	22744	22352	22129	21797	21420	21457	21397	2.9	1.1	-0.3	-0.2
Gas	7520	8733	9485	11187	10330	11691	12402	13001	13118	13157	13784	2.3	0.9	1.8	0.5
Electricity	8482	9064	10188	11798	13637	14450	15076	15717	16603	17813	18228	1.8	3.0	1.0	1.0
Heat (from CHP and District Heating)	6886	7056	6968	7062	7365	7685	7864	8058	8327	8496	8266	0.1	0.6	0.7	0.2
Renewable energy forms	3890	4162	5796	7076	9029	9369	10409	10558	11040	11017	10908	4.1	4.5	1.4	0.2
Other fuels (hydrogen, ethanol)	0	0	0	0	0	1	3	6	11	17	22	0.0	53.6	24.0	10.1
RES in Gross Final Energy Consumption [(A)]	**3764**	**4254**	**6418**	**8517**	**12125**	**13315**	**14958**	**16004**	**16700**	**17380**	**17772**	**5.5**	**6.6**	**2.1**	**0.9**
TOTAL GHG emissions (Mt of CO2 eq.)	**386.5**	**391.7**	**400.8**	**422.8**	**425.4**	**418.6**	**371.3**	**338.3**	**318.0**	**291.1**	**260.4**	**0.4**	**0.6**	**-1.3**	**-1.8**
of which ETS sectors (2013 scope) GHG emissions		221.9	209.7	230.0	233.4	229.7	189.9	157.6	139.2	114.9	85.5		1.1	-2.0	-3.9
of which non ETS sectors GHG emissions		169.7	191.1	192.8	191.9	188.9	181.5	180.7	178.8	176.2	174.9		0.0	-0.6	-0.2
CO_2 Emissions (energy related)	**302.1**	**301.6**	**313.4**	**331.4**	**329.8**	**322.8**	**280.4**	**247.1**	**226.5**	**217.0**	**187.4**	**0.4**	**0.5**	**-1.6**	**-2.0**
Power generation/District heating	166.1	169.1	163.7	169.6	170.1	165.4	129.5	95.4	78.3	71.7	44.2	-0.1	0.4	-2.7	-5.2
Energy Branch	10.2	7.7	8.4	9.5	10.8	10.8	10.1	9.6	9.0	8.6	7.9	-1.9	2.5	-0.7	-1.2
Industry	52.4	37.7	31.4	40.8	39.7	42.1	41.9	42.9	40.0	38.4	37.9	-5.0	2.4	0.5	-0.5
Residential	27.4	31.0	39.0	36.7	35.2	33.0	28.7	29.7	29.5	29.2	28.9	3.6	-1.0	-2.0	0.1
Tertiary	18.3	20.6	21.9	20.8	19.3	17.0	15.4	14.5	13.6	13.0	12.3	1.8	-1.3	-2.2	-1.1
Transport	27.6	35.5	49.0	54.1	54.8	54.5	55.0	55.1	56.1	56.0	56.1	5.9	1.1	0.0	0.1
CO_2 Emissions (non energy related)	**15.8**	**18.8**	**18.8**	**26.0**	**28.3**	**29.1**	**26.1**	**27.1**	**27.1**	**9.0**	**8.1**	**1.7**	**4.2**	**-0.8**	**-5.7**
Non-CO_2 GHG emissions	**68.6**	**71.3**	**68.6**	**65.4**	**67.2**	**66.7**	**64.8**	**64.1**	**64.4**	**65.1**	**64.9**	**0.0**	**-0.2**	**-0.4**	**0.0**
TOTAL GHG emissions Index (1990=100)	**84.4**	**85.5**	**87.5**	**92.3**	**92.9**	**91.4**	**81.1**	**73.9**	**69.4**	**63.5**	**56.8**				

Source: PRIMES

SUMMARY ENERGY BALANCE AND INDICATORS (B)															Poland: Reference scenario
	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050	'00-'10	'10-'20	'20-'30	'30-'50
												Annual % Change			
Main Energy System Indicators															
Population (Million)	38.654	38.174	38.167	38.369	38.395	38.121	37.565	36.857	36.112	35.343	34.543	-0.1	0.1	-0.2	-0.4
GDP (in 000 M€10)	241.9	281.6	354.6	417.0	474.3	520.2	564.2	606.6	646.1	676.0	697.2	3.9	3.0	1.7	1.1
Gross Inl. Cons./GDP (toe/M€10)	371.3	330.5	286.8	262.0	239.1	224.6	208.1	196.2	186.4	180.6	175.6	-2.5	-1.8	-1.4	-0.8
Carbon intensity (t of CO_2/toe of GIC)	3.36	3.24	3.08	3.03	2.91	2.76	2.39	2.08	1.88	1.78	1.53	-0.9	-0.6	-2.0	-2.2
Import Dependency %	10.6	17.6	31.5	38.0	33.3	30.6	33.9	32.8	31.0	30.9	32.6				
Total energy-rel. and other mitigation costs [B] (in 000 M€10)	36.6	49.7	74.7	94.2	107.5	119.8	131.4	137.8	143.8	151.3	156.2	7.4	3.7	2.0	0.9
as % of GDP	15.1	17.7	21.1	22.6	22.7	23.0	23.3	22.7	22.3	22.4	22.4				
Energy intensity indicators															
Industry (Energy on Value added, index 2000=100)	100.0	61.3	36.0	34.7	32.2	30.5	28.6	27.4	25.9	25.5	25.0	-9.7	-1.1	-1.2	-0.7
Residential (Energy on Private Income, index 2000=100)	100.0	92.5	86.4	75.0	65.1	60.8	56.1	53.4	50.5	48.2	46.4	-1.4	-2.8	-1.5	-0.9
Tertiary (Energy on Value added, index 2000=100)	100.0	100.8	99.2	90.8	83.5	74.6	67.5	62.1	58.3	56.4	54.2	-0.1	-1.7	-2.1	-1.1
Passenger transport (toe/Mpkm)	31.8	29.2	27.1	26.5	24.5	22.0	20.3	19.4	18.8	18.4	18.1	-1.6	-1.0	-1.9	-0.6
Freight transport (toe/Mtkm)	21.8	28.8	29.7	29.1	28.3	27.0	25.8	24.9	24.2	23.7	23.3	3.1	-0.5	-0.9	-0.5
Carbon Intensity indicators															
Electricity and Steam production (t of CO_2/MWh)	0.70	0.68	0.65	0.62	0.56	0.52	0.40	0.28	0.22	0.19	0.11	-0.8	-1.5	-3.3	-6.1
Final energy demand (t of CO_2/toe)	2.26	2.14	2.13	2.09	1.96	1.90	1.80	1.79	1.73	1.68	1.66	-0.6	-0.8	-0.8	-0.4
Industry	2.76	2.27	2.04	2.20	1.99	2.01	1.94	1.91	1.75	1.64	1.61	-3.0	-0.3	-0.2	-0.9
Residential	1.59	1.69	1.86	1.68	1.61	1.47	1.26	1.27	1.25	1.24	1.23	1.5	-1.4	-2.4	-0.1
Tertiary	1.91	1.90	1.78	1.59	1.40	1.26	1.16	1.10	1.03	0.97	0.94	-0.7	-2.3	-1.9	-1.1
Transport [C]	2.82	2.85	2.79	2.77	2.69	2.68	2.67	2.67	2.67	2.66	2.65	-0.1	-0.3	-0.1	0.0
Indicators for renewables															
Share of RES in Gross Final Energy Consumption [D] (%)	6.4	6.9	9.2	11.3	15.4	16.6	18.5	19.3	19.8	20.3	20.5				
RES in transport (%)	0.0	0.4	6.0	7.0	10.0	10.6	10.7	10.9	10.6	10.7	10.9				
Gross Electricity generation by source (in GWh_e) [E]	**143174**	**155359**	**157089**	**180512**	**204760**	**214708**	**219831**	**233340**	**246030**	**267113**	**280114**	**0.9**	**2.7**	**0.7**	**1.2**
Nuclear energy	0	0	0	0	0	12732	48565	61641	74059	74059	74059	0.0	0.0	0.0	2.1
Solids	135888	142160	136592	155422	165453	156315	117936	109855	109047	123189	135679	0.1	1.9	-3.3	0.7
Oil (including refinery gas)	1916	2757	2892	860	673	385	301	649	605	1010	510	4.2	-13.6	-7.7	2.7
Gas (including derived gases)	2707	6357	6473	7066	10960	13171	16261	18027	19550	22486	20322	9.1	5.4	4.0	1.1
Biomass-waste	552	1749	6548	9380	10759	11888	14302	18395	16397	19119	20605	28.1	5.1	2.9	1.8
Hydro (pumping excluded)	2106	2201	2920	3459	3893	3855	4812	5051	5279	5453	5707	3.3	2.9	2.1	0.9
Wind	5	135	1664	4319	12972	15987	17084	18717	19697	20344	21711	78.7	22.8	2.8	1.2
Solar	0	0	0	6	49	377	571	1005	1396	1452	1521	0.0	0.0	27.9	5.0
Geothermal and other renewables	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Other fuels (hydrogen, methanol)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Net Generation Capacity in MW_e	**27648**	**28929**	**31034**	**34872**	**40239**	**44393**	**48758**	**50886**	**53700**	**57083**	**58084**	**1.2**	**2.6**	**1.9**	**0.9**
Nuclear energy	0	0	0	0	0	1671	6315	8000	9600	9600	9600	0.0	0.0	0.0	2.1
Renewable energy	813	1015	2199	3582	7827	9946	10839	11880	12681	13036	13657	10.5	13.5	3.3	1.2
Hydro (pumping excluded)	809	932	1019	1104	1261	1265	1467	1515	1554	1619	1681	2.3	2.2	1.5	0.7
Wind	4	83	1180	2472	6515	8331	8843	9385	9742	9972	10460	76.6	18.6	3.1	0.8
Solar	0	0	0	6	51	350	530	980	1386	1445	1516	0.0	0.0	26.5	5.4
Other renewables (tidal etc.)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Thermal power	26835	27914	28835	31290	32412	32775	31603	31006	31419	34447	34827	0.7	1.2	-0.3	0.5
of which cogeneration units	9354	9826	8116	8316	9333	9008	9804	9980	10971	12677	11836	-1.4	1.4	0.5	0.9
of which CCS units	0	0	0	0	229	229	229	2948	4628	6621	10994	0.0	0.0	0.0	21.3
Solids fired	24918	25406	26327	26719	24936	22842	20417	18689	18961	20913	22092	0.6	-0.5	-2.0	0.4
Gas fired	787	1329	1331	2823	5702	8281	9643	10191	10277	11168	10115	5.4	15.7	5.4	0.2
Oil fired	496	498	494	446	480	358	242	379	367	355	277	0.0	-0.3	-6.6	0.7
Biomass-waste fired	633	680	683	1302	1294	1294	1301	1748	1813	2011	2342	0.8	6.6	0.1	3.0
Hydrogen plants	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Geothermal heat	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Avg. Load factor of net power capacity [F] (%)	53.8	56.0	52.3	54.3	53.5	51.1	48.0	47.8	47.5	48.0	48.2				
Electricity indicators															
Efficiency of gross thermal power generation (%)	33.2	34.1	34.3	37.5	39.3	39.1	40.0	42.8	44.3	46.6	49.8				
% of gross electricity from CHP	16.1	16.8	17.6	21.0	25.1	23.3	23.4	25.8	26.7	28.7	24.9				
% of electricity from CCS	0.0	0.0	0.0	0.0	1.2	0.8	1.1	12.8	18.6	24.5	38.6				
Carbon free gross electricity generation (%)	1.9	2.6	7.1	9.5	13.5	20.9	38.8	44.9	47.5	45.1	44.1				
- nuclear	0.0	0.0	0.0	0.0	0.0	5.9	22.1	26.4	30.1	27.7	26.4				
- renewable energy forms	1.9	2.6	7.1	9.5	13.5	15.0	16.7	18.5	17.4	17.4	17.7				
Transport sector															
Passenger transport activity (Gpkm)	**215.3**	**256.4**	**354.5**	**387.6**	**423.9**	**456.8**	**492.2**	**516.8**	**542.5**	**557.5**	**572.7**	**5.1**	**1.8**	**1.5**	**0.8**
Public road transport	31.7	29.3	21.6	21.8	21.9	22.7	23.5	24.1	24.7	25.1	25.5	-3.8	0.1	0.7	0.4
Private cars and motorcycles	153.6	201.2	303.3	331.6	362.2	386.0	410.7	428.9	447.7	458.0	468.4	7.0	1.8	1.3	0.7
Rail	27.0	20.9	21.0	23.9	27.2	33.0	40.1	43.4	46.9	48.5	50.1	-2.5	2.6	4.0	1.1
Aviation	2.8	4.8	8.4	10.2	12.4	14.8	17.6	20.1	22.9	25.6	28.5	11.7	4.0	3.6	2.4
Inland navigation	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	-1.5	1.7	1.4	0.7
Freight transport activity (Gtkm)	**130.3**	**162.2**	**259.7**	**307.2**	**340.5**	**367.8**	**397.1**	**414.1**	**431.8**	**439.9**	**448.2**	**7.1**	**2.7**	**1.6**	**0.6**
Trucks	75.0	111.8	210.8	254.1	281.4	301.5	322.7	336.1	350.2	356.2	362.4	10.9	2.9	1.4	0.6
Rail	54.0	50.0	48.7	52.9	58.8	66.0	74.0	77.6	81.2	83.3	85.4	-1.0	1.9	2.3	0.7
Inland navigation	1.2	0.4	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.4	-16.8	2.9	3.1	0.7
Energy demand in transport (ktoe) [G]	**9700**	**12164**	**17337**	**19219**	**20017**	**19997**	**20242**	**20343**	**20660**	**20698**	**20811**	**6.0**	**1.4**	**0.1**	**0.1**
Public road transport	417	378	292	295	296	300	303	305	309	309	310	-3.5	0.2	0.2	0.1
Private cars and motorcycles	6093	6739	8783	9339	9341	8959	8821	8789	8862	8876	8937	3.7	0.6	-0.6	0.1
Trucks	2369	4254	7397	8601	9277	9544	9834	9877	10001	9958	9964	12.1	2.3	0.6	0.1
Rail	540	468	355	382	413	445	486	499	518	524	530	-4.1	1.5	1.7	0.4
Aviation	274	319	508	600	688	747	795	871	967	1027	1067	6.4	3.1	1.5	1.5
Inland navigation	6	5	2	2	2	3	3	3	3	3	3	-10.5	1.9	1.4	0.4

Source: PRIMES

Portugal: Reference scenario											SUMMARY ENERGY BALANCE AND INDICATORS (A)				
ktoe	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**	**'00-'10**	**'10-'20**	**'20-'30**	**'30-'50**
												Annual % Change			
Production (incl.recovery of products)	**3891**	**3615**	**5629**	**6062**	**6798**	**7669**	**8427**	**9188**	**9425**	**9600**	**9767**	**3.8**	**1.9**	**2.2**	**0.7**
Solids	0	0	0	0	0	0	0	0	0	0	0	989.0	-100.0	0.0	0.0
Oil	0	0	48	48	48	48	48	48	48	48	48	174.1	0.0	0.0	0.0
Natural gas	45	0	0	0	228	247	160	186	223	179	171	0.0	0.0	-3.5	0.3
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Renewable energy sources	3846	3615	5581	6014	6521	7374	8219	8954	9154	9373	9549	3.8	1.6	2.3	0.8
Hydro	974	407	1388	950	968	986	1023	1085	1118	1110	1145	3.6	-3.5	0.6	0.6
Biomass & Waste	2770	2967	3137	3513	3645	3770	3939	4017	4066	4065	4004	1.3	1.5	0.8	0.1
Wind	14	152	790	1107	1181	1462	1840	2022	2043	2065	2087	49.2	4.1	4.5	0.6
Solar and others	18	23	76	247	520	953	1216	1362	1444	1650	1829	15.3	21.1	8.9	2.1
Geothermal	70	66	190	197	207	203	202	467	484	483	483	10.5	0.9	-0.3	4.5
Net Imports	**21880**	**24768**	**18734**	**18330**	**17390**	**15490**	**14486**	**14285**	**14083**	**14083**	**14039**	**-1.5**	**-0.7**	**-1.8**	**-0.2**
Solids	3914	3225	1629	1657	1157	136	71	29	28	27	26	-8.4	-3.4	-24.4	-4.9
Oil	15847	17063	12583	12050	11461	10934	10838	10943	10966	11073	11199	-2.3	-0.9	-0.6	0.2
- Crude oil and Feedstocks	12230	13716	11900	11448	10895	10391	10270	10316	10308	10366	10443	-0.3	-0.9	-0.6	0.1
- Oil products	3618	3347	684	602	566	543	568	627	658	707	756	-15.3	-1.9	0.0	1.4
Natural gas	2039	3893	4505	3940	4078	3561	2647	2360	2085	1928	1700	8.2	-1.0	-4.2	-2.2
Electricity	80	587	226	545	385	445	448	411	428	450	476	10.9	5.5	1.5	0.3
Gross Inland Consumption	**25107**	**27402**	**24296**	**23815**	**23620**	**22604**	**22370**	**22916**	**22951**	**23105**	**23220**	**-0.3**	**-0.3**	**-0.5**	**0.2**
Solids	3805	3349	1657	1657	1157	136	71	29	28	27	26	-8.0	-3.5	-24.4	-4.9
Oil	15297	16101	12303	11523	10951	10445	10365	10468	10495	10587	10713	-2.2	-1.2	-0.5	0.2
Natural gas	2078	3751	4489	3937	4297	3789	2784	2513	2270	2062	1818	8.0	-0.4	-4.2	-2.1
Nuclear	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Electricity	80	587	226	545	385	445	448	411	428	450	476	10.9	5.5	1.5	0.3
Renewable energy forms	3846	3615	5622	6153	6831	7789	8702	9495	9730	9978	10187	3.9	2.0	2.5	0.8
as % in Gross Inland Consumption															
Solids	15.2	12.2	6.8	7.0	4.9	0.6	0.3	0.1	0.1	0.1	0.1				
Oil	60.9	58.8	50.6	48.4	46.4	46.2	46.3	45.7	45.7	45.8	46.1				
Natural gas	8.3	13.7	18.5	16.5	18.2	16.8	12.4	11.0	9.9	8.9	7.8				
Nuclear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Renewable energy forms	15.3	13.2	23.1	25.8	28.9	34.5	38.9	41.4	42.4	43.2	43.9				
Gross Electricity Generation in GWh_e	**43364**	**46180**	**53682**	**50169**	**53684**	**53746**	**57243**	**61595**	**63139**	**65273**	**66565**	**2.2**	**0.0**	**0.6**	**0.8**
Self consumption and grid losses	5435	6125	5891	5695	5729	5568	6148	6734	6775	6960	7054	0.8	-0.3	0.7	0.7
Fuel Inputs to Thermal Power Generation	**6520**	**7913**	**5783**	**5331**	**5322**	**3800**	**3062**	**3354**	**3259**	**3198**	**3031**	**-1.2**	**-0.8**	**-5.4**	**-0.1**
Solids	3198	3319	1597	1627	1128	107	42	0	0	0	0	-6.7	-3.4	-28.1	-100.0
Oil (including refinery gas)	1682	1793	570	334	208	48	50	0	0	1	0	-10.3	-9.6	-13.2	-22.4
Gas (including derived gases)	1215	2309	2775	2367	2809	2301	1400	1152	925	760	522	8.6	0.1	-6.7	-4.8
Biomass & Waste	356	428	662	813	979	1145	1371	1737	1852	1955	2027	6.4	4.0	3.4	2.0
Geothermal heat	69	65	180	188	199	199	199	465	482	482	482	10.1	1.0	0.0	4.5
Hydrogen - Methanol	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Fuel Input to other conversion processes	**12916**	**13875**	**12377**	**11926**	**11539**	**11043**	**10935**	**10990**	**10969**	**11020**	**11104**	**-0.4**	**-0.7**	**-0.5**	**0.1**
Refineries	12468	13875	12078	11537	10983	10478	10357	10404	10394	10452	10529	-0.3	-0.9	-0.6	0.1
Biofuels and hydrogen production	0	0	300	389	556	565	577	585	574	566	574	0.0	6.4	0.4	0.0
District heating	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Derived gases, cokeries etc.	449	0	0	0	0	0	1	1	1	1	1	0.0	0.0	11.7	2.2
Energy Branch Consumption	**1028**	**1235**	**1242**	**1176**	**1122**	**1067**	**1079**	**1150**	**1146**	**1157**	**1164**	**1.9**	**-1.0**	**-0.4**	**0.4**
Non-Energy Uses	**2334**	**2505**	**1741**	**1665**	**1724**	**1676**	**1625**	**1610**	**1586**	**1608**	**1686**	**-2.9**	**-0.1**	**-0.6**	**0.2**
Final Energy Demand	**17745**	**18958**	**18081**	**17920**	**17794**	**17751**	**17995**	**18280**	**18468**	**18643**	**18731**	**0.2**	**-0.2**	**0.1**	**0.2**
by sector															
Industry	6293	5868	5390	5412	5537	5537	5535	5575	5577	5568	5587	-1.5	0.3	0.0	0.0
- energy intensive industries	4156	3967	3572	3574	3744	3772	3781	3814	3796	3754	3728	-1.5	0.5	0.1	-0.1
- other industrial sectors	2137	1901	1818	1838	1793	1765	1754	1761	1781	1814	1859	-1.6	-0.1	-0.2	0.3
Residential	2804	3224	2982	2915	2806	2848	2972	3079	3105	3121	3104	0.6	-0.6	0.6	0.2
Tertiary	2106	2759	2413	2321	2346	2281	2316	2383	2370	2411	2378	1.4	-0.3	-0.1	0.1
Transport	6542	7107	7296	7271	7106	7086	7171	7244	7416	7542	7662	1.1	-0.3	0.1	0.3
by fuel															
Solids	466	16	50	29	29	29	29	29	28	27	26	-20.0	-5.3	0.0	-0.6
Oil	10539	10762	9238	8753	8298	8066	8044	8244	8295	8347	8390	-1.3	-1.1	-0.3	0.2
Gas	873	1307	1581	1439	1354	1339	1242	1203	1188	1158	1154	6.1	-1.5	-0.9	-0.4
Electricity	3299	3983	4290	4325	4466	4545	4799	5084	5227	5412	5536	2.7	0.4	0.7	0.7
Heat (from CHP and District Heating)	134	328	338	418	523	550	623	702	748	791	833	9.7	4.5	1.8	1.5
Renewable energy forms	2434	2563	2584	2955	3123	3221	3257	3015	2976	2899	2779	0.6	1.9	0.4	-0.8
Other fuels (hydrogen, ethanol)	0	0	0	0	0	1	1	2	6	9	13	-8.8	47.6	19.9	12.6
RES in Gross Final Energy Consumption [(A)]	**3538**	**3860**	**4475**	**5654**	**6056**	**6840**	**7661**	**7979**	**8086**	**8248**	**8293**	**2.4**	**3.1**	**2.4**	**0.4**
TOTAL GHG emissions (Mt of CO2 eq.)	**84.2**	**89.2**	**72.9**	**66.5**	**63.6**	**56.6**	**52.7**	**52.7**	**52.1**	**51.9**	**51.2**	**-1.4**	**-1.4**	**-1.9**	**-0.1**
of which ETS sectors (2013 scope) GHG emissions		41.0	28.0	26.1	24.8	18.8	15.8	15.2	14.8	14.4	13.7		-1.2	-4.4	-0.7
of which non ETS sectors GHG emissions		48.2	44.9	40.4	38.7	37.7	36.8	37.4	37.4	37.5	37.4		-1.5	-0.5	0.1
CO_2 Emissions (energy related)	**60.4**	**64.4**	**49.8**	**46.2**	**43.1**	**36.3**	**33.6**	**33.2**	**32.8**	**32.5**	**32.0**	**-1.9**	**-1.4**	**-2.5**	**-0.2**
Power generation/District heating	21.7	24.9	14.9	13.3	11.9	6.0	3.6	2.7	2.2	1.8	1.2	-3.7	-2.2	-11.2	-5.3
Energy Branch	2.5	3.1	2.6	2.5	2.3	2.2	2.1	2.1	2.1	2.1	2.1	0.3	-1.1	-0.9	-0.1
Industry	11.4	8.4	6.1	5.1	5.0	4.7	4.5	5.1	4.8	4.7	4.7	-6.0	-2.1	-1.0	0.2
Residential	2.0	2.3	2.6	2.3	2.1	2.1	2.0	1.9	1.8	1.7	1.5	2.5	-1.8	-0.7	-1.3
Tertiary	3.2	4.2	2.5	2.1	1.9	1.6	1.5	1.4	1.3	1.3	1.2	-2.6	-2.4	-2.7	-0.8
Transport	19.6	21.4	21.1	20.8	19.8	19.7	19.9	20.1	20.6	20.9	21.2	0.7	-0.6	0.0	0.3
CO_2 Emissions (non energy related)	**6.2**	**6.5**	**5.1**	**4.8**	**5.2**	**5.1**	**4.2**	**4.0**	**3.8**	**3.7**	**3.5**	**-1.8**	**0.1**	**-2.1**	**-0.9**
Non-CO_2 GHG emissions	**17.6**	**18.3**	**18.0**	**15.5**	**15.3**	**15.2**	**14.9**	**15.5**	**15.5**	**15.7**	**15.6**	**0.2**	**-1.6**	**-0.3**	**0.2**
TOTAL GHG emissions Index (1990=100)	**136.9**	**145.0**	**118.5**	**108.1**	**103.3**	**91.9**	**85.6**	**85.6**	**84.7**	**84.3**	**83.2**				

Source: PRIMES

SUMMARY ENERGY BALANCE AND INDICATORS (B)															Portugal: Reference scenario
	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050	'00-'10	'10-'20	'20-'30	'30-'50
												Annual % Change			
Main Energy System Indicators															
Population (Million)	10.195	10.529	10.638	10.689	10.728	10.760	10.780	10.786	10.767	10.707	10.598	0.4	0.1	0.0	-0.1
GDP (in 000 M€10)	162.1	168.9	172.7	171.6	182.0	198.9	219.4	238.3	255.6	272.1	287.9	0.6	0.5	1.9	1.4
Gross Inl. Cons./GDP (toe/M€10)	154.9	162.2	140.7	138.8	129.8	113.7	101.9	96.2	89.8	84.9	80.7	-1.0	-0.8	-2.4	-1.2
Carbon intensity (t of CO_2/toe of GIC)	2.41	2.35	2.05	1.94	1.82	1.61	1.50	1.45	1.43	1.41	1.38	-1.6	-1.2	-1.9	-0.4
Import Dependency %	84.9	88.5	75.4	75.1	71.9	66.9	63.2	60.9	59.9	59.5	59.0				
Total energy-rel. and other mitigation costs [B] (in 000 M€10)	18.1	24.4	27.5	32.5	35.6	38.6	40.5	42.2	44.4	46.2	47.9	4.3	2.6	1.3	0.8
as % of GDP	11.2	14.4	16.0	18.9	19.6	19.4	18.5	17.7	17.4	17.0	16.6				
Energy intensity indicators															
Industry (Energy on Value added, index 2000=100)	100.0	95.0	92.3	93.3	90.5	86.8	83.1	79.7	76.4	73.4	70.6	-0.8	-0.2	-0.9	-0.8
Residential (Energy on Private Income, index 2000=100)	100.0	107.6	94.3	92.9	84.0	77.8	73.3	69.8	65.5	61.8	58.1	-0.6	-1.2	-1.4	-1.2
Tertiary (Energy on Value added, index 2000=100)	100.0	120.8	97.9	94.5	90.0	79.3	72.2	67.9	62.5	59.3	55.1	-0.2	-0.8	-2.2	-1.3
Passenger transport (toe/Mpkm)	36.6	36.0	38.0	36.4	33.8	30.3	27.8	26.4	25.6	25.2	24.7	0.4	-1.2	-2.0	-0.6
Freight transport (toe/Mtkm)	60.7	55.8	63.7	62.3	60.6	57.9	55.6	53.9	52.5	51.3	50.3	0.5	-0.5	-0.8	-0.5
Carbon Intensity indicators															
Electricity and Steam production (t of CO_2/MWh)	0.48	0.50	0.25	0.23	0.19	0.10	0.05	0.04	0.03	0.02	0.02	-6.3	-2.6	-11.9	-6.0
Final energy demand (t of CO_2/toe)	2.04	1.92	1.79	1.70	1.62	1.58	1.55	1.55	1.54	1.53	1.53	-1.3	-1.0	-0.5	0.0
Industry	1.81	1.44	1.14	0.95	0.90	0.84	0.81	0.91	0.86	0.85	0.84	-4.5	-2.4	-1.0	0.2
Residential	0.71	0.72	0.86	0.79	0.76	0.73	0.67	0.62	0.58	0.54	0.50	1.8	-1.2	-1.2	-1.5
Tertiary	1.52	1.54	1.02	0.92	0.82	0.71	0.63	0.57	0.56	0.53	0.52	-3.9	-2.2	-2.6	-0.9
Transport [C]	3.00	3.01	2.90	2.86	2.79	2.78	2.78	2.77	2.77	2.77	2.77	-0.4	-0.4	0.0	0.0
Indicators for renewables															
Share of RES in Gross Final Energy Consumption [D] (%)	19.3	19.7	23.9	30.7	33.3	37.8	41.7	42.7	43.0	43.7	43.8				
RES in transport (%)	0.2	0.2	5.1	6.8	10.1	10.7	11.2	11.8	12.0	12.3	12.7				
Gross Electricity generation by source (in GWh_e) [E]	**43372**	**46188**	**53691**	**50169**	**53684**	**53746**	**57243**	**61595**	**63139**	**65273**	**66565**	**2.2**	**0.0**	**0.6**	**0.8**
Nuclear energy	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Solids	14595	15226	7100	7438	5155	516	201	0	0	0	0	-7.0	-3.2	-27.7	-100.0
Oil (including refinery gas)	8421	8791	3011	1676	383	123	97	0	0	6	2	-9.8	-18.6	-12.8	-18.0
Gas (including derived gases)	7231	13606	14900	11795	14267	10583	6295	5129	4293	3332	1947	7.5	-0.4	-7.9	-5.7
Biomass-waste	1553	1987	2943	3505	4225	4843	5387	6493	7178	7646	7326	6.6	3.7	2.5	1.5
Hydro (pumping excluded)	11323	4731	16147	11049	11257	11462	11898	12622	12998	12908	13318	3.6	-3.5	0.6	0.6
Wind	168	1773	9182	12876	13736	17000	21390	23511	23753	24015	24266	49.2	4.1	4.5	0.6
Solar	1	3	211	1610	3800	8245	10905	12345	13150	15372	17526	70.8	33.5	11.1	2.4
Geothermal and other renewables	80	71	197	219	862	974	1070	1495	1768	1995	2181	9.4	15.9	2.2	3.6
Other fuels (hydrogen, methanol)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Net Generation Capacity in MW_e	**10363**	**13013**	**18001**	**20146**	**21767**	**24361**	**26417**	**27469**	**28214**	**29757**	**31308**	**5.7**	**1.9**	**2.0**	**0.9**
Nuclear energy	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Renewable energy	3984	5446	8041	11034	12817	16140	19111	20793	21595	22832	24038	7.3	4.8	4.1	1.2
Hydro (pumping excluded)	3883	4422	4043	4584	4589	4628	4738	4946	5122	5336	5613	0.4	1.3	0.3	0.9
Wind	100	1021	3864	5398	5689	6802	8324	9043	9148	9260	9370	44.1	3.9	3.9	0.6
Solar	1	2	134	1051	2212	4325	5613	6309	6698	7491	8214	63.2	32.4	9.8	1.9
Other renewables (tidal etc.)	0	0	0	0	327	385	435	495	626	745	841	0.0	0.0	2.9	3.3
Thermal power	6379	7568	9960	9113	8950	8221	7307	6676	6620	6925	7270	4.6	-1.1	-2.0	0.0
of which cogeneration units	1676	1874	1764	1327	1551	1430	1537	1656	1683	1921	1951	0.5	-1.3	-0.1	1.2
of which CCS units	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Solids fired	1885	1895	1800	1800	1800	1421	568	0	0	0	0	-0.5	0.0	-10.9	-100.0
Gas fired	1796	2626	4864	4864	4768	4750	4746	4883	4597	4640	4771	10.5	-0.2	0.0	0.0
Oil fired	2374	2667	2813	1823	1750	1277	996	515	486	434	556	1.7	-4.6	-5.5	-2.9
Biomass-waste fired	310	366	458	601	606	746	970	1217	1473	1787	1880	4.0	2.8	4.8	3.4
Hydrogen plants	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Geothermal heat	14	14	25	25	26	26	26	62	64	64	64	6.0	0.5	0.0	4.5
Avg. Load factor of net power capacity [F] (%)	46.1	39.1	33.2	27.7	27.5	24.8	24.4	25.2	25.2	24.7	23.9				
Electricity indicators															
Efficiency of gross thermal power generation (%)	42.0	43.1	41.9	39.7	39.2	36.9	34.3	31.2	31.8	31.0	27.9				
% of gross electricity from CHP	10.0	11.6	11.8	12.5	11.2	11.4	12.3	11.2	11.4	12.0	10.8				
% of electricity from CCS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Carbon free gross electricity generation (%)	30.3	18.5	53.4	58.3	63.1	79.1	88.5	91.7	93.2	94.9	97.1				
- nuclear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
- renewable energy forms	30.3	18.5	53.4	58.3	63.1	79.1	88.5	91.7	93.2	94.9	97.1				
Transport sector															
Passenger transport activity (Gpkm)	**104.8**	**120.0**	**119.7**	**122.7**	**125.8**	**137.6**	**150.4**	**159.3**	**168.7**	**175.9**	**183.2**	**1.3**	**0.5**	**1.8**	**1.0**
Public road transport	11.8	11.1	10.6	10.7	10.7	11.7	12.9	13.5	14.2	14.8	15.4	-1.1	0.1	1.8	0.9
Private cars and motorcycles	72.5	87.0	85.5	85.9	86.1	92.8	100.0	104.4	108.9	111.7	114.6	1.7	0.1	1.5	0.7
Rail	4.6	4.7	5.2	5.5	5.9	7.0	8.4	9.2	10.1	10.7	11.3	1.4	1.1	3.7	1.5
Aviation	15.7	17.0	18.1	20.3	22.8	25.7	28.8	31.8	35.1	38.2	41.6	1.5	2.3	2.4	1.8
Inland navigation	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.1	1.7	0.7
Freight transport activity (Gtkm)	**44.6**	**49.9**	**43.1**	**45.0**	**47.1**	**50.3**	**53.8**	**56.3**	**58.9**	**60.6**	**62.4**	**-0.3**	**0.9**	**1.4**	**0.7**
Trucks	38.9	42.6	35.4	36.9	38.5	41.0	43.8	45.7	47.8	49.2	50.6	-0.9	0.9	1.3	0.7
Rail	2.2	2.4	2.3	2.5	2.7	3.0	3.4	3.5	3.7	3.8	4.0	0.6	1.6	2.2	0.8
Inland navigation	3.5	4.9	5.4	5.6	5.8	6.3	6.7	7.0	7.4	7.6	7.8	4.4	0.8	1.4	0.8
Energy demand in transport (ktoe) [G]	**6542**	**7107**	**7296**	**7270**	**7105**	**7085**	**7170**	**7243**	**7415**	**7541**	**7661**	**1.1**	**-0.3**	**0.1**	**0.3**
Public road transport	207	193	194	189	184	194	204	209	215	220	226	-0.7	-0.5	1.0	0.5
Private cars and motorcycles	2767	3183	3283	3100	2827	2693	2647	2611	2623	2630	2659	1.7	-1.5	-0.7	0.0
Trucks	2645	2733	2677	2736	2779	2841	2914	2951	3005	3022	3052	0.1	0.4	0.5	0.2
Rail	88	66	57	54	56	61	66	67	69	69	69	-4.2	-0.2	1.6	0.3
Aviation	790	914	1040	1145	1212	1246	1285	1349	1445	1542	1596	2.8	1.5	0.6	1.1
Inland navigation	44	17	45	46	47	50	54	55	57	58	59	0.2	0.5	1.3	0.5

