OPTIMAL USE OF THE EU GRANT AND FINANCIAL INSTRUMENTS IN THE NEXT MULTIANNUAL FINANCIAL FRAMEWORK TO ADDRESS THE CLIMATE OBJECTIVE

Annexes to the final report

DG CLIMA.A.2/ETU/2012/0002r

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LIST OF ANNEXES

ANNEX 1 – INTRODUCTION TO FINANCE

1. Sources and types of financing: the basics

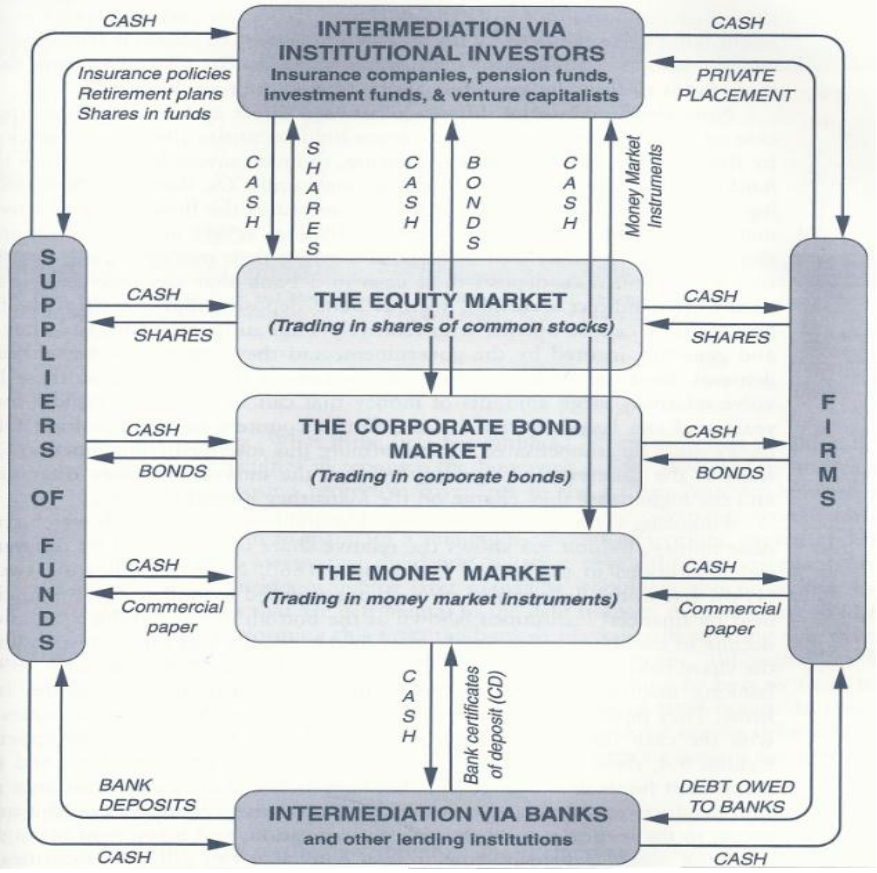
Investment projects that target mitigation or adaptation to climate change inhibit many similarities with other investment projects. Raising funds for their financing is based on the same generic principles and models of financing investments as elsewhere in the economy. In order to better understand how to better tap private sector investment sources it is hence necessary to understand how private sector investment and financing decisions are taken.

Investments represent decisions to acquire assets, be it real assets in forms of fixed and working capital (i.e. land, buildings, plants, equipment, but also patents, trademarks) or financial assets (i.e. securities, deposits), taking into account the operational costs of the investment over the lifetime of the projects. The financing decision then concerns the question how much capital the company needs to raise for funding the related operations, and how the mix of funding should look like. Firms can generate capital internally, through their own net operating cash flows, or externally through equity capital markets, bond markets or the banking system (particularly for short- and medium-term borrowing).

The financial system acts as a conduit through which cash surplus of 'savers' is channelled to companies and government entities that need cash. The various components of the financial system, the main actors and the way they interact are described in Figure 1. The cash-deficit firms that want to raise funds are on the right side. The suppliers of capital, mostly the household sector, are on the left hand side. The institutions and processes that facilitate the transfer of funds between these two groups constitute what is called the financial system.[1]

[1] Hawawini, G. and Viallet, C. (2007) Finance for executives: managing the value creation. Fourth edition. South-Western Cengage learning.

Figure 1. The financial system



Source: Hawawini and Viallet

The **financial system** operates through two alternative financing channels, known as direct and indirect financing.[2]

1) Direct financing

One way for firms to raise money is to get it directly from savers by selling them securities for cash. A security is a certificate that specifies the conditions under which the firm has received the money.

2) Indirect or intermediated financing

Very often, firms cannot access the financial markets to sell their securities directly to investors. This is the case in many newly established firms and also firms that are too small to issue sufficient amount of securities to appeal to investors. These firms rely on indirect or intermediated financing. Indirect financing refers to raising capital through financial intermediaries, such as commercial banks, insurance companies, pension funds and venture capital funds that act as agents between the ultimate recipients of capital and the provider of capital.

There are a number of **different actors** involved with varying interests. They include commercial banks, leasing companies, mutual and other funds, investment banks and venture capitalists[3].

[2] Hawawini, G. and Viallet, C. (2007) Finance for executives: managing the value creation. Fourth edition. South-Western Cengage learning.

[3] These are investors providing capital to early-stage, high-potential, high risk, growth startup companies. The funds are usually provided as equity to the companies.

Commercial banks typically offer short- to medium- term loans with terms of one day to ten years. Long-term loans can be obtained when those are a benefit from debt securities from insurance companies, pension funds. Venture capital firms supply equity to newly established firms with limited track records, and can either focus on short-term or longer-term gains.[4]

Each type of investor has **different risk appetites**. Some focus on debt instruments and others on equity. Their requirements for guarantees or security vary, as do the rates of return they seek, their degree of involvement in the companies in which they invest, and how they realize their return. The common interest they have is the return on their investment. Therefore, different companies/projects, which have different size, risk profile and potential to generate a return on the investment will pursue different financing strategies, including different sources and forms of financing.

Outside of this core financial system, funds can also be obtained through *government budgets, investment agencies and /or international financial institutions*, which are also potential sources for financing.[5]

- ***Senior debt instruments***

Debt financing refers to the acquisition of funds by borrowing: a lender provides capital to a borrower for a defined purpose over a fixed period of time. These can be loans or bonds, under recourse or limited recourse structure and full or limited guarantees.

Loans can take a number of forms, but fundamentally they can be of two types:

1) *Secured* – borrower pledges a specific asset as collateral[6], of which lender might take possession in the event of a default;
2) *Unsecured* – where there is no potential asset to take possession of in the event of a default; interest rates tend to be higher as a result.

Loans have three main elements:

- Face (or nominal) value – the amount of money owed by the borrower;
- Interest rate – the cost of borrowing, which will be higher for riskier projects; and
- Maturity (or tenor) – term over which the loan is to be repaid.

Financing with recourse means that the company stands behind the project or venture and the related debt and the financiers can have claim on the company's assets in the event of default. Financing with recourse is usually used by companies for core activities,[7] however they also frequently opt for the so called limited or non-recourse financing (see project financing below).

Debt instruments also include **bonds**, which are debt securities issued by companies or governments**.** They entitle the lender to the repayment of the principal plus interest. Bonds provide the borrower with external funds to finance long-term investment. These are similar to loans, but are simpler to trade. If bonds are issued by project companies to raise funding from the markets for a specific project on a non-recourse basis, they are often called 'project bonds'. EU Project Bonds are

[4] Hawawini, G. and Viallet, C. (2007) Finance for executives: managing the value creation. Fourth edition. South-Western Cengage learning.

[5] International institute for sustainable development (2002) Business and sustainable development: A global guide.

[6] Collateral is a borrower's pledge of specific property to a lender, to secure repayment of a loan.

[7] Rezessy, S. and Bertoldi, P. (2010) Financing energy efficiency. Forcing the link between financing and project implementation. Report by the Joint research Centre of the European Commission.

a financial instrument because they are enhanced by an EU/EIB-funded **risk-sharing mechanism**, to increase their credit rating. This reduces risks and interest rate required by the investors in these bonds thus lowering the costs for the promoters (sponsors) of the project.

Debt instruments may require some sort of a **guarantee mechanism**. In some cases, where risks are too high to attract private finance, guarantee programme/mechanisms (often publicly backed) could be provided for companies/projects to access debt financing. Guarantees can be applied in all phases of a project development to improve access to and the terms of financial products that would be under-supplied without guarantees.[8] There are some common guarantee structures available:

- Pari passu partial guarantees (the EIB and the Commission offer guarantees sharing in parallel the risks);
- Portfolio first loss and second loss guarantee (the European Commission takes the first loss covering to a designated amount followed by the EIB with a second loss if the amount is exceeded);
- Subordinated recovery guarantees (providing partial coverage of risk exposure against loans);
- Loss reserves acting like loss guarantees, and liquidity support schemes.

Guarantees have an important function to bridge the gap between the perceived risks and the actual risks, thus assisting beneficiaries in providing them access to finance, reducing their cost of capital, and expanding loan tenor[9] and/or grace periods[10] to match project cash flows.[11] In other words, they can overcome risk related barriers in financing companies/projects.

- ***Subordinated debt and mezzanine financing***

Subordinated debt finance is capital that sits midway between senior debt and equity in the order of repayments i.e. level of seniority. Because it sits after the senior debt, it is considered a more risky in terms of collateral rights and right to cash flow. There are fewer sources of subordinated debt financing. It is usually obtained from insurance companies, subordinated debt funds or finance companies or it is raised with public offerings of high yield bonds to institutions investors.

Mezzanine debt financing has features of both debt and equity financing. It is considerably cheaper than equity (it does not involve forgoing control of the company) and also could help raise sufficient capital to meet the risk-return requirements of senior lenders. It is often considered complementary or alternative solution to portfolio guarantees as it can reduce or substitute the amount of senior debt.[12]

[8] Rezessy, S. and Bertoldi, P. (2010) Financing energy efficiency. Forcing the link between financing and project implementation. Report by the Joint research Centre of the European Commission.

[9] Period of time until a loan is due.

[10] Initial time where no repayments are due, or a period after the due date of a loan where late payments are not penalised.

[11] Rezessy, S. and Bertoldi, P. (2010) Financing energy efficiency. Forcing the link between financing and project implementation. Report by the Joint research Centre of the European Commission

[12] Rezessy, S. and Bertoldi, P. (2010) Financing energy efficiency. Forcing the link between financing and project implementation. Report by the Joint research Centre of the European Commission

- ***Equity financing***

Equity financing refers to the acquisition of funds by issuing shares of common or preferred stock in anticipation of income from individuals and capital gains as the value of stock raise. Equity is a residual claim or interest and the most junior class of investors in an asset, after all liabilities are paid. Equity financing can come in the form of public listing or private equity (venture capital or growth capital).

There are different **levels of seniority** of equity and debt financing when it comes to the order of repayments. Depending on who is the lender and what are the agreements on the debt and equity, the finance for a company can be listed in the following order of repayment priority. The top form of financing needs to be reimbursed first and escalates down to equity, which can only be paid once all other loans have been covered (if anything is left):

- Senior secured debt
- Senior (unsecured) debt
- Subordinated debt (mezzanine financing)
- Equity

The financing architecture of a project, such as the share of equity financing, any risk mitigating public support needs to be measured according to the needs of potential investors. The **risk-return** trade-off has to be right. For each risk level investors need a minimum return to participate, the higher the risk, the higher the return. Either the risks are mitigated through financial instruments or the investment volume. Lower cost projects may attract a larger pool of investors which would accept higher risks if costs are lower. Public equity with low interest will also allow higher returns to be spread with the private investors, improving their risk return prospects.

- ***Public finance mechanisms***

Governments are able to design expenditure/investment programmes in order to respond to investment needs and respond to market barriers and market failure. This can take the form of traditional grant support schemes, technical assistance, soft loans and other forms of financial instruments (including debt and equity).

Grants are a traditional form of support which does not normally require a repayment. It is often used to support high upfront costs for some projects or basic research. Grants can increase the financial rate of return on investment and leverage additional resources through requirements on co-financing / matching funds.

Interest subsidies (i.e.) Soft loans are another instrument often used by governmental institutions/agencies. Common conditions for soft loans usually entail:

- Extended payback periods;
- Low or zero interest rates;
- Short-term interest deferral periods; and/or
- Inclusion of payback grace period.

Revolving funds offer loans that can be repaid with the realized revenue and then it can be reinvested in new projects in the same area. Revolving funds are considered to be particularly important in times of a lack of liquidity.

Financial instruments are increasingly being used by governments to attract private investors. Those are combinations of grants and loans aimed at changing the costs and risk return profile of the

projects to attract investors, expand the leverage of funding from the private sector to finance projects with public objectives.

2. The Internal Rate of Return (IRR)

The IRR is the discounted rate of return to an investment or the 'annualised effective compounded interest rate'. It is a key measure of the expected profitability of a project. It provides an estimate of the rate of return of a project at the end of the project life once all negative and positive cash flows specific to the project have been taken into account. In other words, it indicates at which discount rate the project's cash flows would have zero Net Present Value (NPV).

In theory, in the private sector, all projects with an IRR superior to the firm's cost of capital would be undertaken. This is not the case in many cases because of the following reasons:

- The upfront capital is missing
- The IRR is too low compared to the opportunity costs of the investment (other investments may be more profitable, i.e. have a higher IRR)
- The financial markets offer no funds for projects because the time to maturity, when the loan or bonds are repaid, is too distant in the future.
- The financial markets are not offering funding because the IRR is too low given their expected return rates.
- A risk analysis shows high risk, the probability that the IRR is positive is low (e.g. case of R&D where the outcome is uncertain)
- In case of loans with payments in instalments the cash flows may not be viable.
- Finally, the project may not be undertaken because there is a lack of capability by the contractors to perform it (human capital, lack of expertise, legal barriers, etc.)

3. The Economic Rate of Return (ERR)

In theory under perfectly operating markets ERR and IRR would be identical. However, market failures, regulatory impacts or state interventions affect the profitability of projects for the private operators and for society. The ERR seeks to capture the full cost and value of a project for society as a whole internalising externalities, such as impacts from pollution generated which the project promoters do not always pay for. Subsidies, direct or indirect, which increase the profitability of the project, but that cause a cost to society have also to be integrated (e.g. tariff barriers which increase profitability at the cost of consumers), subsidy costs need in turn to be balanced by positive impacts (e.g. on employment)[13].

The ERR is decisive for the decision if to support a specific project activity from the public purse. The IRR is still key for any investment, public or private, as it indicates the financial return to the project. What to include in the ERR may vary from organisation to organisation and may be undertaken by private operators too, if they are concerned with the wider impacts of their investments.

There is a case for public intervention when investments with significant ERR are not undertaken by the private sector. Remedial action may range from a pure grant (positive ERR with highly negative IRR) down to technical assistance and or guarantees (positive ERR with weak or slightly negative IRR).

[13] While the IRR calculation is done in the same way for all companies and institutions, the ERR calculations may vary substantially depending on the elements incorporated and the assumptions it is based upon. The 'social' or 'environmental' may or may not be integrated. The valuation of those may vary substantially depending on the assumptions giving those a monetary value.

4. Identifying investment risks

One of the key variables crucial for the decision on whether to support a project and which financial mechanism to use is its risk level. There are a large number of risks to which investments can be exposed deriving from contextual factors or project and technology specific factors.[14] The most relevant risks grouped into these two categories are as follows:

Contextual risks:

Macroeconomic risks are related to long-term price uncertainty and the macroeconomic stability.

Force majeure risk is related to events which render the construction or operation of the project impossible, either temporarily (e.g. minor floods) or permanently (e.g. complete destruction by fire).

Political risk is the danger of political or financial instability in the host country caused by events such as insurrections, strikes, suspension of foreign exchange, creeping expropriation and outright nationalisation. It also includes the risk that a government may be able to avoid its contractual obligations through sovereign immunity doctrines. This is mainly relevant in actions outside the EU.

Financial risk including currency risk includes depreciation in loan currencies which may increase the costs of construction or depreciation in the revenue currencies which may cause a cash-flow problem in the operating phase. This is mainly relevant in actions outside the Euro zone.

Project and technology specific risks:

Regulatory and policy risks are related to inadequate and/or non-existent or frequently changing regulatory and/or policy frameworks. These risks are considered to be one of the biggest barriers to accessing affordable private capital at the scales needed.[15]

Technical risks relate to costs and performance in the development, construction and operation of the project's plant and equipment, including latent defects.

Completion risk is mainly present in construction projects[16]. A project may not be completed on time or may experience delays due to technical, labour or other difficulties. Such delays may delay loan repayments and cause interest and debt to accumulate. This is considered one of the most significant risks for financiers.

Resource / reserve risk is related to inadequate inputs that can be processed or serviced to produce an adequate return. For example, this is the risk that there are insufficient passengers for a railway (also called traffic risk) or renewable energy, fuel for a power station or vehicles for a toll road.

Operating risks may include, for example, the level of experience and resources of the operator, inefficiencies in operations or shortages in the supply of skilled labour. These risks may affect the cash-flow of the project by increasing the operating costs or affecting the project's capacity to continue to generate the quantity and quality of the planned output over the life of the project.

[14] Gray, S., Tatrallyay, N. (2012) *The Green Climate Fund and private finance: Instruments to mobilise investment in climate change mitigation projects*, Climate Change Capital, London.

[15] UNEP (2011) Innovative climate finance: examples from the UNEP Bilateral institutions climate change working group.

[16] As opposed to support for SMEs or many types of research projects.

Market / off-take risk is the risk that a buyer cannot be found for the product at a price sufficient to provide adequate cash-flow to service the debt.

Risk related to climate relevant projects:

While risks are inherent to any investment, two types of risk are of particular relevance to *climate-relevant projects* and can be a major impediment to them. These include:

- policy and regulatory uncertainty,
- the level of technological maturity of at least some low carbon technologies.[17]

Policy and regulatory uncertainty constitutes a major risk for low-carbon investments because most of them are still dependent on public policy support. As a consequence any change to existing policies may affect the economic viability of a project before a final investment decision is taken but also during operation. Recent policy and regulatory changes, including retroactive ones, to support schemes for renewable energy sources in response to pressure on public budgets have underlined the importance of this type of risk. Many low carbon technologies are still faced with high technological risks as compared to conventional alternatives which often have been implemented for a long time and hence could prove their reliability. These two most prominent risks for climate-relevant projects are usually reflected in higher risk premiums for these projects and translate into higher discount rates. This in turn adds to the total investment costs of a climate-relevant project. FI that are to (also) incentivise climate-related projects need to be able to sufficiently compensate the specific risks related to climate-related projects and they need to be structured accordingly so that they are able to mobilise and leverage private capital.

The relevance of each investment risk will differ along the stages of the **development stage** of a technology or project. The overall risk level is generally considered to be highest in the early stages of research and development and is declining with successful pilot testing. While regulatory and policy and technical risk is relevant throughout the project cycle, the completion risk becomes important when the technology is deployed at larger scale and increases for large scale infrastructure projects. Moreover their relevance for taking a final investment decision depends on the type of investor. A public investor such as a municipality is likely to be less concerned about policy and regulatory risks, e.g. changes in local planning rules. These specificities need to be considered when assessing climate relevant projects and appropriate funding mechanisms. Further details on the specific risks and their relevance will be discussed as part of the suitability assessment in Chapter 2.

It should be stressed however that the overall investment risk will strongly depend on the **country specific framework conditions** in terms of supportive policies and regulations in place as well as the institutional set-up and overall macro-economic conditions.

[17] IIGCC et al (2011) *Investment-grade climate change policy: financing the transition to the low-carbon economy*. http://www.unepfi.org/fileadmin/documents/Investment-GradeClimateChangePolicy.pdf

ANNEX 2 - INVESTMENT NEEDS IN CLIMATE RELEVANT SECTORS

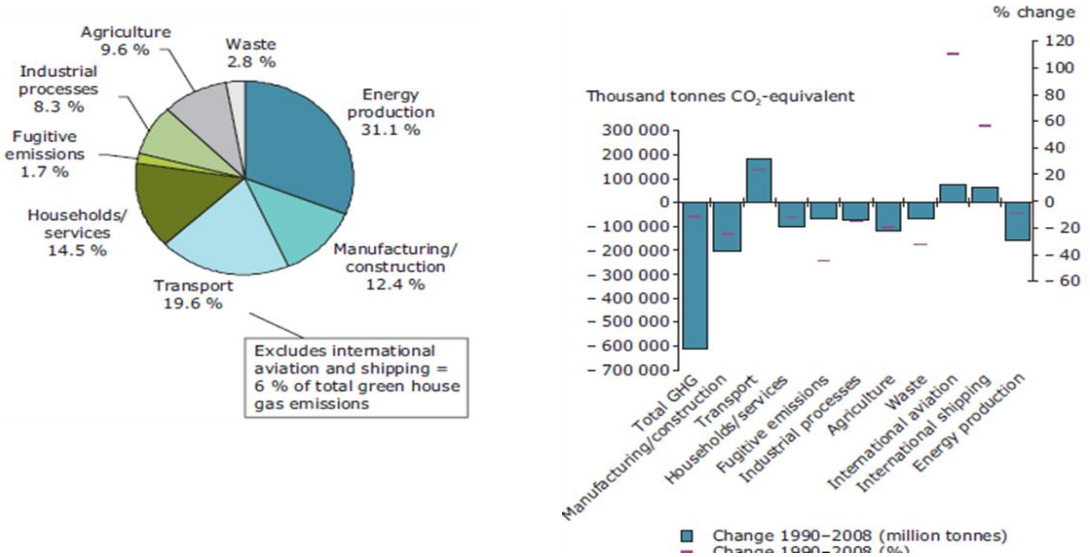
The scale of investments needed to meet the EU's climate change objectives and facilitate the transition to a low-carbon economy is substantial. The Commission's Roadmap for moving to a competitive low carbon economy sets out various decarbonisation' scenarios to 2050 in line with the 2°C objective, in the context of global action and in the context of fragmented action, and compares this to a reference scenario that projects existing policies. Public and private investment will on average need to increase by around €270 billion annually to 2050.[18] Sector specific estimates of investment needs have been produced by the European Commission and set out in recent long-term roadmaps, infrastructure development plans and related impact assessments. Estimates of investment needs have also been put forward by independent organisations and industry groups, in particular relating to the energy sector.

The following six sectors will be analysed in more detail:

1. **Energy**;
2. **Transport;**
3. **Buildings;**
4. **SME support;**
5. **Agriculture** – including agro-forestry;
6. **Water** – including floods and risk prevention activities.

These six sectors were chosen because of their relevance for achieving a low carbon economy. As shown in Figure 2 the energy, transport and household sectors are the most important sectors being responsible for around two third of greenhouse gas emissions, followed by manufacturing/construction and agriculture. This study does not cover industry as a whole but focuses on SMEs due to their relevance in the European economy, their potential role in developing and implementing eco-innovation and, linked to that, their prominent role in EU funding instruments. The water sector is included because of its role for adaptation to climate change.

Figure 2. Greenhouse gas emissions per sector (CO2-equivalent)



Source: EEA SOER 2010

[18] EC (2011) Communication from the Commission - Roadmap for moving to a competitive low carbon economy in 2050, (COM(2011)112), 8.3.2011, Brussels

This section will assess the investment needs both in terms of mitigation and adaptation to climate change of each sector. The main data gaps and uncertainties relating to each sector will be briefly described. An assessment of the market demand for private capital/private engagement and the appetite for private sector investment in each sector will also be examined which will concentrate on key barriers for a market demand to develop. The investment estimates will be used as a benchmark in the gap analysis in task 3.3/4.3 to evaluate the extent to which the Commission's proposals for the 2014-2020 MFF address the identified investment needs in relevant sectors.

Estimating investment needs for climate mitigation and adaptation measures is in general a difficult task due to different methodologies and assumptions used, e.g. on technological innovation, different scale of spatial and time resolution, lack of data and information and general uncertainties about key economic and regulatory influencing factors. This is why investments needs are as much as possible based on official Commission documents such as the 2050 Roadmaps to ensure a minimum of comparability and consistency.

We particularly note a number of issues with regard to investment needs relating to adaptation including: the identification of capital and finance for relevant adaptation measures; the definition of market demand and scope for private sector investment. Where cost estimates are available, it is difficult to distinguish between adaptation and mitigation investment needs, as quite often such investments will deliver benefits applicable to both agendas.[19] Moreover, values are typically determined by modelling the impact of different climate change scenarios, subsuming damage costs, which may not represent what is required in terms of investment needs for the implementation of adaptation measures. The quantification of adaptation cost is still in its infancy, and the difficulty in providing EU level estimates for adaptation investment needs is attributed largely to data availability. Although several studies have assessed the need for, and scope of adaptation measures in different sectors[20], there are relatively few data available to explicitly support adaptation investment needs estimates. Finally, taking account of climate change in the early planning stage of a new project in view of ensuring it being climate resilient can considerably reduce costs related to climate adaptation.[21]

There remain significant data gaps and uncertainties for all sectors. Data gaps on investment needs are particularly pertinent for adaptation measures in all the sectors as many studies were mainly qualitative in scope. In particular for the agriculture sector estimates on investment needs have been mainly carried out at global scale and are hence lacking sufficient level of detail.

As for the market demand for the required low carbon investments, published studies mostly deal with the clean energy sector. In 2011 new investments in renewable energy projects in Europe increased by 10% to USD 101 billion,[22] while it fell by 29% year-on-year in the third quarter 2012 mainly linked to policy uncertainty.[23] In particular energy efficiency in all sectors constitutes an

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[20] For example, Parry, M, Arnell, N., Berry, P., Dodman, D., Fankhauser, S., Hope, C., Kovats, S., Nicholls, R., Satterthwaite, D., Tiffin, R., Wheeler, T. (2009) *Assessing the Costs of Adaptation to Climate Change: A Review of the UNFCCC and Other Recent Estimates*, International Institute for Environment and Development and Grantham Institute for Climate Change, London; Altvater, S., de Block, D., Bouwma, I., Dworak, T., Frelih-Larsen, A., Görlach, B. Hermeling, C., Klostermann, J., König, M., Leitner, M., Marinova, N., McCallum, S., Naumann, S., Osberghaus, D., Prutsch, A., Reif, C., van de Sandt, K., Swart, R. and J. Tröltzsch, (2012) Adaptation Measures in the EU: Policies, Costs, and Economic Assessment, report is a deliverable for the project "*Climate Proofing" of key EU policies – short term actions*, for the European Commission, DG Climate Action (contract CLIMA.C.3/SER/2010/0009); *Climate Change Risk Assessment* (2012), Business, Industry and Services, Department of Food and Rural Affairs, London

[21] Acclimatise, COWI: Guidelines for Project Managers: Making vulnerable investments climate resilient. Report for the European Commission. Final, September 2012.

[22] UNEP (2012) *Global trends in renewable energy investment 2012*. Frankfurt School of Finance & Management

[23] Bloomberg (2012) *Clean Energy Investment Drops 20% on Lower Wind Financing*, http://www.bloomberg.com/news/2012-10-09/clean-energy-investment-drops-20-on-lower-wind-financing.html

increasingly interesting investment option and may become more attractive to investors.[24] In 2011 the ability of European banks to provide capital for project finance was reduced as a result of the sovereign debt crisis. As a consequence, alternative long-term funding sources such as pension funds became more important.[25] A global survey on climate-related investments in 2011 among asset managers and asset owners shows increasing interest in unlisted assets such as private equity and infrastructure as well as climate bonds.[26] An expansion of the mix of available instruments is important to address different investor needs in terms of risk/return and liquidity and hence to exploit the potential market demand.

1. Energy

1.1 Relevance of the energy sector for tackling climate change in Europe

The energy system is the single largest source of emissions in the EU, it produces around 80% of GHG emissions, with the **energy sector** itself taking the largest share (31% of all emissions, see **Error! Reference source not found.**2). According to Commission estimates, the **power sector** is expected to achieve emission reductions above 60% by 2030 and for decarbonisation to be practically complete by 2050.[27] Near complete decarbonisation of the power sector in the Commission scenarios is achieved through a combination of different low carbon technologies – renewables, nuclear and carbon-capture storage technologies for coal in addition to gas, and overall energy efficiency achievements. The Commission notes however that technology specific long-term projections are to a certain extent indicative and need to be interpreted with care in view of uncertainties including on technological progress and the development of the electricity infrastructure and it points to the crucial role of R&D and innovation. In the Commission's Energy Roadmap energy efficiency and renewable energy were identified as no regret policy options. These should therefore be treated as priority in the energy sector.

The **impacts of climate change** are very likely to affect energy generation. Extreme weather events such as floods can also impact on critical energy infrastructures and can lead to disruptions in energy services, e.g. more frequent extreme water flows may have an impact on dam safety, increasing severity in summer droughts could affect hydropower generation, reduce the availability of cooling water for energy plants which need to be shut down.[28] Climate change will also have an impact on energy consumption patterns. As climate zones shift northwards with rising temperatures, buildings that were designed for cold weather conditions will increasingly need to function in drier, hotter climates. Projections suggest a reduction in space-heating demand in northern Europe and an increase in demand for cooling in southern Europe.[29] The energy sector will therefore be affected by climate change impacts both on the supply side including distribution and transmission networks and the demand side.

[24] DB Climate Change Advisors (2012) *Investing in Climate Change 2012*, https://www.dbadvisors.com/content/_media/Inv_in_CC_2012.pdf

[25] UNEP (2012) *Global trends in renewable energy investment 2012*. Frankfurt School of Finance & Management

[26] IIGCC 2012: Global Investor Survey on Climate Change: Annual Report on Actions and Progress 2011.

[27] EC (2011) Impact Assessment. A Roadmap for moving to a competitive low carbon economy 2050, Commission staff working document, SEC(2011)288, 8.3.2011, Brussels

[28] EEA (2010) The European environment - State and outlook 2010, Adapting to climate change, EEA, Copenhagen

[29] EEA (2010) The European environment - State and outlook 2010, Adapting to climate change, EEA, Copenhagen

1.2 Estimated investment needs to mitigate climate change

Commission estimates

Sector specific investment needs are provided in the Commission's low carbon economy Roadmap. Of the €270 billion of additional average annual investment required to reach the decarbonisation objectives €29 billion are needed in the power sector until 2050 and €3 billion in the period 2011-20. It is worth noting that this brings the total annual investments in the power sector to €84 billion per year between 2011-20, increasing to €137 billion in the period 2041-50.

The energy Roadmap sets out **grid investment costs** for 2011-2050. These costs differ between scenarios as some decarbonisation scenarios require more sophisticated infrastructures (mainly electricity lines, smart grids and storage). These costs include investments in the transmission grid including interconnectors and investments in the distribution grid including smart components across the different decarbonisation scenarios. The additional costs under the decarbonisation scenarios, compared to the current policy and initiatives (CPI) scenario are between €40 and €50 billion except for the High Energy Efficiency scenario where the need for additional grid investments is considerably lower. These additional investments would predominantly concern the distribution grid (around €40 billion).[30]

The Commission's 2009 SET Plan sets out the **research, technological development, demonstration (RDD)** investment needs[31] of different technologies. According to the Communication, investment has to increase from the current €3 billion per year to around €8 billion per year, representing additional public and private investment of €50 billion over the next 10 years until 2020.[32] The accompanying IA notes that an estimated total investment of €67.5 to €80.5 billion is required over the next 10 years to advance the actions in the SET Plan. Once current investments are taken into account, the additional financing needs are estimated to be between €47.5-60.5 billion.[33] A break-down of these costs is provided in the technology roadmaps in the Commission Staff Working Document accompanying the SET Plan.[34]

Other estimates of investment needs in the energy sector

A survey by the **Council of European Energy Regulators** (CEER) among national regulatory authorities (NRAs) in 2011 estimated total investment needs in national electricity transmission for the same period in the range of €96 to €143 billion, of which €25-55 billion would be for offshore grids. The **European Network of Transmission System Operators in Electricity** (ENTSO-E) envisages roughly €100 billion of investment needs for the period up to 2020, excluding investments for offshore grids and maintenance and refurbishment of ageing assets. This figure does not reflect specific investment needs for smart grids which could exceed €40 billion.[35]

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[30] EC (2011) Commission Staff Working Paper - Impact Assessment Accompanying the Energy Roadmap 2050, SEC(2011) 1565, Part1/2, 15.12.2011, Brussels

[31] It also covers early market take-up, but excludes the cost of actual market deployment and market-based incentives, such as feed-in tariffs

[32] EC (2009) Communication from the Commission - Investing in the Development of Low Carbon Technologies (SET-Plan), COM(2009)519, 7.10.2009, Brussels

[33] EC (2009) Commission Staff Working Paper - Impact Assessment for the Communication on Investing in the Development of Low Carbon Technologies (Set-Plan), SEC(2009)1297, 7.10.2009, Brussels

[34] EC (2009) Commission Staff Working Document - Accompanying document to the Communication on Investing in the Development of Low Carbon Technologies (SET-Plan), SEC(2009)1295, 7.10.2009, Brussels

[35] EC (2011) Commission Staff Working Paper - Energy infrastructure investment needs and financing requirements, SEC(2011)755, 6.6.2011, Brussels

The **ECF Roadmap 2050**[36] examines different decarbonisation pathways for the power sector with different shares of low/zero carbon supply technologies (fossil fuel plus CCS, nuclear energy, and a mix of renewable technologies) and a scenario with 100% electricity from renewable sources. The analysis estimates that within the power sector, around €30-50 billion of additional funds is required per year over the 2010-2050 period for more capital intensive **energy generation capacity and grid investments** under different decarbonisation scenarios. The analysis also estimates that funding required for new investments in **energy efficiency measures**, heat pumps and alternative drive trains, may add up to over €2-3 trillion over 40 years.

The **European Renewable Energy Council** (EREC) estimates that by 2020, total cumulative **renewables investments** will be €963 billion, increasing up to €1,620 billion by 2030 and reaching more than €2,800 billion by 2050. Average annual renewable energy investments are estimated to be about €162 billion between 2020 and 2030 and €140 billion between 2030 and 2050. These investments are expected to be off-set by the avoided CO_2 costs alone. Additional cumulative capital requirements are estimated to increase from about €660 billion in 2030 (resulting in an additional average annual investment of approximately €66 billion[37]) to more than €1,180 billion in 2050.[38]

A 2011 study by **Ecofys et al.** for DG ENER analyses scenarios for the future deployment of renewable technologies within the EU. The study estimates meeting the 2020 targets of the renewable energy Directive requires average annual **capital expenditures for new renewables installations** of between €60 and 70 billion. About 60 to 65% of these capital expenditures relate to renewable electricity (offshore wind energy, onshore wind energy and solid biomass are expected to be the predominant renewable electricity technologies). Renewables in the heating and cooling sector require less investments, estimated to be about €22 to 24 billion on average per year. The annual average finance gap compared to the business as usual scenario is estimated to be between € 25 and 35 billion in the 2011-2020 period. [39]

A 2012 study by **E3G** suggests that a shift of at least €1.5 trillion to €2.1 trillion into **low carbon sectors** (renewable electricity; renewable heat; carbon capture and storage (CCS); buildings energy efficiency; grids; transport efficiency improvements; and research, development and deployment) is needed to deliver a 30% GHG reduction in 2020. This is equivalent to total annual investment of between €146 billion to €208 billion. Based on Commission figures and conservative estimates of public-private leverage levels across different sectors, the study estimates that total **public financing** of €465 billion to €713 billion over 10 years could be needed to drive this investment (total annual investment between €47 billion and € 71 billion).[40]

1.3 Estimated investment needs to adapt to climate change

Investment needs relating to adaptation in the energy sector can be categorised according to supply side (generation, transmission and distribution) and demand side measures. On the supply side, the need to enhance the resilience of power grids is particularly relevant, given the direct impacts on electricity transmission from more intense storms, heat stress and decreased precipitation. The investment needs for the adaptation of electricity grids in EU26 (without Malta) was estimated to be

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[36] ECF (2010) Roadmap 2050: Volume 1 – Technical and Economic Analysis, McKinsey & Company; KEMA; The Energy Futures Lab at Imperial College London; Oxford Economics and the ECF, April 2010

[37] EREC (2011) 45% by 2030: Towards a truly sustainable energy system in the EU, http://www.erec.org/fileadmin/erec_docs/Documents/Publications/45pctBy2030_ERECReport.pdf [accessed 13/9/2012]

[38] EREC (2010) RE-Thinking 2050 – A 100% Renewable Energy Vision for the European Union, http://www.erec.org/fileadmin/erec_docs/Documents/Publications/ReThinking2050_full%20version_final.pdf [accessed 13/9/2012]

[39] Ecofys, Fraunhofer ISI, TU Vienna EEG, Ernst &Young (2011) Financing Renewable Energy in the European Union Energy Market, http://ec.europa.eu/energy/renewables/studies/doc/renewables/2011_financing_renewable.pdf [accessed 13/9/2012]

[40] E3G (2012) Financing the Decarbonisation of European Infrastructure: 30% and beyond, February 2012

between €637 million and €654 million per year. In addition the adaptation of thermal power plants by installing additional cooling systems is estimated to require annual investments of €637 million.

The UK's recent Climate Change Risk Assessment indicates that upgrading the existing distribution network to cope with the impacts of climate change will cost its energy sector between £1-100 million per annum by the 2080s.[41]

Rademaekers et al.[42] suggest that significant adaptation investment will also be needed for electricity generation from off-shore wind, due to sea level rise, while Altvater et al.[43] consider the investment needs to be low.

1.4 Market demand and financing gaps

Energy infrastructure projects are primarily financed by the private sector, mostly using corporate financing. Transmission system operators (TSOs) develop projects with their own capital and loans from commercial banks and international financial institutions. Project finance is used rarely. In certain cases TSOs seek corporate equity investments from other companies which offer additional capital in return for participation in profits generated by the TSO's projects. This system functions relatively well in a predictable and stable regulatory environment, however financing of infrastructure becomes more challenging for projects with low or no commercial viability, which due to their high economic, social or environmental benefits, justify the use of public funding to trigger an investment decision.[44]

As noted by the Commission; locked-in investments, vested interests, high risks and the need for significant investments in less profitable alternatives, mean that markets and energy companies acting on their own are unlikely to be able to deliver the needed **technological breakthroughs** within a sufficiently short time span to meet the EU's energy and climate objectives.[45] The financing gap is driven by *inter alia*: the specificities of the energy technologies sector, spill-over effects (innovation efforts undertaken in the private sector will be smaller than the benefit for society as a whole); environmental externalities (additional support measures may be required to foster RDD in less mature low-carbon technologies); uncertainty and risk aversion vis-à-vis new technologies by private investors; other market failures; the specificity of the energy sector including barriers to entry for new technologies and the fragmented regulatory framework for new infrastructure deployment.[46]

R&D programmes should typically have a prominent public and EU investment component, **demonstration programmes** should have a strong industrial drive, accompanied by public support,

[41] Climate Change Risk Assessment (2012), Energy, Department of Food and Rural Affairs, London.

[42] Rademaekers, K, van der Laan, J., Boeve, S., Lise, W., van Hienen, J., Metz, B., Haigh, P. de Groot, K., Dijkstra, S., Jansen, J., Bole, T., Lako, P. Kirchsteiger, C. (2011): Investment needs for future adaptation measures in EU
nuclear power plants and other electricity generation technologies due to effects of climate change, Final report, Contract No TREN/09/NUCL/SI2.547222, p. 99

[43] Altvater, S., van de Sandt, K., Marinova, N., de Block, D., Klostermann, J., Swart, R., Bouwma, I., McCallum, S., Dworak, T., Osberghaus, D. (2011): Assessment of the most significant threats to the EU posed by the changing climate in the short, medium and long term – Task 1 report, Ecologic, Berlin, p. 33.

[44] EC (2011) Commission Staff Working Paper - Impact assessment accompanying the document Proposal for a
Regulation of the European Parliament and of the Council on guidelines for trans-European energy infrastructure and repealing Decision No 1364/2006/EC, SEC(2011)1233, 19.10.2011, Brussels

[45] EC (2009) Communication from the Commission - Investing in the Development of Low Carbon Technologies (SET-Plan), COM(2009)519, 7.10.2009, Brussels

[46] EC (2009) Commission Staff Working Paper - Impact Assessment for the Communication on Investing in the Development of Low Carbon Technologies (Set-Plan), SEC(2009)1297, 7.10.2009, Brussels

both EU and national; and **market replication measures** should have large participation from industry.[47]

In terms of the estimated financing gap, of the €142 billion of overall estimated investment needs for **electricity networks** to 2020 (including interconnections, offshore connections and smart grids),[48] about €90 billion is assumed to be commercially viable under current market and regulatory conditions. The attainment of the overall level of investment needed is however unlikely due to delays in the planning and authorisation of overhead electricity lines, uncertainties concerning technologies needed, planning coordination and cost-benefit allocation for offshore grids deployment, and uncertainties related to technologies, common standards and appropriate market models and incentive regulation for smart grids. Thus, the Commission estimates that only about 30% of the total investment needed will be delivered under a business-as-usual scenario (i.e. €45 billion of €142 billion).[49] In the IA accompanying the **TEN-E** proposal[50], the Commission estimates that a significant share of the needed investment of approximately EUR 200 billion to 2020 will not be delivered on time under the existing framework. For example, of the total investment needs in electricity of €100 billion (excluding smart grid investments), up to €50 billion worth of projects could be subject to delays beyond 2020.[51]

The need for public support for the development of new clean energy technologies and deployment of RES technologies has also been recognised by independent studies. For example, a study by Ecofys et al. notes that redirecting sufficient capital to the deployment of RES technologies and further reducing the costs of capital is highly uncertain, thus it is believed that this 'redirecting' requires strong support from both governments and the Commission.[52] The 2012 THINK project concluded that there is a gap between the cost of financing the development of new clean technologies and the funds that private parties are willing to contribute due to the myriad of barriers faced by clean technologies. Thus there is a need for direct public support.[53] The 2011 report by ECF notes that the scale and speed of investment needed in the power sector means that conventional sources of financing such as through the balance sheets of utility companies and project finance will not deliver the full scale of capital required and highlights the need for a new financing model to attract institutional investors (i.e. sovereign wealth funds, pension funds, insurance companies).[54]

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[47] EC (2009) Commission Staff Working Document - Accompanying document to the Communication on Investing in the Development of Low Carbon Technologies (SET-Plan), SEC(2009)1295, 7.10.2009, Brussels

[48] EC (2010) Commission Staff Working Document – Impact Assessment Energy infrastructure priorities for 2020 and beyond - A Blueprint for an integrated European energy network COM(2010)1395, 17.11.2010, Brussels

[49] EC (2010) Commission Staff Working Document – Impact Assessment Energy infrastructure priorities for 2020 and beyond - A Blueprint for an integrated European energy network COM(2010)1395, 17.11.2010, Brussels

[50] EC (2011) Commission Staff Working Paper - Impact assessment Accompanying the document Proposal for a Regulation of the European Parliament and of the Council on guidelines for trans-European energy infrastructure and repealing Decision No 1364/2006/EC, SEC(2011)1233, 19.10.2011, Brussels

[51] EC (2011) Commission Staff Working Paper - Impact assessment Accompanying the document Proposal for a Regulation of the European Parliament and of the Council on guidelines for trans-European energy infrastructure and repealing Decision No 1364/2006/EC, SEC(2011)1233, 19.10.2011, Brussels

[52] Ecofys, Fraunhofer ISI, TU Vienna EEG, Ernst &Young (2011) Financing Renewable Energy in the European Union Energy Market, http://ec.europa.eu/energy/renewables/studies/doc/renewables/2011_financing_renewable.pdf [accessed 13/9/2012]

[53] Olmos, L., Newbery, D., Ruester, S., Jen Liong, S., Glachant, J-M (2012) Public Support for the Financing of RD&D Activities in New Clean Energy Technologies, Final report of the THINK project - January 2011, European University Institute, http://www.eui.eu/Projects/THINK/Documents/Thinktopic/THINKTopic1.pdf [accessed 13/9/2012]

[54] ECF (2011) Roadmap 2050 - Financing for a zero-carbon power sector in Europe - A financial sector's view on the decarbonisation of the European power sector

2. Transport

2.1 Relevance of the transport sector for tackling climate change in Europe

Between 1990 and 2009 demand for transport grew by approximately 29%resulting in an overall increase of GHG emission by 27%[55]. The Commission's 2050 Low Carbon Roadmap proposes that by 2050 GHG emissions in the transport sector should be between 54% and 67% lower than 1990 levels[56], which represents a true challenge. The 2011 Transport White Paper proposes that transport's GHG emissions be reduced by at least 60% by 2050 compared to 1990[57].

One of the measures contained in the Transport White Paper is to have a fully functional, EU-wide, multi-modal trans-European transport network (TEN-T) core network by 2030 that will enable high volumes of passengers and freight to be transported efficiently and with low emissions. Development of the network includes investment in low carbon modes, advanced technologies and the supply infrastructure for clean transport fuels. [58] From the perspective of adaptation, roads, railways, airports and ports are all potentially vulnerable to the impacts of climate change, such as increased flooding, storms, heat impacts, more snow and ice. Disruptions of key transport infrastructure functioning could be short-term, e.g. from flooding, or longer-term if infrastructure is significantly damaged and needs to be (even partially) closed for repair. The need for new transport infrastructure to be climate-resilient and not to adversely affect the adaptive capacity of the natural environment should be taken into account in the location and design of each scheme. [59]

2.2 Estimated investment needs to mitigate climate change

In the context of the TEN-T guidelines the EU's transport network has been distinguished into a comprehensive network and a core network. The comprehensive network consists of all existing and planned infrastructure that meets the requirements of the TEN-T guidelines, while the core network consists of the strategically most important parts of the former. The aim is to have the core network complete by 2030 and the larger comprehensive network complete by 2050[60]. The European Commission estimates that the investment needed is over €1.5 trillion in the period 2010 to 2030, with €550 billion needed by 2020 in order to complete the TEN-T, of which around €215 billion is needed to complete missing links and to remove bottlenecks on the core network [61,62]. Some of this

[55] European Environment Agency (2011) TERM Report 2011, EEA: Copenhagen.

[56] European Commission (2011) A Roadmap for moving to a competitive low carbon economy in 2050. Communication from the Commission, COM(2011) 112, 8.3.2011, Brussels.

[57] European Commission (2011) Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system. Communication from the Commission, COM(2011) 144, 28.3.2011, Brussels.

[58] European Commission (2011) Proposal for a Regulation on Union guidelines for the development of the trans-European transport network. COM(2011) 650/2, Brussels.

[59] Hjerp et al (2012) Methodologies for climate proofing investments and measures under cohesion and regional policy and the common agricultural policy, IEEP: London.

[60] European Commission (2011) Proposal for a Regulation on Union guidelines for the development of the trans-European transport network. COM(2011) 650/2, Brussels.

[61] European Commission (2011) Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system. Communication from the Commission, COM(2011) 144, 28.3.2011, Brussels.

[62] The proposal for the Connecting Europe Facility (COM(2011) 665/3) quotes different figures: the completion of the TEN-T requires €500 billion by 2020 of which €250 billion would be used to complete missing links and remove bottlenecks. The White Paper figures are used in the text, as these are also used in the IA of the MFF itself (i.e. in SEC(2011) 868).

investment, e.g. that on rail infrastructure, could be classified as investment in climate measures, whereas some of it, such as investment in road infrastructure, would not[63].

The Impact Assessment of the Commission's 2050 Low Carbon Economy Roadmap attempts to identify the additional investment needed under various decarbonisation scenarios. For transport, over **€1,100 billion of investment** is estimated to be needed annually under various decarbonisation scenarios by 2050 compared to €830 billion annually in the reference scenario (i.e. the baseline resulting from existing policies and trends). On average, over the 40-year period, **annual investment under the decarbonisation scenarios amounts to over €930 billion**, which is around €160 billion more than under the reference scenario. Hence, this is the annual average investment needed to decarbonise the transport sector[64]. **In the period 2011-20** the average yearly total investments and fuel expenses are estimated to be €669 billion under the reference scenario, **the additional annual investment needs are estimated to be €21 billion**. The transport sector is therefore by far the sector with highest additional investment needs under decarbonisation scenarios.

