

Report from EPPC Energy Demand meetings 25 January, 23 February and 2 May 2006

The present report tries to distil the important messages coming from the first of 2 meetings on energy demand. Most presentations are on the Circa-website:

http://forum.europa.eu.int/Public/irc/env/eccp_2/library?l=/eccp_review_energy_1&vm=detail&sb=Title

1. Energy demand trends:

Energy efficiency in end-uses is broadly expected to be able to provide half of global GHG reductions (Staff working paper behind EU Communication “Winning the battle against climate change”). Recent trends in EU energy demand do not seem to be in line with this expectation:

- EU gross energy consumption has increased by 10.8 % 1990-2003 (0.8 % p.a.) on the back of an average, annual economic growth of 2 %. The growth rate for final energy demand has increased after year 2000 – to 1.4 % compared to 0.8 % 1990-2003. Energy intensity is still falling (on average 1.2 % annually 1990-2003), which implies some but still insufficient decoupling of energy use from economic growth. Trends differ across fuels, final energy forms, sectors and member states. Most important trends: Transport keeps growing – both freight and passenger, household and service sector energy use also grew but at a somewhat lower rate, whereas industrial energy consumption declined during the early 90'ies with a renewed increase after 1994, but is still below 1990 levels. Electricity use grows at almost the same rate as the economy. EU 15 energy use grew whereas EU 10 first declined but has since started increasing again (For more detail: See presentation by Tobias Wiesental, EEA)
- Structural change is behind some of the increasing energy demand (higher share of single family houses with relative larger outside surfaces than multifamily buildings, more single person units – each with some basic appliances, older population demanding higher indoor temperatures and all-day heating) Average energy consumption pr. dwelling in the EU has remained almost constant since 1990 – despite a 10 % energy efficiency improvement – as structural change and changes in lifestyles offset efficiency improvements.

The implications of this are:

- Energy efficiency improvements have not been able to keep up with energy demand growth since 1990 – in spite of policies and measures recently increased on member state level. The growth in electricity demand is almost equal to GDP growth.
- Some countries electricity consumption grow more than others – also corrected for economic and population growth (indicate some saturation or stronger policies in the richest countries DK, Germany, Sweden)
- The problem does not seem to be overestimation of energy efficiency potentials – a number of studies confirm their presence and favourable cost-effectiveness. Higher oil/gas-prices can – if persisting – increase cost-effective saving potentials.

- The reasons for the slow take-up of energy efficiency seem to be:
 - Most EU energy efficiency regulation has only been adopted recently – and member states have been slow to implement it (As of 25 January 16 member states are late transposing the Energy Performance of Buildings Directive – and most opt for late implementation of important parts of the directive).
 - Many energy efficiency regulations work only gradually as most policies for cost effectiveness reasons tend to focus on time of purchase/new investment/replacement or major retrofit situations.
 - Strong underlying growth in energy services demand (number and size and features of appliances, higher indoor temperatures, more heated rooms) tend to overshadow improvements in technical energy efficiency.
 - Rebound effects – consumers starting to use more of an energy service, when it becomes cheaper due to energy efficiency programmes – may have been underestimated.
 - Large cost-effective saving potentials in existing buildings are harder to get at in terms of policy measures than new buildings. The reasons being lack of knowledge by the relevant decision-makers, less ready access to financing compared to new buildings. The Energy Performance of Buildings Directive seeks to remediate that.
 - Enforcement of building regulations (mostly new buildings) is impeded by ineffective public control of building regulations due to lack of resources.
 - Many EU states have been slow to enact strict building regulations – leading to a host of lost opportunities in buildings, as retrofits generally are much more expensive pr. energy unit saved than measures taken in new buildings.
 - Energy taxation in some EU member states is relatively low – especially for heating fuels – although with wide variation between member-states.