Source: PRIMES

Romania: Reference scenario												SUMMARY ENERGY BALANCE AND INDICATORS (A)			
ktoe	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**	**'00-'10**	**'10-'20**	**'20-'30**	**'30-'50**
												Annual % Change			
Production (incl.recovery of products)	**28551**	**28239**	**27741**	**29416**	**30423**	**30583**	**30650**	**31516**	**32210**	**32614**	**31215**	**-0.3**	**0.9**	**0.1**	**0.1**
Solids	5603	5793	5904	5549	5056	4234	3695	3094	4645	5083	5205	0.5	-1.5	-3.1	1.7
Oil	6441	6242	4513	5417	5491	5336	5316	5143	5000	4768	4530	-3.5	2.0	-0.3	-0.8
Natural gas	10968	9701	8619	7561	8484	9104	8778	9046	8454	8821	7648	-2.4	-0.2	0.3	-0.7
Nuclear	1407	1433	2998	3003	3016	3016	3703	4676	4676	4676	4676	7.9	0.1	2.1	1.2
Renewable energy sources	4131	5070	5708	7886	8376	8892	9157	9557	9434	9266	9156	3.3	3.9	0.9	0.0
Hydro	1271	1737	1679	1907	1883	1921	1928	1953	1999	2067	2165	2.8	1.2	0.2	0.6
Biomass & Waste	2854	3314	3980	5535	5839	5786	5908	6238	6046	5669	5321	3.4	3.9	0.1	-0.5
Wind	0	0	26	225	227	582	673	674	674	802	820	0.0	24.0	11.5	1.0
Solar and others	0	0	0	98	272	438	488	516	553	569	692	0.0	120.7	6.0	1.8
Geothermal	7	18	23	121	156	164	160	175	163	160	157	13.1	21.1	0.3	-0.1
Net Imports	**8109**	**10875**	**7736**	**6872**	**6639**	**6287**	**6460**	**6323**	**6417**	**6505**	**7727**	**-0.5**	**-1.5**	**-0.3**	**0.9**
Solids	1920	2936	1234	2077	1978	1976	1990	1752	1711	1545	1470	-4.3	4.8	0.1	-1.5
Oil	3537	3998	4748	3982	4198	4307	4290	4419	4811	4943	5171	3.0	-1.2	0.2	0.9
- Crude oil and Feedstocks	4869	8885	6161	5245	5180	5081	4880	4832	5012	4986	5043	2.4	-1.7	-0.6	0.2
- Oil products	-1331	-4888	-1413	-1264	-982	-774	-591	-414	-201	-43	128	0.6	-3.6	-5.0	0.0
Natural gas	2712	4190	1816	2062	1730	1412	1646	1703	1604	1675	2744	-3.9	-0.5	-0.5	2.6
Electricity	-60	-250	-196	-302	-350	-576	-721	-819	-1049	-1096	-1199	12.6	6.0	7.5	2.6
Gross Inland Consumption	**36832**	**39346**	**35708**	**36265**	**37034**	**36839**	**37076**	**37803**	**38589**	**39079**	**38900**	**-0.3**	**0.4**	**0.0**	**0.2**
Solids	7493	8784	7009	7625	7035	6210	5685	4846	6356	6628	6675	-0.7	0.0	-2.1	0.8
Oil	10175	10411	9247	9376	9661	9612	9572	9526	9775	9672	9661	-1.0	0.4	-0.1	0.0
Natural gas	13680	13942	10788	9624	10214	10516	10423	10748	10057	10494	10390	-2.3	-0.5	0.2	0.0
Nuclear	1407	1433	2998	3003	3016	3016	3703	4676	4676	4676	4676	7.9	0.1	2.1	1.2
Electricity	-60	-250	-196	-302	-350	-576	-721	-819	-1049	-1096	-1199	12.6	6.0	7.5	2.6
Renewable energy forms	4137	5026	5862	6939	7458	8060	8413	8825	8774	8705	8697	3.5	2.4	1.2	0.2
as % in Gross Inland Consumption															
Solids	20.3	22.3	19.6	21.0	19.0	16.9	15.3	12.8	16.5	17.0	17.2				
Oil	27.6	26.5	25.9	25.9	26.1	26.1	25.8	25.2	25.3	24.8	24.8				
Natural gas	37.1	35.4	30.2	26.5	27.6	28.5	28.1	28.4	26.1	26.9	26.7				
Nuclear	3.8	3.6	8.4	8.3	8.1	8.2	10.0	12.4	12.1	12.0	12.0				
Renewable energy forms	11.2	12.8	16.4	19.1	20.1	21.9	22.7	23.3	22.7	22.3	22.4				
Gross Electricity Generation in GWh_e	**51925**	**59402**	**60248**	**67256**	**70780**	**75073**	**78447**	**82936**	**91284**	**97194**	**100169**	**1.5**	**1.6**	**1.0**	**1.2**
Self consumption and grid losses	9936	9987	12112	10955	10776	10877	10739	11103	13946	14422	14719	2.0	-1.2	0.0	1.6
Fuel Inputs to Thermal Power Generation	**10788**	**10372**	**8676**	**7459**	**7790**	**7385**	**7160**	**7182**	**8133**	**8981**	**8955**	**-2.2**	**-1.1**	**-0.8**	**1.1**
Solids	5462	6127	5928	5647	5145	4399	3913	3247	4803	5158	5300	0.8	-1.4	-2.7	1.5
Oil (including refinery gas)	1736	800	328	510	584	630	671	543	663	546	543	-15.4	5.9	1.4	-1.1
Gas (including derived gases)	3579	3437	2399	1033	1623	1626	1709	1926	1253	1929	1828	-3.9	-3.8	0.5	0.3
Biomass & Waste	11	9	21	254	424	715	851	1451	1399	1333	1269	6.2	35.1	7.2	2.0
Geothermal heat	0	0	1	15	15	15	15	15	15	15	15	0.0	33.5	0.0	0.0
Hydrogen - Methanol	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Fuel Input to other conversion processes	**16426**	**19709**	**15376**	**18211**	**19069**	**18580**	**19010**	**19491**	**19234**	**18672**	**18117**	**-0.7**	**2.2**	**0.0**	**-0.2**
Refineries	11401	15264	11350	14006	14607	14268	14162	13799	13562	13094	12616	0.0	2.6	-0.3	-0.6
Biofuels and hydrogen production	0	1	115	144	492	466	451	453	454	435	412	80.7	15.6	-0.9	-0.5
District heating	1737	824	689	675	595	492	399	336	286	222	185	-8.8	-1.5	-3.9	-3.8
Derived gases, cokeries etc.	3287	3621	3221	3386	3376	3355	3998	4903	4933	4921	4904	-0.2	0.5	1.7	1.0
Energy Branch Consumption	**3676**	**4105**	**2888**	**2966**	**3043**	**3030**	**3002**	**2979**	**3202**	**3235**	**3157**	**-2.4**	**0.5**	**-0.1**	**0.3**
Non-Energy Uses	**1883**	**2437**	**1724**	**1606**	**1634**	**1675**	**1736**	**1738**	**1716**	**1700**	**1690**	**-0.9**	**-0.5**	**0.6**	**-0.1**
Final Energy Demand	**22725**	**24958**	**22474**	**25222**	**26050**	**26250**	**26383**	**26666**	**27056**	**27270**	**27269**	**-0.1**	**1.5**	**0.1**	**0.2**
by sector															
Industry	9293	10228	6881	8489	8701	8755	8833	8631	8566	8563	8362	-3.0	2.4	0.2	-0.3
- energy intensive industries	6328	7430	4763	6019	6064	6104	6182	5992	5894	5964	5790	-2.8	2.4	0.2	-0.3
- other industrial sectors	2966	2798	2117	2470	2637	2651	2652	2640	2673	2598	2572	-3.3	2.2	0.1	-0.2
Residential	8408	7990	8102	8558	8575	8710	8667	8995	9210	9369	9515	-0.4	0.6	0.1	0.5
Tertiary	1602	2463	2487	2692	2728	2623	2536	2528	2528	2520	2458	4.5	0.9	-0.7	-0.2
Transport	3421	4277	5004	5483	6045	6162	6348	6512	6751	6818	6935	3.9	1.9	0.5	0.4
by fuel															
Solids	1047	1607	939	1564	1501	1450	1467	1365	1286	1213	1137	-1.1	4.8	-0.2	-1.3
Oil	5478	6876	6067	6633	6871	6894	6941	7077	7247	7241	7293	1.0	1.3	0.1	0.2
Gas	6910	7754	6189	6550	6548	6843	6813	6930	6876	6873	6940	-1.1	0.6	0.4	0.1
Electricity	2918	3341	3553	4138	4403	4544	4707	4968	5191	5602	5738	2.0	2.2	0.7	1.0
Heat (from CHP and District Heating)	3570	2135	1650	1898	1973	1946	1981	2009	2012	2144	2131	-7.4	1.8	0.0	0.4
Renewable energy forms	2802	3244	4077	4439	4754	4572	4473	4315	4441	4194	4027	3.8	1.5	-0.6	-0.5
Other fuels (hydrogen, ethanol)	0	0	0	0	0	1	2	2	3	4	5	-2.4	64.1	13.8	5.3
RES in Gross Final Energy Consumption [(A)]	**4090**	**4601**	**5601**	**6644**	**7322**	**7887**	**8184**	**8462**	**8555**	**8430**	**8449**	**3.2**	**2.7**	**1.1**	**0.2**
TOTAL GHG emissions (Mt of CO2 eq.)	**137.8**	**147.7**	**120.8**	**126.7**	**126.2**	**123.3**	**117.8**	**113.9**	**110.9**	**101.4**	**99.7**	**-1.3**	**0.4**	**-0.7**	**-0.8**
of which ETS sectors (2013 scope) GHG emissions		76.7	56.6	60.1	58.8	55.8	51.1	46.9	44.0	34.9	33.3		0.4	-1.4	-2.1
of which non ETS sectors GHG emissions		71.0	64.2	66.6	67.4	67.6	66.7	66.9	66.9	66.5	66.5		0.5	-0.1	0.0
CO_2 Emissions (energy related)	**88.7**	**96.5**	**77.0**	**80.1**	**79.8**	**76.7**	**73.7**	**70.0**	**67.4**	**65.8**	**64.6**	**-1.4**	**0.4**	**-0.8**	**-0.7**
Power generation/District heating	42.0	39.2	33.5	29.4	28.6	25.2	22.8	19.9	17.9	16.9	16.1	-2.2	-1.6	-2.2	-1.7
Energy Branch	6.8	7.7	5.2	5.6	5.8	5.6	5.4	5.2	5.0	4.8	4.5	-2.5	1.0	-0.8	-0.8
Industry	21.6	25.7	14.4	19.7	19.1	18.9	18.2	16.7	15.5	14.9	14.4	-4.0	2.9	-0.5	-1.2
Residential	6.6	7.3	5.8	6.1	6.5	7.1	7.2	7.6	7.9	8.0	8.2	-1.2	1.1	1.1	0.6
Tertiary	1.9	4.2	3.6	3.5	3.4	3.2	2.9	2.9	2.9	2.8	2.8	6.8	-0.5	-1.5	-0.3
Transport	9.8	12.4	14.5	15.8	16.4	16.8	17.2	17.6	18.2	18.4	18.7	4.0	1.3	0.5	0.4
CO_2 Emissions (non energy related)	**9.1**	**10.6**	**8.6**	**10.1**	**11.1**	**11.6**	**9.6**	**9.4**	**9.1**	**1.2**	**0.9**	**-0.5**	**2.6**	**-1.5**	**-11.2**
Non-CO_2 GHG emissions	**40.1**	**40.5**	**35.2**	**36.4**	**35.2**	**35.1**	**34.5**	**34.5**	**34.4**	**34.4**	**34.3**	**-1.3**	**0.0**	**-0.2**	**0.0**
TOTAL GHG emissions Index (1990=100)	**54.2**	**58.1**	**47.5**	**49.8**	**49.6**	**48.5**	**46.3**	**44.8**	**43.6**	**39.9**	**39.3**				

Source: PRIMES

SUMMARY ENERGY BALANCE AND INDICATORS (B)															Romania: Reference scenario
	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050	'00-'10	'10-'20	'20-'30	'30-'50
												Annual % Change			
Main Energy System Indicators															
Population (Million)	22.455	21.659	21.462	21.261	21.006	20.664	20.251	19.857	19.437	18.986	18.483	-0.5	-0.2	-0.4	-0.5
GDP (in 000 M€10)	83.1	109.7	124.1	141.6	157.3	167.6	178.7	190.2	201.4	209.4	216.0	4.1	2.4	1.3	1.0
Gross Inl. Cons./GDP (toe/M€10)	443.5	358.8	287.8	256.1	235.5	219.8	207.5	198.7	191.6	186.6	180.1	-4.2	-2.0	-1.3	-0.7
Carbon intensity (t of CO_2/toe of GIC)	2.41	2.45	2.16	2.21	2.15	2.08	1.99	1.85	1.75	1.68	1.66	-1.1	0.0	-0.8	-0.9
Import Dependency %	22.0	27.6	21.7	18.9	17.9	17.1	17.4	16.7	16.6	16.6	19.8				
Total energy-rel. and other mitigation costs [B] (in 000 M€10)	12.3	20.6	23.4	30.4	35.5	38.8	42.1	44.7	47.5	50.2	51.7	6.6	4.3	1.7	1.0
as % of GDP	14.8	18.8	18.8	21.5	22.6	23.2	23.6	23.5	23.6	24.0	23.9				
Energy intensity indicators															
Industry (Energy on Value added, index 2000=100)	100.0	83.7	48.9	50.8	45.5	42.8	40.4	37.1	35.3	34.7	33.7	-6.9	-0.7	-1.2	-0.9
Residential (Energy on Private Income, index 2000=100)	100.0	59.2	48.8	44.1	39.1	37.0	34.3	33.2	32.0	31.3	30.8	-6.9	-2.2	-1.3	-0.5
Tertiary (Energy on Value added, index 2000=100)	100.0	117.6	110.3	103.6	94.4	84.9	76.9	71.6	66.8	63.5	59.6	1.0	-1.5	-2.0	-1.3
Passenger transport (toe/Mpkm)	26.8	23.5	22.7	21.7	19.9	18.0	16.7	15.8	15.3	15.0	14.9	-1.7	-1.3	-1.7	-0.6
Freight transport (toe/Mtkm)	30.8	26.5	54.7	48.9	45.8	42.1	38.8	37.2	35.7	34.5	33.5	5.9	-1.8	-1.6	-0.7
Carbon Intensity indicators															
Electricity and Steam production (t of CO_2/MWh)	0.41	0.42	0.39	0.30	0.28	0.23	0.20	0.17	0.14	0.13	0.12	-0.6	-3.3	-3.0	-2.7
Final energy demand (t of CO_2/toe)	1.76	1.99	1.70	1.79	1.74	1.75	1.73	1.69	1.64	1.62	1.61	-0.3	0.2	-0.1	-0.3
Industry	2.33	2.51	2.09	2.32	2.20	2.16	2.06	1.94	1.81	1.74	1.72	-1.1	0.5	-0.7	-0.9
Residential	0.78	0.92	0.72	0.71	0.76	0.81	0.83	0.85	0.86	0.85	0.86	-0.8	0.5	1.0	0.1
Tertiary	1.16	1.72	1.44	1.30	1.25	1.20	1.16	1.15	1.13	1.13	1.13	2.2	-1.4	-0.8	-0.1
Transport [C]	2.87	2.90	2.89	2.88	2.71	2.72	2.72	2.71	2.70	2.69	2.70	0.1	-0.6	0.0	0.0
Indicators for renewables															
Share of RES in Gross Final Energy Consumption [D] (%)	16.7	17.2	23.0	24.9	26.6	28.4	29.4	30.0	29.7	29.0	29.0				
RES in transport (%)	1.1	0.9	3.2	3.9	10.2	10.3	10.3	10.5	10.6	10.5	10.5				
Gross Electricity generation by source (in GWh_e) [E]	**51934**	**59413**	**60259**	**67256**	**70780**	**75073**	**78447**	**82936**	**91284**	**97194**	**100169**	**1.5**	**1.6**	**1.0**	**1.2**
Nuclear energy	5456	5555	11623	11880	11880	11880	14875	19024	19024	19024	19024	7.9	0.2	2.3	1.2
Solids	18926	21916	20681	20259	18416	15585	13713	11139	22075	23013	24126	0.9	-1.2	-2.9	2.9
Oil (including refinery gas)	3399	1894	692	2371	2313	2150	2010	2647	3131	3017	3281	-14.7	12.8	-1.4	2.5
Gas (including derived gases)	9375	9834	7323	6568	10934	10961	11524	11779	7509	11427	9996	-2.4	4.1	0.5	-0.7
Biomass-waste	0	7	111	1101	1857	3272	3933	5590	6198	5022	5229	0.0	32.5	7.8	1.4
Hydro (pumping excluded)	14778	20207	19523	22175	21896	22341	22413	22713	23242	24037	25169	2.8	1.2	0.2	0.6
Wind	0	0	306	2621	2634	6773	7831	7835	7837	9323	9539	0.0	24.0	11.5	1.0
Solar	0	0	0	262	832	2093	2130	2191	2253	2314	3788	0.0	174.0	9.9	2.9
Geothermal and other renewables	0	0	0	18	18	18	18	18	18	18	18	0.0	0.0	0.0	0.0
Other fuels (hydrogen, methanol)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Net Generation Capacity in MW_e	**19999**	**18357**	**19665**	**19557**	**20243**	**20996**	**20893**	**22199**	**23921**	**25706**	**27492**	**-0.2**	**0.3**	**0.3**	**1.4**
Nuclear energy	667	663	1357	1368	1374	1374	1718	2194	2194	2194	2194	7.4	0.1	2.3	1.2
Renewable energy	6154	6162	6737	8848	9425	12615	13172	13270	13438	14310	15831	0.9	3.4	3.4	0.9
Hydro (pumping excluded)	6154	6160	6275	7068	7175	7244	7268	7314	7432	7604	7836	0.2	1.3	0.1	0.4
Wind	0	2	462	1566	1572	3540	4043	4045	4046	4695	4783	0.0	13.0	9.9	0.8
Solar	0	0	0	214	679	1830	1860	1910	1960	2010	3213	0.0	164.9	10.6	2.8
Other renewables (tidal etc.)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Thermal power	13177	11532	11571	9341	9444	7007	6003	6735	8289	9202	9466	-1.3	-2.0	-4.4	2.3
of which cogeneration units	3431	2995	3136	2976	3326	3119	3220	3545	3941	4428	4451	-0.9	0.6	-0.3	1.6
of which CCS units	0	0	0	0	0	0	0	29	1088	1552	1704	0.0	0.0	0.0	0.0
Solids fired	7284	6615	6471	5737	5714	4552	3465	3068	4523	4796	4968	-1.2	-1.2	-4.9	1.8
Gas fired	3910	3478	3704	2812	2924	1701	1726	2771	2815	3395	3432	-0.5	-2.3	-5.1	3.5
Oil fired	1776	1232	1188	583	597	552	518	602	589	605	597	-3.9	-6.6	-1.4	0.7
Biomass-waste fired	208	208	206	207	207	200	292	292	359	404	469	-0.1	0.0	3.5	2.4
Hydrogen plants	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Geothermal heat	0	0	2	2	2	2	2	2	2	2	2	0.0	0.0	0.0	0.0
Avg. Load factor of net power capacity [F] (%)	27.8	34.5	32.0	37.4	38.2	39.0	41.1	40.8	40.5	40.0	38.5				
Electricity indicators															
Efficiency of gross thermal power generation (%)	25.3	27.9	28.5	35.0	37.0	37.2	37.5	37.3	41.2	40.7	41.0				
% of gross electricity from CHP	32.3	26.2	10.8	22.3	24.1	24.0	23.5	24.3	26.1	23.4	23.2				
% of electricity from CCS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	12.4	16.7	17.6				
Carbon free gross electricity generation (%)	39.0	43.4	52.4	56.6	55.3	61.8	65.3	69.2	64.2	61.5	62.7				
- nuclear	10.5	9.3	19.3	17.7	16.8	15.8	19.0	22.9	20.8	19.6	19.0				
- renewable energy forms	28.5	34.0	33.1	38.9	38.5	46.0	46.3	46.2	43.3	41.9	43.7				
Transport sector															
Passenger transport activity (Gpkm)	**84.9**	**92.7**	**109.5**	**120.6**	**132.9**	**147.9**	**164.7**	**180.2**	**197.3**	**206.8**	**216.7**	**2.6**	**2.0**	**2.2**	**1.4**
Public road transport	12.0	11.8	12.0	12.8	13.6	14.5	15.4	16.2	17.1	17.9	18.8	0.0	1.3	1.2	1.0
Private cars and motorcycles	53.6	63.4	78.3	85.0	91.8	101.1	111.1	120.4	130.3	134.8	139.2	3.9	1.6	1.9	1.1
Rail	17.6	14.6	12.6	14.4	16.4	18.4	20.7	23.1	25.9	27.4	29.0	-3.3	2.7	2.4	1.7
Aviation	1.7	3.0	6.6	8.5	11.1	13.9	17.5	20.4	23.9	26.7	29.6	14.7	5.3	4.7	2.7
Inland navigation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-3.1	1.7	1.9	1.2
Freight transport activity (Gtkm)	**33.3**	**75.7**	**45.2**	**57.4**	**73.0**	**81.4**	**90.9**	**96.3**	**102.1**	**105.1**	**108.0**	**3.1**	**4.9**	**2.2**	**0.9**
Trucks	14.3	51.5	25.9	34.9	46.7	52.3	58.5	61.9	65.6	67.3	69.0	6.1	6.1	2.3	0.8
Rail	16.4	16.6	12.4	14.6	17.3	19.3	21.6	23.0	24.4	25.4	26.3	-2.7	3.4	2.3	1.0
Inland navigation	2.6	7.6	6.9	7.9	9.0	9.8	10.8	11.4	12.1	12.4	12.7	10.1	2.6	1.8	0.8
Energy demand in transport (ktoe) [G]	**3298**	**4188**	**4953**	**5424**	**5980**	**6092**	**6272**	**6433**	**6668**	**6731**	**6846**	**4.2**	**1.9**	**0.5**	**0.4**
Public road transport	142	137	137	145	152	156	161	166	171	177	183	-0.4	1.0	0.6	0.6
Private cars and motorcycles	1898	1881	2018	2059	1992	1934	1952	2009	2096	2120	2161	0.6	-0.1	-0.2	0.5
Trucks	661	1842	2245	2553	3060	3136	3221	3274	3338	3325	3336	13.0	3.1	0.5	0.2
Rail	355	158	221	253	282	305	325	338	346	341	334	-4.6	2.5	1.4	0.1
Aviation	128	128	272	346	418	479	524	552	619	670	733	7.8	4.4	2.3	1.7
Inland navigation	112	42	59	67	76	82	89	93	97	98	99	-6.2	2.6	1.6	0.5

Source: PRIMES

Slovakia: Reference scenario												SUMMARY ENERGY BALANCE AND INDICATORS (A)			
ktoe	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**	**'00-'10**	**'10-'20**	**'20-'30**	**'30-'50**
												Annual % Change			
Production (incl.recovery of products)	**6385**	**6684**	**6319**	**7386**	**8109**	**8310**	**9143**	**9871**	**9636**	**9876**	**9392**	**-0.1**	**2.5**	**1.2**	**0.1**
Solids	1018	637	613	613	487	437	421	486	76	395	546	-4.9	-2.3	-1.4	1.3
Oil	161	383	366	314	0	0	0	0	0	0	0	8.5	-100.0	0.0	0.0
Natural gas	133	126	88	81	84	86	82	81	78	28	22	-4.0	-0.5	-0.2	-6.4
Nuclear	4255	4626	3819	4932	5751	6017	6677	7293	7299	7299	6648	-1.1	4.2	1.5	0.0
Renewable energy sources	818	912	1432	1447	1787	1769	1963	2012	2183	2154	2175	5.8	2.2	0.9	0.5
Hydro	397	399	452	515	497	527	528	543	559	566	614	1.3	1.0	0.6	0.8
Biomass & Waste	421	505	972	860	1165	1077	1215	1220	1351	1302	1236	8.7	1.8	0.4	0.1
Wind	0	1	1	8	20	32	76	94	112	121	125	0.0	44.3	14.2	2.5
Solar and others	0	0	0	59	99	129	139	150	157	161	197	0.0	114.6	3.4	1.8
Geothermal	0	8	8	4	6	5	4	4	4	4	4	0.0	-3.1	-3.0	-0.7
Net Imports	**11680**	**12492**	**11314**	**11164**	**11403**	**11678**	**11366**	**10930**	**10999**	**10843**	**10697**	**-0.3**	**0.1**	**0.0**	**-0.3**
Solids	3432	3739	2951	2849	2857	2933	2730	2495	2403	2334	2249	-1.5	-0.3	-0.5	-1.0
Oil	2773	3337	3283	3006	3406	3449	3534	3532	3503	3451	3380	1.7	0.4	0.4	-0.2
- Crude oil and Feedstocks	5406	5488	5412	5031	5257	5129	5036	4877	4696	4496	4282	0.0	-0.3	-0.4	-0.8
- Oil products	-2634	-2150	-2128	-2024	-1851	-1681	-1502	-1345	-1193	-1046	-903	-2.1	-1.4	-2.1	-2.5
Natural gas	5707	5735	5003	5021	4863	5025	4791	4721	4755	4672	4579	-1.3	-0.3	-0.1	-0.2
Electricity	-232	-281	90	13	-154	-201	-272	-464	-460	-474	-453	0.0	0.0	5.8	2.6
Gross Inland Consumption	**17977**	**19094**	**17922**	**18550**	**19513**	**19988**	**20509**	**20801**	**20635**	**20720**	**20089**	**0.0**	**0.9**	**0.5**	**-0.1**
Solids	4278	4230	3897	3462	3345	3370	3151	2981	2479	2729	2796	-0.9	-1.5	-0.6	-0.6
Oil	3090	3775	3689	3320	3406	3449	3534	3532	3503	3451	3380	1.8	-0.8	0.4	-0.2
Natural gas	5776	5884	5006	5101	4947	5111	4874	4801	4833	4700	4601	-1.4	-0.1	-0.1	-0.3
Nuclear	4255	4626	3819	4932	5751	6017	6677	7293	7299	7299	6648	-1.1	4.2	1.5	0.0
Electricity	-232	-281	90	13	-154	-201	-272	-464	-460	-474	-453	0.0	0.0	5.8	2.6
Renewable energy forms	810	859	1421	1723	2219	2242	2546	2658	2982	3015	3116	5.8	4.6	1.4	1.0
as % in Gross Inland Consumption															
Solids	23.8	22.2	21.7	18.7	17.1	16.9	15.4	14.3	12.0	13.2	13.9				
Oil	17.2	19.8	20.6	17.9	17.5	17.3	17.2	17.0	17.0	16.7	16.8				
Natural gas	32.1	30.8	27.9	27.5	25.4	25.6	23.8	23.1	23.4	22.7	22.9				
Nuclear	23.7	24.2	21.3	26.6	29.5	30.1	32.6	35.1	35.4	35.2	33.1				
Renewable energy forms	4.5	4.5	7.9	9.3	11.4	11.2	12.4	12.8	14.4	14.6	15.5				
Gross Electricity Generation in GWh_e	**30792**	**31346**	**27442**	**30831**	**35461**	**37920**	**41060**	**44674**	**45285**	**47401**	**47707**	**-1.1**	**2.6**	**1.5**	**0.8**
Self consumption and grid losses	5209	3905	3427	2518	2817	3057	3307	3512	3623	4142	4451	-4.1	-1.9	1.6	1.5
Fuel Inputs to Thermal Power Generation	**2656**	**2664**	**2555**	**1739**	**1766**	**1759**	**1809**	**1773**	**1541**	**1889**	**2076**	**-0.4**	**-3.6**	**0.2**	**0.7**
Solids	1619	1677	1205	1070	958	994	851	736	282	607	755	-2.9	-2.3	-1.2	-0.6
Oil (including refinery gas)	31	100	293	1	8	8	10	9	6	3	1	25.3	-30.2	2.2	-10.6
Gas (including derived gases)	1002	847	793	399	385	455	455	446	441	448	418	-2.3	-7.0	1.7	-0.4
Biomass & Waste	4	40	264	270	415	302	493	582	813	831	902	51.0	4.6	1.7	3.1
Geothermal heat	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Hydrogen - Methanol	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Fuel Input to other conversion processes	**12851**	**14320**	**12733**	**13409**	**14226**	**14369**	**14781**	**15146**	**15026**	**14683**	**13639**	**-0.1**	**1.1**	**0.4**	**-0.4**
Refineries	5638	6458	6119	5625	5547	5418	5330	5168	4971	4761	4530	0.8	-1.0	-0.4	-0.8
Biofuels and hydrogen production	0	10	164	204	227	245	262	267	273	278	286	0.0	3.3	1.5	0.4
District heating	674	718	497	668	660	682	661	658	776	688	581	-3.0	2.9	0.0	-0.6
Derived gases, cokeries etc.	6539	7134	5952	6912	7793	8025	8529	9054	9006	8955	8242	-0.9	2.7	0.9	-0.2
Energy Branch Consumption	**784**	**1492**	**974**	**816**	**833**	**826**	**811**	**796**	**776**	**794**	**802**	**2.2**	**-1.5**	**-0.3**	**-0.1**
Non-Energy Uses	**1633**	**1524**	**1041**	**1037**	**1102**	**1145**	**1176**	**1187**	**1152**	**1114**	**1082**	**-4.4**	**0.6**	**0.7**	**-0.4**
Final Energy Demand	**10553**	**11075**	**11593**	**12221**	**12636**	**12963**	**13033**	**13041**	**13031**	**13017**	**12903**	**0.9**	**0.9**	**0.3**	**-0.1**
by sector															
Industry	4101	4229	4352	4642	4974	5138	5258	5250	5197	5196	5078	0.6	1.3	0.6	-0.2
- energy intensive industries	3236	3404	3628	3738	4000	4070	4126	4085	4014	4011	3908	1.2	1.0	0.3	-0.3
- other industrial sectors	865	826	724	904	974	1068	1131	1165	1183	1185	1169	-1.8	3.0	1.5	0.2
Residential	2586	2540	2307	2450	2461	2567	2518	2552	2589	2590	2600	-1.1	0.6	0.2	0.2
Tertiary	2407	1916	2278	2355	2357	2376	2282	2248	2218	2212	2195	-0.5	0.3	-0.3	-0.2
Transport	1459	2389	2655	2775	2844	2882	2976	2990	3028	3020	3030	6.2	0.7	0.5	0.1
by fuel															
Solids	1476	1300	1637	1531	1538	1574	1608	1626	1610	1560	1506	1.0	-0.6	0.4	-0.3
Oil	1707	2165	2297	2337	2371	2380	2473	2509	2537	2523	2496	3.0	0.3	0.4	0.0
Gas	4537	4346	4109	4279	4137	4255	3976	3879	3845	3766	3755	-1.0	0.1	-0.4	-0.3
Electricity	1893	1965	2074	2368	2574	2719	2896	2996	3048	3167	3186	0.9	2.2	1.2	0.5
Heat (from CHP and District Heating)	619	951	851	928	923	940	930	928	909	898	889	3.2	0.8	0.1	-0.2
Renewable energy forms	320	348	624	776	1092	1094	1149	1101	1081	1099	1066	6.9	5.8	0.5	-0.4
Other fuels (hydrogen, ethanol)	0	0	0	0	0	1	1	1	2	3	4	0.0	0.0	14.4	7.7
RES in Gross Final Energy Consumption [(A)]	**379**	**723**	**1139**	**1509**	**1937**	**2001**	**2271**	**2380**	**2664**	**2700**	**2776**	**11.6**	**5.5**	**1.6**	**1.0**
TOTAL GHG emissions (Mt of CO2 eq.)	**49.4**	**53.6**	**50.4**	**47.5**	**46.3**	**47.1**	**44.7**	**43.3**	**41.0**	**37.9**	**37.0**	**0.2**	**-0.8**	**-0.4**	**-0.9**
of which ETS sectors (2013 scope) GHG emissions		29.6	25.6	24.3	23.5	24.0	22.1	21.0	18.7	15.8	15.1		-0.9	-0.6	-1.9
of which non ETS sectors GHG emissions		24.1	24.7	23.1	22.9	23.0	22.5	22.3	22.3	22.0	21.9		-0.8	-0.1	-0.1
CO_2 Emissions (energy related)	**37.6**	**40.5**	**38.6**	**35.9**	**35.1**	**35.6**	**33.8**	**32.6**	**30.5**	**30.0**	**29.3**	**0.3**	**-0.9**	**-0.4**	**-0.7**
Power generation/District heating	11.1	11.2	9.2	6.8	6.2	6.4	5.8	5.2	3.4	3.5	3.2	-1.8	-3.9	-0.7	-2.9
Energy Branch	3.1	5.2	2.5	2.1	2.1	2.0	1.7	1.5	1.4	1.4	1.3	-2.3	-1.8	-2.1	-1.2
Industry	10.7	11.1	12.8	13.1	13.5	13.7	13.1	12.8	12.5	12.2	11.8	1.8	0.5	-0.3	-0.5
Residential	4.1	3.6	3.4	3.4	3.2	3.4	3.2	3.2	3.3	3.2	3.2	-2.0	-0.7	0.2	0.0
Tertiary	4.5	2.7	3.6	3.1	2.7	2.6	2.2	2.1	2.0	1.9	1.8	-2.1	-2.9	-1.9	-1.0
Transport	4.1	6.6	7.1	7.4	7.5	7.6	7.8	7.8	7.9	7.8	7.8	5.7	0.5	0.3	0.0
CO_2 Emissions (non energy related)	**3.8**	**4.4**	**3.6**	**4.6**	**4.7**	**4.9**	**4.4**	**4.2**	**4.2**	**1.4**	**1.3**	**-0.7**	**2.8**	**-0.6**	**-6.0**
Non-CO_2 GHG emissions	**8.0**	**8.7**	**8.1**	**7.0**	**6.5**	**6.5**	**6.5**	**6.4**	**6.4**	**6.4**	**6.4**	**0.2**	**-2.3**	**0.0**	**0.0**
TOTAL GHG emissions Index (1990=100)	**68.7**	**74.7**	**70.1**	**66.1**	**64.5**	**65.5**	**62.2**	**60.2**	**57.1**	**52.7**	**51.5**				

Source: PRIMES

SUMMARY ENERGY BALANCE AND INDICATORS (B)															Slovakia: Reference scenario
	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050	'00-'10	'10-'20	'20-'30	'30-'50
												Annual % Change			
Main Energy System Indicators															
Population (Million)	5.399	5.385	5.425	5.511	5.576	5.600	5.580	5.528	5.467	5.403	5.326	0.0	0.3	0.0	-0.2
GDP (in 000 M€10)	41.3	52.4	65.7	74.4	83.9	95.5	105.8	113.2	119.0	123.6	127.4	4.8	2.5	2.3	0.9
Gross Inl. Cons./GDP (toe/M€10)	435.6	364.2	272.6	249.3	232.5	209.2	193.9	183.7	173.3	167.6	157.6	-4.6	-1.6	-1.8	-1.0
Carbon intensity (t of CO_2/toe of GIC)	2.09	2.12	2.16	1.93	1.80	1.78	1.65	1.57	1.48	1.45	1.46	0.3	-1.8	-0.9	-0.6
Import Dependency %	65.0	65.4	63.1	60.2	58.4	58.4	55.4	52.5	53.3	52.3	53.2				
Total energy-rel. and other mitigation costs [B] (in 000 M€10)	7.3	9.3	13.0	16.0	18.2	20.0	21.6	22.1	22.9	23.6	23.4	5.9	3.4	1.8	0.4
as % of GDP	17.7	17.8	19.8	21.5	21.6	21.0	20.5	19.5	19.3	19.1	18.4				
Energy intensity indicators															
Industry (Energy on Value added, index 2000=100)	100.0	58.3	38.4	36.8	34.9	31.4	28.8	26.7	25.3	24.7	24.2	-9.1	-1.0	-1.9	-0.9
Residential (Energy on Private Income, index 2000=100)	100.0	77.8	59.2	55.2	48.8	44.4	39.0	36.8	35.3	33.9	32.9	-5.1	-1.9	-2.2	-0.8
Tertiary (Energy on Value added, index 2000=100)	100.0	71.2	75.3	67.2	59.3	52.6	45.7	42.0	39.1	37.2	35.1	-2.8	-2.4	-2.6	-1.3
Passenger transport (toe/Mpkm)	23.2	22.7	25.1	24.2	21.7	19.2	17.8	17.0	16.5	16.2	16.1	0.8	-1.4	-2.0	-0.5
Freight transport (toe/Mtkm)	22.1	27.6	36.7	34.9	33.3	31.3	29.9	28.9	28.1	27.4	26.9	5.2	-1.0	-1.1	-0.5
Carbon Intensity indicators															
Electricity and Steam production (t of CO_2/MWh)	0.27	0.25	0.23	0.15	0.13	0.12	0.10	0.09	0.06	0.06	0.05	-1.4	-5.9	-1.9	-3.4
Final energy demand (t of CO_2/toe)	2.22	2.17	2.32	2.21	2.12	2.10	2.02	1.99	1.97	1.93	1.92	0.5	-0.9	-0.5	-0.3
Industry	2.60	2.62	2.93	2.81	2.71	2.67	2.48	2.44	2.41	2.34	2.33	1.2	-0.8	-0.9	-0.3
Residential	1.60	1.40	1.47	1.40	1.28	1.31	1.28	1.27	1.26	1.25	1.25	-0.9	-1.4	0.0	-0.1
Tertiary	1.85	1.43	1.58	1.32	1.14	1.08	0.97	0.92	0.90	0.87	0.83	-1.6	-3.3	-1.6	-0.8
Transport [C]	2.82	2.77	2.69	2.66	2.65	2.63	2.62	2.61	2.61	2.60	2.59	-0.5	-0.2	-0.1	-0.1
Indicators for renewables															
Share of RES in Gross Final Energy Consumption [D] (%)	3.3	6.2	9.3	12.0	14.8	14.9	16.8	17.6	19.7	19.9	20.6				
RES in transport (%)	0.5	0.9	7.8	9.3	10.1	10.9	11.3	11.6	12.0	12.3	12.7				
Gross Electricity generation by source (in GWh_e) [E]	**30798**	**31352**	**27447**	**30831**	**35461**	**37920**	**41060**	**44674**	**45285**	**47401**	**47707**	**-1.1**	**2.6**	**1.5**	**0.8**
Nuclear energy	16494	17727	14574	19101	22363	23562	26441	29065	29090	29090	27631	-1.2	4.4	1.7	0.2
Solids	5584	5535	3570	1673	2629	2930	2198	1631	777	2482	3363	-4.4	-3.0	-1.8	2.1
Oil (including refinery gas)	202	741	600	6	41	42	51	47	29	17	4	11.5	-23.5	2.2	-11.7
Gas (including derived gases)	3871	2629	2716	2330	2152	2540	2536	2480	2320	2375	1970	-3.5	-2.3	1.7	-1.3
Biomass-waste	32	76	726	1063	1525	1316	1694	2833	3971	4051	4305	36.6	7.7	1.1	4.8
Hydro (pumping excluded)	4615	4638	5255	5984	5779	6132	6144	6319	6497	6587	7135	1.3	1.0	0.6	0.8
Wind	0	6	6	99	235	375	882	1092	1303	1408	1450	0.0	44.3	14.2	2.5
Solar	0	0	0	576	739	1023	1115	1207	1299	1391	1850	0.0	0.0	4.2	2.6
Geothermal and other renewables	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	-100.0
Other fuels (hydrogen, methanol)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Net Generation Capacity in MW_e	**6602**	**7090**	**6636**	**7415**	**7098**	**7971**	**8910**	**9434**	**9414**	**9762**	**9907**	**0.1**	**0.7**	**2.3**	**0.5**
Nuclear energy	2436	2550	1831	2748	2762	2921	3294	3633	3636	3636	3510	-2.8	4.2	1.8	0.3
Renewable energy	1494	1584	1608	2213	2428	2886	3329	3523	3724	3866	4323	0.7	4.2	3.2	1.3
Hydro (pumping excluded)	1494	1579	1584	1626	1626	1758	1866	1899	1940	1973	2110	0.6	0.3	1.4	0.6
Wind	0	5	5	48	113	180	455	555	655	705	725	0.0	36.6	15.0	2.4
Solar	0	0	19	539	689	949	1009	1069	1129	1189	1488	0.0	43.2	3.9	2.0
Other renewables (tidal etc.)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Thermal power	2671	2957	3198	2453	1908	2163	2287	2278	2054	2260	2074	1.8	-5.0	1.8	-0.5
of which cogeneration units	618	786	1270	1032	1221	946	993	1812	1551	1654	1395	7.5	-0.4	-2.0	1.7
of which CCS units	0	0	0	0	0	0	0	0	0	161	248	0.0	0.0	0.0	0.0
Solids fired	1357	1426	1357	1045	465	462	528	579	383	584	672	0.0	-10.2	1.3	1.2
Gas fired	1122	1182	1488	1228	1230	1481	1523	1317	1138	1138	826	2.9	-1.9	2.2	-3.0
Oil fired	87	184	185	11	11	18	20	20	16	16	12	7.8	-24.8	6.6	-2.7
Biomass-waste fired	105	165	167	170	202	202	216	361	518	522	565	4.8	1.9	0.7	4.9
Hydrogen plants	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Geothermal heat	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Avg. Load factor of net power capacity [F] (%)	47.4	47.0	43.0	45.5	54.7	52.0	50.4	51.9	52.7	52.8	52.1				
Electricity indicators															
Efficiency of gross thermal power generation (%)	31.4	29.0	25.6	25.1	30.9	33.4	30.8	33.9	39.6	40.6	39.9				
% of gross electricity from CHP	18.4	15.3	15.9	8.0	12.3	14.4	12.3	15.2	15.5	15.4	15.2				
% of electricity from CCS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4	5.1				
Carbon free gross electricity generation (%)	68.6	71.6	74.9	87.0	86.4	85.5	88.3	90.7	93.1	89.7	88.8				
- nuclear	53.6	56.5	53.1	62.0	63.1	62.1	64.4	65.1	64.2	61.4	57.9				
- renewable energy forms	15.1	15.1	21.8	25.0	23.3	23.3	24.0	25.6	28.9	28.3	30.9				
Transport sector															
Passenger transport activity (Gpkm)	**37.2**	**39.0**	**36.2**	**40.2**	**44.7**	**50.5**	**57.0**	**60.2**	**63.6**	**65.4**	**67.3**	**-0.3**	**2.1**	**2.4**	**0.8**
Public road transport	9.3	8.5	5.3	5.8	6.5	7.3	8.2	8.6	9.0	9.2	9.5	-5.5	2.1	2.4	0.7
Private cars and motorcycles	24.4	26.4	27.4	30.3	33.5	37.6	42.2	44.4	46.7	47.7	48.7	1.2	2.0	2.3	0.7
Rail	3.2	2.6	2.6	2.9	3.3	3.8	4.5	4.8	5.2	5.4	5.6	-2.1	2.4	3.1	1.1
Aviation	0.2	1.5	0.9	1.1	1.4	1.7	2.0	2.3	2.7	3.1	3.5	14.8	4.7	3.6	2.8
Inland navigation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Freight transport activity (Gtkm)	**27.0**	**32.8**	**36.9**	**40.7**	**45.0**	**49.1**	**53.5**	**55.6**	**57.8**	**59.0**	**60.1**	**3.2**	**2.0**	**1.7**	**0.6**
Trucks	14.3	22.6	27.6	30.0	32.6	35.2	38.0	39.5	41.0	41.6	42.3	6.8	1.7	1.6	0.5
Rail	11.2	9.5	8.1	9.5	11.1	12.4	13.9	14.5	15.2	15.6	16.1	-3.2	3.2	2.3	0.7
Inland navigation	1.4	0.7	1.2	1.3	1.4	1.5	1.6	1.6	1.7	1.7	1.7	-1.5	1.5	1.3	0.5
Energy demand in transport (ktoe) [G]	**1459**	**1790**	**2262**	**2393**	**2470**	**2506**	**2610**	**2632**	**2674**	**2678**	**2699**	**4.5**	**0.9**	**0.6**	**0.2**
Public road transport	62	56	35	39	42	46	50	51	52	52	52	-5.5	1.8	1.6	0.3
Private cars and motorcycles	759	784	825	878	864	847	881	884	899	901	910	0.8	0.5	0.2	0.2
Trucks	514	861	1308	1369	1439	1473	1527	1536	1551	1541	1542	9.8	1.0	0.6	0.0
Rail	83	42	40	46	53	59	65	67	69	69	69	-7.1	2.9	2.1	0.3
Aviation	27	39	41	50	59	67	73	78	88	98	110	4.5	3.6	2.1	2.1
Inland navigation	14	7	12	13	14	14	15	16	16	16	16	-2.0	1.4	1.1	0.2