The IA accompanying the transport white paper estimates the **total costs of transport** including capital costs related to transport equipment, infrastructure costs for the charging and refuelling of electric propulsion vehicles, fixed operation costs, variable operation costs (including fuel costs), users' disutility, and external costs of congestion, air pollution, noise and accidents in different scenarios. The additional total costs above the reference scenario range between €640 billion and €1,193 billion by 2050. Savings in fuel costs amount to between €300 and €330 billion in 2050 relative to the reference scenario. The total investment required for developing the electric road transport infrastructure is estimated to range between €80 billion and €140 billion under different policy options by 2050.[65]

Other estimates of investment needs in the transport sector

According to a study by a group of companies and organisations[66] total capital investment for a large-scale roll-out of hydrogen supply infrastructure in Europe is estimated at €100 billion over 40 years. This is based on an estimate of 25% market share of fuel cell electric vehicles (FCEVs) by 2050. Large-scale roll-out of battery electric vehicles (BEVs) and plug-in hybrids (PHEVs) in Europe are estimated to require up over €500 billion over the next 40 years. This average annual investment of €13+ billion over the next 40 years is considerably larger than investment needed for FCEVs, but serves more vehicles (~200 million BEVs/PHEVs compared to ~100 million FCEVs).[67]

[63] The Impact Assessment of the proposed Regulation for the TEN-T Guidelines (SEC(2011) 1212) notes that investment figures for the core network were discussed during bilateral meetings between DG MOVE and Member State representatives. They are based on estimates provided by Member States through the TENtec system and on data from the 2010 analysis of Priority Projects. No further information on how this figure is split between the modes is presented.

[64] European Commission (2011) Impact Assessment accompanying the Communication on A Roadmap for moving to a competitive low carbon economy in 2050. Commission Staff Working Document, SEC(2011) 288, Brussels.

[65] European Commission (2011) Impact Assessment Accompanying the White Paper on Transport, SEC(2011) 358, Brussels

[66] McKinsey (2010), A portfolio of power-trains for Europe: a fact-based analysis; http://www.iphe.net/docs/Resources/Power_trains_for_Europe.pdf

[67] For example: McKinsey (2010), A portfolio of power-trains for Europe: a fact-based analysis; http://www.iphe.net/docs/Resources/Power_trains_for_Europe.pdf

2.3 Estimated investment needs to adapt to climate change

There are a range of potential impacts on transport infrastructure caused by the possible effects of climate change resulting from, for example, increased summer heat, extreme precipitation and floods, extreme storm events and sea level rise. Evidence on the range of impacts, as well as of the possible adaptation options, has only recently begun to be brought together. It is not the purpose of this study to provide an overview of these impacts and potential adaptation options, but examples of adaptation options include:

- For railways, adaptation options include: Improved air conditioning in trains and for signals to protect against higher temperatures, strengthening of embankments against landslides and other infrastructure (e.g. bridges, cables etc.) against more extreme weather, development of plans to deal with impacts of such events and develop more early warning systems.

- For roads: Improved equipment in vehicles to better enable these to deal with extreme weather situations, strengthening and otherwise improving infrastructure to enable it to better cope with impacts, improved links with other modes to enhance resilience and improved early warning systems.

- For airports: Update cooling systems, install structures to protect runways and improved early warning systems.

- For inland and maritime shipping: Elevate bridges, install structures to protect ports, consider climate change impacts when designing ships and improve early warning systems, including those that monitor river flow[68].

If any of these options were funded from the EU budget, they could be considered to be expenditure on climate change adaptation for transport. Some recent reports have also made an attempt at identifying the potential costs associated with these adaptation options. A 2010 study estimated that investment needs for the adaptation of transport infrastructure in the EU27 (plus CH and N) in 2050 to be **between €3 and €6 billion**[69] of which between €2.9 and €5.7 billion would have to be covered by public funding. A more recent study, carried out for the Commission, provides ranges of potential costs of selected adaptation options in transport sector. These range between €36 million and €182 million for retrofitting airports' infrastructure system to between €3 billion and €9 billion for adapting roads to higher temperatures (see Table 1).

It is important to note that many climate change adaptation options (other than retrofitting existing or vehicles) can be designed in to existing projects, so that adaptation for transport often occurs as part of existing projects rather than as a separate project.

Table 1: Total annual costs of selected transport adaptation options in the EU-27 (€ m)

Adaptation option	Minimum total cost	Maximum total cost
Adapting railway tracks to higher temperatures	59	261

[68] Altvater, S., de Block, D., Bouwma, I., Dworak, T., Frelih-Larsen, A., Görlach, B. Hermeling, C., Klostermann, J., König, M., Leitner, M., Marinova, N., McCallum, S., Naumann, S., Osberghaus, D., Prutsch, A., Reif, C., van de Sandt, K., Swart, R. and J. Tröltzsch, (2012) Adaptation Measures in the EU: Policies, Costs, and Economic Assessment, report is a deliverable for the project "*Climate Proofing" of key EU policies – short term actions*, for the European Commission, DG Climate Action (contract CLIMA.C.3/SER/2010/0009)

[69] CEPS and ZEW (2010) The Fiscal Implications of Climate Change Adaptation, Final Report, Part I to European Commission, DG ECFIN.

Adapting roads to higher temperatures	2,973	8,918
Adapting roads to increased precipitation	28	140
Better surface asphalt for European runways	143	428
Retrofitting airports' infrastructure system to increase in wet days	36	182
TOTAL	3,200	9,900

Source: Altvater *et al* (2012)[70]

2.4 Market demand and financial gaps

As noted in the IA accompanying the Commission's transport white paper insufficient public and private finance and insufficient access to long-term finance are among the most important obstacles to the development of transport infrastructure. Although higher financing thresholds may have helped for certain projects, but in an overall limited (and insufficient) budget this has come at the cost of financing capabilities of other projects.[71] The Commission also recognises that the market introduction of innovative solutions in the transport sector is prevented by the lack of economic incentives for changes at 'systems-level', both for users and suppliers.[72]

An industry study estimates that fuel cell electric vehicles (FCEVs) face a cumulative economic gap (cars + infrastructure) of €25 billion (mainly due to a higher purchase price) and an additional €75 billion up to 2030; that the cumulative economic gap for battery electric vehicles (BEVs) by 2020 is €80 billion and €500 billion by 2050; while plug-in hybrids (PHEVs) are said to face an economic gap of €420 billion by 2050.[73]

3. Buildings

3.1 Relevance for tackling climate change in Europe

The buildings sector accounts for 40% of the EU's energy consumption and almost the same level of GHG emissions.[74] Ensuring the refurbishment of the existing building stock, and how to finance necessary investments in this regard will be key challenge.

[70] Altvater, S., de Block, D., Bouwma, I., Dworak, T., Frelih-Larsen, A., Görlach, B. Hermeling, C., Klostermann, J., König, M., Leitner, M., Marinova, N., McCallum, S., Naumann, S., Osberghaus, D., Prutsch, A., Reif, C., van de Sandt, K., Swart, R. and J. Tröltzsch, (2012) Adaptation Measures in the EU: Policies, Costs, and Economic Assessment, report is a deliverable for the project "*Climate Proofing" of key EU policies – short term actions*, for the European Commission, DG Climate Action (contract CLIMA.C.3/SER/2010/0009)

[71] European Commission (2011) Impact Assessment Accompanying the White Paper on Transport, SEC(2011) 358, Brussels

[72] EC (2012) Communication from the Commission - Research and innovation for Europe's future mobility - Developing a European transport-technology strategy, COM(2012)501, 13.9.2012, Brussels

[73] For example: McKinsey (2010), A portfolio of power-trains for Europe: a fact-based analysis; http://www.iphe.net/docs/Resources/Power_trains_for_Europe.pdf

[74] BPIE (2012) Energy efficiency policies in buildings – The use of financial instruments at Member State level, Buildings Performance Institute Europe (BPIE)

Above average contributions in the medium to long term are expected in the **residential and service sectors** (37-53% reduction by 2030 and 88-91% reduction by 2050) given significant reductions in required heating from improved insulation, greater use of electricity and renewables for building heating and the use of more energy efficient appliances.[75] Heating and cooling is the most important component but its share is projected to decrease to less than 60% of residential energy use by 2050. Despite significant efficiency improvements, electrical appliances and lighting are projected to at least double their share to nearly 25% by 2050.[76]

The buildings sector is also vulnerable to the impacts of climate change, in particular potential vulnerability to extreme events, such as floods and storm events, and to a lesser extent also heat-waves and droughts and to their impacts on soil stability (landslides, coastline erosion). These extreme events pose a specific threat to the urban environment.[77] Climate-related hazards are projected to mostly increase, although changes will vary geographically across the EU. [78]

3.2 Estimated investment needs to mitigate climate change

According to the Commission's 2050 low carbon Roadmap, investments in residential and commercial **buildings** are projected to increase by around 30% in various decarbonisation scenarios compared to the reference scenario in the next 2 decades, reaching nearly €70 billion instead of nearly €50 billion of investments annually which are expected in the reference scenario. The Commission estimates that over the next decade (to 2020) investments in **energy-saving building components and equipment** will need to be increased by up to €200 billion.[79] Average annual investments in **energy related capital** (e.g. boilers and electric appliances) by the residential and tertiary sectors are estimated to be between €126-138 billion to 2050 under various decarbonisation scenarios, compared to average annual investment of €50 billion under the reference scenario. These investments in turn are expected to drive significant reductions for the expenses of fuel and electricity, by about €70 to 100 billion for fuels by 2050 and around € 90 to 120 billion for electricity.[80] The renovation of 3% of public buildings as stipulated in the Energy Efficiency Directive[81] would require additional investments of €1.6 billion per year between 2010 and 2020 and would be offset by savings on energy bills of €1.92 billion. If this was done to nearly zero energy standards additional investments would increase to €5 billion and would be partially offset by savings on energy bills of €3.7 billion.[82]

As noted in a study by the **Buildings Performance Institute Europe (BPIE)**, actual investments in **new buildings** for heat pumps, pellet heating systems, ventilation systems with heat recovery, triple glazed windows and insulation materials at EU level were estimated to have reached about EUR 23 billion (in 2009 during the financial crisis). The study estimates that in order to implement nearly

[75] EC (2011) Impact Assessment. A Roadmap for moving to a competitive low carbon economy 2050, Commission staff working document, SEC(2011)288, 8.3.2011, Brussels

[76] EC (2011) Impact Assessment. A Roadmap for moving to a competitive low carbon economy 2050, Commission staff working document, SEC(2011)288, 8.3.2011, Brussels

[77] EC (2009) Impact Assessment, accompanying the White Paper on Adapting to climate change: Towards a European framework for action, SEC(2009)387, 1.4.2009, Brussels

[78] EEA (2010) The European environment - State and outlook 2010, Adapting to climate change, EEA, Copenhagen

[79] EC (2011) Communication from the Commission - A Roadmap for moving to a competitive low carbon economy in 2050, (COM(2011)112), 8.3.2011, Brussels

[80] EC (2011) Impact Assessment. A Roadmap for moving to a competitive low carbon economy 2050, Commission staff working document, SEC(2011)288, 8.3.2011, Brussels

[81] Directive 2012/27/EU on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC, OJ L 315, p1.

[82] Commission Staff Working Paper, Impact Assessment accompanying the document Directive of the European Parliament and of the council on energy efficiency and amending and subsequently repealing Directives 2004/8/EC and 2006/32/EC, p40.

zero emission building requirements for every new building, investments will reach about €62 billion per year to 2020 which means an additional investment of €39 billion.[83]

3.3 Estimated investment needs to adapt to climate change

Improving the energy performance of buildings may help to address some of the climate impacts that will affect the buildings sector, including higher temperatures and heat waves. Passive cooling systems for example will help to cope with higher temperatures will at the same time reducing energy demand for air conditioning. Costs for the implementation of green spaces and green roofs in urban areas, if implemented in all 323 European cities registered in the Urban Audit database[84], have been estimated at €5 billion annually (green spaces) and a one-time investment of €7 billion and annual maintenance costs of €100 million (green roofs).[85]

In addition, energy efficiency improvement in building generates additional important multiple individual and macroeconomic benefits such heath improvement, local job creation and energy cost savings. It was estimated that € 1 of public investment into energy efficiency improvements would generate € 2-5 of public revenue (through additional fiscal revenue, VAT, reduced public health expenditures, etc.)[86]

3.4 Market demand and financing gaps

A report by BPIE highlighted many of the market barriers to improving the energy performance of buildings. 'In simple economic terms, the fact that there is a large untapped cost-effective potential for improving the energy performance of buildings is evidence that consumers and investors, as well as society in general, are not keen on investing in energy saving. Market dynamics, however, do not always follow a straight path and there are a multitude of reasons why consumers or building owners make specific decisions.' [87]

Barriers that hinder the uptake of renovation measures can be categorised as financial, institutional and administrative, awareness, advice and skills; the separation of expenditure and benefit. The main barrier relates to financing including the lack of funds and/or inability to secure finance on acceptable terms; payback expectations/investment horizons; competing purchase decisions and consumer price signals. While the investments are considered cost-effective over the lifetime of the building, there are undoubtedly high up-front expenditures and this is seen as an obstacle to consumer investment decisions. Other barriers relate to institutional and administrative issues that can have an effect on the rate and ambition of renovation as well as barriers relating to awareness, information and technical expertise.[88]

All 27 EU Member States have on-going programmes to support the energy performance of buildings, including conventional or innovative financing or through external funding. Many Member States have programmes that utilise Structural Funds as core funding, with some Member States

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83 BPIE (2011) Principles for nearly Zero-Energy Buildings Paving the way for effective implementation of policy requirements, Buildings Performance Institute Europe (BPIE)

84 The Urban Audit provides European urban statistics for 258 cities across 27 European countries. It contains almost 300 statistical indicators presenting information on matters such as demography, society, the economy, the environment, transport, the information society and leisure, www.urbanaudit.org

85 Altvater, S., de Block, D., Bouwma, I., Dworak, T., Frelih-Larsen, A., Görlach, B. Hermeling, C., Klostermann, J., König, M., Leitner, M., Marinova, N., McCallum, S., Naumann, S., Osberghaus, D., Prutsch, A., Reif, C., van de Sandt, K., Swart, R. and J. Tröltzsch, (2012) Adaptation Measures in the EU: Policies, Costs, and Economic Assessment, report is a deliverable for the project "*Climate Proofing" of key EU policies – short term actions*, for the European Commission, DG Climate Action (contract CLIMA.C.3/SER/2010/0009)

86 *Impact on public budgets of KfW promotional programmes in the field of "energy-efficient building and rehabilitation", Research Centre Jülich, October 2011*

87 BPIE (2011) Europe's Buildings Under the Microscope, Buildings Performance Institute Europe (BPIE)

88 BPIE (2011) Europe's Buildings Under the Microscope, Buildings Performance Institute Europe (BPIE)

almost entirely dependent on Structural funds for their national programmes, particularly in new Member States. Future deployment will need to see an increased effort.[89]

4. Support for Small and Medium-Sized Enterprises (SMEs)

4.1 Relevance for tackling climate change in Europe

Small and medium-sized enterprises (SMEs) make up a large part of Europe's economy, representing 99.8% of all enterprises.[90] As such, SMEs have a key role to play in shifting the European economy to more sustainable production and consumption patterns[91] and contributing to the achievement of the EU's climate change objectives.

The environment / climate impacts of SMEs vary by sector, by country and by the underlying structure and size of the companies. A 2010 study[92] for DG ENTR concluded that sectors with high energy use and GHG emissions are the manufacture of food products, manufacture of chemicals, manufacture of metals and non-mineral products, energy production, construction and transport. The study found that SMEs have an impact on the environment and account for about 64% of industrial pollution in Europe and that up to 24% of SMEs actively engage in actions to reduce their environmental impact (mainly relating to reduction of energy consumption).

As noted in the Commission's 2008 Small Business Act for Europe, climate change is among the key **challenges** facing European SMEs which have to adopt more sustainable production and business models. According to the Communication, only 29% of SMEs have introduced any measures for saving energy or raw materials (compared with 46% of large enterprises), 4% of EU SMEs have a comprehensive energy efficiency system in place (compared with 19% for large enterprises). [93]

Climate change also offers important business **opportunities** to SMEs with increasing demand for environmentally friendly products and services. Technologies such as smart electricity grids will help to boost the competitiveness and worldwide technological leadership of EU industry including SMEs. Investments in transmission infrastructure are expected to create additional jobs and promote the diffusion of EU technologies. EU industry including SMEs, are key producers of energy infrastructure technologies and stand to benefit from such investments.[94] The Commission's 2011 Eco-innovation Action Plan (Eco-AP) notes that small firms are stronger on new regulation-driven markets, such as eco-construction and renewable energy and that the potential to eco-innovate and as a result improve resource productivity is expected to be higher for SMEs than for large enterprises.[95]

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[89] BPIE (2012) Energy efficiency policies in buildings – The use of financial instruments at Member State level, Buildings Performance Institute Europe (BPIE)

[90] Ecorys (2011) Are EU SMEs recovering from the crisis? Annual Report on EU Small and Medium sized Enterprises 2010/2011, Report for DG Enterprise

[91] EC (2007) Commission Communication, Small, clean and competitive A programme to help small and medium-sized enterprises comply with environmental legislation, COM(2007) 379, 8.10.2007, Brussels

[92] Calogirou Constantinos, Stig Yding Sørensen, Peter Bjørn Larsen, Stella Alexopoulou et al. (2010) SMEs and the environment in the European Union, PLANET SA and Danish Technological Institute, Published by European Commission, DG Enterprise and Industry, http://ec.europa.eu/enterprise/policies/sme/business-environment/files/main_report_en.pdf

[93] EC (2008) Commission Communication – "Think Small First" A "Small Business Act" for Europe, COM(2008)394), 25.6.2008, Brussels

[94] EC (2010) Commission Staff Working Document – Impact Assessment Energy infrastructure priorities for 2020 and beyond - A Blueprint for an integrated European energy network COM(2010)1395, 17.11.2010, Brussels

[95] EC (2011) Commission Communication - Innovation for a sustainable Future - The Eco-innovation Action Plan (Eco-AP), COM(2011)899, 15.12.2011, Brussels

As noted in a report by the UK Federation of Small Businesses, according to the Carbon Trust if all UK businesses and public sector organisations undertook effective energy efficiency measures it would lead to savings of £3.6 billion per year with a resulting 29MtCO2 reduction in emissions. SMEs would have the highest savings opportunity across all sectors of the economy with an average saving opportunity of 20%.[96]

At the same time, SMEs are also **sensitive to future climate change impacts.** SMEs are vulnerable to rising energy prices as recognised in a recent survey of managers of SMEs in the EU on causes of eco-innovation.[97] SMEs may also have more difficulties than larger companies to assess the risks and consequences of climate change for their business, due to less advances capacities.[98]

4.2 Estimated investment needs to mitigate climate change

There are no quantitative estimates identifying climate change related investment needs in SMEs from an EU perspective. The SET Plan identifies the need for additional public/private funding (€50bn by 2020) for low carbon technologies to cover basic and applied research, demonstration and market take up. SMEs are expected to play a significant role in this regard.

4.3 Estimated investment needs to adapt to climate change

The exposure of small and medium sized enterprises (SMEs) to the impacts of climate change depends on the sector, structure and size of the organisation as well as its operations etc. and depending on type affects different elements of operation.

There is some evidence outlining adaptation costs for SMEs in certain Member States. For example in the UK, the cost of flooding based on insurance claims made in 2007, is said to total £200-300 million. The loss of productivity associated with staff absences and workplace overheating is also estimated to cost between £1.1 billion and £5.3 billion by the 2050s, and between £1.2 billion and £15.2 billion by the 2080s (current estimate: £0.77 billion).[99]

4.4 Market demand and financing gaps

Faster pace of eco-innovation and market penetration is hampered by the lack of risk finance and support for demonstration. For example, only 15%-20% of applications for eco-innovation demonstration have been supported under CIP programme.[100] According to the Eco-AP[101], public financing is needed to support market demand for eco-innovation in the private sector, particularly in SMEs for the following reasons:

- The relative immaturity of the market means that access to finance is especially difficult for small businesses engaging in eco-innovation where the perceived commercial risk is greater.
- Financiers and investors tend to use the same investment rationale for eco-innovation as for other investments i.e. the same expected returns and same level of accepted risks.

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[96] Wood, F., Caro, D., (2010) Making Sense of Going Green - Small Businesses and the Low Carbon Economy, UK Federation of Small Businesses, http://www.fsb.org.uk/frontpage/assets/fsb0029_environment_report_web.pdf [accessed 2/10/2012]

[97] Flash Eurobarometer, (2011) Attitudes of European entrepreneurs towards eco-innovation, Flash Eurobarometer 315 – The Gallup Organization, http://ec.europa.eu/public_opinion/flash/fl_315_sum_en.pdf [accessed 14/9/2012]

[98] EC (2009) Impact Assessment, accompanying the White Paper on Adapting to climate change: Towards a European framework for action, SEC(2009)387, 1.4.2009, Brussels

[99] Climate Change Risk Assessment (2012), Business, Industry and Services, Department of Food and Rural Affairs, London

[100] EC (2011) Commission Staff working document – Impact assessment accompanying Innovation for a sustainable Future - The Eco-innovation Action Plan (Eco-AP), SEC(2011)1599, 15.12.2011, Brussels

[101] EC (2011) Commission Communication - Innovation for a sustainable Future - The Eco-innovation Action Plan (Eco-AP), COM(2011)899, 15.12.2011, Brussels

- The added value (i.e. in terms of reducing environmental pressures) is not accounted for and only plays a marginal role in investment decisions.

A recent report for the European Commission on financing eco-innovation[102] identifies a clear need for the finance of eco-innovations. Eco-innovative businesses are often SMEs that face known market failures including informational asymmetries and transactions costs which limit their access to finance. Another significant barrier found in the study is that available financing often is not tailored to the small scale financing needs of SMEs. Some of the barriers to accelerated take up of eco-innovation include the lack of funds, uncertain demand from the market, existing regulations and structures, technical and technological lock-ins or a market dominated by established companies, and a lack of qualified personnel and technological capabilities.[103]

Furthermore a large proportion of SMEs are said to not engage in environmental impact reducing solutions as they do not perceive themselves as having an impact on the environment and their energy bills or environmental costs are relatively small. Consequently, investments are just perceived as an extra cost, especially for low-impact SMEs. The major barrier for investing in solutions that reduce the environmental impact is found to be a lack of financial resources and the high costs required to invest in new technology[104]

Market demand for adaptation measures among SMEs is likely to vary significantly according to the relevant economic sector, level of awareness, and regional context. The EU added value of public intervention may comprise the funding of measures complementing autonomous responses, such as awareness raising activities based on web-based information tools, training sessions on climate change impacts and adaptation, and printed materials.[105] Over the course of the next MFF, it is estimated that roughly €1.8 billion would be required to fund climate change awareness raising programmes for SMEs throughout the EU.[106]

5. Agriculture (including agro-forestry)

This section covers the agricultural sector including agro-forestry. In terms of investment needs it does not cover investment needs in the countryside and rural areas beyond the agricultural sector, some of which are significant and can be funded through grants under the rural development Pillar of the Common Agricultural Policy (CAP) (e.g. community renewable energy initiatives, investments in water infrastructure for rural communities etc.).

[102] EIM, Oxford Research, (2011) Financing Eco-innovation; Final Report for DG Environment, Brussels, 2011

[103] Flash Eurobarometer, (2011) Attitudes of European entrepreneurs towards eco-innovation, Flash Eurobarometer 315 – The Gallup Organization, http://ec.europa.eu/public_opinion/flash/fl_315_sum_en.pdf [accessed 14/9/2012]

[104] Calogirou Constantinos, Stig Yding Sørensen, Peter Bjørn Larsen, Stella Alexopoulou et al. (2010) SMEs and the environment in the European Union, PLANET SA and Danish Technological Institute, Published by European Commission, DG Enterprise and Industry, http://ec.europa.eu/enterprise/policies/sme/business-environment/files/main_report_en.pdf

[105] Hjerp, P. et al (2012) Methodologies for Climate Proofing Investments and Measures under Cohesion and Regional Policy and the Common Agricultural Policy, A report for DG CLIMA, IEEP et al: Brussels.

[106] Ibid.

5.1 Relevance of the sector for tackling climate change in Europe

In 2005, non-CO_2 emissions represented 17% of total GHG emissions in the EU, agriculture accounted for around 9% of these emissions.[107] The agricultural sector in the EU-27 is responsible for 49.6% of methane emissions, 78.6% of nitrous oxide emissions and 1.9%[108] of carbon dioxide[109]. While reducing its emissions in absolute terms, agriculture is projected to represent a third of total EU GHG emissions by 2050, thus tripling its share compared to 2005.[110] The Commission's analysis shows a reduction in GHG emissions of 36-37% by 2030, further decarbonisation steps are however more difficult with reductions estimated between 42-49% by 2050. The rate of emission reductions is projected to slow down after 2030 in part due to increased agricultural production to meet the demands of a growing global population. In the effective technology decarbonisation scenario, 50 to 60% of non-CO_2 emissions reductions could come from agriculture.[111]

The agricultural sector also has a high exposure to climate change risks such as extreme weather events, heat stress for livestock, flooding, drought, loss of farmland biodiversity, soil erosion, and an increase in pests and diseases. There have already been changes in the growing season and the timing of the cycle of agricultural crops in different parts of Europe; the variability of crop yields has increased due to extreme climatic events; and there have been increases in water demand for agriculture mainly in Mediterranean areas. These changes are projected to continue in the years ahead.[112] The exposure to climate change risks varies greatly in severity and scale across different bio-climatic regions in the EU-27 and changes annually. The adaptive response therefore varies in terms of approach (sometimes requiring planned adaptation while at other times adaptation is autonomous) and scale (sometimes requiring adaptation at a farm scale and at other times at a landscape scale). Furthermore, exposure will differ between the short and longer term, e.g. exposure to loss of farmland biodiversity is likely to be a greater risk in the long term than the short term.

5.2 Estimated investment needs to mitigate climate change

There is only a limited number of studies available that quantify investments needs in this area.[113] One quantitative example available at EU level provides a cost estimate for one element of climate change mitigation, indicating annual funding needed of approximately €12 billion to manage soil organic matter on all arable areas at risk. This is based on the average payment rates under agri-environment schemes in the EU-27 for addressing soil organic matter (SOM) and assumes they are carried out on areas at risk of SOM degradation. 114 The benefits identified from the study include the increased nutrient availability in the soil which enhances crop productivity as well as reductions in soil loss from soil erosion. These benefits were calculated to come to approximately €10 billion/year.

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[107] EC (2011) Impact Assessment. A Roadmap for moving to a competitive low carbon economy 2050, Commission staff working document, SEC(2011)288, 8.3.2011, Brussels

[108] Includes forestry and fisheries.

[109] http://www.eea.europa.eu/data-and-maps/data/data-viewers/greenhouse-gases-viewer

[110] EC (2011) Communication from the Commission - A Roadmap for moving to a competitive low carbon economy in 2050, (COM(2011)112), 8.3.2011, Brussels

[111] EC (2011) Impact Assessment. A Roadmap for moving to a competitive low carbon economy 2050, Commission staff working document, SEC(2011)288, 8.3.2011, Brussels

[112] EEA (2010) The European environment - State and outlook 2010, Adapting to climate change, EEA, Copenhagen

[113] We have taken 'investments' to mean 'expenditure' more generally, to include area payments for environmental management, rather than purely 'physical' investments in grey infrastructure, which is often how this term in used in relation to agriculture.

[114] Kuhlman, T., Reinhard, S. and Gaaff, A. (2010) Estimating the costs and benefits of soil conservation in Europe. *Land Use Policy* 27, 22–32

Although it was not possible to extrapolate figures for climate mitigation alone, a study for DG Environment in 2010[115] calculated that the costs of undertaking **environmentally beneficial land management on agricultural and forested land** in 2020 via the CAP (Pillar 2) would be in the region of **€34 billion/year**, with about €30 billion of this needed for agriculture to reduce GHG emissions. This study was not able to estimate with any accuracy the cost of supporting the physical investments needed to meet different environmental needs given the **variability of the costs of such capital investments on farms in different parts of the EU-27** and the **lack of available data**. Current expenditure within rural development policy on physical investments from the main measures used by Member States in their Rural Development Programmes is around €3.2 billion/year (based on expenditure under measures 121, 125, 216 and 227) – only a proportion of which will be spent on climate mitigation. This is likely to be an underestimate of what investment is needed in practice.[116]

5.3 Estimated investment needs to adapt to climate change

Despite there being clear evidence that significant support is required and justified from EU funds to enable land managers to adapt to climate change (for infrastructure to adapt buildings and holdings to withstand extreme weather events, to ensure adequate cooling of stables or storage of water and infrastructure to harvest rainwater; for land management to improve water and soil management; and for advice and training), there is very little evidence on the sorts of investment costs that these might entail.

There have been efforts at a **global scale** to estimate the cost of climate change adaptation in agriculture which are useful to demonstrate the scale of uncertainty: over a twenty year period, the estimates vary from **US$5 billion to over US$100 billion**[117] (€4 billion to over €81 billion)[118].

Additional irrigation systems for EU27 are estimated to cost €331 million per year and capacity building in terms of advice to farmers is estimated to cost between €53 million and €198 million per year, the latter in the case of compulsory farm advice to all farms receiving direct payments.[119]

5.4 Market demand and financing gaps

While farmers are used to adapt to changing weather conditions in the short-term, the expected climate impacts on the agricultural sector require more fundamental adaptations. Several barriers to adaptation have been by the Commission. These include:[120]

- Farm characteristics such as production type, size of the farm, level of intensity;
- Diversity of cropping and livestock systems, and the presence of other income sources apart from agriculture;

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115 Hart K, Baldock D, Tucker G, Allen B, Calatrava J, Black H, Newman S, Baulcomb C, McCracken D, Gantioler S (2011) *Costing the Environmental Needs Related to Rural Land Management, Report Prepared for DG Environment*, Contract No ENV.F.1/ETU/2010/0019r. Institute for European Environmental Policy, London.

116 Hart K, Baldock D, Tucker G, Allen B, Calatrava J, Black H, Newman S, Baulcomb C, McCracken D, Gantioler S (2011) *Costing the Environmental Needs Related to Rural Land Management, Report Prepared for DG Environment*, Contract No ENV.F.1/ETU/2010/0019r. Institute for European Environmental Policy, London

117 Downing, T. and Chambwera, M., Cabot Venton, C., Dyszynski, J., Crawford, V., 2011. *Planning and costing agriculture's adaptation to climate change: Policy Perspectives.* International Institute for Environment and Development (IIED), London, UK. http://pubs.iied.org/pdfs/G03175.pdf

118 Exchange rate of USD1 = EUR0.81, http://ec.europa.eu/budget/contracts_grants/info_contracts/inforeuro/inforeuro_en.cfm

119 Altvater, S., de Block, D., Bouwma, I., Dworak, T., Frelih-Larsen, A., Görlach, B. Hermeling, C., Klostermann, J., König, M., Leitner, M., Marinova, N., McCallum, S., Naumann, S., Osberghaus, D., Prutsch, A., Reif, C., van de Sandt, K., Swart, R. and J. Tröltzsch, (2012) Adaptation Measures in the EU: Policies, Costs, and Economic Assessment, report is a deliverable for the project "*Climate Proofing" of key EU policies – short term actions*, for the European Commission, DG Climate Action (contract CLIMA.C.3/SER/2010/0009), p. 204

120 EC(2009): Commission Staff Working Document, Adapting to climate change: the challenge for European agriculture and rural areas, SEC(2009) 417, Brussels, 1.4.2009

- Access to relevant information, skills and knowledge about climate trends and adaptive solutions; the role played by advisory services in facilitating adaptation;
- General socio-economic situation, farmers with limited resources or living in remote rural areas being most vulnerable;
- Access to available technology and infrastructure capacity.

Different instruments are discussed in the literature that may be used to support the implementation of adaptation measures including insurance, pricing systems and public private partnerships. Insurance could build on existing schemes in the European agricultural sector. Such insurance schemes' premiums would reflect increasing climate risks and hence provide an incentive to act and invest in climate adaptation.[121]

6 Water - including floods and risk prevention activities

6.1 Relevance of the water sector for tackling climate change in Europe

The relevance of the water sector for tackling climate change in Europe is strongly related to the sector's strong inter-linkages with the energy sector. On the one hand, water plays an important role in the provision of low carbon energy supply, e.g. hydropower. On the other hand, the water sector consumes a considerable amount of energy for drinking water supply and wastewater treatment. Increased used of desalination in response to water shortage (see below) will further increase the energy use and hence greenhouse gas emissions if desalination is not combined with renewable energy sources. It is estimated that the production of drinking water with seawater desalination by reverse osmosis is roughly 6 times more energy intensive than traditional water supply.[122] In the absence of a reduction in water demand total energy use from desalination and transport was estimated to range between 3 and 7% of total power production in 2030.[123] This underlines the need for fully exploiting water savings potentials and low carbon desalination technologies.

Climate change is expected to lead to major changes in water availability across Europe with increasing water scarcity mainly in southern Europe and increasing risk of floods throughout most of the continent. In addition to the negative consequences for the energy sector as described above and physical impacts such as sea-level rise and coastal flooding, there will also be significant economic impacts, particularly in water-dependent economic sectors such as fisheries, aquaculture, and coastal tourism, and social impacts resulting from the loss of provision.[124]

Climate change is expected to have a significant impact on the quantity and quality of water resources both within Europe and globally. It is expected to affect the following variables:

- water availability (river flows and groundwater levels);
- water demand (esp. peak demands during periods of drought);
- intensity and frequency of floods and droughts, and of strong stream or low flow conditions;
- surface water quality, including temperature, nutrient and other contaminants content;
- biodiversity in aquatic systems; and

[121] Wreford, A., Moran, D., Adger, N. (2010): Climate Change and Agriculture: Impacts, adaptation and mitigation, OECD, Paris.

[122] EEA (2012): Towards efficient use of water resources in Europe. EEA Report No 1/2012

[123] Anderson, J., Bassi, S., Dworak, T., Fergusson, M., Laaser, C., Le Mat, O., Matteiβ, V., Strosser, P. (2008): Potential impacts of desalination development on energy consumption. DG Environment Study Contract #07037/2007/486641/EUT/D2

[124] EC (2009) Commission staff working document accompanying the White Paper on Adapting to climate change: Towards a European framework for action - Climate Change and Water, Coasts and Marine Issues, COM (2009)386, 1.4.2009

- groundwater quality.[125]

Extreme weather events such as flooding or landslides are also expected to have an impact on the functioning of water infrastructures. In cities for example, such events may affect the continuity of essential services such as water supply and sewerage.[126]

6.2 Estimated investment needs to mitigate climate change

Quantitative investment needs relating to mitigation in the water sector could not be identified.

6.3 Estimated investment needs to adapt to climate change

Adaptation costs for sea level rise and inland flooding have been estimated at €1.5 billion per year and €3 billion per year respectively.[127] Adaptation cost refers to the sum total of inland and coastal flood protection measures for the EU as a whole. Applicable measures, and the investment needed to fund them, could include sea walls for coastal flooding including dykes, floodplain management for inland flooding, and measures applicable to buildings and municipal water infrastructure.

To avoid sewage water leaks during high precipitation events, additional storm water retention reservoirs could be built to store greater volumes of water.[128] These types of reservoirs are typically implemented by property developers, given the impact of urban flooding on commercial and residential buildings. Considering interlinkages with other options, storm retention reservoirs can be combined sustainable urban drainage systems (SUDS). Similar to storm retention reservoirs, SUDS are thus aimed at reducing impacts from intra-urban flooding which can affect private properties, industrial facilities, commercial buildings, public infrastructures and, in extreme cases, also health. They are also typically implemented by property developers.

6.4 Market demand and financing gaps

Given the impact of flooding on commercial and residential buildings, there is likely to be a significant degree of autonomous adaptation in these areas by the private sector. At the same time, the implementation of sea walls and more extensive floodplain management, are measures more likely to be planned, and implemented by municipalities or member state governments.

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[125] EC (2009) Common implementation strategy for the water framework Directive (2000/60/EC) – river basin management in a changing climate, Technical Report - 2009 – 040 Guidance document No. 24, http://circa.europa.eu/Public/irc/env/wfd/library?l=/framework_directive/guidance_documents/management_finalpdf/_EN_1.0_&a=d [accessed 17/9/2012]

[126] EEA (2010) The European environment - State and outlook 2010, Adapting to climate change, EEA, Copenhagen

[127] Climate Cost (2011). Sea-Level Rise. Final report for DG Research under the Seventh Framework Programme, Brussels.

[128] Hjerp, P. et al (2012) Methodologies for Climate Proofing Investments and Measures under Cohesion and Regional Policy and the Common Agricultural Policy, A report for DG CLIMA, IEEP et al: Brussels.

Table 2: Summary table of investment needs in climate relevant sectors

Sector	Estimated mitigation investment needs and timeframe	Estimated adaptation investment needs and timeframe
Energy	Average yearly total investments and fuel expenses for the period 2011-2020: €84 billion, additional yearly total investments as compared to reference scenario: €3 billion. Average yearly total investments and fuel expenses for the period 2011-50: €114 billion, additional yearly total investments as compared to reference scenario: €29 billion. The additional grid investment costs under the decarbonisation scenarios, compared to the current policy and initiatives (CPI) scenario are between €40 and €50 billion except for the High Energy Efficiency scenario where the need for additional grid investments is considerably lower. These additional investments would predominantly concern the distribution grid (around €40 billion). Around €8 billion per annum need to be invested in RDI over the next 10 years to move forward key actions in the SET Plan. Total investment of €67.5-80.5 billion is required over the next 10 years. This includes both public and private investment. Once current investments are taken into account, additional financing needs are estimated to be between €47.5-60.5 billion.	Adaptation of electricity grids in EU26 (without Malta) was estimated to be between €637 million and €654 million per year. Adaptation of thermal power plants by installing additional cooling systems is estimated to require annual investments of €637 million
Transport	Average annual investment under various decarbonisation scenarios amount to over €930 billion to 2050. This is around €160 billion more than under the reference scenario. In the period 2011-20 average yearly total investments and fuel expenses are estimated to be €669 billion under the reference scenario, whereas the decarbonisation scenario would require additional annual investment needs of €21 billion.	Estimates of between €3-€6 billion in 2050, of which the public share is estimated to be between €2.9 and €5.7 billion. Making transport infrastructure climate resilient would require investments in the range of between €36 million and €182 million for retrofitting airports' infrastructure system to between €3 billion and €9 billion for adapting roads to higher temperatures
Buildings	Investments in residential and commercial buildings are projected to increase in the next 2 decades to reach nearly €70 billion annually (compared to nearly €50 billion in the reference scenario).	Implementation of green spaces in urban areas in all 323 European cities registered in the Urban Audit database[129] would require annual investments of €5 billion, the installation of green roofs would amount

[129] The Urban Audit provides European urban statistics for 258 cities across 27 European countries. It contains almost 300 statistical indicators presenting information on matters such as demography, society, the economy, the environment, transport, the information society and leisure, www.urbanaudit.org

	Over the next decade (to 2020) investments in energy-saving building components and equipment will need to be increased by up to €200 billion. Average annual investments in energy-related capital (e.g. boilers and electric appliances) by the residential and tertiary sectors are estimated to be between €126-138 billion to 2050 (compared to €50 billion under the reference scenario).	to a one-time investment of €7 billion and annual maintenance costs of €100 million.
SME support	There are no quantitative estimates identifying climate change related investment needs in SMEs at an EU level. 2010 venture capital investments in Europe added up to approximately €1.3 billion in the eco-innovation sector of which 71% were spent on energy generation and energy efficiency in the fourth quarter of 2009.	No data available.
Agriculture	A cost estimate for one element of climate change mitigation indicates annual investment of €12.8 billion to manage soil organic matter on all agricultural areas at risk to deliver increased nutrient availability in the soil to enhance crop productivity as well as reductions in soil loss from soil erosion. A study for DG Environment calculated the costs of undertaking environmentally beneficial land management on agricultural and forested land to meet the EU's environmental objectives in 2020 via the CAP (Pillar 2) to be in the region of €34 billion/year, with about €30 billion of this needed for agriculture.	At a global scale the cost of climate change adaptation in agriculture over a twenty year period has been estimated to be between US$5 billion to over US$100 billion Additional irrigation systems in EU27 are estimated to cost €331 million per year, capacity building in terms of advice to farmers is estimated to cost between €53 million and €198 million per year, the latter in the case of compulsory farm advice to all farms receiving direct payments
Water	No data available.	Adaptation costs to prepare for sea level rise are estimated to be €1.5 billion per year, for inland flooding €3 billion per year.

ANNEX 3 – REVIEW OF 2007-2013 EU GRANTS AND FINANCIAL INSTRUMENTS

This Annex 3 presents a detailed review of EU grants and financial instruments under the 2007-2013 EU MFF. The fiches explore their relevance to climate change. The reviewed grants and financial instruments include the following:

1) FP7
    a. Grant support under the Cooperation Programme
    b. RSFF
2) CIP
    a. IEE
    b. ELENA
    c. GIF
    d. SMEG
3) TEN
    a. TEN-T and TEN-E – grants and LGTT
    b. EU project bonds pilot
4) Cohesion Policy
    a. Grant support under ERDF, CF and ESF
    b. Financial engineering under ERDF: JESSICA, JEREMIE, JASPERS and JASMINE
5) CAP
    a. EAFRD – grants and FI
6) LIFE
7) European Economic Recovery Programme
    a. EEEF
    b. Marguerite

Seventh Framework Programme for research and development (FP7)	
Instrument type	Grant[130] For research and technological development activities, the EU financial contribution may reach a maximum of 50 % of the total eligible costs. However, in the case of non-profit public bodies, secondary and higher education establishments, research organisations and SMEs, it may reach a maximum of 75 % of the total eligible costs. For demonstration activities, the EU financial contribution may reach a maximum of 50 % of the total eligible costs.[131]
Objective and rationale of the instrument	FP7 is carried out to pursue the general objectives described in Article 163 of the Treaty, to strengthen industrial competitiveness and to meet the research needs of other EU policies, thereby contributing to the creation of a knowledge-based society, building on a European Research Area and complementing activities at a national and regional level. It will promote excellence in scientific and technological research, development and demonstration through the following four programmes: cooperation, ideas, people and capacities.[132] FP7 should contribute towards promoting growth, sustainable development and environmental protection, including by addressing the problem of climate change.[133]
Target group/ Final Beneficiary	Any undertaking, university or research centre or other legal entity, whether established in a Member State or associated country, or in a third country, may participate in an indirect action.[134]

[130] Financial instruments are also used under FP7, but the focus of this fiche is on grant support. Financial instruments under the FP7, especially the RSFF, is reviewed in the subsequent fiche.

[131] Regulation (EC) No 1906/2006 of the European Parliament and of the Council of 18 December 2006 laying down the rules for the participation of undertakings, research centres and universities in actions under the Seventh Framework Programme and for the dissemination of research results (2007-2013), Art. 33

[132] Decision No 1982/2006/EC of the European Parliament and of the Council of 18 December 2006 concerning the Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007-2013), Annex 1

[133] Decision No 1982/2006/EC of the European Parliament and of the Council of 18 December 2006 concerning the Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007-2013), Annex 1, Recital 29

[134] Regulation (EC) No 1906/2006 of the European Parliament and of the Council of 18 December 2006 laying down the rules for the participation of undertakings, research centres and universities in actions under the Seventh Framework Programme and for the dissemination of research results (2007-2013), Art. 4

	The minimum conditions for indirect actions shall be the following: (a) at least three legal entities must participate, each of which must be established in a Member State or associated country, and no two of which may be established in the same Member State or associated country; (b) all three legal entities must be independent of each other.[135]
Implementation level	EU
Implementing body	FP7 is implemented through specific programmes (see below) which are implemented by DG RTD – the Ideas programme is implemented by the ERC.
Total budget	Max. Union financial participation in shall be €50,521 million. For each programme this is distributed as follows: • Cooperation €32,413 million • Ideas €7,510 million • People €4,750 million • Capacities €4,097 million • Non-nuclear actions of the Joint Research Centre €1,751 million
Eligible activities (types and scale)	Specified in the relevant work programme. The maximum reimbursement rates to the costs of a project depend on the funding scheme, the legal status of the participants and the type of activity.

[135] Ibid., Art. 5. However, pursuant to Art. 12 specific programmes or work programmes may lay down conditions regarding the minimum number of participants. They may also lay down, according to the nature and objectives of the indirect action, additional conditions to be met as regards type of participant and, where appropriate, place of establishment.

	• The standard reimbursement rate for research and technological development activities is 50%. Certain legal entities can receive up to 75% (non-profit public bodies, SMEs, research organisations, higher education establishments). For demonstration activities, the reimbursement rate may reach 50%. • For other activities (consortium management, networking, training, coordination, dissemination etc.), the reimbursement can be up to 100% of the eligible costs. The 100% rate applies also to frontier research actions under the European Research Council.

Climate change relevance

Rationale

The key rationale for FP7 is to enable the Union to meet new scientific and technologic challenges by making the European research system more efficient and effective and using the leverage effect by triggering national and private investments. This is aimed to contribute to *inter alia* finding solutions to climate change and sustainability.[136]

Activities

Most relevant for climate objectives is the 'Cooperation' programme's theme 5 'Energy' which provides support to the following overall FP7 objective: 'Adapting the current energy system into a more sustainable one, less dependent on imported fuels and based on a diverse mix of energy sources, in particular renewables, energy carriers and non polluting sources; enhancing energy efficiency, including by rationalising use and storage of energy; addressing the pressing challenges of security of supply and climate change, whilst increasing the competitiveness of Europe's industries.'[137]

Activities funded under the 'Energy' theme include: Hydrogen and fuel cells, Renewable electricity generation, Renewable fuel production, Renewables for heating and cooling, CO2 capture and storage technologies for zero emission power generation, Clean coal technologies, Smart

[136] Decision No 1982/2006/EC of the European Parliament and of the Council of 18 December 2006 concerning the Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007-2013), Recital 25

[137] Work Programme 2010 Cooperation Theme 5 ENERGY (European Commission C(2009) 5893 of 29 July 2009)

energy networks, Energy efficiency and savings. Total energy theme: €2,350 million

The Environment (including Climate Change) theme aims to better understand and cope with issues such as climate change and identify environmentally friendly technologies in order to improve our management of both natural and man-made resources. Total environment / climate theme: €1,900 million.

Coordination and coherence with other EU instruments

It was aimed that FP7 should in particular secure the appropriate involvement of SMEs through concrete measures and specific actions for their benefit. Innovation and SME-related activities supported under FP7 should be complementary to those undertaken under the Competitiveness and Innovation Framework Programme.[138] FP7 funds were also used to establish and run other financial instruments such as the RSFF.

Lessons learnt

In 2009, a progress report published by the Commission on the 2007-2013 FP7 took account of, *inter alia*, its contribution to sustainable development[139]. It noted that the first two years of the FP7 resulted in 44% of the Cooperation programme's budget being allocated to research in support of the renewed EU Sustainable Development Strategy, mainly through projects targeting the environment, energy and food, agriculture and biotechnology themes.