Other important findings were:

- Member state reporting on energy efficiency policies in National Climate Communications is minimalist. The newly adopted Energy Services Directive will help alleviate that problem, as member states will have clear incentives to report in their national energy efficiency action plans all relevant policies in order to prove their fulfilment of the annual savings targets.
- Measuring and quantifying energy efficiency has been reported to be difficult – and data-intensive/expensive: Previous lack of commonly accepted methods will be solved within Energy Services Directive Framework – hopefully also meeting a strong political demand for information on energy demand drivers. This work can build on good tools already developed in EU/member state projects.
- Development of reasonable CEN standards can in some instances be important as the prerequisite for implementing measures under the EcoDesign Directive and energy labels.
- Information to decision makers on all levels must be greatly improved to help up-take of energy efficiency – characterised by a much larger and heterogeneous group of decision makers than energy supply.

- Decision-making on energy efficiency is spread on many millions of individuals – often lacking knowledge and training on energy issues and having no organisation with that knowledge easily available. Innovative policy measures (white certificates and others measures) can help overcome the lack of big professional organisations behind end use energy efficiency decisions. An equal commitment is needed both from public authorities and the business world.
- Energy intensive industries have much focus on energy efficiency in order to retain their competitiveness. Public assistance in this field is consequently less needed, whereas these industries are vulnerable to add-ons to energy prices, resulting from publicly mandated energy efficiency programs for other customer groups. Small and medium sized companies aired similar concerns.
- Most global energy models are so far based on un-realistic low expectations on oil- and gas-prices.

2. Key political and/or methodological messages were aired:

- All seem to agree to the existence of large, cost-effective saving potentials, energy efficiency enjoys broad political support on a high level and among consumers – but the backing wanes when it comes to real legislation – where member states often drag their feet.
- Shouldn't something be done to change behaviour to counter the growth in demand for energy services and will it succeed?
- One scenario presented during the review meetings pointed at 30 % reduction of EU greenhouse gas emissions in 2020 is still possible and within economic reach – with most emphasis on energy efficiency (-22% emissions as compared to business as usual), fossil fuel switch (-2%) and renewables (-14%).
- The normal cost-effectiveness definition for energy efficiency is short-sighted – looking only at actual costs of measures. Whereas it should take a dynamic look – applying dynamic minimum Life Cycle Cost including the effect of learning curves as is usually done for renewables.
- Some questioned the effectiveness of existing voluntary agreements on energy efficiency vs. ambitious minimum energy efficiency standards – notably the voluntary commitment by car-manufacturers to reduce CO₂-emissions. Others stressed the superior flexibility of voluntary agreements for very dynamic technologies like computers and the possibility to set more stringent conditions. Yet others stressed that many national voluntary agreements have been working well. Monitoring, verification and compliance control are key in ensuring effectiveness of voluntary agreements.
- Some warned against double-counting electricity and heat savings in areas served by district heating in the current EU climate policy set-up, as the resulting emission reductions are already covered by the EU emissions trading scheme (ETS). In that case electricity and heat producers will be able to sell surplus allowances resulting from the savings undertaken by their customers out of the country to their own benefit. This makes electricity and heat saving programmes less attractive instruments to improve national climate accounts. Others stressed that much electricity and some heat consumption have low price-elasticity, so higher prices alone will not trigger the economic savings potential. Saving programmes should rather be seen as key to keep allowance prices at a reasonable level. The problem can be solved by setting caps for

the affected electricity and heat-producers in anticipation of saving programmes (and equally of renewable energy and CHP programmes).

3. Existing policy measures

EU labelling scheme

Key findings:

- The EU labelling scheme has been a great success really moving the market towards more efficient appliances. Savings of up to 2/3 of previous consumption in less than 15 years. A-labels are widely regarded as a quality mark by consumers, why producers have to respond in order to keep market shares.
- Supporting schemes – voluntary producer commitments, public campaigns, subsidies – have proven to increase the impact of the labels. Short term campaigns including time-limited subsidies cheaper than tax-rebates. Take-back of existing appliances in return for subsidies is key, as retirement of old appliances is ensured. Campaigns must also take quality aspects into account, e.g. for Compact Fluorescent Lamps. General subsidy schemes can prove costly pr. unit of energy saved – short term campaigns including subsidies can move the market at lower costs.
- Still huge savings potential in old appliances, which could be realised by targeted replacement programmes, but overall economics seem questionable but for very old appliances.
- Green public procurement can be an important driver in this market.