Source: PRIMES

Slovenia: Reference scenario												SUMMARY ENERGY BALANCE AND INDICATORS (A)			
ktoe	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**	**'00-'10**	**'10-'20**	**'20-'30**	**'30-'50**
												Annual % Change			
Production (incl.recovery of products)	**3085**	**3492**	**3726**	**3520**	**3377**	**3565**	**3500**	**3172**	**3214**	**1755**	**1709**	**1.9**	**-1.0**	**0.4**	**-3.5**
Solids	1062	1184	1196	991	608	642	572	164	132	155	125	1.2	-6.5	-0.6	-7.3
Oil	1	0	0	0	0	0	0	0	0	0	0	0.0	-100.0	0.0	0.0
Natural gas	6	3	6	0	0	0	0	0	0	0	0	-0.1	-100.0	0.0	0.0
Nuclear	1228	1518	1459	1467	1493	1493	1493	1493	1493	0	0	1.7	0.2	0.0	-100.0
Renewable energy sources	788	787	1064	1062	1276	1430	1435	1516	1589	1600	1585	3.1	1.8	1.2	0.5
Hydro	330	298	388	363	396	396	397	395	395	397	397	1.6	0.2	0.0	0.0
Biomass & Waste	458	489	642	629	759	783	744	780	845	844	802	3.4	1.7	-0.2	0.4
Wind	0	0	0	1	27	46	54	75	81	88	120	0.0	0.0	7.2	4.0
Solar and others	0	0	6	41	60	164	195	220	220	221	215	0.0	25.5	12.5	0.5
Geothermal	0	0	28	28	34	41	44	47	49	50	50	0.0	1.8	2.7	0.7
Net Imports	**3389**	**3830**	**3590**	**3995**	**4021**	**3900**	**4034**	**4226**	**4274**	**4833**	**4826**	**0.6**	**1.1**	**0.0**	**0.9**
Solids	244	323	282	191	197	132	128	83	67	64	61	1.5	-3.5	-4.2	-3.7
Oil	2439	2609	2604	2647	2593	2518	2525	2533	2540	2553	2560	0.7	0.0	-0.3	0.1
- Crude oil and Feedstocks	151	0	0	0	0	0	0	0	0	0	0	-100.0	0.0	0.0	0.0
- Oil products	2288	2609	2604	2647	2593	2518	2525	2533	2540	2553	2560	1.3	0.0	-0.3	0.1
Natural gas	820	925	857	1170	1098	1145	1239	1426	1455	1701	1683	0.4	2.5	1.2	1.5
Electricity	-114	-28	-182	-110	-60	-82	-81	-41	-42	253	262	4.8	-10.5	3.1	0.0
Gross Inland Consumption	**6426**	**7301**	**7264**	**7496**	**7379**	**7445**	**7515**	**7379**	**7468**	**6567**	**6515**	**1.2**	**0.2**	**0.2**	**-0.7**
Solids	1305	1539	1458	1182	805	774	701	247	198	219	185	1.1	-5.8	-1.4	-6.4
Oil	2393	2556	2573	2628	2574	2499	2506	2514	2521	2533	2540	0.7	0.0	-0.3	0.1
Natural gas	826	929	863	1170	1097	1145	1239	1425	1454	1700	1682	0.4	2.4	1.2	1.5
Nuclear	1228	1518	1459	1467	1493	1493	1493	1493	1493	0	0	1.7	0.2	0.0	-100.0
Electricity	-114	-28	-182	-110	-60	-82	-81	-41	-42	253	262	4.8	-10.5	3.1	0.0
Renewable energy forms	788	787	1093	1159	1470	1618	1657	1741	1844	1862	1846	3.3	3.0	1.2	0.5
as % in Gross Inland Consumption															
Solids	20.3	21.1	20.1	15.8	10.9	10.4	9.3	3.3	2.7	3.3	2.8				
Oil	37.2	35.0	35.4	35.1	34.9	33.6	33.4	34.1	33.8	38.6	39.0				
Natural gas	12.8	12.7	11.9	15.6	14.9	15.4	16.5	19.3	19.5	25.9	25.8				
Nuclear	19.1	20.8	20.1	19.6	20.2	20.0	19.9	20.2	20.0	0.0	0.0				
Renewable energy forms	12.3	10.8	15.0	15.5	19.9	21.7	22.1	23.6	24.7	28.4	28.3				
Gross Electricity Generation in GWh_e	**13622**	**15114**	**16245**	**17092**	**17462**	**17967**	**18295**	**17648**	**18260**	**14819**	**14922**	**1.8**	**0.7**	**0.5**	**-1.0**
Self consumption and grid losses	1640	1921	2045	2096	1992	1988	1972	1807	1885	1688	1684	2.2	-0.3	-0.1	-0.8
Fuel Inputs to Thermal Power Generation	**1302**	**1508**	**1561**	**1606**	**1284**	**1272**	**1300**	**1094**	**1156**	**1457**	**1385**	**1.8**	**-1.9**	**0.1**	**0.3**
Solids	1215	1412	1381	1125	748	721	639	205	164	183	152	1.3	-5.9	-1.6	-6.9
Oil (including refinery gas)	13	9	3	2	1	1	1	1	1	1	1	-13.4	-10.1	-1.0	-2.9
Gas (including derived gases)	59	58	113	397	374	398	513	693	711	973	945	6.7	12.7	3.2	3.1
Biomass & Waste	15	30	65	83	161	151	147	195	281	301	286	15.4	9.5	-0.9	3.4
Geothermal heat	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Hydrogen - Methanol	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Fuel Input to other conversion processes	**1477**	**1607**	**1562**	**1620**	**1766**	**1756**	**1759**	**1771**	**1757**	**235**	**241**	**0.6**	**1.2**	**0.0**	**-9.5**
Refineries	170	0	0	0	0	0	0	0	0	0	0	-100.0	0.0	0.0	0.0
Biofuels and hydrogen production	0	0	45	90	190	192	193	202	205	203	208	0.0	15.4	0.2	0.4
District heating	80	89	58	64	83	71	72	75	58	30	31	-3.2	3.8	-1.5	-4.1
Derived gases, cokeries etc.	1228	1518	1459	1467	1493	1493	1494	1494	1494	2	2	1.7	0.2	0.0	-28.0
Energy Branch Consumption	**107**	**100**	**112**	**100**	**83**	**84**	**80**	**61**	**64**	**45**	**43**	**0.4**	**-3.0**	**-0.4**	**-3.0**
Non-Energy Uses	**238**	**311**	**207**	**209**	**208**	**201**	**200**	**198**	**197**	**195**	**193**	**-1.3**	**0.0**	**-0.4**	**-0.2**
Final Energy Demand	**4432**	**4872**	**4970**	**5278**	**5449**	**5539**	**5609**	**5617**	**5685**	**5713**	**5713**	**1.2**	**0.9**	**0.3**	**0.1**
by sector															
Industry	1423	1643	1280	1389	1429	1455	1454	1441	1453	1449	1451	-1.1	1.1	0.2	0.0
- energy intensive industries	835	1029	782	859	901	921	918	895	887	869	859	-0.7	1.4	0.2	-0.3
- other industrial sectors	587	614	498	530	528	534	536	546	565	580	591	-1.6	0.6	0.2	0.5
Residential	1125	1186	1275	1318	1323	1371	1394	1377	1372	1364	1331	1.3	0.4	0.5	-0.2
Tertiary	645	569	621	678	680	639	618	622	633	651	648	-0.4	0.9	-0.9	0.2
Transport	1239	1475	1794	1893	2017	2074	2142	2176	2228	2249	2283	3.8	1.2	0.6	0.3
by fuel															
Solids	90	80	52	56	55	51	60	40	33	34	31	-5.3	0.5	0.9	-3.2
Oil	2238	2384	2445	2494	2442	2374	2382	2391	2398	2412	2421	0.9	0.0	-0.3	0.1
Gas	569	665	620	654	631	667	647	649	661	649	659	0.9	0.2	0.2	0.1
Electricity	905	1096	1029	1171	1265	1287	1318	1320	1364	1380	1398	1.3	2.1	0.4	0.3
Heat (from CHP and District Heating)	195	196	192	218	247	243	251	247	232	229	230	-0.2	2.5	0.2	-0.4
Renewable energy forms	435	452	631	685	807	916	949	969	994	1006	972	3.8	2.5	1.6	0.1
Other fuels (hydrogen, ethanol)	0	0	0	0	0	1	1	2	2	3	3	0.0	57.5	12.9	4.5
RES in Gross Final Energy Consumption [(A)]	**767**	**810**	**1020**	**1113**	**1444**	**1583**	**1606**	**1688**	**1749**	**1758**	**1746**	**2.9**	**3.5**	**1.1**	**0.4**
TOTAL GHG emissions (Mt of CO2 eq.)	**18.6**	**20.2**	**19.4**	**19.1**	**17.1**	**17.0**	**16.7**	**15.2**	**15.0**	**15.7**	**15.5**	**0.5**	**-1.2**	**-0.3**	**-0.4**
of which ETS sectors (2013 scope) GHG emissions		9.0	8.3	7.9	6.2	6.3	6.0	4.5	4.3	5.0	4.8		-2.9	-0.4	-1.1
of which non ETS sectors GHG emissions		11.2	11.1	11.2	10.9	10.7	10.7	10.6	10.7	10.7	10.7		-0.2	-0.2	0.0
CO_2 Emissions (energy related)	**14.0**	**15.5**	**15.3**	**15.2**	**13.2**	**13.0**	**13.0**	**11.5**	**11.4**	**12.1**	**12.0**	**0.9**	**-1.5**	**-0.2**	**-0.4**
Power generation/District heating	5.5	6.3	6.2	5.8	4.1	4.0	3.9	2.5	2.4	3.1	2.9	1.3	-4.1	-0.4	-1.5
Energy Branch	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-14.9	-100.0	0.0	0.0
Industry	2.4	2.3	1.8	1.8	1.8	1.8	1.8	1.7	1.6	1.6	1.6	-2.9	0.1	-0.1	-0.4
Residential	1.3	1.4	1.2	1.3	1.2	1.0	0.9	0.9	0.9	0.9	0.8	-1.0	-0.4	-2.0	-0.7
Tertiary	1.2	1.0	0.9	0.8	0.8	0.6	0.5	0.5	0.5	0.5	0.5	-2.6	-1.7	-3.3	-0.1
Transport	3.6	4.4	5.2	5.4	5.5	5.6	5.8	5.9	6.0	6.1	6.1	3.8	0.4	0.6	0.3
CO_2 Emissions (non energy related)	**1.0**	**1.2**	**0.8**	**0.9**	**1.0**	**1.0**	**0.8**	**0.8**	**0.8**	**0.8**	**0.7**	**-1.7**	**1.4**	**-1.2**	**-0.8**
Non-CO_2 GHG emissions	**3.6**	**3.6**	**3.3**	**3.1**	**3.0**	**2.9**	**2.8**	**2.8**	**2.8**	**2.8**	**2.8**	**-0.9**	**-1.0**	**-0.4**	**-0.1**
TOTAL GHG emissions Index (1990=100)	**100.4**	**109.1**	**105.0**	**103.1**	**92.6**	**91.8**	**90.0**	**81.8**	**81.0**	**84.8**	**83.7**				

Source: PRIMES

SUMMARY ENERGY BALANCE AND INDICATORS (B)															Slovenia: Reference scenario
	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050	'00-'10	'10-'20	'20-'30	'30-'50
												Annual % Change			
Main Energy System Indicators															
Population (Million)	1.988	1.998	2.047	2.106	2.142	2.155	2.155	2.149	2.141	2.132	2.115	0.3	0.5	0.1	-0.1
GDP (in 000 M€10)	27.1	32.4	35.4	38.2	41.8	45.1	48.8	52.1	55.2	57.9	60.7	2.7	1.7	1.6	1.1
Gross Inl. Cons./GDP (toe/M€10)	236.9	225.3	205.1	196.0	176.6	164.9	154.0	141.5	135.3	113.3	107.4	-1.4	-1.5	-1.4	-1.8
Carbon intensity (t of CO_2/toe of GIC)	2.18	2.12	2.11	2.02	1.79	1.75	1.73	1.56	1.53	1.85	1.84	-0.3	-1.6	-0.4	0.3
Import Dependency %	52.7	52.3	49.3	53.2	54.4	52.2	53.5	57.1	57.1	73.4	73.8				
Total energy-rel. and other mitigation costs [B] (in 000 M€10)	4.1	5.1	6.3	7.6	8.9	9.6	10.3	10.7	11.2	11.7	12.1	4.4	3.5	1.4	0.8
as % of GDP	15.1	15.8	17.8	19.9	21.4	21.2	21.1	20.5	20.3	20.2	20.0				
Energy intensity indicators															
Industry (Energy on Value added, index 2000=100)	100.0	93.0	70.1	67.8	64.4	61.4	57.0	53.1	50.6	48.0	46.0	-3.5	-0.8	-1.2	-1.1
Residential (Energy on Private Income, index 2000=100)	100.0	92.3	88.4	84.2	76.7	72.8	67.6	61.6	57.2	53.4	49.1	-1.2	-1.4	-1.3	-1.6
Tertiary (Energy on Value added, index 2000=100)	100.0	73.6	70.8	72.2	65.7	56.8	50.5	47.4	45.4	44.4	42.2	-3.4	-0.7	-2.6	-0.9
Passenger transport (toe/Mpkm)	41.8	34.7	32.9	31.2	28.3	25.2	22.8	21.6	20.8	20.3	20.0	-2.4	-1.5	-2.1	-0.7
Freight transport (toe/Mtkm)	22.7	37.8	41.2	37.5	36.3	35.2	33.6	32.9	32.2	31.5	31.0	6.1	-1.2	-0.8	-0.4
Carbon Intensity indicators															
Electricity and Steam production (t of CO_2/MWh)	0.34	0.35	0.33	0.29	0.19	0.19	0.18	0.12	0.11	0.17	0.16	-0.3	-5.1	-0.8	-0.6
Final energy demand (t of CO_2/toe)	1.91	1.88	1.83	1.77	1.68	1.63	1.62	1.61	1.59	1.59	1.59	-0.4	-0.9	-0.4	-0.1
Industry	1.66	1.41	1.38	1.33	1.25	1.23	1.21	1.17	1.12	1.11	1.11	-1.8	-1.0	-0.3	-0.4
Residential	1.18	1.22	0.94	0.96	0.87	0.72	0.68	0.66	0.65	0.63	0.61	-2.2	-0.8	-2.5	-0.5
Tertiary	1.80	1.76	1.44	1.25	1.10	0.97	0.87	0.86	0.81	0.80	0.81	-2.2	-2.6	-2.4	-0.3
Transport [C]	2.91	2.97	2.92	2.86	2.71	2.72	2.71	2.70	2.70	2.70	2.69	0.0	-0.7	0.0	0.0
Indicators for renewables															
Share of RES in Gross Final Energy Consumption [D] (%)	16.4	15.7	19.4	20.2	25.5	27.5	27.6	29.0	29.7	29.8	29.6				
RES in transport (%)	0.4	0.3	2.8	5.2	10.2	10.2	10.2	10.7	11.0	11.0	11.3				
Gross Electricity generation by source (in GWh_e) [E]	**13624**	**15117**	**16248**	**17092**	**17462**	**17967**	**18295**	**17648**	**18260**	**14819**	**14922**	**1.8**	**0.7**	**0.5**	**-1.0**
Nuclear energy	4761	5884	5657	5684	5785	5785	5785	5785	5785	0	0	1.7	0.2	0.0	-100.0
Solids	4611	5271	5288	4301	4026	4058	3591	1123	899	1016	837	1.4	-2.7	-1.1	-7.0
Oil (including refinery gas)	55	42	8	4	3	4	2	2	3	2	2	-17.5	-9.7	-3.5	0.9
Gas (including derived gases)	293	339	548	2425	1891	1841	2542	3881	4126	6098	6078	6.5	13.2	3.0	4.5
Biomass-waste	70	120	222	357	706	666	649	925	1419	1555	1490	12.2	12.3	-0.8	4.2
Hydro (pumping excluded)	3834	3461	4512	4225	4607	4600	4621	4588	4591	4621	4617	1.6	0.2	0.0	0.0
Wind	0	0	0	11	316	541	633	871	939	1029	1399	0.0	0.0	7.2	4.0
Solar	0	0	13	85	129	471	473	473	498	498	498	0.0	25.9	13.9	0.3
Geothermal and other renewables	0	0	0	0	0	0	0	0	0	0	0	0.0	-100.0	0.0	0.0
Other fuels (hydrogen, methanol)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Net Generation Capacity in MW_e	**2822**	**3180**	**3164**	**3730**	**4201**	**4772**	**5145**	**5207**	**5263**	**4986**	**5240**	**1.1**	**2.9**	**2.0**	**0.1**
Nuclear energy	696	696	694	694	694	694	694	694	694	0	0	0.0	0.0	0.0	-100.0
Renewable energy	829	963	1050	1232	1672	2147	2214	2384	2453	2517	2781	2.4	4.8	2.8	1.1
Hydro (pumping excluded)	829	963	1038	1139	1317	1317	1317	1317	1317	1317	1317	2.3	2.4	0.0	0.0
Wind	0	0	0	8	225	387	453	623	672	736	1000	0.0	0.0	7.2	4.0
Solar	0	0	12	85	130	443	444	444	464	464	464	0.0	26.9	13.1	0.2
Other renewables (tidal etc.)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Thermal power	1297	1520	1420	1804	1834	1930	2236	2129	2115	2468	2459	0.9	2.6	2.0	0.5
of which cogeneration units	648	507	428	486	471	479	511	494	479	900	890	-4.1	1.0	0.8	2.8
of which CCS units	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Solids fired	956	955	889	889	737	703	701	658	649	649	649	-0.7	-1.8	-0.5	-0.4
Gas fired	213	441	472	853	959	1091	1410	1188	1137	1493	1515	8.3	7.4	3.9	0.4
Oil fired	19	12	11	10	8	7	0	0	0	0	0	-4.9	-3.3	-44.0	-100.0
Biomass-waste fired	109	113	48	52	130	130	126	283	330	327	295	-7.8	10.4	-0.4	4.4
Hydrogen plants	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Geothermal heat	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Avg. Load factor of net power capacity [F] (%)	51.8	50.8	54.9	49.2	45.1	40.9	38.8	37.3	38.2	32.9	31.6				
Electricity indicators															
Efficiency of gross thermal power generation (%)	33.2	32.9	33.4	38.0	44.4	44.4	44.9	46.6	48.0	51.2	52.2				
% of gross electricity from CHP	6.4	7.3	6.9	11.8	14.5	14.0	14.2	16.7	17.0	22.1	25.4				
% of electricity from CCS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Carbon free gross electricity generation (%)	63.6	62.6	64.0	60.6	66.1	67.1	66.5	71.6	72.5	52.0	53.6				
- nuclear	34.9	38.9	34.8	33.3	33.1	32.2	31.6	32.8	31.7	0.0	0.0				
- renewable energy forms	28.7	23.7	29.2	27.4	33.0	34.9	34.8	38.9	40.8	52.0	53.6				
Transport sector															
Passenger transport activity (Gpkm)	**25.0**	**26.9**	**30.3**	**32.5**	**34.9**	**37.2**	**39.6**	**40.7**	**41.9**	**42.6**	**43.2**	**1.9**	**1.4**	**1.3**	**0.4**
Public road transport	3.5	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.7	3.8	3.8	-1.0	0.7	0.5	0.2
Private cars and motorcycles	20.5	22.7	26.0	27.8	29.6	31.4	33.2	33.9	34.7	35.2	35.7	2.4	1.3	1.1	0.4
Rail	0.7	0.8	0.8	1.1	1.4	1.7	2.1	2.3	2.5	2.6	2.6	1.4	5.3	4.6	1.1
Aviation	0.3	0.4	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.7	3.8	3.3	2.3
Inland navigation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Freight transport activity (Gtkm)	**8.2**	**14.3**	**19.4**	**23.4**	**28.2**	**32.2**	**36.8**	**39.4**	**42.1**	**43.8**	**45.6**	**9.0**	**3.9**	**2.7**	**1.1**
Trucks	5.3	11.0	15.9	19.0	22.6	25.4	28.6	30.5	32.6	33.9	35.3	11.6	3.5	2.4	1.1
Rail	2.9	3.2	3.4	4.4	5.7	6.8	8.2	8.8	9.5	9.9	10.3	1.8	5.2	3.8	1.1
Inland navigation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Energy demand in transport (ktoe) [G]	**1229**	**1474**	**1793**	**1892**	**2015**	**2072**	**2140**	**2174**	**2226**	**2247**	**2281**	**3.8**	**1.2**	**0.6**	**0.3**
Public road transport	41	35	37	39	40	40	40	39	39	39	39	-1.0	0.7	0.0	-0.1
Private cars and motorcycles	977	874	932	944	914	857	820	794	781	772	769	-0.5	-0.2	-1.1	-0.3
Trucks	163	514	772	849	992	1098	1193	1250	1311	1338	1373	16.8	2.5	1.9	0.7
Rail	24	28	26	31	36	41	47	48	49	48	47	1.0	3.3	2.5	0.1
Aviation	25	23	26	30	33	36	40	43	46	49	53	0.5	2.3	2.1	1.4
Inland navigation	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0

Source: PRIMES

Spain: Reference scenario												SUMMARY ENERGY BALANCE AND INDICATORS (A)			
ktoe	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**	**'00-'10**	**'10-'20**	**'20-'30**	**'30-'50**
												Annual % Change			
Production (incl.recovery of products)	**31592**	**30002**	**34105**	**34644**	**37342**	**37070**	**40903**	**45907**	**46611**	**47686**	**48246**	**0.8**	**0.9**	**0.9**	**0.8**
Solids	7966	6265	3034	2656	2583	1562	1260	887	1221	988	813	-9.2	-1.6	-6.9	-2.2
Oil	229	168	124	93	67	0	0	0	0	0	0	-5.9	-5.9	-100.0	0.0
Natural gas	234	185	85	33	0	0	0	0	0	0	0	-9.7	-100.0	0.0	0.0
Nuclear	16046	14842	15991	15035	15035	14886	14886	18005	14782	13939	13939	0.0	-0.6	-0.1	-0.3
Renewable energy sources	7118	8542	14872	16829	19657	20622	24757	27015	30608	32760	33494	7.6	2.8	2.3	1.5
Hydro	2543	1537	3635	2630	2739	2921	3093	3038	3108	3126	3185	3.6	-2.8	1.2	0.1
Biomass & Waste	4131	5112	6404	7512	9043	8965	9502	9453	10968	11045	11096	4.5	3.5	0.5	0.8
Wind	406	1821	3798	4852	4891	5011	7793	9094	9606	10940	11414	25.0	2.6	4.8	1.9
Solar and others	33	65	1019	1775	2820	3547	4172	5219	5803	6289	6434	41.1	10.7	4.0	2.2
Geothermal	5	7	16	60	163	177	196	210	1123	1361	1365	11.5	26.2	1.9	10.2
Net Imports	**99543**	**123977**	**106256**	**108271**	**104445**	**111338**	**109300**	**105416**	**105897**	**106082**	**104242**	**0.7**	**-0.2**	**0.5**	**-0.2**
Solids	12840	14418	6732	7121	7190	8895	8816	5253	5569	5461	4611	-6.3	0.7	2.1	-3.2
Oil	70854	79426	68869	69259	64931	65428	66169	65931	65966	66090	65523	-0.3	-0.6	0.2	0.0
- Crude oil and Feedstocks	59238	60839	56661	56544	52816	52820	53186	52871	52760	52758	52235	-0.4	-0.7	0.1	-0.1
- Oil products	11616	18587	12209	12715	12115	12608	12983	13060	13205	13333	13288	0.5	-0.1	0.7	0.1
Natural gas	15467	30248	30950	31254	31317	35961	33194	33001	32858	33243	32970	7.2	0.1	0.6	0.0
Electricity	382	-115	-717	-262	-253	-129	-113	-116	-104	-275	-350	0.0	-9.9	-7.7	5.8
Gross Inland Consumption	**123962**	**144336**	**130224**	**133598**	**132165**	**138601**	**140330**	**141131**	**142066**	**142970**	**141294**	**0.5**	**0.1**	**0.6**	**0.0**
Solids	20938	20566	7828	9776	9773	10457	10076	6140	6790	6449	5424	-9.4	2.2	0.3	-3.0
Oil	64174	70616	60616	60055	55461	55794	56516	56278	56218	56107	55312	-0.6	-0.9	0.2	-0.1
Natural gas	15305	29886	31221	31266	31232	35788	32974	32464	32164	32428	31988	7.4	0.0	0.5	-0.2
Nuclear	16046	14842	15991	15035	15035	14886	14886	18005	14782	13939	13939	0.0	-0.6	-0.1	-0.3
Electricity	382	-115	-717	-262	-253	-129	-113	-116	-104	-275	-350	0.0	-9.9	-7.7	5.8
Renewable energy forms	7118	8542	15285	17728	20916	21805	25992	28361	32217	34322	34982	7.9	3.2	2.2	1.5
as % in Gross Inland Consumption															
Solids	16.9	14.2	6.0	7.3	7.4	7.5	7.2	4.4	4.8	4.5	3.8				
Oil	51.8	48.9	46.5	45.0	42.0	40.3	40.3	39.9	39.6	39.2	39.1				
Natural gas	12.3	20.7	24.0	23.4	23.6	25.8	23.5	23.0	22.6	22.7	22.6				
Nuclear	12.9	10.3	12.3	11.3	11.4	10.7	10.6	12.8	10.4	9.7	9.9				
Renewable energy forms	5.7	5.9	11.7	13.3	15.8	15.7	18.5	20.1	22.7	24.0	24.8				
Gross Electricity Generation in GWh_e	**222195**	**288872**	**299828**	**304544**	**314374**	**340480**	**358549**	**374400**	**387420**	**403020**	**412858**	**3.0**	**0.5**	**1.3**	**0.7**
Self consumption and grid losses	32640	40416	27398	21805	22729	25246	25550	26149	27791	28538	29837	-1.7	-1.9	1.2	0.8
Fuel Inputs to Thermal Power Generation	**26469**	**35403**	**25369**	**27345**	**26286**	**29461**	**25562**	**21213**	**24888**	**25461**	**23821**	**-0.4**	**0.4**	**-0.3**	**-0.4**
Solids	18244	17623	5552	7566	7485	7994	7426	3381	4426	4224	3417	-11.2	3.0	-0.1	-3.8
Oil (including refinery gas)	4452	5249	3383	3781	1535	1152	463	290	268	168	48	-2.7	-7.6	-11.3	-10.7
Gas (including derived gases)	3075	11140	15007	13808	14242	17890	15464	15484	15350	16077	15447	17.2	-0.5	0.8	0.0
Biomass & Waste	697	1391	1427	2191	3024	2425	2209	2057	3941	3862	3778	7.4	7.8	-3.1	2.7
Geothermal heat	0	0	0	0	0	0	0	0	904	1130	1130	0.0	0.0	0.0	0.0
Hydrogen - Methanol	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Fuel Input to other conversion processes	**80074**	**79615**	**78306**	**77667**	**74968**	**75492**	**76400**	**79193**	**75810**	**75049**	**74720**	**-0.2**	**-0.4**	**0.2**	**-0.1**
Refineries	60888	61499	58634	58629	55407	55705	56271	56054	56110	56146	55739	-0.4	-0.6	0.2	0.0
Biofuels and hydrogen production	72	258	1436	2294	2773	3058	3290	3254	3170	3356	3584	34.9	6.8	1.7	0.4
District heating	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Derived gases, cokeries etc.	19115	17857	18237	16744	16788	16729	16839	19885	16530	15547	15397	-0.5	-0.8	0.0	-0.4
Energy Branch Consumption	**6372**	**6621**	**8136**	**6919**	**6699**	**6920**	**6692**	**6533**	**6266**	**6285**	**6153**	**2.5**	**-1.9**	**0.0**	**-0.4**
Non-Energy Uses	**9407**	**8361**	**7041**	**7191**	**7537**	**7878**	**8014**	**8063**	**8067**	**8054**	**8133**	**-2.9**	**0.7**	**0.6**	**0.1**
Final Energy Demand	**79537**	**97454**	**90587**	**92960**	**92444**	**97049**	**100934**	**102333**	**103329**	**104203**	**104718**	**1.3**	**0.2**	**0.9**	**0.2**
by sector															
Industry	25360	30956	23352	24357	25763	27058	27858	28085	27825	28154	28026	-0.8	1.0	0.8	0.0
- energy intensive industries	17346	20335	14562	15222	16278	17085	17711	17795	17599	17728	17352	-1.7	1.1	0.8	-0.1
- other industrial sectors	8014	10620	8790	9135	9485	9974	10147	10290	10226	10426	10674	0.9	0.8	0.7	0.3
Residential	11985	15114	16478	16988	16797	18144	19269	19914	20087	19911	19722	3.2	0.2	1.4	0.1
Tertiary	9266	11684	13513	13464	13170	13729	13339	13452	13552	13610	13723	3.8	-0.3	0.1	0.1
Transport	32926	39701	37244	38152	36715	38118	40468	40882	41865	42528	43247	1.2	-0.1	1.0	0.3
by fuel															
Solids	1774	1712	1261	1276	1313	1433	1546	1684	1363	1302	1170	-3.4	0.4	1.6	-1.4
Oil	45947	53146	46762	46075	43668	44317	45725	45744	46121	46159	45810	0.2	-0.7	0.5	0.0
Gas	12141	17978	14571	15040	14604	15161	14899	14347	14060	13504	13444	1.8	0.0	0.2	-0.5
Electricity	16205	20827	22406	23714	24497	26653	28182	29475	30439	31521	32156	3.3	0.9	1.4	0.7
Heat (from CHP and District Heating)	0	0	0	194	380	577	772	894	1224	1397	1705	0.0	0.0	7.3	4.0
Renewable energy forms	3470	3790	5588	6661	7977	8898	9791	10156	10063	10236	10321	4.9	3.6	2.1	0.3
Other fuels (hydrogen, ethanol)	0	0	0	1	4	9	19	33	58	85	112	13.3	0.0	17.7	9.2
RES in Gross Final Energy Consumption [(A)]	**6610**	**8398**	**12874**	**16819**	**19346**	**20365**	**24469**	**27037**	**29104**	**30842**	**31714**	**6.9**	**4.2**	**2.4**	**1.3**
TOTAL GHG emissions (Mt of CO2 eq.)	**391.0**	**447.5**	**364.5**	**366.2**	**355.7**	**372.1**	**360.5**	**338.0**	**325.7**	**293.8**	**294.3**	**-0.7**	**-0.2**	**0.1**	**-1.0**
of which ETS sectors (2013 scope) GHG emissions		217.7	146.4	162.3	161.0	174.6	160.3	136.5	122.9	90.0	89.6		1.0	0.0	-2.9
of which non ETS sectors GHG emissions		229.8	218.1	203.9	194.7	197.5	200.2	201.6	202.9	203.8	204.6		-1.1	0.3	0.1
CO_2 Emissions (energy related)	**290.7**	**346.4**	**272.8**	**276.0**	**261.2**	**274.9**	**268.7**	**245.0**	**236.0**	**220.1**	**219.7**	**-0.6**	**-0.4**	**0.3**	**-1.0**
Power generation/District heating	98.8	117.7	70.6	75.8	69.2	78.6	68.3	45.9	40.7	26.7	29.1	-3.3	-0.2	-0.1	-4.2
Energy Branch	13.4	13.5	16.3	14.1	13.7	14.0	13.6	13.4	12.4	12.3	11.4	2.0	-1.7	-0.1	-0.9
Industry	50.3	59.2	43.5	45.4	47.0	48.6	48.7	47.9	43.4	42.0	40.3	-1.5	0.8	0.3	-0.9
Residential	17.0	20.8	19.9	19.1	17.3	17.7	17.9	17.6	16.8	15.9	14.7	1.6	-1.4	0.3	-1.0
Tertiary	13.2	16.4	14.1	13.2	11.8	11.0	9.4	8.3	7.9	7.3	7.0	0.7	-1.8	-2.3	-1.4
Transport	97.9	118.7	108.4	108.4	102.2	105.1	110.9	111.9	114.8	116.0	117.2	1.0	-0.6	0.8	0.3
CO_2 Emissions (non energy related)	**26.1**	**29.5**	**21.9**	**25.8**	**29.6**	**31.6**	**26.8**	**26.0**	**21.6**	**4.1**	**3.1**	**-1.7**	**3.1**	**-1.0**	**-10.2**
Non-CO_2 GHG emissions	**74.2**	**71.6**	**69.8**	**64.4**	**64.9**	**65.6**	**64.9**	**67.1**	**68.1**	**69.7**	**71.4**	**-0.6**	**-0.7**	**0.0**	**0.5**
TOTAL GHG emissions Index (1990=100)	**135.5**	**155.0**	**126.3**	**126.9**	**123.2**	**128.9**	**124.9**	**117.1**	**112.9**	**101.8**	**102.0**				