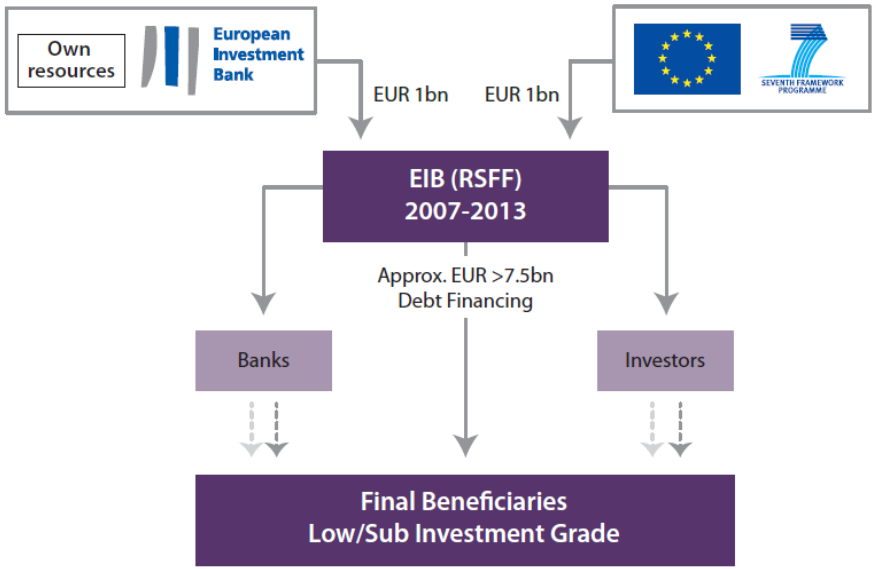
A 2010 interim evaluation of the framework programme was concluded by an Expert Group in November 2010, following a public consultation process between July and August 2010. The evaluation identified concrete positive effects of the FP7 including wide diversity and high quality of projects under both Cooperation and People programmes, the establishment of research infrastructure as well as leverage in promoting national research efforts. It noted, however, that tackling excessive administrative burdens, boosting female participation and ensuring the involvement of industry need to be further improved. The evaluation also raised additional issues regarding the coordination of EU and

[138] Decision No 1982/2006/EC of the European Parliament and of the Council of 18 December 2006 concerning the Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007-2013), Recital 22

[139] COM(2010)209

national research activities, low success rates which appear to be territorially differentiated and the ultimate impact of research for the benefit of society.[140]

[140] Expert Group (2010) Interim Evaluation of the Seventh Framework Programme: Final Report, 12.11.2010, Brussels

7th Framework Programme for Research (FP7)	
Risk Sharing Finance Facility (RSFF)	
Instrument type	FI - loans and guarantees Generally, the RSFF provides funding of up to a maximum of 50% of the project costs, although it can be higher in some cases. The beneficiary must provide the other 50% from own resources or other investors. *Structure of the RSFF*  *Source: European Commission (2011) research*eu focus magazine, No 10, June 2011, ftp://ftp.cordis.europa.eu/pub/news/research-eu/docs/focus-10_en.pdf*

Objective and rationale of the instrument	The preamble of the cooperation agreement on the Risk-Sharing Finance Facility between the EC and the EIB outlines the major objectives of the facility, namely: • 'the EIB is setting up the RSFF, an instrument aimed at fostering investment for Europe in research, technological development and demonstration, as well as innovation, in particular in the private sector' • 'the EC financial contribution will allow for a larger volume of EIB lending and guarantees for a certain level of risk, and the financing of riskier European RTD Projects than would be possible without such Community support' The primary objectives of RSFF are to foster private investment in RDI in the EU Member States and associated countries through improved access to loan finance. This should be achieved through the financing of innovative companies of any size and ownership for RDI implementation in line with FP 7 objectives. Furthermore, RSFF access should be ensured in all Member States and Associated Countries and, in particular, the implementation of European projects (Joint Technology Initiatives, Eureka) and European Research Infrastructures should be supported. Ultimately, a leverage effect with the EC budget resources of the FP 7 should be achieved.[141] In addition to leverage EIB funding, the RSFF also encourages private investors, such as commercial banks and investment funds, to participate in funding selected RDI projects by providing confidence in the project as a result of the EIB's expertise in evaluating the creditworthiness of complex and high-risk projects.[142]
Target group/ Final Beneficiary	RSFF financing is provided to promoters of eligible RSFF projects, i.e. private and public entities of all sizes and ownership, including Midcaps, Small and Medium-sized Enterprises (SMEs), Special Purpose Companies, Joint Ventures, PPP's Research Institutes, Universities, Science and Technology Parks, Joint Technology Initiatives as well as Partners collaborating under European Technology Platforms and Eureka. Beneficiaries under RSFF financing will be required to present a coherent business plan confirming their capacity to repay RSFF financing. The EIB will under RSFF provide or guarantee loans with higher risk profiles compared to its normal financing activities.[143]

[141] EIB (2010) Operations Evaluation: Evaluation of Activities Under the Risk Sharing Finance Facility (RSFF), p. 6.
[142] European Commission (2011) research*eu focus magazine, No 10, June 2011, ftp://ftp.cordis.europa.eu/pub/news/research-eu/docs/focus-10_en.pdf.
[143] EIB (2010) The EIB Risk Sharing Finance Facility (RSFF): Additional Debt Capacity to Support European Innovation, Information Note, EIB, November 2010, Luxembourg: EIB.

Implementation level	EU
Implementing body	Based on its own financial evaluation and in accordance with its credit risk policy guidelines, the EIB assesses – on a project-by-project basis – the level of financial risks for which it is required to set aside provisioning and capital allocation (for expected and unexpected loss), in accordance with normal banking rules. The Commission is represented in the RSFF Steering Committee which oversees the implementation of the instrument in accordance with the policy objectives of the instrument.
Total budget	The pooling of the EU contribution of €1 billion from the FP7 budget and the EIB contribution of €1 billion from its own resources provides a capital cushion to cover potential losses incurred for the financing of estimated EUR 10 billion of loans or guarantees over the period 2007-2013. In this way, every euro provided by the partners translates into five euros of RDI investment.[144]
Eligible activities (types and scale)	Risky projects in the field of Research, Development and Innovation (RDI). Projects that receive RSFF support can cover all sectors. Funded sectors notably include ICT technologies, life sciences, energy, and industrial engineering. The RSFF is also supporting EU research initiatives such as technology platforms and 'Joint technology initiatives' (JTI).[145] Financing up to 50% of eligible costs, very flexible Not more than 300 million per project
Climate change relevance **Rationale** The RSFF aims to bridge gaps in access to capital for RDI projects by reducing the risks via direct loans or loan guarantees. The gaps were not specifically defined when the instrument was set up. The major objective was to increase funding for RDI activities in Europe as overall RDI	

[144] European Commission (2011) research*eu focus magazine, No 10, June 2011, ftp://ftp.cordis.europa.eu/pub/news/research-eu/docs/focus-10_en.pdf.
[145] European Commission (2011) research*eu focus magazine, No 10, June 2011, ftp://ftp.cordis.europa.eu/pub/news/research-eu/docs/focus-10_en.pdf.

spending in Europe was lower than in other parts in the world. In addition there were differences within Europe. These gaps were to be addressed without targeting specific policy areas or risk profiles.

Activities

The Facility is open to all RDI projects and is not currently aimed specifically at innovations in the areas of climate change and energy. 'Nonetheless, given its characteristics it provides a particularly appropriate model for the energy sector where returns to investments are high but the costs, time lags and risks are often also too high, in particular for renewables, to transpose research results to commercially viable and profitable technologies.' [146]

Any RDI project may be eligible and therefore all climate related activities could be eligible. In practice, it will be mostly energy related projects.

Case study 1: Andasol Solar Thermal Power 1 & 2[147]
Total cost: EUR 594 000 000
RSFF financing: EUR 120 000 000
Signature date: 22 June 2006
Beneficiary: Andasol-1 Central Termosolar Uno S.A., Andasol-2 Central Termosolar Dos S.A.
A partnership of Spanish and German companies used RSFF funding to build the latest generation of solar thermal power plants in Europe. Incorporating innovative technical approaches, the Andasol project raises operating efficiencies and reduces costs, thus helping meet EU targets for renewable energy sources and combating climate change.

By an RSFF loan, the first large-scale commercial solar thermal power plant in Europe - Andasol-1, was constructed and came online in the Spanish province of Granada in December 2008. This new power plant uses innovative parabolic trough technology which concentrates the sun's rays to produce heat that is converted to electricity. Andasol-1 is one of the flagship projects of the RSFF. Incorporating European innovations into solar power generation, the RSFF helped the industrialisation of a new European technology, which involved many other EU companies in its development and construction. The success of the RSFF-supported Andasol-1 demonstrator led directly to plans for

[146] Withana, S., Núñez Ferrer, J., Medarova-Bergstrom, K., Volkery, A., and Gantioler, S. (2011) Mobilising private investment for climate change action in the EU: The role of new financial instruments, IEEP, London/Brussels.
[147] European Commission (2011) research*eu focus magazine, No 10, June 2011, ftp://ftp.cordis.europa.eu/pub/news/research-eu/docs/focus-10_en.pdf

expansion. Andasol-2 has been built and commissioned and the EIB has since financed other innovative CSP projects, such as Abengoa's PS 10 and PS 20, Solnova 1 and 3, Gemasolar and a number of additional operations in this sector which are under preparation. Significantly, much of this expansion is funded by private sector sources of finance – demonstrating the leverage effect of the original RSFF investment.

Case study 2: Car efficiency and safety RDI[148]
Total cost: EUR 645 000 000
RSFF financing: EUR 300 000 000
Signature date: 30 July 2009
Beneficiary: Valeo
The EUR 300-million RSFF loan secured by Valeo supports this vision, maintaining the company's leading position and building competitiveness. 'This funding is very important, particularly during the current [economic] crisis,' said Valeo CEO Jacques Aschenbroich at the loan signature event, 'and it will allow Valeo to continue and accelerate existing research projects aimed at improving fuel efficiency and active safety for vehicles.' Valeo's RDI is contributing to its customers' effort to meet CO2 emission legislation, and it also supports the European efforts to fund the development of new-generation vehicle technologies.

Leverage effect

The demand for RSFF loans to finance RDI projects exceeds the initial projections by far, with 87 approved loans for a total amount of €8.7 billion, and 63 signed loans amounting to €6.3 billion by the end of 2010.[149] In their mid-term evaluation report of 2010 the EIB notes that the leverage achieved as of end 2009 reached the factor 14 triggering some EUR 16.2 bn of investments in research.[150] The leverage factor is defined as ratio of the money spent (in addition to the capital provided from EU funds) and the capital provided from EU funds. The determination of the leverage factor depends however on several assumptions for its calculation. Taking account of the FP7 contribution only (EUR 1 billion) and not the EIB contribution (EUR 1 billion) leads to higher leverage factor. In addition it depends on the time period considered, i.e. whether only spent funding is taken into account.

In general, it is worth noting that the risk profile of projects will ultimately affect the leverage effect. The higher the risk profile of projects, the

[148] European Commission (2011) research*eu focus magazine, No 10, June 2011, ftp://ftp.cordis.europa.eu/pub/news/research-eu/docs/focus-10_en.pdf
[149] European Commission (2011) research*eu focus magazine, No 10, June 2011, ftp://ftp.cordis.europa.eu/pub/news/research-eu/docs/focus-10_en.pdf
[150] EIB (2010) Operations Evaluation: Evaluation of Activities Under the Risk Sharing Finance Facility (RSFF).

lower the leverage factor as higher guarantees are required for the financing of the project.

Coordination and coherence with other EU instruments

The Impact Assessment accompanying the SET Plan mentions the risk that technologies which have an industrial chain which is ready to absorb the increased investment (e.g. CCS, wind or solar) could crowd out technologies at an earlier stage of the supply chain (e.g. ocean wave energy). There is thus a risk that profitable ventures use the resources of the RSFF unnecessarily.[151]

The Independent Expert Group (IEG) assembled to evaluate the RSFF proposed a new regional scope by blending Structural Funds resources with lending from the EIB or other intermediaries which could help raise the effectiveness of regional policies and in particular regional RDI investments. Such an approach would be particularly helpful in regions where local banks remain unwilling to invest in riskier projects.[152]

Lessons learnt

Promoting climate change activities was not a key aspect of the instrument. In general, providing access to risk capital was the key success factor.

According to a mid-term evaluation by an Independent Expert Group (IEG), the impact of the RSFF could have been bigger taking account of the market needs for a higher volume of risk based financing. Since the EIB is intrinsically limited in its risk-taking capacity given its reputation in the financial market and its extensive risk-taking coverage the IEG proposed that the RSFF authorities reflect on opportunities to utilise part of the EC contribution within the present RSFF Agreement as a first-loss piece[153] for specific sub-sectors e.g. for some target groups like Research Infrastructures and SMEs.[154] This may also be of particular concern for promoting high risk low carbon technologies in the early stage

[151] Withana, S., Núñez Ferrer, J., Medarova-Bergstrom, K., Volkery, A., and Gantioler, S. (2011) Mobilising private investment for climate change action in the EU: The role of new financial instruments, IEEP, London/Brussels.
[152] Mann, E., et al. (2010) Mid-Term Evaluation of the Risk-Sharing Finance Facility (RSFF): Final Draft of the Group of Independent Experts.
[153] The EC contribution would be used first to cover potential losses for a portfolio of loans provided to a specific target group, up to a defined percentage of losses ("first-loss" cushion). Only if potential losses were to exceed the EC contribution, the EIB contribution to the RSFF would be used to cover such further losses on an agreed basis.
[154] Mann, E., et al. (2010) Mid-Term Evaluation of the Risk-Sharing Finance Facility (RSFF): Final Draft of the Group of Independent Experts.

of development. It may also be a way to address "the inherent conflict between EIB banking prudency rules and EC disbursement considerations"[155] due to the fact that most of the ultimate financial risk is borne by the EIB.

The IEG in their a mid-term review of FP7 recommends potentially putting in place a 'renewed RSFF' for the post-2013 period with a budget of €5 billion. In a response to this evaluation the Commission welcomes the objectives of the recommendations of the IEG regarding the next programming period (post-2013). It notes that they are in compliance with the objectives of the Innovation Union Communication to enhance access to finance; attract a major increase in private finance; and make more extensive use of financial engineering instruments in support of innovation. At the time analysis is on-going on how to concretely fund an expansion of the scope of the RSFF to allow for an increase of risk sharing for both R&D and innovation projects and how the EU shall be able to finance and support the implementation of ambitious new objectives (like the SET Plan), including Europe 2020 Flagship Initiatives like Digital Agenda or Resource efficient Europe.[156]

The debt facility proposed as part of the new Horizon 2020 should be one element in continuing the RSFF as part of the new overall framework for Horizon 2020 in order to streamline and simplify the instrument. This should have a demand driven dimension on a 'first come first served'-basis, but also a policy driven dimension to ensure that it contributes to specific policy objectives such as climate mitigation and adaptation. Explicit climate related objectives may help to ensure that a higher share of the investments go into low carbon investments. However, too specific targets may lead to money unspent and not sufficient flexibility overtime to adapt the programme. For example, under the existing RSFF it was decided in 2012 to set money aside to facilitate funding of SMEs. This was only possible as the legal basis of the RSFF was sufficiently broad in scope.

[155] EIB (2010) Operations Evaluation: Evaluation of Activities Under the Risk Sharing Finance Facility (RSFF), p. vi.
[156] COM(2011) 52 final

Competitiveness and Innovation Framework Programme (CIP)	
The Intelligent Energy Europe II Programme (IEE)	
Instrument type	IEE provides grants (through call for proposals), procurement (through call for tenders) and project development services.
Objective and rationale of the instrument	As noted in the CIP Decision, the IEE should provide for action to: foster energy efficiency and the rational use of energy resources; promote new and renewable energy sources and support energy diversification; and promote energy efficiency and the use of new and renewable energy sources in transport.[157] The operational objectives of the Programme are to: [158] • Support the improvement of sustainability, the potential of cities and regions, preparation of the legislative measures to attain the related strategic objectives; develop means and instruments to follow up, monitor and evaluate the impact of adopted measures; • Boost investment in new and best performing technologies in the fields of energy efficiency, renewable energy sources and energy diversification, including in transport, by bridging the gap between successful demonstration of innovative technologies and their market uptake; • Remove non-technological barriers to efficient and intelligent patterns of energy production and consumption by promoting institutional capacity building at inter alia local and regional level. According to the IEE's performance report the programme forms the link from R&D to mass deployment, by means of activities aimed at accelerating the market uptake of energy innovations.[159]
Target group/ Final	Any legal entity, whether public or private, established in the territory of the EU Member States, Norway, Iceland, Liechtenstein, Croatia, or the Former Yugoslav Republic of Macedonia. Legal entities established in other countries are eligible as well if the

[157] Decision N° 1639/2006/EC of the European Parliament and of the Council of 24 October 2006 establishing a Competitiveness and Innovation Framework Programme (2007 to 2013) - OJ L 310/15, 09.11.2006

[158] Decision N° 1639/2006/EC of the European Parliament and of the Council of 24 October 2006 establishing a Competitiveness and Innovation Framework Programme (2007 to 2013) - OJ L 310/15, 09.11.2006

[159] IEE (2012): Intelligent energy Europe II: performance report (2007-2011), http://ec.europa.eu/energy/intelligent/files/doc/reports/iee-ii-performance-report-2007-2011-final_en.pdf

Beneficiary	relevant country has undertaken the necessary steps to join the IEE II programme.
Implementation level	EU
Implementing body	Executive Agency for Competitiveness and Innovation (EACI)
Total budget	The total budget allocated for implementation of the IEE II Programme for the period 2007-2013 is €**730 million** within an overall CIP budget of €3.6 billion.
Eligible activities	Different strategies have been adopted under the IEE Programme: • The SAVE strand focuses on energy efficiency and a rational use of resources, in particular for the building and industry sectors. • The ALTENER action is designed to help promote new and renewable energy resources in the production of electricity, heat and cooling. • The STEER strategy is directed toward the promotion of energy efficiency and renewable energies in the transport sector. • Integrated Initiatives allow addressing energy efficiency and renewable sources altogether. Grants can be used to cover up to 75% of the project's costs. Applicants have to respond to calls for proposals which are published annually. The eligibility, selection and award criteria are set out clearly in each call.

Climate change relevance

Rationale

IEE II focuses on the non-technical barriers to the market uptake, promotion and dissemination of energy technologies. Stakeholders consulted for the final evaluation of the IEE stated that in general awareness raising and education, building capacity and skills, boosting investments and support to policy development and implementation were perceived as the major needs related to energy efficiency and renewable energy in Europe. Given

the objectives of the actions supported under the IEE, the final evaluation of the programme concluded that it tackles the needs and problems related to the slow uptake of sustainable energy technologies in Europe by supporting activities in the fields of policy support, capacity building, dissemination and promotion and market replication projects.[160]

The main added-value of the programme is reported to be the transnational dimension of the action supported, the transfer of knowledge and best practices from more advanced Member States in energy issues to less advanced Member States and the combination of actions.[161]

Activities

The IEE II programme was used for climate change objectives as the overall objective of the programme is to foster a more sustainable energy system by addressing non-technical barriers. The supported actions aim to develop, apply, share and replicate sustainable energy solutions with a high leverage factor in EU sustainable energy markets.

The priorities for such solutions have been to change behaviours, leverage investment and accelerate progress towards the 2020 energy targets, by implementing actions which:

- create favourable market conditions;
- shape policy development and implementation;
- prepare the ground for investments;
- build capacity and skills;
- inform stakeholders and foster commitment.

The IEE performance report include the following case studies: [162]

[160] Deloitte (2011) Final Evaluation of the Intelligent Energy-Europe II Programme within the Competitiveness and Innovation Framework Programme – Final report for Directorate-General for Energy

[161] Deloitte (2011) Final Evaluation of the Intelligent Energy-Europe II Programme within the Competitiveness and Innovation Framework Programme – Final report for Directorate-General for Energy

'To address the specific requirements of the on-site construction work force, a new BUILD UP Skills initiative was launched in 2011 following its announcement in the new Energy Efficiency Plan. The response exceeded expectations with 21 countries (and as many projects) committing to developing a national roadmap for the qualification and training of their construction craftsmen within 18 months.'

'The QUALICERT project developed common success criteria for certification (or equivalent qualification) schemes for installers of biomass stoves and boilers, shallow geothermal energy systems, heat pumps, photovoltaic and solar thermal systems, with a view to achieving mutual recognition across the EU, in line with Article 14 of the Renewable Energy Sources (RES) Directive. The project has stimulated businesses and strengthened local entrepreneurship (notably in SMEs) by training and qualifying installers across the EU. It has also helped to ensure higher quality installations and eventually a more reliable and transparent market.'

'The Ecoheat4EU project5 contributed to improve the legislative environment for district heating and cooling (DHC) across Europe. The project surveyed and analysed support legislation for DHC and produced 14 national DHC roadmaps. Additionally, a 'DH Barometer' was set-up in order to measure and monitor the development of DH on national markets so that the success of support measures can be assessed. The project results were widely disseminated at EU and national level at a time when the proposed Energy Efficiency directive put a special emphasis on the important role of district heating and cooling.'

Target group/ beneficiaries

According to the IEE performance report published in May 2012, between 2007 and 2011, public bodies represent roughly a third of the IEE promotion and dissemination projects beneficiaries and the other two thirds are private entities including important European, national and regional intermediaries as well as businesses. On average about 45 % of all beneficiaries are SMEs. [163] The uptake by final beneficiaries seems very good with 3.500+ applicants per year.[164]

[162] IEE (2012) Intelligent energy Europe II: performance report (2007-2011), http://ec.europa.eu/energy/intelligent/files/doc/reports/iee-ii-performance-report-2007-2011-final_en.pdf
[163] IEE (2012) Intelligent energy Europe II: performance report (2007-2011), http://ec.europa.eu/energy/intelligent/files/doc/reports/iee-ii-performance-report-2007-2011-final_en.pdf
[164] IEE: Energy efficiency and Renewable energy, http://ec.europa.eu/energy/intelligent/files/doc/iee_at_a_glance_2011_en.pdf

Coordination and coherence with other EU instruments

The final evaluation of the IEE concludes that there is evidence of interactions and synergies between IEE II and other EU initiatives in the area of sustainable energy development, these include synergies in the management of IEE II and of certain related EU initiatives and programmes and synergies concerns sharing of knowledge, mainly through inter-service consultations and joint communication to beneficiaries with other EU initiatives such as FP7 or the SF/CF. The final evaluation also notes that there are concrete links between projects, e.g. coordinated communication between IEE II and other EU programmes, and certain projects directly link to other EU programmes like the Structural Funds. IEE II is said to complement existing programmes in sustainable energy (research or physical investment programmes). There are however also some potential overlaps between IEE II, the SF/CF, and the LIFE+ programme e.g. The SF/CF include funding for creation of networks and promotion/mainstreaming of best practices (e.g. Interreg IVC may have overlaps with IEE for projects such as RECORA, REGENERGY, REGIOSUSTAIN, ENERCYREGIO, or OKOPROFIT); LIFE+ has a climate change section under which energy projects similar to IEE are undertaken.[165]

Monitoring and reporting

According to the final evaluation of the IEE II programme within the CIP, In order to monitor the projects, the EACI has put in place a series of indicators to help identify the project's contribution to the overall performance of the programme. For this purpose, project coordinators are asked first to set the objectives of their action by defining specific (during the action) and strategic (for the long term – to 2020) objectives. Based on these objectives, project coordinators are then asked to assess the expected impact of the action. They have to formulate specific energy-related impacts and suggest performance indicators to measure them. Performance indicators should be described and quantified according to the SMART principle (specific, measurable, achievable, relevant and time-bound). [166]

Since Work Programme 2011, the expected specific energy-related impacts of the projects within its duration and by 2020 have to be summarised using a set of performance indicators, which are common to all IEE II actions. the set of performance indicators related to: [167]

- Cumulative investment made by European stakeholders in sustainable energy (measurement in EUR)

[165] Deloitte (2011) Final Evaluation of the Intelligent Energy-Europe II Programme within the Competitiveness and Innovation Framework Programme – Final report for Directorate-General for Energy

[166] Deloitte (2011) Final Evaluation of the Intelligent Energy-Europe II Programme within the Competitiveness and Innovation Framework Programme – Final report for Directorate-General for Energy

[167] Deloitte (2011) Final Evaluation of the Intelligent Energy-Europe II Programme within the Competitiveness and Innovation Framework Programme – Final report for Directorate-General for Energy

- Renewable energy production triggered (measurement unit toe/year)
- Primary energy savings compared to projection (measurement unit toe/year)
- Reduction of greenhouse gas emissions (measurement unit t CO2e/year)

The majority of the interviewees that responded to the survey for the purpose of the evaluation of the IEE II programme recognised that measurable impact at programme level is necessary, but were of the opinion that that it is too difficult to quantify these four performance indicators, in particular if the project is about removing non-technical barriers or "soft measures" such as behaviour change, promotion and dissemination of good practices, training and education.

Main policy outcomes

Policy outcomes at programme level have so far not been quantified. This may also be challenging given the programme's focus on the removal non-technical barriers and soft measures. Policy outcomes include the sharing of best practices across borders and thus enable transnational learning at local and regional.

An assessment of the effectiveness of the actions supported under the programme demonstrates that the activities co-funded/funded by the programme are likely to reach their objectives and to achieve expected results and lasting effects.[168]

Lessons learnt

The final evaluation of the IEE II concludes that the programme is relevant and addresses the evolving needs, problems and barriers related to sustainable energy in Europe. This is due to the combination of the actions under the programme which covers a wide range of priorities, the involvement of different type of actors which can influence the uptake of sustainable energy solutions, the combination of market solution oriented projects and projects targeting policy adaptation as well as the influence of the IEE II actions at different moments of the market cycle. A survey

[168] Deloitte (2011) Final Evaluation of the Intelligent Energy-Europe II Programme within the Competitiveness and Innovation Framework Programme – Final report for Directorate-General for Energy

showed that IEE II is perceived by the project participants as a less burdensome in terms if administrative requirements than other EU funding programmes such as INTERREG, FP7, or structural funds. [169]

The final evaluation of the CIF found that the design of the IEE Programme was such that it was difficult to validate its distinctive contribution and suggested that the definition of objectives, the determination of anticipated impacts, the formulation of indicators and the establishment of a baseline be reconsidered. This would include stronger upfront prioritisation and programming from a climate policy perspective. Climate adaptation may play a more prominent role in future similar programmes.

Other potential improvements may include:

- Strengthening the focus on bridging the gap between EU-15 Member States and EU-12 Member States in sustainable energy issues;
- Promoting more and strengthening Concerted Actions. Their success lies not only in the transposition of EU legislation, but also in its implementation;
- Strengthening synergies with the Structural Funds/Cohesion Funds – the key issue being the creation of funding opportunities for investments in sustainable energy;
- Strengthening the link of IEE II supported actions and activities linked to investments and demonstrations (which should not fall into the scope of the IEE support);

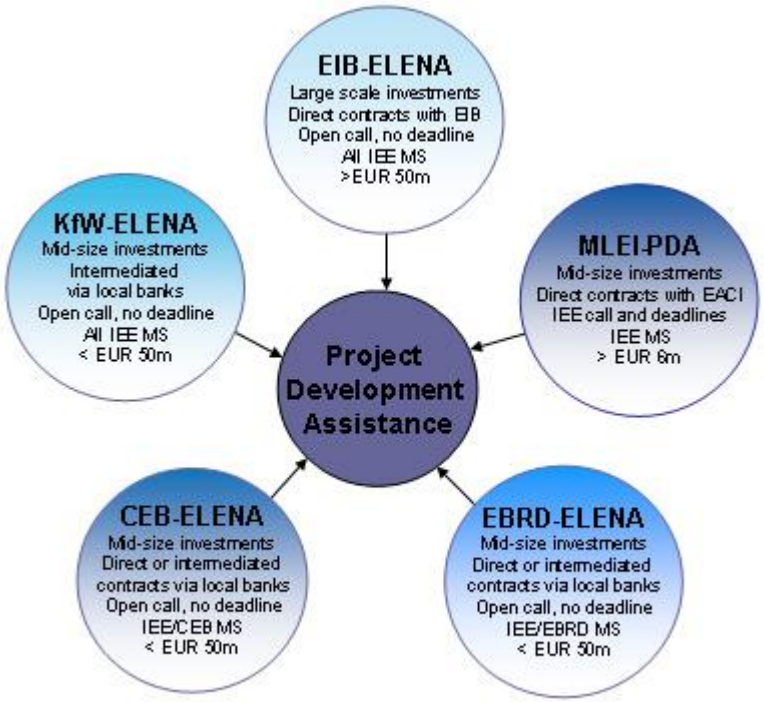
The budget of the programme could be further increased to better facilitate achievement of the overarching objectives of the programme, especially given the limited time remaining to achieve these before 2020 and the delays incurred to date vis-à-vis certain sustainable energy development objectives. [170]

[169] Deloitte (2011) Final Evaluation of the Intelligent Energy-Europe II Programme within the Competitiveness and Innovation Framework Programme – Final report for Directorate-General for Energy

[170] Deloitte (2011) Final Evaluation of the Intelligent Energy-Europe II Programme within the Competitiveness and Innovation Framework Programme – Final report for Directorate-General for Energy

Intelligent Energy Europe (IEE) programme	
European Local Energy Assistance (ELENA)	
Instrument type	Grant for technical assistance
Objective and rationale of the instrument	The first ELENA facility was launched by the European Commission and the European Investment Bank (EIB) in December 2009 to support more than €1 billion of energy efficiency and renewable energy projects in 2010. To do so it is providing to help cities and regions implement viable investment projects in the areas of energy efficiency, renewable energy and sustainable urban transport. Urban areas represent around 70% of the energy consumption of the EU. The ELENA facility is designed to help cities and regions unlock this potential by providing technical assistance to structure and implement projects in the most efficient way so they can attract finance from local banks or other sources, such as EIB. The technical assistance is funded from the Intelligent Energy Europe II (IEE) programme.[171] As of 2012 the following four ELENA facilities are in place: • EIB-ELENA (the first facility to be established) • KfW-ELENA • CEB-ELENA • EBRD-ELENA In addition, the IEE manages a similar Project Development Assistance fund, the MLEI-PDA. Depending on the facility eligible projects are of different size and the delivery mechanism (direct loan or via intermediaries) varies:

[171] http://www.eib.org/about/press/2010/2010-046-eib-european-commission-support-eur-1-bn-investment-by-cities-regions-in-energy-efficiency-renewables.htm

	 **Project development assistance facilities under the IEE Programme** *Source: EC IEE, http://ec.europa.eu/energy/intelligent/getting-funds/elena-financing-facilities/index_en.htm*
Target group/ Final Beneficiary	Final Beneficiaries are local or regional authorities, including members of the Covenant of Mayors Initiative (www.eumayors.eu), or associations of such bodies, mainly in the small and medium-sized range, and other Public Bodies lending support to such bodies. Financial institutions such as local banks can be intermediary beneficiaries.

Implementation level	EU
Implementing body	ELENA facilities are implemented by the bank operating the facility except for MLEI-PDA which is directly managed by the Commission's EACI. In case of the facilities (KfW-ELENA, CEB-ELENA, EBRD-ELENA) providing loans via intermediated local banks these are part of the implementing structure.
Total budget	As of July 2012 €49 million were committed under the IEE programme.[172]
Eligible activities (types and scale)	ELENA covers up to 90% of the technical support cost needed to prepare, implement and finance the investment programme. This could include feasibility and market studies, programme structuring, energy audits and tendering procedure preparation. With solid business and technical plans in place, this will also help attract funding from private banks and other sources, including the EIB.[173] Eligible investments may cover buildings, transport and infrastructure in relation to renewables and energy efficiency. The investment programmes supported by the facility shall contribute to achieving the 20-20-20 objectives.

Climate change relevance

Rationale

The instrument provides technical assistance to address market failures due to administrative barriers or information gaps. The instrument aims to bring together local and regional authorities and relevant actors to identify bankable projects in the area of energy efficiency and renewable energy. It provides support to all activities necessary to prepare and mobilise investments into these projects. This may include feasibility studies, stakeholder and community mobilisation or the preparation of procurement procedures.

[172] EIB: The European Investment Bank ELENA – European Local ENergy Assistance, http://www.eib.org/attachments/thematic/elena_en.pdf
[173] http://www.eib.org/products/elena/index.htm

Activities

The instrument is exclusively used for climate related projects in the area of renewable energy and energy efficiency. One of the selection criteria requires the project to contribute to the 2020 climate and energy targets.

Eligible investments may cover buildings, transport and infrastructure in relation to renewables and energy efficiency. All investments must contribute to achieving the 20-20-20 objectives.

Case study 1[174]
Region: Zealand, Denmark
Sector: Energy Efficiency, renewable Energy
ELENA contribution: EUR 2,495,520
The 11 participating municipalities of the region, that have joined the Covenant of Mayors, have each committed to a reduction of over 20 % of their current emissions by 2020.
ELENA operation:
Region Zealand will set up the required technical and contractual Support Unit and advisory system, in order to support the municipalities of the region and the region itself in establishing the framework and conditions for the implementation of their investments in RES and EE. 3 members of staff will be recruited. Investment programme description:

- RE Electricity Production. The region and 10 of the 12 participating municipalities wish to set up photovoltaic installations on their public buildings.
- RE Heat Production. Development of opportunities in suitable locations and technical support for possible projects in the area of renewable energy from surface based geothermal heat pumps, attached to specific buildings.
- Building stock insulation. The investment will be implemented directly through contracts between the municipalities and construction companies.
- Regulation and replacement of inefficient installations. The investment will be implemented directly through contracts between the municipalities and construction companies.
- Hospitals Equipment. Investments combining PV and possibly solar thermal installations as well as the EE in the associated buildings.

[174] EIB Project Factsheet "Renewable Energy and Energy Efficiency in Zealand – REEEZ", 22 February 2012, http://www.eib.org/attachments/documents/reeez_project_factsheet_en.pdf

Investment to be mobilized: EUR 62.4 million
Energy Efficiency – Annual total energy saved 43 GWh.
Renewable Energy – 5 GWh.
CO2 reductions – Annual total reductions of CO2 emissions 15 281 CO2 eq t.
Leverage factor: 25

Coordination and coherence with other EU instruments

Several selection criteria aim to ensure coordination and coherence with other instruments. These include that a project must demonstrated added value for the EU, in particular with respect to energy policies (2020 targets). Moreover it is verified that ELENA is not used for investment programs that can be more effectively supported by other EU funds. Otherwise, the applicant must prove that the use of ELENA is the most appropriate course of action. In addition funding is only provided if no other EU assistance is available for the same beneficiary and the same purpose.[175]

Policy outcomes

According to a mid-term evaluation by Deloitte, signed and approved projects as of February 2011 are expected to lead to reduction of 0.5 Mtonnes CO2 per year plus energy savings of nearly 1 TWh per year and additional other environmental improvements such as reduction of air pollution within the cities. Direct and indirect jobs created during the implementation and lifetime of the investment programmes is estimated to 25.400 person-years if fully achieved. The current pipeline comprises 23 projects with a good distribution on sectors, and a majority of projects with investments in multiple sectors. The total potential investment is EUR 3.7 billion.[176]

Leverage effect

All ELENA facility requires a minimum leverage factor for each project. Under the first ELENA facility the required leverage factor is 25, under the new ELENA facilities the required leverage factor is reduced to 20 (15 for MLEI-PDA) due to an expected decrease in leverage for smaller

[175] EIB: ELENA TECHNICAL ASSISTANCE, http://www.eib.org/attachments/documents/elena-presentation_en.pdf
[176] Deloitte (2011): Ex-ante evaluation of a successor of the "Intelligent Energy – Europe II" (2007-2013). Final report, European Commission, DG Energy, June 8, 2011

investment projects.

Under the ELENA facility EUR 28 million has been invested from IEE which triggered around EUR 1.5 billion of total investment which would mean a leverage factor for current projects of 54. 18 projects with EUR 34 million ELENA funding are in the pipeline worth investments of EUR 2.2 billion.[177]

Lessons learnt

A particular strength of the facility is that it brings together different sectors at an urban and/ or regional scale and hence supports a systemic approach to energy efficiency and renewable energy investments. By doing so it can lead to synergies and increase the contribution of public expenditure to climate policy objectives.

A status report on the IEE programme identified the following barriers relating to the institutional framework[178]:

- A lack of capacity for the preparation of large scale projects.
- Unfamiliarity with requirements of ELENA, in particular the conditional link between technical assistance and underlying investment.
- The low level of communication between different sectors inside the administration.

The following barriers were identified relating to the economic/financial framework:

- Reluctance from public bodies to commit to large investment programmes in short period of time.
- The level of indebtedness and creditworthiness of some local authorities.
- Limited knowledge on alternative financing opportunities.

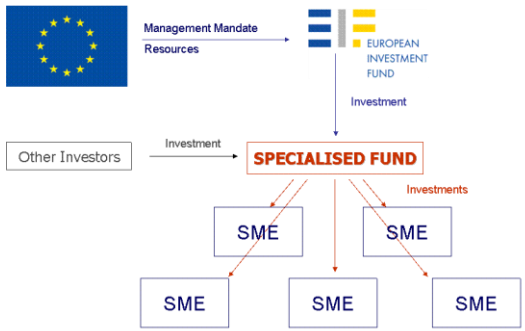
[177] Doubrava, R.: Overview of EU investment support instruments for sustainable energy, http://www.managenergy.net/lib/documents/376/original_08%20R%20Doubrava_EC.pdf

[178] Deloitte (2011): Ex-ante evaluation of a successor of the "Intelligent Energy – Europe II" (2007-2013). Final report, European Commission, DG Energy, June 8, 2011

A survey among representatives from EU institutions expressed the view that the ELENA facility should either be abolished or clearly focused on a specific type of investment. Furthermore, despite some synergies in the mobilisation of investments between ELENA and the other EU funds for direct energy investments (for example the JESSICA SF/CF funds) the limited number of cases is also emphasised as a reason why local energy investment potentials have not yet materialised to a very high extent. Based on that, a number of respondents suggest that more conditionality could be built into the ELENA programme, for example, conditions and plans for applying for regional funds (and/or other EU energy investment funds, for example EEEF). A number of respondents suggested that the ELENA facility should possibly not be co-managed (via sub delegation and contribution agreements) by IFIs as it would be preferable to involve more national and local financial institutions with project development services performed as independently of downstream financing as possible to allow maximum flexibility in support to local mobilisation of financial resources.[179]

Features of the new ELENA facilities may address some shortcomings of the original facility. There is a more direct link between the ELENA support provided under the new facilities and the access to loans for the underlying investments. In fact, a condition for receiving support under the KfW-ELENA facility is that the investments are financed through loans from the KfW and its financial intermediaries, that is, local banks in the Member States that have been selected to act as participating intermediaries. This has the advantage that better guarantees for realising the investments are provided for all projects for which ELENA-KfW support is granted, since the beneficiaries (local governments) can rely on the financial arrangements provided through KfW and therefore do not have to search the local market for available loans after the initiation of projects. Hence, the risk of not being able to mobilise the necessary financial resources for the investments are less than under the first ELENA facility where subsequent loans may, or may not be, provided by the EIB, and usually only for a part of the entire investment. However, it has the disadvantage of fixing the potential sources of funding at a very early stage, as well as of ultimately constituting a form of grant financing linked to loans which requires careful management.[180]

[179] Deloitte (2011): Ex-ante evaluation of a successor of the "Intelligent Energy – Europe II" (2007-2013). Final report, European Commission, DG Energy, June 8, 2011
[180] Deloitte (2011): Ex-ante evaluation of a successor of the "Intelligent Energy – Europe II" (2007-2013). Final report, European Commission, DG Energy, June 8, 2011

Entrepreneurship and Innovation Programme (EIP) under the Competitiveness and Innovation Framework Programme (CIP)	
High Growth and Innovative SME Facility (GIF)	
Instrument type	Financial instrument The GIF consists of[181]: 1. GIF1 which covers early stage (seed and start-up) investments by investing in specialised venture capital funds (i.e. early stage funds, funds operating regionally, funds focused on specific sectors, technologies or research etc.) and other investment vehicles which in turn provide risk capital to innovative SMEs; and 2. GIF2 which covers expansion stage investments by investing in specialised risk capital funds which in turn provide quasi-equity or equity for innovative SMEs with high growth potential. *Figure: Structure of GIF*  *Source: EC*

[181] Decision N° 1639/2006/EC of the European Parliament and of the Council of 24 October 2006 establishing a Competitiveness and Innovation Framework Programme (2007 to 2013) - OJ L 310/15, 09.11.2006

Objective and rationale of the instrument	The overall objective is to improve access to finance for the start-up and growth of SMEs and investment in innovation activities (including eco-innovation). The instrument contributes to the EIP objective of increasing access to finance for the start-up and growth of SMEs.[182] More specifically, the GIF aims to[183]: • Help establish and finance SMEs and reduce the equity and risk capital market gap which prevents SMEs from exploiting their growth potential, with a view to improving the European venture capital market; and • Support innovative SMEs with high growth potential, in particular those undertaking research, development and other innovation activities.
Target group/ Final Beneficiary	Small and Medium Sized Enterprises (SMEs)
Implementation level	EU
Implementing body	Implemented on behalf of the Commission by the European Investment Fund (EIF) via selected financial intermediaries (venture capital funds and business angels). Small businesses contact selected financial intermediaries to gain access to investment capital.[184]
Total budget	The EIP has a budget of €2.17 billion for the 2007-2013 programming period.[185] €1.13 billion of the total EIP budget has been

[182] CSES, EIM (2011) Final Evaluation of the Entrepreneurship and Innovation Programme – Final report April 2011, Framework Service Contract for the Procurement of Studies and other Supporting Services on Commission Impact Assessments and Evaluations Interim, final and ex-post evaluations of policies, programmes and other activities

[183] Decision N° 1639/2006/EC of the European Parliament and of the Council of 24 October 2006 establishing a Competitiveness and Innovation Framework Programme (2007 to 2013) - OJ L 310/15, 09.11.2006

[184] CSES, EIM (2011) Final Evaluation of the Entrepreneurship and Innovation Programme – Final report April 2011, Framework Service Contract for the Procurement of Studies and other Supporting Services on Commission Impact Assessments and Evaluations Interim, final and ex-post evaluations of policies, programmes and other activities

	allocated to FI (of which €228 million has been allocated for eco-innovation).[186] FI instruments receive about ½ of the amount of the EIP allocated to eco-innovation, the rest is allocated to market replication projects.[187] The initial budget allocation to the GIF was €550 million for the 2007-2013 period which increased to **€623 million** with the closing down of the Capacity Building Scheme (CBS)[188] which was foreseen in the CIP legal basis but attracted no response from the market.[189]
Eligible activities	Early stage and expansion stage investments in SMEs.
Leverage effect	The leverage effect of the GIF1 and the GIF2 has been estimated at 6.5.[190] This is according to a definition of leverage effect in the interim evaluation of the EIP which defines leverage as target fund size divided by committed capital, i.e. every 1 EUR of EU investment in venture capital funds (such as the GIF1/GIF2 facility) generates EUR 6.5 for SME financing.[191] The Commission estimates the ex ante leverage effect to be around 1:6 – 1:6.7. This is calculated by dividing the amount put into

[185] CSES, EIM (2011) Final Evaluation of the Entrepreneurship and Innovation Programme – Final report April 2011, Framework Service Contract for the Procurement of Studies and other Supporting Services on Commission Impact Assessments and Evaluations Interim, final and ex-post evaluations of policies, programmes and other activities

[186] EC (2012) Entrepreneurship and Innovation Programme EIP Performance Report, January 2012

[187] Personal communication

[188] The CBS aimed to improve the investment and technology expertise of funds or by enhancing the credit appraisal procedures of financial intermediaries for SME lending. It was to consist of Seed Capital Action and Partnership Action. See Decision N° 1639/2006/EC of the European Parliament and of the Council of 24 October 2006 establishing a Competitiveness and Innovation Framework Programme (2007 to 2013) - OJ L 310/15, 09.11.2006

[189] EC (2012) Entrepreneurship and Innovation Programme EIP Performance Report, January 2012

[190] Technopolis group (2010) Interim Evaluation of the Competitiveness and Innovation Framework Programme (2007 – 2013), Specific Contract No ENTR/A4/04/093/1/09/22 Implementing Framework Contract No ENTR/04/093, Lot 1 - Handbook on Climate-Related Investing across Asset Classes

[191] GHK, Technopolis (2009) Interim Evaluation of the Enterprise and Innovation Framework Programme, Final Report Submitted within the framework of ENTR/04/093-FC-Lot 1 Specific Contract No ENTR/A4/04/093/1/08/18 30th April 2009

	the fund by the EU with the total fund size. The EU contribution is estimated to make up between 15-17% of the total fund size. The actual leverage effect is likely to be much higher when taking into account money made/profits.[192]

Climate change relevance

Rationale

The GIF is underpinned by a strong market failure rational – it aims to address the financial constraints faced by start-up and growing SMEs and the identified market gaps with regard to SMEs access to finance.

In a survey of FI beneficiaries carried out as part of the final evaluation of the EIP, 62% of GIF beneficiaries indicated that the support provided through the GIF was crucial to find the finance they needed, for 39% of GIF beneficiaries it was the only option at all for financing. Thus, the instrument has been successful in addressing the problem of access to finance by SMEs. 32% of GIF beneficiaries active in eco-innovation noted that while other sources of finance were available to them, they preferred the GIF which may reflect the expertise of the fund managers involved and the ease of access to the other forms of support. Approximately 43% of GIF beneficiaries indicated that the support received was sufficient, although in certain cases beneficiaries considered the capital received to not be sufficient.[193] It can thus be concluded that the GIF meets a clear need for finance by SMEs.

Activities

The GIF 1 and GIF 2 are horizontal instruments and it is not clear to what extent they specifically supported climate change related activities given the lack of data available in this regard. The GIF has however supported eco-innovation in beneficiaries, while a part of eco-innovation related activities can contribute to climate objectives (i.e. energy/CO2 reductions), it also supports activities beyond this (e.g. resource/materials reduction) which cannot be classified as climate specific. Given the lack of specific data on climate change, support for eco-innovation is used as a proxy to assess the extent to which the GIF supported climate change related activities – keeping in mind the caveat noted above.

It is not possible to determine the amount of the total budget allocated specifically to climate change. However, in terms of eco-innovation, the CIP

[192] Personal communication

[193] CSES, EIM (2011) Final Evaluation of the Entrepreneurship and Innovation Programme – Final report April 2011, Framework Service Contract for the Procurement of Studies and other Supporting Services on Commission Impact Assessments and Evaluations Interim, final and ex-post evaluations of policies, programmes and other activities

Decision stipulated that at least 20% of the EIP budget should be spent on eco-innovation and the Work Programmes routinely report on actions and allocations that have implications for the promotion of eco-innovation. In practice, 90% of the expenditure on eco-innovation is accounted for by the FI and the Eco-innovation scheme (pilot application and market replication projects). [194] It is not possible to determine the amount of the budget allocated specifically to climate change.

Under GIF 1 and GIF 2 specific targets are set for support of eco-innovation - 4 funds are to be focussed on eco-innovation. At the end of December 2010, agreements had been signed with 3 funds, under the eco-innovation envelope, so this element has nearly been achieved. As at the end of June 2011, 17 early stage venture capital funds were supported under GIF 1 of which 3 were eco-innovation; and 7 expansion stage venture capital funds were supported under GIF 2 of which 1 was eco-innovation.[195]

A higher GIF commitment rate (up to 50%)[196] is also provided for funds focusing on eco-innovation.[197] GIF commitments of €69 million have been made in five funds focusing on clean technologies: Demeter 2 (FR,DE, ES); Capricorn (BE); WHEB 2 (Western Europe); Munich Venture Partners 2 (DE); and Pinova (DE).[198]

Support for eco-innovation activities in SMEs which contribute to energy savings and CO_2 emission reductions. The EIP evaluation indicates that the FI are providing effective support for innovation in general and eco-innovation in particular. Findings indicate a positive contribution to eco-innovative activity

[194] CSES (2011) Final Evaluation of the Competitiveness and Innovation Framework Programme – Final report
Framework Service Contract for the Procurement of Studies and other Supporting Services on Commission Impact Assessments and Evaluations Interim, final and ex-post evaluations of policies, programmes and other activities December 2011

[195] CSES (2011) Final Evaluation of the Competitiveness and Innovation Framework Programme – Final report
Framework Service Contract for the Procurement of Studies and other Supporting Services on Commission Impact Assessments and Evaluations Interim, final and ex-post evaluations of policies, programmes and other activities December 2011

[196] Personal communication

[197] Non-eco innovation related activities could also benefit from a higher GIF commitment rate where they are expected to have strong catalytic effects, e.g. in new Member States. Personal communication

[198] EC (2011) Competitiveness and Innovation Framework Programme (CIP) Financial Instruments, Presentation by DG ECFIN 14 September 2011

from both GIF and SMEG schemes resulting in the development of new products and services and environmental benefits primarily in the form of energy savings and CO_2 emission reductions.[199] For example, in the final evaluation of the EIP, 44% of eco-innovative beneficiaries under the GIF stated that eco-innovations led to energy savings while 23% said it related to a reduction of carbon emissions, thus indicating the potential climate related benefits of this support.