Proposal for future amendments:

- Extension of the scheme to more appliances and equipment
- Regular, automatic updating every 4-5 years – although not too often in order to save costs and avoid confusion. At present the labelling scheme is no longer driving innovation, as most appliances are already A-level. A-labels to be reserved for the very best of existing appliances.
- A-labels should not be set according to present minimum life-cycle costs, as initial higher production costs for the most efficient appliances have proven to come down when production levels go up.
- The EU Commission should do more to ensure full implementation of labelling directives in member states.

Eco-Design Directive:

Key findings:

- The Eco-Design Directive is a very comprehensive and flexible tool for ambitious energy savings and integrated pollution reduction.
- Least-Life-Cycle-Costs (LLCC) generally 20-30 % more efficient than current sales. Best-Available-Technologies (BAT) generally 30-50 % more efficient than

current sales. Best-not-yet-available technologies (BNAT) up to 80% more efficient than current sales.

- Energy-share of Life-Cycle-Costs (LCC) varies greatly across energy using products: Form more than 80% for boilers till 16% for PCs and 3 % for photo-copiers.
- Energy consumption during use the dominant factor for most products, but paper and toner (photo-copiers), eutrophication (washing & dishwashing machines) and heavy metals (street lighting) also important.
- Designs for variable load, light-weight solutions and good system-integration usually clear winners.

Proposals for implementation:

- The directive should be used in a dynamic way with early indications of new and tighter standards in order to stimulate development efforts in industry/
- Industry self-regulation possible if requirements laid down in framework directive 2005/32/EC, Annex VIII are fulfilled.
- Pragmatic approach needed in order to develop results addressing significant environmental impacts adequately
- Work with producers to go further than present LLCC, as production costs for more efficient designs usually decrease over time.
- Must go for ambitious implementing measures to clear the market for bad products. An equally ambitious complementary labelling scheme can provide the necessary drive for even more efficient appliances.
- Accelerated replacement programmes for household appliances could give large short term savings, but cost-efficiency shall be ensured.
- Some attendants indicated that the EU is behind Japan and the US in implementing minimum energy efficiency standards, and the work should be speeded up. This was disputed by other attendants, though.

Energy Performance of Buildings Directive:

Key findings:

- The Energy Performance of Buildings Directive (EPBD) in general a big step forward – though leaving it for member states to set ambition levels in many respects. Not clear how ambitious transposition of the directive will be, as many countries failed to meet transposition deadline January 4th..
- Minimum efficiency standard for buildings a powerful tool – although compliance is a problem. Energy certification of new buildings under the EPBD useful in this respect. Local and regional authorities key to ensure compliance, information and motivation.
- Existing buildings still hold large, cost-effective saving potentials – savings of 50 % or more can often be achieved in well-designed retrofits. But these

potentials are harder to realise due to information, motivation and financing problems by a very large and diversified group of decision-makers.

- Some innovative government programs becoming better to achieve savings in existing buildings at costs much lower than energy supply costs.
- The savings potential is particularly high in new member states, but local government programs are in many cases insufficient.
- Integrated and comprehensive energy efficiency programs key to success – information, education, standards, energy efficiency obligations on energy supply companies, subsidies, tax-incentives. Schemes differ substantially between countries.

Proposals for implementation:

- Governments should ensure ambitious and dynamic minimum efficiency standards and certification procedures, when transposing the EPBD. The EU could possibly propose a minimum requirement differentiated between climate zones. Future tightening of standards should be announced early for the building industry to start research and development work.
- The threshold of 1000 m² for efficiency upgrades of existing buildings during major renovation could be lowered or abolished altogether.
- Some suggested the mandatory integrated calculation methods for energy performance in the EPoBD could be supplemented by minimum requirements for components. Industry will normally only provide equipment in compliance with component standards. Thereby component standards will ensure savings also for retrofits of existing buildings not covered by the EPoBD and prevent non-compliance for buildings covered. Others argued in favour of the integrated approach as the only instrument to be used.
- EU structural funds only allow small funds for energy efficiency upgrades should allow much higher shares to be used for energy efficiency upgrades.
- Key energy efficiency upgrades (replacement of very old boilers, minimum insulation of lofts) could be made mandatory for existing buildings.
- Different incentive programs for existing buildings should be evaluated in order to identify best practices. But "one-size-fits-all" incentive programs not either realistic or desirable, as countries differ widely.
- The EU Commission should seek a voluntary agreement with the mortgage industry in Europe to enhance lending for energy efficiency projects in buildings.
- Programmes to solve the split incentives problem between landlord and tenants problems should be developed and implemented – although no specific ideas were aired.
- The public sector should drive the market for energy efficient buildings – both as a buyer/owner and tenant of buildings.