Source: PRIMES

SUMMARY ENERGY BALANCE AND INDICATORS (B)															Spain: Reference scenario
	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050	'00-'10	'10-'20	'20-'30	'30-'50
												Annual % Change			
Main Energy System Indicators															
Population (Million)	40.050	43.038	45.989	46.923	47.961	49.028	49.961	50.867	51.714	52.378	52.688	1.4	0.4	0.4	0.3
GDP (in 000 M€10)	856.8	1005.9	1051.3	1118.9	1227.4	1395.9	1583.3	1723.5	1835.6	1933.4	2045.3	2.1	1.6	2.6	1.3
Gross Inl. Cons./GDP (toe/M€10)	144.7	143.5	123.9	119.4	107.7	99.3	88.6	81.9	77.4	73.9	69.1	-1.5	-1.4	-1.9	-1.2
Carbon intensity (t of CO_2/toe of GIC)	2.34	2.40	2.09	2.07	1.98	1.98	1.91	1.74	1.66	1.54	1.55	-1.1	-0.6	-0.3	-1.0
Import Dependency %	76.6	81.5	76.7	75.8	73.7	75.0	72.8	69.7	69.4	69.0	68.4				
Total energy-rel. and other mitigation costs [B] (in 000 M€10)	76.2	100.9	128.8	160.6	176.3	193.9	205.4	212.9	223.9	233.7	237.1	5.4	3.2	1.5	0.7
as % of GDP	8.9	10.0	12.3	14.4	14.4	13.9	13.0	12.4	12.2	12.1	11.6				
Energy intensity indicators															
Industry (Energy on Value added, index 2000=100)	100.0	114.4	98.2	95.4	90.8	84.3	79.6	75.7	71.1	68.7	65.0	-0.2	-0.8	-1.3	-1.0
Residential (Energy on Private Income, index 2000=100)	100.0	106.3	112.3	108.8	98.1	93.0	86.9	82.3	77.7	73.0	68.1	1.2	-1.3	-1.2	-1.2
Tertiary (Energy on Value added, index 2000=100)	100.0	107.7	110.9	103.1	91.7	83.9	71.0	65.2	61.2	58.1	55.1	1.0	-1.9	-2.5	-1.3
Passenger transport (toe/Mpkm)	41.5	39.8	38.2	36.6	32.9	29.5	27.2	26.0	25.2	24.5	24.1	-0.8	-1.5	-1.9	-0.6
Freight transport (toe/Mtkm)	68.1	65.6	67.5	66.5	62.0	59.3	57.5	55.1	53.6	52.8	51.8	-0.1	-0.8	-0.8	-0.5
Carbon Intensity indicators															
Electricity and Steam production (t of CO_2/MWh)	0.44	0.41	0.24	0.25	0.22	0.23	0.19	0.12	0.10	0.06	0.07	-6.2	-0.8	-1.5	-5.0
Final energy demand (t of CO_2/toe)	2.24	2.21	2.05	2.00	1.93	1.88	1.85	1.82	1.77	1.74	1.71	-0.9	-0.6	-0.4	-0.4
Industry	1.98	1.91	1.86	1.86	1.83	1.80	1.75	1.71	1.56	1.49	1.44	-0.6	-0.2	-0.4	-1.0
Residential	1.42	1.38	1.21	1.12	1.03	0.97	0.93	0.88	0.84	0.80	0.74	-1.6	-1.6	-1.0	-1.1
Tertiary	1.42	1.41	1.05	0.98	0.90	0.80	0.70	0.62	0.59	0.53	0.51	-3.0	-1.5	-2.4	-1.6
Transport [C]	2.97	2.99	2.91	2.84	2.78	2.76	2.74	2.74	2.74	2.73	2.71	-0.2	-0.4	-0.2	-0.1
Indicators for renewables															
Share of RES in Gross Final Energy Consumption [D] (%)	8.0	8.2	13.7	17.7	20.6	20.6	23.7	25.9	27.6	29.0	29.7				
RES in transport (%)	0.4	1.2	4.9	7.8	10.2	11.1	11.7	11.9	11.8	12.6	13.3				
Gross Electricity generation by source (in GWh_e) [E]	**222235**	**288924**	**299882**	**304544**	**314374**	**340480**	**358549**	**374400**	**387420**	**403020**	**412858**	**3.0**	**0.5**	**1.3**	**0.7**
Nuclear energy	62206	57539	61990	58274	58274	57733	57733	72167	62321	60909	60909	0.0	-0.6	-0.1	0.3
Solids	79094	84047	25499	33847	33432	36541	33978	14642	16902	15992	14364	-10.7	2.7	0.2	-4.2
Oil (including refinery gas)	22578	24420	16562	15425	7387	5510	2173	1328	1329	863	292	-3.1	-7.8	-11.5	-9.5
Gas (including derived gases)	21942	80725	97607	83749	86237	107679	91741	89040	88656	86307	90895	16.1	-1.2	0.6	0.0
Biomass-waste	2100	3104	4676	10047	13792	11234	10371	9620	16112	16004	16078	8.3	11.4	-2.8	2.2
Hydro (pumping excluded)	29570	17872	42278	30578	31846	33966	35967	35331	36145	36347	37031	3.6	-2.8	1.2	0.1
Wind	4727	21176	44165	56421	56876	58271	90621	105747	111698	127205	132720	25.0	2.6	4.8	1.9
Solar	18	41	6411	16144	26473	29487	35906	46468	53147	58022	59195	80.0	15.2	3.1	2.5
Geothermal and other renewables	0	0	694	58	58	58	58	58	1109	1372	1372	0.0	-21.9	0.0	17.1
Other fuels (hydrogen, methanol)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Net Generation Capacity in MW_e	**47652**	**68493**	**95422**	**104382**	**109809**	**110661**	**123306**	**134100**	**137643**	**136969**	**142482**	**7.2**	**1.4**	**1.2**	**0.7**
Nuclear energy	7579	7579	7500	7052	7052	6982	6982	8738	7557	7393	7393	-0.1	-0.6	-0.1	0.3
Renewable energy	14780	23076	38679	46876	52407	54842	67755	77571	82755	89581	92272	10.1	3.1	2.6	1.6
Hydro (pumping excluded)	12533	12993	13513	14151	14509	14830	15073	15447	15655	15892	16132	0.8	0.7	0.4	0.3
Wind	2235	10023	20567	25028	25213	25828	35707	40333	42155	46891	48577	24.9	2.1	3.5	1.6
Solar	12	60	4598	7667	12655	14154	16945	21761	24916	26767	27532	81.3	10.7	3.0	2.5
Other renewables (tidal etc.)	0	0	0	30	30	30	30	30	30	30	30	0.0	0.0	0.0	0.0
Thermal power	25294	37838	49244	50454	50350	48836	48568	47791	47330	39996	42817	6.9	0.2	-0.4	-0.6
of which cogeneration units	4570	5223	4812	4821	5409	5798	6028	6468	6484	6860	7494	0.5	1.2	1.1	1.1
of which CCS units	0	0	0	0	0	0	0	667	1903	11024	5702	0.0	0.0	0.0	0.0
Solids fired	10987	11091	10864	10864	10527	10006	9335	8822	8605	7631	2426	-0.1	-0.3	-1.2	-6.5
Gas fired	6713	20263	31560	34121	34219	33957	33914	33657	33454	28130	36326	16.7	0.8	-0.1	0.3
Oil fired	7091	5600	5737	4295	4256	3520	3513	3507	2774	1696	1003	-2.1	-2.9	-1.9	-6.1
Biomass-waste fired	503	884	1083	1174	1349	1354	1806	1805	2378	2389	2912	8.0	2.2	3.0	2.4
Hydrogen plants	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Geothermal heat	0	0	0	0	0	0	0	0	120	150	150	0.0	0.0	0.0	0.0
Avg. Load factor of net power capacity [F] (%)	50.8	46.2	34.6	32.3	31.8	34.1	32.3	31.2	31.4	32.8	32.3				
Electricity indicators															
Efficiency of gross thermal power generation (%)	40.8	46.7	49.2	45.0	46.1	47.0	46.5	46.5	42.9	40.7	44.4				
% of gross electricity from CHP	9.2	7.8	7.4	8.3	9.2	8.5	8.4	7.2	7.8	8.0	8.4				
% of electricity from CCS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.4	1.6				
Carbon free gross electricity generation (%)	44.4	34.5	53.4	56.3	59.6	56.0	64.3	72.0	72.4	74.4	74.4				
- nuclear	28.0	19.9	20.7	19.1	18.5	17.0	16.1	19.3	16.1	15.1	14.8				
- renewable energy forms	16.4	14.6	32.8	37.2	41.0	39.1	48.2	52.7	56.3	59.3	59.7				
Transport sector															
Passenger transport activity (Gpkm)	**476.1**	**535.4**	**539.1**	**569.6**	**599.9**	**683.4**	**778.2**	**826.8**	**877.8**	**916.7**	**957.4**	**1.3**	**1.1**	**2.6**	**1.0**
Public road transport	50.3	53.2	50.9	52.9	55.0	59.1	63.5	66.6	69.9	72.1	74.4	0.1	0.8	1.4	0.8
Private cars and motorcycles	310.2	346.4	351.8	363.8	373.0	425.1	483.2	506.3	529.4	545.9	562.9	1.3	0.6	2.6	0.8
Rail	25.4	27.6	28.6	33.1	38.2	47.2	58.3	63.3	68.7	72.2	75.9	1.2	2.9	4.3	1.3
Aviation	88.6	106.5	106.2	118.1	131.9	150.1	170.9	188.1	207.3	223.9	241.4	1.8	2.2	2.6	1.7
Inland navigation	1.6	1.7	1.6	1.7	1.8	2.0	2.3	2.4	2.5	2.6	2.7	0.2	0.9	2.5	0.8
Freight transport activity (Gtkm)	**191.4**	**278.5**	**246.6**	**259.7**	**273.5**	**302.8**	**335.3**	**351.5**	**368.5**	**378.9**	**389.5**	**2.6**	**1.0**	**2.1**	**0.8**
Trucks	148.7	233.2	210.1	220.9	232.3	257.1	284.7	298.8	313.7	322.9	332.3	3.5	1.0	2.1	0.8
Rail	11.6	11.6	9.2	10.2	11.3	13.0	15.0	15.8	16.6	17.1	17.5	-2.3	2.1	2.8	0.8
Inland navigation	31.1	33.7	27.3	28.6	29.9	32.7	35.7	36.9	38.2	39.0	39.7	-1.3	0.9	1.8	0.5
Energy demand in transport (ktoe) [G]	**32780**	**39554**	**37233**	**38139**	**36701**	**38103**	**40452**	**40866**	**41848**	**42510**	**43228**	**1.3**	**-0.1**	**1.0**	**0.3**
Public road transport	662	688	648	666	670	698	730	749	773	787	802	-0.2	0.3	0.9	0.5
Private cars and motorcycles	14008	14540	13950	13737	12271	12243	13061	13257	13558	13755	14037	0.0	-1.3	0.6	0.4
Trucks	11534	16434	15298	15879	15513	16438	17675	17763	18139	18433	18620	2.9	0.1	1.3	0.3
Rail	705	1024	898	956	1001	1075	1161	1139	1128	1107	1086	2.5	1.1	1.5	-0.3
Aviation	4486	5323	5389	5804	6105	6402	6462	6560	6814	6979	7220	1.9	1.3	0.6	0.6
Inland navigation	1386	1544	1050	1097	1140	1248	1364	1398	1435	1450	1463	-2.7	0.8	1.8	0.4

Source: PRIMES

Sweden: Reference scenario												SUMMARY ENERGY BALANCE AND INDICATORS (A)			
ktoe	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**	**'00-'10**	**'10-'20**	**'20-'30**	**'30-'50**
												Annual % Change			
Production (incl.recovery of products)	**30052**	**34233**	**33097**	**36505**	**37829**	**39366**	**39680**	**41317**	**42630**	**43825**	**43809**	**1.0**	**1.3**	**0.5**	**0.5**
Solids	162	211	238	221	210	248	0	0	0	0	0	4.0	-1.2	-100.0	0.0
Oil	0	0	0	0	0	0	0	0	0	0	0	-6.7	-100.0	0.0	0.0
Natural gas	40	44	18	0	0	0	0	0	0	0	0	-7.6	-100.0	0.0	0.0
Nuclear	14785	18670	14917	16430	17384	18492	19039	20146	21171	21731	21258	0.1	1.5	0.9	0.6
Renewable energy sources	15066	15308	17923	19854	20234	20626	20642	21171	21459	22093	22551	1.8	1.2	0.2	0.4
Hydro	6757	6260	5709	5858	5885	5931	5994	5986	6005	6013	6022	-1.7	0.3	0.2	0.0
Biomass & Waste	8264	8961	11902	13153	13264	13429	13319	13399	13620	13828	13856	3.7	1.1	0.0	0.2
Wind	39	80	301	787	982	1098	1137	1575	1618	2024	2446	22.6	12.5	1.5	3.9
Solar and others	5	6	11	56	102	168	192	211	216	228	228	7.3	24.9	6.5	0.9
Geothermal	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.3	0.8
Net Imports	**19188**	**20206**	**19467**	**19366**	**17768**	**17256**	**17069**	**16537**	**16498**	**16518**	**16801**	**0.1**	**-0.9**	**-0.4**	**-0.1**
Solids	2409	2556	2548	2736	2820	2977	3104	2987	2559	2299	2328	0.6	1.0	1.0	-1.4
Oil	15601	17443	15427	15211	14182	13613	13177	13228	13388	13605	13716	-0.1	-0.8	-0.7	0.2
- Crude oil and Feedstocks	20331	20098	19450	19128	17992	17186	16514	16203	15944	15757	15501	-0.4	-0.8	-0.9	-0.3
- Oil products	-4730	-2655	-4023	-3917	-3810	-3574	-3337	-2976	-2556	-2151	-1785	-1.6	-0.5	-1.3	-3.1
Natural gas	776	843	1313	1518	1736	1392	1333	1336	1437	1719	2091	5.4	2.8	-2.6	2.3
Electricity	402	-636	179	-367	-1517	-1566	-1665	-2438	-2641	-3206	-3765	-7.8	0.0	0.9	4.2
Gross Inland Consumption	**47660**	**51739**	**51352**	**53594**	**53330**	**54102**	**54181**	**55076**	**56257**	**57298**	**57471**	**0.7**	**0.4**	**0.2**	**0.3**
Solids	2452	2629	2492	2957	3030	3226	3104	2987	2559	2299	2328	0.2	2.0	0.2	-1.4
Oil	14139	14882	14509	12949	11979	11231	10785	10725	10871	11003	11063	0.3	-1.9	-1.0	0.1
Natural gas	816	886	1331	1503	1673	1254	1156	1060	1082	1277	1606	5.0	2.3	-3.6	1.7
Nuclear	14785	18670	14917	16430	17384	18492	19039	20146	21171	21731	21258	0.1	1.5	0.9	0.6
Electricity	402	-636	179	-367	-1517	-1566	-1665	-2438	-2641	-3206	-3765	-7.8	0.0	0.9	4.2
Renewable energy forms	15066	15308	17923	20122	20781	21465	21763	22595	23214	24194	24982	1.8	1.5	0.5	0.7
as % in Gross Inland Consumption															
Solids	5.1	5.1	4.9	5.5	5.7	6.0	5.7	5.4	4.5	4.0	4.1				
Oil	29.7	28.8	28.3	24.2	22.5	20.8	19.9	19.5	19.3	19.2	19.2				
Natural gas	1.7	1.7	2.6	2.8	3.1	2.3	2.1	1.9	1.9	2.2	2.8				
Nuclear	31.0	36.1	29.0	30.7	32.6	34.2	35.1	36.6	37.6	37.9	37.0				
Renewable energy forms	31.6	29.6	34.9	37.5	39.0	39.7	40.2	41.0	41.3	42.2	43.5				
Gross Electricity Generation in GWh_e	**145205**	**158337**	**148479**	**161881**	**171978**	**177016**	**180905**	**191989**	**197829**	**209669**	**220189**	**0.2**	**1.5**	**0.5**	**1.0**
Self consumption and grid losses	18770	17745	15560	16658	16546	17142	17653	18200	18833	19891	21075	-1.9	0.6	0.6	0.9
Fuel Inputs to Thermal Power Generation	**3262**	**4473**	**6532**	**6143**	**8079**	**7238**	**6592**	**6813**	**6799**	**6752**	**7518**	**7.2**	**2.1**	**-2.0**	**0.7**
Solids	462	508	597	716	721	724	713	697	431	106	100	2.6	1.9	-0.1	-9.3
Oil (including refinery gas)	277	317	426	187	60	35	22	16	49	53	56	4.4	-17.8	-9.6	4.8
Gas (including derived gases)	440	490	1018	1211	1334	754	721	709	692	947	1296	8.8	2.7	-6.0	3.0
Biomass & Waste	2083	3158	4491	4029	5964	5725	5136	5392	5627	5646	6065	8.0	2.9	-1.5	0.8
Geothermal heat	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Hydrogen - Methanol	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Fuel Input to other conversion processes	**39360**	**42800**	**40006**	**43210**	**42453**	**42436**	**42201**	**42713**	**43297**	**44300**	**43910**	**0.2**	**0.6**	**-0.1**	**0.2**
Refineries	21632	20828	21354	21108	19934	19136	18467	18183	17954	17814	17603	-0.1	-0.7	-0.8	-0.2
Biofuels and hydrogen production	0	135	401	475	561	565	579	597	598	618	668	0.0	3.4	0.3	0.7
District heating	1213	1336	1615	3308	2475	1948	1913	1744	1764	2227	2351	2.9	4.4	-2.5	1.0
Derived gases, cokeries etc.	16516	20501	16636	18320	19483	20786	21242	22189	22981	23641	23287	0.1	1.6	0.9	0.5
Energy Branch Consumption	**1509**	**1514**	**1611**	**1719**	**1740**	**1762**	**1764**	**1798**	**1828**	**1928**	**2029**	**0.7**	**0.8**	**0.1**	**0.7**
Non-Energy Uses	**1731**	**2293**	**2005**	**1958**	**1958**	**1969**	**1993**	**2048**	**2084**	**2091**	**2098**	**1.5**	**-0.2**	**0.2**	**0.3**
Final Energy Demand	**34851**	**33554**	**34436**	**34929**	**33255**	**34110**	**34310**	**34523**	**34956**	**35516**	**35722**	**-0.1**	**-0.3**	**0.3**	**0.2**
by sector															
Industry	14264	12557	12597	13164	12604	13453	13870	14032	14331	14633	14678	-1.2	0.0	1.0	0.3
- energy intensive industries	10610	9348	9557	9703	9166	9901	10238	10301	10403	10444	10217	-1.0	-0.4	1.1	0.0
- other industrial sectors	3654	3209	3040	3461	3439	3553	3633	3730	3928	4189	4461	-1.8	1.2	0.6	1.0
Residential	7294	7302	7558	7592	7157	7218	7271	7307	7331	7401	7463	0.4	-0.5	0.2	0.1
Tertiary	5205	5108	5631	5548	5320	5526	5421	5444	5427	5480	5438	0.8	-0.6	0.2	0.0
Transport	8088	8587	8649	8625	8174	7912	7749	7740	7866	8001	8143	0.7	-0.6	-0.5	0.2
by fuel															
Solids	1115	1346	1202	1175	1196	1315	1268	1270	1254	1248	1205	0.8	-0.1	0.6	-0.3
Oil	13151	11388	10092	9481	8784	8136	7743	7648	7735	7826	7889	-2.6	-1.4	-1.3	0.1
Gas	673	694	618	657	754	917	812	677	660	657	682	-0.8	2.0	0.7	-0.9
Electricity	11068	11238	11283	11771	11487	11802	11985	12097	12319	12653	12885	0.2	0.2	0.4	0.4
Heat (from CHP and District Heating)	3550	4174	5141	5307	5300	4943	4704	4721	4605	4638	4747	3.8	0.3	-1.2	0.0
Renewable energy forms	5294	4715	6100	6528	5651	6875	7668	7988	8275	8380	8193	1.4	-0.8	3.1	0.3
Other fuels (hydrogen, ethanol)	0	0	0	10	84	123	132	123	109	113	121	0.0	0.0	4.7	-0.5
RES in Gross Final Energy Consumption [(A)]	**13722**	**14414**	**17510**	**18930**	**19078**	**19961**	**20053**	**20663**	**21054**	**21583**	**22317**	**2.5**	**0.9**	**0.5**	**0.5**
TOTAL GHG emissions (Mt of CO2 eq.)	**73.2**	**70.6**	**67.1**	**65.6**	**63.8**	**61.8**	**59.1**	**58.0**	**56.5**	**54.7**	**52.1**	**-0.9**	**-0.5**	**-0.8**	**-0.6**
of which ETS sectors (2013 scope) GHG emissions		26.1	25.8	26.1	26.4	25.6	23.9	23.1	21.5	19.4	16.5		0.3	-1.0	-1.8
of which non ETS sectors GHG emissions		44.5	41.3	39.5	37.3	36.3	35.2	34.9	35.0	35.2	35.6		-1.0	-0.6	0.1
CO_2 Emissions (energy related)	**55.3**	**52.1**	**49.4**	**48.0**	**46.1**	**43.8**	**41.7**	**40.6**	**38.9**	**39.0**	**36.2**	**-1.1**	**-0.7**	**-1.0**	**-0.7**
Power generation/District heating	6.8	7.4	9.6	9.5	10.0	7.6	7.7	8.0	6.4	6.1	3.4	3.5	0.4	-2.6	-3.9
Energy Branch	2.0	1.9	2.0	2.1	2.1	2.0	1.9	1.9	1.8	1.9	1.9	0.4	0.1	-0.6	-0.1
Industry	16.2	13.7	10.5	10.2	9.7	10.8	9.5	8.3	7.9	7.9	7.6	-4.3	-0.7	-0.2	-1.1
Residential	2.9	1.4	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.1	0.1	-17.8	-2.7	-2.6	-3.2
Tertiary	4.5	3.2	2.7	1.9	1.9	2.0	1.9	1.9	1.9	1.9	1.9	-4.8	-3.5	0.2	-0.1
Transport	22.9	24.5	24.2	23.9	22.1	21.1	20.4	20.3	20.7	21.0	21.2	0.5	-0.9	-0.8	0.2
CO_2 Emissions (non energy related)	**3.1**	**3.3**	**3.8**	**3.6**	**3.8**	**3.8**	**3.0**	**2.9**	**2.8**	**0.7**	**0.6**	**1.9**	**-0.1**	**-2.2**	**-8.1**
Non-CO_2 GHG emissions	**14.8**	**15.1**	**13.9**	**14.0**	**13.9**	**14.3**	**14.4**	**14.6**	**14.7**	**15.0**	**15.4**	**-0.6**	**0.0**	**0.3**	**0.3**
TOTAL GHG emissions Index (1990=100)	**98.8**	**95.2**	**90.5**	**88.6**	**86.1**	**83.5**	**79.8**	**78.3**	**76.2**	**73.8**	**70.4**				

Source: PRIMES

SUMMARY ENERGY BALANCE AND INDICATORS (B)															Sweden: Reference scenario
	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050	'00-'10	'10-'20	'20-'30	'30-'50
												Annual % Change			
Main Energy System Indicators															
Population (Million)	8.861	9.011	9.341	9.732	10.072	10.355	10.578	10.746	10.898	11.060	11.231	0.5	0.8	0.5	0.3
GDP (in 000 M€10)	283.3	323.5	349.2	388.9	423.6	463.1	505.2	551.4	603.1	659.7	717.0	2.1	2.0	1.8	1.8
Gross Inl. Cons./GDP (toe/M€10)	168.2	159.9	147.0	137.8	125.9	116.8	107.3	99.9	93.3	86.9	80.2	-1.3	-1.5	-1.6	-1.4
Carbon intensity (t of CO_2/toe of GIC)	1.16	1.01	0.96	0.90	0.86	0.81	0.77	0.74	0.69	0.68	0.63	-1.9	-1.1	-1.1	-1.0
Import Dependency %	39.2	37.7	36.5	34.7	32.0	30.5	30.1	28.6	27.9	27.4	27.7				
Total energy-rel. and other mitigation costs [B] (in 000 M€10)	31.7	40.4	47.9	53.1	58.6	58.3	60.4	63.3	66.9	70.7	74.5	4.2	2.0	0.3	1.1
as % of GDP	11.2	12.5	13.7	13.7	13.8	12.6	12.0	11.5	11.1	10.7	10.4				
Energy intensity indicators															
Industry (Energy on Value added, index 2000=100)	100.0	68.7	69.3	65.0	58.3	58.4	56.5	53.9	51.3	48.8	45.2	-3.6	-1.7	-0.3	-1.1
Residential (Energy on Private Income, index 2000=100)	100.0	89.6	84.3	75.1	64.3	58.7	53.6	48.8	44.3	40.4	37.0	-1.7	-2.7	-1.8	-1.8
Tertiary (Energy on Value added, index 2000=100)	100.0	88.8	89.2	78.6	68.7	64.7	57.6	52.5	47.5	43.6	39.7	-1.1	-2.6	-1.7	-1.8
Passenger transport (toe/Mpkm)	44.1	42.5	41.8	38.9	34.1	30.9	28.2	27.1	26.7	26.3	25.9	-0.5	-2.0	-1.9	-0.4
Freight transport (toe/Mtkm)	36.1	40.1	37.7	36.0	33.7	31.0	29.2	28.2	27.4	26.9	26.5	0.4	-1.1	-1.4	-0.5
Carbon Intensity indicators															
Electricity and Steam production (t of CO_2/MWh)	0.04	0.04	0.05	0.04	0.04	0.03	0.03	0.03	0.03	0.02	0.01	2.4	-0.7	-2.7	-4.7
Final energy demand (t of CO_2/toe)	1.34	1.28	1.10	1.04	1.02	1.00	0.94	0.89	0.88	0.87	0.86	-1.9	-0.7	-0.9	-0.4
Industry	1.14	1.09	0.83	0.78	0.77	0.80	0.69	0.59	0.55	0.54	0.52	-3.1	-0.7	-1.2	-1.4
Residential	0.40	0.20	0.05	0.05	0.04	0.04	0.03	0.03	0.02	0.02	0.02	-18.1	-2.2	-2.7	-3.3
Tertiary	0.86	0.62	0.48	0.35	0.36	0.37	0.36	0.35	0.36	0.35	0.35	-5.6	-2.9	0.0	-0.1
Transport [C]	2.83	2.86	2.79	2.77	2.70	2.67	2.64	2.63	2.63	2.62	2.60	-0.1	-0.3	-0.2	-0.1
Indicators for renewables															
Share of RES in Gross Final Energy Consumption [D] (%)	36.7	40.3	48.1	50.6	53.4	54.6	54.5	55.8	56.2	56.7	58.2				
RES in transport (%)	1.9	3.5	6.5	8.3	11.9	13.8	15.2	15.9	15.9	16.5	17.5				
Gross Electricity generation by source (in GWh_e) [E]	**145231**	**158365**	**148506**	**161881**	**171978**	**177016**	**180905**	**191989**	**197829**	**209669**	**220189**	**0.2**	**1.5**	**0.5**	**1.0**
Nuclear energy	57316	72377	57828	63650	67330	71710	73830	78409	82691	88206	89518	0.1	1.5	0.9	1.0
Solids	1706	1169	1770	735	1218	1233	1207	1311	733	181	171	0.4	-3.7	-0.1	-9.3
Oil (including refinery gas)	1533	1379	1774	589	294	173	109	81	90	151	154	1.5	-16.5	-9.4	1.7
Gas (including derived gases)	1292	1342	3828	2498	3565	1879	1716	2267	1749	2645	5477	11.5	-0.7	-7.1	6.0
Biomass-waste	4342	8357	13397	17133	19542	20051	20886	21740	23651	24743	26124	11.9	3.8	0.7	1.1
Hydro (pumping excluded)	78584	72803	66398	68113	68434	68966	69694	69606	69826	69924	70018	-1.7	0.3	0.2	0.0
Wind	457	936	3502	9152	11421	12767	13224	18314	18809	23538	28442	22.6	12.5	1.5	3.9
Solar	1	2	9	12	174	238	239	260	279	282	282	19.7	35.1	3.2	0.8
Geothermal and other renewables	0	0	0	0	0	0	0	0	0	0	0	0.0	-100.0	0.0	0.0
Other fuels (hydrogen, methanol)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Net Generation Capacity in MW_e	**32778**	**33409**	**36314**	**38687**	**40135**	**40366**	**40473**	**42633**	**43583**	**45836**	**48205**	**1.0**	**1.0**	**0.1**	**0.9**
Nuclear energy	9786	9850	9275	9280	9282	9271	9271	9654	10173	10750	10807	-0.5	0.0	0.0	0.8
Renewable energy	15756	16661	18437	21053	22413	23403	23674	25587	25891	27597	29385	1.6	2.0	0.5	1.1
Hydro (pumping excluded)	15522	16147	16407	17394	17784	18218	18319	18429	18551	18684	18828	0.6	0.8	0.3	0.1
Wind	231	510	2019	3646	4447	4937	5107	6888	7051	8622	10265	24.2	8.2	1.4	3.6
Solar	3	4	11	13	182	247	248	269	289	292	292	13.9	32.4	3.2	0.8
Other renewables (tidal etc.)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Thermal power	7236	6898	8602	8354	8441	7692	7528	7393	7518	7490	8013	1.7	-0.2	-1.1	0.3
of which cogeneration units	4940	3950	5523	5463	5904	5060	5196	5179	5276	5186	5237	1.1	0.7	-1.3	0.0
of which CCS units	0	0	0	0	0	0	0	0	0	0	353	0.0	0.0	0.0	0.0
Solids fired	527	481	482	482	483	479	479	479	358	69	66	-0.9	0.0	-0.1	-9.5
Gas fired	554	408	1107	1116	1357	1347	1280	1256	1073	1204	1501	7.2	2.1	-0.6	0.8
Oil fired	3777	2501	3264	2826	2198	1420	1135	973	952	950	928	-1.5	-3.9	-6.4	-1.0
Biomass-waste fired	2377	3508	3749	3930	4403	4447	4634	4685	5135	5266	5519	4.7	1.6	0.5	0.9
Hydrogen plants	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Geothermal heat	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Avg. Load factor of net power capacity [F] (%)	49.3	52.8	45.6	46.0	47.1	48.3	49.2	49.6	49.9	50.2	50.0				
Electricity indicators															
Efficiency of gross thermal power generation (%)	23.4	23.5	27.3	29.3	26.2	27.7	31.2	32.1	33.2	35.3	36.5				
% of gross electricity from CHP	5.9	6.7	12.5	11.7	13.1	13.2	13.2	13.2	13.3	13.2	13.2				
% of electricity from CCS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3				
Carbon free gross electricity generation (%)	96.9	97.5	95.0	97.6	97.0	98.1	98.3	98.1	98.7	98.6	97.4				
- nuclear	39.5	45.7	38.9	39.3	39.2	40.5	40.8	40.8	41.8	42.1	40.7				
- renewable energy forms	57.4	51.8	56.1	58.3	57.9	57.6	57.5	57.3	56.9	56.5	56.7				
Transport sector															
Passenger transport activity (Gpkm)	**132.3**	**137.1**	**142.0**	**150.8**	**159.0**	**168.8**	**178.1**	**184.4**	**190.2**	**196.0**	**202.2**	**0.7**	**1.1**	**1.1**	**0.6**
Public road transport	9.5	8.8	8.6	9.1	9.8	10.1	10.6	10.9	11.2	11.5	11.8	-1.0	1.4	0.8	0.5
Private cars and motorcycles	92.4	98.1	100.1	105.0	108.7	114.0	118.1	120.7	122.5	124.6	126.8	0.8	0.8	0.8	0.4
Rail	10.2	11.0	13.5	14.4	15.4	16.2	17.1	17.7	18.3	18.9	19.5	2.8	1.3	1.1	0.7
Aviation	14.2	13.5	14.2	16.3	18.7	21.8	25.3	27.9	30.8	33.5	36.5	0.0	2.8	3.1	1.8
Inland navigation	6.1	5.8	5.6	6.0	6.4	6.7	6.9	7.1	7.3	7.5	7.6	-0.9	1.4	0.8	0.5
Freight transport activity (Gtkm)	**62.5**	**68.6**	**72.2**	**76.6**	**81.4**	**87.1**	**93.2**	**97.6**	**102.2**	**106.0**	**109.8**	**1.5**	**1.2**	**1.4**	**0.8**
Trucks	35.6	38.6	36.3	38.2	40.2	41.8	43.3	45.0	46.7	48.4	50.1	0.2	1.0	0.7	0.7
Rail	19.5	21.7	23.5	25.3	27.2	30.4	33.9	35.7	37.6	39.0	40.4	1.9	1.5	2.2	0.9
Inland navigation	7.4	8.4	12.4	13.2	13.9	14.9	16.0	16.9	17.9	18.6	19.4	5.4	1.1	1.4	1.0
Energy demand in transport (ktoe) [G]	**8088**	**8587**	**8651**	**8624**	**8173**	**7911**	**7748**	**7739**	**7865**	**8000**	**8142**	**0.7**	**-0.6**	**-0.5**	**0.2**
Public road transport	143	130	127	134	141	141	143	143	144	145	146	-1.2	1.1	0.1	0.1
Private cars and motorcycles	4556	4678	4782	4599	4043	3715	3520	3462	3457	3457	3470	0.5	-1.7	-1.4	-0.1
Trucks	2006	2543	2507	2527	2498	2438	2433	2460	2499	2551	2619	2.3	0.0	-0.3	0.4
Rail	299	246	208	220	237	252	270	272	278	274	271	-3.6	1.3	1.3	0.0
Aviation	928	846	840	944	1041	1145	1155	1170	1253	1336	1395	-1.0	2.2	1.0	0.9
Inland navigation	155	142	187	199	212	220	228	232	236	238	240	1.9	1.3	0.7	0.3