The percentage of GIF beneficiaries engaged in product and/or service eco-innovation was 55%, 38% in process eco-innovation and 36% in strategy and business practices eco-innovation. The percentage of beneficiaries that declare turnover related to eco-innovation to be between 50 and 100% has risen from 50% to 70% between receiving the financial support and the end of 2010. This indicates how successful the GIF has been in allowing eco-innovation uptake in the markets. This does not however mean that the financing is specifically used for innovation or eco-innovation. It could for example also be used for working capital or for entry to a new market.

Case study of a clean tech venture capital firm
A venture capital fund supported through the FI now has a capital base of € 112 million to invest in companies developing clean technology. This Fund currently invests in 16 SMEs, both start-ups and established companies with a high growth potential, investing over € 50 million in companies based across several Member States and beyond the EU. The Fund initially approached the EIF because it was experiencing difficulties in raising investment in clean technology. The FI provided € 15 million to the Fund which had a direct effect on the Fund's ability to support enterprises developing clean technology; moreover the EIF's backing triggered further investments of around € 22 million.

Target group / main beneficiary

The GIF supports a high number of innovative SMEs, however this does not necessarily mean that the extended loans and equity capital are directly used for (eco) innovation. 48% of the innovative GIF beneficiaries active in product and/or service innovation use the funding specifically for financing a new product and/or service. The group of GIF beneficiaries innovative in Strategy and Business practices use the financing for innovation in 58% of cases. Specific use of the funding for eco-innovations is still quite low for all forms of eco-innovation. According to the final evaluation of the EIP, this might imply the need for more specific allocation of funds to eco-innovation.

In terms of uptake, at the end December 2010, the number of GIF beneficiaries was 143. The anticipated level for the whole period as stipulated in the

[199] EC (2012) EIP Implementation Report 2011 - EIPC of 15 March 2012

annex to the CIP Decision is 1,200. Given the budget and the average investment per fund, the final evaluation of the EIP concludes that this anticipated level is likely to be difficult to achieve. 200 According to the Commission, the uptake for eco-innovation related activities under the GIF and SMEG has been a bit slower than expected, but they expect the allocated budget to be fully utilised by the end of 2013.[201]

Leverage effect

The support of beneficiaries by the GIF encourages other investors or financiers to come on board. 77% of GIF beneficiaries, often innovative and capital intensive SMEs, stated that the GIF made it easier when seeking additional financing. Thus the GIF can be seen to both provide financing and leverage other financial sources. [202] The FI (SMEG & GIF) under the EIP is said to have enhanced access to finance for nearly 110 000 SMEs and received very positive feedback from final beneficiaries. [203]

The IA of the Eco-AP notes that the total amount of "leveraged" eco-innovation GIF funding is €528.5 million. The expected leverage is around 7.5 and under current CIP framework programme around €225 million are earmarked for eco-innovation. This means a total expected leveraged amount of €1,687 million over the 2007-2013 period or around €241 million annually.[204]

Coordination and coherence with other EU funds

Following the recommendations of the EIP Interim Evaluation which suggested that the Commission develop a deal allocation policy for the different mandates of FI under which venture capital and loan guarantee schemes can be developed; co-ordination mechanisms have been established between DG ENTR, DG ECFIN, DG REGIO and the EIF, and a deal allocation policy developed. However overall, the final evaluation of the EIP concludes that there

[200] CSES, EIM (2011) Final Evaluation of the Entrepreneurship and Innovation Programme – Final report April 2011, Framework Service Contract for the Procurement of Studies and other Supporting Services on Commission Impact Assessments and Evaluations Interim, final and ex-post evaluations of policies, programmes and other activities

[201] Personal communication

[202] CSES, EIM (2011) Final Evaluation of the Entrepreneurship and Innovation Programme – Final report April 2011, Framework Service Contract for the Procurement of Studies and other Supporting Services on Commission Impact Assessments and Evaluations Interim, final and ex-post evaluations of policies, programmes and other activities

[203] EC (2012) Entrepreneurship and Innovation Programme EIP Performance Report, January 2012

[204] EC (2011) Commission Staff working document – Impact assessment accompanying Innovation for a sustainable Future - The Eco-innovation Action Plan (Eco-AP), SEC(2011)1599, 15.12.2011, Brussels

does not appear to be a systematic mechanism to ensure coherence of the EIP with other EU actions, such as those undertaken under the Structural Funds or the Framework Programme for Research.

The degree of synergy between GIF and national instruments is considered to be rather limited. Although some MS governments have similar instruments in place, given the large demand for venture capital, this is not seen as a significant issue. No detrimental spill-over effects were identified as a result of these overlaps in the final evaluation of the EIP.

Monitoring and reporting

There are no specific monitoring requirements related to climate change. In terms of eco-innovation, the share of venture capital funds dedicated to eco-innovation and SMEs in the clean technology sector that have received new financing is to be reported by financial intermediaries through the EIF. The final evaluation of the EIP however notes the sensitivity concerning reporting requirements - financial intermediaries are often reluctant to go beyond providing information that they usually collect for ordinary operational purposes. Any perceived additional reporting burden may have a detrimental effect on the attractiveness of the initiative to the intermediaries and thus affect the ultimate success of the financial instrument. Thus a balance needs to be achieved between ensuring a sufficient level of accountability for public funds and imposing additional administrative burdens on financial intermediaries. [205]

Funds applying for the eco-innovation are assessed on two criteria: (i) innovation and (ii) prevention or reduction of environmental impacts or a more efficient and responsible resources use, including energy use.[206] In terms of ex-post impacts, there are no specific assessment criteria to assess the eco-innovation, climate change or environmental impacts of funded SMEs.[207]

[205] CSES, EIM (2011) Final Evaluation of the Entrepreneurship and Innovation Programme – Final report April 2011, Framework Service Contract for the Procurement of Studies and other Supporting Services on Commission Impact Assessments and Evaluations Interim, final and ex-post evaluations of policies, programmes and other activities

[206] EIF Guidance paper for investors on eco-innovation in CIP financial instruments, http://www.eif.org/attachments/venture/resources/Paper-for-investors_on_Ecoinnovation_in_CIP_Financial_Instruments.pdf [accessed 3/10/2012]

[207] EC (2011) Commission Staff working document – Impact assessment accompanying Innovation for a sustainable Future - The Eco-innovation Action Plan (Eco-AP), SEC(2011)1599, 15.12.2011, Brussels

Policy outcomes

Eco-innovation support is said to have led to a reduction in energy savings according to 44% of beneficiaries and a reduction in carbon emissions according to 23% beneficiaries of the FI (GIF and SMEG).[208] More specific data on the actual energy savings achieved / CO2 reductions made are not available.

Between 2007 and 2010, the GIF and SMEG have assisted more than 90 000 companies with underlying debt financing of €6 billion under guarantees and investment volumes of up to €1.3 billion under venture capital. More than 108 000 jobs were created or maintained.[209]

Lessons learnt

The interim evaluation of the CIP notes that FI under the EIP cater to a range of financing needs of SMEs at different stages of their development and for different levels of financing (small to large). They offer a mix of pro-cyclical (venture capital) and counter-cyclical (guarantees) instruments which allows for responsiveness to changing market conditions. The flexible design of the FI allows adaptability to local conditions while a global budget (with the possibility to transfer resources easily between different instruments) facilitates absorption and the maximum utilisation of available funds. The evaluation concluded that the underlying intervention strategy of the FI remains valid and highlights the need for EIP to place greater emphasis on risk-capital and hybrid instruments (as compared to purely debt based instruments) to support the financing needs of innovative SMEs with high growth potential.[210]

Although the CIP Decision refers to the EU's major strategic priorities, notably the Lisbon Agenda, there is no real mechanism for pursuing cross-cutting objectives or for articulating possible implications for the Programme of subsequent developments in strategic thinking at EU level. There are no/only partial processes in place to ensure that strategic objectives of the EU, e.g. on climate change, are carried through in the operational actions of the EIP.

[208] CSES, EIM (2011) Final Evaluation of the Entrepreneurship and Innovation Programme – Final report April 2011, Framework Service Contract for the Procurement of Studies and other Supporting Services on Commission Impact Assessments and Evaluations Interim, final and ex-post evaluations of policies, programmes and other activities

[209] EC (2012) Entrepreneurship and Innovation Programme EIP Performance Report, January 2012

[210] GHK, Technopolis (2009) Interim Evaluation of the Competitiveness and Innovation Framework Programme (2007 – 2013), Specific Contract No ENTR/A4/04/093/1/09/22 Implementing Framework Contract No ENTR/04/093-Lot 1

Moreover there is a lack a systematic management process, particularly regarding co-ordination across the various strands of the EIP, with the other programmes of the CIP or wider initiatives e.g. relating to innovation / other strategic EU developments. [211]

Finally, the GIF operates on a commercial basis, thus its geographical coverage indicates the institutional and operational capacity of financial institutions across the Member States.[212]

Climate change could be taken into account in all programmes and activities covered by the CIP and where possible, evaluation reports should examine climate mainstreaming in programme activities. Evaluations of current programmes indicate weaknesses in the monitoring and reporting systems, including lack of information on actual expenditure, the use of funding offered to financial intermediaries, outcomes and impacts.[213]

The IA accompanying the Eco-AP recommends a better balance between push and pull facilities. The supply side of FI is covered by a risk sharing facility such as GIF. Demand side measures could be interesting to overcome the valley of death for companies, loans or other debt oriented instruments could be used to help eco-innovators overcome the "valley of death" and help their customers finance investments. There is currently no instrument in place that addresses debt funding specifically for eco-innovation although some interesting initiatives exist at the national level, e.g. KFW has set up an instrument to support SMEs investing in acquiring eco-innovations allowing for an interest reduction.[214]

[211] CSES, EIM (2011) Final Evaluation of the Entrepreneurship and Innovation Programme – Final report April 2011, Framework Service Contract for the Procurement of Studies and other Supporting Services on Commission Impact Assessments and Evaluations Interim, final and ex-post evaluations of policies, programmes and other activities

[212] GHK, Technopolis (2009) Interim Evaluation of the Competitiveness and Innovation Framework Programme (2007 – 2013), Specific Contract No ENTR/A4/04/093/1/09/22 Implementing Framework Contract No ENTR/04/093-Lot 1

[213] Núñez-Ferrer, J., Volkery, A., Withana S., Medarova K. (2012) The implications for the EU and national budgets of the use of innovative financial instruments for the financing of EU policies and objectives. Study for the European Parliaments Committee on the Budget. Directorate General for Internal Policies, Strasbourg

[214] EC (2011) Commission Staff working document – Impact assessment accompanying Innovation for a sustainable Future - The Eco-innovation Action Plan (Eco-AP), SEC(2011)1599, 15.12.2011, Brussels

Entrepreneurship and Innovation Programme (EIP) under the Competitiveness and Innovation Framework Programme (CIP)	
SME Guarantee (SMEG) Facility	
Instrument type	Financial instrument The SMEG Facility consists of four windows (business lines)[215]: 1. Guarantees for *debt financing* via loans or leasing to reduce difficulties SMEs face in accessing finance; 2. Guarantees for *microcredit* financing to encourage financial institutions to play a greater role in the provision of smaller loans; 3. Guarantees for *equity or quasi-equity* investments in SMEs in the seed and/or start-up phase, as well as *mezzanine* financing; 4. Guarantees to support *securitisation* of SME debt finance portfolios to mobilise additional debt financing for SMEs.
Objective and rationale of the instrument	The overall objective is to improve access to finance for the start-up and growth of SMEs and investment in innovation activities (including eco-innovation). The instrument contributes to the EIP objective of increasing access to finance for the start-up and growth of SMEs. [216] More specifically, the SMEG Facility aims to[217]:

[215] Decision N° 1639/2006/EC of the European Parliament and of the Council of 24 October 2006 establishing a Competitiveness and Innovation Framework Programme (2007 to 2013) - OJ L 310/15, 09.11.2006

[216] CSES, EIM (2011) Final Evaluation of the Entrepreneurship and Innovation Programme – Final report April 2011, Framework Service Contract for the Procurement of Studies and other Supporting Services on Commission Impact Assessments and Evaluations Interim, final and ex-post evaluations of policies, programmes and other activities

[217] Decision N° 1639/2006/EC of the European Parliament and of the Council of 24 October 2006 establishing a Competitiveness and Innovation Framework Programme (2007 to 2013) - OJ L 310/15, 09.11.2006

	• Provide counter-guarantees or, where appropriate, co-guarantees for guarantee schemes operating in eligible countries; • Provide direct guarantees for any other appropriate financial intermediary.
Target group	Small and Medium Sized Enterprises (SMEs)
Implementation level	EU
Implementing body	Implemented on behalf of the Commission by the European Investment Fund (EIF) via selected financial intermediaries (guarantee institutions, promotional and commercial banks). Small businesses contact selected financial intermediaries directly to benefit from the guarantees provided by the SMEG.[218]
Total budget	The EIP has a budget of €2.17 billion for the 2007-2013 programming period.[219] €1.13 billion of the total EIP budget has been allocated to FI (of which €228 million has been allocated for eco-innovation).[220] FI instruments receive about ½ of the amount of the EIP allocated to eco-innovation, the rest is allocated to market replication projects.[221] The SMEG has a total budget of €506 million for the 2007-2013 period. [222]
Eligible	Counter- or co-guarantees to guarantee schemes operating in eligible countries, and direct guarantees to financial intermediaries to

[218] CSES, EIM (2011) Final Evaluation of the Entrepreneurship and Innovation Programme – Final report April 2011, Framework Service Contract for the Procurement of Studies and other Supporting Services on Commission Impact Assessments and Evaluations Interim, final and ex-post evaluations of policies, programmes and other activities

[219] CSES, EIM (2011) Final Evaluation of the Entrepreneurship and Innovation Programme – Final report April 2011, Framework Service Contract for the Procurement of Studies and other Supporting Services on Commission Impact Assessments and Evaluations Interim, final and ex-post evaluations of policies, programmes and other activities

[220] EC (2011) Competitiveness and Innovation Framework Programme (CIP) Financial Instruments, Presentation by DG ECFIN 14 September 2011

[221] Personal communication

[222] CSES, EIM (2011) Final Evaluation of the Entrepreneurship and Innovation Programme – Final report April 2011, Framework Service Contract for the Procurement of Studies and other Supporting Services on Commission Impact Assessments and Evaluations Interim, final and ex-post evaluations of policies, programmes and other activities

activities	increase the supply of debt finance to SMEs. [223]
Leverage effect[224] (estimated or achieved)	The leverage effect of the SMEG has been estimated to be about 1 to 67 for all windows taken together i.e. every 1 EUR of EU investment generates EUR 67 for SME financing.[225] This is according to a definition of leverage effect in the interim evaluation of the EIP which defines leverage as estimated underlying loan volume divided by the cap amount (the amount allocated to cover losses under guarantee operations). The reason for the high leverage effect of the SMEG facility as explained in the interim evaluation of the EIP is that: • The EU budget covers a maximum risk exposure at portfolio level that is capped on the basis of expected losses, net of expected recoveries and risk premiums received by the Financial Intermediaries. This capped amount allows the leveraging of a higher amount of SME loans; and • There is a chain of actors with risk-sharing arrangements which increases further the leverage effect. For example, SMEG loan guarantees have high leverage as they are often provided in the form of counter-guarantees to institutions that in turn provide guarantees to other actors, such as intermediaries and banks. Due to the risk-sharing between these actors, the leverage in terms of volume of loans supported is high for the SMEG loan window. [226] The Commission estimates the ex ante leverage effect to be around 1:30 – 1:35. This reflects the total amount of financing reaching SMEs for every €1 of EU money spent. However it is not clear how much of this is truly additional and how much would have been put forward by SMEs anyway.[227]

[223] EC (2012) Entrepreneurship and Innovation Programme EIP Performance Report, January 2012

[224] In the case of FI

[225] GHK, Technopolis (2010) Interim Evaluation of the Competitiveness and Innovation Framework Programme (2007 – 2013), Specific Contract No ENTR/A4/04/093/1/09/22 Implementing Framework Contract No ENTR/04/093-Lot 1

[226] GHK, Technopolis (2009) Interim Evaluation of the Enterprise and Innovation Framework Programme, Final Report Submitted within the framework of ENTR/04/093-FC-Lot 1 Specific Contract No ENTR/A4/04/093/1/08/18 30th April 2009

[227] Personal communication

Climate change relevance

Activities

The SMEG is a horizontal instrument and it is not clear to what extent the SMEG specifically supported climate change related activities given the lack of data available in this regard. The SMEG has however supported eco-innovation in beneficiaries, while a part of eco-innovation related activities can contribute to climate objectives (i.e. energy/CO2 reductions), it also supports activities beyond this (e.g. resource/materials reduction) which cannot be classified as climate specific. Given the lack of specific data on climate change, support for eco-innovation is used as a proxy to assess the extent to which the SMEG supported climate change related activities – keeping in mind the caveat noted above.

Findings indicate a positive contribution to eco-innovative activity from both the GIF and SMEG resulting in the development of new products and services and environmental benefits primarily in the form of energy savings and CO_2 emission reductions.[228] For example, in the final evaluation of the EIP, 25%% of eco-innovative beneficiaries under the SMEG stated that eco-innovations led to energy savings, thus indicating the potential climate related benefits of this support.

The percentage of SMEG beneficiaries engaged in product and/or service eco-innovation was 32%, 27% in process eco-innovation and 30% in strategy and business practices eco-innovation. This does not however mean that the financing is specifically used for innovation or eco-innovation. It could for example also be used for working capital or for entry to a new market.[229]

The Guarantee covers loans and leases for environment related investments including into renewable energy capacities and eco-friendly equipment (clean vehicles and energy saving facilities. Eligible loans are for investments by SMEs active in environment protection, waste recycling, water management, renewable energy areas as well as SMEs producing environment protection goods.[230]

[228] EC (2012) EIP Implementation Report 2011 - EIPC of 15 March 2012

[229] CSES, EIM (2011) Final Evaluation of the Entrepreneurship and Innovation Programme – Final report April 2011, Framework Service Contract for the Procurement of Studies and other Supporting Services on Commission Impact Assessments and Evaluations Interim, final and ex-post evaluations of policies, programmes and other activities

[230] EC (2011) Commission Staff working document – Impact assessment accompanying Innovation for a sustainable Future - The Eco-innovation Action Plan (Eco-AP), SEC(2011)1599, 15.12.2011, Brussels

Case example provided in 2012 EIP Performance report[231]

The micro-credit window of the SMEG Facility provided a guaranteed micro-loan of €21 000 to a newly established Spanish micro-enterprise specialised in renewable energy. This helped the entrepreneur to start up a company providing consultancy advice, technical assessments and maintenance services and create two jobs. According to the owner, without the provision of the micro-credit he would not have been able to start his business. Other banks had been reluctant to provide him any finance as he was unemployed at the time.

Main target group / beneficiary

The number of SMEs benefiting from the SMEG is 109,775 whereas the anticipated level over the whole period of the programme is 315,750. Numbers benefiting have almost doubled in 2010, the availability period can run until 2016, thus as noted in the final evaluation of the EIP, the anticipated level could be reached.[232] These figures relate to all SMEs, not just eco-innovation related activities. According to the Commission, the uptake for eco-innovation related activities under the GIF and SMEG has been a bit slower than expected, but they expect the allocated budget to be fully utilised by the end of 2013.[233]There is no data available specifically related to climate change.

The take up of the guarantee scheme for equity and quasi-equity investment is however very low. Although the scheme enables the EIF to have a complete portfolio of support to intermediaries, support for this window is limited. Furthermore, the take up of the guarantee scheme to support securitisation structures, has not been realised yet, as a result of the current situation in the market for securitisation with the continuing credit crunch. However expectations remain high given the high potential leverage effect of the instrument. [234]

Leverage effect

The support of beneficiaries by SMEG through guarantees encourages other investors or financiers to come on board as a result of the sharing of financial

[231] EC (2012) Entrepreneurship and Innovation Programme EIP Performance Report, January 2012

[232] CSES, EIM (2011) Final Evaluation of the Entrepreneurship and Innovation Programme – Final report April 2011, Framework Service Contract for the Procurement of Studies and other Supporting Services on Commission Impact Assessments and Evaluations Interim, final and ex-post evaluations of policies, programmes and other activities

[233] Personal communication

[234] CSES, EIM (2011) Final Evaluation of the Entrepreneurship and Innovation Programme – Final report April 2011, Framework Service Contract for the Procurement of Studies and other Supporting Services on Commission Impact Assessments and Evaluations Interim, final and ex-post evaluations of policies, programmes and other activities

risk. 42% of SMEG beneficiaries stated that receiving the guaranteed loan made it easier to obtain additional financing, thus indicating the considerable leveraging effects attributable to the investment made by Facility.[235] The FI (SMEG and GIF) enhanced the access to finance for nearly 110 000 SMEs with a multiplier effect[236] up to more than 24 (SMEG) and received very positive feedback from final beneficiaries. [237]

Coordination and coherence with other EU instruments

Following the recommendations of the EIP Interim Evaluation which suggested that the Commission develop a deal allocation policy for the different mandates of FI under which venture capital and loan guarantee schemes can be developed; co-ordination mechanisms are said to have been established between DG ENTR, DG ECFIN, DG REGIO and the EIF, and a deal allocation policy developed for its different mandates (EIP, JEREMIE etc.).

Additionally, relevant DGs have joined forces and developed the European Progress Microfinance Facility (EPMF) that became operational in June 2010. Guidelines clarify when the EPMF or the SMEG micro credit window should be used. In addition, relevant DGs are developing a code of conduct for micro finance institutions in cooperation with stakeholders. The final evaluation of the EIP recommends that similar approaches be developed for the loan guarantee schemes and the venture capital schemes to improve efficiency, transparency and information on the FI.

Similar instruments to the SMEG Facility operate at the national level (e.g. loan guarantee schemes in some older EU MS). More beneficiaries can be supported through the SMEG than through national instruments, and in some cases SMEG guaranteed loans are provided to beneficiaries that are not covered by national schemes (e.g. by covering riskier enterprises engaged in innovative activities). In addition, the SMEG provides skills on how to run loan guarantee schemes in countries in which these are not available and thus contributes to the exchange of best practice.[238] The added value of the

[235] CSES, EIM (2011) Final Evaluation of the Entrepreneurship and Innovation Programme – Final report April 2011, Framework Service Contract for the Procurement of Studies and other Supporting Services on Commission Impact Assessments and Evaluations Interim, final and ex-post evaluations of policies, programmes and other activities

[236] Please note that the new Financial Regulation determines the use of the term 'leverage' instead of a 'multiplier' effect. Previous documents and evaluations however have used the term multiplier effect to express the global investment mobilised in addition to the EU contribution.

[237] EC (2012) Entrepreneurship and Innovation Programme EIP Performance Report, January 2012

[238] CSES, EIM (2011) Final Evaluation of the Entrepreneurship and Innovation Programme – Final report April 2011, Framework Service Contract for the Procurement of Studies and other Supporting Services on Commission Impact Assessments and Evaluations Interim, final and ex-post evaluations of policies, programmes and other activities

SMEG has however been questioned. For example, the Court of Auditors has criticised the SMEG for its considerable deadweight loss[239] (estimated at 38%). While the SMEG serves to develop SME programmes in countries where such assistance does not exist, it is not clear that it should operate where such instruments already exist.[240]

[239] In the context of the SMEG facility, it is considered that deadweight occurs if guarantees are provided for loans to SMEs with sufficient collateral and without innovative investments. (…) Other things being equal, these borrowers could have obtained the loans from commercial lenders without the SME guarantee." (ECA 2011, Annual report on the implementation of the budget, 2011/C 326/01, pg. 85)

[240] Núñez-Ferrer, J., Volkery, A., Withana S., Medarova K. (2012) The implications for the EU and national budgets of the use of innovative financial instruments for the financing of EU policies and objectives. Study for the European Parliaments Committee on the Budget. Directorate General for Internal Policies, Strasbourg.

Trans European Networks (TEN) Programme – Transport and Energy	
Instrument type	The TEN-T budget mainly provides **grants** for studies or works, but can also be used to supply financial aid in the form of: **interest rate rebates** on loans provided by the EIB or other public or private financial institution; a **financial contribution** to the "provisioning and capital allocation for guarantees to be issued by the EIB"; **risk capital participation** for investment funds; and a **financial contribution** to joint undertakings (within the meaning of Article 187 of the Treaty)[241]. The forms of financial aid supported by the TEN-T budget were expanded in 2012 to include the redeployment of up to €200 million in 2012 and 2013 to the "pilot phase of the risk-sharing instruments for project bonds in the transport sector"[242]. There is also a direct grant contribution from the TEN-T programme to the European PPP Expertise Centre (EPEC)[243]. The focus of this fiche is on grant finance.
Objective and rationale of the instrument	The aim of the TEN-T budget is to provide financial aid to projects of common interest that contribute to the completion of the trans-European transport network (TEN-T) in line with the objectives and priorities set out within the TEN-T Guidelines[244]. Its objectives were: • To contribute to a sustainable transport system at European level by giving priority to investments in environmental friendly modes in view of rebalancing modal shares • To further integrate transport networks of the EU-12 with those in the EU-15 and improve the quality of the networks in the EU-12 in order to reduce travel time, travel cost, accidents and environmental damage from transport • To contribute to strengthening the EU's competitive position by improving the quality of the core transport network in the EU-27[245]

[241] Article 6(1) of Regulation (EC) No 680/2007 laying down general rules for the granting of Community financial aid in the field of the trans-European transport and energy networks

[242] Article 2(3) of Regulation (EU) No 670/2012 amending … Regulation (EC) No 680/2007 laying down general rules for the granting of Community financial aid in the field of the trans-European transport and energy networks

[243] http://www.eib.org/epec/about/funding/index.htm

[244] Articles 1 and 5(1) of Regulation (EC) 680/2007

[245] Ecorys (2007) *Ex ante evaluation of the TEN-T Programme (2007-2013)* Report for the European Commission, DG MOVE

	The Trans-European Energy Networks were created in order to enhance the establishment of a genuine internal market for energy by constructing energy infrastructure with high cross-border value added[246]. In 2006, Decision 1364/2006/EC established the objectives of TEN-E among which is 'contributing to sustainable development and protection of the environment, *inter alia* by involving renewable energies and reducing environmental risks associated with the transportation and transmission of energy'.[247]
Target group/ Final Beneficiary	Beneficiaries of the financial aid can be one or more Member States, international organisations, joint undertakings (see above) or public or private undertakings or bodies. All potential beneficiaries must have the permission of the Member State concerned to apply for financial aid. To be a beneficiary, the public/private undertakings/bodies must have complete responsibility for the project and be investing their own resources or those of third parties[248].
Implementation level	EU
Implementing body	The TEN-T budget is centrally managed by the European Commission. DG MOVE sets the policy framework, while the TEN-T Executive Agency (TEN-TEA) is responsible for the day-to-day management[249]. TEN-E is implemented by the Commission in co-operation with the Agency for the Cooperation of Energy Regulators (ACER).[250]
Total budget	The total budget allocated to the TEN-T budget for the 2007-13 period was €8.013 billion[251]. This figure was only 2% of the anticipated expenditure on the TEN-T in this period. It was complemented by €44 billion from the Cohesion Fund and ERDF

[246] Council Regulation 2236/95/EC of 18 September 1995 laying down general rules for the granting of Community financial aid in the field of trans-European networks

[247] Decision No 1364/2006/EC of the European Parliament and of the Council of 6 September 2006 laying down guidelines for trans-European energy networks and repealing Decision 96/391/EC and Decision No 1229/2003/EC

[248] Articles 2(7) and 4 of Regulation (EC) 680/2007

[249] van Essen, H., Brinke, L., Bain, R., Smith, N. and I. Skinner (2012) *Financing instruments for the EU's transport infrastructure* Report IP/B/TRAN/FWC/2010-006/LOT4/C2/SC1 for the European Parliament's Transport and Tourism Committee.

[250] DECISION No. 1364/20906/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 6 September 2006, laying down guidelines for trans-European energy networks and repealing Decision 96/391/EC and Decision No 1229/2003/EC. 22.9.2006, Brussels

[251] Article 18(1) of Regulation (EC) 680/2007

	and €53 billion of EIB loans and guarantees, as well as €285 billion from Member States. The total EU contribution to TEN-T funding in this period was anticipated to be 27% of the total[252]. The total budget allocated to the TEN-E budget is €155 million. A budget is not outlined in the Decision. Calls are published annually for proposals, providing on average funding of approximately €25 Million per annum. At present the TEN-E primarily funds feasibility studies intended to promote and support the expansion of energy networks. Studies under the TEN-E are eligible for a grant of up to 50% of eligible costs, whereas projects in the field of energy currently receive 10%.

Eligible activities	The TEN-T budget provides financial aid to projects of common interest that are consistent with the objectives and priorities set out within the TEN-T Guidelines[253]. Aid can be granted to the cover a percentage of the costs of the following types of projects:
	
	• Studies (up to 50% of eligible costs);
	• Works, eligible costs up to a maximum of:
	  ○ 30% for cross-border sections (if accompanied by Member State guarantees re financial viability and timescales);
	  ○ 20% for other Priority Projects;
	  ○ 10% for non-Priority Projects;
	  ○ 50% for equipment for be used for the European Rail Traffic Management System; and
	  ○ 20% for traffic management systems for other modes.
	
	For TEN-E the scope of activities includes the following:
	
	• Projects of common interest related to the electricity and gas networks and displaying potential economic viability
	• Priority projects, those having significant impact on the proper functioning of the internal market, on the security of supply and/or the use of renewable energy sources

[252] http://ec.europa.eu/transport/infrastructure/ten-t-funding-and-financing/doc/funding_figs.pdf
[253] Article 5(1) of Regulation (EC) 680/2007

	• Projects of European interest, those priority projects, which have a cross-border nature or a significant impact on cross-border transmission capacity. The maximum co-financing rate is 50% for studies and 10% for construction works.
Leverage effect	The first €7 billion of funding allowed under the TEN-T the co-financing of nearly €42 billion of projects, which implies a leverage rate of around 6[254].

Climate change relevance

Rationale

Prior to 1985, transport was mainly a national issue, with Member States developing their transport networks largely to deliver national priorities. With the completion of the internal market in 1992, a White Paper was published was that set out a vision of a Common Transport Policy, which defined the establishment and the development of trans-European transport networks as a goal of Community policy. In order to achieve this goal, the White Paper called for the interconnection of national networks and for these to be made interoperable. The aim at this stage was very much to enable the functioning of the internal market. In 1994, 14 projects of particular importance were identified, which was closely followed by additional measures to support the development of these projects, i.e. the first rules for financial support and the first TEN-T Guidelines [255]**.** In this respect, the TEN-T could be seen as aiming to address a regulatory failure, i.e. that Member States developed their transport networks with primarily national objectives in mind.

With the subsequent enlargement of the EU to 27 Member States, the 2007-13 TEN-T budget, along with the revised TEN-T Guidelines, is still supporting the delivery of the TEN-T by co-financing projects of common interest that contribute to the completion of the TEN-T with the aim of ensuring the cohesion, interconnectivity and interoperability of the TEN-T and access to the network. Action at the EU level is still considered to be needed, the implementation of the TEN-T would not be sufficiently achieved by Member States alone. As the CEF has been designed to improve the implementation of the TEN-T, the framework set for the 2007-13 period has not adequately addressed the problem

[254] SEC 2011 1262 *IA of COM (2011) 665*

[255] van Essen *et al* (2012); the White Paper was entitled "The Future Development of the Common Transport Policy", COM (92) 494, while the first rules for financial support for the TEN-T were established by Regulation (EC) No 2236/95 and the first TEN-T Guidelines were set out in Decision No 1692/96/EC.

(see the CEF-Transport fiche for further discussion).

Activities

There was no explicit mention of climate change in the objectives of the TEN-T budget, but expenditure by the TEN-T budget was guided by some objectives in favour of less environmentally-damaging modes, as well as the wider need to protect the environment. Hence, some projects have been funded that would be beneficial to the climate, and could therefore be referred to as a 'climate change project' within the context of this project.

The general rules for the granting of financial aid from the TEN-T budget made no explicit reference to climate change. However, in the selection of projects 'special attention' was to be paid *inter alia* to projects that contribute to the 're-balancing' of transport in favour of the most environmentally-friendly modes, such as inland waterways. Additionally, decisions to grant financial aid should *inter alia* take account of environmental consequences, while projects funded had to be in conformity with inter alia the EU's environmental and sustainable development policies[256].

Similarly, the TEN-T Guidelines, which effectively set general reference framework for the development of the TEN-T by setting out the objectives, priorities and broad measures to be used, make no explicit mention of climate change. However, TEN-T network should ensure sustainable mobility, while helping to achieve *inter alia* the EU's environmental objectives. One of the priorities was to integrate environmental concerns into the design and implementation of the TEN-T and another was to develop sustainable mobility in line with the EU's sustainable development objectives. When projects are planned and implemented, environmental protection must be taken into account by undertaking an EIA of the project[257], by 'applying" the Habitats and Birds Directives[258] and by undertaking an SEA on the plan or programme that led to the project[259]. Projects of priority interest should also *inter alia* "contribute to the sustainable development of transport by … reducing environmental damage caused by transport, in particular by promoting a modal shift towards railways, intermodal transport, inland waterways and maritime transport"[260].

[256] Articles 5(2)(h), 5(4)(e) and 12, respectively, of Regulation (EC) 680/2007
[257] In line with Directive 85/337/EEC
[258] Directives 92/43/EEC and 2009/147/EC
[259] In line with Directive 2001/42/EC
[260] Articles 2(2)(a), 5(g), 5(h), 8 and 23(1)(f), respectively, of Decision 661/2010/EU on Union guidelines for the development of the trans-European transport network

There was no explicit *ex ante* budget allocation for (types of) climate change activities or by mode. However, the majority of Priority Projects, to which 'special attention' was to be paid in the course of project selection, focused on rail (18 out of 30 projects were pure rail projects), with three other projects focusing on water-based modes and some of the remaining projects being multi-modal, particularly rail/motorway[261]. Hence, to some extent, this list would target the budget on the transport modes that could be considered to be 'climate change projects', such as rail and waterborne transport projects.

As the respective legislation contains a number of environmental objectives (see above), activities relevant to climate change could be clearly funded. By the end of 2011, over half of the 328 projects funded by TEN-T budget involved rail projects (including rail traffic management) representing 61% of the resources awarded. A further 19% of project related to water modes, while 6% were inter-modal, representing 11% and 5% of total resources awarded, respectively[262]. Additionally, calls for proposals can also specifically target projects contributing to climate change mitigation and adaptation, as did the January 2012 call under the 2011 Annual Work Programme[263].

The beneficiaries of rail projects are varied and include Member States' ministries, national infrastructure administrators, national railway companies and concessionaries[264]. The review of the TEN-T programme identified that many of the Priority Projects were behind schedule, largely due to insufficient project financing. Furthermore, the programme had delivered a patchwork of badly connected national projects, rather than a fully interconnected pan-European network. There was also a lack of attention paid to links between the modes[265].

Case study 1: Speeding up rail travel in the Spanish Basque Country
Total cost: €273,340,000
TEN-T financing: €26,759,986
Start date: January 2007

[261] These projects were listed in Annex III of Decision 661/2010/EU; Article 5(2)(a) of Regulation (EC) 680/2007 refers to the consideration of these projects in the selection process; see also SDG (2011) "*Mid-term evaluation of the TEN-T Multi Annual Programme 2007-2013"* Report for the European Commission, DG TREN

[262] TEN-T Executive Agency (no date) "TEN-T projects in figures"; see http://tentea.ec.europa.eu/download/publications/agency_in_numbers_0112_superfinal.pdf

[263] TEN-T Executive Agency (2012) "Call for proposals for projects of common interest in the field of the trans-European transport network under the Annual Work Programme 2011"

[264] For example see the project specific information at: http://tentea.ec.europa.eu/en/ten-t_projects/ten-t_projects_by_year/projects_2007-2013_financial_framework.htm

[265] van Essen et al (2012)

End date: September 2012
Beneficiary: Administrador de Infraestructuras Ferroviarias (ADIF)
The project was on part of Priority Project 3 and supported the construction of high speed rail lines, including the construction of a series of viaducts and tunnels. The project contributed to improving the competitiveness of cities along the corridor, as well as reducing travel times.

Case study 2: Making Flemish inland waterways safer and more navigable
Total cost: €8,889,503
TEN-T financing: €1,929,730
Start date: January 2008
End date: September 2011
Beneficiary: Flemish Ministry of Mobility and Public Works
The project involved the creation of a series of pilot schemes to help Flanders comply with the River Information Services Directive. A series of studies and works were funded that led to the introduction of a harmonised, interoperable and publicly-accessible intelligent transport solutions, such as electronic navigation charts and electronic ship reporting, as well as tracking and tracing applications. This has led to improved navigation and safety, increased speed of transfer of information and reduced waiting times at locks[266].

Regarding TEN-E, out of the €155 million spent in the 2007-2009 period, only €25 million has been allocated to actual investment in gas and electricity infrastructure with €45 million being allocated to studies. Financial support has been allocated to 31 electricity projects and 20 gas projects. With respect to actual infrastructure, 11 projects were funded in the electricity sector, and 3 in the gas sector.[267] While the instrument has been able to fund a number of feasibility studies, the implementation of actual infrastructure projects has often encountered significant delays associated with the environmental permitting process. The revisions to the proposed guidelines aim to address a number of issues associated with the delay in implementing infrastructure projects, outlining options for streamlining the permitting process.

TEN-E funding may have indirectly contributed to climate change objectives, particularly in terms of upgraded the EU's renewable energy potential. Information analysed indicates that three renewable energy projects received funding in the 2007-2010 period.[268]

[266] TEN-T Executive Agency (2011) "10 out of TEN: TEN-T project implementation successes"; Brussels.
[267]. Commission Staff Working Document (2010) Report from the commission to the European Parliament, the council, the European Economic and Social Committee and the Committee of the Regions on the implementation of the Trans-European energy networks in the period 2007-2009, SEC(2010)505 final, 4.5.2010.
[268]. See: http://ec.europa.eu/energy/infrastructure/tent_e/doc/2012_ten_e_financed_projects_1995_2010.pdf, accessed October 18, 2012.

Country(ies)	Generation Type and Scale	Amount and Purpose of Funding	Year
UK and Ireland	Wind	€3.5 million Stakeholder consultation, build phase documentation, technical and feasibility studies	2007
Germany	Offshore wind	€0.775 million for feasibility studies	2009
United Kingdom	Offshore wind	€1 million for feasibility studies	2010

Leverage effect

In 2007-13, 73% of the funding for the TEN-T (i.e. €285 billion) was anticipated to come from Member States to complement the contribution from the TEN-T budget, Cohesion Fund, ERDF and EIB loans and guarantees[269]. The mid-term review concluded that the financial leverage of the programme was poor[270].

Coordination and coherence with other EU instruments

The definition and development of the TEN-T network is considered to be important from the perspective of the single market, as well as its contribution to mobility, job creation and other benefits (see below). Hence, the instrument is coherent with wider EU policy[271]. Additionally, Regulation 680/2007 explicitly stated that EIB operations would be compatible with the granting of financial aid under the Regulation and also allowed contributions to EIB issued guarantees (see above). The Commission was also explicitly tasked with coordinating and ensuring the coherence of projects co-financed by Regulation 680/2007 and related actions, financial instruments and EIB operations[272]. As noted above, it was also explicitly noted that the instrument should provide a financial contribution to the LGTT and that it could provide risk capital for investment funds. Hence, it was designed to complement and finance other instruments.

[269] http://ec.europa.eu/transport/infrastructure/ten-t-funding-and-financing/doc/funding_figs.pdf
[270] SDG (2011)
[271] Personal communication with DG MOVE
[272] Article 7 of Regulation (EC) 680/2007

Policy outcomes

Many of the projects funded from the TEN-T budget are still on-going, so to some extent it is too early to evaluate the impacts of the programme. However, the overarching objectives of TEN-T policy, including the TEN-T budget, is to deliver an integrated, pan-European transport network (i.e. the TEN-T), focusing on the cleaner modes, that can contribute to the EU's 20-20-20 climate and energy targets, as well as to job creation (in the short-term through the works themselves, in the longer-term through increased competitiveness)[273]. While Ecorys' ex ante evaluation estimated the potential CO_2 savings from the programme, a similar estimate was not attempted in the mid-term evaluation of the programme. Indeed, this evaluation did not contain any specific numbers; instead it focused more generally on the evaluation of the programme. In this respect, it concluded that it was difficult to evaluate the TEN-T programme, as the objectives are too general. However, the evaluation did conclude that the programme had been the catalyst for a number of key pieces of transport infrastructure, and so had at least contributed to the development of the TEN-T network to some extent, and in turn had made a positive contribution to the mobility needs of EU citizens and goods. However, a number of the largest projects are behind schedule. While a few Priority Projects are complete, many are not, particularly the cross-border sections. In spite of 18 of the Priority Projects focusing on rail, the European rail network still experiences bottlenecks and significant obstacles in relation to interoperability[274].

Lessons learnt

As the instrument has funded mainly rail projects, it could be considered that it was relatively successful in promoting climate change projects[275]. As noted above, the implicit ex ante allocation to the more environmentally-friendly modes, e.g. in the list of Priority Projects, helped to focus the attention of funding on to these modes.

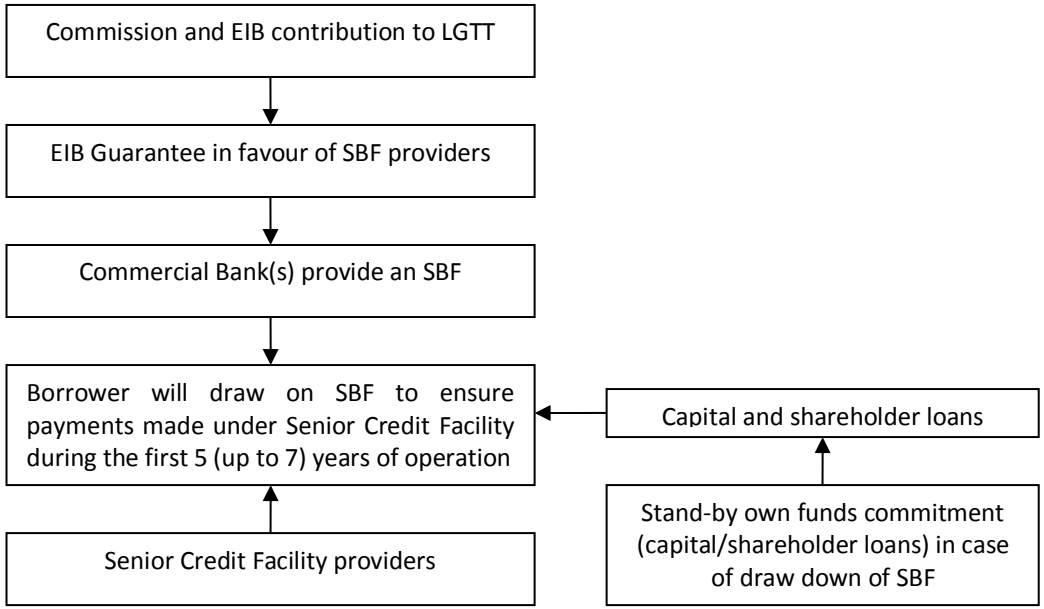
It was concluded that there was a need to provide higher levels of co-financing to rail and inland waterway projects and increase the focus on the more environmentally-friendly modes, as these were still not being funded as much as had been hoped, while reducing expenditure on roads.[276].

[273] Personal communication with DG MOVE
[274] SDG (2011)

[275] Personal communication with DG MOVE
[276] Personal communication with DG MOVE

TEN-T	
Loan Guarantee Instrument for Trans-European Transport Network Projects (LGTT)	
Instrument type	The LGTT is a financial instrument provided under the TEN budget. It is an EIB loan guarantee which, if used, would become junior debt. The LGTT guarantee is provided in favour of commercial banks that provide a stand-by credit facility (SBF) to a project. This will not normally exceed 10% of total senior debt (although it can be up to 20% in exceptional circumstances). There is a maximum ceiling of €200 million per project[277]. The CEF proposal foresees that the LGTT could continue into the 2014-2020 programming period (see CEF fiche)[278]. The contractual structure of the instrument is given in the diagram, below.

[277] EIB and the European Commission (2008) *"The Loan Guarantee Instrument for Trans-European Transport Network Projects – Fact-Sheet"*
[278] Personal communication with DG MOVE

	 *Source: EIB and European Commission (2008)*
Objective and rationale of the instrument	The aim of the instrument is to facilitate private sector involvement in financing TEN-T infrastructure, although the focus is on bank lending. The LGTT covers some of these risks associated with such projects by improving the ability of a borrower to meet senior debt servicing obligations in the first five to seven years of operation to make up for any revenue shortfalls (i.e. where traffic levels are less than anticipated)[279].

[279] EIB and the European Commission (2008); personal communication with DG MOVE

Target group/ Final Beneficiary	The target group are project promoters, which could be Member State authorities or private companies (supported by Member States). Often a special purpose vehicle, which has been set up for a specific project in order to shield private companies from the risk of project failure, is the recipient of the funds[280].
Implementation level	EU
Implementing body	The LGTT is managed by the EIB[281].
Total budget	The budget of the LGTT is €1 billion, of which half comes from the EIB and half from the European Commission, specifically from the EU's TEN-T budget[282].
Eligible activities (types and scale)	In order to benefit from the LGTT, projects must be a project of common interest (or part of such a project) as defined by the TEN-T Guidelines, be compliant with EU law and their financial viability is based (wholly or in part) on the income of some form of user charging[283].
Leverage effect	Between 2008 and 2011, the LGTT enabled six projects to proceed: five motorways and one rail project. In these projects, a total LGTT volume of €400 million helped to raise €4.9 billion of senior debt and supported a total capital investment of €10.6 billion. By project, the leverage ranged from nine times for the A8 autobahn in Germany (where an LGTT contribution of €60 million supported a total project cost of €562 million) to 39 times for the SEA high speed rail link between Tours and Bordeaux in France (where the LGTT contribution was €200 million and the total project cost was €7,836 million). The other motorway projects had leverage effects of 12 times, 18 times, 19 times and 22 times, which gave an average leverage effect of 26 times across all six projects. However, it is worth noting that the rail scheme in particular benefited from a sizeable

[280] EIB and the European Commission (2008); van Essen, H., Brinke, L., Bain, R., Smith, N. and I. Skinner (2012) *Financing instruments for the EU's transport infrastructure* Report IP/B/TRAN/FWC/2010-006/LOT4/C2/SC1 for the European Parliament's Transport and Tourism Committee

[281] van Essen *et al* (2012)

[282] Article 6(1)(d) of Regulation (EC) No 680/2007 laying down general rules for the granting of Community financial aid in the field of the trans-European transport and energy networks; also EIB and the European Commission (2008)

[283] EIB and the European Commission (2008)

	contribution (over half of the total project costs) from grants and revenues received during the construction of the project. If these were excluded, the leverage factor for this project is only 15 times[284]. The achieved figures are comparable to a leverage effect of 20 to 30 times that was considered feasible prior to the application of the instrument[285]. By early 2012, a contract for an additional project had been signed bringing the total amount of capital investment underpinned by the LGTT to €12 billion[286].

Climate change relevance

Rationale

As noted above, the aim of the instrument is to improve the ability of a borrower to meet senior debt servicing obligations in the first five to seven years of operation of a project in order to make up for any revenue shortfalls (i.e. where traffic levels are less than anticipated). Such infrastructure often has problems attracting funding from the private sector as a result of the high risk that predicted revenues will not be delivered in their early operating stages. The LGTT aims to cover some of these risks[287]. The LGTT allows the EIB to bear higher financial risks than under its normal lending operations[288]. However, the take up of the LGTT has not been as high as had been expected. Its focus on income-generating (i.e. user pay) projects restricts its potential use and its launch in 2008 coincided with the start of the financial crisis, which has affected the availability of credit more generally. The project bond initiative was launched in response to these concerns (see separate fiche)[289].