Cross-cutting programs: GreenLights, Motor Challenge and Energy Management

Key findings:

- Some energy efficiency potentials are hard to realise by means of standards, but call for a systems approach and integrated programs. Lighting, efficient non-residential buildings and electric motor-systems are key examples.
- The EU Commission and member states benefit from working together on such cross-cutting programs on energy efficiency
- Support from top-management is key to success and management in general as important as hardware.
- Energy Service Companies (ESCOs) a success in some member states and are spreading to more. ESCOs good at securing savings with no or small investments, but investments in projects with longer pay-back still a problem.

Industrial energy saving:

Key findings:

- Dutch benchmarking program for industry to continue as it has proven cost-effective
- Waste-heat from industry can provide heating for households via district heating systems.

4. New cross-cutting policy measures:

A number of ideas are under consideration in relation to the Energy Efficiency Action Plan following the Green Paper on energy efficiency: Three pillars: Fiscal & financial, implementation of existing legislation and public awareness.

- Energy taxation
- Targeted state aid for energy efficiency
- Public procurement
- EU co-financing of energy efficiency measures
- Coordination of policies with EIB and EBRD
- Relaxation of state aid rules as regards energy efficiency subsidies
- Cars:
 - Registration taxes in relation to energy use/CO₂-emissions
 - Common EU efficiency label
- Air: Better EU air management

New ideas on measures:

- Better EU monitoring of trends in energy efficiency is needed. (“Without a compass doomed to go in wrong direction”) – using e.g. methodology developed by Odysse project and reporting on EE under the Energy Services Directive

- VAT rules should be changed: Either should the option for special low VAT-rates on energy supply be removed. Or equally low rates should be made available for energy efficiency equipment, as is now allowed for installation work
- Structural funds should be able to support energy efficiency upgrades of buildings The European Investment Bank should set aside much more funds – revolving or other types of loans - for energy efficiency upgrades
- The public sector should use its purchasing power to promote energy efficient products, buildings and solutions in all end-uses
- Financing is a major problem for energy efficiency: The EU could develop common guidelines for energy efficient technologies, which deserve to receive subsidised financing
- The EU could do more to study and disseminate information on effective energy efficiency programmes.
- Production of energy efficient products could be promoted by tax-breaks or other subsidies, as is done in the US.

5. Can energy efficiency stop growth in energy consumption and eventually decrease it? And what policies are necessary to do it?

Key positions:

- California and Denmark have largely managed to stabilise energy demand over the last 20-30 years in spite of substantial economic growth.
- Energy service levels will keep growing. Energy efficiency measures and policies must be made stronger to outpace this growth
- Reductions possible for buildings, service sector and industry, but the transport sector difficult, as there is limited political appetite for effective reduction policies here.
- Transaction costs often un-necessary high as politicians shy away from the most effective regulations
- No perception of a real crisis in the general population – and without that little political appetite for stronger policies and measures.
- Higher energy prices help energy efficiency, but EU-wide energy taxes difficult. Energy-price subsidies should be abolished. Taxes could be used to stabilise energy prices at a high level in case prices fall again.
- Existing EU legislative framework basically a good working platform – must be implemented in an ambitious way, revised on some details and supplemented by other policies (se above)
- Large saving potentials seem to remain in spite of many government energy efficiency programmes over the years. There is a need to review both previous and existing policies in order to understand better, what the real barriers may be, before applying more of the same policies.