Source: PRIMES

United Kingdom: Reference scenario												SUMMARY ENERGY BALANCE AND INDICATORS (A)			
ktoe	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**	**'00-'10**	**'10-'20**	**'20-'30**	**'30-'50**
												Annual % Change			
Production (incl.recovery of products)	**270137**	**204270**	**148109**	**130226**	**111180**	**95544**	**82429**	**74225**	**69447**	**60779**	**54307**	**-5.8**	**-2.8**	**-2.9**	**-2.1**
Solids	18658	11899	10751	11394	9983	11182	5917	4425	3794	3485	2669	-5.4	-0.7	-5.1	-3.9
Oil	129530	87786	64141	50743	39815	30831	23832	17758	12274	6812	2536	-6.8	-4.7	-5.0	-10.6
Natural gas	97554	79397	51468	41748	32705	25095	19580	13514	8638	4413	1739	-6.2	-4.4	-5.0	-11.4
Nuclear	21942	21054	16029	16255	7941	5563	8462	11461	16525	17477	17477	-3.1	-6.8	0.6	3.7
Renewable energy sources	2453	4134	5720	10086	20736	22873	24638	27067	28217	28591	29884	8.8	13.7	1.7	1.0
Hydro	437	423	310	465	464	463	464	463	463	464	463	-3.4	4.1	0.0	0.0
Biomass & Waste	1922	3430	4444	5965	8056	8227	8068	8424	8778	8535	8450	8.7	6.1	0.0	0.2
Wind	81	250	876	2848	9857	11305	13058	14977	15952	16168	17573	26.8	27.4	2.9	1.5
Solar and others	11	30	90	803	2317	2786	2907	3018	2814	3199	3159	23.0	38.4	2.3	0.4
Geothermal	1	1	1	5	42	93	143	185	210	226	239	0.0	48.9	13.0	2.6
Net Imports	**-39661**	**31733**	**60700**	**79199**	**74397**	**84421**	**91372**	**98031**	**105701**	**116354**	**123212**	**0.0**	**2.1**	**2.1**	**1.5**
Solids	14454	27222	15740	17461	7680	3215	1025	1250	1581	1474	2101	0.9	-6.9	-18.2	3.7
Oil	-46024	-2592	11302	22915	27953	34931	40270	45612	50390	55640	60324	0.0	9.5	3.7	2.0
- Crude oil and Feedstocks	-39602	4552	12975	24187	29315	35521	40163	44710	48585	52840	56342	0.0	8.5	3.2	1.7
- Oil products	-6422	-7144	-1673	-1272	-1362	-589	107	902	1805	2800	3982	-12.6	-2.0	0.0	19.8
Natural gas	-9311	5973	31968	35944	34712	42155	46009	46845	49231	54712	56239	0.0	0.8	2.9	1.0
Electricity	1219	715	229	838	1188	1082	978	980	889	896	831	-15.4	17.9	-1.9	-0.8
Gross Inland Consumption	**231729**	**233400**	**212629**	**206933**	**183020**	**177409**	**171188**	**169566**	**172374**	**174282**	**174539**	**-0.9**	**-1.5**	**-0.7**	**0.1**
Solids	36516	37737	30457	28856	17662	14397	6941	5675	5375	4960	4771	-1.8	-5.3	-8.9	-1.9
Oil	82200	83873	73919	71174	65245	63273	61572	60801	60058	59931	60267	-1.1	-1.2	-0.6	-0.1
Natural gas	87399	85473	84814	77684	67383	67185	65506	60237	57701	58795	57592	-0.3	-2.3	-0.3	-0.6
Nuclear	21942	21054	16029	16255	7941	5563	8462	11461	16525	17477	17477	-3.1	-6.8	0.6	3.7
Electricity	1219	715	229	838	1188	1082	978	980	889	896	831	-15.4	17.9	-1.9	-0.8
Renewable energy forms	2453	4548	7181	12126	23600	25911	27729	30412	31826	32222	33601	11.3	12.6	1.6	1.0
as % in Gross Inland Consumption															
Solids	15.8	16.2	14.3	13.9	9.7	8.1	4.1	3.3	3.1	2.8	2.7				
Oil	35.5	35.9	34.8	34.4	35.6	35.7	36.0	35.9	34.8	34.4	34.5				
Natural gas	37.7	36.6	39.9	37.5	36.8	37.9	38.3	35.5	33.5	33.7	33.0				
Nuclear	9.5	9.0	7.5	7.9	4.3	3.1	4.9	6.8	9.6	10.0	10.0				
Renewable energy forms	1.1	1.9	3.4	5.9	12.9	14.6	16.2	17.9	18.5	18.5	19.3				
Gross Electricity Generation in GWh_e	**374308**	**395354**	**377911**	**378836**	**356074**	**363790**	**373960**	**390507**	**422981**	**447085**	**454792**	**0.1**	**-0.6**	**0.5**	**1.0**
Self consumption and grid losses	48243	46542	43689	47128	40616	39582	38310	39806	43176	45663	46137	-1.0	-0.7	-0.6	0.9
Fuel Inputs to Thermal Power Generation	**56133**	**60361**	**57472**	**51448**	**37645**	**35902**	**29047**	**25362**	**24409**	**25544**	**24532**	**0.2**	**-4.1**	**-2.6**	**-0.8**
Solids	28027	29535	23521	22146	11847	9218	1822	942	878	668	636	-1.7	-6.6	-17.1	-5.1
Oil (including refinery gas)	767	1000	752	306	327	396	392	422	435	438	396	-0.2	-8.0	1.8	0.0
Gas (including derived gases)	26034	26641	29439	25593	21289	21795	22595	19293	18018	19481	18220	1.2	-3.2	0.6	-1.1
Biomass & Waste	1304	3185	3760	3402	4149	4424	4132	4575	4922	4776	5086	11.2	1.0	0.0	1.0
Geothermal heat	0	0	0	0	32	68	107	131	155	179	194	0.0	0.0	12.8	3.0
Hydrogen - Methanol	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Fuel Input to other conversion processes	**122735**	**117156**	**99795**	**97954**	**84394**	**78778**	**79194**	**80520**	**83806**	**83554**	**82815**	**-2.0**	**-1.7**	**-0.6**	**0.2**
Refineries	89911	88250	75278	73451	67556	64853	62556	61092	59575	58451	57749	-1.8	-1.1	-0.8	-0.4
Biofuels and hydrogen production	0	68	1127	1939	3210	3252	3256	3369	3397	3463	3586	0.0	11.0	0.1	0.5
District heating	3201	2124	2258	897	898	726	615	549	409	407	414	-3.4	-8.8	-3.7	-2.0
Derived gases, cokeries etc.	29623	26714	21131	21668	12729	9947	12766	15510	20425	21233	21065	-3.3	-4.9	0.0	2.5
Energy Branch Consumption	**14944**	**16104**	**13542**	**12864**	**10608**	**9398**	**8491**	**7758**	**7239**	**6750**	**6352**	**-1.0**	**-2.4**	**-2.2**	**-1.4**
Non-Energy Uses	**11323**	**11205**	**8084**	**8765**	**9445**	**9383**	**9357**	**9323**	**9215**	**9070**	**9006**	**-3.3**	**1.6**	**-0.1**	**-0.2**
Final Energy Demand	**152576**	**152311**	**142950**	**142898**	**134101**	**133004**	**130740**	**130341**	**131612**	**133483**	**134529**	**-0.6**	**-0.6**	**-0.3**	**0.1**
by sector															
Industry	36873	33390	28248	29326	27981	27267	27351	26554	26205	26218	26184	-2.6	-0.1	-0.2	-0.2
- energy intensive industries	19391	16519	13416	14387	13505	12889	12548	11975	11468	11167	10807	-3.6	0.1	-0.7	-0.7
- other industrial sectors	17483	16871	14832	14939	14476	14378	14803	14580	14737	15051	15377	-1.6	-0.2	0.2	0.2
Residential	43033	44151	44633	44651	42040	42631	41273	41282	41753	42182	42070	0.4	-0.6	-0.2	0.1
Tertiary	20362	19675	17508	16414	15151	14875	14405	14589	15337	16137	16323	-1.5	-1.4	-0.5	0.6
Transport	52307	55095	52562	52507	48929	48230	47710	47917	48317	48945	49953	0.0	-0.7	-0.3	0.2
by fuel															
Solids	5956	4579	3962	4162	3566	3249	3266	3033	2880	2746	2667	-4.0	-1.0	-0.9	-1.0
Oil	63047	65413	60323	57701	51951	50460	48959	48433	47990	48104	48512	-0.4	-1.5	-0.6	0.0
Gas	52180	50380	46917	46111	41032	40873	39159	37843	37156	37249	37733	-1.1	-1.3	-0.5	-0.2
Electricity	28325	29981	28230	28634	27709	28381	29278	30548	32896	34735	35283	0.0	-0.2	0.6	0.9
Heat (from CHP and District Heating)	2439	1268	1285	1139	1524	1579	1442	1620	1719	1754	1787	-6.2	1.7	-0.6	1.1
Renewable energy forms	630	690	2232	5128	8239	8350	8495	8691	8751	8632	8256	13.5	14.0	0.3	-0.1
Other fuels (hydrogen, ethanol)	0	0	0	23	79	113	141	173	219	262	290	0.0	0.0	6.0	3.7
RES in Gross Final Energy Consumption [(A)]	**1430**	**2071**	**4658**	**9615**	**20789**	**22220**	**23946**	**26312**	**27813**	**28033**	**29719**	**12.5**	**16.1**	**1.4**	**1.1**
TOTAL GHG emissions (Mt of CO2 eq.)	**707.5**	**691.0**	**621.5**	**590.1**	**496.4**	**474.1**	**428.4**	**401.6**	**392.8**	**390.3**	**389.0**	**-1.3**	**-2.2**	**-1.5**	**-0.5**
of which ETS sectors (2013 scope) GHG emissions		314.7	273.9	256.2	193.8	179.5	146.3	125.5	119.9	116.1	112.4		-3.4	-2.8	-1.3
of which non ETS sectors GHG emissions		376.3	347.6	334.0	302.6	294.6	282.1	276.1	272.9	274.2	276.6		-1.4	-0.7	-0.1
CO_2 Emissions (energy related)	**566.4**	**572.3**	**518.6**	**489.6**	**398.2**	**377.7**	**338.3**	**312.8**	**304.3**	**305.5**	**303.5**	**-0.9**	**-2.6**	**-1.6**	**-0.5**
Power generation/District heating	194.2	199.6	178.2	157.8	103.2	92.2	62.9	47.3	44.0	46.5	43.4	-0.9	-5.3	-4.8	-1.8
Energy Branch	31.3	35.2	29.0	27.0	22.6	19.9	18.2	16.1	14.6	13.2	12.3	-0.8	-2.5	-2.1	-2.0
Industry	77.4	67.6	54.5	56.8	50.8	48.1	48.2	43.5	41.3	40.3	40.6	-3.4	-0.7	-0.5	-0.9
Residential	82.6	80.4	83.1	80.1	71.8	71.6	67.4	65.2	64.4	65.0	64.3	0.1	-1.4	-0.6	-0.2
Tertiary	26.9	25.3	19.8	16.1	13.0	11.7	9.7	9.2	8.2	7.8	8.3	-3.0	-4.1	-2.9	-0.8
Transport	154.0	164.2	154.0	151.7	136.8	134.2	131.9	131.5	131.8	132.7	134.7	0.0	-1.2	-0.4	0.1
CO_2 Emissions (non energy related)	**20.7**	**20.4**	**15.1**	**16.2**	**17.5**	**17.0**	**14.5**	**13.4**	**12.6**	**7.3**	**6.8**	**-3.1**	**1.5**	**-1.9**	**-3.7**
Non-CO_2 GHG emissions	**120.5**	**98.3**	**87.8**	**84.4**	**80.7**	**79.4**	**75.5**	**75.4**	**75.9**	**77.4**	**78.7**	**-3.1**	**-0.8**	**-0.7**	**0.2**
TOTAL GHG emissions Index (1990=100)	**90.8**	**88.6**	**79.7**	**75.7**	**63.7**	**60.8**	**55.0**	**51.5**	**50.4**	**50.1**	**49.9**				

Source: PRIMES

SUMMARY ENERGY BALANCE AND INDICATORS (B)											United Kingdom: Reference scenario				
	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050	'00-'10	'10-'20	'20-'30	'30-'50
												Annual % Change			
Main Energy System Indicators															
Population (Million)	58.785	60.039	62.027	64.148	66.292	68.350	70.208	71.874	73.443	74.962	76.406	0.5	0.7	0.6	0.4
GDP (in 000 M€10)	1444.8	1664.7	1706.3	1835.1	2023.8	2229.4	2445.4	2687.2	2965.4	3271.0	3581.8	1.7	1.7	1.9	1.9
Gross Inl. Cons./GDP (toe/M€10)	160.4	140.2	124.6	112.8	90.4	79.6	70.0	63.1	58.1	53.3	48.7	-2.5	-3.2	-2.5	-1.8
Carbon intensity (t of CO_2/toe of GIC)	2.44	2.45	2.44	2.37	2.18	2.13	1.98	1.84	1.77	1.75	1.74	0.0	-1.1	-1.0	-0.6
Import Dependency %	-17.0	13.5	28.3	37.8	40.1	46.9	52.6	56.9	60.3	65.7	69.4				
Total energy-rel. and other mitigation costs [B] (in 000 M€10)	162.6	162.9	184.4	222.0	260.0	278.3	293.4	305.0	312.1	326.2	342.8	1.3	3.5	1.2	0.8
as % of GDP	11.3	9.8	10.8	12.1	12.8	12.5	12.0	11.3	10.5	10.0	9.6				
Energy intensity indicators															
Industry (Energy on Value added, index 2000=100)	100.0	93.0	83.4	81.1	73.0	67.0	63.6	58.3	54.4	51.6	49.1	-1.8	-1.3	-1.4	-1.3
Residential (Energy on Private Income, index 2000=100)	100.0	87.2	87.6	82.4	71.1	65.9	58.3	53.0	48.4	44.0	39.6	-1.3	-2.1	-2.0	-1.9
Tertiary (Energy on Value added, index 2000=100)	100.0	79.9	67.4	58.7	48.6	43.0	37.6	34.4	32.5	30.7	28.2	-3.9	-3.2	-2.5	-1.4
Passenger transport (toe/Mpkm)	46.1	47.1	45.2	42.6	37.5	34.1	31.7	30.3	29.3	28.8	28.6	-0.2	-1.9	-1.7	-0.5
Freight transport (toe/Mtkm)	62.9	61.8	67.5	66.6	61.0	59.3	55.5	55.0	53.4	52.6	51.8	0.7	-1.0	-0.9	-0.3
Carbon Intensity indicators															
Electricity and Steam production (t of CO_2/MWh)	0.48	0.49	0.45	0.40	0.27	0.24	0.16	0.11	0.10	0.10	0.09	-0.6	-4.9	-5.2	-2.8
Final energy demand (t of CO_2/toe)	2.23	2.22	2.18	2.13	2.03	2.00	1.97	1.91	1.87	1.84	1.84	-0.3	-0.7	-0.3	-0.3
Industry	2.10	2.02	1.93	1.94	1.82	1.76	1.76	1.64	1.58	1.54	1.55	-0.8	-0.6	-0.3	-0.6
Residential	1.92	1.82	1.86	1.80	1.71	1.68	1.63	1.58	1.54	1.54	1.53	-0.3	-0.8	-0.5	-0.3
Tertiary	1.32	1.29	1.13	0.98	0.86	0.78	0.68	0.63	0.53	0.48	0.51	-1.5	-2.7	-2.4	-1.4
Transport [C]	2.94	2.98	2.93	2.89	2.80	2.78	2.76	2.75	2.73	2.71	2.70	0.0	-0.5	-0.1	-0.1
Indicators for renewables															
Share of RES in Gross Final Energy Consumption [D] (%)	0.9	1.3	3.2	6.7	15.5	16.8	18.5	20.3	21.2	21.1	22.2				
RES in transport (%)	0.0	0.2	2.9	5.2	10.1	11.0	11.9	12.8	13.4	13.9	14.8				
Gross Electricity generation by source (in GWh_e) [E]	**374375**	**395425**	**377979**	**378836**	**356074**	**363790**	**373960**	**390507**	**422981**	**447085**	**454792**	**0.1**	**-0.6**	**0.5**	**1.0**
Nuclear energy	85063	81618	62140	61901	29981	22177	34923	48103	70364	76479	76479	-3.1	-7.0	1.5	4.0
Solids	119950	134637	107695	105609	58060	45608	9629	5207	4785	3763	3573	-1.1	-6.0	-16.4	-4.8
Oil (including refinery gas)	8446	5339	4861	1657	1796	2055	2246	2484	2612	2650	2368	-5.4	-9.5	2.3	0.3
Gas (including derived gases)	150427	154339	176101	154161	120687	125667	139003	121076	118384	131000	122377	1.6	-3.7	1.4	-0.6
Biomass-waste	4455	11658	13362	14704	17693	19197	17993	20898	22726	21942	22089	11.6	2.8	0.2	1.0
Hydro (pumping excluded)	5086	4922	3604	5402	5397	5388	5392	5386	5381	5391	5389	-3.4	4.1	0.0	0.0
Wind	947	2904	10183	33120	114619	131449	151832	174152	185490	188001	204340	26.8	27.4	2.9	1.5
Solar	1	8	33	1516	5767	8262	8907	9140	9148	9213	9279	42.0	67.5	4.4	0.2
Geothermal and other renewables	0	0	0	766	2073	3988	4033	4061	4090	8645	8898	0.0	0.0	6.9	4.0
Other fuels (hydrogen, methanol)	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Net Generation Capacity in MW_e	**74755**	**80254**	**91185**	**97797**	**110945**	**118038**	**123687**	**133987**	**143320**	**149805**	**156263**	**2.0**	**2.0**	**1.1**	**1.2**
Nuclear energy	13038	10962	10399	9585	3708	2802	4402	6056	8850	9600	9600	-2.2	-9.8	1.7	4.0
Renewable energy	1870	2796	6876	15648	47064	55819	62789	70309	73965	76664	81833	13.9	21.2	2.9	1.3
Hydro (pumping excluded)	1462	1453	1595	1622	1622	1622	1622	1622	1642	1682	1769	0.9	0.2	0.0	0.4
Wind	406	1332	5204	12140	38627	44340	50721	58028	61656	62410	67334	29.1	22.2	2.8	1.4
Solar	2	11	77	1574	5985	8263	8853	9065	9073	9133	9193	44.1	54.5	4.0	0.2
Other renewables (tidal etc.)	0	0	0	312	830	1594	1594	1594	1594	3440	3536	0.0	0.0	6.7	4.1
Thermal power	59846	66496	73910	72564	60173	59416	56496	57622	60505	63540	64830	2.1	-2.0	-0.6	0.7
of which cogeneration units	5794	5425	4310	5579	7222	7600	7996	9195	10709	10954	11465	-2.9	5.3	1.0	1.8
of which CCS units	0	0	0	0	448	448	448	947	947	947	947	0.0	0.0	0.0	3.8
Solids fired	26097	25930	25256	19089	7220	5527	3989	2142	2142	725	471	-0.3	-11.8	-5.8	-10.1
Gas fired	26612	33444	40990	47011	48907	49617	47937	50924	53349	57668	58923	4.4	1.8	-0.2	1.0
Oil fired	5819	5442	5520	4192	1307	1147	1052	966	819	866	757	-0.5	-13.4	-2.1	-1.6
Biomass-waste fired	1319	1680	2144	2273	2735	3117	3504	3573	4174	4257	4654	5.0	2.5	2.5	1.4
Hydrogen plants	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0
Geothermal heat	0	0	0	0	4	9	14	17	21	24	26	0.0	0.0	12.8	3.0
Avg. Load factor of net power capacity [F] (%)	54.7	53.7	45.3	42.0	35.2	34.0	33.6	32.5	32.9	33.3	32.5				
Electricity indicators															
Efficiency of gross thermal power generation (%)	43.4	43.6	45.2	46.2	45.3	46.1	50.0	50.8	52.4	53.7	52.8				
% of gross electricity from CHP	6.1	6.8	6.2	8.6	9.9	11.5	14.4	12.5	12.9	12.9	11.4				
% of electricity from CCS	0.0	0.0	0.0	0.0	0.8	1.3	1.2	2.1	1.8	1.7	1.6				
Carbon free gross electricity generation (%)	25.5	25.6	23.6	31.0	49.3	52.4	59.7	67.0	70.3	69.3	71.8				
- nuclear	22.7	20.6	16.4	16.3	8.4	6.1	9.3	12.3	16.6	17.1	16.8				
- renewable energy forms	2.8	4.9	7.2	14.7	40.9	46.3	50.3	54.7	53.6	52.2	55.0				
Transport sector															
Passenger transport activity (Gpkm)	**822.9**	**882.2**	**857.7**	**896.5**	**933.6**	**989.5**	**1045.8**	**1086.9**	**1130.1**	**1164.8**	**1200.3**	**0.4**	**0.9**	**1.1**	**0.7**
Public road transport	48.5	46.5	46.5	48.5	50.6	53.0	55.6	57.6	59.6	61.2	62.8	-0.4	0.8	1.0	0.6
Private cars and motorcycles	644.7	680.6	658.8	683.5	705.1	739.9	772.3	796.6	821.8	842.1	862.5	0.2	0.7	0.9	0.6
Rail	46.7	53.1	66.0	70.1	74.9	79.4	84.6	88.2	91.9	94.1	96.5	3.5	1.3	1.2	0.7
Aviation	77.4	96.7	81.3	89.0	97.5	111.5	127.3	138.3	150.4	160.9	171.9	0.5	1.8	2.7	1.5
Inland navigation	5.5	5.3	5.1	5.3	5.5	5.7	6.0	6.2	6.4	6.5	6.6	-0.9	0.8	0.8	0.5
Freight transport activity (Gtkm)	**219.9**	**219.2**	**203.8**	**215.5**	**228.1**	**244.7**	**261.9**	**273.0**	**284.1**	**293.0**	**301.8**	**-0.8**	**1.1**	**1.4**	**0.7**
Trucks	165.6	161.3	146.7	154.9	163.6	176.3	189.3	198.5	207.7	214.8	221.8	-1.2	1.1	1.5	0.8
Rail	18.1	21.4	18.6	20.0	21.7	23.4	25.4	26.7	28.0	29.3	30.7	0.3	1.5	1.6	0.9
Inland navigation	36.2	36.5	38.5	40.6	42.8	44.9	47.2	47.7	48.4	48.9	49.4	0.6	1.1	1.0	0.2
Energy demand in transport (ktoe) [G]	**51798**	**55091**	**52551**	**52505**	**48926**	**48227**	**47707**	**47914**	**48314**	**48942**	**49949**	**0.1**	**-0.7**	**-0.3**	**0.2**
Public road transport	704	663	656	674	680	685	692	700	712	721	732	-0.7	0.4	0.2	0.3
Private cars and motorcycles	25608	26965	25610	24232	20944	19321	18751	18649	18715	18843	19109	0.0	-2.0	-1.1	0.1
Trucks	12628	12123	12323	12822	12280	12792	12725	13198	13342	13603	13840	-0.2	0.0	0.4	0.4
Rail	817	982	940	1002	1068	1133	1190	1212	1213	1199	1179	1.4	1.3	1.1	0.0
Aviation	11115	13082	11650	12339	12455	12747	12750	12543	12706	12950	13466	0.5	0.7	0.2	0.3
Inland navigation	926	1275	1371	1436	1500	1548	1599	1612	1625	1626	1625	4.0	0.9	0.6	0.1

Source: PRIMES

(A) including the part of electricity and heat generated by renewables

(B) excluding payments for auctioned emission allowances (if applicable)

(C) including pipeline transport and other non-specified transport

(D) according to Eurostat's indicator "Share of Renewables in Gross Final Energy Consumption", calculated as ratio of renewable energy in all sectors including the part of electricity and heat generated by renewables over final energy demand increased by distribution losses and self consumption of electricity and steam plants

(E) for years 2000 to 2010, total gross electricity generation by source as reported in this table and total gross electricity generation reported in table (A), as part of the energy balance, slightly differ becauses of differences in the respective statistical sources

(F) electricity generated over maximum potential generation based on net power capacity

(G) energy demand in transport reported in table (B) does not include pipeline transport and other non-specified transport compared to table (A) where this category is included

Disclaimer: Energy and transport statistics reported in this publication and used for the modelling are taken mainly from Eurostat and from the publications "EU Energy in Figures" of the Directorate General for Energy and "EU Transport in Figures" of the Directorate General for Mobility and Transport. Energy and transport statistical concepts have developed differently in the past according to their individual purposes. Energy demand in transport reflects usually sales of fuels at the point of refuelling, which may differ from the region of consumption. This is particularly relevant for air transport and road freight transport. For road freight, transport activity is defined according to the nationality principle because of the lack of sufficiently long time series defined according to the territoriality principle. These differences should be borne in mind when comparing energy and transport figures. This applies in particular to transport activity ratios, such as energy efficiency in freight transport, which is measured in tonnes of oil equivalent per million tonne-km.

Abbreviations

GIC: Gross Inland Consumption
CHP: combined heat and power

Units

toe: tonne of oil equivalent, or 10^7 kilocalories, or 41.86 GJ (Gigajoule)
ktoe: 1000 toe
MW: Megawatt or 10^6 watt
MWh: megawatt-hour or 10^6 watt-hours
GWh: gigawatt-hour or 10^9 watt-hours
t: metric tonnes, or 1000 kilogrammes
Mt: Million metric tonnes
km: kilometre
pkm: passenger-kilometre (one passenger transported a distance of one kilometre)
tkm: tonne-kilometre (one tonne transported a distance of one kilometre)
Gpkm: Giga passenger-kilometre, or 10^9 passenger-kilometre
Gtkm: Giga tonne-kilometre, or 10^9 tonne-kilometre

APPENDIX 3: NON-CO_2 GHG EMISSIONS

EU-28

Non-CO_2 GHG emissions Reference scenario

Non-CO_2 GHG in Mt CO_2eq	UNFCCC CRF code	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total CH_4		430.24	400.48	352.13	343.34	336.03	325.58	325.21	327.46	328.69	329.81
Total N_2O		389.56	340.26	340.70	327.97	322.61	320.02	318.27	318.40	319.48	320.26
Total F-gases		83.49	90.20	83.10	86.20	88.25	82.61	81.21	79.38	83.65	87.88
Agriculture	4A-4F	481.19	463.90	466.33	464.80	460.77	459.75	459.72	460.99	462.91	464.88
Energy	1A-1B	114.68	101.41	95.84	88.67	82.90	73.40	69.18	67.88	66.08	63.87
Industry	2A-2E,2F.7,8	64.43	21.52	20.73	9.43	9.59	9.75	9.87	10.00	10.11	10.16
Waste	6A	109.37	99.96	54.83	52.24	48.35	44.99	46.75	48.88	50.98	53.09
Wastewater	6B	38.87	37.64	38.82	39.78	40.73	41.53	41.88	42.18	42.35	42.48
Air Conditioning & refrigeration	2F.1	56.09	68.01	60.57	62.46	63.45	59.25	57.01	54.41	57.89	61.38
Other sectors	3D, 2F.2,4,9	25.47	25.30	25.62	26.94	27.91	26.36	27.08	27.72	28.32	28.90
Calibration to UNFCCC data		13.19	13.19	13.19	13.19	13.19	13.19	13.19	13.19	13.19	13.19
in ETS sectors		57.35	17.83	16.91	5.53	5.55	5.55	5.52	5.48	5.39	5.30
in non-ETS sectors		845.95	813.11	759.02	751.98	741.34	722.67	719.16	719.76	726.43	732.66
Total non-CO_2 GHG		903.29	830.94	775.93	757.51	746.89	728.22	724.68	725.24	731.82	737.96

Source: GAINS

EU-27

Non-CO_2 GHG emissions Reference scenario

Non-CO_2 GHG in Mt CO_2eq	UNFCCC CRF code	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total CH_4		427.17	397.39	349.44	340.81	333.39	322.95	322.83	325.06	326.25	327.37
Total N_2O		386.08	336.99	337.60	325.57	320.21	317.59	315.78	315.88	316.96	317.74
Total F-gases		83.16	89.77	82.79	85.90	87.94	82.31	80.90	79.07	83.33	87.54
Agriculture	4A-4F	477.84	460.78	463.27	461.76	457.70	456.63	456.54	457.79	459.70	461.70
Energy	1A-1B	113.41	100.16	94.75	87.78	82.02	72.56	68.36	67.06	65.25	63.05
Industry	2A-2E,2F.7,8	63.66	20.74	19.96	9.35	9.51	9.67	9.79	9.92	10.03	10.09
Waste	6A	108.42	98.99	54.22	51.59	47.63	44.24	46.25	48.35	50.43	52.53
Wastewater	6B	38.41	37.17	38.33	39.27	40.21	41.00	41.34	41.63	41.80	41.92
Air Conditioning & refrigeration	2F.1	55.80	67.61	60.29	62.19	63.18	58.99	56.74	54.14	57.61	61.08
Other sectors	3D, 2F.2,4,9	25.32	25.16	25.48	26.79	27.76	26.21	26.93	27.56	28.17	28.75
Calibration to UNFCCC data		13.55	13.55	13.55	13.55	13.55	13.55	13.55	13.55	13.55	13.55
in ETS sectors		56.59	17.05	16.15	5.46	5.48	5.48	5.45	5.41	5.33	5.23
in non-ETS sectors		839.83	807.10	753.69	746.81	736.07	717.37	714.05	714.60	721.21	727.43
Total non-CO_2 GHG		896.42	824.16	769.84	752.28	741.55	722.85	719.51	720.01	726.53	732.66

Source: GAINS

Austria

Non-CO_2 GHG emissions Reference scenario

Non-CO_2 GHG in Mt CO_2eq	UNFCCC CRF code	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total CH_4		6.09	5.34	5.25	4.96	4.87	4.97	4.85	4.83	4.87	4.92
Total N_2O		5.43	5.33	5.62	5.51	5.55	5.59	5.48	5.44	5.43	5.39
Total F-gases		1.85	1.75	1.70	1.75	1.75	1.34	1.27	1.21	1.25	1.31
Agriculture	4A-4F	7.24	7.15	7.54	7.47	7.57	7.68	7.51	7.50	7.53	7.52
Energy	1A-1B	1.64	1.80	1.75	1.55	1.38	1.27	1.19	1.11	1.08	1.09
Industry	2A-2E,2F.7,8	0.73	0.25	0.25	0.26	0.27	0.27	0.28	0.28	0.29	0.30
Waste	6A	1.76	1.02	0.87	0.72	0.72	0.84	0.86	0.88	0.90	0.92
Wastewater	6B	0.50	0.52	0.53	0.54	0.56	0.58	0.58	0.58	0.59	0.59
Air Conditioning & refrigeration	2F.1	0.93	1.19	1.09	1.12	1.11	1.00	0.92	0.85	0.88	0.92
Other sectors	3D, 2F.2,4,9	0.60	0.51	0.56	0.57	0.58	0.27	0.28	0.29	0.29	0.30
Calibration to UNFCCC data		-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02
in ETS sectors		0.27	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
in non-ETS sectors		13.11	12.35	12.50	12.14	12.10	11.82	11.54	11.40	11.48	11.54
Total non-CO_2 GHG		13.38	12.42	12.57	12.21	12.17	11.89	11.61	11.47	11.55	11.62

Source: GAINS

Belgium

Non-CO_2 GHG emissions Reference scenario

Non-CO_2 GHG in Mt CO_2eq	UNFCCC CRF code	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total CH_4		7.05	6.51	6.63	6.20	6.19	6.14	6.04	6.06	6.06	6.09
Total N_2O		9.66	8.33	6.68	6.70	6.70	6.69	6.57	6.57	6.56	6.58
Total F-gases		1.90	2.04	1.82	1.87	1.91	1.75	1.72	1.68	1.81	1.93
Agriculture	4A-4F	10.81	10.54	10.83	10.77	10.73	10.65	10.34	10.28	10.19	10.15
Energy	1A-1B	1.12	1.24	1.19	1.10	1.07	1.03	1.05	1.05	1.05	1.06
Industry	2A-2E,2F.7,8	3.62	2.28	0.46	0.47	0.47	0.47	0.47	0.48	0.48	0.49
Waste	6A	1.34	0.93	0.95	0.65	0.68	0.69	0.72	0.76	0.80	0.85
Wastewater	6B	0.63	0.65	0.67	0.71	0.74	0.77	0.80	0.83	0.87	0.90
Air Conditioning & refrigeration	2F.1	1.40	1.61	1.34	1.38	1.41	1.31	1.26	1.21	1.31	1.42
Other sectors	3D, 2F.2,4,9	0.45	0.39	0.44	0.46	0.48	0.41	0.43	0.45	0.47	0.49
Calibration to UNFCCC data		-0.76	-0.76	-0.76	-0.76	-0.76	-0.76	-0.76	-0.76	-0.76	-0.76
in ETS sectors		3.40	2.07	0.25	0.26	0.26	0.26	0.26	0.26	0.26	0.26
in non-ETS sectors		15.21	14.82	14.87	14.52	14.55	14.32	14.07	14.05	14.17	14.34
Total non-CO_2 GHG		18.61	16.89	15.12	14.78	14.81	14.58	14.32	14.31	14.43	14.60

Source: GAINS

Bulgaria

Non-CO_2 GHG emissions Reference scenario

Non-CO_2 GHG in Mt CO_2eq	UNFCCC CRF code	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total CH_4		7.76	6.63	5.05	4.44	4.30	4.15	4.16	3.83	3.91	3.94
Total N_2O		5.01	4.96	4.98	5.01	5.08	5.13	5.21	5.14	5.14	5.04
Total F-gases		0.52	0.62	0.61	0.63	0.59	0.51	0.47	0.44	0.46	0.48
Agriculture	4A-4F	5.53	5.68	5.60	5.87	5.96	6.07	6.17	6.03	6.11	6.00
Energy	1A-1B	1.26	1.28	1.31	1.29	1.34	1.18	1.17	0.89	0.89	0.92
Industry	2A-2E,2F.7,8	0.73	0.29	0.32	0.11	0.11	0.12	0.11	0.11	0.11	0.11
Waste	6A	3.55	3.10	1.58	0.97	0.78	0.75	0.78	0.80	0.82	0.84
Wastewater	6B	1.10	0.65	0.64	0.62	0.61	0.59	0.58	0.57	0.56	0.55
Air Conditioning & refrigeration	2F.1	0.38	0.55	0.53	0.54	0.50	0.41	0.37	0.33	0.35	0.36
Other sectors	3D, 2F.2,4,9	0.24	0.18	0.17	0.17	0.17	0.17	0.18	0.18	0.18	0.18
Calibration to UNFCCC data		0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
in ETS sectors		0.71	0.27	0.29	0.09	0.09	0.09	0.09	0.09	0.08	0.08
in non-ETS sectors		12.59	11.94	10.35	9.98	9.88	9.69	9.76	9.32	9.43	9.38
Total non-CO_2 GHG		13.30	12.21	10.65	10.08	9.97	9.79	9.85	9.41	9.52	9.46

Source: GAINS

Croatia

Non-CO_2 GHG emissions Reference scenario

Non-CO_2 GHG in Mt CO_2eq	UNFCCC CRF code	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total CH_4		3.06	3.09	2.69	2.53	2.64	2.63	2.37	2.40	2.44	2.44
Total N_2O		3.49	3.27	3.09	2.40	2.40	2.44	2.49	2.52	2.53	2.52
Total F-gases		0.33	0.43	0.31	0.31	0.31	0.30	0.31	0.31	0.33	0.34
Agriculture	4A-4F	3.35	3.12	3.05	3.04	3.07	3.12	3.18	3.20	3.21	3.19
Energy	1A-1B	1.27	1.25	1.10	0.89	0.89	0.84	0.82	0.82	0.83	0.82
Industry	2A-2E,2F.7,8	0.77	0.78	0.77	0.07	0.08	0.08	0.08	0.08	0.08	0.08
Waste	6A	0.95	0.98	0.61	0.65	0.73	0.75	0.50	0.52	0.55	0.56
Wastewater	6B	0.46	0.47	0.49	0.51	0.52	0.53	0.54	0.55	0.55	0.56
Air Conditioning & refrigeration	2F.1	0.29	0.40	0.27	0.27	0.27	0.26	0.27	0.26	0.28	0.29
Other sectors	3D, 2F.2,4,9	0.15	0.14	0.15	0.15	0.15	0.15	0.16	0.16	0.16	0.16
Calibration to UNFCCC data		-0.36	-0.36	-0.36	-0.36	-0.36	-0.36	-0.36	-0.36	-0.36	-0.36
in ETS sectors		0.76	0.77	0.76	0.06	0.07	0.07	0.07	0.07	0.07	0.06
in non-ETS sectors		6.12	6.01	5.33	5.17	5.28	5.30	5.11	5.16	5.22	5.23
Total non-CO_2 GHG		6.88	6.78	6.09	5.23	5.34	5.37	5.17	5.23	5.29	5.29

Source: GAINS

Cyprus

Non-CO_2 GHG emissions Reference scenario

Non-CO_2 GHG in Mt CO_2eq	UNFCCC CRF code	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total CH_4		0.83	0.81	0.50	0.57	0.68	0.80	0.85	0.91	0.96	0.97
Total N_2O		0.47	0.47	0.45	0.44	0.44	0.45	0.46	0.46	0.47	0.47
Total F-gases		0.14	0.19	0.16	0.16	0.17	0.16	0.16	0.15	0.16	0.17
Agriculture	4A-4F	0.62	0.61	0.59	0.60	0.61	0.63	0.64	0.65	0.65	0.66
Energy	1A-1B	0.05	0.05	0.04	0.10	0.20	0.32	0.35	0.40	0.43	0.42
Industry	2A-2E,2F.7,8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Waste	6A	0.36	0.38	0.14	0.13	0.13	0.12	0.13	0.14	0.15	0.16
Wastewater	6B	0.16	0.13	0.07	0.07	0.07	0.07	0.08	0.08	0.08	0.09
Air Conditioning & refrigeration	2F.1	0.12	0.17	0.14	0.14	0.14	0.13	0.13	0.12	0.13	0.14
Other sectors	3D, 2F.2,4,9	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04
Calibration to UNFCCC data		0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
in ETS sectors		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
in non-ETS sectors		1.44	1.46	1.11	1.17	1.29	1.41	1.46	1.52	1.59	1.62
Total non-CO_2 GHG		1.44	1.46	1.11	1.17	1.29	1.41	1.46	1.52	1.59	1.62

Source: GAINS

Czech Republic

Non-CO_2 GHG emissions Reference scenario

Non-CO_2 GHG in Mt CO_2eq	UNFCCC CRF code	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total CH_4		10.40	9.86	7.94	7.64	7.69	7.62	7.26	7.87	8.02	8.11
Total N_2O		8.18	7.20	6.78	6.51	6.46	6.30	6.15	6.14	6.19	6.29
Total F-gases		0.75	0.96	0.89	0.93	0.94	0.87	0.84	0.79	0.84	0.88
Agriculture	4A-4F	8.72	8.19	7.94	7.98	7.91	7.83	7.71	7.76	7.82	7.92
Energy	1A-1B	6.18	5.64	5.30	5.15	5.23	5.08	4.64	5.15	5.25	5.31
Industry	2A-2E,2F.7,8	1.07	0.47	0.53	0.18	0.18	0.19	0.20	0.21	0.21	0.22
Waste	6A	2.51	2.66	0.83	0.71	0.68	0.68	0.72	0.75	0.78	0.82
Wastewater	6B	0.69	0.71	0.73	0.75	0.76	0.77	0.78	0.78	0.78	0.78
Air Conditioning & refrigeration	2F.1	0.63	0.83	0.73	0.76	0.75	0.66	0.61	0.55	0.58	0.61
Other sectors	3D, 2F.2,4,9	0.23	0.23	0.25	0.27	0.29	0.30	0.31	0.32	0.32	0.33
Calibration to UNFCCC data		-0.71	-0.71	-0.71	-0.71	-0.71	-0.71	-0.71	-0.71	-0.71	-0.71
in ETS sectors		1.02	0.41	0.46	0.11	0.10	0.11	0.11	0.11	0.11	0.11
in non-ETS sectors		18.30	17.61	15.14	14.98	14.98	14.68	14.14	14.69	14.94	15.17
Total non-CO_2 GHG		19.32	18.02	15.60	15.09	15.09	14.79	14.25	14.80	15.05	15.28

Source: GAINS

Denmark

Non-CO_2 GHG emissions Reference scenario

Non-CO_2 GHG in Mt CO_2eq	UNFCCC CRF code	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total CH_4		5.64	5.45	5.21	5.14	5.19	5.22	5.16	5.15	5.12	5.12
Total N_2O		6.28	6.17	5.86	5.74	5.60	5.46	5.31	5.19	5.11	5.03
Total F-gases		1.01	1.05	1.18	1.24	1.29	1.20	1.23	1.27	1.37	1.50
Agriculture	4A-4F	9.84	9.87	9.38	9.31	9.27	9.22	8.99	8.81	8.69	8.55
Energy	1A-1B	1.12	1.05	0.96	0.83	0.72	0.63	0.62	0.59	0.56	0.54
Industry	2A-2E,2F.7,8	0.03	0.03	0.03	0.02	0.03	0.03	0.03	0.03	0.03	0.03
Waste	6A	0.39	0.19	0.19	0.17	0.19	0.18	0.19	0.19	0.20	0.21
Wastewater	6B	0.72	0.68	0.70	0.73	0.77	0.81	0.85	0.89	0.94	1.00
Air Conditioning & refrigeration	2F.1	0.84	0.94	0.93	0.97	1.02	1.01	1.03	1.04	1.14	1.24
Other sectors	3D, 2F.2,4,9	0.21	0.17	0.31	0.33	0.34	0.26	0.27	0.29	0.30	0.32
Calibration to UNFCCC data		-0.25	-0.25	-0.25	-0.25	-0.25	-0.25	-0.25	-0.25	-0.25	-0.25
in ETS sectors		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
in non-ETS sectors		12.93	12.67	12.25	12.12	12.08	11.89	11.71	11.60	11.60	11.65
Total non-CO_2 GHG		12.93	12.67	12.25	12.12	12.08	11.89	11.71	11.60	11.60	11.65