Activities

Between 2008 and 2011, the LGTT was used mainly for motorway projects and only one rail project (see above). However, the mid-term review of

[284] EIB (2011) *"Loan Guarantee Instrument for TEN-T Projects – Mid-term Review (2011)"* OpsA/NPST/1-NPDD/2011-1577, Luxembourg
[285] Ecorys (2007) *Ex ante evaluation of the TEN-T Programme (2007-2013)* Report for the European Commission, DG MOVE
[286] Withana, S., Núñez Ferrer, J., Medarova-Bergstrom, K., Volkery, A., and Gantioler, S. (2011) Mobilising private investment for climate change action in the EU: The role of new financial instruments, IEEP, London/Brussels; EIB (2011)
[287] EIB and the European Commission (2008)
[288] van Essen *et al* (2012)
[289] Withana *et al* (2011); EIB (2011)

the LGTT listed 11 additional projects that were considered to be active operations, five of which were road projects, 3 were rail projects, two maritime projects and one airport project[290]. Hence, while the LGTT does not directly target projects that deliver upon climate change objectives, the instrument can be used for projects, such as rail and maritime projects that could be considered to be climate projects.

As noted above, projects that could be considered to be relevant to climate change, such as rail or maritime projects, have either already benefited, or could benefit in the future, from the LGTT. To date, only one of these projects has had its LGTT role agreed.

Case study: LGV SEA high speed rail line (France)
Total cost: €7,836 million
LGTT guarantee: €200 million (which is equivalent to 2.6% of total cost of the project and 6.6% of senior debt)
Financing documentation signed: 16 June 2007
Guarantee available from: 2015
Beneficiary: Réseau Ferré de France (RFF) and a consortium led by Vinci

The concession is for 50 years and covers the financing, design, construction, operation and maintenance of the high speed rail line between Tours and Bordeaux[291].

Coordination and coherence with other EU instruments

A noted above, the LGTT was developed to cover a revenue risk in the early stages of the operation of projects (generally 5 years, but up to 7 years) that relied upon revenue for their financial viability. It is also partially financed by the TEN-T budget. Consequently, it was developed to fill a perceived gap in the range of funding mechanisms.

Target group

As noted above, the only beneficiary of a climate change related project supported by the LGTT to date has been the owner and manager of French national railway network and the consortium that is the partner in the one rail project to be supported to date. It can be expected that beneficiaries under potential rail and maritime projects would also be Member States directly, or infrastructure owners/managers and

[290] EIB (2011)
[291] EIB (2011)

associated consortia.

Leverage effect

The six projects benefiting from the LGTT between 2008 and 2011 were reasonably successful at attracting additional funding from the private and public sectors. Of the €10.6 billion total cost of the six projects, €3.4 billion was from commercial banks, while €1.3 billion was from the borrowers' own resources. For these projects, commercial bank debt made up between 24% and 40% of the total project costs, while own resources generally contributed between 10% and 20% of these costs (in one case it was 33%). Three of the projects also benefited from grants or revenues, which amounted to around 30% of total costs for the two road projects, and over 50% in the case of the SEA high speed rail project. The EIB calculated the average multiplier effect[292] of the six projects to be 273, although this was skewed by the rail project, which had a multiplier effect of 392. For the road projects, the multiplier effect ranged from 115 times to 242 times.

Lessons learnt

The instrument supports projects that are considered to be projects of common interest as part of the TEN-T, as set out in the TEN-T Guidelines. These include projects, such as rail, inland waterway and maritime projects that could be considered to be climate projects. Hence, it is the projects as defined by the TEN-T Guidelines that determine that some "climate projects" can be supported by the LGTT.

As was mentioned above, the instrument focuses on developing the TEN-T network, so is essentially an instrument aimed at the development of infrastructure. This restricts it from funding non-infrastructure climate projects. With respect to infrastructure projects, as noted above, the LGTT works within the framework of the TEN-T Guidelines. Hence, it is the way that these Guidelines address climate change that is important for the LGTT (for more detail on these Guidelines, see the TEN-T fiche).

As the TEN-T Guidelines also includes infrastructure projects that are not generally considered to be climate projects, e.g. road and air projects, then these enable the LGTT to support non-climate projects. From the perspective of climate change, the TEN-T Guidelines could have only focused on infrastructure that could be considered to be climate-related, which would have in turn focused the LGTT on such projects. However, the Guidelines have to be seen in context, i.e. they are not a climate instrument but are supposed to set out a framework for an EU-wide transport network. Additionally, the LGTT is part of a wider package of instrument that work together to maximise support in

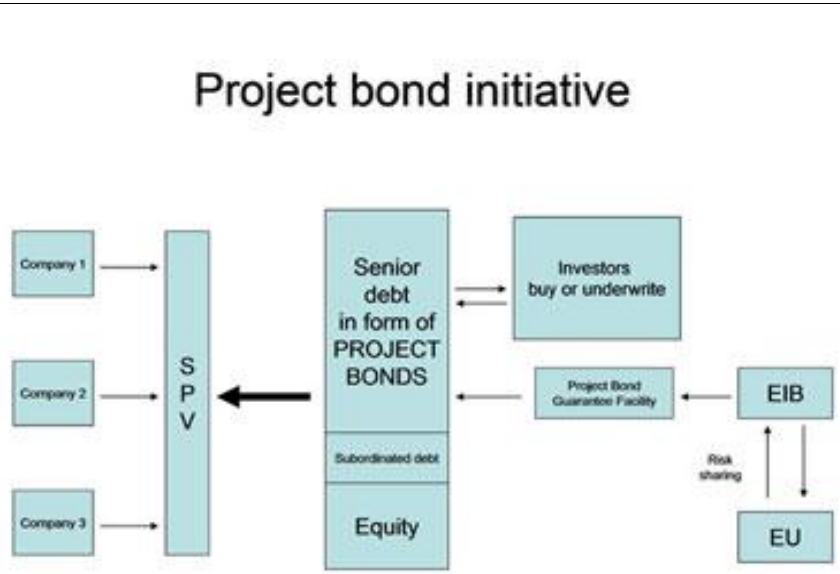
[292] Please note that the new Financial Regulation determines the use of the term 'leverage' instead of a 'multiplier' effect. Previous documents and evaluations however have used the term multiplier effect to express the global investment mobilised in addition to the EU contribution.

the form of grants for the more environmentally-friendly modes and aim to attract private finance for other infrastructure that would then apply user charging, which is consistent with wider EU environmental objectives.

TEN	
EU Project Bond Initiative (PBI), including the pilot phase	
Instrument type	EU project bonds are a risk-sharing financial instrument. It is a credit enhancement mechanism that should help to improve a project's credit-rating. The instrument can take the form of "a debt instrument or a contingent (guarantee) facility or both" so that a project bond can be issued. This effectively means that the EIB will create a standby loan facility, which can be drawn upon if the project ever suffers from financial problems, and/or supply subordinated debt at the start of the project. In all cases, the mechanism can cover up to 20% of senior debt. If the facility is used it becomes subordinated debt[293]. The working of the instrument is illustrated in the diagram, below[294].

[293] Article 1a of Regulation (EC) No 680/2007 laying down general rules for the granting of Community financial aid in the field of the trans-European transport and energy networks, as amended by Regulation (EU) No 670/2012; van Essen, H., Brinke, L., Bain, R., Smith, N. and I. Skinner (2012) *Financing instruments for the EU's transport infrastructure* Report IP/B/TRAN/FWC/2010-006/LOT4/C2/SC1 for the European Parliament's Transport and Tourism Committee

[294] EIB (2011) "Innovative financial instruments for climate change", presentation at IEEP Policy Dialogue Workshop, 11 October 2011; see also SEC (2011) 1237 Impact Assessment of the Proposal for a Regulation amending … Regulation (EC) No 680/2007, Commission Staff Working Paper

	 *Source: EC* The pilot phase of the PBI continues to 2014, but an interim review is previewed for 2013, on the basis of which amendments to the instrument could be introduced. Similarly, an independent evaluation is planned for 2015, which could also lead to amendments to the instrument, if necessary[295].
Objective and rationale of the	The Project Bond Initiative has two objectives: to stimulate investment in transport (and other) infrastructure and to establish debt capital markets as a new source of financing in the area of infrastructure[296]. The pilot phase aims to enable stakeholders to gain experience from working with, and to familiarise themselves with, project bonds in the current

[295] Personal communication with DG MOVE
[296] SEC (2011) 1237

instrument	programming period, in order that they are comfortable with project bonds from 2014, when they will be rooted within the Connecting European Facility[297]. The pilot phase will also test the design and parameters of the initiative and enable any necessary changes to be made by 2014[298]. In this respect, the Project Bond Initiative aims to revive the bond market, to increase the ability of projects to attract investment and to make projects bonds more attractive to a larger investor base[299]. It broadens the scope of the LGTT to cover all categories of project risk (including construction, operations and performance, as agreed between project promoters and the EIB) and extends eligibility to a wider range of projects in transport and other sectors[300]. Additionally, whereas the LGTT focused on bank lending, project bonds focus on the capital markets more generally, particularly investment and insurance funds[301].
Target group/ Final Beneficiary	The target group are project promoters, which could be Member State authorities or private companies (supported by Member States). Often a special purpose vehicle, which has been set up for a specific project in order to shield private companies from the risk of project failure, is the recipient of the funds[302].
Implementation level	EU
Implementing body	The EIB will implement the instrument – indeed applications for risk coverage under the instrument are to be made directly to the EIB. The Commission participates in steering meetings and supervisory bodies[303].

[297] COM (2011) 660 "A pilot for the Europe 2020 Project Bond Initiative" Communication from the Commission.

[298] Withana, S., Núñez Ferrer, J., Medarova-Bergstrom, K., Volkery, A., and Gantioler, S. (2011) Mobilising private investment for climate change action in the EU: The role of new financial instruments, IEEP, London/Brussels

[299] Spence, J., Smith, J. and P. Dardier (2012) *Overview of financial instruments used in the EU multiannual financial framework period 2007-2013 and the Commission's proposals for 2014-2020* Report PE 453.232 for the European Parliament's Budgetary Affairs Policy Department

[300] EIB (2011); personal communication with DG MOVE

[301] van Essen *et al* (2012); personal communication with DG MOVE

[302] EIB and the European Commission (2008); van Essen, H., Brinke, L., Bain, R., Smith, N. and I. Skinner (2012) *Financing instruments for the EU's transport infrastructure* Report IP/B/TRAN/FWC/2010-006/LOT4/C2/SC1 for the European Parliament's Transport and Tourism Committee

[303] Regulation (EC) No 680/2007, as amended by Regulation (EU) No 670/2012; van Essen *et al* (2012)

Total budget	The budget for transport projects in the pilot phase (i.e. 2012-13) is €200 million, of which up to €100 million is for 2012. This comes from the TEN-T budget, or more specifically the LGTT budget[304]. The budget for energy projects in the pilot phase (2013 only) is €10 million from the TEN-E budget. The budget for ICT projects in the pilot phase (2013 only) is €20 million. Total pilot phase: €230 million.
Eligible activities	The eligibility of transport projects is determined – at least in the pilot phase – by the TEN-T guidelines[305].
Leverage effect	The Commission estimates a leverage effect of between 15 and 20 is anticipated by the Commission, which is based on experience with the LGTT. It also notes that the effect will vary according to the details of the project[306].

Climate change relevance

The Regulation setting up the project bond initiative was only adopted in July 2012. During the pilot phase, the Commission has to report on the performance of the instrument to the European Parliament and the Council every six months, but no report has yet been produced. In the second half of 2013, the EIB and the Commission have to submit an interim report to the same two institutions, while an independent evaluation of the initiative will be undertaken in 2015[307]. To date, no agreement to support a project with a project bond has been signed. However, there are potential projects in the pipeline, including motorways and a sea lock, and the first contract for support is expected to be signed in early 2013[308].

However, as the focus of the bonds in the pilot phase is on projects that are consistent with the TEN-T Guidelines, the instrument clearly has the potential to support the development of infrastructure for railways, inland waterways and maritime transport, which could all be considered to contribute to climate change objectives. Project bonds can effectively be used where there is the potential to create a reliable revenue stream from which investors can receive a return on their investment. Consequently, motorways are a good candidate for project bonds, as they can provide potential revenue streams through user charges that can be used to provide a return for investors. However,

[304] COM (2011) 660
[305] COM (2011) 660
[306] SEC (2011) 1237; van Essen *et al* (2012)
[307] Regulation (EC) No 680/2007, as amended by Regulation (EU) No 670/2012
[308] Personal communication with the Commission

infrastructure for other modes also has potential to generate reliable revenue streams, and therefore are also potential candidates for projects bonds. Potential projects include those focusing on high speed railways (as can be seen by the fact that the Tours-Bordeaux line has been supported by the LGTT; see LGTT fiche) and sea locks and inland waterway locks, where users could pay access charges that could be used to provide a return to investors. Multi-modal projects are also a potential candidate, as access charges between the modes could be used to create a revenue stream[309].

Under the Project Bond Initiative, each project is assessed on a case-by-case basis, so there is no ex ante share of the budget that is earmarked for projects that could be considered to be climate change projects. However, these projects need to be in line with the TEN-T Guidelines, which, as noted elsewhere, contain environmental conditions. Furthermore, the instrument needs to be seen as part of a package (see below) that contributes to the development of infrastructure for environmentally-friendly modes, as well as for other modes. As noted in the CEF fiche, the intention is that grants under the CEF be used for the more environmentally-friendly modes, while other modes such as roads benefit virtually exclusively from financial instruments. In this way, grants are freed up for the more environmentally-friendly modes. On the other hand, the application of financial instruments for roads requires user charges, which makes this infrastructure more consistent with the user pays and polluter pays principles, other objectives of EU policy. The application of user charging can also ensure that this infrastructure also contributes to wider climate and energy objectives. Hence, while there was no explicit earmarking for climate change projects, seen as part of the wider package of instruments, the instrument frees up more resources to be used as grants for the more environmentally-friendly modes, while contributing to ensuring that other infrastructure such as roads is used in a way that is more consistent with the Commission's environmental and climate policy objectives[310].

Rationale

The European Commission estimates that the investment needed to ensure that EU transport infrastructure development matches the demand for transport is over €1.5 trillion in the period 2010 to 2030, with €550 billion needed by 2020 in order to complete the TEN-T, of which around €215 billion is needed to complete missing links and to remove bottlenecks on the core network[311]. From 2014 the Connecting Europe Facility is expected to provide a more solid and coherent basis for funding transport (and other) infrastructure, but until then the EU has infrastructure financing problems. Governments are looking to cut their spending and it is difficult to obtain long-term lending from banks.

[309] Personal communication with DG MOVE

[310] Personal communication with DG MOVE

[311] European Commission (2011) Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system. Communication from the Commission, COM(2011) 144, 28.3.2011, Brussels.

Even though project finance volumes increased slightly in 2010, they declined dramatically in the first half of 2011. Consequently, while investment in infrastructure could contribute to reviving the EU economy, the finance has not been available. Hence, transport (and other) infrastructure projects had no access to finance from the bond markets. The EU 2020 Project Bond Initiative, including the pilot phase, aims to address this problem by increase the access of projects to capital market debt funding, which will complement grants and bank financing[312]. Hence, the instrument effectively expands the potential range of investors in EU transport infrastructure projects, e.g. to pension funds, the initiative aims to attract more investment. Pension funds are considered likely to be potentially interested in such investments, as they need long-term assets to match their long-term liabilities and returns (i.e. user charges) tend to increase with inflation[313].

Activities

It is important to remember that project bonds are only suited to certain types of projects, as these are market driven and require a ring-fenced asset with dedicated funding streams. Project bonds are not suitable for small scale projects that involve many actors and have a large number of different components. Hence, from the perspective of transport, it is likely that large infrastructure projects will be more suitable for project bonds[314]. As noted above, projects that could be considered to be relevant to climate change, such as high speed rail, inland waterway or maritime projects, are eligible for support from the Project Bond Initiative, so could theoretically be supported, as long as a reliable revenue stream is possible. However, to date no transport projects have benefited from the instrument.

Coordination and coherence with other EU instruments

As noted above, the Project Bond Initiative, including the pilot phase, was developed to encourage investment from a wider range of sources and can be used for a wider range of risks and projects than the LGTT. Hence, it has been developed to fill a gap in the existing instrument framework and a gap in financing and to complement grants and bank lending[315]. However, the instrument needs to be seen as part of a wider package, which includes all of the potential ways of financing TEN-T infrastructure that would be permitted by the proposed CEF. [316].

[312] SEC (2011) 1237
[313] van Essen *et al* (2012)
[314] Withana *et al* (2011)
[315] SEC (2011) 1237
[316] Personal communication with DG MOVE

Expected policy outcomes

The main results are likely to be the development of the development of TEN-T, and the associated beneficial impacts, including the freer movement of goods and services, overcoming market segmentation, fostering accessibility and territorial cohesion, as well as fostering research and innovation. There will be increased choice for consumers and the investment in infrastructure will boost growth and create jobs, although the impacts are difficult to estimate. Cleaner transport solutions will be beneficial for the environment[317]. However, it is too early to give any more information, as there is no record of any project being supported by EU project bonds, as yet.

Lessons learnt

The instrument supports projects that are considered to be projects of common interest as part of the TEN-T, as set out in the TEN-T Guidelines. These include projects, such as rail, inland waterway and maritime projects that could be considered to be climate projects. As yet, it is too early to say whether these were successful, as there is no record of any project being supported by EU project bonds, as yet. However, it is likely that the projects as defined by the TEN-T Guidelines would determine that some "climate projects" can be supported by project bonds.

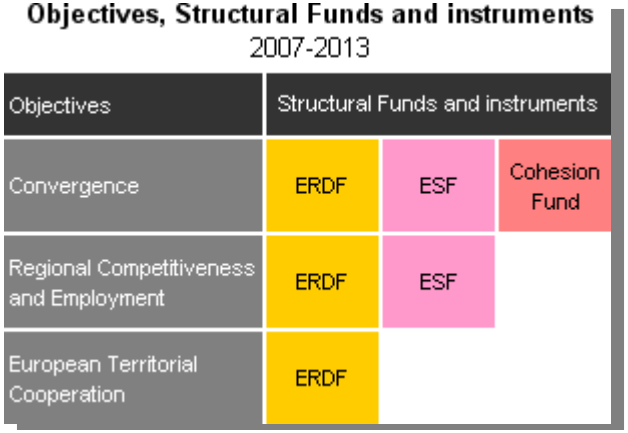
As was mentioned above, the instrument focuses on developing the TEN-T network, so is essentially an instrument aimed at the development of infrastructure. This restricts it from funding non-infrastructure climate projects. With respect to infrastructure projects, as noted above, project bonds work within the framework of the TEN-T Guidelines. Hence, it is the way that these Guidelines address climate change that is important for the PBI. However, it is too early to be too specific, as no project has yet been supported by EU project bonds.

As the TEN-T Guidelines also includes infrastructure projects that are not generally considered to be climate projects, e.g. road and air projects, then these enable project bonds to support non-climate projects. The Guidelines have to be seen in context, i.e. they are not a climate instrument but are supposed to set out a framework for an EU-wide transport network. Additionally, as noted above, the PBI has to be seen as part of a package that increase the amount of finance in the form of grants available for the more environmentally-friendly modes, while ensuring that user charging is applied to other infrastructure such as roads that can be supported by project bonds.

[317] SEC 2011 1262 *IA of COM (2011) 665*

Cohesion Policy	
Instrument type	Grant and special support instruments The focus of this fiche is on grant finance while financial instruments used under the special support instruments are reviewed in the next fiche.
Objective and rationale of the instrument	The aim of EU Cohesion Policy historically has been to address regional disparities and bring structural change to the economies of less developed European regions. Article 174 of the TFEU (former Article 158 of the TEC) stipulates that: '*In order to promote its overall harmonious development, the Union shall develop and pursue its actions leading to the strengthening of its economic, social and territorial cohesion*'. Therefore, Cohesion Policy and its funding instruments – the European Regional Development Fund and the European Social Fund – have traditionally pursued economic and social objectives (article 175 TFEU, formerly 159 TEC). The Cohesion Fund was established in 1993 and was intended to assist the four poorest Member States at that time (Greece, Ireland, Portugal and Spain, subsequently known as the 'cohesion countries') through projects in the field of transport and environment infrastructure. The creation of the funds somewhat coincided with the process for the reform of the Structural Funds at that time and therefore the goal of CF was perceived to be similar to that of the Structural Funds.[318] The 2007-2013 Cohesion Policy streamlined for the first time the application of different funding instruments under the same regulatory framework, targeting them towards **three objectives**. 1) The **Convergence** objective is available to the EU's poorest Member States and regions, with a GDP below 75% of the EU average. The objective covers 17 Member States – including all twelve 'new' Member States and 84 regions. 2) **Regional Competitiveness and Employment** objective aims to strengthen regions' competitiveness and attractiveness. All regions outside the Convergence objective are eligible under this objective. 3) **European Territorial Co-operation** Objective aims to reinforce co-operation across national borders to promote common solutions to a range of shared economic, social and environmental problems. The European Territorial Co-operation Objective is divided into three 'strands' - cross-border, transnational and interregional co-operation. The type of environmental project that may be supported, and the funding conditions, differ between each strand.

[318] Lenshcow, A. 1997. Variations in EC environmental policy integration: agency push within complex institutional structures. Journal of European Public Policy 4:1, March 1997: 109-27

Target group/ Final Beneficiary	Broad range of final beneficiaries including governmental bodies and executive agencies, regional and local authorities, private operators and utility management organisations, SMEs, NGOs
Implementation level	The ERDF, CF and ESF is managed under the principle of shared management where Member States and regions are entrusted with the implementation of expenditure programmes and investment projects at national and regional levels of governance.
Implementing body	Managing authorities at national / regional level
Total budget	1) The Convergence: **€283 billion;** 2) Regional Competitiveness and Employment: **€55 billion**; and 3) European Territorial Co-operation: **€8.7 billion**. This objective can be financed only under the ERDF. **Objectives, Structural Funds and instruments** 2007-2013  *Source: DG Regional Policy*

Eligible activities	Under the **ERDF**, eligible activities aimed at supporting the development and structural adjustment of regional economies, including the conversion of declining industrial regions and regions lagging behind, and support for cross-border, transnational and interregional cooperation include: • productive investment which contributes to creating and safeguarding sustainable jobs, primarily through direct aid to investment primarily in SMEs; • investment in infrastructure; • development of endogenous potential by measures which support regional and local development. These measures include support for and services to enterprises, in particular SMEs, creation and development of financing instruments such as venture capital, loan and guarantee funds, local development funds, interest subsidies, networking, cooperation and exchange of experience between regions, towns, and relevant social, economic and environmental actors (see next fiche) • technical assistance Regulation 1084/2006/EC establishes the **Cohesion Fund**, which operates only in regions under the Convergence objective and presents further opportunities for climate proofing Cohesion Policy interventions. Besides financing transport projects within the framework of the Trans-European Transport Network (Article 2(a)), particularly the EU's priority projects of common interest, the Cohesion Fund provides funding for environmental projects in support of the Sixth Environmental Action Programme, in particular energy efficiency, renewable energy, and sustainable transport initiatives outside the Trans-European Network (Article 2(b)). Commission Decision 2006/596/EC establishes the eligibility of Member States for the Cohesion Fund. The beneficiaries are restricted to those Member States with a GNP per capita of less than 90% of the EU average. These states are: Bulgaria; the Czech Republic; Greece; Cyprus; Latvia; Lithuania; Hungary; Malta; Poland; Portugal; Romania; Slovenia; and Slovakia. Spain is eligible on a transitional basis.

Climate change relevance

Rationale

Climate change as such did not feature among the key priority objectives and areas of intervention in the 2007-2013 Cohesion Policy. The Community Strategic Guidelines set out important links between promoting energy efficiency and renewable energy as ways of contributing to the achievement of economic and social cohesion as well as the implementation of the Lisbon Strategy. This message however did not translate into significant allocations for such measures under the 2007-2013 Operational programmes as set by national and regional managing authorities. The understanding of the relation between climate change and economic/social/territorial cohesion however evolved over the years. In 2008, the 'Regions 2020' report was published by DG Regional Policy that explores the regional effects of four key challenges - adapting to globalisation, demographic change, climate

change and the energy challenge - in the medium-term perspective to 2020. This is the first Commission document which frames the issues of climate change and energy as 'key challenges' and could be considered, to a degree, as providing a rationale for enhanced Cohesion Policy intervention as far as climate change is concerned.

A year later, a high-level report outlining an 'agenda for a reformed Cohesion Policy' is presented by Fabrizio Barca, Director General in Italy's Ministry of Finance and Economy. The report argues that there is no doubt that EU cohesion policy should be coherent with the EU's objectives on climate change, whatever the direct spending objectives are. However, it also makes the case for a place-based approach to tackling climate change, making this one of the top 3 to 4 priorities. This is because the overall capacity to innovate and adapt to climate change will be reliant on local capacity and the ability to agree on preferences etc. In addition, some places could be affected more than others due to differences in income levels and so forth, therefore existing social traps could worsen and new ones emerge.[319]

Objective and activities

The General Regulation 1083/2006/EC is the key legal act laying down general provisions for the ERDF and CF and setting out the **key principles** guiding the programming and implementation of the funds. It introduces **sustainable development and environmental protection** as horizontal principles in Article 17 which stipulates that '*the objectives of the Funds shall be pursued in the framework of sustainable development and the Community promotion of the goal of protecting and improving the environmen*t'. Recital 22 of the Preamble also calls for policy coherence by stipulating that the '*activities of the Funds and the operations which they help to finance should be consistent with the other Community policies and comply with Community legislation'*. The Regulation does not, however, include a reference to climate change *per se*, which is not surprising given that the CARE package was adopted two years after the adoption of the legislative package for Cohesion Policy.

For the first time since 2006, **Community Strategic Guidelines** on cohesion as set out in Council Decision 2006/702/EC were developed establishing a strategic framework for Cohesion Policy for the 2007-2013 budgetary cycle. They seek to set overarching EU priorities for the Member States' National Strategic Reference Frameworks and Operational Programmes, in particular in view of aligning these to the objectives of the renewed Lisbon Strategy through 'earmarking' EU funds towards these objectives. The Community Strategic Guidelines contain stronger language calling for strengthening synergies between environmental protection and growth, stressing that environmental (including climate) measures can have numerous ancillary benefits on competitiveness, innovation, energy security and job creation. It recommends a number of concrete measures which can be supported by

[319] Barca, F. 2009. An Agenda for a Reformed Cohesion Policy – A place-based approach to meeting European Union challenges and expectations'

EU funds in this respect, *inter alia* energy conservation, renewable forms of energy, and the promotion of rail and environmentally-friendly modes of transportation in cities, as well as protection against certain environmental risks (desertification, droughts, fires, and floods).

In the 2007-2013 budgetary period, climate actions can be financed only under the **European Regional Development Funds** (ERDF). It is governed by Council Regulation 1080/2006/EC. The aim of the ERDF is to promote competitiveness and innovation, create and safeguard sustainable jobs and ensure sustainable development through investments in SMEs, infrastructure, local development initiatives and technical assistance. It also builds upon the previous URBAN Community initiative and therefore can support measures for sustainable urban development *inter alia* the rehabilitation of the physical environment, brownfield redevelopment and the preservation and development of natural heritage. There are a number of **climate related measures** which could be financed with ERDF's support under the current financial perspective:

Environmental measures eligible for co-financing under the ERDF, 2007-2013

Objective	Environmental measures eligible for co-financing under the ERDF
Convergence	**Research and technological development, innovation and entrepreneurship** (Article 4.1): • clean technologies and environmental research and innovation. **Environment** (Article 4.4): • mitigation of climate change effects; and • aid to SMEs to promote sustainable production patterns through the introduction of cost-effective environmental management systems. **Prevention of risks** (Article 4.5): • development and implementation of plans to prevent and cope with natural and technological risks[320]. **Transport** (Article 4.8): • integrated strategies for clean urban transport; • better modal balance; and • reduction of environmental impacts. **Energy** (Article 4.9): • improvement of energy efficiency; and • development of renewable energies.

[320] This is obviously broader than climate change impacts, however, flood, fire and desertification prevention measures are eligible under this category.

Regional Competitiveness and Employment	**Innovation and Knowledge Economy** (Article 5.1): • introduction of new and improved products, processes and services on the market by SMEs; and • integration of cleaner and innovative technologies in SMEs. **Environment and risk prevention** (Article 5.2): • energy efficiency, renewable energy sources and energy efficient management systems; • clean and urban public transport; and • development of plans and measures to tackle natural disasters.

Source: IEEP

Following a two-year negotiation process between 2004 and 2006 steered by the four Visegrad countries (Hungary, Czech Republic, Poland and Slovakia), housing expenditure related to deteriorating public buildings infrastructure was also made eligible for funding under the ERDF for new Member States (EU12)[321]. This was considered an important amendment to the original Commission proposals at the time as funding was made available for the renovation of public buildings, including insulation improvements to boost energy efficiency.

The importance of the provision of funding for energy efficiency in housing was stepped up within the European Economic Recovery Plan adopted in 2008, where these measures were considered 'smart' investments on the road to a 'low carbon' economy. Subsequently, the ERDF Regulation was amended in 2009 as far as housing eligibility was concerned by permitting all Member States to invest up to 4% of their total ERDF allocations for energy efficiency and renewable energy in social housing[322]. The fact that the amendment was undertaken mid-term in the programming period may imply that if the prevailing political agenda is changing, legislative changes are possible during the implementation phase of the on-going budgetary period. It also comes to show that certain flexibility in the funding allocations is plausible in the presence of high-level political commitment to such. In January 2010 DG REGIO has noted that 10 MS are actively utilising SCF for energy efficiency: Bulgaria, Estonia, France, Latvia, Lithuania, Malta, Portugal, Slovenia, the Netherlands and the UK. As of May 2010 DG REGIO is analysing the national strategic reports on the implementation of the Cohesion Policy and will possibly include further countries on the list. Bulgaria and Lithuania modified their OPs in 2009 in order to scale-up funding for EE.[323]

[321] Tosics, I. 2008. Negotiating with the Commission: the debates on the 'housing element' of the Structural Funds. Urban Research and Practice. 1 (1) 93-100

[322] Regulation (EC) No 397/2009 of the European Parliament and of the Council of 6 May 2009 amending Regulation (EC) No 1080/2006 on the European Regional Development Fund as regards the eligibility of energy efficiency and renewable energy investments in housing, OJ L129, 21/05/2009

[323] Rezessy, S. and Bertoldi, P. (2011) FINANCING ENERGY EFFICIENCY: FORGING THE LINK BETWEEN FINANCING AND PROJECT IMPLEMENTATION. Report prepared by the Joint Research Centre of the European Commission

In the current 2007-2013 budgetary period, according to Commission figures approximately €9.5 billion EU funds have been allocated to energy efficiency and renewable energy, which is approximately 3% of the total EU funding. Indirect climate related funding was also allocated for clean public transport, intelligent transport systems and cycling tracks (€7.8 billion) as well as rail infrastructure (€24 billion).[324] Overall, the available funding for climate mitigation-related measures targets efficient energy and transport interventions, and could be deemed as relatively low given the considerable investments necessary to achieve the CARE package objectives and facilitate a transition to a low carbon economy. At the same time, reference to climate change adaptation is not made in the 2007-2013 Cohesion Policy. Therefore, there is no corresponding funding for such interventions.[325] The scope of ERDF funding, however, includes a category of expenditure for 'risk prevention'. Arguably, climate adaptation measures (e.g. floods, fires and desertification) can be financed therein; however, the concept of risk prevention is broader as it also includes 'technological risks' alongside natural ones. A total of €6 billion is allocated to 'risk prevention' measures in the 2007-2013 EU funding, but it is rather difficult to assess how much of this targets natural risks.[326]

Case example: Grants for energy efficiency in housing in France[327]

Each French region will be permitted to use up to 4% of their Operational Programme funding for energy efficiency investments and greater use of renewable energy in existing housing. Operations must target a significant number of housing, most energy inefficient buildings or most effective energy-saving refurbishment actions. Two types of housing will be eligible: social housing and run-down co-ownership with social occupation, within the framework of an operation supported by ANAH (national housing agency). For the most recently constructed buildings, the eligible actions will be the ones that achieve a gain of at least 8kWh/m2 and reach an energy consumption of less than 150kWh/m2. The French government has chosen to use the ERDF in a grant scheme as an additional resource to reach its objectives of retrofitting 800,000 very energy inefficient dwellings. In many cases, like in the Nord-Pas de Calais region, the ERDF will serve to release the extra investment needed to improve the increase energy performance of buildings.

[324] DG Regio, Statistics. http://ec.europa.eu/regional_policy/themes/statistics/2007_environment_climate.pdf

[325] Hjerp, P, Volkery, A, Lückge, A, Medhurst, J, Hart, K, Medarova-Bergstrom, K, Tröltszsch, J, McGuinn, J, Skinner, I, Desbarats, J, Slater, C, Bartel, A, and ten Brink, P, (2012), *Methodologies for Climate Proofing Investments and Measures under Cohesion and Regional Policy and the Common Agricultural Policy*, A report for DG Climate, August 2012.

[326] DG Regio. Statistics, http://ec.europa.eu/regional_policy/themes/statistics/2007_environment_climate.pdf

[327] Rezessy, S. and Bertoldi, P. (2011) FINANCING ENERGY EFFICIENCY: FORGING THE LINK BETWEEN FINANCING AND PROJECT IMPLEMENTATION. Report prepared by the Joint Research Centre of the European Commission

Monitoring and reporting

Overall, climate change trends and impacts are not explicitly embedded with regards to monitoring, reporting and evaluation. This is the stage of the policy cycle which offers significant potential for developing climate-proofing instruments concerning accounting systems, reporting mechanisms and feedback loops for policy learning. These, however, should be considered from the perspective of the 'simplification' agenda where some sort of a trade off should be made between the goals of cutting administrative burden and establishing effective monitoring and reporting tools for climate change. The majority of reporting in essence concerns the rate of spending according to different categories of expenditure, or developments based on strictly social and economic indicators. This is mirrored in general criticism of the evaluation system of Cohesion Policy, which suggests that little regard is given to actual outcomes and impacts. In the current Cohesion Policy framework, many countries included indicators regarding GHG emissions, but it is too early to assess their adequacy and effectiveness in terms of providing a proper assessment of the climate change impacts of Cohesion interventions. Of course, the issue is also methodological in terms of linking financial flows to induced greenhouse gas emissions, as well as relating to the availability and quality of regional/national data to this end. Therefore, the discussion about devising appropriate **indicators** resurfaces and is likely to feature prominently in the negotiations of the future policy.

Lessons learnt

The PromoSCene project has identified a number of barriers in using EU funds for sustainable energy investment[328], including:

- Limited budget directly allocated to sustainable energy during the development of OPs;
- On the side of Managing Authorities: lack of targeted promotion, changing framework conditions of the OPs, lack of transparency of procedures and coordinated monitoring, as well as lack of platforms for exchange and dissemination of experience; and
- On the side of potential beneficiaries: lack of project development skills and capacity, problems in making projects bankable and lack of commitment when creating a consortium for bundling smaller projects.

The barriers encountered on the side of Managing Authorities and beneficiaries during the implementation phase may hamper the absorption of EU funds. The 2010 Commission strategic report[329] shows some worrisome trends. For the 18-month implementation period, €93 billion, which is 27.1% of

[328] PromoScene, Greening the economy with Structural and cohesion Funds. Results of the IEE PromoSCene project. 2009.

[329] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Cohesion policy: Strategic Report 2010 on the implementation of the programmes 2007-2013, COM(2010)110, 31/03/2010

the available 2007-2013 Cohesion Policy funding, has been contracted to concrete projects in the 27 Member States. Highest-performing Member States include Belgium and the Netherlands, which have selected projects absorbing 61.1% and 55.8%, respectively, of their EU funding allocations. Greece and Romania are at the bottom, managing to invest 11.9% and 14.1%, respectively. So called 'Lisbon earmarking' investments allocated to strategic EU objectives stemming from the Lisbon Strategy for growth and jobs, are advancing well, particularly for projects such as research and innovation in SMEs, implementing active labour market and lifelong learning activities.

The report underlines that environmental investments are 'underperforming at this stage' utilising 21% of the total amount available for such measures, with Greece and the Czech Republic facing major delays while Estonia, Spain and Hungary are making some progress. Traditional investments in environmental infrastructure (e.g. waste water treatment) are taking place faster compared to investments in climate adaptation and risk prevention, in which the uptake of funds is 'especially weak' in countries like Spain, Greece, Poland and Romania. Spending on energy efficiency has been successful in the Czech Republic, Italy and Lithuania but close to non-existent in several other countries including the UK. Spending in wind energy is also slow, utilising only 2.9% of the available EU funds. Therefore, the Commission has identified 'priority areas' *inter alia* rail, energy, environment and capacity building, where Member States are urged to undertake special efforts in order to speed up the implementation of EU funding.[330]

What can be inferred from the findings of the Strategic report is that the so called 'cohesion' countries and new Member States, who constitute the biggest recipients of Cohesion funding, face significant impediments for implementing EU funded programmes and projects. The observed 'implementation deficit' often regards not only environmental/climate measures but generally all cohesion measures and puts in question the ability of beneficiary countries to absorb Community funding. This emphasizes the importance of developing the necessary institutional set-up in different governance levels through investing in 'soft measures', e.g. administrative capacity, help desk services, new skills and training, etc. Designing the institutional structure and investing in developing their capacity to enhance the promotion and absorption of climate change projects will be crucial to overcome the existing implementation barriers and in a way could be considered part of an institutional approach to climate proofing Cohesion funding.

Against the background of the current economic crisis, another drawback in the implementation process appears to be the declining availability of national co-financing for EU funded projects. This could have an impact on the implementation of the CARE package in a number of Member States which seek to cut down their national budgets for an array of measures, including climate change related ones. The 'smart' use and enhanced absorption of EU funding in this case becomes even more important especially for less developed regions. The development of innovative financial engineering schemes e.g. revolving funds, guarantees, etc. and in some ways could aid the system of EU funding by improving implementation and absorption rates.

[330] Commission Staff Working Document. (SEC(2010)360). 31/03/2010

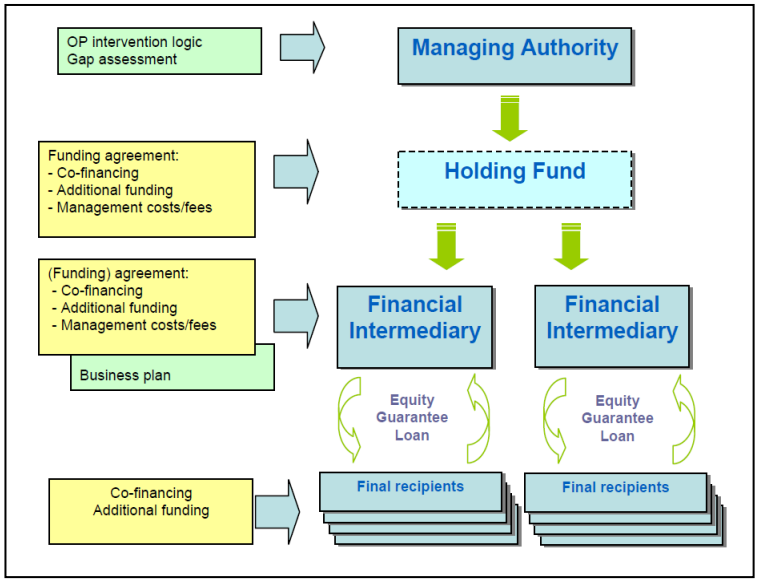
Cohesion Policy	
Special support instruments	
Instrument type	Special support instruments have been used for delivering investments under the Structural Funds since the 1994-1999 programming period, in particular for SMEs. Their relative importance and scope increased during the 2007-2013 period and a number of initiatives were developed by the European Commission in co-operation with the EIB and other financial institutions which sought to strengthen the use of financial instruments in Cohesion Policy. Financial instruments can be set up either through direct contributions to equity funds, loan funds and guarantee fund mechanisms or indirectly through holding funds set up to invest in several funds. According to article 44 of the General regulation[331], financing engineering under the 20072-103 Cohesion Policy can take the following forms: 1. Financial engineering instruments for enterprises, primarily SMEs, such as *venture capital*, *guarantee* funds and *loan* funds; 2. *Urban development funds*, interested in PPP and other projects included in an integrated plan for sustainable urban development; and 3. Funds and other forms of incentive schemes, providing *loans*, *guarantees* for repayable investment, or equivalent instruments, for energy efficiency and use of renewable energy in buildings, including in existing housing.[332] In the 2007-2013 period, two initiatives were set up to promote the use of **financial engineering** instruments • JEREMIE (Joint European Resources for Micro to Medium Enterprises); and • JESSICA (Joint European Support for Sustainable Investment in City Areas).

[331] COUNCIL REGULATION (EC) No 1083/2006 of 11 July 2006 laying down general provisions on the European Regional Development Fund, the European Social Fund and the Cohesion Fund and repealing Regulation (EC) No 1260/1999

[332] EC (2012) Revised guidance note on financial engineering instruments, under article 44 of Council regulation (EC) No1083/2006. 8.2.2012, Brussels

	Two **technical assistance** facilities were also launched • JASPERS (Joint Assistance to Support Projects in European Regions); and • JASMINE (Joint Action to Support Microfinance Institutions). The scheme is implemented by allocating ERDF funding to **Urban development Funds** (UDF), which can then be invested in public-private partnerships or other projects that are part of an integrated urban development plan. Another option is to create **Holding Funds** which can then invest in several UDFs (see Figure below). Financial products under Holding Funds can include[333]: *1) Equity* – Pari passu or non-pari passu • Preferential or priority returns, • first loss piece • Combination of the above *2) Guarantees* *3) Loans* – Senior or subordinated (mezzanine) with preferential coupon or other terms – Market rates or preferential coupon with a floor of zero %

[333] Lee, F. (2010) JESSICA Addressing State aid issues in Andalucia (ES) and the United Kingdom, JESSICA & Investment Funds, European Investment Bank, Conference on JEREMIE and JESSICA, Brussels, 30/11/2010

	FI in 2007-2013 Cohesion Policy  *Source: EC*
Objective and rationale of the instrument	Financial instruments were designed to complement traditional grant-based financing, attract private resources and consequently increase the financial capacity of managing authorities (MAs) for investment. The objective is to use public sector resources in a more efficient way by drawing on private sector practices and actors and by stimulating the participation of private market capital. FI shall be seen as 'vehicles of repayable investments which contribute to the achievement of the goals set out under specific priority axes of the operational programme'.[334] FI are used to support revenue generating projects that cannot on their own obtain commercial bank loans or equality investment (suboptimal investment situations).[335]

[334] EC (2012) *Revised guidance note on financial engineering instruments*, under article 44 of Council regulation (EC) No1083/2006. 8.2.2012, Brussels
[335] EC (2012) *Financial instruments in Cohesion Policy*. Commission Staff Working Document, SWD(2012)36, 27.2.2012, Brussels

	Grant and FI assistance through Cohesion Policy aims to address specific market gaps, mainly in less developed regions, for example, low administrative capacity, low rate of entrepreneurship, high unemployment rates, underdeveloped financial markets and low density population. The objective of FI is arguably not limited to financial returns.[336] In other words, FI are aligned with the objectives of EU's Cohesion Policy, which are translated into the objectives and priorities of national/regional Operational Programmes. In the case of ERDF, and JESSICA in particular, the rationale for the use of financial instruments is threefold: • Engage project promoters in urban development activities which they would otherwise not deliver; • Leverage funding from market investors to maximise urban development impact; and • Involve investment intermediaries for effective implementation.
Target group/ Final Beneficiary	The Commission has established definitions for 'operation', 'beneficiary' and 'final recipient' in the context of Cohesion Policy, which seem to be slightly different compared to other financial instruments under central management. *Operation*: Project or a group of projects constituted by the financial contributions from OPs to a FI (including Funds of Funds (FoFs)) and the subsequent financial support provided by the FI[337] *Beneficiary*: Operator, body or firm, whether public or private, which is responsible for initiating and implementing operations and has a contractual relationship with Managing Authority (FoFs i.e. Holding funds or development funds or body implementing the FI). In this sense, the beneficiary is the financial engineering instrument itself.[338] *Final recipient*: Legal or natural person that receives financial support from a financial instrument (e.g. SMEs, public-private partnerships, projects, citizens)
Implementation	While the Commission can encourage the use of such instruments, the final decision as to whether or not to use financial instruments

[336] EC (2012) *Financial instruments in Cohesion Policy*. Commission Staff Working Document, SWD(2012)36, 27.2.2012, Brussels
[337] EC (2007) Note of the Commission services on Financial Engineering in the 20072-013 programming period. COCOF guidance note, July 2007, Brussels.
[338] EC (2007) Note of the Commission services on Financial Engineering in the 20072-013 programming period. COCOF guidance note, July 2007, Brussels.

level	is made by the managing authorities at national and regional levels.
Implementing body	Instruments are implemented through different governance models and legal structures specific to each Member State or region[339], thus each project and each area of investment is different. Based on data to end of 2010, the majority of holding funds are managed by public bodies such as national or regional development agencies or financial institutions such as the EIB.[340]
Total budget	• ERDF - around 5% has been committed to FI. • ESF - until the end of 2010, 0.7% (or some €300 million) have been used for FI; mainly for micro-credit schemes or guarantee funds for micro-credit).[341] Importantly, the general principle is that contributions of EU Structural Funds used for financial instruments are capped therefore the **risk** is limited to the amount allocated to the different instruments.
Eligible activities	According to article 44 of the General regulation[342], financing engineering under the 20072-103 Cohesion Policy can support the following types of activities: 1. enterprises, primarily SMEs; 2. urban development projects included in an integrated plan for sustainable urban development; and 3. energy efficiency and use of renewable energy in buildings, including in existing housing. **JEREMIE** promotes the use of financial engineering instruments to improve access to finance for SMEs via Structural Funds interventions. These funds can support:

[339] EC (2011a), *A new framework for the next generation of innovative InFIs – the EU equity and debt platforms*, Communication from the Commission, (COM(2011)662), Brussels,19.10.2011

[340] EC (2012) *Financial instruments in Cohesion Policy*. Commission Staff Working Document, SWD(2012)36, 27.2.2012, Brussels

[341] EC (2012) Financial instruments in Cohesion Policy. Commission Staff Working Document, SWD(2012)36, 27.2.2012, Brussels

[342] COUNCIL REGULATION (EC) No 1083/2006 of 11 July 2006 laying down general provisions on the European Regional Development Fund, the European Social Fund and the Cohesion Fund and repealing Regulation (EC) No 1260/1999

	• creation of new business or expansion of existing ones; • access to investment capital by enterprises (particularly SMEs) to modernise and diversify their activities, develop new products, secure and expand market access; • business oriented research and development, technology transfer, innovation and entrepreneurship; • technological modernisation of productive structures to help reach low carbon economy targets; • productive investments which create and safeguard sustainable jobs The most relevant initiative for this study is **JESSICA** in particular promotes sustainable urban development[343] by supporting projects in the following areas: • **urban infrastructure** – including transport, water/waste water, energy • **heritage or cultural sites** – for tourism or other sustainable uses • **redevelopment of brownfield sites** – including site clearance and decontamination • **creation of new commercial floor space** for SMEs, IT and/or R&D sectors • **university buildings** – medical, biotech and other specialised facilities • **energy efficiency improvements**. By the end of December 2011, a total amount of €1.9 billion was already committed to 23 JESSICA operations in 11 Member States.[344] These include: • 18 Holding fund agreements signed by the EIB (amounting to €1.75 billion); • 1 Holding Fund set up with a national financial institutions (Estonia); and • 4 Urban Development Funds established without a Holding Fund (Brandenburg/Germany, Hessen/Germany, East Midlands/UK and Wales/UK).

[343] DG Regional Policy. JESSICA web page, http://ec.europa.eu/regional_policy/thefunds/instruments/jessica_en.cfm#2

[344] European Union DG Regional Policy (2011) JESSICA implementation in the EU Member States – State of Play. December 2011, Brussels.