Source: GAINS

Estonia

Non-CO_2 GHG emissions Reference scenario

Non-CO_2 GHG in Mt CO_2eq	UNFCCC CRF code	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total CH_4		1.04	1.04	0.94	0.94	1.00	0.96	0.99	1.01	1.01	1.00
Total N_2O		0.97	1.04	1.02	1.02	1.06	1.04	1.03	1.02	1.02	1.00
Total F-gases		0.20	0.16	0.14	0.15	0.15	0.14	0.14	0.14	0.15	0.15
Agriculture	4A-4F	1.39	1.42	1.35	1.44	1.52	1.52	1.52	1.52	1.50	1.47
Energy	1A-1B	0.39	0.43	0.40	0.36	0.36	0.34	0.35	0.35	0.34	0.34
Industry	2A-2E,2F.7,8	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Waste	6A	0.25	0.27	0.24	0.19	0.21	0.17	0.18	0.19	0.20	0.21
Wastewater	6B	0.18	0.17	0.18	0.18	0.18	0.18	0.18	0.19	0.19	0.19
Air Conditioning & refrigeration	2F.1	0.10	0.12	0.11	0.11	0.11	0.10	0.09	0.09	0.09	0.09
Other sectors	3D, 2F.2,4,9	0.12	0.06	0.05	0.05	0.05	0.06	0.06	0.06	0.07	0.07
Calibration to UNFCCC data		-0.23	-0.23	-0.23	-0.23	-0.23	-0.23	-0.23	-0.23	-0.23	-0.23
in ETS sectors		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
in non-ETS sectors		2.21	2.24	2.10	2.11	2.21	2.15	2.16	2.17	2.17	2.15
Total non-CO_2 GHG		2.21	2.24	2.10	2.11	2.21	2.15	2.16	2.17	2.17	2.15

Source: GAINS

Finland

Non-CO_2 GHG emissions Reference scenario

Non-CO_2 GHG in Mt CO_2eq	UNFCCC CRF code	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total CH_4		4.53	4.67	3.83	3.95	3.98	4.00	3.96	3.99	4.02	4.09
Total N_2O		6.67	5.33	5.18	5.03	4.98	4.89	4.83	4.65	4.55	4.40
Total F-gases		0.82	0.92	0.90	0.92	0.92	0.87	0.85	0.83	0.88	0.93
Agriculture	4A-4F	5.94	5.72	5.53	5.56	5.61	5.61	5.50	5.44	5.40	5.40
Energy	1A-1B	1.57	1.93	1.90	1.80	1.70	1.61	1.58	1.46	1.41	1.29
Industry	2A-2E,2F.7,8	1.70	0.22	0.21	0.13	0.14	0.14	0.14	0.14	0.14	0.14
Waste	6A	1.32	1.45	0.69	0.77	0.77	0.75	0.78	0.80	0.82	0.84
Wastewater	6B	0.97	0.97	0.97	1.00	1.03	1.07	1.08	1.09	1.10	1.12
Air Conditioning & refrigeration	2F.1	0.67	0.78	0.70	0.72	0.72	0.66	0.63	0.61	0.66	0.70
Other sectors	3D, 2F.2,4,9	0.17	0.17	0.24	0.24	0.25	0.25	0.25	0.25	0.25	0.26
Calibration to UNFCCC data		-0.33	-0.33	-0.33	-0.33	-0.33	-0.33	-0.33	-0.33	-0.33	-0.33
in ETS sectors		1.64	0.17	0.16	0.08	0.09	0.08	0.08	0.08	0.08	0.08
in non-ETS sectors		10.37	10.75	9.75	9.82	9.79	9.67	9.55	9.38	9.37	9.35
Total non-CO_2 GHG		12.01	10.92	9.91	9.90	9.88	9.75	9.63	9.47	9.45	9.43

Source: GAINS

France

Non-CO_2 GHG emissions Reference scenario

Non-CO_2 GHG in Mt CO_2eq	UNFCCC CRF code	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total CH_4		62.65	62.55	53.55	52.12	51.51	51.18	51.00	50.84	50.75	50.87
Total N_2O		67.48	62.06	62.42	59.70	57.60	57.55	57.17	57.17	57.78	58.57
Total F-gases		14.28	16.15	13.66	14.45	14.88	14.50	14.37	14.21	14.90	15.56
Agriculture	4A-4F	90.84	89.75	88.14	85.80	83.78	83.48	82.90	82.53	82.87	83.60
Energy	1A-1B	8.02	7.34	6.71	5.87	5.19	4.67	4.47	4.47	4.41	4.38
Industry	2A-2E,2F.7,8	7.62	2.35	2.45	1.41	1.48	1.54	1.59	1.63	1.68	1.71
Waste	6A	9.63	10.03	3.40	3.34	3.13	3.41	3.55	3.70	3.87	4.04
Wastewater	6B	4.11	4.14	4.29	4.44	4.60	4.74	4.79	4.85	4.91	4.96
Air Conditioning & refrigeration	2F.1	7.98	9.65	8.36	8.59	8.76	8.19	7.88	7.58	8.12	8.66
Other sectors	3D, 2F.2,4,9	5.43	6.71	5.51	6.05	6.27	6.43	6.56	6.67	6.78	6.87
Calibration to UNFCCC data		10.78	10.78	10.78	10.78	10.78	10.78	10.78	10.78	10.78	10.78
in ETS sectors		6.50	1.72	1.80	0.74	0.75	0.76	0.76	0.76	0.75	0.74
in non-ETS sectors		137.90	139.04	127.83	125.53	123.25	122.48	121.77	121.46	122.67	124.26
Total non-CO_2 GHG		144.40	140.76	129.63	126.28	124.00	123.23	122.54	122.22	123.42	125.00

Source: GAINS

Germany

Non-CO_2 GHG emissions Reference scenario

Non-CO_2 GHG in Mt CO_2eq	UNFCCC CRF code	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total CH_4		55.59	51.72	42.51	40.28	38.23	36.17	35.63	35.20	34.74	34.34
Total N_2O		61.30	55.33	55.60	51.84	49.91	48.55	47.94	47.53	46.99	46.41
Total F-gases		13.16	14.39	13.67	13.50	13.19	10.28	9.63	9.07	9.37	9.65
Agriculture	4A-4F	72.85	71.36	71.93	71.50	69.47	68.64	67.96	67.54	66.87	66.19
Energy	1A-1B	19.66	15.71	12.82	11.02	9.44	7.71	7.27	6.94	6.71	6.49
Industry	2A-2E,2F.7,8	9.60	4.71	4.98	2.00	2.00	1.98	1.96	1.95	1.94	1.95
Waste	6A	10.99	11.16	4.25	3.40	3.06	2.24	2.31	2.34	2.36	2.38
Wastewater	6B	4.64	4.56	4.62	4.64	4.65	4.64	4.58	4.52	4.44	4.38
Air Conditioning & refrigeration	2F.1	7.65	9.34	8.38	8.15	7.72	6.65	5.94	5.31	5.51	5.70
Other sectors	3D, 2F.2,4,9	5.45	5.40	5.61	5.70	5.80	3.94	3.97	4.02	4.07	4.12
Calibration to UNFCCC data		-0.81	-0.81	-0.81	-0.81	-0.81	-0.81	-0.81	-0.81	-0.81	-0.81
in ETS sectors		8.59	3.99	4.24	1.26	1.24	1.22	1.19	1.17	1.14	1.13
in non-ETS sectors		121.45	117.44	107.54	104.36	100.09	93.78	92.00	90.64	89.96	89.28
Total non-CO_2 GHG		130.04	121.43	111.78	105.61	101.33	95.00	93.19	91.80	91.10	90.40

Source: GAINS

Greece

Non-CO_2 GHG emissions Reference scenario

Non-CO_2 GHG in Mt CO_2eq	UNFCCC CRF code	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total CH_4		10.15	10.29	7.81	7.48	6.99	6.64	6.70	6.77	6.86	6.94
Total N_2O		7.94	7.59	6.89	6.37	6.09	6.00	6.11	6.12	6.10	6.05
Total F-gases		3.47	2.30	1.83	1.84	1.82	1.75	1.75	1.73	1.81	1.90
Agriculture	4A-4F	8.79	8.73	7.88	7.74	7.65	7.74	8.10	8.17	8.22	8.26
Energy	1A-1B	2.86	2.44	2.17	1.83	1.32	0.84	0.63	0.60	0.59	0.56
Industry	2A-2E,2F.7,8	1.98	0.58	0.56	0.21	0.21	0.21	0.21	0.21	0.21	0.21
Waste	6A	2.85	3.17	1.13	1.08	0.90	0.84	0.84	0.87	0.90	0.92
Wastewater	6B	1.01	1.07	1.08	1.10	1.11	1.13	1.15	1.15	1.16	1.17
Air Conditioning & refrigeration	2F.1	1.63	1.93	1.54	1.54	1.51	1.43	1.42	1.39	1.46	1.53
Other sectors	3D, 2F.2,4,9	0.57	0.39	0.32	0.33	0.34	0.35	0.36	0.37	0.37	0.38
Calibration to UNFCCC data		1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86
in ETS sectors		0.61	0.48	0.45	0.11	0.11	0.11	0.11	0.11	0.11	0.10
in non-ETS sectors		20.95	19.70	16.08	15.58	14.80	14.29	14.45	14.51	14.67	14.79
Total non-CO_2 GHG		21.56	20.18	16.53	15.69	14.90	14.40	14.56	14.62	14.78	14.89

Source: GAINS

Hungary

Non-CO_2 GHG emissions Reference scenario

Non-CO_2 GHG in Mt CO_2eq	UNFCCC CRF code	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total CH_4		8.99	8.13	5.97	5.43	5.11	4.75	4.77	4.82	4.63	4.64
Total N_2O		8.74	6.50	7.24	7.45	7.45	7.54	7.67	7.70	7.64	7.60
Total F-gases		0.83	0.70	0.70	0.72	0.75	0.71	0.69	0.64	0.68	0.72
Agriculture	4A-4F	9.42	8.59	9.09	9.30	9.26	9.32	9.47	9.51	9.46	9.40
Energy	1A-1B	2.96	2.55	2.39	2.17	2.11	2.01	2.01	2.02	1.81	1.82
Industry	2A-2E,2F.7,8	1.95	0.07	0.07	0.07	0.08	0.08	0.08	0.08	0.08	0.08
Waste	6A	3.02	3.26	1.52	1.23	1.02	0.79	0.82	0.85	0.89	0.92
Wastewater	6B	1.10	0.66	0.64	0.63	0.61	0.60	0.58	0.57	0.55	0.54
Air Conditioning & refrigeration	2F.1	0.55	0.64	0.61	0.62	0.65	0.60	0.58	0.52	0.56	0.59
Other sectors	3D, 2F.2,4,9	0.21	0.19	0.22	0.23	0.23	0.23	0.24	0.24	0.24	0.23
Calibration to UNFCCC data		-0.64	-0.64	-0.64	-0.64	-0.64	-0.64	-0.64	-0.64	-0.64	-0.64
in ETS sectors		1.93	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
in non-ETS sectors		16.64	15.28	13.85	13.56	13.25	12.94	13.08	13.10	12.90	12.90
Total non-CO_2 GHG		18.57	15.33	13.90	13.61	13.30	12.99	13.14	13.16	12.95	12.95

Source: GAINS

Ireland

Non-CO_2 GHG emissions Reference scenario

Non-CO_2 GHG in Mt CO_2eq	UNFCCC CRF code	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total CH_4		12.81	11.65	12.22	12.40	12.61	12.50	12.73	13.05	13.37	13.70
Total N_2O		8.09	7.77	7.84	7.88	7.89	7.86	7.82	7.93	8.02	8.08
Total F-gases		1.06	0.91	0.81	0.89	0.99	1.04	1.07	1.10	1.19	1.29
Agriculture	4A-4F	18.96	17.75	18.24	18.52	18.62	18.68	18.73	19.01	19.27	19.51
Energy	1A-1B	0.58	0.57	0.56	0.52	0.47	0.46	0.48	0.49	0.50	0.51
Industry	2A-2E,2F.7,8	0.25	0.07	0.08	0.08	0.09	0.10	0.11	0.12	0.13	0.13
Waste	6A	1.20	0.88	1.02	0.98	1.11	0.90	1.00	1.11	1.23	1.34
Wastewater	6B	0.23	0.29	0.31	0.33	0.36	0.39	0.41	0.43	0.45	0.47
Air Conditioning & refrigeration	2F.1	0.60	0.68	0.62	0.68	0.75	0.77	0.79	0.80	0.87	0.95
Other sectors	3D, 2F.2,4,9	0.27	0.23	0.18	0.20	0.22	0.24	0.26	0.27	0.29	0.30
Calibration to UNFCCC data		-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15
in ETS sectors		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
in non-ETS sectors		21.96	20.33	20.87	21.17	21.48	21.39	21.63	22.09	22.58	23.06
Total non-CO_2 GHG		21.96	20.33	20.87	21.17	21.48	21.39	21.63	22.09	22.58	23.06

Source: GAINS

Italy

Non-CO_2 GHG emissions Reference scenario

Non-CO_2 GHG in Mt CO_2eq	UNFCCC CRF code	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total CH_4		41.25	33.54	33.00	32.00	30.08	29.27	28.44	28.63	28.53	28.82
Total N_2O		37.75	26.97	27.96	27.31	27.15	27.03	26.10	26.02	26.10	26.18
Total F-gases		11.34	12.34	10.57	10.86	11.09	10.55	10.26	9.92	10.46	11.04
Agriculture	4A-4F	35.68	31.59	33.43	33.26	33.25	33.32	32.17	32.20	32.25	32.47
Energy	1A-1B	10.10	8.92	9.23	8.85	7.98	7.51	6.59	6.30	5.88	5.66
Industry	2A-2E,2F.7,8	8.41	1.04	1.06	0.55	0.56	0.57	0.59	0.62	0.65	0.67
Waste	6A	19.41	13.33	11.15	10.43	9.12	8.48	8.78	9.14	9.52	9.92
Wastewater	6B	4.20	4.13	4.57	4.68	4.78	4.88	4.87	4.85	4.83	4.79
Air Conditioning & refrigeration	2F.1	9.63	10.87	9.32	9.51	9.69	9.08	8.72	8.32	8.79	9.30
Other sectors	3D, 2F.2,4,9	1.94	2.02	1.80	1.92	1.98	2.04	2.10	2.15	2.21	2.26
Calibration to UNFCCC data		0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
in ETS sectors		7.93	0.71	0.72	0.21	0.21	0.21	0.21	0.22	0.23	0.23
in non-ETS sectors		82.41	72.15	70.80	69.96	68.12	66.64	64.59	64.35	64.87	65.81
Total non-CO_2 GHG		90.34	72.86	71.52	70.16	68.32	66.85	64.80	64.57	65.09	66.04

Source: GAINS

Latvia

Non-CO_2 GHG emissions Reference scenario

Non-CO_2 GHG in Mt CO_2eq	UNFCCC CRF code	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total CH_4		1.82	1.77	1.44	1.34	1.42	1.41	1.40	1.42	1.38	1.36
Total N_2O		1.61	1.69	1.55	1.65	1.77	1.81	1.88	1.97	2.06	2.15
Total F-gases		0.13	0.13	0.15	0.15	0.14	0.12	0.10	0.09	0.09	0.09
Agriculture	4A-4F	2.18	2.25	2.14	2.22	2.43	2.48	2.54	2.65	2.72	2.79
Energy	1A-1B	0.49	0.52	0.51	0.47	0.46	0.46	0.46	0.46	0.45	0.44
Industry	2A-2E,2F.7,8	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01
Waste	6A	0.53	0.57	0.20	0.16	0.16	0.14	0.15	0.15	0.16	0.17
Wastewater	6B	0.25	0.15	0.17	0.17	0.16	0.16	0.16	0.15	0.15	0.14
Air Conditioning & refrigeration	2F.1	0.12	0.12	0.14	0.14	0.13	0.10	0.09	0.07	0.07	0.07
Other sectors	3D, 2F.2,4,9	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Calibration to UNFCCC data		-0.06	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06
in ETS sectors		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
in non-ETS sectors		3.56	3.60	3.15	3.14	3.33	3.34	3.38	3.47	3.53	3.60
Total non-CO_2 GHG		3.56	3.60	3.15	3.14	3.33	3.34	3.38	3.47	3.53	3.60

Source: GAINS

Lithuania

Non-CO_2 GHG emissions Reference scenario

Non-CO_2 GHG in Mt CO_2eq	UNFCCC CRF code	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total CH_4		3.38	3.41	2.77	2.80	2.65	2.52	2.54	2.55	2.55	2.55
Total N_2O		5.28	3.43	3.44	3.20	3.32	3.42	3.48	3.45	3.44	3.56
Total F-gases		0.28	0.34	0.33	0.33	0.31	0.28	0.26	0.24	0.26	0.27
Agriculture	4A-4F	4.42	4.35	4.20	4.38	4.56	4.63	4.69	4.63	4.61	4.71
Energy	1A-1B	0.77	0.74	0.79	0.75	0.63	0.60	0.60	0.61	0.61	0.62
Industry	2A-2E,2F.7,8	2.43	0.59	0.63	0.27	0.26	0.26	0.26	0.25	0.25	0.24
Waste	6A	0.77	0.89	0.28	0.30	0.22	0.15	0.16	0.16	0.17	0.18
Wastewater	6B	0.40	0.42	0.43	0.43	0.43	0.45	0.45	0.47	0.48	0.49
Air Conditioning & refrigeration	2F.1	0.26	0.32	0.31	0.31	0.29	0.25	0.23	0.21	0.23	0.24
Other sectors	3D, 2F.2,4,9	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Calibration to UNFCCC data		-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17
in ETS sectors		2.43	0.58	0.62	0.26	0.25	0.25	0.25	0.25	0.24	0.23
in non-ETS sectors		6.52	6.61	5.92	6.07	6.03	5.97	6.04	5.99	6.01	6.15
Total non-CO_2 GHG		8.95	7.19	6.54	6.33	6.29	6.23	6.28	6.24	6.25	6.38

Source: GAINS

Luxembourg

Non-CO_2 GHG emissions Reference scenario

Non-CO_2 GHG in Mt CO_2eq	UNFCCC CRF code	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total CH_4		0.46	0.49	0.43	0.41	0.37	0.36	0.35	0.35	0.35	0.34
Total N_2O		0.48	0.50	0.45	0.45	0.44	0.44	0.43	0.43	0.43	0.43
Total F-gases		0.12	0.15	0.13	0.14	0.14	0.15	0.15	0.16	0.17	0.18
Agriculture	4A-4F	0.63	0.72	0.61	0.60	0.54	0.53	0.52	0.52	0.51	0.50
Energy	1A-1B	0.16	0.13	0.13	0.13	0.13	0.12	0.13	0.13	0.13	0.13
Industry	2A-2E,2F.7,8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Waste	6A	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03
Wastewater	6B	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04
Air Conditioning & refrigeration	2F.1	0.11	0.13	0.12	0.13	0.13	0.13	0.14	0.14	0.15	0.17
Other sectors	3D, 2F.2,4,9	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Calibration to UNFCCC data		0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
in ETS sectors		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
in non-ETS sectors		1.06	1.13	1.00	1.00	0.95	0.94	0.94	0.94	0.95	0.96
Total non-CO_2 GHG		1.06	1.13	1.00	1.00	0.95	0.94	0.94	0.94	0.95	0.96

Source: GAINS

Malta

Non-CO_2 GHG emissions Reference scenario

Non-CO_2 GHG in Mt CO_2eq	UNFCCC CRF code	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total CH_4		0.22	0.23	0.14	0.16	0.16	0.15	0.15	0.15	0.15	0.15
Total N_2O		0.05	0.05	0.04	0.04	0.05	0.05	0.04	0.04	0.04	0.04
Total F-gases		0.06	0.07	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.07
Agriculture	4A-4F	0.11	0.10	0.10	0.11	0.12	0.11	0.11	0.11	0.11	0.11
Energy	1A-1B	0.02	0.01	0.01	0.02	0.02	0.02	0.01	0.02	0.02	0.02
Industry	2A-2E,2F.7,8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Waste	6A	0.12	0.14	0.05	0.05	0.05	0.04	0.04	0.04	0.05	0.05
Wastewater	6B	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Air Conditioning & refrigeration	2F.1	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.05	0.05	0.06
Other sectors	3D, 2F.2,4,9	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Calibration to UNFCCC data		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
in ETS sectors		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
in non-ETS sectors		0.33	0.34	0.25	0.28	0.28	0.26	0.26	0.26	0.26	0.26
Total non-CO_2 GHG		0.33	0.34	0.25	0.28	0.28	0.26	0.26	0.26	0.26	0.26

Source: GAINS

Netherlands

Non-CO_2 GHG emissions Reference scenario

Non-CO_2 GHG in Mt CO_2eq	UNFCCC CRF code	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total CH_4		17.36	17.82	13.32	13.20	12.84	12.49	12.60	12.77	12.78	12.75
Total N_2O		15.63	9.56	9.65	9.39	9.18	9.04	8.90	8.86	8.84	8.82
Total F-gases		2.01	2.13	2.21	2.27	2.27	2.11	2.03	1.94	2.05	2.16
Agriculture	4A-4F	18.55	18.65	18.61	18.40	17.96	17.49	17.41	17.55	17.51	17.43
Energy	1A-1B	2.25	2.29	2.40	2.14	1.94	1.79	1.75	1.65	1.60	1.54
Industry	2A-2E,2F.7,8	6.87	0.88	0.95	0.95	0.94	0.96	0.97	0.99	1.01	1.01
Waste	6A	6.22	6.30	1.72	1.78	1.86	1.95	2.03	2.10	2.17	2.26
Wastewater	6B	1.00	0.94	0.99	1.02	1.04	1.07	1.09	1.11	1.13	1.15
Air Conditioning & refrigeration	2F.1	1.35	1.69	1.74	1.77	1.74	1.55	1.44	1.33	1.42	1.52
Other sectors	3D, 2F.2,4,9	0.25	0.26	0.27	0.29	0.30	0.32	0.33	0.33	0.32	0.32
Calibration to UNFCCC data		-1.49	-1.49	-1.49	-1.49	-1.49	-1.49	-1.49	-1.49	-1.49	-1.49
in ETS sectors		6.34	0.55	0.60	0.59	0.56	0.57	0.56	0.55	0.54	0.53
in non-ETS sectors		28.66	28.95	24.58	24.28	23.73	23.07	22.97	23.02	23.13	23.21
Total non-CO_2 GHG		35.00	29.51	25.18	24.87	24.30	23.64	23.53	23.57	23.67	23.74

Source: GAINS

Poland

Non-CO_2 GHG emissions Reference scenario

Non-CO_2 GHG in Mt CO_2eq	UNFCCC CRF code	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total CH_4		37.22	36.19	32.57	33.93	33.96	32.84	32.88	33.47	33.78	33.61
Total N_2O		29.36	26.55	26.19	26.20	25.38	25.07	24.55	24.56	24.67	24.45
Total F-gases		4.71	5.87	6.59	7.12	7.31	6.90	6.67	6.41	6.69	6.88
Agriculture	4A-4F	34.96	35.48	35.23	35.96	35.22	35.31	35.11	35.46	35.79	35.95
Energy	1A-1B	18.58	16.64	16.69	17.12	16.67	14.86	14.16	14.03	13.80	13.01
Industry	2A-2E,2F.7,8	4.93	1.17	1.39	0.66	0.68	0.70	0.71	0.72	0.72	0.70
Waste	6A	7.49	8.70	4.64	5.43	5.77	6.03	6.53	6.99	7.41	7.78
Wastewater	6B	2.87	2.89	2.98	3.06	3.10	3.13	3.06	2.99	2.92	2.83
Air Conditioning & refrigeration	2F.1	3.95	5.35	5.83	6.38	6.53	6.06	5.79	5.51	5.76	5.94
Other sectors	3D, 2F.2,4,9	1.06	0.93	1.14	1.18	1.22	1.25	1.28	1.29	1.28	1.27
Calibration to UNFCCC data		-2.54	-2.54	-2.54	-2.54	-2.54	-2.54	-2.54	-2.54	-2.54	-2.54
in ETS sectors		4.84	1.07	1.28	0.53	0.55	0.56	0.57	0.57	0.56	0.53
in non-ETS sectors		66.46	67.55	64.07	66.71	66.11	64.24	63.53	63.88	64.58	64.41
Total non-CO_2 GHG		71.30	68.61	65.35	67.25	66.66	64.80	64.10	64.45	65.14	64.94

Source: GAINS

Portugal

Non-CO_2 GHG emissions Reference scenario

Non-CO_2 GHG in Mt CO_2eq	UNFCCC CRF code	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total CH_4		11.98	12.01	9.77	9.80	9.61	9.35	9.76	9.87	9.98	9.87
Total N_2O		5.21	4.68	4.69	4.46	4.48	4.51	4.72	4.73	4.76	4.71
Total F-gases		1.12	1.27	1.01	1.03	1.08	1.02	0.98	0.92	0.98	1.03
Agriculture	4A-4F	7.33	7.06	7.14	7.17	7.33	7.44	8.05	8.15	8.29	8.11
Energy	1A-1B	1.45	1.30	1.16	1.15	1.03	0.89	0.84	0.81	0.78	0.74
Industry	2A-2E,2F.7,8	0.59	0.33	0.32	0.05	0.06	0.06	0.06	0.06	0.06	0.06
Waste	6A	4.40	4.61	2.44	2.40	2.11	1.83	1.77	1.76	1.76	1.79
Wastewater	6B	2.57	2.55	2.56	2.64	2.71	2.80	2.90	2.97	3.01	3.04
Air Conditioning & refrigeration	2F.1	0.97	1.18	0.92	0.93	0.98	0.91	0.86	0.80	0.85	0.90
Other sectors	3D, 2F.2,4,9	0.27	0.22	0.23	0.23	0.23	0.24	0.25	0.25	0.26	0.26
Calibration to UNFCCC data		0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
in ETS sectors		0.56	0.30	0.28	0.02	0.02	0.02	0.02	0.02	0.02	0.02
in non-ETS sectors		17.75	17.67	15.19	15.26	15.15	14.86	15.44	15.49	15.70	15.59
Total non-CO_2 GHG		18.31	17.97	15.47	15.29	15.17	14.88	15.46	15.52	15.72	15.61

Source: GAINS

Romania

Non-CO_2 GHG emissions Reference scenario

Non-CO_2 GHG in Mt CO_2eq	UNFCCC CRF code	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total CH_4		26.15	22.33	22.00	21.89	21.69	21.19	21.16	21.16	21.12	20.94
Total N_2O		13.73	11.75	13.42	12.29	12.31	12.37	12.45	12.44	12.39	12.41
Total F-gases		0.65	1.13	0.96	1.04	1.05	0.93	0.87	0.79	0.85	0.90
Agriculture	4A-4F	18.69	17.00	18.98	18.84	18.77	18.79	18.85	18.93	18.88	18.97
Energy	1A-1B	6.08	5.51	5.53	5.67	5.67	5.50	5.50	5.42	5.42	5.21
Industry	2A-2E,2F.7,8	3.08	1.29	1.44	0.30	0.30	0.30	0.30	0.29	0.29	0.29
Waste	6A	3.79	2.24	1.47	1.39	1.30	1.03	1.07	1.09	1.10	1.10
Wastewater	6B	1.43	1.21	1.20	1.20	1.19	1.17	1.14	1.11	1.08	1.05
Air Conditioning & refrigeration	2F.1	0.43	0.91	0.70	0.76	0.76	0.64	0.57	0.49	0.54	0.59
Other sectors	3D, 2F.2,4,9	0.43	0.42	0.43	0.44	0.44	0.44	0.44	0.45	0.44	0.44
Calibration to UNFCCC data		6.61	6.61	6.61	6.61	6.61	6.61	6.61	6.61	6.61	6.61
in ETS sectors		3.04	1.26	1.40	0.26	0.26	0.26	0.25	0.25	0.24	0.24
in non-ETS sectors		37.49	33.95	34.97	34.96	34.79	34.23	34.22	34.15	34.13	34.02
Total non-CO_2 GHG		40.53	35.20	36.38	35.22	35.05	34.49	34.48	34.39	34.37	34.25

Source: GAINS

Slovakia

Non-CO_2 GHG emissions Reference scenario

Non-CO_2 GHG in Mt CO_2eq	UNFCCC CRF code	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total CH_4		4.52	4.42	3.09	3.12	3.13	3.10	3.12	3.13	3.16	3.17
Total N_2O		3.81	3.21	3.47	2.81	2.83	2.84	2.82	2.83	2.80	2.80
Total F-gases		0.40	0.52	0.48	0.53	0.56	0.53	0.49	0.45	0.46	0.47
Agriculture	4A-4F	3.44	3.01	3.36	3.42	3.42	3.41	3.39	3.39	3.38	3.38
Energy	1A-1B	1.16	1.10	1.10	1.08	1.08	1.03	1.03	1.02	1.00	1.00
Industry	2A-2E,2F.7,8	1.36	0.98	0.97	0.22	0.23	0.24	0.24	0.23	0.23	0.22
Waste	6A	2.22	2.26	0.85	0.90	0.87	0.87	0.90	0.93	0.96	0.99
Wastewater	6B	0.77	0.88	0.90	0.93	0.97	1.00	1.02	1.02	1.03	1.03
Air Conditioning & refrigeration	2F.1	0.24	0.40	0.35	0.39	0.40	0.36	0.32	0.28	0.29	0.29
Other sectors	3D, 2F.2,4,9	0.17	0.12	0.13	0.13	0.14	0.14	0.15	0.15	0.15	0.15
Calibration to UNFCCC data		-0.61	-0.61	-0.61	-0.61	-0.61	-0.61	-0.61	-0.61	-0.61	-0.61
in ETS sectors		1.34	0.97	0.95	0.21	0.21	0.22	0.22	0.21	0.20	0.19
in non-ETS sectors		7.40	7.18	6.09	6.25	6.30	6.24	6.22	6.20	6.22	6.25
Total non-CO_2 GHG		8.74	8.15	7.04	6.46	6.51	6.46	6.43	6.41	6.42	6.44

Source: GAINS

Slovenia

Non-CO_2 GHG emissions Reference scenario

Non-CO_2 GHG in Mt CO_2eq	UNFCCC CRF code	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total CH_4		2.17	1.89	1.86	1.75	1.73	1.67	1.65	1.66	1.68	1.67
Total N_2O		1.21	1.18	1.02	0.99	0.99	0.99	0.98	0.98	0.98	0.97
Total F-gases		0.21	0.20	0.20	0.21	0.22	0.19	0.17	0.15	0.15	0.15
Agriculture	4A-4F	1.94	1.88	1.73	1.75	1.76	1.77	1.76	1.76	1.76	1.76
Energy	1A-1B	0.45	0.50	0.47	0.41	0.42	0.39	0.36	0.36	0.37	0.36
Industry	2A-2E,2F.7,8	0.06	0.02	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04
Waste	6A	0.68	0.43	0.40	0.31	0.26	0.22	0.22	0.23	0.24	0.24
Wastewater	6B	0.24	0.21	0.21	0.22	0.22	0.22	0.22	0.22	0.22	0.22
Air Conditioning & refrigeration	2F.1	0.12	0.16	0.15	0.15	0.15	0.12	0.10	0.07	0.08	0.08
Other sectors	3D, 2F.2,4,9	0.06	0.05	0.06	0.06	0.07	0.07	0.07	0.07	0.07	0.07
Calibration to UNFCCC data		0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
in ETS sectors		0.05	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.03
in non-ETS sectors		3.53	3.26	3.06	2.93	2.91	2.82	2.77	2.76	2.78	2.77
Total non-CO_2 GHG		3.58	3.28	3.08	2.96	2.94	2.85	2.80	2.79	2.81	2.80

Source: GAINS

Spain

Non-CO_2 GHG emissions Reference scenario

Non-CO_2 GHG in Mt CO_2eq	UNFCCC CRF code	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total CH_4		34.33	33.56	29.98	29.66	29.29	28.78	30.25	30.98	31.66	32.35
Total N_2O		28.45	26.38	25.78	26.18	26.43	26.01	26.43	26.77	27.17	27.70
Total F-gases		8.79	9.83	8.63	9.08	9.86	10.16	10.38	10.34	10.84	11.39
Agriculture	4A-4F	41.63	39.94	39.97	40.59	40.78	40.36	42.04	42.58	43.37	44.38
Energy	1A-1B	4.67	3.84	3.59	3.41	3.23	3.17	3.00	3.13	3.08	2.99
Industry	2A-2E,2F.7,8	2.14	1.06	1.09	0.68	0.71	0.73	0.74	0.75	0.76	0.77
Waste	6A	8.38	9.21	5.10	5.00	4.70	4.13	4.41	4.72	4.98	5.24
Wastewater	6B	4.14	3.91	4.01	4.15	4.30	4.42	4.50	4.59	4.64	4.68
Air Conditioning & refrigeration	2F.1	6.70	8.09	6.70	7.02	7.59	7.68	7.73	7.56	7.95	8.38
Other sectors	3D, 2F.2,4,9	2.07	1.90	2.10	2.23	2.43	2.64	2.80	2.93	3.05	3.17
Calibration to UNFCCC data		1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83
in ETS sectors		1.61	0.64	0.66	0.24	0.25	0.25	0.26	0.26	0.26	0.26
in non-ETS sectors		69.96	69.14	63.73	64.68	65.32	64.69	66.80	67.83	69.41	71.18
Total non-CO_2 GHG		71.57	69.78	64.39	64.92	65.57	64.95	67.05	68.09	69.67	71.44

Source: GAINS

Sweden

Non-CO_2 GHG emissions Reference scenario

Non-CO_2 GHG in Mt CO_2eq	UNFCCC CRF code	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total CH_4		5.89	4.87	4.64	4.62	4.76	4.85	4.95	5.05	5.15	5.26
Total N_2O		7.03	6.88	7.10	6.89	6.95	6.90	6.90	6.81	6.75	6.74
Total F-gases		2.22	2.14	2.30	2.43	2.56	2.61	2.73	2.87	3.13	3.38
Agriculture	4A-4F	7.62	7.24	7.34	7.31	7.39	7.41	7.42	7.41	7.43	7.45
Energy	1A-1B	1.81	1.99	2.06	2.06	2.06	2.00	2.00	1.94	1.89	1.87
Industry	2A-2E,2F.7,8	0.82	0.43	0.44	0.17	0.17	0.17	0.17	0.18	0.17	0.18
Waste	6A	1.47	0.58	0.37	0.39	0.42	0.44	0.47	0.50	0.53	0.56
Wastewater	6B	1.22	1.27	1.31	1.35	1.43	1.49	1.54	1.60	1.64	1.69
Air Conditioning & refrigeration	2F.1	1.64	1.87	1.94	2.06	2.18	2.23	2.34	2.47	2.71	2.96
Other sectors	3D, 2F.2,4,9	0.34	0.30	0.38	0.39	0.40	0.41	0.42	0.43	0.45	0.46
Calibration to UNFCCC data		0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21
in ETS sectors		0.69	0.35	0.35	0.08	0.08	0.08	0.08	0.08	0.08	0.08
in non-ETS sectors		14.44	13.55	13.69	13.86	14.19	14.28	14.50	14.66	14.95	15.30
Total non-CO_2 GHG		15.13	13.90	14.04	13.94	14.27	14.36	14.58	14.74	15.03	15.38

Source: GAINS

United Kingdom

Non-CO_2 GHG emissions Reference scenario

Non-CO_2 GHG in Mt CO_2eq	UNFCCC CRF code	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total CH_4		46.92	40.21	37.02	34.58	33.34	29.88	29.49	29.53	29.65	29.77
Total N_2O		40.25	36.10	36.28	34.49	34.14	34.07	34.34	34.94	35.54	35.87
Total F-gases		11.13	11.51	11.11	11.60	11.93	11.59	11.54	11.47	12.26	13.05
Agriculture	4A-4F	49.69	46.13	46.40	45.88	46.20	46.49	46.92	47.70	48.49	49.05
Energy	1A-1B	17.99	14.65	13.58	10.95	10.16	7.06	6.15	5.63	5.21	4.71
Industry	2A-2E,2F.7,8	3.66	1.61	1.69	0.48	0.49	0.50	0.51	0.52	0.52	0.52
Waste	6A	13.74	11.22	8.70	8.68	7.38	6.58	6.85	7.13	7.44	7.77
Wastewater	6B	3.25	3.37	3.52	3.62	3.76	3.82	3.89	3.95	3.99	4.03
Air Conditioning & refrigeration	2F.1	6.76	8.04	6.95	7.24	7.41	6.89	6.68	6.43	7.04	7.67
Other sectors	3D, 2F.2,4,9	4.58	4.15	4.93	5.17	5.37	5.56	5.74	5.93	6.12	6.30
Calibration to UNFCCC data		-1.36	-1.36	-1.36	-1.36	-1.36	-1.36	-1.36	-1.36	-1.36	-1.36
in ETS sectors		3.07	1.40	1.48	0.28	0.29	0.29	0.29	0.28	0.27	0.26
in non-ETS sectors		95.23	86.41	82.93	80.38	79.12	75.25	75.09	75.65	77.18	78.42
Total non-CO_2 GHG		98.30	87.81	84.41	80.66	79.41	75.54	75.38	75.93	77.45	78.68

Source: GAINS

APPENDIX 4: LULUCF EMISSIONS

EU-28

LULUCF emissions Reference scenario

LULUCF CO2 emissions in Mt CO_2eq	UNFCCC CRF	Source	Pool	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total Forest Land	**5A**			**-345.5**	**-315.1**	**-298.8**	**-260.9**	**-235.8**	**-222.9**	**-207.6**	**-198.9**	**-194.6**	**-168.7**	**-150.1**
Forest Land remaining Forest Land	5A.1	Forest management	Biomass	-393.4	-340.1	-303.3	-246.4	-192.6	-158.3	-126.4	-103.4	-85.7	-50.1	-23.5
Land converted to Forest Land	5A.2	Afforestation/ reforestation	Biomass	0.0	-17.0	-28.5	-39.4	-51.8	-63.8	-73.9	-83.6	-93.3	-100.0	-105.9
		Afforestation/ reforestation	Soil	-6.1	-9.0	-11.6	-13.9	-16.0	-17.9	-19.6	-21.0	-22.4	-23.5	-24.3
Forest Land converted to other land		Deforestation	Biomass	43.0	31.5	22.2	19.4	13.7	10.0	7.3	5.4	4.1	2.8	2.1
use categories		Deforestation	Soil	11.0	19.6	22.4	19.4	10.9	7.1	5.0	3.6	2.8	2.1	1.6
Total Cropland	**5B**	**Cropland management**	**Soil**	**45.8**	**35.7**	**25.7**	**21.5**	**17.4**	**15.9**	**14.4**	**13.6**	**12.9**	**14.4**	**16.0**
Cropland remaining Cropland	5B.1	Cropland management	Soil	39.7	28.0	16.3	9.5	2.7	-0.2	-3.1	-4.9	-6.6	-5.8	-4.9
Land converted to Cropland	5B.2	Cropland management	Soil	6.1	7.7	9.3	12.0	14.6	16.1	17.6	18.5	19.5	20.2	20.9
Total Grassland	**5C**	**Grassland management**	**Soil**	**8.2**	**5.9**	**3.5**	**1.3**	**-0.9**	**-2.9**	**-4.9**	**-6.8**	**-8.7**	**-10.4**	**-12.2**
Grassland remaining Grassland	5C.1	Grassland management	Soil	9.9	9.8	9.6	9.4	9.3	9.1	8.9	8.9	8.8	8.7	8.6
Land converted to Grassland	5C.2	Grassland management	Soil	-1.7	-3.9	-6.1	-8.1	-10.1	-12.0	-13.9	-15.7	-17.5	-19.2	-20.8
Total Wetlands	**5D**	**Wetlands**		**6.2**	**6.1**	**5.3**	**5.3**	**5.3**	**5.3**	**5.3**	**5.3**	**5.3**	**5.3**	**5.3**
Total Settlements	**5E**	**Settlements**		**33.5**	**37.5**	**38.8**	**38.8**	**38.8**	**38.8**	**38.8**	**38.8**	**38.8**	**38.8**	**38.8**
Total Other land	**5F**	**Other land**		**1.4**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**
Harvested Wood Products	**5G**	**Harvested Wood Products**		**0.0**	**-9.4**	**-18.8**	**-34.8**	**-50.8**	**-55.8**	**-60.8**	**-65.2**	**-69.5**	**-82.0**	**-94.5**
LULUCF	**5**	**LULUCF**		**-250.3**	**-238.5**	**-243.6**	**-228.1**	**-225.3**	**-220.9**	**-214.1**	**-212.5**	**-215.1**	**-201.9**	**-196.0**

Source: G4M, GLOBIOM

EU-27

LULUCF emissions Reference scenario

LULUCF CO2 emissions in Mt CO_2eq	UNFCCC CRF	Source	Pool	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total Forest Land	**5A**			**-340.0**	**-309.4**	**-294.7**	**-259.1**	**-236.3**	**-223.7**	**-208.6**	**-200.6**	**-197.0**	**-171.8**	**-153.0**
Forest Land remaining Forest Land	5A.1	Forest management	Biomass	-384.7	-332.7	-300.0	-246.2	-195.1	-161.4	-129.9	-107.6	-90.9	-56.1	-29.3
Land converted to Forest Land	5A.2	Afforestation/ reforestation	Biomass	0.0	-16.6	-27.6	-38.0	-50.1	-61.7	-71.7	-81.2	-90.9	-97.4	-103.3
		Afforestation/ reforestation	Soil	-5.9	-8.8	-11.3	-13.6	-15.7	-17.6	-19.3	-20.7	-22.0	-23.1	-24.0
Forest Land converted to other land		Deforestation	Biomass	40.4	30.3	22.2	19.4	13.7	10.0	7.3	5.4	4.0	2.8	2.1
use categories		Deforestation	Soil	10.2	18.3	22.0	19.3	10.9	7.0	5.0	3.6	2.8	2.1	1.6
Total Cropland	**5B**	**Cropland management**	**Soil**	**45.6**	**35.5**	**25.4**	**21.3**	**17.1**	**15.6**	**14.2**	**13.4**	**12.6**	**14.2**	**15.7**
Cropland remaining Cropland	5B.1	Cropland management	Soil	39.5	27.8	16.1	9.3	2.5	-0.4	-3.4	-5.1	-6.9	-6.0	-5.1
Land converted to Cropland	5B.2	Cropland management	Soil	6.1	7.7	9.3	12.0	14.6	16.1	17.5	18.5	19.5	20.2	20.9
Total Grassland	**5C**	**Grassland management**	**Soil**	**8.2**	**5.9**	**3.5**	**1.4**	**-0.8**	**-2.8**	**-4.8**	**-6.7**	**-8.6**	**-10.3**	**-12.0**
Grassland remaining Grassland	5C.1	Grassland management	Soil	9.9	9.8	9.6	9.4	9.3	9.1	8.9	8.9	8.8	8.7	8.6
Land converted to Grassland	5C.2	Grassland management	Soil	-1.7	-3.9	-6.1	-8.1	-10.1	-11.9	-13.7	-15.6	-17.4	-19.0	-20.7
Total Wetlands	**5D**	**Wetlands**		**6.2**	**6.1**	**5.3**	**5.3**	**5.3**	**5.3**	**5.3**	**5.3**	**5.3**	**5.3**	**5.3**
Total Settlements	**5E**	**Settlements**		**33.2**	**37.0**	**38.1**	**38.1**	**38.1**	**38.1**	**38.1**	**38.1**	**38.1**	**38.1**	**38.1**
Total Other land	**5F**	**Other land**		**1.4**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**
Harvested Wood Products	**5G**	**Harvested Wood Products**		**0.0**	**-9.0**	**-18.1**	**-34.0**	**-50.0**	**-55.0**	**-60.0**	**-64.4**	**-68.8**	**-81.3**	**-93.9**
LULUCF	**5**	**LULUCF**		**-245.5**	**-233.3**	**-239.8**	**-226.5**	**-225.9**	**-221.8**	**-215.2**	**-214.3**	**-217.8**	**-205.2**	**-199.1**

Source: G4M, GLOBIOM

Austria

LULUCF emissions Reference scenario

LULUCF CO2 emissions in Mt CO_2eq	UNFCCC CRF	Source	Pool	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total Forest Land	**5A**			**-5.9**	**-2.8**	**3.8**	**2.7**	**2.2**	**2.3**	**4.0**	**4.9**	**5.9**	**7.9**	**8.1**
Forest Land remaining Forest Land	5A.1	Forest management	Biomass	-9.8	-6.4	1.6	2.3	2.8	3.6	5.9	7.3	8.7	11.0	11.6
Land converted to Forest Land	5A.2	Afforestation/ reforestation	Biomass	0.0	-0.2	-0.4	-0.7	-1.0	-1.5	-1.8	-2.1	-2.4	-2.6	-2.9
		Afforestation/ reforestation	Soil	-0.1	-0.2	-0.3	-0.3	-0.4	-0.4	-0.4	-0.5	-0.5	-0.6	-0.7
Forest Land converted to other land		Deforestation	Biomass	3.1	2.4	1.2	0.7	0.4	0.3	0.2	0.1	0.1	0.1	0.0
use categories		Deforestation	Soil	0.9	1.5	1.6	0.7	0.4	0.2	0.2	0.1	0.1	0.1	0.0
Total Cropland	**5B**	**Cropland management**	**Soil**	**0.2**	**0.2**	**0.1**	**0.1**	**0.0**	**0.0**	**0.1**	**0.0**	**0.0**	**0.1**	**0.1**
Cropland remaining Cropland	5B.1	Cropland management	Soil	0.0	0.0	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	-0.2	-0.1	-0.1
Land converted to Cropland	5B.2	Cropland management	Soil	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2
Total Grassland	**5C**	**Grassland management**	**Soil**	**0.0**	**0.0**	**0.1**	**0.2**	**0.2**	**0.3**	**0.3**	**0.4**	**0.4**	**0.4**	**0.5**
Grassland remaining Grassland	5C.1	Grassland management	Soil	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Land converted to Grassland	5C.2	Grassland management	Soil	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.6
Total Wetlands	**5D**	**Wetlands**		**0.3**	**0.3**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**
Total Settlements	**5E**	**Settlements**		**0.1**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**
Total Other land	**5F**	**Other land**		**0.6**	**0.4**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**
Harvested Wood Products	**5G**	**Harvested Wood Products**		**0.0**	**-0.1**	**-0.1**	**-2.0**	**-4.0**	**-4.9**	**-5.8**	**-6.2**	**-6.6**	**-7.7**	**-8.9**
LULUCF	**5**	**LULUCF**		**-4.8**	**-1.7**	**4.9**	**1.8**	**-0.6**	**-1.3**	**-0.5**	**0.1**	**0.7**	**1.6**	**0.8**

Source: G4M, GLOBIOM

Belgium

LULUCF emissions Reference scenario

LULUCF CO2 emissions in Mt CO_2eq	UNFCCC CRF	Source	Pool	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total Forest Land	**5A**			**-3.6**	**-2.7**	**-2.9**	**-1.7**	**-0.4**	**-0.4**	**0.0**	**0.4**	**0.7**	**0.7**	**0.7**
Forest Land remaining Forest Land	5A.1	Forest management	Biomass	-4.3	-3.1	-3.3	-1.8	-0.3	-0.3	0.2	0.7	1.0	1.1	1.2
Land converted to Forest Land	5A.2	Afforestation/ reforestation	Biomass	0.0	0.0	-0.1	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.4	-0.4
		Afforestation/ reforestation	Soil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1
Forest Land converted to other land		Deforestation	Biomass	0.6	0.4	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0
use categories		Deforestation	Soil	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Cropland	**5B**	**Cropland management**	**Soil**	**0.8**	**0.9**	**0.9**	**0.8**	**0.7**	**0.6**	**0.5**	**0.5**	**0.5**	**0.4**	**0.4**
Cropland remaining Cropland	5B.1	Cropland management	Soil	0.8	0.8	0.8	0.7	0.5	0.5	0.4	0.3	0.3	0.2	0.2
Land converted to Cropland	5B.2	Cropland management	Soil	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.2
Total Grassland	**5C**	**Grassland management**	**Soil**	**0.4**	**0.4**	**0.4**	**0.4**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**
Grassland remaining Grassland	5C.1	Grassland management	Soil	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Land converted to Grassland	5C.2	Grassland management	Soil	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.1
Total Wetlands	**5D**	**Wetlands**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Total Settlements	**5E**	**Settlements**		**0.5**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**
Total Other land	**5F**	**Other land**		**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Harvested Wood Products	**5G**	**Harvested Wood Products**		**0.0**	**-0.2**	**-0.4**	**-0.6**	**-0.7**	**-0.8**	**-0.9**	**-1.0**	**-1.0**	**-1.1**	**-1.1**
LULUCF	**5**	**LULUCF**		**-1.8**	**-0.9**	**-1.4**	**-0.4**	**0.6**	**0.4**	**0.6**	**0.9**	**1.1**	**1.0**	**0.9**

Source: G4M, GLOBIOM

Bulgaria

LULUCF emissions Reference scenario

LULUCF CO2 emissions in Mt CO_2eq	UNFCCC CRF	Source	Pool	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total Forest Land	**5A**			**-10.8**	**-9.8**	**-9.7**	**-8.5**	**-7.6**	**-6.7**	**-6.0**	**-5.5**	**-5.0**	**-4.9**	**-4.9**
Forest Land remaining Forest Land	5A.1	Forest management	Biomass	-10.7	-9.1	-8.6	-6.7	-5.2	-3.9	-2.4	-1.2	-0.1	0.5	1.1
Land converted to Forest Land	5A.2	Afforestation/ reforestation	Biomass	0.0	-0.6	-1.0	-1.5	-2.0	-2.3	-3.0	-3.5	-4.0	-4.5	-5.0
		Afforestation/ reforestation	Soil	-0.2	-0.3	-0.3	-0.4	-0.5	-0.6	-0.7	-0.8	-0.9	-1.0	-1.1
Forest Land converted to other land		Deforestation	Biomass	0.0	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
use categories		Deforestation	Soil	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Cropland	**5B**	**Cropland management**	**Soil**	**1.4**	**1.2**	**1.0**	**0.9**	**0.8**	**0.8**	**0.7**	**0.6**	**0.5**	**0.5**	**0.4**
Cropland remaining Cropland	5B.1	Cropland management	Soil	1.1	0.7	0.3	0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Land converted to Cropland	5B.2	Cropland management	Soil	0.3	0.5	0.6	0.7	0.9	0.9	0.8	0.7	0.6	0.6	0.6
Total Grassland	**5C**	**Grassland management**	**Soil**	**0.0**	**-0.1**	**-0.2**	**-0.2**	**-0.3**	**-0.3**	**-0.3**	**-0.4**	**-0.4**	**-0.4**	**-0.4**
Grassland remaining Grassland	5C.1	Grassland management	Soil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Land converted to Grassland	5C.2	Grassland management	Soil	0.0	-0.1	-0.2	-0.2	-0.3	-0.3	-0.3	-0.4	-0.4	-0.4	-0.4
Total Wetlands	**5D**	**Wetlands**		**0.0**	**0.1**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**
Total Settlements	**5E**	**Settlements**		**0.1**	**0.2**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**
Total Other land	**5F**	**Other land**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Harvested Wood Products	**5G**	**Harvested Wood Products**		**0.0**	**0.0**	**0.0**	**-0.3**	**-0.6**	**-0.7**	**-0.8**	**-0.7**	**-0.7**	**-0.8**	**-1.0**
LULUCF	**5**	**LULUCF**		**-9.4**	**-8.4**	**-8.2**	**-7.4**	**-6.9**	**-6.2**	**-5.6**	**-5.2**	**-4.9**	**-4.9**	**-5.2**

Source: G4M, GLOBIOM

Croatia

LULUCF emissions Reference scenario

LULUCF CO2 emissions in Mt CO_2eq	UNFCCC CRF	Source	Pool	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total Forest Land	**5A**			**-5.5**	**-5.7**	**-4.1**	**-1.8**	**0.5**	**0.8**	**1.0**	**1.7**	**2.5**	**3.1**	**2.9**
Forest Land remaining Forest Land	5A.1	Forest management	Biomass	-8.7	-7.5	-3.3	-0.2	2.5	3.1	3.5	4.3	5.2	6.0	5.8
Land converted to Forest Land	5A.2	Afforestation/ reforestation	Biomass	0.0	-0.5	-0.9	-1.4	-1.8	-2.0	-2.2	-2.4	-2.5	-2.5	-2.6
		Afforestation/ reforestation	Soil	-0.2	-0.2	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3
Forest Land converted to other land		Deforestation	Biomass	2.6	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
use categories		Deforestation	Soil	0.8	1.2	0.4	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Cropland	**5B**	**Cropland management**	**Soil**	**0.2**	**0.2**	**0.2**	**0.2**	**0.3**	**0.3**	**0.3**	**0.3**	**0.2**	**0.2**	**0.2**
Cropland remaining Cropland	5B.1	Cropland management	Soil	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Land converted to Cropland	5B.2	Cropland management	Soil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Grassland	**5C**	**Grassland management**	**Soil**	**0.0**	**0.0**	**0.0**	**-0.1**	**-0.1**	**-0.1**	**-0.1**	**-0.1**	**-0.1**	**-0.1**	**-0.2**
Grassland remaining Grassland	5C.1	Grassland management	Soil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Land converted to Grassland	5C.2	Grassland management	Soil	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2
Total Wetlands	**5D**	**Wetlands**		**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Total Settlements	**5E**	**Settlements**		**0.3**	**0.6**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**
Total Other land	**5F**	**Other land**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Harvested Wood Products	**5G**	**Harvested Wood Products**		**0.0**	**-0.3**	**-0.7**	**-0.7**	**-0.8**	**-0.8**	**-0.8**	**-0.8**	**-0.7**	**-0.7**	**-0.7**
LULUCF	**5**	**LULUCF**		**-4.9**	**-5.2**	**-3.8**	**-1.6**	**0.6**	**0.9**	**1.0**	**1.8**	**2.6**	**3.3**	**3.0**

Source: G4M, GLOBIOM

Cyprus

LULUCF emissions Reference scenario

LULUCF CO2 emissions in Mt CO_2eq	UNFCCC CRF	Source	Pool	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total Forest Land	**5A**			**-0.1**	**-0.1**	**-0.1**	**-0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Forest Land remaining Forest Land	5A.1	Forest management	Biomass	-0.1	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Land converted to Forest Land	5A.2	Afforestation/ reforestation	Biomass	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Afforestation/ reforestation	Soil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forest Land converted to other land		Deforestation	Biomass	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
use categories		Deforestation	Soil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Cropland	**5B**	**Cropland management**	**Soil**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Cropland remaining Cropland	5B.1	Cropland management	Soil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Land converted to Cropland	5B.2	Cropland management	Soil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Grassland	**5C**	**Grassland management**	**Soil**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Grassland remaining Grassland	5C.1	Grassland management	Soil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Land converted to Grassland	5C.2	Grassland management	Soil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Wetlands	**5D**	**Wetlands**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Total Settlements	**5E**	**Settlements**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Total Other land	**5F**	**Other land**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Harvested Wood Products	**5G**	**Harvested Wood Products**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
LULUCF	**5**	**LULUCF**		**-0.1**	**-0.1**	**-0.1**	**-0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Source: G4M, GLOBIOM

Czech Republic

LULUCF emissions Reference scenario

LULUCF CO2 emissions in Mt CO_2eq	UNFCCC CRF	Source	Pool	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total Forest Land	**5A**			**-7.9**	**-6.3**	**-1.8**	**-2.5**	**-2.3**	**-1.4**	**-1.2**	**-0.2**	**0.8**	**1.9**	**3.0**
Forest Land remaining Forest Land	5A.1	Forest management	Biomass	-8.1	-6.6	-2.1	-2.6	-2.1	-1.1	-0.7	0.4	1.5	2.8	4.0
Land converted to Forest Land	5A.2	Afforestation/ reforestation	Biomass	0.0	-0.1	-0.1	-0.2	-0.3	-0.3	-0.4	-0.5	-0.6	-0.7	-0.8
		Afforestation/ reforestation	Soil	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2
Forest Land converted to other land		Deforestation	Biomass	0.2	0.3	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0
use categories		Deforestation	Soil	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Cropland	**5B**	**Cropland management**	**Soil**	**0.1**	**0.0**	**0.0**	**0.0**	**-0.1**	**-0.1**	**-0.2**	**-0.1**	**-0.1**	**-0.1**	**-0.1**
Cropland remaining Cropland	5B.1	Cropland management	Soil	0.0	0.0	-0.1	-0.1	-0.2	-0.2	-0.3	-0.2	-0.2	-0.2	-0.1
Land converted to Cropland	5B.2	Cropland management	Soil	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total Grassland	**5C**	**Grassland management**	**Soil**	**0.0**	**-0.1**	**-0.1**	**-0.1**	**-0.1**	**-0.2**	**-0.2**	**-0.2**	**-0.2**	**-0.3**	**-0.3**
Grassland remaining Grassland	5C.1	Grassland management	Soil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Land converted to Grassland	5C.2	Grassland management	Soil	0.0	-0.1	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	-0.3	-0.3
Total Wetlands	**5D**	**Wetlands**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Total Settlements	**5E**	**Settlements**		**0.1**	**0.2**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Total Other land	**5F**	**Other land**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Harvested Wood Products	**5G**	**Harvested Wood Products**		**0.0**	**0.3**	**0.5**	**-0.3**	**-1.1**	**-1.5**	**-1.8**	**-2.1**	**-2.4**	**-2.9**	**-3.3**
LULUCF	**5**	**LULUCF**		**-7.7**	**-5.9**	**-1.3**	**-2.8**	**-3.5**	**-3.0**	**-3.2**	**-2.5**	**-1.8**	**-1.2**	**-0.6**

Source: G4M, GLOBIOM

Denmark

LULUCF emissions Reference scenario

LULUCF CO2 emissions in Mt CO_2eq	UNFCCC CRF	Source	Pool	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total Forest Land	**5A**			**0.5**	**0.4**	**-0.2**	**-0.2**	**-0.3**	**-0.2**	**-0.3**	**-0.4**	**-0.4**	**-0.4**	**-0.6**
Forest Land remaining Forest Land	5A.1	Forest management	Biomass	0.4	0.3	0.0	0.1	0.1	0.4	0.4	0.5	0.6	0.7	0.7
Land converted to Forest Land	5A.2	Afforestation/ reforestation	Biomass	0.0	0.0	-0.3	-0.3	-0.4	-0.6	-0.7	-0.7	-0.8	-0.9	-1.1
		Afforestation/ reforestation	Soil	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	-0.2
Forest Land converted to other land		Deforestation	Biomass	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
use categories		Deforestation	Soil	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Cropland	**5B**	**Cropland management**	**Soil**	**2.9**	**2.8**	**2.8**	**3.0**	**3.3**	**2.8**	**2.3**	**1.6**	**1.0**	**1.5**	**2.0**
Cropland remaining Cropland	5B.1	Cropland management	Soil	2.9	2.8	2.7	2.9	3.1	2.6	2.1	1.4	0.8	1.3	1.8
Land converted to Cropland	5B.2	Cropland management	Soil	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2
Total Grassland	**5C**	**Grassland management**	**Soil**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**
Grassland remaining Grassland	5C.1	Grassland management	Soil	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Land converted to Grassland	5C.2	Grassland management	Soil	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total Wetlands	**5D**	**Wetlands**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Total Settlements	**5E**	**Settlements**		**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Total Other land	**5F**	**Other land**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Harvested Wood Products	**5G**	**Harvested Wood Products**		**0.0**	**0.0**	**-0.1**	**-0.1**	**-0.2**	**-0.3**	**-0.4**	**-0.4**	**-0.5**	**-0.6**	**-0.6**
LULUCF	**5**	**LULUCF**		**3.7**	**3.5**	**2.8**	**3.0**	**3.1**	**2.5**	**1.9**	**1.2**	**0.5**	**0.9**	**1.2**

Source: G4M, GLOBIOM

Estonia

LULUCF emissions Reference scenario

LULUCF CO2 emissions in Mt CO_2eq	UNFCCC CRF	Source	Pool	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total Forest Land	**5A**			**-0.1**	**-2.2**	**1.0**	**1.9**	**2.2**	**2.3**	**2.4**	**1.5**	**0.0**	**-0.2**	**-0.4**
Forest Land remaining Forest Land	5A.1	Forest management	Biomass	-0.4	-2.3	0.9	2.3	3.4	3.9	4.3	3.8	2.7	2.6	2.4
Land converted to Forest Land	5A.2	Afforestation/ reforestation	Biomass	0.0	-0.4	-0.6	-0.7	-1.1	-1.3	-1.4	-1.8	-2.1	-2.2	-2.2
		Afforestation/ reforestation	Soil	-0.1	-0.2	-0.3	-0.3	-0.4	-0.5	-0.5	-0.6	-0.6	-0.6	-0.6
Forest Land converted to other land		Deforestation	Biomass	0.3	0.4	0.5	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
use categories		Deforestation	Soil	0.1	0.3	0.4	0.5	0.2	0.1	0.0	0.0	0.0	0.0	0.0
Total Cropland	**5B**	**Cropland management**	**Soil**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Cropland remaining Cropland	5B.1	Cropland management	Soil	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Land converted to Cropland	5B.2	Cropland management	Soil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Grassland	**5C**	**Grassland management**	**Soil**	**-0.8**	**-0.8**	**-0.9**	**-0.9**	**-0.9**	**-0.9**	**-1.0**	**-1.0**	**-1.0**	**-1.0**	**-1.1**
Grassland remaining Grassland	5C.1	Grassland management	Soil	-0.8	-0.8	-0.8	-0.8	-0.8	-0.8	-0.7	-0.7	-0.7	-0.7	-0.7
Land converted to Grassland	5C.2	Grassland management	Soil	0.0	0.0	-0.1	-0.1	-0.2	-0.2	-0.2	-0.3	-0.3	-0.3	-0.3
Total Wetlands	**5D**	**Wetlands**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Total Settlements	**5E**	**Settlements**		**0.0**	**0.1**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**
Total Other land	**5F**	**Other land**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Harvested Wood Products	**5G**	**Harvested Wood Products**		**0.0**	**0.0**	**0.1**	**-0.1**	**-0.2**	**-0.1**	**0.0**	**0.2**	**0.3**	**0.1**	**0.0**
LULUCF	**5**	**LULUCF**		**-0.8**	**-2.7**	**0.6**	**1.3**	**1.3**	**1.5**	**1.8**	**1.0**	**-0.5**	**-0.9**	**-1.3**

Source: G4M, GLOBIOM

Finland

LULUCF emissions Reference scenario

LULUCF CO2 emissions in Mt CO_2eq	UNFCCC CRF	Source	Pool	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total Forest Land	**5A**			**-34.2**	**-33.8**	**-29.8**	**-22.0**	**-17.9**	**-15.7**	**-12.5**	**-8.4**	**-6.7**	**-5.6**	**-5.0**
Forest Land remaining Forest Land	5A.1	Forest management	Biomass	-37.3	-37.6	-33.5	-25.1	-19.6	-16.6	-12.8	-8.1	-6.0	-4.5	-3.5
Land converted to Forest Land	5A.2	Afforestation/ reforestation	Biomass	0.0	-0.1	-0.2	-0.3	-0.4	-0.6	-0.8	-0.9	-1.0	-1.1	-1.3
		Afforestation/ reforestation	Soil	-0.1	-0.2	-0.2	-0.3	-0.3	-0.4	-0.4	-0.4	-0.5	-0.5	-0.6
Forest Land converted to other land		Deforestation	Biomass	2.3	2.3	1.7	1.3	1.2	1.0	0.8	0.5	0.4	0.3	0.2
use categories		Deforestation	Soil	0.9	1.7	2.5	2.4	1.3	1.0	0.7	0.5	0.4	0.2	0.2
Total Cropland	**5B**	**Cropland management**	**Soil**	**3.8**	**3.4**	**3.0**	**2.6**	**2.1**	**1.9**	**1.6**	**1.5**	**1.4**	**1.3**	**1.2**
Cropland remaining Cropland	5B.1	Cropland management	Soil	3.8	3.4	3.0	2.4	1.8	1.5	1.2	1.1	1.0	0.8	0.7
Land converted to Cropland	5B.2	Cropland management	Soil	0.0	0.0	0.1	0.2	0.4	0.4	0.4	0.4	0.4	0.5	0.5
Total Grassland	**5C**	**Grassland management**	**Soil**	**1.5**	**1.5**	**1.5**	**1.5**	**1.6**	**1.6**	**1.6**	**1.7**	**1.7**	**1.7**	**1.7**
Grassland remaining Grassland	5C.1	Grassland management	Soil	1.5	1.4	1.4	1.4	1.3	1.3	1.3	1.3	1.2	1.2	1.2
Land converted to Grassland	5C.2	Grassland management	Soil	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5
Total Wetlands	**5D**	**Wetlands**		**1.4**	**1.5**	**2.0**	**2.0**	**2.0**	**2.0**	**2.0**	**2.0**	**2.0**	**2.0**	**2.0**
Total Settlements	**5E**	**Settlements**		**1.4**	**1.9**	**1.8**	**1.8**	**1.8**	**1.8**	**1.8**	**1.8**	**1.8**	**1.8**	**1.8**
Total Other land	**5F**	**Other land**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Harvested Wood Products	**5G**	**Harvested Wood Products**		**0.0**	**-0.1**	**-0.3**	**-1.7**	**-3.1**	**-4.6**	**-6.1**	**-7.9**	**-9.7**	**-10.5**	**-11.3**
LULUCF	**5**	**LULUCF**		**-26.2**	**-25.6**	**-21.8**	**-15.8**	**-13.5**	**-13.1**	**-11.7**	**-9.5**	**-9.6**	**-9.4**	**-9.6**

Source: G4M, GLOBIOM

France

LULUCF emissions Reference scenario

LULUCF CO2 emissions in Mt CO_2eq	UNFCCC CRF	Source	Pool	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total Forest Land	**5A**			**-19.5**	**-44.6**	**-44.5**	**-24.0**	**-7.4**	**-4.3**	**1.7**	**-5.2**	**-15.8**	**-17.8**	**-21.0**
Forest Land remaining Forest Land	5A.1	Forest management	Biomass	-36.5	-54.1	-48.2	-21.3	2.0	9.5	19.1	15.4	8.8	9.5	8.1
Land converted to Forest Land	5A.2	Afforestation/ reforestation	Biomass	0.0	-4.3	-7.0	-8.3	-11.3	-13.5	-15.4	-17.7	-21.1	-23.0	-24.5
		Afforestation/ reforestation	Soil	-1.1	-1.7	-2.2	-2.8	-3.2	-3.7	-4.0	-4.4	-4.7	-5.0	-5.2
Forest Land converted to other land		Deforestation	Biomass	15.2	10.3	7.2	4.9	3.3	2.2	1.2	0.9	0.7	0.5	0.4
use categories		Deforestation	Soil	3.0	5.1	5.8	3.4	1.8	1.1	0.8	0.5	0.4	0.3	0.3
Total Cropland	**5B**	**Cropland management**	**Soil**	**8.5**	**5.4**	**2.3**	**1.8**	**1.3**	**1.7**	**2.2**	**1.9**	**1.7**	**2.2**	**2.6**
Cropland remaining Cropland	5B.1	Cropland management	Soil	8.0	4.8	1.6	0.5	-0.5	-0.5	-0.4	-0.8	-1.2	-1.0	-0.9
Land converted to Cropland	5B.2	Cropland management	Soil	0.5	0.6	0.7	1.2	1.8	2.2	2.6	2.7	2.8	3.2	3.5
Total Grassland	**5C**	**Grassland management**	**Soil**	**-0.4**	**-0.7**	**-0.9**	**-1.1**	**-1.3**	**-1.5**	**-1.6**	**-1.8**	**-1.9**	**-2.1**	**-2.2**
Grassland remaining Grassland	5C.1	Grassland management	Soil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Land converted to Grassland	5C.2	Grassland management	Soil	-0.4	-0.7	-0.9	-1.1	-1.3	-1.5	-1.6	-1.8	-1.9	-2.1	-2.2
Total Wetlands	**5D**	**Wetlands**		**-2.6**	**-2.5**	**-3.5**	**-3.5**	**-3.5**	**-3.5**	**-3.5**	**-3.5**	**-3.5**	**-3.5**	**-3.5**
Total Settlements	**5E**	**Settlements**		**11.2**	**13.1**	**14.3**	**14.3**	**14.3**	**14.3**	**14.3**	**14.3**	**14.3**	**14.3**	**14.3**
Total Other land	**5F**	**Other land**		**0.2**	**0.4**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Harvested Wood Products	**5G**	**Harvested Wood Products**		**0.0**	**-3.1**	**-6.2**	**-12.2**	**-18.2**	**-15.8**	**-13.5**	**-10.9**	**-8.2**	**-7.0**	**-5.7**
LULUCF	**5**	**LULUCF**		**-2.5**	**-31.9**	**-38.4**	**-24.7**	**-14.8**	**-9.1**	**-0.4**	**-5.1**	**-13.5**	**-13.8**	**-15.4**

Source: G4M, GLOBIOM

Germany

LULUCF emissions Reference scenario

LULUCF CO2 emissions in Mt CO_2eq	UNFCCC CRF	Source	Pool	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total Forest Land	**5A**			**-27.9**	**-23.6**	**-10.3**	**-15.6**	**-23.2**	**-24.8**	**-25.6**	**-23.0**	**-20.0**	**-15.2**	**-10.4**
Forest Land remaining Forest Land	5A.1	Forest management	Biomass	-33.0	-25.8	-10.3	-13.3	-18.7	-18.4	-17.4	-13.1	-8.6	-2.3	3.7
Land converted to Forest Land	5A.2	Afforestation/ reforestation	Biomass	0.0	-1.7	-2.8	-3.9	-5.0	-6.3	-7.9	-9.2	-10.4	-11.6	-12.6
		Afforestation/ reforestation	Soil	-0.3	-0.5	-0.6	-0.8	-0.9	-1.1	-1.2	-1.4	-1.5	-1.7	-1.8
Forest Land converted to other land		Deforestation	Biomass	4.9	3.3	2.2	1.5	1.0	0.8	0.6	0.5	0.3	0.3	0.2
use categories		Deforestation	Soil	0.6	1.1	1.3	0.9	0.5	0.3	0.3	0.2	0.2	0.1	0.1
Total Cropland	**5B**	**Cropland management**	**Soil**	**10.7**	**8.2**	**5.7**	**4.8**	**3.9**	**3.4**	**3.0**	**2.8**	**2.6**	**2.6**	**2.5**
Cropland remaining Cropland	5B.1	Cropland management	Soil	9.7	7.0	4.2	2.8	1.4	0.7	-0.1	-0.5	-1.0	-1.2	-1.5
Land converted to Cropland	5B.2	Cropland management	Soil	1.0	1.2	1.5	2.0	2.5	2.8	3.1	3.3	3.6	3.8	4.0
Total Grassland	**5C**	**Grassland management**	**Soil**	**8.7**	**8.4**	**8.1**	**7.7**	**7.4**	**7.0**	**6.6**	**6.4**	**6.2**	**5.9**	**5.6**
Grassland remaining Grassland	5C.1	Grassland management	Soil	9.1	9.0	8.9	8.8	8.6	8.5	8.3	8.2	8.2	8.1	8.1
Land converted to Grassland	5C.2	Grassland management	Soil	-0.4	-0.6	-0.9	-1.1	-1.3	-1.5	-1.7	-1.8	-2.0	-2.2	-2.4
Total Wetlands	**5D**	**Wetlands**		**2.6**	**2.4**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**
Total Settlements	**5E**	**Settlements**		**2.8**	**2.0**	**2.6**	**2.6**	**2.6**	**2.6**	**2.6**	**2.6**	**2.6**	**2.6**	**2.6**
Total Other land	**5F**	**Other land**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Harvested Wood Products	**5G**	**Harvested Wood Products**		**0.0**	**-2.2**	**-4.5**	**-5.4**	**-6.3**	**-6.8**	**-7.3**	**-8.9**	**-10.5**	**-11.8**	**-13.2**
LULUCF	**5**	**LULUCF**		**-3.0**	**-4.8**	**3.7**	**-3.7**	**-13.4**	**-16.4**	**-18.6**	**-18.0**	**-17.1**	**-13.8**	**-10.6**

Source: G4M, GLOBIOM

Greece

LULUCF emissions Reference scenario

LULUCF CO2 emissions in Mt CO_2eq	UNFCCC CRF	Source	Pool	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total Forest Land	**5A**			**-2.3**	**-2.5**	**-2.7**	**-2.8**	**-2.7**	**-2.9**	**-3.1**	**-3.1**	**-3.0**	**-2.9**	**-2.8**
Forest Land remaining Forest Land	5A.1	Forest management	Biomass	-1.9	-1.8	-1.7	-1.5	-1.1	-1.0	-1.0	-0.8	-0.7	-0.5	-0.3
Land converted to Forest Land	5A.2	Afforestation/ reforestation	Biomass	0.0	-0.1	-0.3	-0.5	-0.7	-0.9	-1.2	-1.3	-1.4	-1.5	-1.6
		Afforestation/ reforestation	Soil	-0.4	-0.6	-0.7	-0.8	-0.9	-0.9	-0.9	-0.9	-1.0	-1.0	-1.0
Forest Land converted to other land		Deforestation	Biomass	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
use categories		Deforestation	Soil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Cropland	**5B**	**Cropland management**	**Soil**	**0.5**	**0.5**	**0.5**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.5**
Cropland remaining Cropland	5B.1	Cropland management	Soil	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Land converted to Cropland	5B.2	Cropland management	Soil	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5
Total Grassland	**5C**	**Grassland management**	**Soil**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Grassland remaining Grassland	5C.1	Grassland management	Soil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Land converted to Grassland	5C.2	Grassland management	Soil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Wetlands	**5D**	**Wetlands**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Total Settlements	**5E**	**Settlements**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Total Other land	**5F**	**Other land**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Harvested Wood Products	**5G**	**Harvested Wood Products**		**0.0**	**0.0**	**0.0**	**0.0**	**-0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
LULUCF	**5**	**LULUCF**		**-1.8**	**-2.0**	**-2.3**	**-2.4**	**-2.4**	**-2.5**	**-2.6**	**-2.7**	**-2.6**	**-2.5**	**-2.3**

Source: G4M, GLOBIOM

Hungary

LULUCF emissions Reference scenario

LULUCF CO2 emissions in Mt CO_2eq	UNFCCC CRF	Source	Pool	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total Forest Land	**5A**			**-1.8**	**-2.1**	**-2.2**	**-1.8**	**-1.4**	**-1.4**	**-1.5**	**-1.5**	**-1.6**	**-1.3**	**-1.1**
Forest Land remaining Forest Land	5A.1	Forest management	Biomass	-1.8	-1.7	-1.5	-0.8	0.0	0.4	0.7	1.0	1.1	1.6	2.0
Land converted to Forest Land	5A.2	Afforestation/ reforestation	Biomass	0.0	-0.4	-0.7	-0.9	-1.2	-1.5	-1.8	-2.1	-2.3	-2.5	-2.7
		Afforestation/ reforestation	Soil	-0.1	-0.2	-0.2	-0.3	-0.3	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4
Forest Land converted to other land		Deforestation	Biomass	0.1	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
use categories		Deforestation	Soil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Cropland	**5B**	**Cropland management**	**Soil**	**0.4**	**0.4**	**0.3**	**0.2**	**0.1**	**0.1**	**0.0**	**-0.1**	**-0.1**	**-0.2**	**-0.2**
Cropland remaining Cropland	5B.1	Cropland management	Soil	0.3	0.2	0.1	-0.1	-0.2	-0.3	-0.4	-0.4	-0.4	-0.4	-0.4
Land converted to Cropland	5B.2	Cropland management	Soil	0.1	0.2	0.2	0.3	0.4	0.4	0.4	0.3	0.3	0.2	0.2
Total Grassland	**5C**	**Grassland management**	**Soil**	**0.4**	**0.4**	**0.4**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**
Grassland remaining Grassland	5C.1	Grassland management	Soil	0.4	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2
Land converted to Grassland	5C.2	Grassland management	Soil	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
Total Wetlands	**5D**	**Wetlands**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Total Settlements	**5E**	**Settlements**		**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**
Total Other land	**5F**	**Other land**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Harvested Wood Products	**5G**	**Harvested Wood Products**		**0.0**	**0.2**	**0.4**	**0.3**	**0.3**	**0.1**	**0.0**	**-0.1**	**-0.2**	**-0.3**	**-0.5**
LULUCF	**5**	**LULUCF**		**-0.7**	**-1.0**	**-1.0**	**-0.8**	**-0.5**	**-0.7**	**-0.9**	**-1.2**	**-1.4**	**-1.3**	**-1.4**