	The scope of supported projects included, among others, brownfield regeneration, the development of sustainable urban infrastructure (e.g. waste-to-energy) and energy efficiency interventions in the existing housing stock. In addition, there are two technical assistance facilities under the 2007-2013 Cohesion Policy's special support instruments. These include JASPERS and JASMINE. **JASPERS** is a technical assistance facility for the twelve EU countries which joined the EU in 2004 and 2007. It provides the Member States concerned with the support they need to prepare high quality major projects, which will be co-financed by EU funds. JASPERS provides independent advice to the EU countries concerned to enable them to better prepare major infrastructure projects. JASPERS can provide assistance for all stages of the project cycle - from the initial identification of a project through to the decision to provide EU grant assistance. In some cases, advice can be provided up to the start of the construction phase. JASPERS advice can cover: • project preparation (e.g. cost-benefit analysis, financial analysis, environmental issues, procurement planning) • review of documentation (e.g. feasibility studies, grant applications etc.) • advice on compliance with EU law (environmental, competition etc.) There is clear evidence to suggest that projects which have received assistance from JASPERS are approved significantly faster than those which are not. JASPERS targets assistance on major infrastructure projects costing more than €50 million supported by the EU funds – for example, roads, rail, water, waste, energy and urban transport projects. In the case of small countries where there will not be many projects of this size JASPERS concentrates on the largest projects. **JASMINE** is a joint initiative of the Commission, the EIB and EIF. It was launched to: enhance the capacity of non-bank micro-credit providers/micro-finance institutions (MFIs) in various fields such as institutional governance, information systems, risk management and strategic planning and help them become sustainable and viable operators in the micro-credit market. The micro-credit providers / micro-finance institutions selected by the EIF benefit from a range of services made available free of charge. These services include: • either an evaluation / diagnosis of the structure, organisation and operating mode of the selected micro-credit providers/MFI or an institutional rating performed by a specialised rating agency (Planet Rating or MicroFinanza); • tailor-made training for the staff and the management of the selected MFIs provided by expert consultants following the evaluation / rating exercise; • Business support services open to all MFIs.

Climate change relevance

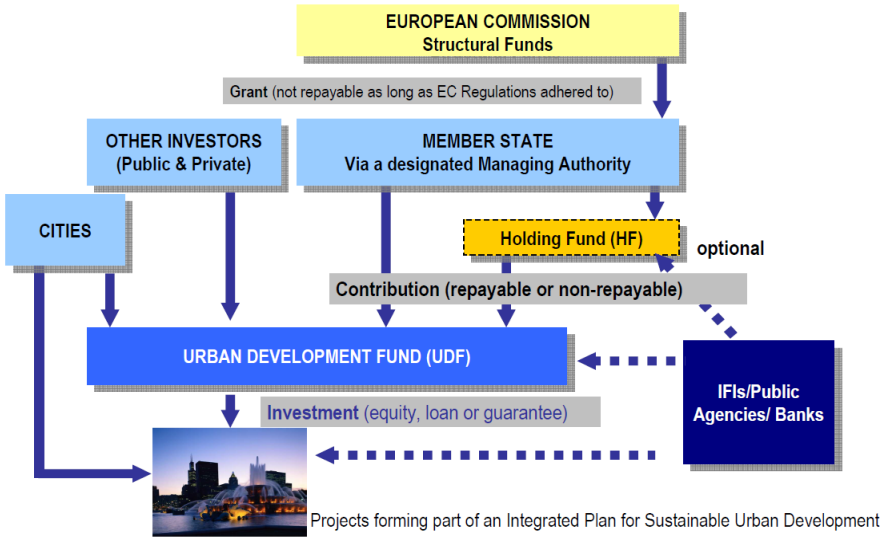
The General regulation sets out that financing engineering under ERDF could take the form of incentive schemes, providing loans, guarantees for repayable investment, or equivalent instruments, for energy efficiency and use of renewable energy in buildings, including in existing housing.[345] These have taken place under the **JESSICA** initiative. Through JESSICA, Member States may choose to use some of their European Regional Development Fund (ERDF) allocations as 'revolving funds'. The notion of revolving funds is that the funds are replenished, i.e. managing authorities receive back the capital invested, including revenue generated throughout the operation which can then be reinvested in new urban development projects.

The scheme is implemented by allocating ERDF funding to Urban Development Funds (EDFs), which can be invested in public-private partnerships or other projects that are part of an integrated urban development plan. Another option is to create holding funds which can then invest in several UDFs. Investments can take the form of loans, guarantees and/or equity (see Figure below). The choice of instrument usually depends on the type and development phase of the project to be financed. A loan, for example, requires periodic servicing of interest and repayment which means that it may be most suitable for low-risk projects that generate periodic cash inflows such as energy efficiency investments in buildings (see Figure below).[346] One of the advantages of such instruments is that they enable managing authorities to delegate part of their tasks to financial experts and engage with the private and banking sector in the implementation of sustainable urban development projects. The success of UDFs depends on achieving the right balance between low and high risk projects.

[345] EC (2012) Revised guidance note on financial engineering instruments, under article 44 of Council regulation (EC) No1083/2006. 8.2.2012, Brussels

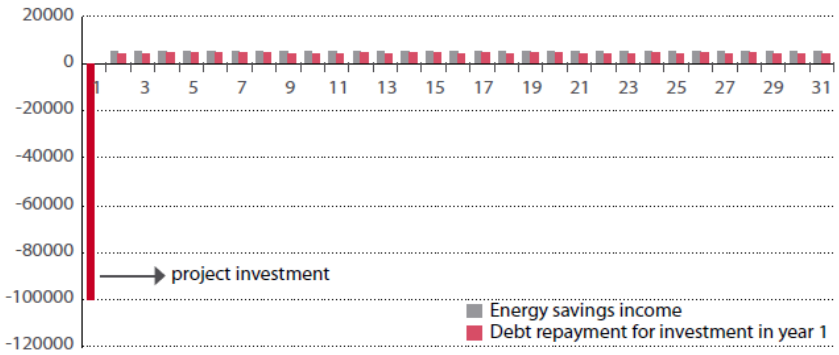
[346] European Investment Bank and European Commission (2010) JESSICA – UDF typologies and governance structures in the context of JESSICA implementation

General JESSICA structure



Source: EIB

Cash flow structure for financing energy efficiency projects



Source: EIB and EC

Out of these 23 JESSICA operations, 10 have an energy efficiency component amounting to a maximum of over €1 billion of possible investment in energy efficiency measures and renewable energy infrastructure in cities (the specific scope could range from urban infrastructure developments to the retrofitting of housing stock). Disbursements to final recipients are now taking place in Estonia, Germany, Poland and Lithuania.[347]

Rationale

The objective of JESSICA is to help the implementation of Cohesion Policy by mobilising private capital, hence alleviating pressure on public budgets and better responding to increasing investment needs. The focus on urban development has been chosen in response to growing importance of European cities as drivers for economic development and competitiveness in line with the Lisbon agenda.[348] The objective is to pool resources from different sources (public, private) but also expertise (financiers, managing authorities).

[347] European Union DG Regional Policy (2011) JESSICA implementation in the EU Member States – State of Play. December 2011, Brussels

348 EC (2007) JESSICA: An for Sustainable Innovative Tool Investment in Urban Areas. DG Regional Policy, Financial Engineering.

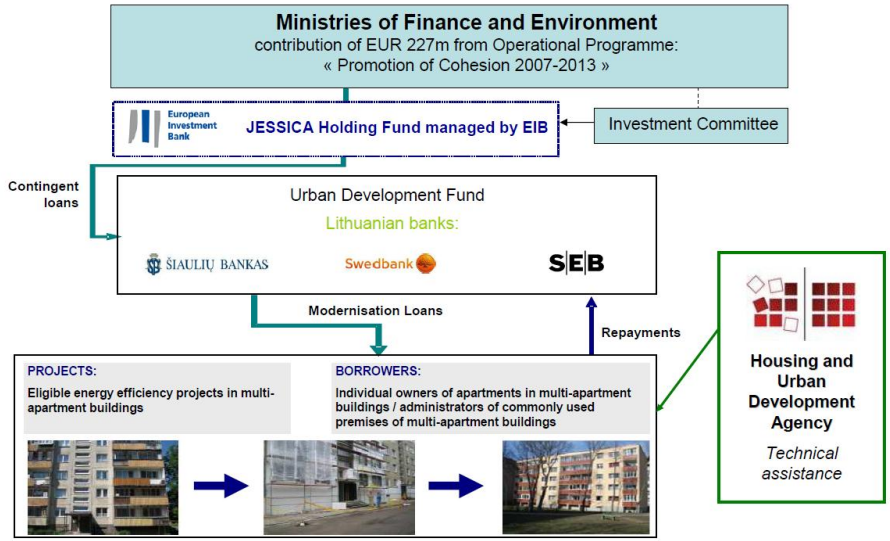
Activities

Case example: JESSICA support in Lithuania

In 2009, the Lithuania government established a €227m JESSICA holding fund, managed by the EIB, as a way to mobilise funds from the ERDF (with €127m), national funding (approximately €100m) and commercial banks (expected contribution €20-40m) to promote energy efficiency measures in multi-apartment buildings. In 2010, the first loan agreement was signed between the EIB and Šiaulių bankas, in which the latter commits to provide 20 year, low interest loans (3% for the entire loan period) for the total amount of €6 million to homeowners. The goal is to support the renovation of 1000 buildings between 2010 and 2015. By April 2011, approximately 100 projects and five project loan agreements (amounting to more than €1m) had been approved. These projects are expected to positively contribute to achieving the EU's 20% target for energy efficiency as well as national refurbishment plans for 2020. After the refurbishment, it is estimated that the average energy savings for a single house will be approximately 50% or 125 MWh a year. Some success factors behind the Lithuanian experience include: political support, huge demand for renovation of the existing housing stock and the inability of national financial schemes to adequately respond to this issue, as well as the use of established national institutions such as the housing and urban development agency (HUDA).[349]

[349] Withana, S., Nunez Ferrer, J., Medarova-Bergstrom, K., Volkery, A., and Gantioler, S. (2011) Mobilising private investment for climate change action in the EU: The role of new financial instruments, IEEP, London/Brussels.

JESSICA scheme in Lithuania



Source: EIB

Case example: Energy efficiency in Estonia

In Estonia, instead of the EIB, a public agency, Kredex, acts as a financial intermediary. Eligible projects include energy efficiency in apartment buildings in Estonia. The type of support includes loans for energy efficiency investments in apartment buildings. The budget is €49 million (of which €17 million from the ERDF + €28.8 million additional loan from the CEB + €3.2 million from Kredex). Result includes 391 projects supported by the end of 2011, total amount €34 million, total investment €45 million.[350]

[350] EC (2012) *Financial instruments in Cohesion Policy*. Commission Staff Working Document, SWD(2012)36, 27.2.2012, Brussels

Main target group

The final recipients of JESSICA support for energy efficiency are households and / or association of home owners. The take up of the instrument was relatively limited to few Member States/regions due to different reasons including weak regulatory framework, late introduction of the financial engineering instruments (after the adoption of OPs), limited awareness and capacity of managing authorities to deal with FI in comparison to traditional grant support. The process of using these instruments is also relatively slow and time consuming – from setting up the instruments to investing in concrete projects have often taken up to several years (see more information under barriers below).

Leverage effect

The Commission uses the term multiplier effect to express what is currently determined as leverage effect by the new Financial regulation. It means 'the additional funds provided by the other sources (public and private) added to the funding provided by the EU'. This is expressed as the ratio of 'overall funding at final recipient level/EU funding at final recipient level'. Based on information to date, the following multiplier effects have been estimated by the Commission:

- For ***equity-based*** instruments, it is estimated that one euro of public support led to equity investment into enterprises between 1 euro and 3.4 euro.
- For ***guarantee-based*** instruments, it is estimated that the multiplier effect between 1 euro and 7.5 euro.
- For ***loan-based*** instruments, estimated multiplier effect is estimated between 1 and 2 euro.[351]

It has also been suggested that aligning FI to the objectives and logic of Cohesion Policy has led to more limited multiplier effects compared to the same investment situation occurring outside of Cohesion Policy. The 2012 ECA report also mentioned that there are some cases where there are limitations of ERDF's financial instruments to leverage private investments.[352] Indeed, aligning FI to policy objectives could limit their flexibility to respond to market signals. On the other hand it shows that even with lower multiplier effect, aligning FI to policy objective is still possible. To better account of the effects

[351] EC (2012) Financial instruments in Cohesion Policy. Commission Staff Working Document, SWD(2012)36, 27.2.2012, Brussels
[352] ECA (2012) Innovative Financial Instruments for SMEs co-financed by the European Regional Development Fund, Special report No 2, 2012

of FI under Cohesion Policy therefore it has been suggested that the leverage effect should be compared to the leverage effect of grants under Cohesion Policy rather than with financial instruments under centrally managed EU funding programmes.[353] Further to this, FI under Cohesion Policy has led to other important benefits beyond the leverage effect which are relevant in terms of understanding the broader impact of FI. For example, the revolving nature of FI still allow for EU public resources to be reinvested in the same projects, which is not possible with grants. Also, FI are subject to more stringent rules on fiscal discipline which arguably has provided an incentive for better quality projects.

The leverage effect of JESSICA operations in other cases however could be higher. For example, in the case of the London Green Fund, approximately £50m of the ERDF allocations has been doubled with public funds, leveraged additional £300-400m from the EIB and the private sector. At least another £500m is expected to be leverage at project level, anticipating a total spent of at least £1bn. This indicates a leverage effect (as defined in the new Financial Regulation) of factor of 20.[354]

Coherence and coordination with other EU instruments

The additionally of the instruments very much depends on the local context conditions. The quality of ex ante assessments carried out varied and it is not clear whether the instruments replaced national support systems or not. According to the ECA, for the 2007-2013 programming period, the SME financing gap assessments, where available, quantified the financing gap and concluded that there was a need for public sector actions in favour of financial engineering for SMEs. Nevertheless, the gap assessments analysed suffered from certain shortcomings (such as not attempting to draw lessons from previous EU SME access to finance support programmes or being conducted independently from the operational programme process)[355]. Given the non-compulsory nature of ex ante assessments, the extent to which these instruments address existing market failures or suboptimal investments is difficult to quantify.[356]

There have also been issues of overlap between certain instruments (e.g. JEREMIE and CIP) as well as a lack of alignment between different financial

[353] Núñez-Ferrer, J., Volkery, A., Withana S., Medarova K. (2012) The implications for the EU and national budgets of the use of innovative financial instruments for the financing of EU policies and objectives. Study for the European Parliaments Committee on the Budget. Directorate General for Internal Policies, Strasbourg

[354] Lee, F. (2012). JESSICA for EE/RES investment – JESSICA & Investment Funds division, EIB.

[355] European Court of Auditors (ECA) (2012) Innovative Financial Instruments for SMEs co-financed by the European Regional Development Fund, Special report No 2, 2012

[356] Núñez-Ferrer, J., Volkery, A., Withana S., Medarova K. (2012) The implications for the EU and national budgets of the use of innovative financial instruments for the financing of EU policies and objectives. Study for the European Parliaments Committee on the Budget. Directorate General for Internal Policies, Strasbourg.

under Cohesion Policy, e.g. funds for jobs (ESF) and for urban development (JESSICA).

Monitoring and reporting

Yearly reporting on financial instruments was only made obligatory for Member States and the Commission under the 2011 amendment to the General Regulation (Regulation No 1310/2011). However the data will only be available from the beginning of 2013, until then, the Commission needs to rely on voluntary reporting by Member States.

Lessons learnt

The implementation of JESSICA is a work in progress and it is still too early to assess its effectiveness. Nonetheless, some challenges can be identified and lessons drawn from experiences to date. Specifically for JESSICA instruments in support for EE/RES, it is considered that FI are suitable as energy savings and related cost savings serve as a revenue-basis. However, shift from grant culture to repayable investments is not self-evident (change of paradigm, financing capacity of final recipients, etc.). Specific success factors have been identified as[357]:

- **Combination of FEIs and grants essential**
    - Financial incentives, such interest rate subsidies or grants to cover the self-financing share of final recipients
    - Performance incentives, such as incremental capital rebates or interest rates related to EE gains / categories reached
    - Technical assistance & project preparation, such as energy audits, planning documents, etc.
- **Campaigning:** Awareness-raising and promotion
- **Stakeholder co-operation & integration of existing programmes or actors**
- Need for relevant **expertise in the market** (easy access; sufficient capacities)
- **Dove-tailing / One-stop shop:** technical project preparation & access to finance in one package
- Involvement and development of **ESCO sector** (large potential)

[357] Gabriel, B. (2012) Financial instruments for energy efficiency in housing, Cohesion Policy experiences & outlook 2014-2020.

- EE intervention as **part of holistic / multi-thematic upgrading approach**

Overall for all types of instruments, the revolving nature of funds created incentives for better performance of projects on the side of the final recipient, for example, better quality of projects and greater financial discipline. The participation of the private sector brought additional financial expertise and knowhow.[358]

JEREMIE and JESSICA networking platforms were launched in 2009 to support the exchange of know-how and good practice. A number of procedure manuals, handbooks, and guidance notes have been developed and several technical seminars have been held in order to improve the take up of financial instruments. The JESSICA Networking Platform (JNP) and JEREMIE Network Platforms were launched in March 2009 by DG Regional Policy in collaboration with the EIB and CEB to provide a forum for exchange of experience and good practice, and to accelerate the implementation of instruments. The interest in JESSICA NP events for example was growing continuously - from 80 participants in the 1st meeting to 160 in the latest. During 2011, the added-value of the JNP was further enhanced through the establishment of dedicated thematic working groups on 'JESSICA lessons learned' and 'Housing in JESSICA'.[359]

The main barriers identified for FI in the 2007-2013 include: lack of a detailed regulatory framework, issues of institutional capacity, availability of data, determining the allocation of public funds to FI, missing financial gap analysis and not reaching optimal level of leverage effect.

On the issue of institutional capacity, the biggest issues was the so called 'cultural switch' or in other words managing authorities had to get used to thinking in terms of grants but onto financial instruments. In addition, managing authorities often lacked expertise in relation to investment know-how and/or struggled to accommodate the objectives/principles of Cohesion Policy and the market reality.[360] Financial instruments took time to become operational given the time taken to set up relevant structures to provide financial support to the project, the need to set up partnerships, build relevant knowledge and understanding within the administrations of MA etc. This was compounded by the limited experience in setting up such processes and the different levels of expertise / market development across Member States. Member State capacity issues also led to delays in launching and delivering funds to final recipients.[361] Overall, the scope of application of FI under shared management (see below), their potential to contribute to EU

[358] EC (2012) Financial instruments in Cohesion Policy. Commission Staff Working Document, SWD(2012)36, 27.2.2012, Brussels
[359] EC (2010) JESSICA implementation in the EU Member States – State of play, November 2010

[360] EC (2012) Financial instruments in Cohesion Policy. Commission Staff Working Document, SWD(2012)36, 27.2.2012, Brussels
[361] ECA (2012) Innovative Financial Instruments for SMEs co-financed by the European Regional Development Fund, Special report No 2, 2012

objectives and achieve a critical mass of investments in relation to SMEs, sustainable urban development and energy efficiency has not been optimised and experiences vary considerably across different Member States.[362]

The increasing role and use of financial instruments means more requirements on monitoring and reporting, which is linked to certain gaps in the availability of data and reporting mechanisms in this regard. Another issue identified was linked to the over allocation of resources to FI, which remained unused at the end. For instance, the ECA found a number of compliance errors in relation to ERDF and ESF payments to funds implementing financial instruments, most of which related to non-respect of regulatory requirements for making contributions from the OP to the fund[363].

Other concerns have been raised regarding the use of public funds to take away risks for commercial investors, missing to achieve a critical mass of funding, heavy collateral requirements or the choice of financial intermediaries.

[362] Núñez-Ferrer, J., Volkery, A., Withana S., Medarova K. (2012) The implications for the EU and national budgets of the use of innovative financial instruments for the financing of EU policies and objectives. Study for the European Parliaments Committee on the Budget. Directorate General for Internal Policies, Strasbourg.

[363] ECA (2012) Innovative Financial Instruments for SMEs co-financed by the European Regional Development Fund, Special report No 2, 2012

CAP	
EAFRD	
Instrument type	The European Agricultural Fund for Rural Development (EAFRD) has been in place since 2007, following from the previous 'Rural Development Regulation' in the 2000-2006 programming period. It is a single fund providing support to farmers, foresters and other actors in rural areas for a range of activities, identified within its measures. It is implemented via 88 Rural Development Programmes, designed at the Member State/regional level. The nature of the payments that are made within the EAFRD are mainly in the form of grants, some payments are made on an annual basis for on-going environmental management on agricultural or forestry land, whereas others are provided as one off grants to support, for example capital investments, setting up advice and training services or supporting activities in rural communities. The amended amount and rates of financial support are outlined in Annex 1 of the consolidated 2005 regulations.[364] However, there is also the possibility for elements of RDPs to be delivered using Financial Instruments (or financial engineering actions as they are referred to in Article 50 of the Implementing Regulations – 1974/2006). Venture capital funds, guarantee funds and loan funds are permitted. Where these are used they are approved as part of the individual RDP and operate at the Member State/regional level. To date, 6 Member States have provisions within their RDPs to set up financial instruments using funds from EAFRD (BG, RO, LT, LV, IT (not all regions), GR) and of these all but Greece has put some form of FI in place in the form of loan or guarantee funds. No venture capital funds have been put in place.[365] A short description of each of these funds is set out below. Please note that no examples for Bulgaria and Lithuania are provided as the information is not available in the source used, presumably because no input from them was provided:[366] • **Credit Fund:** In 2010, the Latvian Ministry of Agriculture issued a €150.5 million fund for one year to support rural

[364] European Commission (2005) *Regulation (EC) No 1698/2005 on support for rural development by the European Agricultural Fund for Rural Development (EAFRD)*. OJ L277/1, 21.10.2005.
[365] Personal communication
[366] ENRD (2012a) *Final Report on the ENRD Rural Entrepreneurship Thematic Initiative: Rural Finance*

	entrepreneurs seeking EAFRD support for measures 121, 123, 312 and 313. The instrument was introduced due to a lack of funding in the banking system causing high rates of interest following the global credit crunch. The fund provided a fixed interest rate of no more than 0.2% for 15 years for EAFRD approved projects. 'The ratio of uptake was low (measure 121: 3.17%, measure 123: 11.43%, measures 312 and 313: 0%). The reasons for the low uptake of the CF facility fall in two broad categories, one relating to the actual availability of the credit and the relevant rules, the other relating to the economic sector which the relevant measure belongs to.' (ENRD, 2012a) • **First Call Guarantee Scheme (FCGS):** This Italian scheme was established in 2006 as an additional tool to the Rural Credit Guarantee Fund to support agricultural enterprises within EAFRD. It emerged due to a lack of collateral among rural actors and poor access to funding due to the scale of rural enterprise. These loans can be issued for medium and long term bank loans for productive investments, short term debt consolidation, or renewable energy. • **Rural Credit Guarantee Fund (FGCR IFN S.A.)**[367]: This Romanian guarantee fund targets SMEs and micro-businesses that lack capital and do not have access to funds due to the scale of rural enterprise. The size of the fund is €220,000,000 and has been running for less than five years. The fund supports measures 121, 123, 312 and 313 from the EAFRD by guaranteeing up to 80% of the finance needed. Beneficiaries must provide proof of the financing contact with the Paying Agency and be free of any outstanding debts. • The Greek **Credit Fund** was not activated due to increased co-financing rates, the decline of public expenditure for rural development and the unwillingness of banks to participate due to the economic crisis in Greece. Outside of the EAFRD, there are a few examples of a financial instrument being used in conjunction to facilitate the use of the EAFRD. One example given here is in Lithuania. It is not used specifically for climate change objectives but offers an example of how a financial instrument could be use alongside EAFRD for the forthcoming programming period. The Rural Credit Guarantee Fund[368]: Established in 1997 by the Lithuanian Ministry of Agriculture, this financial institution offers state support to the agricultural sector and promotes economic development. The market failure it seeks to address by issuing credit guarantees is where individuals have insufficient collateral to get a loan. It provides this service to farmers, agricultural bodies, rural and agricultural SMEs[369]. In 2011, 70% of guaranteed credits were issued for EU funded projects

[367] http://www.fgcr.ro/index.php?page=Contact&lng=en
[368] www.garfondas.lt
[369] http://www.aecm.be/servlet/Repository/description-garfondas.pdf?IDR=77

	under EAFRD and the main clients were farmers, accounting for 78% of clientele in that year. For 2011, these guarantee credits were invested in agricultural equipment (46%), manufacturing equipment (15%), construction and reconstruction (10%)[370].
Objective and rationale of the instrument	**EAFRD grants/payments**: The EU added value of the CAP, and by extension EAFRD, is that it provides a coordinated framework for: EU wide support for safe and high-quality agricultural production; EU wide support for rural development; EU wide environmental protection from certain damaging agricultural practices; and positive encouragement for environmental land management across the 27 Member States (European Commission, 2011b). This framework originates from the five principal objectives of the CAP, as outlined under Article 39 of the Treaty of Rome: i. To increase agricultural productivity through the rational development of agriculture towards the optimum utilisation of the factors of production; ii. To ensure a fair standard of living for agricultural producers; iii. To stabilise agricultural markets; iv. To guarantee regular supplies of food to consumers; v. To ensure reasonable prices of food to consumers. These five objectives help to identify the key market failures in the EU agricultural sector and have since been extended under Pillar 2, the European Agricultural Fund for Rural Development (EAFRD), to cover other aspects of market failure in rural development and environmental protection by supporting the provision of public goods, including support to encourage activities to mitigate and adapt to climate change impacts (IEEP, 2012). In summary, the benefit of having an EU policy is that: it provides a level playing field across the 27 Member States; it facilitates transboundary environmental management and meeting common objectives; it promotes mutual learning; and facilitates financial cohesion (Cooper *et al*, 2010). This rationale for the EAFRD is translated into four overarching strategic objectives that are set out in four Axes: • Axis 1 - Improving the competitiveness of the agricultural and forestry sector; • Axis 2 – Improving the environment and the countryside;

[370] Rural Credit Guarantee Fund (2011) *2011 Annual Report.*

	• Axis 3 – The quality of life in rural areas and diversification of the rural economy; • Axis 4 – Leader
Target group/ Final Beneficiary	The EAFRD targets farmers, foresters and other land managers as well as communities and individuals in rural areas. Financial Instruments under EAFRD may only support individuals and enterprises and only for investments – they have to adhere to the EAFRD implementing rules for the measure to which the investments are related. For example, in Latvia, the Credit Fund was introduced and activated linked to the RDP measures 121 (farm modernisation), 123 (adding value to products), 312 (setting up micro-enterprises), and 313 (rural tourism) and therefore the final beneficiaries can only be those who meet the rules and requirements of the EAFRD in related to these 4 measures.
Implementation level	EAFRD: Shared management. The implementation of the EAFRD is determined at a Member State or regional level, within the strategic framework provided by the EAFRD and the Community Strategic Guidelines for Rural Development. Co-financing is required from Member States to complement the EU budget allocation. This programming approach to design is intended to provide flexibility for Member States to design a rural development programme best designed to meet their respective requirements. FIs are implemented at the MS/regional level and approved through the RDP approval process by the Commission.
Implementing body	The Rural Development Programmes are implemented through 'Managing Authorities' – one for each programme. These are usually part of the Agriculture Ministries although responsibility for implementation can sometimes be devolved to a more local level under strict rules of accountability. Control and enforcement is carried out via the Payment Agencies who are responsible for ensuring that funding has been implemented in accordance with the rules. FIs must be operated via independent legal entities and must adhere to the rules set out in Commission Regulation 1974/2006, Arts 51/52. Currently FIs cannot be managed via the EIB as the CAP rules do not allow this – although this is changing for 2014-2020.

Total budget	The 5 FIs that are operating in BG, RO, IT, LT and LV have paid out to date approximately €618 million in commitments[371]. For the EAFRD as a whole: The allocated total public expenditure for EU-27 for the 2007-2013 programming period amounted to €154 billion, of which actual expenditure for 2007-2011 amounts to €73 billion. This public expenditure is split between national co-financing (an allocated budget of €58 billion, of which €29 billion has been spent) and EAFRD (€96 billion, of which €44 billion has been spent).[372] By Axis, the greatest budget allocation is for Axis 2 (44.4% of total EAFRD budget) and Axis 1 (33.6% of total EAFRD budget), followed by Axis 3 (13.3%) and Axis 4 (6%).
Eligible activities (types and scale)	The EAFRD as a whole supports a large range of activities which include physical investments for rural infrastructure (such as investments for the installation of biogas plants, building insulation, modern machinery, etc.), incentive based payments for land management (such as reduced tillage, establishing and maintaining agro-forestry systems, etc.) and development of human capacity (such as training and the provision of advice). These activities are typically at a farm / business scale. Although there is no upper limit for most physical investments, a share of the investment must be privately sourced (i.e. not from national co-funds nor from EAFRD). The limits for how much can be reimbursed can vary by article, Member State and the beneficiary. These are provided in the amended amount and rates of financial support outlined in Annex 1 of the consolidated 2005 regulations[373]. Eligible activities for the 5 FIs include: venture capital funds, guarantee funds and loan funds. However, no venture capital funds have been established in the current EAFRD[374]. See Q1 for more detail about activities within FIs.

[371] Personal communication
[372] ENRD (2012b) *State of Total Public and EAFRD expenditure per measure: Rural Development Programmes 2007-2013, EU-27 (updated on February 2012)*
[373] European Commission (2005) *Regulation (EC) No 1698/2005 on support for rural development by the European Agricultural Fund for Rural Development (EAFRD)*. OJ L277/1, 21.10.2005.
[374] ENRD (2012a) *Final Report on the ENRD Rural Entrepreneurship Thematic Initiative: Rural Finance*

Climate change relevance

EAFRD measures: Although there are no measures within EAFRD designed for the sole purpose of delivering climate change objectives, the following multi-objective measures have the potential to be used for climate change adaptation and mitigation among other objectives:

111 - Vocational training and information actions
114- Use of advisory services
115 - Setting up of management, relief and advisory services
121- Modernisation of agricultural holdings
123 – Adding Value to agricultural and forestry products
125 - Infrastructure related to the development and adaptation of agriculture and forestry
213 - Natura 2000 payments and payments linked to Directive 2000/60/EC (for agricultural land)
214 - Agri-environment payments
216 - Non-productive investments (for agricultural land)
221 - First afforestation of agricultural land
222 - First establishment of agro-forestry systems on agricultural land
223 -First afforestation of non-agricultural land
224 - Natura 2000 payments (for forestry)
225 - Forest-environment payments
227 - Non-productive investments (for forestry)
311 - Diversification into non-agricultural activities
312 – support for the creation and development of micro-enterprises
321 – Basic services for the economy and rural population
323 - Conservation and upgrading of the rural heritage
331 - Training and information
411 – LEADER – Competitiveness of the agriculture/forestry sectors
412 - LEADER Environment/land management
413 - LEADER Quality of life/diversification
421 - LEADER Implementing cooperation projects

Furthermore, in 2009 several new challenges were identified for Europe that led to some amendments to the EAFRD regulations with additional emphasis placed on climate change adaptation and mitigation objectives. Of particular relevance to climate change, the amendments referred to the challenges of climate change, renewable energy, water management and protecting biodiversity. These challenges were flagged following growing scientific evidence showing the negative impact of greenhouse gas emissions on climate,

international pressure to reduce greenhouse gas emissions (notably from the Kyoto Protocol), water scarcity and droughts and EU targets to halt the loss of biodiversity by 2010. (European Commission, 2009)

Specific FIs: While none of the 5 FIs currently operating using EAFRD funds specifically focus on climate change, there is no reason why investments funded through them could not be climate related. However, there is insufficient evidence available to know the extent to which this is or is not the case.

Rationale

EAFRD: The general rationale for the EAFRD is set out under question 2 above. In relation to climate change, the EAFRD provides public support to help address climate issues in instances where markets are not operating to deliver the outcomes required. Under the EAFRD public support is provided to facilitate the on-going delivery of public goods by EU agriculture for a stable climate, such as the reduction of greenhouse gas emissions and protecting and enhancing carbon sequestration in agricultural soils (Cooper *et al,* 2009). To date there has been much less of a focus on climate adaptation, apart from through support to increase the efficiency of water use and address issues of water scarcity. The territorial and environmental balanced provision of these public goods at an EU level is important and is currently enabled by public support via the CAP (European Commission, 2011c). The latest evaluations of the RDPs are the mid-term evaluations, carried out during 2010. The synthesis of this information is being carried out currently under contract to DG Agriculture and is not yet in the public domain. As a result it is difficult to assess the degree to which RDPs have succeeded in delivering climate outcomes. Due to the fact that most measures under the EAFRD are multi-objective, often it is difficult to disentangle the climate impacts of particular interventions, particularly if this has not been stated as their primary objective. This does not mean, however, that climate benefits have not been achieved. **Specific FIs**: The Guarantee Funds mainly aim to address lack of collateral by potential borrowers

Activities

Although by no means an exhaustive list, the types of eligible activities relevant to climate change under EAFRD generally are:

- The provision of training and advice to farmers and foresters to reduce GHG emissions and adapt to climate change;
- Investments for improved fuel efficiency with modern tractors;
- Investments in new technology such as precision agriculture to reduce nitrogen emissions;
- Investments for the installation of renewable energy sources (such as photovoltaic panels and biogas plants);
- Investments for the construction of energy efficient buildings (such as new windows and insulation);

- Support for land use change (such as reversion of arable land for carbon sequestration);
- Incentive based payment to enhance carbon storage capacity of soils (e.g. protect peat and grass lands, low tillage, manage agro-forestry systems);
- Incentive based payment to reduce carbon emissions (ban burning);
- Incentive based payment to reduce nitrous oxide emissions (efficient fertiliser use and introduce nitrogen fixing crops in crop rotations);
- Incentive based payment to reduce methane emissions (efficient livestock management, e.g. avoid overgrazing and use appropriate feedstocks)
- Incentive based payment for soil management practices (tillage methods, crop rotations, catch crops) ;
- Incentive based payment to plant and maintain hedgerows/terraces;
- Incentive based payment for crop management (introduce new crop varieties);
- Incentive based payment to establish and maintain organic farming;
- Incentive based payment to establish and maintain integrated pest management;
- Incentive based payment to establish and maintain agro-forestry systems;
- Incentive based payment to conserve of genetic resources (important for managing disease outbreaks).

These activities are prescribed by a number of measures, the eligibility rules for which are set out in the implementing regulations. Within the framework provided by the implementing regulations there is a great deal of scope for Member States to decide the sorts of investments that they want to prioritise within their Rural Development Programmes. The following examples illustrate the range of activities that have been funded in the current programming period.

The share of total budget earmarked specifically for climate change type of activities is not available for the 2007-2013 programming period, neither for the EAFRD as a whole or for the FIs operating in the 5 RDPs mentioned above. However, following the 2009 amendments to the EAFRD regulations, Member States have indicated the allocation of **additional** resources for the 2010-2013 period, per 'new challenge' outlined in the amendment (one of which is climate change). These funding allocations are available in detail for each Member State here and outlined in summary below in Table.

Overall distribution of CAP Health Check and EERP funds between environmental 'new challenges'

RDP	Climate change	Renewable energy	Water management	Bio-diversity	Total
			in million euro		
AT	21			21	97
CY				1	2
MT					1
DK	22	7	61	34	124
PL		4	34	10	169
LT		0			22
NL	23	19	21	23	98
LU	2				5
LV					13
EE					9
SI	5	1	1		12
BG		12	19		33
EL	20		70		176
RO	18	36	22	14	102

SE	19	34	13	31	120
SK	12			11	27
CZ	15	8	7		42
HU					54
IE	18		26	89	146
IT	83	29	88	86	465
BE	18	10	22	12	68
UK	129	4	104	235	482
ES	26	70	189	243	574
DE	252	22	166	264	942
FI	3	3	31	1	68
FR	17	16	461	468	992
PT	1			1	102
EU27	**704**	**275**	**1332**	**1,542**	**4,946**

Source: Hart et al, 2011[375]

[375] Hart K, Baldock D, Tucker G, Allen B, Calatrava J, Black H, Newman S, Baulcomb C, McCracken D, Gantioler S (2011) *Costing the Environmental Needs Related to Rural Land Management*, Report Prepared for DG Environment, Contract No ENV.F.1/ETU/2010/0019r. Institute for European Environmental Policy, London.

Monitoring and reporting

The Common Monitoring and Evaluation Framework[376] guides the monitoring and evaluation of all measures that are funded by the EAFRD to ensure the sustainable development of rural areas. In relation to climate change, there are several baseline indicators that monitor adaptation and mitigation objectives within Axis 2 measures (note that there are no baseline indicators to monitor climate change objectives in relation to the other axes despite their potential to deliver climate change objectives). These are:

- The production of renewable energy in agriculture and forestry;
- The area of UAA dedicated to the production of energy and biomass crops;
- Surplus of nitrogen;
- Annual trends in the concentrations of nitrate in ground and surface waters;
- Emissions of greenhouse gases and ammonia from agriculture.

The production of renewable energy in agriculture and forestry is also an impact indicator.

Member States are required to report their performance in Rural Development Programme (RDP) ex-ante and mid-term evaluations[377] on a wide range of indicators, including those listed as relevant to climate change objectives. The series of evaluations is designed to ensure that the evaluations are an on-going process, starting with the ex-ante evaluations that are required before the RDPs are submitted for approval.

Leverage effects

In the case of a few measures under EAFRD, a share of private financing is required as outlined in Annex 1 of the consolidated 2005 regulations[378]. The amount of private financing sourced for these measures can be calculated by looking at the output indicators alongside EAFRD expenditure (see Table below). However, there is no means of determining where private financing is used for climate change objectives.

[376] http://ec.europa.eu/agriculture/rurdev/eval/index_en.htm
[377] http://enrd.ec.europa.eu/evaluation/en/
[378] European Commission (2005) *Regulation (EC) No 1698/2005 on support for rural development by the European Agricultural Fund for Rural Development (EAFRD)*. OJ L277/1, 21.10.2005.

EU-27 volume of public and private investments (2007-2011)

Axis	Measure	Description	Total EU 27 Investments €[379]	Total EU 27 Public expenditure €[380]	Private investments €
1	121	Modernisation of agricultural holdings	12,822,874,570	9,188,336,682	3,634,537,888
1	125	Infrastructure related to the development and adaptation of agriculture and forestry	1,889,286,780	228,548,873	1,660,737,907
2	216	Non-productive investments	281,645,690	245,628,210.87	36,017,479
3	311	Diversification into non-agricultural activities	586,866,510	635,480,820.60	-48,614,311
3	322	Village renewal and development	2,097,574,810	1,923,771,599.01	173,803,211
3	323	Conservation and upgrading of the rural heritage	354,763,000	683,160,979.82	-328,397,980

Source: Own table based on data from ENRD

In relation to the FIs:

- **Latvian Credit Fund:** €150.5 million fund. Low uptake: measure 121, 3.17%; measure 123, 11.43%; measures 312 and 313, 0%. 'The reasons for the low uptake of the CF facility fall in two broad categories, one relating to the actual availability of the credit and the relevant rules, the other relating to the economic sector which the relevant measure belongs to.'
- **Italian First Call Guarantee Scheme (FCGS):** €106 million fund. Uptake and allocation not readily available
- **Romanian Rural Credit Guarantee Fund (FGCR IFN S.A.)**: €220 million fund. Uptake and allocation not readily available
- The Greek **Credit Fund** was not activated due to increased co-financing rates, the decline of public expenditure for rural development and the unwillingness of banks to participate due to the economic crisis in Greece. [381]

[379] ENRD (2012c) *Output indicators: State of implementation per measure (EU-27) (updated June 2011).* http://enrd.ec.europa.eu/app_templates/filedownload.cfm?id=D0F3CCFA-E1A7-2614-A559-76CBFFAB233C

[380] ENRD (2012b) *State of the Total Public and EAFRD expenditure per measure (updated on February 2012)* http://enrd.ec.europa.eu/app_templates/enrd_assets/pdf/monitoring_indicators/financial_and_physical_indicators/rdp/B_Financial%20expenditure%202012_A_EU27.pdf

[381] ENRD (2012a) *Final Report on the ENRD Rural Entrepreneurship Thematic Initiative: Rural Finance*

Lessons learnt

Member State flexibility to allocate EAFRD and public finances allows the instrument to be tailored to local needs in relation to climate change objectives. Also, where the climate change objective is being met through land management options, the multi-annual nature of the agreements ensures on-going support for climate change objectives; for example, the maintenance of permanent pasture for carbon sequestration.[382]

For the specific FIs, a report by the European Network for Rural Development earlier in 2012, looked at the use of FIs in a number of RDPs, but success factors are not clearly identified, rather barriers – see below. However these are not climate specific.

For EAFRD/RDPs as a whole: The main barriers for promoting climate change are listed below (building on barriers identified by Hjerp *et al,* 2012):

- Political (political commitment, priority for action, lobbying power of political interest groups);
- Institutional (institutional capacities, knowledge, expertise);
- Financial (financial resources, allocation of funds). For example, the Lithuanian example of a Rural Credit Guarantee Fund demonstrates how lack of credit and insufficient assets to secure loans can be a problem for farmers, particularly young farmers, to access EAFRD where part private financing is required (Rural Credit Guarantee Fund, 2011).
- Integrated Planning and Delivery (coordination between government departments, policy/strategic frameworks, preparatory work). For example, the lack of targets for climate change adaptation makes it difficult to ascertain progress (CCRU *et al*, 2008). The lack of climate change adaptation and mitigation targets for land management options has also been flagged as a barrier (European Court of Auditors, 2011).
- Information/data availability (availability of data, risk assessments, maps of vulnerability); and
- Knowledge transfer. For example, the lack of understanding about climate change challenges and the need to take action from beneficiaries, need to develop human capital (CCRU *et al* 2008) (also see for example Spanish LIFE project Changing the Change).

[382] Allen B, Keenleyside C and Menadue H (2012) *Fit for the environment: principles and environmental priorities for the 2014 - 2020 Rural Development Programmes*. Report produced for the RSPB. Institute for European Environmental Policy, London.

For FIs: Reasons for MSs not introducing FIs:

- Administrative challenges – including additional administrative workload, the opinion that FEI are too complicated, uncertainty relating to FEI control rules subject to the same system of funding cuts and sanctions applied to the first pillar of the CAP have been the most often cited reasons for not having introduced FEI in the RDPs. This type of response was given by Germany, Sweden, and Austria, while the Czech Republic and Denmark referred to lack of experience with FEI.
- Availability of rural finance from the financial markets or in the form of state aid was the second reason why MS have not opted for the introduction of FEI in their RDPs. Factors that fall into this category have been cited by Denmark, Estonia, and Germany.
- The higher risk of financial corrections was mentioned by Germany as another reason for not introducing FEI.

Issues experienced with the operation of FIs:

- low activity due to insufficient information , restricted availability of funds limits the number of beneficiaries, failure to repay micro-credits on schedule and the resulting waiting lists,
- low number of participating banks due to fixed credit conditions for 15 years, restriction for fees, and full responsibility for collection of debts

Specifically in relation to Latvia, the Credit Fund was introduced and activated linked to the RDP measures 121, 123, 312, and 313. The ratio of uptake was low (measure 121: 3.17%, measure 123: 11.43%, measures 312,313: 0%). The reasons for the low uptake of CF facility fall in two broad categories, one relating to the actual availability of the credit and the relevant rules, the other relating to the economic sector which the relevant measure belongs to. The set of rules that apply to participating banks' in terms of the fees chargeable (max. 0.2% of the value of the credit which makes funding small projects less profitable), the responsibility for collection of debts from clients, and the interest rates chargeable (fixed at the base of the lending period) have all contributed to the reduced activity in terms of CF. Another reason is the improvement of credit markets since the introduction of the CF which made finance more accessible. Considering the zero uptake for Axis III measures (312,313), it is due to the downturn in the relevant sectors of the economy, the resulting low number of projects and banks' loss of confidence.

There are a few areas within the EAFRD that could be developed in order to better promote climate change objectives. These are:

- More advice to ensure better understanding and awareness of climate change challenges and how to address them.
- Better monitoring in order to monitor how successful EAFRD is in the delivery of climate change objectives, the aims need to be more clearly defined and measurable. In addition to more clearly defined objectives, a suite of indicators needs to be developed to ensure adequate assessment of climate change mitigation and adaptation (CCRU *et al*, 2008).
- Better integration to ensure that synergies between different projects meeting climate change challenges should be promoted, for example renewable energy production, livestock, extensification, peatland and forest preservation and expansion (CCRU *et al*, 2008).

There are also initiatives that could be taken beyond the EAFRD to support it in meeting climate change objectives. These are:

- Greater use of innovation and research and development in the agricultural sector in terms of land management and technologies used.
- Improving institutional capacity;
- Improving the knowledge base;
- Improving the dissemination of information to all actors involved – from the European Commission to the beneficiaries of CAP funding;
- Ensuring that requirements to address climate adaptation needs are embedded in all aspects of the CAP regulations from the assessment of strategic priorities, to programme development, to implementation, to monitoring and evaluation[383].

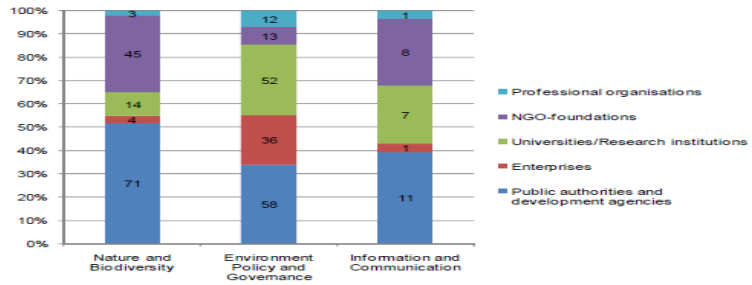
In terms of mobilising the funds available, it has been proposed that EAFRD could introduce an ecosystem service payment scheme for climate change mitigation and adaptation supporting local ecosystem provisioning services offered through carbon sequestration and water retention[384]. There are also on-going discussions about improving EAFRD by involving the banking system in the forthcoming programming period. This could include a private capital flow for rural development and financial advice on rural development investments.[385]

[383] Hjerp, P, Volkery, A, Lückge, A, Medhurst, J, Hart, K, Medarova-Bergstrom, K, Tröltszsch, J, McGuinn, J, Skinner, I, Desbarats, J, Slater, C, Bartel, A, and ten Brink, P, (2012), *Methodologies for Climate Proofing Investments and Measures under Cohesion and Regional Policy and the Common Agricultural Policy*, A report for DG Climate, August 2012.

[384] CCRU, INEA, IfLS, IEEP, VUZE, AgraCeas (2008) *Review of Rural Development Instruments: DG Agri project 2006-G4-10.* Final Report.

There is significant scope for improving the use of the FIs in the five MSs in which they operate for climate change objectives as they are not currently explicit (although funding may benefit climate objectives depending on the investment made). In relation to the Rural Credit Guarantee Fund in Lithuania, according to the annual report for 2011, as many as 70% of the guaranteed credits were for EAFRD funded projects, of which the largest share of investments were for agricultural equipment. To ensure the climate change objectives of EAFRD are met, there environmental criteria or an assessment on issuing these credit guarantees could improve their climate relevance.

[385] D'Auria, R, Guido, M, Cardini, G and Venceslai, G (2012) *Future Rules on Financial Instruments, EAFRD 2014-2020.* Presentation for ENRD workshop 'Facilitating access to finance for rural micro-enterprises', 28 June 2012, Riga, Latvia.

LIFE+ 2007-2013	
Instrument type	Grant
Objective and rationale of the instrument	According to the LIFE+ Regulation 614/2007, the general objective of LIFE+ is to contribute to the implementation, updating and development of Community environmental policy and legislation and, in particular, to support the implementation of the 6th EAP. By working together through Community instruments to networking, mutual learning and the exchange of best practice; and improved dissemination of information, awareness-raising and communication. Financial support under this Regulation should therefore contribute to the development, implementation, monitoring and evaluation of environmental policy and legislation, as well as its communication and dissemination throughout the Community.
Target group/ Final Beneficiary	A wide range of stakeholders have benefitted from LIFE+. The figure below shows the main beneficiaries per action grant strand for 2007-2008.[386] *Main beneficiaries per action grant strand for 2007-2008* 

[386] SEC (2011) 1541 Final COMMISSION STAFF WORKING PAPER IMPACT ASSESSMENT accompanying the document on the Proposal for a Regulation on the establishment of a Programme for the Environment and Climate Action (LIFE)

	NGOs have also received further support through operational grants. Demand for LIFE action grants is continuously growing, and with it, its capacity to mobilise both private sector and national funds.
Implementation level	EU and third countries (including EFTS, candidate and Western Balkan countries).
Implementing body	LIFE+ is managed centrally by the Commission, assisted by the LIFE+ Committee. The Committee consists of representatives from the Member States and helps to determine the content of the monitoring reports from beneficiaries, establishing indicators to monitor LIFE+ and amending non-essential elements of the Regulation.
Total budget	The total budget is €2.143 billion for the whole funding period 2007-2013.
Eligible activities (types and scale)	LIFE+ was adopted through Regulation (EC) No 614/2007, covering both the operational expenditure of DG Environment and the co-financing of projects. The programme consists of: 1. Action grants (78 % of the budget): • LIFE+ Nature and Biodiversity, which co-finances best practice or demonstration projects that contribute to the implementation of the Birds and Habitats Directives and the Natura 2000 network. In addition, it co-finances innovative or demonstration projects that contribute to the implementation of the objectives of the 2006 Community Commission "Halting the loss of biodiversity by 2010 – and beyond"; • LIFE+ Environment Policy and Governance, which co-finances innovative or pilot projects that contribute to the implementation of European environmental policy and the development of innovative policy ideas, technologies, methods and instruments. It also helps with monitoring pressures on the environment. It also includes the principal objective of climate change. • LIFE+ Information and Communication, which co-finances projects relating to communication and awareness raising campaigns on environmental, nature protection or biodiversity conservation issues, as well as projects related to forest fire prevention. 2. Operating grants for NGOs (3 % of the budget)

	3. Public procurement contracts (13 % of the budget) for services and studies related to the development, update and implementation of EU environmental and climate policy and legislation. 4. Technical assistance (6 % of the budget) to the selection, monitoring and evaluation of LIFE projects.

Climate change relevance

The LIFE+ Regulation mentions the principal objective of climate change as the stabilisation of greenhouse gas concentration at a level that prevents global warming above 2 °C. However, LIFE+ has been addressing in practice broader climate change objectives, such as resilience to climate change.

Rationale

LIFE+ has been designed to address market failure as well as meeting the objectives of the 6EAP. These general aims also apply to the justification of tackling climate change as part of LIFE+. LIFE+ has worked best when focused on a particular sector and thus is able to create critical mass. These sectors tend to be as well those in which LIFE+ has also brought more direct environmental benefits. In any case, the lack of focus of the Environment strand meant that projects even within a common and successful theme such as waste or climate change addressed in fact a wide range of issues. As a consequence, the overall body of projects lack coherence, reducing the capacity for direct environmental benefits, mutual learning exchange, transferability and the delivery of multipliers.[387]

Activities

For Environment Policy and Governance (EPG) strand the objective for climate change is to stabilise greenhouse gas concentration at a level that prevents global warming above 2 °C.

The Multiannual work programme for EPG lists the following priority activities for climate change:

- ensuring the implementation of EU commitments under the Kyoto Protocol to the United Nations Framework Convention on Climate Change and developing a post-2012 strategy and implementation programme;
- ensuring the adaptation of the EU economy and society, of nature and biodiversity, of water resources and of human health to the

[387] SEC (2011) 1541 Final COMMISSION STAFF WORKING PAPER IMPACT ASSESSMENT accompanying the document on the Proposal for a Regulation on the establishment of a Programme for the Environment and Climate Action (LIFE)

adverse impacts of climate change (to a potential temperature increase of 2 °C resulting from increased greenhouse gas concentrations) and mitigating such impacts; and

- ensuring the implementation and use of market-based instruments, in particular greenhouse gas emission trading, in order to achieve a cost-efficient emission reduction in a post-2012 framework.

A number of climate change related activities have been financed under LIFE+. These have not necessarily been classified as climate change, particularly adaptation related ones which cut across other priority themes such as water, risk prevention, nature protection, sustainable urban development.

The mid-term evaluation[388] found that the climate change theme attracted a significantly higher number of projects in LIFE+ compared to previous LIFE programmes. Some examples of good examples were identified in the LIFE+ Impact Assessment and two of these are described in Box 1.

Case study: BIOAGRO project
Support for methods to reduce Greenhouse gas output in the agricultural sector leading to the setting up of a complete facility for producing a carbon neutral biomass pellet fuel. This project was targeted towards developing and implementing an innovative method to reduce greenhouse gas output from the agricultural sector. The project involved the seed industry, combustion technology industry and academia.

Case study: The 'SuperC' project
Aimed to demonstrate the economical and ecological advantages of using geothermal energy to heat and cool large buildings. Taking the Students' Service Centre of the RWTH Institute of Technology at the University of Aachen as its demonstration site, it planned to develop an installation which would provide the energy required for the heating and cooling of this large building with a 95% reduction in CO2 emissions.

Main target group

Demand for LIFE+ action grants, including climate change, is continuously growing, and with it, its capacity to mobilise both private sector and national funds. The overall level of applications and co-financing requested is oversubscribed for all strands. Since LIFE action grant funding covers up to 50% of the eligible project costs (up to 75% for Nature projects targeting priority species and/or habitats), matching funds are

[388] Arcadis (2010) Mid-term evaluation of the Implementation of the LIFE+ Regulation

brought by project beneficiaries and, where relevant, co-financers from the public or private sectors. In some Member States, national funds provide matching funds to LIFE funding as co-financers.[389]

Coordination and coherence with other EU instruments

There are a number of instruments that contribute towards meeting environmental objectives. According to the combined Impact Assessment and ex-ante evaluation of LIFE+,[390]feedback from consultations with Commission staff suggests, however, that the synergies between the different financial instruments could be strengthened and that more efforts are needed to build linkages between LIFE and other instruments, in particularly as regards complementarity and synergies created between LIFE and Cohesion Policy; or between CIP and Cohesion Policy.[4]

The concern of programme managers has been to avoid the double funding by two or more instruments, in line with financial regulations, rather than the creation of better linkages between instruments[4].

Policy outcomes

The Impact Assessment of LIFE+ assessed EPG projects in terms of the physical environmental impacts, the economic value of these benefits in so far as relevant external costs have been identified, and any related economic and social impacts identified by the projects. The assessment is based on the best assessments of project managers as to the likely future impact of the projects. Projects were asked to anticipate the impact three years after the end of the project, recognising a period of elapsed time would be required before the full impacts of the projects could be realised. Based on 33 EPG projects the responses received on climate change impacts are shown in table below.

Theme	Indicator	Unit	Survey Response
Climate Change	Expected reduction in emissions of CO2 or other greenhouse gases	Tons/year	152,467
Urban environment	Expected reduction in CO2 emissions through	Tons/year	4,803

[389] SEC (2011) 1541 Final COMMISSION STAFF WORKING PAPER IMPACT ASSESSMENT accompanying the document on the Proposal for a Regulation on the establishment of a Programme for the Environment and Climate Action

[390] GHK (2011) Combined Impact Assessment and Ex-ante Evaluation of the Review of the LIFE+ Regulation: Options Development – FINAL REPORT, 17 June 2011.

	increase in bicycle traffic		
Urban environment	Expected reduction in CO2 emissions through reduction in car traffic	Tons/year	6,301
Natural resources & waste	Likely reduction in energy consumption	KwH/Year	3

Lessons learnt

There has been an increase in the number of applications linked to climate change and mainly due to the higher profile that climate change received in the calls. Action grants in the area of climate change, water and waste were be considered in the Impact Assessment of LIFE+ as the most successful in achieving direct environmental benefits.

Still, the lack of focus within the strands meant that projects even within a common and successful theme such as waste or climate change addressed in fact a wide range of issues. As a consequence, the overall body of projects lack coherence, reducing the capacity for direct environmental benefits, mutual learning exchange, transferability and the delivery of multipliers. [391]

The main criticism of the current instrument is the absence of a strategic approach, which means that EU policy priorities are not fully reflected. For example, climate change was a priority for 2007-2009 calls, but given the open competition, it only obtained 14% of LIFE budget for action grants. LIFE+ has also been criticised for only reaching a limited number of stakeholders and should strive to increase the applicant base. [392]

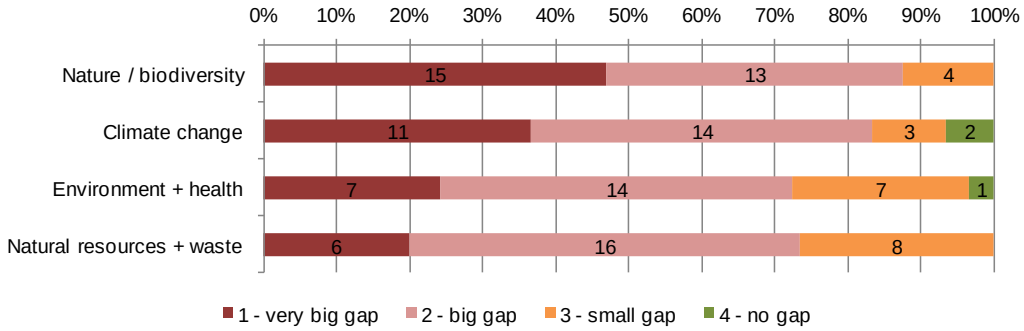
Policy implementation was identified as being a significant concern across all four environmental policy areas, but most especially in terms of nature and biodiversity policy (although this might be a reflection of the respondents of a survey on the LIFE+ programme and the number of

[391] SEC (2011) 1541 Final COMMISSION STAFF WORKING PAPER IMPACT ASSESSMENT accompanying the document on the Proposal for a Regulation on the establishment of a Programme for the Environment and Climate Action

[392] SEC (2011) 1541 Final COMMISSION STAFF WORKING PAPER IMPACT ASSESSMENT accompanying the document on the Proposal for a Regulation on the establishment of a Programme for the Environment and Climate Action

environmental NGO respondents); almost half believed there was a very big gap in policy implementation with almost all the remainder believing there was a big gap (see Figure below)[393].

Stakeholders believed there were significant gaps in policy implementation across all four environmental policy areas



No risk of crowding has been foreseen, especially since the increase in LIFE funding is inferior to current and expected demand (Impact Assessment.

As identified in this assessment, one of the aspects hampering most the implementation of LIFE+ was the lack of a more coherent approach, especially in relation to climate change. Many of the criticisms identified have been taken into consideration in the LIFE Proposal for 2014-2020 and will be discussed in more detail there.

[393] GHK (2011) Combined Impact Assessment and Ex-ante Evaluation of the Review of the LIFE+ Regulation: Options Development – FINAL REPORT, 17 June 2011

European Energy Efficiency Fund	
Instrument type	FI - structured finance vehicle.
Objective and rationale of the instrument	The European Energy Efficiency Fund (EEEF) was set up in 2011 using unspent funds of EUR 146 million from the European Energy Programme for Recovery[394]. €125 million are placed as risk capital into the fund to leverage public and private funding and about €21 million to TA and awareness raising activities.[395] The EEEF is a public-private partnership open to investments from institutional investors, professional investors and other investors. Targeted investors are donor agencies, governments, international financial institutions, and professional private investors. EEEF aims to provide commercial returns to its investors. EEEF contributes with a layered risk/return structure to enhance energy efficiency and foster renewable energy in the form of a targeted private public partnership, primarily through the provision of dedicated financing via direct finance and partnering with financial institutions. Investments should contribute significantly towards energy savings and the reduction of greenhouse gas emissions to promote the environmentally friendly use of energy. Maximizing its impact, EEEF facilitates investments in the public sector, which offers an enormous potential, but in which projects are often hindered or decelerated due to budget restrictions and lack of experience with this kind of investments.[396] EU funds will have to be allocated by end March 2014.
Target group/ Final Beneficiary	Public authorities, preferably at local and regional level, and public or private entities acting on behalf of those public authorities. The EEEF focuses on investments at the local and regional level by municipal, local and regional authorities as well as public and private entities acting on their behalf (e.g. PPPs, utilities, public transport providers, energy service

[394] Regulation (EU) No 1233/2010 of the European Parliament and the Council of 15 December 2010 amending Regulation (EC) No 663/2009 establishing a programme to aid economic recovery by granting Community financial assistance to projects in the field of energy

[395] Frequently Asked Questions, Brussels, 1 July 2011, Launch of the new European Energy Efficiency Fund (EEE– F) of the European Energy Programme for Recovery (EEPR), http://ec.europa.eu/energy/eepr/eeef/doc/20110701_eeef_faq.pdf

[396] http://www.eeef.eu/objective-of-the-fund.html

	companies (ESCOs), social housing associations etc.).
Implementation level	EU
Implementing body	The Investment Manager conducts the Fund's business on behalf of the Management Board and the Investment Committee.
Total budget	At its launch the initial fund volume will be €265 million: in addition to the EU contribution (€125 million), the European Investment Bank (EIB) will invest €75 million, Cassa Depositi e Prestiti SpA (CDP, Italy) €60 million and the designated investment manager (Deutsche Bank) €5 million. Other financial institutions at Member State level have been invited and could also join the fund later. In addition private sector investors are expected to leverage the public sector contribution. In addition, about €20 million of the EU funding will be made available as grants for project development services (technical assistance) related to technical and financial preparation of projects.[397]
Eligible activities (types and scale)	EEEF can pursue two types of investments:[398] *1) Direct Investments* These comprise projects from project developers, energy service companies (ESCOs), small scale renewable energy and energy efficiency service and supply companies that serve energy efficiency and renewable energy markets in the target countries. • Investments in energy efficiency and renewable energy projects in the range of €5m to €25m • Investment instruments include senior debt, mezzanine instruments, leasing structures and forfeiting loans (in cooperation with industry partners) • Also possible are equity (co-)investments for renewable energy over the lifetime of projects or equity participation in special purpose vehicles, both in cooperation directly with municipalities, or with public and private entities

[397] http://ec.europa.eu/energy/eepr/eeef/eeef_en.htm
[398] http://www.eeef.eu/eligible-investments.html

	acting on behalf of those authorities. • Debt investments can have a maturity of up to 15 years, equity investments can be adapted to the needs of various project phases • The Fund can (co-)invest as part of a consortium and participate through risk sharing with a local bank *2) Investments into Financial Institutions* These include investments in local commercial banks, leasing companies and other selected financial institutions that either finance or are committed to financing projects of the Final Beneficiaries meeting the eligibility criteria of EEEF. Selected partner financial institutions will receive debt instruments with a maturity of up to 15 years.

Rationale

Maximizing its impact, EEEF facilitates investments in the public sector, which offers an enormous potential, but in which projects are often hindered or decelerated due to budget restrictions and lack of experience with this kind of investments.[399]

The provision of forfeiting agreements through the EEEF could also open up a new stream of financing for ESCOs. Under an EEEF loan to support upfront costs and offer better access conditions to an ESCO, the ESCO could sell part of its receivables to the EFFF which are secured by the guaranteed energy savings of the energy performance contract (EPC). Thus, the EPC (receivable) is used as collateral to secure the EEEF loan, if the ESCO does not deliver, the EEEF is covered by the EPC, and the fund does not bear the technical risk.[400]

Activities

The EEEF is expected to cover projects in the following areas:

[399] http://www.eeef.eu/objective-of-the-fund.html

[400] Based on discussions at workshop on 'Exploring the potential of new financial instruments for climate change', 11 October 2011, Brussels

- *Energy saving and energy efficiency investments* – expected to make up 70% of the investment portfolio and to include *inter alia* investments in public and private buildings, combined heat and power, local infrastructure, technologies;
- *Small and medium-scale renewable energy projects* – expected to make up 20% of the investment portfolio and to include *inter alia* distributed generation from local renewable energy sources to medium and low voltage distribution networks, smart-grids, energy storage, decentralised energy sources, micro generation from renewable energy sources, various technologies);
- *Clean urban transport* – expected to make up 10% of the investment portfolio and to include investments in *inter alia* public transport, electric and hydrogen vehicles, substitution of oil by alternative fuels, development of vehicles which consume less energy and generate fewer pollutant emissions)[401].

General **criteria** to be met by projects financed by the EEEF are set out below:[402]

- Investments must achieve at least 20% primary energy savings for energy efficiency projects (for projects in the building sector, a higher percentage is required) and 20% reduction of CO_2 emissions for renewables and transport projects;
- Specific criteria, e.g. economic viability, may apply for some technologies;
- Public authorities requesting financing should have concrete objectives to mitigate climate change (i.e. increasing energy efficiency) and multi-annual strategies to do so;
- The fund will only consider proven technologies;
- The fund should seek to invest in projects which enhance the use of energy service companies providing guaranteed energy savings; and
- Investments should be aligned with relevant EU legislation. For renewable energy projects using biomass compliance with the renewable energy Directive 2009/28/EC is essential.

Monitoring and reporting

Measuring the CO_2 reduction is a precondition to obtain EEEF funding and project partners are required to report to the Carbon Efficiency Management - a programme designed for CO_2 measurement accessible through the EEEF website[403]. The criteria for energy savings/CO_2

[401] EEEF, Investment categories, http://www.eeef.eu/investment-categories.html
[402] EEEF, What are the key eligibility criteria for direct investments?, http://www.eeef.eu/direct-investments.html [Accessed 5.10.2011]
[403] EEEF, Technology/CO2 measurement, http://www.eeef.eu/technology-co2-measurement.html [Accessed 5.10.2011]

reductions are considered to be a minimum and in practice, savings realised may be higher than those stipulated. The relatively low criteria were selected so as not to deter potential investors by setting a high benchmark upfront.[404]

Coordination and coherence with other EU instruments

The FI's focus on providing funding to public authorities and specifically ESCOs fills a gap in funding landscape for climate relevant funding.

Pursuant to Annex II of the EEEF-Regulation grants or technical assistance from EEF shall pay attention to synergies with other financial resources available in the Member States, such as the Structural and Cohesion Funds and the ELENA Facility, in order to avoid overlaps with other instruments.

Projects under the 'Smart Cities and Communities' initiative will be co-financed to a maximum of 50% and should be embedded in comprehensive urban sustainability plans covering at least energy, transport and ICT.

[404] Based on discussions at workshop on 'Exploring the potential of new financial instruments for climate change', 11 October 2011, Brussels

Marguerite Fund - 2020 European Fund for Energy, Climate Change and Infrastructure	
Instrument type	FI – equity fund
Objective and rationale of the instrument	The objective of the 2020 European Fund for Energy, Climate Change and Infrastructure (the Marguerite Fund) is to bring together public and private capital by joining both public and private investors to make capital-intensive infrastructure investments.[405] The proposal to create the Marguerite Fund was included under the political priorities set out in the European Economic Recovery Plan. The Marguerite Fund is the first fund of its kind set up for long-term institutional investors, from both the public and the private sector, in order to provide financing in particular to "greenfield" infrastructure investments, i.e. investments creating new assets, which are not sufficiently served by other investment funds.[406]
Target group/ Final Beneficiary	Private and public sector promoters of capital intensive infrastructure projects.
Implementation level (EU, shared management)	EU
Implementing body	The Fund was established as a regulated, specialised investment vehicle under Luxembourg law. The Commission, representing the EU, has a seat on the Supervisory Board responsible for setting the overall strategy of the Fund, but is not involved in the day-to-day management of the Fund or in individual investment decisions, as this is the responsibility of the Management Board and Investment Committee of the Fund. All decisions must be taken in compliance with the investment policy of the Fund, which was established together with the Commission.

[405] http://www.margueritefund.eu/aboutus.php?pageid=4

[406] Commission Decision of 2010 establishing an annual work programme for granting financial aid in the field of trans-European Transport network (TEN-T) for 2010, C(2010) 796 final

Total budget	Marguerite is seeking €1.5 billion in total commitments for projects with attractive long-term and stable risk-adjusted returns. Each of the six Core Sponsors[407] has committed €100 million to the Fund. In addition, three further investors (including the European Commission which provides €80 million in risk capital out of the TEN-T budget to the fund) have committed an incremental €110 million to the Fund, bringing current commitments to €710 million. Fundraising with other institutional investors, both private and public, continues with a EUR 1.5 billion target fund size and a final close expected during 2012.
Eligible activities (types and scale)	• Greenfield: new projects and facilities, with typical development risks largely mitigated (minimum of 65% of the Fund) • Brownfield: replacement, modernisation and capacity enhancement of existing assets (maximum of 35% of the Fund) • Investments in the Transport Sector for up to 30%-40%, in the Energy Sector for up to 25%-35% and in Mature Renewables for up to 35%-45% of the total fund size. • Minimum of EUR 10 million and maximum 10% of the total fund size.[408]

Climate change relevance

Rationale

The main rationale for setting up the Marguerite fund was to provide funding for capital-intensive infrastructure projects of public interest and bridge a funding gap for such projects.

Activities

Although the fund may invest in brownfield projects where modernisation, retrofitting, capacity enhancement or similar investments are necessary,[409] its main focus is on greenfield investments within three target sectors[410]:

[407] Caisse des dépôts et consignations, France ; Cassa Depositi e Prestiti, Italy ; European Investment Bank ; Instituto de Crédito Oficial, Spain ; KfW, Germany ; PKO Bank Polski SA, Poland.
[408] http://www.margueritefund.eu/fundoverview.php?pageid=7
[409] Marguerite Fund, Key features, http://www.margueritefund.eu/fundoverview.php?pageid=8 [Accessed 4.10.2011]

- *Transport*, in particular trans-European transport networks (TEN-T) (i.e. road, rail, inland waterway, seaports, airports, interconnection points between modal networks), expected to make up to 30-40% of the total size of the fund;
- *Energy*, in particular trans-European energy networks (TEN-E) (i.e. electricity and gas transportation, interconnection, storage and infrastructure, distribution, electricity/gas/oil production, carbon capture and storage), expected to make up to 25-35% of the total fund size; and
- *Renewable energies* (i.e. sustainable energy production, clean transport infrastructure, energy distribution and systems for hybrid transport, wind, solar, geothermal, biomass, biogas, hydro, waste-to-energy projects) expected to make up to 35-45% of the total size of the fund.

Case study
In December 2011 the Marguerite Fund acquired a stake in C-Power, the owner and operator of the 325 MW Thornton Bank Offshore Wind Project in Belgium. The stake was sold by EDF Energies Nouvelles, which divested 49.9% of its 18.3% participation in C-Power. C-Power is the company set up for the development, construction and operation of the Thornton Bank offshore wind farm Project, located in the North Sea 30 km off the Belgian Coast. Once complete the wind farm will have a total capacity of 325 MW, including the already operational capacity of 30 MW, enough to provide power to 600,000 inhabitants and to avoid 450,000 tons of carbon emissions per annum to the environment. C-Power will thus contribute 10% of the renewable energy needed for Belgium to meet its EU objective to reach 13% renewable energy by 2020.[411]

Target group

Main target group/beneficiary of climate change related activities were project developers in large-scale mature renewable energy projects such as PV and offshore wind.

Coordination and coherence with other EU instruments

There seems to have been no explicit coordination and coherence with other instruments. However, the programme is dedicated to large and

[410]Marguerite Fund, Core Sectors – Transport, energy and renewables, http://www.margueritefund.eu/fundoverview.php?pageid=6 [Accessed 4.10.2011]
[411]http://www.margueritefund.eu/news/The%20Marguerite%20Fund%20completes%20first%20investment%20to%20acquire%20stake%20in%20C-Powers%20Thornton%20Bank%20Offshore%20Wind%20Project%2021%2012%202011%20final.pdf

capital-intensive infrastructure projects which make its scope distinctive to other funding instruments. It also provides equity as opposed to grants, loans or guarantees provided by most other existing FIs.

The complementarity or added value of the Marguerite fund is less clear since some of the project investments cover investments from other private companies which suggests that the projects were bankable and commercially attractive at some point. The equity contribution from the Marguerite fund seems therefore not to have been a necessary condition for the project to go ahead, but potentially to continue its operation.

As an equity fund, Marguerite is seen to be complementary to the Commission's recent proposal for the project bond initiative which would aim to facilitate project bond finance.[412] Its relationship with the project bond initiative in terms of the combined potential of such financial instruments in the transport and energy sectors is worth exploring further.

412 EC (2001), Impact Assessment accompanying Communication on a pilot for the Europe 2020 Project Bond Initiative and the proposal for a Regulation establishing a Competitiveness and Innovation Framework Programme (2007-2013) and Regulation (EC) No 680/2007 laying down general rules for the granting of Community financial aid in the field of the trans-European transport and energy networks, (SEC(2011)1237), 19.10.2011, Brussels

ANNEX 4 - SUITABILITY OF INSTRUMENTS PER PROJECT TYPE

4.1 Rationale for developing typologies of projects

The key objective of this study is to assess the extent to which the proposed FIs at EU level can help addressing the investment needs identified in the previous Chapter and hence to contribute to EU climate policy objectives. For this purpose typologies of projects are developed. The typologies will allow a project type specific analysis of the proposed FIs and identifying strengths, weaknesses and potential gaps of future EU funding via FIs in the area of climate change. Typologies of sectoral projects / investment types for climate change mitigation and adaptation have been developed for the 6 sectors which relevance and investment needs have been discussed in more detail in the previous Chapter. Priority has therefore been given to the energy, buildings and transport sectors. This is where the scope of enhancing FI through the EU budget seems biggest and hence the typologies in these sectors have been developed in more detail. The typology for the SME support, agriculture and water are less detailed.

4.2 Approach for developing the typologies of projects

The development of the typologies of projects was guided by several principles/criteria:

1) **EU budget principles**: Key principles providing a rationale for EU intervention through the EU budget, including EU added value, Treaty obligations and market / regulatory failure.

2) **Climate change objectives**:
   For mitigation types, proposed project types contribute to the objective of *Reducing GHG emissions*. This can be done through three means, notably:
   a. Reducing energy demand;
   b. Low carbon energy supply; and
   c. In the case of agriculture, the contribution of projects to increase the ability of 'sinks' to absorb carbon was also taken into account.

   These three means to achieve the overarching objective for reducing GHG emissions inform the clusters and hence to structure the typology.

   For adaptation types, proposed project types contribute to the objective of improving adaptive capacity and resilience of systems. The project types are clustered into grey and green options.

3) **Definitions, criteria and examples of investment types by international organisations, EU and the EIB:** The development of typologies was also guided by current practices and approaches to defining climate change mitigation and adaptation finance, including criteria and examples of what qualifies 'climate change related expenditure'. For definitions on mitigation and adaptation activities, we have reviewed definitions by international organisations and the EU. For criteria and illustrations of typical activities of expenditure for mitigation and adaptation to climate change we have reviewed and compared the approached to monitoring and tracking climate finance by the OECD (Rio markers), the EU (in the context of development cooperation spending) and the EIB (see Annex 2 for more details).

4) **Additional literature review:** Additional literature was reviewed by the sector experts related to the specific sectors and technology options. This included, for example, the JRC's SETIS Technology and Capacities Map reports.[413]

5) **Feedback by sector experts:** If and where possible, a draft typology was consulted with sectoral experts.

These guiding principles and methodological steps helped not only to develop the typologies but to also to filter them. For example, we have not included too detailed technology options for each sector but selected those types which would make most sense from the perspective of the EU budget and future EU financing mechanisms as well as in view of the GHG reduction potential in the area of climate adaptation.

Cross-cutting project types regarding information, institutional capacity and governance are included across the different sectors as their nature, scope and implications for financing are likely to differ.

4.3 Presentation of typologies of projects

A detailed typology of projects is presented accompanied by a set of project characteristics. The selection of project characteristics is derived from the review of literature on concepts, principles and models for financing mechanisms (see chapter 4). As it was established, the most relevant project characteristics which will determine the use of different financing instruments will depend on the project types, size, development stage and risk profile. These include:

- **'Project type'** refers to the actual type of activity/measures;
- '**Project size**' is meant to differentiate between the project types based on their size, i.e. small scale for project types which total cost is below €5 million, medium scale between €5 and 50 million and large scale is for project types which total cost is above €50 million;

[413] http://setis.ec.europa.eu/newsroom/library

- '**Development stage**' relates to the market maturity of a particular project type. The stages which we use include: research and development (basic research and development of technologies), demonstration (large scale pilot testing in real life conditions), pre-commercial (larger scale early deployment, replication of demonstration) and commercial (technology is available commercially)
- '**Risk profile**' indicates the potential risk for investors from the different projects e.g. high, medium and low; given the different types of risks relevant for a project, as discussed in section 4, it is not possible to provide an upfront definition or quantification of high, medium and low.

N.B. A typology provides a classification according to general project types. Generalisation is therefore an inherent feature of any typology. The below typologies of projects for climate change mitigation and adaptation provide a generalised classification as a basis to assess the suitability of EU financial instruments for certain project types. A concrete project's characteristics, however, will be influenced by its specific institutional, economic, financial and social framework conditions. Therefore, in practice, a case by case analysis will be required to determine which financial instrument (or mix thereof) suits a specific project. Furthermore, it should be highlighted that the typology is not to provide an overview of all of the options, but to identify types of action that might be considered to be "climate actions" in the context of EU funds and the 20% target.

4.4 Suitability of instruments

A number of caveats need to be made upfront as this is an exercise that needs to break very complex environment into a manageable approach for analysis:

- The choice of instrument has to be based on the specific market environment in which the project is to be developed. There is no generic investment readiness based only on the risk of a project. The risk profile of investor changes depending on the type of investor (e.g. pension fund) and the location of the investment (there may be less interest, fewer institutional investors active in the area, etc.). The risk/return trade-off needs to be properly understood to create develop the necessary instrument mix;

- The market characteristics may change between countries due to changes in the regulatory environment. For example, a change in the obligations of property owners would make energy efficiency programmes for residential buildings workable in one country and very difficult in another, requiring a different set of incentives and instruments;

- In a number of cases, several instruments appear suitable, making the project characteristics a key determinant for the choice of FIs to support the project;

- Projects differ with regard to their size, risk profile and stage of development. Accordingly, different needs arise for the way FIs are designed and managed. The analysis cannot precisely allocate all possible variations of FIs for each project type. Such an analysis is not possible from a top-down perspective, but needs a project-by-project approach. But the analysis sheds further light and indicates the general suitability of the different FIs and how they can be best used for supporting the implementation of different project types.

- The instruments presented are indicative options; they do not exclude other combinations and even non-direct support, such as fiscal incentives. The proposed options are based on the analysts' perceived 'best fit under market logic' for the specific investment in a developed market economy. They do not judge on the need of specific support for, for example, in the case of less developed regions, which are provided EU public support to develop infrastructures and technologies in the pursuit of objectives for social and economic cohesion. If such additional support in poorer regions is considered relevant, it is flagged.

- In the following we list for each generic type of project a generic risk profile, which presents the types of risk and level of risks that should be expected. This is a fairly broad assessment. We acknowledge the fact that the actual risks will of course be project specific (see also chapter 2). Risks will also vary depending on the development stage and this affects the instrument to be used. Political and currency risks are not listed.

- Risk assessments vary considerably from one organisation to another. Risk is also to a considerable extent dominated by the 'perception' of risk of those analysing the risk level, investment in areas where the assessors are no experts in the field may result in higher risk perception[414]. Probability of success is related to the expertise of the institutions in the area of intervention and also the reputation of the companies having to undertake the project. Different actors can thus assess the same investment in terms of risk very differently[415]. Nevertheless, it is possible to give, as it is done here, a general expected risk. For example, for a new technology being developed where there is uncertainty if the result will work or if there will be demand for the product (even if it works, it is not possible to foresee if the market uptake will be successful or if a competitor will not bring in a better product). The market risks are thus generally high for technologies in development. The generic risk profile will help in identifying the most plausible kind of instrument required. In addition to risk, time to maturity (the time the investors can recover the investment and dividends) will also affect the instrument required to attract them, the longer the payback the higher the return required for a given level of risk.

[414] IEA(2010), 'Money Matters - mitigating risk to spark private investments in energy efficiency', IEA/OECD, Paris
[415] Hopkin P. (2010),"Fundamentals of Risk Management, understanding, Evaluating and implementing effective risk management', The Institute of Risk Management, Kogan Page Limited, London and New York.

Nevertheless, despite the caveats, it is possible to highlight the most relevant instrument for specific kinds of infrastructure. Experience has indicated that equity and risk guarantees are appropriate in the deployment stages of risky new innovations. Similarly, bonds and guarantees are seen as appropriate instruments in the area of infrastructures. This is the base of the analysis we present.

4.5 Suitability of instruments per project type

The detailed evaluation tables presenting the suitability analysis of instruments per project type can be found in Annex 3 accompanying this Interim report.

This section expands the typology tables in chapter 4 to include a more detailed risk classification by type of development stage and presents the potential suitability of financial instruments for the required investments.

The risks classification is based on the assessment of the authors and does not apply to every project. It indicates a most likely risk distribution.

Similarly, for the instruments, the most appropriate ones are highlighted given the characteristics for normal market conditions. Some alternatives may be mentioned if relevant, such as special schemes for less developed regions.

Alterations in the risk profile and specific situations in the market where the project has to be developed may point to other instruments as the most suitable. These tables do not replace the need for project to project assessments.

Energy

The final report has already presented the rationale for investments in R&D. This is particularly pertinent for the energy sector, which has the following characteristics:

- High investment requirements for research and demonstration
- Long-term investment needs over the stages of development and demonstration
- Uncertain market conditions in the long term
- High technical, operational and market risks

Due to these characteristics, the development of new technologies is costly and risky, too costly and too risky to attract the funds necessary to have a high rate of development and early deployment.

List of appropriate instruments:

a) Pure grants for the basic research
b) Grant and grant-loan blending schemes (e.g. loan guarantees) for demonstration phases
c) Some risk guarantee based schemes for pre-commercial deployment and commercial stages
d) Technical assistance grants and credit enhancement instruments (including guarantees) for market uptake

The final stage of deployment and at commercial stages new development can be accompanied by indirect support to develop the necessary accompanying infrastructure and services by SMEs, which may in some cases be a prerequisite for the successful deployment and installation the new technologies. For SMEs this is discussed in the SME section.

The adaptation needs for the energy sector are twofold: Changing the network to adapt it to the needs for a system with higher fluctuations of energy produced from numerous renewable sources, as well as adapting the power stations to climate impacts, such as the increased recurrence of droughts, which can affect cooling systems of power stations.

These investments should be financed and performed by the energy companies themselves. There is little rationale for offering subsidies in any form and incentives should in first line be regulatory. Co-financed Grant support should be restricted to installations in poorer countries in the, mainly to reduce the impact of the investment on prices to consumers. Technical assistance programmes can also be supported by grants.

ENERGY - MITIGATION

Project type	Project size	Development stage	Risk profile		Suitable instrument
	Small: < €5 million *Medium: €5-50 million* *Large: > €50 million*	*R&D* *Demonstration* *Pre-commercial* *Commercial*	*Risk type*	*Level of risk:* *Low* *Medium* *high*	
Test (pilot testing) new supply and storage technologies: *- marine and tidal technologies;* *- enhanced geothermal systems;* *- new wind turbine design;* *- high-efficiency PV;* *- concentrated PV;* *- concentrated solar power;* *- advanced batteries, flywheel-storage.*	Small / medium	R&D/ Demonstration	Completion risk Resource/reserve risk Operating risk Technical risk Market/Off-take risk Participant/credit risk Regulatory	medium medium high high high medium medium	**Grants** Given the high risks the most appropriate instruments would be: Grants Equity or quasi-equity
Early commercial-scale deployment of new supply and storage technologies, e.g.: *- floating offshore wind;* *- enhanced geothermal systems;* *- marine and tidal technologies;* *- enhanced geothermal systems;* *- new wind turbine design;* *- organic/ high-efficiency PV;* *- concentrated PV;* *- concentrated solar power;* *- hydrogen-based storage;* *- CCS.*	Medium / large	Pre-commercial	Resource/reserve risk Operating risk Technical risk Market/Off-take risk Participant/credit risk Regulatory	medium high high high medium medium	**Grants** Given the high risks the most appropriate instruments would be: Equity or quasi-equity Risk guarantees Partial grants reducing the volume of investment needed.

Smart distribution infrastructure projects to enable a high share of renewable energy supply	Small/medium	R&D/ Demonstration	Completion risk Resource/reserve risk Operating risk Technical risk Market/Off-take risk Participant/credit risk Regulatory	medium medium high high high low medium	Given the high risks the most appropriate instruments would be: Equity or quasi-equity Risk guarantees Partial grants reducing the volume of investment needed.
Smart transmission infrastructure projects to enable a high share of renewable energy supply and demand response for energy savings	Large	R&D/ Demonstration	Completion risk Resource/reserve risk Operating risk Technical risk Market/Off-take risk Participant/credit risk Regulatory	medium medium high high medium/low low medium	Project finance (project bonds) Equity or quasi-equity Risk guarantees **Grants** for technical assistance
Accelerate deployment of commercially available supply and storage technologies	Medium / large	Commercial	Market/Off-take risk Participant/credit risk Regulatory	medium/high medium low	**Most suitable Financial instrument are risk guarantees** **Grants** could be provided to less developed countries where access to capital may be limited
Construction and refurbishment of district heating/cooling networks	Small/ medium	Commercial	Completion risk Resource/reserve risk Operating risk Technical risk Market/Off-take risk Participant/credit risk Regulatory	Medium/high medium low low medium/low low medium	**Most suitable Financial instrument are risk guarantees** **Project finance (project bonds) or loan guarantees** **Equity finance** There are many possible alternative financial mechanisms possible, which include shareholding by citizens for example. **Grants** could be provided for technical

					assistance and for less developed countries to soften the charges on users.
Demand side management projects, e.g.: *- Shifting demand;* *- ICT technologies;* *- smart meters.*	Small	Commercial	Resource/reserve risk Operating risk Technical risk Market/Off-take risk Participant/credit risk Regulatory	medium high medium medium medium medium/high	There are many potential instruments than can be used including non-financial ones. Financial instruments should not be the first measure to consider. Some instruments through ESCOs can be considered (see energy efficiency)
Large-scale infrastructure (e.g. cross-border or national transmission lines, energy storage facilities)	Large	Commercial	Completion risk Resource/reserve risk Operating risk Technical risk Market/Off-take risk Participant/credit risk Regulatory	Medium/high medium high medium medium/low low medium	For large projects a number of financial combinations are possible. The financial package will be very specific to the project and geographical location **Risk guaranteed (First loss)** **Project Bond or Corporate issuance** They can be complemented with a **grant** co-financing in les developed regions and also for TA aimed at beneficiaries
Developing and testing new energy market designs suited for a low carbon energy system with a high share of variable renewable energy sources	Small/medium	R&D	Resource/reserve risk Operating risk Technical risk Market/Off-take risk Participant/credit risk Regulatory	low high low medium/low low medium	**Grants**

Energy efficient air conditioning (e.g. magnetic cooling)	Small	R&D	Resource/reserve risk Operating risk Technical risk Market/Off-take risk Participant/credit risk Regulatory	low high high medium medium medium	**Grants**
Conversion of existing coal power plants to biomass plants	Medium / large	Commercial	Completion risk Resource/reserve risk Operating risk Technical risk Market/Off-take risk Participant/credit risk Regulator	Low medium low low medium/low low medium/low	Given the risk and investment profile, this option is likely to occur autonomously and thus there is no justification for EU public funding support. A case can be made for less developed regions where **grant** co-financing can be offered, including specific guarantee schemes, if the mitigation impacts justify investment.
Substitution of fossil fuels in existing power plants by biomass co-firing	Medium / large	Commercial	Completion risk Resource/reserve risk Operating risk Technical risk Market/Off-take risk Participant/credit risk Regulatory	Low medium low low medium/low low medium/low	Given the risk and investment profile, this option is likely to occur autonomously and thus there is no justification for EU public funding support. A case can be made for less developed regions in relation to solidarity objectives where **guarantees** can be offered.
Accelerate the deployment of highly efficient energy consuming products	Small/medium	Commercial	Market/Off-take risk	low	**For consumer product appliances**, many non-financial regulatory and labelling measures can be used successfully. **Financial instruments** can be used to accelerate the adoption of energy efficient heating and cooling technologies in buildings, using ESCOs to manage them. Targeted grants, subsidized loans, etc. See section Buildings and Construction.

Information, institutional capacity, governance, e.g.: *- Technical assistance;* *- Training/ education / increase awareness of all stakeholders in the energy sector;* *- Developing low carbon development strategies at national and regional levels;* *- Cooperation and sharing best practices.*	Small/medium	n.a.	n.a.		**Grants (technical assistance)**

ENERGY - ADAPTATION

Project type	**Project size**	**Development stage**	**Risk profile**		**Suitable instrument**
	Small: < €5 million *Medium: €5-50 million* *Large: > €50 million*	*R&D* *Demonstration* *Pre-commercial* *Commercial*	*Risk type*	*Level of risk:* *Low* *Medium* *high*	
Information, institutional capacity, governance, e.g.: *- Technical assistance;* *- Training/ education / increase awareness of all stakeholders in the energy sector;* *- Developing adaptation strategies at national and regional levels;* *- Cooperation and sharing best practices.*	Small	n.a.	n.a.	n.a.	**Grants (technical assistance)**

Retrofitting energy infrastructure to increase their resilience to extreme weather event and climate change impacts, e.g.: *- Increase robustness of transmission grids to storm damages* *- Installation of additional network capacities (e.g. smart grids)* *- Adjustments in design standards for wind turbine generators (consideration of extreme storm)* *- Installation of additional storage facilities to adapt to higher volatility in base load* *- Reducing the use of water in cooling system (e.g. developing closed circuit cooling systems to isolate it from water flow changes)* *- Higher energy efficiency of ventilation systems*	Medium / Large	Deployment / Commercial	Completion risk Resource/reserve risk Operating risk Technical risk Market/Off-take risk Participant/credit risk Regulatory	Low low low low medium/low low medium/low	Given the risk and investment profile, this option is likely to occur autonomously and thus there is no justification for EU public funding support. A case can be made for **less developed regions** in relation to solidarity objectives where, where **grant co-financing** can be offered.

Buildings

Besides new technology development it is crucial to implement energy efficiency measures in the buildings sector. Existing highly efficient solutions for energy efficiency suffer from regulatory barriers and, decentralized and dispersed market structure, high transaction costs, high need for up-front capital, long-term repayment of deep renovation investments, lack of confidence of financiers and low capacity of building operators/owners with structuring bundled bankable investment projects.

Energy efficiency has also a number of components, from isolation to heating and cooling systems. Partial refurbishment of buildings may lock buildings into a suboptimal efficiency level for many years. It is important to devise energy efficiency programmes appropriately.

On the financial side the largest identified problem has been a lack of understanding by financial institutions of the investment profile of energy efficiency. Risk perception is high, counterbalancing this risk perception to unleash private finance is essential.

Thus in addition to the continuous use of grants for basic research for innovative solutions, guarantee schemes and grants for deep renovation together with a TA package for beneficiaries and financiers appear to be the most appropriate to finance energy efficiency in buildings[416].

For energy efficiency in large residential buildings with many inhabitants, finding financial solutions requires also to have a clear regulatory framework that clarifies the obligations of owners and tenants. The different schemes are all complex, due to the difficulties of bringing together all different actors and the complexity of identifying the best way to finance the costs of energy efficiency investments. Technical assistance is also important and should be offered.

As for adaptation, energy efficiency in buildings and adaptation are closely related. The first step in energy efficiency investments in to increase the isolation of the buildings from the external climate. Thus most buildings-related energy efficiency investments are an adaptation as well as mitigation measure.

[416] ibid,

BUILDINGS - MITIGATION

Project type	Project size	Development stage	Risk profile		Suitable instrument
	Small: < €5 million *Medium: €5-50 million* *Large: > €50 million*	*R&D* *Demonstration* *Pre-commercial* *Commercial*	*Risk type*	*Level of risk:* *Low* *Medium* *high*	
Low carbon energy districts	Medium	Demonstration and (Pre-)commercial	Completion risk Resource/reserve risk Operating risk Technical risk Market/Off-take risk Participant/credit risk Regulatory	Medium/high medium high high high medium medium	In the case of new technology demonstration, **loan guarantees, equity and grants** seem appropriate. **Technical assistance to beneficiaries and financiers is essential**.
Deep renovation of existing residential buildings to nearly zero energy buildings standards (e.g. insulation), including installation and operation of highly efficient equipment	Small/medium	(pre-)commercial	Resource/reserve risk Operating risk Technical risk Market/Off-take risk Participant/credit risk Regulatory	medium low low medium/low medium low	Main problem is risk perception, high up-front capital needs and long-term paybacks. **Loan guarantees** seem suitable, in combination with grants for long-term investments (envelope, windows, etc.). Needs to be combined with **grants** for TA for both the beneficiaries and financiers.
Deep renovation of existing non-residential buildings (incl. public buildings) to nearly zero energy buildings standards (e.g. insulation), including installation and operation of highly efficient equipment	Small/medium	Commercial	Resource/reserve risk Operating risk Technical risk Market/Off-take risk Participant/credit risk Regulatory	medium low low low medium low	Main problem is risk perception, high up-front capital needs and long-term paybacks. **Loan guarantees** seem suitable, in combination with grants for long-term investments (envelope, windows etc.).

					Needs to be combined with **grants** for TA for both the beneficiaries and financiers. Project finance mechanisms for Energy Performance Contracting are needed. Main problem is risk perception. **Loan guarantees** are suitable. Could be combined with **grants** for TA.
Construction of new residential zero/Energy+ energy buildings	Small	Demonstration/ pre-commercial	Completion risk Resource/reserve risk Operating risk Technical risk Market/Off-take risk Participant/credit risk Regulatory	Medium medium medium medium medium low medium	**Loan guarantees and equity** to attract private finance are a suitable instrument. Grant use should be limited.
Construction of new non-residential zero/Energy+ energy buildings (incl. public buildings)	Small/medium	Demonstration/ pre-commercial	Completion risk Resource/reserve risk Operating risk Technical risk Market/Off-take risk Participant/credit risk Regulatory	Medium/low medium high high high medium medium	**Loan guarantees and equity** to attract private finance are a suitable instrument. Grant use should be limited.
Developing and testing alternative construction material including for the refurbishment of listed buildings	Small	R&D /early demonstration	Resource/reserve risk Operating risk Technical risk Market/Off-take risk Participant/credit risk Regulatory	medium high high high low low	**Research grants**
Developing and testing zero emission buildings over the whole lifecycle	Small	R&D	Completion risk Resource/reserve risk Operating risk Technical risk Market/Off-take risk	Medium medium high high medium	**Research grants**

			Participant/credit risk Regulatory	low low	
Information, institutional capacity, governance, e.g.: *- Technical assistance;* *- Training/ education / increase awareness of all stakeholders in the buildings sector;* *- Integration of climate objectives in buildings codes and urban planning regulations;* *- Urban planning for passive buildings;* *- Cooperation and sharing best practices.*	Small	n.a.	n.a.	n.a.	**Technical assistance grants**
Integrating low carbon micro generation technologies in new building designs	Small/medium	Commercial	Resource/reserve risk Operating risk Technical risk Market/Off-take risk Participant/credit risk Regulatory	medium/low low low low medium/low medium	**Loans or loan guarantees** to attract private finance are a suitable instrument.

BUILDINGS - ADAPTATION

Project type	Project size	Development stage	Risk profile		Suitable instrument
	Small: < €5 million *Medium: €5-50 million* *Large: > €50 million*	*R&D* *Demonstration* *Pre-commercial* *Commercial*	*Risk type*	*Level of risk:* *Low* *Medium* *high*	
Energy efficient adaptation of homes against heat	Small	Demonstration/ deployment	Resource/reserve risk Operating risk Technical risk Market/Off-take risk Participant/credit risk Regulatory	medium low low medium low low	**Loan guarantees**
Protection of buildings to storms, extreme precipitation	Small / Medium	Commercial	Resource/reserve risk Operating risk Technical risk Market/Off-take risk Participant/credit risk Regulatory	medium low low medium low low	**Loan guarantees**
Information, institutional capacity, governance, e.g.: *- Technical assistance;* *- Training/ education / increase awareness of all stakeholders in the buildings sector;* *- Cooperation and sharing best practices.*	Small	n.a.			**Grants**
Retro-fitting water-efficiency features (e.g. meters, tap fittings etc.)	Small	Commercial	Resource/reserve risk Operating risk Technical risk Market/Off-take risk Participant/credit risk	low low low low low	**Grants**

			Regulatory	low	
Passive cooling, e.g. green roofs	Small	Commercial	Completion risk Resource/reserve risk Operating risk Technical risk Market/Off-take risk Participant/credit risk Regulatory	Medium/high medium high high high medium medium	**Grants**

Transport

Investment needs in the transport sector can be addressed through a range of FIs. However, the diversity of technologies and related infrastructures aggravates a simplified presentation of the suitability of different instruments, which depends on the actual framework conditions.