Source: G4M, GLOBIOM

Ireland

LULUCF emissions Reference scenario

LULUCF CO2 emissions in Mt CO_2eq	UNFCCC CRF	Source	Pool	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total Forest Land	**5A**			**-0.8**	**-1.1**	**-1.0**	**-0.9**	**0.1**	**0.2**	**0.2**	**-0.3**	**-0.5**	**-0.4**	**-0.4**
Forest Land remaining Forest Land	5A.1	Forest management	Biomass	-0.9	-0.9	-0.5	0.0	1.3	1.7	2.0	1.9	2.0	2.4	2.7
Land converted to Forest Land	5A.2	Afforestation/ reforestation	Biomass	0.0	-0.3	-0.5	-0.8	-1.0	-1.3	-1.5	-1.8	-2.1	-2.4	-2.6
		Afforestation/ reforestation	Soil	-0.1	-0.2	-0.2	-0.3	-0.3	-0.4	-0.4	-0.4	-0.5	-0.5	-0.5
Forest Land converted to other land		Deforestation	Biomass	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
use categories		Deforestation	Soil	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
Total Cropland	**5B**	**Cropland management**	**Soil**	**0.2**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Cropland remaining Cropland	5B.1	Cropland management	Soil	0.2	0.1	0.1	0.0	-0.1	-0.1	-0.2	-0.1	-0.1	-0.1	-0.1
Land converted to Cropland	5B.2	Cropland management	Soil	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.1	0.1
Total Grassland	**5C**	**Grassland management**	**Soil**	**0.2**	**0.2**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**-0.1**
Grassland remaining Grassland	5C.1	Grassland management	Soil	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Land converted to Grassland	5C.2	Grassland management	Soil	0.0	0.0	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	-0.3	-0.3
Total Wetlands	**5D**	**Wetlands**		**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Total Settlements	**5E**	**Settlements**		**0.0**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Total Other land	**5F**	**Other land**		**0.0**	**-0.1**	**-0.2**	**-0.2**	**-0.2**	**-0.2**	**-0.2**	**-0.2**	**-0.2**	**-0.2**	**-0.2**
Harvested Wood Products	**5G**	**Harvested Wood Products**		**0.0**	**0.0**	**0.0**	**-0.5**	**-1.0**	**-1.1**	**-1.1**	**-1.0**	**-1.0**	**-1.2**	**-1.4**
LULUCF	**5**	**LULUCF**		**-0.3**	**-0.8**	**-1.0**	**-1.4**	**-1.0**	**-0.9**	**-1.0**	**-1.4**	**-1.6**	**-1.8**	**-2.1**

Source: G4M, GLOBIOM

Italy

LULUCF emissions Reference scenario

LULUCF CO2 emissions in Mt CO_2eq	UNFCCC CRF	Source	Pool	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total Forest Land	**5A**			**-36.3**	**-39.2**	**-40.9**	**-41.3**	**-40.4**	**-40.1**	**-39.8**	**-39.4**	**-38.8**	**-37.4**	**-35.9**
Forest Land remaining Forest Land	5A.1	Forest management	Biomass	-35.6	-35.1	-34.3	-32.2	-29.2	-27.3	-25.7	-24.5	-23.3	-21.8	-20.3
Land converted to Forest Land	5A.2	Afforestation/ reforestation	Biomass	0.0	-3.0	-5.2	-7.3	-9.2	-10.7	-11.9	-12.7	-13.2	-13.4	-13.3
		Afforestation/ reforestation	Soil	-1.0	-1.4	-1.8	-1.9	-2.1	-2.1	-2.2	-2.3	-2.3	-2.3	-2.3
Forest Land converted to other land		Deforestation	Biomass	0.3	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
use categories		Deforestation	Soil	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Cropland	**5B**	**Cropland management**	**Soil**	**2.2**	**1.9**	**1.7**	**1.7**	**1.7**	**1.9**	**2.1**	**2.3**	**2.6**	**2.6**	**2.7**
Cropland remaining Cropland	5B.1	Cropland management	Soil	1.3	0.8	0.4	0.1	-0.2	-0.2	-0.2	-0.3	-0.4	-0.4	-0.4
Land converted to Cropland	5B.2	Cropland management	Soil	0.9	1.1	1.3	1.6	2.0	2.2	2.3	2.6	3.0	3.0	3.1
Total Grassland	**5C**	**Grassland management**	**Soil**	**-1.1**	**-1.3**	**-1.5**	**-1.7**	**-1.8**	**-2.0**	**-2.2**	**-2.3**	**-2.4**	**-2.6**	**-2.7**
Grassland remaining Grassland	5C.1	Grassland management	Soil	-0.8	-0.8	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7
Land converted to Grassland	5C.2	Grassland management	Soil	-0.3	-0.5	-0.7	-0.9	-1.1	-1.3	-1.4	-1.6	-1.8	-1.9	-2.0
Total Wetlands	**5D**	**Wetlands**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Total Settlements	**5E**	**Settlements**		**2.5**	**3.4**	**3.4**	**3.4**	**3.4**	**3.4**	**3.4**	**3.4**	**3.4**	**3.4**	**3.4**
Total Other land	**5F**	**Other land**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Harvested Wood Products	**5G**	**Harvested Wood Products**		**0.0**	**0.8**	**1.5**	**1.9**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**
LULUCF	**5**	**LULUCF**		**-32.7**	**-34.4**	**-35.7**	**-36.0**	**-34.9**	**-34.6**	**-34.3**	**-33.8**	**-33.1**	**-31.8**	**-30.4**

Source: G4M, GLOBIOM

Latvia

LULUCF emissions Reference scenario

LULUCF CO2 emissions in Mt CO_2eq	UNFCCC CRF	Source	Pool	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total Forest Land	**5A**			**-18.3**	**-17.5**	**-16.8**	**-14.4**	**-13.0**	**-13.0**	**-13.0**	**-12.7**	**-13.3**	**-13.5**	**-13.7**
Forest Land remaining Forest Land	5A.1	Forest management	Biomass	-18.8	-18.1	-17.5	-14.8	-12.8	-12.7	-12.5	-12.1	-12.5	-12.7	-12.8
Land converted to Forest Land	5A.2	Afforestation/ reforestation	Biomass	0.0	-0.1	-0.2	-0.2	-0.3	-0.4	-0.5	-0.5	-0.6	-0.7	-0.7
		Afforestation/ reforestation	Soil	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	-0.2
Forest Land converted to other land		Deforestation	Biomass	0.4	0.6	0.5	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0
use categories		Deforestation	Soil	0.1	0.2	0.3	0.4	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Total Cropland	**5B**	**Cropland management**	**Soil**	**0.4**	**0.3**	**0.2**	**0.0**	**-0.1**	**-0.1**	**-0.1**	**-0.1**	**-0.1**	**0.0**	**0.1**
Cropland remaining Cropland	5B.1	Cropland management	Soil	0.4	0.3	0.2	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	0.0	0.0
Land converted to Cropland	5B.2	Cropland management	Soil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Grassland	**5C**	**Grassland management**	**Soil**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Grassland remaining Grassland	5C.1	Grassland management	Soil	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Land converted to Grassland	5C.2	Grassland management	Soil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Wetlands	**5D**	**Wetlands**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Total Settlements	**5E**	**Settlements**		**0.1**	**0.1**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**
Total Other land	**5F**	**Other land**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Harvested Wood Products	**5G**	**Harvested Wood Products**		**0.0**	**0.4**	**0.8**	**0.5**	**0.2**	**-0.1**	**-0.4**	**-0.5**	**-0.7**	**-0.9**	**-1.1**
LULUCF	**5**	**LULUCF**		**-17.7**	**-16.5**	**-15.6**	**-13.6**	**-12.6**	**-13.0**	**-13.3**	**-13.1**	**-13.8**	**-14.1**	**-14.5**

Source: G4M, GLOBIOM

Lithuania

LULUCF emissions Reference scenario

LULUCF CO2 emissions in Mt CO_2eq	UNFCCC CRF	Source	Pool	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total Forest Land	**5A**			**-8.3**	**-7.3**	**-6.0**	**-6.0**	**-7.1**	**-7.0**	**-6.6**	**-7.2**	**-7.2**	**-7.2**	**-7.4**
Forest Land remaining Forest Land	5A.1	Forest management	Biomass	-8.5	-7.3	-5.9	-5.6	-6.3	-5.9	-5.3	-5.6	-5.4	-5.1	-5.2
Land converted to Forest Land	5A.2	Afforestation/ reforestation	Biomass	0.0	-0.2	-0.4	-0.5	-0.6	-0.8	-1.0	-1.2	-1.4	-1.5	-1.7
		Afforestation/ reforestation	Soil	-0.1	-0.1	-0.2	-0.2	-0.3	-0.3	-0.4	-0.4	-0.5	-0.5	-0.5
Forest Land converted to other land		Deforestation	Biomass	0.2	0.3	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
use categories		Deforestation	Soil	0.0	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Cropland	**5B**	**Cropland management**	**Soil**	**0.2**	**0.2**	**0.1**	**0.0**	**-0.1**	**-0.1**	**-0.2**	**-0.2**	**-0.2**	**0.0**	**0.1**
Cropland remaining Cropland	5B.1	Cropland management	Soil	0.2	0.1	0.1	0.0	-0.1	-0.1	-0.2	-0.2	-0.2	-0.1	-0.1
Land converted to Cropland	5B.2	Cropland management	Soil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2
Total Grassland	**5C**	**Grassland management**	**Soil**	**0.3**	**0.2**	**0.2**	**0.1**	**0.1**	**0.0**	**0.0**	**-0.1**	**-0.1**	**-0.2**	**-0.2**
Grassland remaining Grassland	5C.1	Grassland management	Soil	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2
Land converted to Grassland	5C.2	Grassland management	Soil	0.0	-0.1	-0.1	-0.2	-0.2	-0.2	-0.3	-0.3	-0.4	-0.4	-0.4
Total Wetlands	**5D**	**Wetlands**		**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Total Settlements	**5E**	**Settlements**		**0.6**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Total Other land	**5F**	**Other land**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Harvested Wood Products	**5G**	**Harvested Wood Products**		**0.0**	**0.1**	**0.2**	**0.1**	**0.0**	**-0.1**	**-0.2**	**-0.2**	**-0.2**	**-0.3**	**-0.3**
LULUCF	**5**	**LULUCF**		**-7.2**	**-6.7**	**-5.5**	**-5.7**	**-7.0**	**-7.1**	**-6.9**	**-7.6**	**-7.6**	**-7.5**	**-7.8**

Source: G4M, GLOBIOM

Luxembourg

LULUCF emissions Reference scenario

LULUCF CO2 emissions in Mt CO_2eq	UNFCCC CRF	Source	Pool	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total Forest Land	**5A**			**-0.5**	**-0.2**	**-0.5**	**-0.5**	**-0.3**	**-0.2**	**-0.1**	**-0.2**	**-0.2**	**-0.2**	**0.0**
Forest Land remaining Forest Land	5A.1	Forest management	Biomass	-0.5	-0.2	-0.5	-0.5	-0.3	-0.1	-0.1	0.0	0.0	0.0	0.2
Land converted to Forest Land	5A.2	Afforestation/ reforestation	Biomass	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2
		Afforestation/ reforestation	Soil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forest Land converted to other land		Deforestation	Biomass	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
use categories		Deforestation	Soil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Cropland	**5B**	**Cropland management**	**Soil**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Cropland remaining Cropland	5B.1	Cropland management	Soil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Land converted to Cropland	5B.2	Cropland management	Soil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Grassland	**5C**	**Grassland management**	**Soil**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Grassland remaining Grassland	5C.1	Grassland management	Soil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Land converted to Grassland	5C.2	Grassland management	Soil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Wetlands	**5D**	**Wetlands**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Total Settlements	**5E**	**Settlements**		**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Total Other land	**5F**	**Other land**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Harvested Wood Products	**5G**	**Harvested Wood Products**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**-0.1**	**-0.1**	**-0.1**
LULUCF	**5**	**LULUCF**		**-0.4**	**-0.1**	**-0.4**	**-0.4**	**-0.2**	**0.0**	**0.0**	**-0.1**	**-0.1**	**-0.2**	**0.0**

Source: G4M, GLOBIOM

Malta

LULUCF emissions Reference scenario

LULUCF CO2 emissions in Mt CO_2eq	UNFCCC CRF	Source	Pool	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total Forest Land	**5A**			**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Forest Land remaining Forest Land	5A.1	Forest management	Biomass	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Land converted to Forest Land	5A.2	Afforestation/ reforestation	Biomass	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Afforestation/ reforestation	Soil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forest Land converted to other land		Deforestation	Biomass	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
use categories		Deforestation	Soil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Cropland	**5B**	**Cropland management**	**Soil**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Cropland remaining Cropland	5B.1	Cropland management	Soil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Land converted to Cropland	5B.2	Cropland management	Soil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Grassland	**5C**	**Grassland management**	**Soil**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Grassland remaining Grassland	5C.1	Grassland management	Soil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Land converted to Grassland	5C.2	Grassland management	Soil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Wetlands	**5D**	**Wetlands**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Total Settlements	**5E**	**Settlements**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Total Other land	**5F**	**Other land**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Harvested Wood Products	**5G**	**Harvested Wood Products**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
LULUCF	**5**	**LULUCF**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Source: G4M, GLOBIOM

Netherlands

LULUCF emissions Reference scenario

LULUCF CO2 emissions in Mt CO_2eq	UNFCCC CRF	Source	Pool	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total Forest Land	**5A**			**-1.4**	**-1.2**	**-1.1**	**-1.4**	**-1.7**	**-2.3**	**-2.7**	**-3.1**	**-3.4**	**-3.7**	**-3.9**
Forest Land remaining Forest Land	5A.1	Forest management	Biomass	-2.6	-2.2	-1.9	-1.6	-1.3	-1.3	-1.2	-1.1	-1.0	-1.1	-1.0
Land converted to Forest Land	5A.2	Afforestation/ reforestation	Biomass	0.0	-0.2	-0.2	-0.4	-0.7	-1.0	-1.3	-1.6	-2.0	-2.2	-2.5
		Afforestation/ reforestation	Soil	0.0	0.0	-0.1	-0.1	-0.2	-0.3	-0.4	-0.4	-0.4	-0.4	-0.4
Forest Land converted to other land		Deforestation	Biomass	0.9	0.7	0.5	0.4	0.3	0.2	0.1	0.0	0.0	0.0	0.0
use categories		Deforestation	Soil	0.2	0.4	0.6	0.4	0.2	0.1	0.1	0.0	0.0	0.0	0.0
Total Cropland	**5B**	**Cropland management**	**Soil**	**0.1**	**0.0**	**-0.1**	**-0.1**	**-0.2**	**-0.2**	**-0.2**	**-0.2**	**-0.2**	**-0.2**	**-0.1**
Cropland remaining Cropland	5B.1	Cropland management	Soil	0.1	0.0	-0.1	-0.2	-0.3	-0.3	-0.3	-0.3	-0.3	-0.2	-0.2
Land converted to Cropland	5B.2	Cropland management	Soil	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Grassland	**5C**	**Grassland management**	**Soil**	**2.9**	**3.0**	**3.1**	**3.2**	**3.3**	**3.4**	**3.4**	**3.5**	**3.6**	**3.6**	**3.7**
Grassland remaining Grassland	5C.1	Grassland management	Soil	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
Land converted to Grassland	5C.2	Grassland management	Soil	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.6	0.7	0.7	0.8
Total Wetlands	**5D**	**Wetlands**		**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Total Settlements	**5E**	**Settlements**		**0.5**	**0.8**	**0.8**	**0.8**	**0.8**	**0.8**	**0.8**	**0.8**	**0.8**	**0.8**	**0.8**
Total Other land	**5F**	**Other land**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Harvested Wood Products	**5G**	**Harvested Wood Products**		**0.0**	**-0.1**	**-0.3**	**-0.3**	**-0.3**	**-0.2**	**-0.2**	**-0.2**	**-0.3**	**-0.2**	**-0.2**
LULUCF	**5**	**LULUCF**		**2.2**	**2.6**	**2.6**	**2.4**	**2.0**	**1.6**	**1.2**	**0.9**	**0.7**	**0.5**	**0.3**

Source: G4M, GLOBIOM

Poland

LULUCF emissions Reference scenario

LULUCF CO2 emissions in Mt CO_2eq	UNFCCC CRF	Source	Pool	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total Forest Land	**5A**			**-42.6**	**-34.9**	**-29.3**	**-27.3**	**-26.9**	**-26.2**	**-24.3**	**-22.8**	**-21.5**	**-16.2**	**-11.0**
Forest Land remaining Forest Land	5A.1	Forest management	Biomass	-42.6	-33.5	-27.2	-24.4	-22.9	-21.3	-18.5	-16.2	-14.3	-8.4	-2.6
Land converted to Forest Land	5A.2	Afforestation/ reforestation	Biomass	0.0	-1.3	-1.9	-2.6	-3.3	-4.0	-4.7	-5.4	-5.9	-6.4	-6.8
		Afforestation/ reforestation	Soil	-0.4	-0.5	-0.7	-0.8	-0.9	-1.0	-1.1	-1.3	-1.4	-1.5	-1.6
Forest Land converted to other land		Deforestation	Biomass	0.3	0.2	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0
use categories		Deforestation	Soil	0.1	0.1	0.2	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0
Total Cropland	**5B**	**Cropland management**	**Soil**	**0.7**	**0.0**	**-0.6**	**-1.1**	**-1.6**	**-1.7**	**-1.8**	**-1.6**	**-1.4**	**-1.3**	**-1.1**
Cropland remaining Cropland	5B.1	Cropland management	Soil	0.4	-0.3	-0.9	-1.4	-1.9	-2.0	-2.1	-1.9	-1.8	-1.6	-1.4
Land converted to Cropland	5B.2	Cropland management	Soil	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Total Grassland	**5C**	**Grassland management**	**Soil**	**0.5**	**0.3**	**0.2**	**0.0**	**-0.2**	**-0.3**	**-0.5**	**-0.7**	**-0.8**	**-1.0**	**-1.2**
Grassland remaining Grassland	5C.1	Grassland management	Soil	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Land converted to Grassland	5C.2	Grassland management	Soil	-0.1	-0.2	-0.3	-0.5	-0.6	-0.8	-0.9	-1.1	-1.2	-1.4	-1.6
Total Wetlands	**5D**	**Wetlands**		**2.9**	**3.1**	**3.1**	**3.1**	**3.1**	**3.1**	**3.1**	**3.1**	**3.1**	**3.1**	**3.1**
Total Settlements	**5E**	**Settlements**		**0.2**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Total Other land	**5F**	**Other land**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Harvested Wood Products	**5G**	**Harvested Wood Products**		**0.0**	**-0.9**	**-1.9**	**-3.5**	**-5.1**	**-5.5**	**-6.0**	**-6.5**	**-7.0**	**-9.5**	**-12.0**
LULUCF	**5**	**LULUCF**		**-38.2**	**-32.3**	**-28.3**	**-28.6**	**-30.4**	**-30.5**	**-29.3**	**-28.3**	**-27.5**	**-24.7**	**-22.0**

Source: G4M, GLOBIOM

Portugal

LULUCF emissions Reference scenario

LULUCF CO2 emissions in Mt CO_2eq	UNFCCC CRF	Source	Pool	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total Forest Land	**5A**			**-4.9**	**-5.1**	**-4.7**	**-6.2**	**-8.2**	**-8.7**	**-8.7**	**-8.9**	**-8.7**	**-8.2**	**-7.5**
Forest Land remaining Forest Land	5A.1	Forest management	Biomass	-9.9	-8.2	-5.5	-10.6	-8.8	-6.1	-4.4	-3.4	-2.2	-1.4	-0.6
Land converted to Forest Land	5A.2	Afforestation/ reforestation	Biomass	0.0	-1.3	-1.7	-2.9	-3.6	-4.4	-5.0	-5.5	-6.0	-5.8	-5.6
		Afforestation/ reforestation	Soil	-0.3	-0.5	-0.7	-0.9	-1.1	-1.4	-1.5	-1.6	-1.7	-1.7	-1.7
Forest Land converted to other land		Deforestation	Biomass	3.7	2.0	0.7	4.3	2.9	1.8	1.3	0.9	0.7	0.4	0.3
use categories		Deforestation	Soil	1.7	2.8	2.5	3.9	2.5	1.3	0.9	0.6	0.5	0.3	0.2
Total Cropland	**5B**	**Cropland management**	**Soil**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Cropland remaining Cropland	5B.1	Cropland management	Soil	0.1	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0
Land converted to Cropland	5B.2	Cropland management	Soil	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1
Total Grassland	**5C**	**Grassland management**	**Soil**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Grassland remaining Grassland	5C.1	Grassland management	Soil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Land converted to Grassland	5C.2	Grassland management	Soil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Wetlands	**5D**	**Wetlands**		**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**
Total Settlements	**5E**	**Settlements**		**2.1**	**2.6**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**
Total Other land	**5F**	**Other land**		**-0.8**	**-0.7**	**-0.7**	**-0.7**	**-0.7**	**-0.7**	**-0.7**	**-0.7**	**-0.7**	**-0.7**	**-0.7**
Harvested Wood Products	**5G**	**Harvested Wood Products**		**0.0**	**-0.2**	**-0.4**	**-0.4**	**-0.4**	**-0.4**	**-0.4**	**-0.4**	**-0.4**	**-0.4**	**-0.3**
LULUCF	**5**	**LULUCF**		**-3.0**	**-2.8**	**-3.0**	**-4.5**	**-6.6**	**-7.1**	**-7.1**	**-7.4**	**-7.2**	**-6.6**	**-5.9**

Source: G4M, GLOBIOM

Romania

LULUCF emissions Reference scenario

LULUCF CO2 emissions in Mt CO_2eq	UNFCCC CRF	Source	Pool	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total Forest Land	**5A**			**-21.9**	**-19.8**	**-20.5**	**-13.9**	**-6.7**	**-2.4**	**2.6**	**5.4**	**8.6**	**12.5**	**16.1**
Forest Land remaining Forest Land	5A.1	Forest management	Biomass	-24.4	-22.5	-23.5	-16.8	-9.1	-4.5	1.0	4.3	8.2	12.8	16.9
Land converted to Forest Land	5A.2	Afforestation/ reforestation	Biomass	0.0	-0.2	-0.3	-0.4	-0.5	-0.7	-0.8	-1.0	-1.1	-1.3	-1.4
		Afforestation/ reforestation	Soil	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2
Forest Land converted to other land		Deforestation	Biomass	2.1	2.1	2.2	2.2	2.1	2.1	1.9	1.6	1.2	0.9	0.6
use categories		Deforestation	Soil	0.4	0.8	1.2	1.2	0.9	0.8	0.7	0.6	0.4	0.3	0.2
Total Cropland	**5B**	**Cropland management**	**Soil**	**1.8**	**1.7**	**1.6**	**1.3**	**1.0**	**0.9**	**0.8**	**1.0**	**1.2**	**0.7**	**0.3**
Cropland remaining Cropland	5B.1	Cropland management	Soil	1.3	0.9	0.6	0.2	-0.2	-0.3	-0.5	-0.5	-0.5	-0.6	-0.7
Land converted to Cropland	5B.2	Cropland management	Soil	0.5	0.8	1.1	1.2	1.3	1.3	1.3	1.5	1.7	1.4	1.0
Total Grassland	**5C**	**Grassland management**	**Soil**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Grassland remaining Grassland	5C.1	Grassland management	Soil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Land converted to Grassland	5C.2	Grassland management	Soil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Wetlands	**5D**	**Wetlands**		**0.0**	**-0.3**	**-0.1**	**-0.1**	**-0.1**	**-0.1**	**-0.1**	**-0.1**	**-0.1**	**-0.1**	**-0.1**
Total Settlements	**5E**	**Settlements**		**0.5**	**0.6**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**
Total Other land	**5F**	**Other land**		**1.1**	**0.4**	**0.8**	**0.8**	**0.8**	**0.8**	**0.8**	**0.8**	**0.8**	**0.8**	**0.8**
Harvested Wood Products	**5G**	**Harvested Wood Products**		**0.0**	**-0.8**	**-1.5**	**-2.6**	**-3.7**	**-4.1**	**-4.5**	**-4.4**	**-4.4**	**-5.0**	**-5.5**
LULUCF	**5**	**LULUCF**		**-18.5**	**-18.1**	**-19.3**	**-14.1**	**-8.3**	**-4.5**	**0.0**	**3.0**	**6.5**	**9.4**	**12.0**

Source: G4M, GLOBIOM

Slovakia

LULUCF emissions Reference scenario

LULUCF CO2 emissions in Mt CO_2eq	UNFCCC CRF	Source	Pool	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total Forest Land	**5A**			**-8.3**	**-4.8**	**-3.5**	**-4.3**	**-4.7**	**-4.6**	**-3.8**	**-3.3**	**-2.4**	**-1.3**	**-0.1**
Forest Land remaining Forest Land	5A.1	Forest management	Biomass	-8.5	-5.0	-3.7	-4.4	-4.7	-4.5	-3.6	-3.1	-2.2	-1.1	0.2
Land converted to Forest Land	5A.2	Afforestation/ reforestation	Biomass	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.3
		Afforestation/ reforestation	Soil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1
Forest Land converted to other land		Deforestation	Biomass	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
use categories		Deforestation	Soil	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Cropland	**5B**	**Cropland management**	**Soil**	**0.6**	**0.4**	**0.2**	**0.2**	**0.3**	**0.3**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**
Cropland remaining Cropland	5B.1	Cropland management	Soil	0.5	0.3	0.1	0.1	0.1	0.1	0.0	0.0	-0.1	0.0	0.0
Land converted to Cropland	5B.2	Cropland management	Soil	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Total Grassland	**5C**	**Grassland management**	**Soil**	**0.0**	**-0.1**	**-0.1**	**-0.1**	**-0.2**	**-0.2**	**-0.2**	**-0.3**	**-0.3**	**-0.3**	**-0.3**
Grassland remaining Grassland	5C.1	Grassland management	Soil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Land converted to Grassland	5C.2	Grassland management	Soil	0.0	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.3	-0.3	-0.3	-0.3
Total Wetlands	**5D**	**Wetlands**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Total Settlements	**5E**	**Settlements**		**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Total Other land	**5F**	**Other land**		**0.2**	**0.3**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Harvested Wood Products	**5G**	**Harvested Wood Products**		**0.0**	**-0.2**	**-0.4**	**-0.7**	**-0.9**	**-1.0**	**-1.1**	**-1.1**	**-1.0**	**-1.8**	**-2.7**
LULUCF	**5**	**LULUCF**		**-7.5**	**-4.4**	**-3.6**	**-4.6**	**-5.2**	**-5.3**	**-4.6**	**-4.2**	**-3.2**	**-3.0**	**-2.7**

Source: G4M, GLOBIOM

Slovenia

LULUCF emissions Reference scenario

LULUCF CO2 emissions in Mt CO_2eq	UNFCCC CRF	Source	Pool	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total Forest Land	**5A**			**-10.4**	**-10.7**	**-10.3**	**-10.4**	**-10.1**	**-10.7**	**-10.5**	**-10.0**	**-9.4**	**-8.7**	**-9.2**
Forest Land remaining Forest Land	5A.1	Forest management	Biomass	-10.9	-10.8	-10.0	-9.8	-9.2	-8.9	-8.7	-8.0	-7.5	-6.8	-7.1
Land converted to Forest Land	5A.2	Afforestation/ reforestation	Biomass	0.0	-0.4	-0.6	-0.8	-1.0	-1.8	-1.7	-1.7	-1.7	-1.7	-1.9
		Afforestation/ reforestation	Soil	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Forest Land converted to other land		Deforestation	Biomass	0.5	0.4	0.4	0.3	0.2	0.2	0.1	0.0	0.0	0.0	0.0
use categories		Deforestation	Soil	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Cropland	**5B**	**Cropland management**	**Soil**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.1**	**0.1**	**0.2**	**0.2**	**0.2**	**0.2**
Cropland remaining Cropland	5B.1	Cropland management	Soil	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Land converted to Cropland	5B.2	Cropland management	Soil	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
Total Grassland	**5C**	**Grassland management**	**Soil**	**0.0**	**0.1**	**0.2**	**0.3**	**0.4**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**
Grassland remaining Grassland	5C.1	Grassland management	Soil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Land converted to Grassland	5C.2	Grassland management	Soil	0.0	0.1	0.2	0.3	0.4	0.5	0.5	0.5	0.5	0.5	0.5
Total Wetlands	**5D**	**Wetlands**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Total Settlements	**5E**	**Settlements**		**0.5**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**
Total Other land	**5F**	**Other land**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Harvested Wood Products	**5G**	**Harvested Wood Products**		**0.0**	**-0.1**	**-0.1**	**-0.2**	**-0.3**	**-0.4**	**-0.4**	**-0.5**	**-0.6**	**-0.7**	**-0.7**
LULUCF	**5**	**LULUCF**		**-9.7**	**-9.9**	**-9.4**	**-9.5**	**-9.3**	**-9.9**	**-9.6**	**-9.2**	**-8.8**	**-8.1**	**-8.6**

Source: G4M, GLOBIOM

Spain

LULUCF emissions Reference scenario

LULUCF CO2 emissions in Mt CO_2eq	UNFCCC CRF	Source	Pool	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total Forest Land	**5A**			**-19.3**	**-19.7**	**-21.8**	**-20.4**	**-18.8**	**-18.5**	**-17.9**	**-18.3**	**-18.1**	**-15.5**	**-12.7**
Forest Land remaining Forest Land	5A.1	Forest management	Biomass	-18.9	-18.2	-19.4	-17.1	-14.6	-13.4	-12.2	-11.7	-11.1	-8.1	-5.1
Land converted to Forest Land	5A.2	Afforestation/ reforestation	Biomass	0.0	-0.8	-1.5	-2.1	-2.7	-3.3	-3.8	-4.4	-4.7	-5.0	-5.1
		Afforestation/ reforestation	Soil	-0.6	-0.9	-1.2	-1.4	-1.7	-2.0	-2.2	-2.3	-2.5	-2.5	-2.6
Forest Land converted to other land		Deforestation	Biomass	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
use categories		Deforestation	Soil	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
Total Cropland	**5B**	**Cropland management**	**Soil**	**1.5**	**1.4**	**1.2**	**1.0**	**0.7**	**0.8**	**0.9**	**0.8**	**0.7**	**0.7**	**0.7**
Cropland remaining Cropland	5B.1	Cropland management	Soil	1.1	0.8	0.5	0.0	-0.6	-0.7	-0.8	-0.8	-0.9	-0.9	-0.9
Land converted to Cropland	5B.2	Cropland management	Soil	0.5	0.6	0.7	1.0	1.3	1.5	1.7	1.7	1.7	1.7	1.7
Total Grassland	**5C**	**Grassland management**	**Soil**	**-0.2**	**-1.3**	**-2.4**	**-3.4**	**-4.4**	**-5.3**	**-6.2**	**-7.1**	**-8.0**	**-8.8**	**-9.6**
Grassland remaining Grassland	5C.1	Grassland management	Soil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Land converted to Grassland	5C.2	Grassland management	Soil	-0.2	-1.3	-2.4	-3.4	-4.4	-5.3	-6.2	-7.1	-8.0	-8.8	-9.6
Total Wetlands	**5D**	**Wetlands**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Total Settlements	**5E**	**Settlements**		**0.5**	**0.5**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**
Total Other land	**5F**	**Other land**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Harvested Wood Products	**5G**	**Harvested Wood Products**		**0.0**	**-0.5**	**-1.0**	**-1.2**	**-1.3**	**-1.4**	**-1.5**	**-1.5**	**-1.5**	**-2.4**	**-3.3**
LULUCF	**5**	**LULUCF**		**-17.4**	**-19.6**	**-23.4**	**-23.4**	**-23.1**	**-23.8**	**-24.2**	**-25.5**	**-26.2**	**-25.4**	**-24.4**

Source: G4M, GLOBIOM

Sweden

LULUCF emissions Reference scenario

LULUCF CO2 emissions in Mt CO_2eq	UNFCCC CRF	Source	Pool	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total Forest Land	**5A**			**-43.1**	**-8.5**	**-31.3**	**-30.3**	**-33.2**	**-31.7**	**-37.3**	**-35.5**	**-33.2**	**-30.1**	**-28.6**
Forest Land remaining Forest Land	5A.1	Forest management	Biomass	-47.7	-12.0	-34.3	-32.0	-31.8	-28.6	-33.4	-31.2	-28.7	-25.6	-24.1
Land converted to Forest Land	5A.2	Afforestation/ reforestation	Biomass	0.0	-0.7	-1.2	-1.8	-2.4	-2.9	-3.3	-3.5	-3.6	-3.6	-3.6
		Afforestation/ reforestation	Soil	-0.6	-0.9	-1.0	-1.1	-1.1	-1.2	-1.2	-1.2	-1.2	-1.2	-1.2
Forest Land converted to other land		Deforestation	Biomass	4.2	3.1	2.5	1.5	0.8	0.3	0.2	0.2	0.1	0.1	0.1
use categories		Deforestation	Soil	1.1	2.0	2.8	3.2	1.4	0.7	0.4	0.3	0.2	0.2	0.2
Total Cropland	**5B**	**Cropland management**	**Soil**	**1.9**	**1.2**	**0.5**	**0.4**	**0.2**	**0.1**	**-0.1**	**-0.2**	**-0.3**	**-0.4**	**-0.5**
Cropland remaining Cropland	5B.1	Cropland management	Soil	1.8	1.1	0.4	0.1	-0.1	-0.3	-0.4	-0.5	-0.5	-0.5	-0.6
Land converted to Cropland	5B.2	Cropland management	Soil	0.2	0.2	0.1	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.1
Total Grassland	**5C**	**Grassland management**	**Soil**	**-0.6**	**-0.8**	**-1.0**	**-1.2**	**-1.4**	**-1.6**	**-1.8**	**-1.9**	**-2.1**	**-2.2**	**-2.2**
Grassland remaining Grassland	5C.1	Grassland management	Soil	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Land converted to Grassland	5C.2	Grassland management	Soil	-0.1	-0.3	-0.5	-0.7	-0.9	-1.1	-1.3	-1.4	-1.6	-1.7	-1.7
Total Wetlands	**5D**	**Wetlands**		**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
Total Settlements	**5E**	**Settlements**		**2.4**	**2.9**	**2.9**	**2.9**	**2.9**	**2.9**	**2.9**	**2.9**	**2.9**	**2.9**	**2.9**
Total Other land	**5F**	**Other land**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Harvested Wood Products	**5G**	**Harvested Wood Products**		**0.0**	**-2.2**	**-4.3**	**-4.0**	**-3.8**	**-5.2**	**-6.6**	**-8.6**	**-10.6**	**-14.0**	**-17.4**
LULUCF	**5**	**LULUCF**		**-39.3**	**-7.3**	**-33.1**	**-32.2**	**-35.2**	**-35.4**	**-42.8**	**-43.3**	**-43.3**	**-43.7**	**-45.7**

Source: G4M, GLOBIOM

United Kingdom

LULUCF emissions Reference scenario

LULUCF CO2 emissions in Mt CO_2eq	UNFCCC CRF	Source	Pool	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total Forest Land	**5A**			**-10.1**	**-9.1**	**-7.7**	**-7.3**	**-6.7**	**-5.3**	**-4.7**	**-4.0**	**-3.9**	**-4.0**	**-4.0**
Forest Land remaining Forest Land	5A.1	Forest management	Biomass	-11.3	-10.5	-8.9	-7.8	-6.6	-4.8	-3.7	-2.6	-2.1	-1.9	-1.7
Land converted to Forest Land	5A.2	Afforestation/ reforestation	Biomass	0.0	-0.2	-0.4	-0.6	-0.8	-1.0	-1.3	-1.5	-1.7	-1.9	-2.1
		Afforestation/ reforestation	Soil	-0.1	-0.2	-0.2	-0.3	-0.4	-0.4	-0.5	-0.5	-0.6	-0.6	-0.7
Forest Land converted to other land		Deforestation	Biomass	0.6	0.5	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.1
use categories		Deforestation	Soil	0.7	1.3	1.5	1.1	0.8	0.6	0.5	0.4	0.4	0.3	0.3
Total Cropland	**5B**	**Cropland management**	**Soil**	**6.0**	**4.7**	**3.3**	**2.7**	**2.1**	**2.0**	**1.8**	**1.9**	**2.1**	**2.7**	**3.3**
Cropland remaining Cropland	5B.1	Cropland management	Soil	4.9	3.4	1.9	1.0	0.1	-0.3	-0.7	-0.9	-1.0	-0.7	-0.4
Land converted to Cropland	5B.2	Cropland management	Soil	1.1	1.3	1.4	1.8	2.1	2.3	2.5	2.8	3.1	3.4	3.7
Total Grassland	**5C**	**Grassland management**	**Soil**	**-3.7**	**-3.8**	**-3.9**	**-4.0**	**-4.0**	**-4.1**	**-4.2**	**-4.3**	**-4.4**	**-4.5**	**-4.5**
Grassland remaining Grassland	5C.1	Grassland management	Soil	-3.4	-3.4	-3.3	-3.3	-3.2	-3.2	-3.1	-3.1	-3.1	-3.1	-3.0
Land converted to Grassland	5C.2	Grassland management	Soil	-0.3	-0.4	-0.5	-0.7	-0.8	-0.9	-1.1	-1.2	-1.3	-1.4	-1.5
Total Wetlands	**5D**	**Wetlands**		**0.5**	**0.5**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**
Total Settlements	**5E**	**Settlements**		**6.5**	**6.3**	**6.2**	**6.2**	**6.2**	**6.2**	**6.2**	**6.2**	**6.2**	**6.2**	**6.2**
Total Other land	**5F**	**Other land**		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Harvested Wood Products	**5G**	**Harvested Wood Products**		**0.0**	**0.0**	**0.0**	**-0.8**	**-1.5**	**-2.4**	**-3.3**	**-3.5**	**-3.8**	**-4.5**	**-5.3**
LULUCF	**5**	**LULUCF**		**-0.7**	**-1.4**	**-1.8**	**-2.9**	**-3.7**	**-3.4**	**-4.0**	**-3.4**	**-3.5**	**-3.8**	**-4.1**

Source: G4M, GLOBIOM

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