Key areas of action for addressing energy supply include alternative fuels and propulsion technologies, including electrification. Many of these technologies are still at early stages and considerable uncertainties for investors apply, making it more difficult to attract private investment in a number of cases. For refuelling stations, assistance will depend on the fuel in question and who will be the provider. Will it be a municipally installed service (electric charging stations managed by municipalities) or private companies or charging stations owned by different legal persons, even for individual stations? The type of fuel makes an important difference, for example, hydrogen demonstration projects at regional level have a very high cost and risk profile compared to other fuel forms.

In the case of large scale infrastructures the balance between public or private finance with different levels of guarantees or grants, will depend on the expected demand risk. Population density, mobility demand and level of incomes will all play a role on the determination of the level of public finance. The complexity and costs of the underlying infrastructure will also be of importance as well as the associated technical and operational risks. There is no one size fits all solution, but clearly the risks should be spread across private investors more broadly and FIs can help here.

The introduction of city zone charging and other fee based access control does not need to be supported other than with technical assistance, the schemes should be self financing and raising funds for other clean transport investments.

For public works on bike lanes etc. the whole operation can only be financed publicly.

Traffic management systems, congestion charge zones, etc. are rather low cots or profitable endeavours and require regulatory interventions. Their implementation in less developed regions however could justify public finance support.

In the area of adaptation, needs in transport are retrofitting existing infrastructure to make it more climate reliant and ensuring new infrastructure is climate proof. This means that traditional infrastructure planning should take into account adaptation needs in the planning stage and factor in the cost of adaptation in the overall project cost.

TRANSPORT - MITIGATION

Project type	**Project size**	**Development stage**	**Risk profile**		**Suitable instrument**
	Small: < €5 million *Medium: €5-50 million* *Large: > €50 million*	*R&D* *Demonstration* *Pre-commercial* *Commercial*	*Risk type*	*Level of risk:* *Low* *Medium* *high*	
Electricity charging points	Small / medium	Demonstration (for fleets or specific geographical locations) / Commercial	Resource/reserve risk Operating risk Technical risk Market/Off-take risk Participant/credit risk Regulatory	medium high high high low medium/low	**For municipal infrastructure risk guarantees and municipal bonds may be options. For companies stepping in, mezzanine loans and start-up finance can be offered.** Given the risk profile, a **grant** co-financing may be required in addition, but not if already at commercial deployment. **TA grants** for the municipal planning authorities may also ne needed.
Biofuel refuelling stations	Small	Commercial / Demonstration (for higher blends in fleets)	Completion risk Resource/reserve risk Operating risk Technical risk	low low low medium medium	**For municipal infrastructure risk guarantees and municipal bonds may be options. For companies stepping in, mezzanine loans and start-up finance can be offered.**

			Market/Off-take risk Participant/credit risk Regulatory	low low	Given the risk profile, a **grant** co-financing may be required in addition, but not if already at commercial deployment. **TA grants** for the municipal planning authorities may also ne needed.
Vehicle efficiency (technical) e.g.: *- Electric and plug-in hybrid vehicles in fleets* *- Hydrogen vehicles in fleets* *- Improved efficiency to existing vehicles*	Small / medium	Demonstration/ pre-commercial (testing whether vehicles work in the conditions in which the fleet has to operate) / Commercial (for more efficient conventional vehicles)	Resource/reserve risk Operating risk Technical risk Market/Off-take risk Participant/credit risk Regulatory	low high high low medium medium	At demonstration and pre-commercial stage equity support may be offered. Costs at the stage of deployment should mainly be borne by the developers.
Infrastructure for co-modality and softer modes, e.g.: *- Long-distance railway (including high speed rail),* *- Inland waterways and maritime transport*	Small / Large	Commercial / Demonstration (innovative systems, e.g. public rapid transit systems (and other potential low carbon systems	Completion risk Resource/reserve risk Operating risk Technical risk Market/Off-take risk Participant/credit risk Regulatory	high medium high high medium high low	**Mainly Grants** In case the infrastructure is revenue generating, through user charges, **risk mitigating guarantees can be used. Depending on size, project bonds or Corporate issuance may also be considered** Can be complemented by TA **grants**, and if necessary other grant co-financing to less developed regions
Increasing occupancy and different modes of use, including investment in shared modes, e.g. car clubs, trolley buses and bike hire schemes	Small	Commercial	Resource/reserve risk Operating risk Technical risk Market/Off-take risk Participant/credit risk	medium low low medium/low low low	**Venture and seed capital, mezzanine loans** should be sufficient to provide the incentives to invest. If any support is given should depend n the kind of operation and profitability.

			Regulatory		
Research and development, e.g.: *- improving the climate performance of the new technologies, including biofuels;* *- test ICT for transport;* *- test new transport business models.*	Small	R&D, demonstration	Resource/reserve risk Operating risk Technical risk Market/Off-take risk Participant/credit risk Regulatory	medium high high high low low	**Grants**
Information, institutional capacity, governance, e.g.: *- Technical assistance* *- Training/ education / increase awareness of all players in the buildings sector e.g. to administrators and the public on the benefits (and differences) of the new technologies and business models, and (integrated, cross-modal) travel information, including using ICT;* *- Developing low carbon mobility plans at national and regional levels;* *- Cooperation and sharing best practices.*	Small	n.a.	n.a	n.a.	**Grants**
Infrastructure for co-modality and softer modes, e.g.: *- Local infrastructure in urban areas, including for clean public transport, walking and cycling*	Small / Large	Commercial / Demonstration (innovative systems, e.g. public rapid transit systems (and other potential low carbon systems	Construction risk Resource/reserve risk Operating risk Technical risk Market/Off-take risk Participant/credit risk Regulatory	high medium high high medium high low	**Grants** In case the infrastructure is revenue generating, through user charges, **risk mitigating guarantees** can offered linked also to municipal bond schemes.

Measures to reduce or manage demand, e.g. *- Traffic management systems* *- Congestion charging zones* *- Other types of access restrictions, e.g. to central areas* *- ICT applications to manage demand and capacity*	Small / Medium	Pre-commercial / Commercial	Resource/reserve risk Operating risk Technical risk Market/Off-take risk Participant/credit risk Regulatory	low low low low low low	Grants

TRANSPORT - ADPATATION

Project type	Project size	Development stage	Risk profile		Suitable EU instrument
	Small: < €5 million *Medium: €5-50 million* *Large: > €50 million*	*R&D* *Demonstration* *Pre-commercial* *Commercial*	*Risk type*	Level of risk: Low Medium high	
Designing adaptation features into new infrastructure (additional costs of), including green options	Small	Commercial	Construction risk Resource/reserve risk Operating risk Technical risk Market/Off-take risk Participant/credit risk Regulatory	high medium high high medium high low	**Grants** In case the infrastructure is revenue generating, through user charges, **risk mitigating guarantees** can offered linked also to municipal bond schemes.
Building new climate resilient infrastructure to replace that at risk from climate change, incorporating green infrastructure	Small / Medium	Demonstration/ Pre-Commercial	Construction risk Resource/reserve risk Operating risk Technical risk	high medium high low n.a.	**Grants** In case the infrastructure is revenue generating, through user charges, **risk mitigating guarantees** can offered linked also to municipal

			Market/Off-take risk Participant/credit risk Regulatory	low medium	bond schemes.
Developing innovative products and materials for resilient infrastructure development (e.g. new types of asphalt), green infrastructure, etc.	Small	R&D	Construction risk Resource/reserve risk Operating risk Technical risk Market/Off-take risk Participant/credit risk Regulatory	high medium high low n.a. low medium	**Grants**
Information, institutional capacity, governance, e.g.: *- Technical assistance;* *- Training/ education / increase awareness of all stakeholders in the transport sector;* *- Cooperation and sharing best practices.*	Small	n.a.	n.a	n.a.	**Grants**
Measures to retrofit existing infrastructure and vehicles, such as: *- Retrofitting roads/rail to better deal with higher temperatures* *- Retrofitting roads/airports to better deal with higher precipitation* *- Retrofitting trains with air conditioning*	Small	Commercial	Low		**Grants** In case the infrastructure is revenue generating, through user charges, **risk mitigating guarantees** can offered linked also to municipal bond schemes.

SME support

The main objective of public intervention to SMEs is to make those adopt low carbon practices as well as help them adapt to climate change where necessary. Another objective is to also develop the necessary skill base to have the technical experts and companies necessary to provide the technical support to smart energy systems.

While public support in the private sector should be avoided not to infringe completion and weaken the single market, there is a case to be made to support the SMEs in cases where there is an under-provision of funding from the financial sector, in particular for the early stages of development. The lack of finance is partly due to the size of needed loans, which are often too small for banks to involve themselves due to the rather poor rate of return in comparison to costs associated to monitoring of the loans. The lack of collateral is also an important cause for the reluctance to lend.

Financial instruments are particularly suitable to expand lending to SMEs. Support for entry and early stage and business development support can be enhanced by offering financial institutions funding to extend to SMEs in the form of mezzanine loans or equity. For later, more mature stages of development loan guarantees to financial institutions can be offered to extend loans, or also further mezzanine loans.

In the case of climate change oriented investments, start-up funding can be offered to businesses developing innovative solutions for mitigation or/and adaptation to climate change. For other businesses, support could be offered for investments in resource and energy efficiency.

Support for SMEs can be channelled in three forms.

a) Loan guarantees and equity for banks or encourage the extension of low cost loans to SMEs to undertake the necessary investments and to encourage the opening of new specialised businesses;
b) Seed finance for assisting the entry of new SMEs that would supply the necessary services in a low carbon economy;
c) Venture capital for highly innovative SMEs;
d) A limited level of grants co-financing for SMEs in less developed regions with very low access to finance; and
e) Technical assistance for capacity building and information.

SME SUPPORT - MITIGATION

Project type	Project size	Development stage	Risk profile		Suitable EU instrument
	Small: < €5 million *Medium: €5-50 million* *Large: > €50 million*	*R&D* *Demonstration* *Pre-commercial* *Commercial*	*Risk type*	*Level of risk:* *Low* *Medium* *high*	
Development of new businesses and business models supporting low carbon activities (production of biofuels from waste materials, etc.)	Small / Medium	Commercial	Resource/reserve risk Operating risk Technical risk Market/Off-take risk Participant/credit risk Regulatory	low medium medium medium/high medium/high low	**Seed capital, Mezzanine loans** Complemented by TA **grants** or grant co-financing for smallest SMEs
Introducing energy efficient practices and technologies in the SME sector (e.g.) better resource and energy efficient systems in businesses	Small / Medium	Commercial	Resource/reserve risk Operating risk Technical risk Market/Off-take risk Participant/credit risk Regulatory	low medium medium medium/high medium/high low	**Mezzanine loans** Complemented by TA **grants** or grant co-financing for smallest SMEs
Introducing low carbon and resource efficient physical capital /machinery	Small / Medium	Commercial	Resource/reserve risk Operating risk Technical risk Market/Off-take risk Participant/credit risk Regulatory	low medium low medium medium/high low	**Mezzanine loans** Complemented by TA **grants** or grant co-financing for smallest SMEs

Setting up SMEs in the area of services provision related to energy so as to create capacity for society to adapt and introduce new energy systems, from small energy generation to smart metering.	Small / Medium	Commercial	Resource/reserve risk Operating risk Technical risk Market/Off-take risk Participant/credit risk Regulatory	low medium medium high high low	**Equity for early stages, i.e. start-up capital**
Information, institutional capacity, governance, e.g.: *- Technical assistance;* *- Informing and assisting SMEs is crucial to mobilise energy efficient actions;* *- Cooperation and sharing best practices.*	Small	n.a.	n.a.	n.a.	**Grants**
Assistance in introducing more efficient energy management practices and of the Environmental Management Systems (EMS)	Small / Medium	Commercial	n.a.	n.a.	**Grants**
Improvements in logistics in low carbon practices (e.g., fleet management, teleworking, etc.)	Small / Medium	Commercial	Resource/reserve risk Operating risk Technical risk Market/Off-take risk Participant/credit risk Regulatory	low medium medium medium low low	**Normal loans, can be promoted with guarantees for local banks to extend the loans**

SME SUPPORT - ADAPTATION

Project type	Project size	Development stage	Risk profile	Suitable EU instrument

	Small: < €5 million *Medium: €5-50 million* *Large: > €50 million*	*R&D* *Demonstration* *Pre-commercial* *Commercial*	*Risk type*	*Level of risk:* *Low* *Medium* *high*	
Improve the resilience of SMEs to climate change impacts, particularly with regards to water use, e.g.: *- Increase in resource efficiency with the aim of reducing water use in water stressed areas. Adopting low water technologies* *- Introduce the recycling of water* *- Improve the collection rainwater for non-drinking water processes* *- Improve the separation of drinking water from other water*	Small / Medium	Commercial	Resource/reserve risk Operating risk Technical risk Market/Off-take risk Participant/credit risk Regulatory	low medium low medium medium low	**Normal loans, can be promoted with guarantees for local banks to extend the loans**
Improve the resilience of SMEs to higher temperatures and heat waves, e.g.: *- Food sector – improving cooling and transport systems*	Small / Medium	Commercial	Resource/reserve risk Operating risk Technical risk Market/Off-take risk Participant/credit risk Regulatory	low medium low medium medium/high low	**Normal loans, can be promoted with guarantees for local banks to extend the loans** Some co-financed **grants** to smallest SMEs can be offered
Support SMEs develop new adaptation practices, services and products	Small / Medium	R&D	Resource/reserve risk Operating risk Technical risk Market/Off-take risk Participant/credit risk Regulatory	high high high high medium/high low	**Venture capital** **Grants**

Agriculture

Farm practices, production methods, farm sizes and their profitability vary largely across countries and regions, making a uniform assessment of the role and relevance of different FIs difficult. In addition, crop farming and livestock farming have very different needs and investment conditions.

The main financial mechanism in agriculture will continue to be grant finance, which could be adapted to incorporate climate related cross-compliance conditions. The rural development programmes can be adapted to better reflect climate end energy objectives. This is largely an exercise in the hands of the member states, as many existing measures can be applied and it is for the member states to decide on the national strategy.

However, in addition to grants and the co-financed actions for rural development financial instruments can play a higher role in the agricultural sector, as well as insurance schemes, which can induce if well designed the investment in better practices, such a more efficient irrigation system. The use of financial instruments needs to be demand driven, this means that water price levels and insurance rules will have an important role on their use.

Nevertheless, financial instruments have not been well analysed for use in the agricultural and could be explored further. This would also be in line with the difficulties of maintaining grant schemes at the present levels, finding alternative ways to ensure sustainability.

Financial instruments can be used in the mitigation area to invest in small energy generation systems in farms, such as, for example, wind power, hydro power and biogas using farm residues and sludge. At the same time, demand-side related improvements in energy efficiency can be offered either as co-financed grants or through loan schemes supported by guarantees.

As for adaptation, climate change will strongly affect the agricultural sector. Support for adaption will also have to include help for:

- structural adjustments and diversification
- risk management and insurances
- innovation

While much of the support will have to be offered in the forms of grants, financial instruments could be used for specific investments, that increase the profitability of farming while making farms more resilient, as mentioned earlier, the form and existence of insurance schemes and the level of water pricing (for irrigation investments) will strongly influence the demand of the instruments.

In addition, changing farm practices requires substantial role of training and extension services programmes. This is also partially linked with an ageing farming community, a trend that can be partially reversed through seed capital for better-trained younger farmers.

For activities related to changes in energy efficiency by substituting tractors and machinery, co-financing trough grants or loans offered at low cost (guarantee backed loans from banks) can be used. The support could be differentiated based on farm profitability, limiting the co-financing grants to farms with low profitability.

AGRICULTURE - MITIGATION

Project type	**Project size**	**Development stage**	**Risk profile**		**Suitable EU instrument**
	Small: < €5 million *Medium: €5-50 million* *Large: > €50 million*	*R&D* *Demonstration* *Pre-commercial* *Commercial*	*Risk type*	*Level of risk:* *Low* *Medium* *high*	
Physical capital development, e.g.: *- Improve fuel efficiency with modern tractors;* *- Install renewable energy sources (e.g. photovoltaic panels and biogas plants);* *- Energy efficient buildings (e.g. new windows, insulation etc.);* *- Introduce agro-forestry system*	Small / medium	Commercial	Resource/reserve risk Operating risk Technical risk Participant/credit risk Regulatory	low low low medium/high low	**Loan guarantee** Upfront costs are main barrier. If possible cheap lending should be promoted with guaranteed loans. Support can also be offered a**s co-financed grants**
Land management measures, e.g.: *- Enhance carbon storage capacity of soils (e.g. protect peat and grass lands, low tillage);* *- Manage agro-forestry systems to store carbon (e.g. plant*	Small	Commercial	Resource/reserve risk Operating risk Technical risk Market/Off-take risk Participant/credit risk Regulatory	low low low high medium low	**Grants** **(The design of support schemes will need to take into account WTO imposed subsidy limitations and rules)**

shelterbelts / linear tree planting; silvopastoralism); *- Ban burning ((largely required under cross-compliance in many Member States);* *- Efficient fertiliser use and introduce nitrogen fixing crops in crop rotations;* *- Efficient livestock management, e.g. avoid overgrazing and use appropriate feedstocks*					
Information, institutional capacity, governance, e.g.: *- Technical assistance;* *- Training/ education / increase awareness of all players in the agriculture sector;* *- Development of low carbon development strategies and plans for rural areas;* *- Cooperation and sharing best practices.*	Small	n.a.	n.a.	n.a.	**Grants** for Technical assistance/extension services
Research and development, e.g.: *- Reduce emissions and enhance carbon sequestration with new technologies (e.g. low impact machinery on soils with more efficient fuel use);* *- Develop new crop varieties (e.g. nitrogen fixing cereals);* *- Develop new feed compositions for livestock to mitigate methane emissions and reduce quantity of feed needed (e.g. adding nutrient premixes and soya to traditional*	Small/ Medium / Large	R&D	Resource/reserve risk Operating risk Technical risk Market/Off-take risk Participant/credit risk Regulatory	low medium high high medium/high medium	**Grants**

feed) *- Enhance per-head livestock productivity*					

AGRICULTURE - ADAPTATION

Project type	**Project size**	**Development stage**	**Risk profile**		**Suitable EU instrument**
	Small: < €5 million *Medium: €5-50 million* *Large: > €50 million*	*R&D* *Demonstration* *Pre-commercial* *Commercial*	*Risk type*	*Level of risk:* *Low* *Medium* *high*	
Water efficient irrigation technology, including water treatment for the reuse of waste water	Small / medium	Pre-commercial	Completion risk Resource/reserve risk Operating risk Technical risk Participant/credit risk Regulatory	low medium medium low medium low	**Loan guarantees** Could be combined with **grants** of technical assistance.

Improving the resilience of agricultural systems, e.g.: *- Flood prevention;* *- Hail nets;* *- Fires breaks;* *- Water storage and rainwater harvesting.*	Small / medium	Commercial	Completion risk Resource/reserve risk Operating risk Technical risk Participant/credit risk Regulatory	low medium medium low medium low	**Grants** for technical assistance and also capital investment.
Improving the resilience of agricultural systems, e.g.: *- Soil management practices (tillage methods, crop rotations, catch crops) ;* *- Planting of hedgerows/terraces;* *- Crop management (introduce new crop varieties);* *- Organic farming; integrated pest management;* *- Manage agro-forestry system: for example, shelterbelts / linear tree planting to moderate microclimate by reducing wind, snow blowing, and allowing economic diversification (such as fruit / nut production); silvopastoralism to provide livestock shelter; short rotation coppice for biomass energy; and riparian buffers to filter run-off;* *- Conservation of genetic resources (important for managing disease outbreaks)* *-Conversion of irrigated cropping to extensive dryland cropping* *-Wetland creation and*	Small		Resource/reserve risk Operating risk Technical risk Participant/credit risk Regulatory	medium medium low medium low	**Grants** for delivery of public goods, mostly based on cross compliance with direct support or specific support payments. Explore the wider use of insurance mechanisms financed by farmers

restoration					
Introduce agro-forestry system	Small / medium	Commercial	Resource/reserve risk Operating risk Technical risk Market/Off-take risk Participant/credit risk Regulatory	low low low high medium/high low	**Grants**
Developing innovative technologies/ products/ processes in the agriculture sector to improve its resilience, e.g.: *- Develop new crop varieties (drought/flood resistant);* *- Develop genetic breeds (e.g. dairy livestock accustomed to heat stress);*	Medium	R&D	Resource/reserve risk Operating risk Technical risk Participant/credit risk Regulatory	medium medium high medium medium/high	**Grants**
Information, institutional capacity, governance, e.g.: *- Technical assistance and advisory services;* *- Training/ education / increase awareness of all stakeholders in the agriculture sector;* *- Training on business models for economic resilience* *- Developing adaptation strategies at national and regional levels;* *- Cooperation and sharing best practices.*	Small	n.a	n.a.	n.a.	**Grants**

Water

As far as mitigation in concerned action is limited into energy production from waste water and the use of less energy consuming technologies in water management and water treatment. Some mitigation actions have also an adaptation impact; as for example a better resource management system to reduce energy use often will result in a lower use of water.

The main problem for water is adaptation to climate change. Flood protection needs as well as better water management in drought regions appear underdeveloped. One main issue is the lack of investment in the water system which has led to large leakage rates in the public supply network, over 50% in some member states. Direct abstraction of water by industry and agriculture without proper monitoring or pricing is also affecting the lifecycle of water and depleting the resource in many parts of Europe. The level of public support needed in the sector is a controversial issue, as many of these problems could have been avoided with an appropriate pricing mechanism. If pricing had been introduced in the spirit of the Water framework Directive much could have been avoided, but the text left area to a very free interpretation on the level of finance.[417]

Thus the optimal use of the FIs in the water sector is bound to be controversial, if water prices are not efficiently applied. It is important that prices are more in line with the real value of resources and the cost to manage it, in order to avoid further distortions.

Except for flood infrastructures, most investments should be based on a sound financial plan and with a more realistic cost recovery system, based on revenues from water prices. Many publicly funded activities by the state in the water network could be covered through the revenues. This has been taken into account when filling in the tables. Many investments that are traditionally undertaken with public funds are thus presented here as *not* to be assisted with the exception of poorer regions.

[417] Egenhofer C., M. Alessi, J. Teusch, J. Núñez-Ferrer (2012), 'Which economic model for a water efficient Europe', CEPS Task Force report, forthcoming.

WATER - MITIGATION

Project type	Project size	Development stage	Risk profile		Suitable instrument
	Small: < €5 million *Medium: €5-50 million* *Large: > €50 million*	*R&D* *Demonstration* *Pre-commercial* *Commercial*	*Risk type*	*Level of risk:* *Low* *Medium* *high*	
Information, institutional capacity, governance, e.g.: *- Technical assistance;* *- Training/ education / increase awareness of all players in the agriculture sector.*	Small	n/a	n.a.	n.a.	**Grants**
Cooperation (e.g. on a river basin or regional level) and community engagement in water resource management	Small / Medium	Commercial	n.a.	n.a.	**Grants**
Improving the water and energy efficiency of water treatment (waste water and drinking water)	Small / Large	R&D	Resource/reserve risk Operating risk Technical risk Market/Off-take risk Participant/credit risk Regulatory	medium high high medium high low	**Grants**

WATER - ADAPTATION

Project type	Project size	Development stage	Risk profile		Suitable instrument
	Small: < €5 million *Medium: €5-50 million* *Large: > €50 million*	*R&D* *Demonstration* *Pre-commercial* *Commercial*	*Risk type*	*Level of risk:* *Low* *Medium* *high*	
Building/ improving infrastructure for and access to water supply and sanitation	Small / Large	Demonstration	Construction risk Resource/reserve risk Operating risk Technical risk Market/Off-take risk Participant/credit risk Regulatory	medium high high medium high low	**Loan guarantee** Co-financed rants can be provided in less developed regions
Construction of flood gates (with impacts for several policy fields)	Medium / large	Commercial	Construction risk Resource/reserve risk Operating risk Technical risk Participant/credit risk	low low low high low	**Grants**
Dike reinforcement and heightening	Medium / large	Commercial	Construction risk Resource/reserve risk Operating risk Technical risk Participant/credit risk	low low low high low	**Grants**
Soft coastal defences	Medium / large	Commercial	Construction risk Resource/reserve risk Operating risk Technical risk Participant/credit	low low low high low	**Grants**

			risk		
Conserving or restoring wetlands/ natural floodplains (e.g. to act as flood buffer zones)	Small / medium	Pre-commercial / Commercial	Construction risk Resource/reserve risk Operating risk Technical risk Participant/credit risk	low low low high low	**Grants**
Mapping water quantity (including resource availability and flooding)	Small / medium	all stages	Construction risk Resource/reserve risk Operating risk Technical risk Participant/credit risk	low low low high low	**Grants**
Developing early warning and/or risk prevention systems (floods/drought) e.g.: *- Remote sensing and satellite imagery for extreme weather events*	Medium / large	R&D / Demonstration/ Pre-commercial	Construction risk Resource/reserve risk Operating risk Technical risk Participant/credit risk	low low low high low	**Grants**
Information, institutional capacity, governance, e.g.: *- Awareness-raising and information sources;* *- Technical assistance;* *- Cooperation and exchange of good practice.*	Small	n.a	n.a	n.a	**Grants**
Building/ improving infrastructure for and access to water supply and sanitation	Small / Large	Commercial	Construction risk Resource/reserve risk Operating risk Technical risk Market/Off-take risk	low medium medium/low medium/low low	Co-financing **grants** in less developed regions

			Participant/credit risk Regulatory	low low	
Reducing leaks in water distribution infrastructures	Small / medium	Commercial	Construction risk Resource/reserve risk Operating risk Technical risk Market/Off-take risk Participant/credit risk Regulatory	medium medium medium/low medium/low low low low	Cost recovery for operation and maintenance should be through tariffs to water users, nit public funding. Co-financing **grants** in less developed regions
New water storage capacity (e.g. desalination plants, reservoirs)	Small / Large	Commercial	Construction risk Resource/reserve risk Operating risk Technical risk Market/Off-take risk Participant/credit risk Regulatory	medium medium medium/high medium low low low	Investments should be usually covered by prices to users. Specialised loans for upfront costs can be created as well as bond schemes for utility infrastructures. Co-financing **grants** in less developed regions
Improving drainage/ storm-water systems	Medium / large	Commercial	Construction risk Resource/reserve risk Operating risk Technical risk Market/Off-take risk Participant/credit risk Regulatory	low medium low low low low low	Should be covered by water tariffs to water users. Co-financing **grants** in less developed regions
Building/ improving infrastructure for and access to water supply and	Small / Large	Pre-Commercial / Commercial	Construction risk Resource/reserve risk Operating risk	medium medium low medium/low	Should be covered by water tariffs to water users. Specialised loans for upfront costs

sanitation			Technical risk Market/Off-take risk Participant/credit risk Regulatory	low low low	can be created as well as bond schemes for utility infrastructures. Co-financing **grants** in less developed regions

ANNEX 5 - USING FINANCIAL INSTRUMENTS - LEARNING FROM THE PUBLIC AND PRIVATE SECTOR PRACTICE

There is a growing experience with using innovative forms of financing for low carbon projects. IFIs as well as national public and private banks have set up various programmes that make use of one or a mix of financial products and services. It is helpful to look at the practice and experiences gained with using FIs in other contexts than the EU budget. This helps to identify both promising, successful practice and to learn from success factors with a view to strengthening and complementing the set of FIs currently in use and planned for future use at EU level.

This chapter hence synthesizes the findings from a broader review of selected examples of the current practices and experiences of IFIs and public banks with financing projects addressing climate change mitigation objectives. The sample of IFIs covered includes among other EIB, the EBRD, the KfW, the UK Green Investment Bank as well as regional facilities of the EU.

The instruments majorly focus on projects for energy efficiency, renewable energy and to some extent low carbon transport infrastructure. The full analysis is presented in Annex 5.

5.1 What is interesting from IFIs practice with regard to climate mitigation

5.1.1 Debt

The EIB is currently developing several ideas on potential new financing mechanisms including a Renewable Energy Performance Programme (REPP) and Debt for Energy Efficiency Projects (DEEP) Platform.

REPP, as currently developed by the EIB, would build on previous experience with GGF and NER300.[418] As under GGF the fund structure would include first loss tranches from donors and mezzanine and senior tranches from IFIs including the EIB, while the private sector would provide funding for senior tranches and notes. As in the case of the NER300 (and the EEEF) a Cooperation Agreement would be used to establish a performance platform to provide credit enhancement and targeted TA which would not involve private sector or EIB financing. REPP's objectives are to increase investments in small renewable energy and energy efficiency projects in countries with new and still unproven policy frameworks as well as to incentivise country actions, leverage donor funds and ensure effective implementation through performance based payments. This would be delivered via the provision of debt through a dedicated layered fund (senior or mezzanine), credit enhancement for first mover projects and project bundling agreements with commercial providers of partial risk guarantees, equity and other key sponsors.

DEEP Green Platform, EIB

In addition to these existing programmes the EIB is currently developing a new strategy in support of energy efficiency projects. The so-called Debt for Energy Efficiency Projects Strategy, or 'DEEP Green Strategy', aims in particular to incentivise commercial banks to address the energy efficiency sector as a distinct financing segment, to facilitate access to public sector counterparts to long-term funding, to develop the ESCO financing market and to provide access to refinancing for utilities investing in energy efficiency with their clients. This may have a similar structure as the RSFF.[419]

[418] Howard, M. (2012): Sustainable Energy 4 All EIB financing mechanisms, Presentation to CIF Partnership Forum, Istanbul, 7 November 2012, https://www.climateinvestmentfunds.org/cif/sites/climateinvestmentfunds.org/files/Monty%20Howard.pdf

[419] EIB presentation "EIB Workshop on financial instruments supporting climate action", Luxemburg, 6 November 2012.

The EIB estimates that EUR 60-80 bn/year are needed to meet the EU 2020 energy savings target – compared to the current EUR 30 bn/year.[420] Reasons for this financing gap include that EE is not considered as distinct lending segment by commercial bank and lending is provided to companies rather than to specific projects. Given the small size of EE projects and low credit worthiness EIB itself cannot bridge this gap via direct lending. In order to fill this gap DEEP would provide EU-wide financing of small EE projects taking account of the needs of different Member States and participants. It could comprise four different lines of products ("compartments") to cover the diverse financing needs of the key players in the EE market: commercial banks, the public sector, ESCOs and utilities.

The underlying idea is to develop lending capacity that is focused on key players in the EE market. Banks should receive dedicated long-term credit lines as well as risk-sharing mechanisms and TA. The public sector would also receive dedicated long-term credit lines, with the financing vehicles remaining under public ownership but potentially allowing for "off balance sheet" debt classification. ESCOs would receive senior or subordinated long-term financing with ESCOs being required to contribute equity or quasi-equity to the financing vehicles and the Commission to support EIB's credit exposure in case of falling below a certain credit category. To support utilities' activities in the EE market DEEP would allow the EIB buying securities, backed by the Commission.

This initiative would expand EIB's activities in the area of financing of energy efficiency investments which amounted to EUR 4.1 bn during the period 2009-2011, and EUR 1 bn in 2011 alone. In this period, EIB financing to EE projects has mainly materialised in debt financing to energy efficiency investments undertaken by the industry (48%), including the electricity sector, and to EE measures in buildings/housing (42%). Other EIB initiatives in cooperation with the European Commission include ELENA, EEEF and JESSICA.

Sustainable Energy Initiative and Sustainable Energy Financing Facilities, EBRD

Green credit lines provide funding and dedicated technical support to development banks and local commercial banks in countries. Their aim is to build capacity and overcome financial and technical barriers to scaled-up investment. Green credit lines help the recipient banks to develop their "climate" strategy and climate finance portfolio and mitigate credit risk – and in turn promote the financing of private green investments that comply with climate friendly eligibility criteria and support private companies and households in elaborating their green investments. The IFIs work together with local banks in partnership to help them to identify investment potential, select sectors with the highest potential and define an action plan that aims to reduce the barriers to investment in the country. Loans granted to customers provide them with incentives (e.g. maturity) to invest. The design of all climate change credit lines is based on the recommendations from thorough market studies carried out by external experts. These studies mobilize all stakeholders (banks, companies, authorities) and provide insights on barriers that have to be overcome to develop investments in the field of climate change.

Main EBRD funding instruments for low carbon projects are the *Sustainable Energy Initiative (SEI)* and *Sustainable Energy Financing Facilities (SEFFs)* being one element of the SEI. SEI provides project financing for large-scale project mostly via loans although in 2011 equity was used for the first time to scale up investment in larger portfolios of wind farms in PL and HU.[421] The EBRD's business model to finance energy efficiency and renewable energy projects combines investments with technical assistance and policy dialogue. Between 2006 and 2011 SEI investments reached €8.8 billion in 464 sustainable energy projects in 29 countries with a total project value of €46.9 billion of which two-

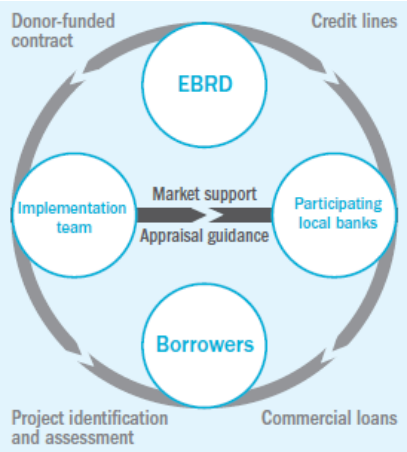
[420] The following information on DEEP is based on EIB (2012): DEEP GREEN PLATFORM: a potential new initiative to develop the European energy efficiency financing market, Summary presentation for DG CLIMA, Brussels, 21 June 2012

[421] EBRD (2011): Sustainable Energy Initiative: Renewable energy activities, http://www.ebrd.com/downloads/research/factsheets/renewables.pdf

thirds are in the private sector. SEI is now in its Phase 3 running from 2012 to 2014 aiming for SEI financing of €4.5 to 6.5 billion and an annual carbon emission reduction of 26 to 32 million tonnes.[422] SEI provides financing to industrial energy efficiency, cleaner energy production, sustainable energy credit lines, renewable energy, and energy efficient municipal infrastructure. The majority of funding goes to the private sector.

SEFFs are one element of the SEI and are used for SMEs based on long-term credit lines to commercial banks for on-lending (on commercial terms) for industrial and small-scale renewable and energy efficiency projects. Credit lines are combined with technical assistance to local banks and prospective recipients. In 2012 there were 18 SEFFs operating in 15 countries. So far loans have been provided to 67 local financial institutions for around €1.7 billion in investments supporting over 31,500 sub-projects.[423] It combines technical assistance and financial support (loans). The early phases of this programme focused on mitigation, but adaptation has been included in Phase III. In practice, EBRD lends funds to local banks that are willing to participate in a Facility and that meet standard EBRD eligibility criteria. The local bank is responsible for assessing the creditworthiness of potential borrowers that apply to the Facility. The project implementation team provides free-of-charge advice (usually based on an energy survey at the potential borrower's site) to help identify and evaluate energy efficiency and renewable energy investment opportunities. The project implementation team works together with the local banks to assess the eligibility of the potential borrowers' loan applications. The local banks take lending decisions, which if positive, result in loans at commercial rates. Loan amounts vary depending on the Facility and the investment opportunity.[424]

Figure 3. Functioning of EBRD's Sustainable Energy Financing Facilities



Source: EBRD

The EU is one of the major multilateral donors under the SEI contributing to technical assistance but also to grant co-financing in particular through frameworks such as the Neighbourhood Investment Facility.

[422] EBRD (2012): SEI overview, http://www.ebrd.com/downloads/research/brochures/sei.pdf
[423] EBRD (2012): Sustainable Energy Initiative: Scaling up finance to address climate change, http://www.ebrd.com/downloads/research/factsheets/sei.pdf
[424] EBRD (2012): Sustainable Energy Initiative: Scaling up finance to address climate change, http://www.ebrd.com/downloads/research/factsheets/sei.pdf

Some of the EBRD's funding is undertaken through specific frameworks, e.g. the EBRD's municipal team operates in this way sometimes; otherwise it is project specific. Frameworks have been agreed in some of the new Member States in cooperation with the Commission. With respect to trust funds, some donors have preferential regions and sectors, *e.g.* Sweden has specifically supported a special purpose fund in Russia and Ukraine for water infrastructure. Other countries support neighbours or other countries in their region more generally. Hence, some funds are multi-purpose with a regional focus. The EBRD's co-financing unit matches donors to projects. There are also some funds that only focus on technical cooperation or capital expenditure. It is very flexible.

EBRD's role therefore is one of channelling finance. It is different to the EIB in a number of ways. First, it is not an EU institution, unlike the EIB, and it also has shareholders who are not EU Member States. The key difference between the two banks stems from their respective mandates. The EBRD is a transition bank and so the projects that it supports need to deliver towards a transition of the countries concerned. Such requirements could influence the type of climate projects that the EBRD would finance. While every funding instrument needs to make commercial sense, the EBRD differs from commercial banks as it is much less risk averse than these.

The non-financial pillars of the SEI are considered important by the EBRD for managing risks. These can contribute to a better understanding of the situation in the potential projects, *e.g.* through energy audits of potential recipients. The results of these can be used to influence the structure of the eventual deal. Some energy efficiency financing is undertaken using credit lines. In such cases, grants are given after the completion of a project. The results are verified by a third party before the grant is provided. In these cases, there is an incentive to undertake projects appropriately, as the successful completion of the project is effectively rewarded. The ultimate goal is to create a self-sustaining market.

Guarantees are often backed by public money either from national or regional governments or from the EU budget, currently under CIP or the Structural Funds. Under the Structural Funds it is up to the Member State and/or region to decide whether funds are used for guarantees or not. Guarantees can be provided for a higher amount than what is actually available in terms of own funds since only a small part of the actually funds need to be paid out. In 2011 guarantees granted by AECM members were 7.9 times higher than own funds.[425] If a coverage rate of 50% is assumed, a loan of around 16 times higher the own funds could be granted. The final total investment will in general be higher and hence the leverage factor in relation to public money involved and the total final private investment.

Credit lines for local banks, KfW

KfW has developed partnerships with financial institutions in different countries to provide green credit lines. In addition, KfW provides grants for consultancy services to support the implementation of energy efficiency and renewable energy (EE/RE) loan products and the institutionalisation of EE/RE within the partner lending institutions. This enables them to introduce a new innovative loan product, to gain access to new client groups, and to have an early entry into a growing green market. Partner countries thereby receive the transfer from KfW of a very successful and reliable model. KfW have also developed tools to support and monitor their climate change credit lines. These tools estimates the carbon footprint and/or greenhouse gas emission reductions of different types of projects and provides insights to banks on the impact of their financing.[426]

In December 2012, the French bank, Banques Populaires et les Caisses d'Epargne **BPCE** , has set up a funding instrument in cooperation with KfW under the KfW-ELENA facility which is strongly

[425] AECM (2012): 20 years of facilitating growth, August 2012
[426] UNEP (2011) Innovative climate finance – examples from the Bilateral finance institutions climate change group.

embedded in the local banking context. This funding instrument will support local energy efficiency projects by providing technical assistance and financing. Technical assistance is provided via ELENA which can cover up to 90% of costs related to capacity building, tender preparation etc. Financing is provided via KfW credit lines. The banking tools this funding instrument uses include:[427]

- Dedicated finance at lower interest through KfW credit lines and local solidarity savings accounts;
- Standard loans and concessional loans to SMEs and households investing in energy efficiency;
- Local guarantee fund;

Green Investment Bank, UK

The UK's Green Investment Bank was officially launched in November 2012. Preparations for its launch had been on-going for some time previously, so the Bank has already supported a number of projects. The bank's main aim is to accelerate the UK's transition to a green economy by leveraging private capital to invest in green investments. The other aim of the initial phase is for the Bank to become an enduring institution that operates at arm's length from government The UK Government has set 5 priority sectors for the bank: offshore wind; waste recycling; energy from waste; non-domestic energy efficiency; support for the Green Deal (the UK's energy efficiency programme focusing on household energy efficiency). Additionally, up to 20% of the bank's capital can be invested in other green infrastructure). The latter has concentrated on bioenergy (biomass and biofuel) to date. The Bank is theoretically able to invest in CCS and marine technology, but has not yet as these technologies are not considered to be commercially viable.

The bank can only invest in UK-based projects and operates at the investable end of the spectrum, so it supports commercially viable projects, but not project development. It has £3 billion in capital to deploy by 2015. All of the Bank's investments have to satisfy three criteria: sound banking, i.e. a reasonable return needs to be made; additionality, i.e. support should not 'crowd out' private capital; and the investment has to be green. Metrics are being defined that will be used to consider whether a project can be considered to be green, which may include climate-related criteria.

To date, the Bank has focused on providing loans to date. It generally invests alongside private investors and focuses on directly investing in projects with a value of more than £50 million. For smaller projects, the GIB has appointed fund managers to effectively act as an aggregation vehicle. Each manager has to bring in a certain amount of private capital, which (once achieved) will be matched by a predetermined amount of GIB resources and be used to invest in smaller projects[428].

EU Regional Investment Facilities

The EU has been using innovative financing mechanisms to pool EU grants with loans from finance Institutions (EIB, EBRD, NIB) and development banks (KfW, AFD) working with third countries and regional banks in order to better respond to investment needs of countries outside of the EU. A number of EU regional investment facilities have been set up to provide collaboration platforms in order to leverage additional investment in projects in various sectors such as transport (around 40% of all investments)[429], energy, environment and SMEs. Grants from the EC are provided in the form of different instruments including:

- direct investment (33%),

[427] BPCE, Commission européenne (2012) : Le Groupe BPCE, première banque française choisie par la Commission européenne et la KfW pour financer des projets locaux d'efficacité énergétique en France, Communiqué de presse, 5/12/2012

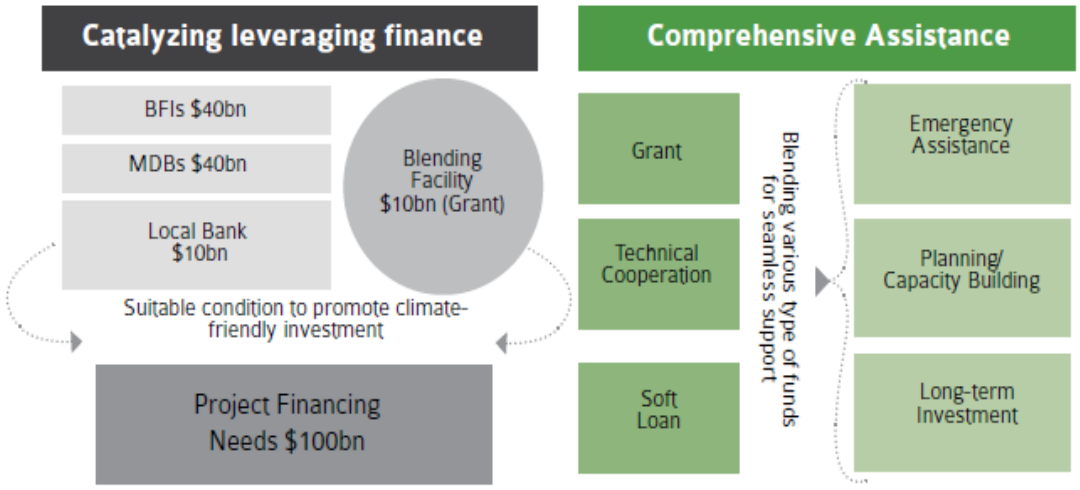
[428] Personal communication; UK Green Investments/BIS (nd) *Introduction to UK Green Investments*; see http://webarchive.nationalarchives.gov.uk/20121017180846/http://www.bis.gov.uk/assets/biscore/business-sectors/docs/g/green-investment-forum-presentation-7-march-2012.pdf

[429] EC, EU Regional Blending Facilities, Presentation, May 2012

- technical assistance (33%),
- interest rate subsidy (27%),
- risk capital (5%) and
- guarantees (2%)[430].

The financiers participating in the facilities collaborate by delegating specific project management to one lead financier, relying on its standards, procedures and practices, thereby decreasing transaction costs.[431] To improve complementarity and division of labour, AFD, EIB and KfW have elaborated procedural guidelines under the framework of the Mutual Reliance Initiative (MRI), which was launched in 2009. The objective of the MRI is to delegate central tasks in project preparation, implementation and monitoring to the maximum possible extent to the institution who is subsequently assuming the responsibility as a 'lead financier'.

Figure 4. Example of a blending facility



Source: Presentation by UNEP BFI CCWG to the United Nations, 9 March 2011

Between 2007 and 2010, the facilities invested some €7 billion in climate change related projects, representing about 40% of the total value for the projects in the facilities. To pursue this effort and better account for it, the European Commission proposed to integrate a **Climate Change Window** (CCW) into each of the existing regional facilities.[432]

The main aim of 'climate change window' is to strengthen the mainstreaming of climate change into development cooperation. Specifically, its purpose is to establish a transparent way of tracking and reporting the climate relevance of projects (using the Rio markers) in the different sectors (e.g. clean energy, renewable energy, energy efficiency, transport, private sector, forest conservation etc.). By using the system of blending EU grants with loans from the financing institutions and regional or local banks, the 'windows' are intended to increase the leverage of credits and the volume of investment projects related to climate change.[433]

[430] EC, EU Regional Blending Facilities, Presentation, May 2012

[431] UNEP (2011) Innovative climate finance – examples from the Bilateral finance institutions climate change group.

[432] Nunez-Ferrer, J. and Behrens, A. (2011) Innovative Approaches to EU Blending Mechanisms for Development Finance. CEPS Special report. May 2011, Brussels, http://www.dev-practitioners.eu/fileadmin/user_upload/EU_Blending_Mechanisms.pdf

[433] European Commission (2010) Q&A on climate change windows. http://europa.eu/rapid/press-release_MEMO-10-628_en.htm?locale=en#PR_metaPressRelease_bottom

Experience so far indicates that there seems to be a tendency towards mitigation projects under the facilities, because they are more profitable and bankable and can thus achieve more financial leverage. Adaptation projects are characterised by higher grant elements to compensate for the lower profitability and leverage. One discussed option to improve the balance between mitigation and adaptation project is to introduce a minimum quota for adaptation projects. However, it is considered that a quota would decrease the flexibility of the project selection, directing financial flows to less financially attractive projects. It has been argued that the facilities should primarily target only those adaptation projects that can achieve similar profitability and leverage rates to mitigation projects.[434] Overall, it is considered that the EU blending facilities are suitable for mitigation projects and less for adaptation projects.[435]

One example of a regional blending facility is the **EU Africa Infrastructure Trust Fund** (ITF), which is operational since 2007 and managed by EIB. EU grant support is used mainly for subsidising interest rates, financing insurance premiums, preparatory studies (e.g. on environmental and social issues, market and pricing studies etc.) as well as other technical assistance (e.g. for the implementation of an environmental management plan).[436] It is estimated that each €1 of grant funds will generate over €14 in total investments. Majority of supported projects include conventional infrastructure such as roads and airports, energy interconnectors and hydropower development. From a climate change perspective, two projects are of particular interest – the geothermal risk mitigation facility for East Africa and the development and implementation of a social and environmental management system (SEMS) for the Banque Ouest Africaine de Developpement (BOAD), a development finance institution in West Africa.[437]

The geothermal risk mitigation facility for East Africa aims at developing power generation capacities in the range of 300 MW in countries like Ethiopia, Kenya, Rwanda, Tanzania and Uganda. A €30 million direct grant from the ITF will finance drilling programmes and if required, a feasibility study that combines drilling results with market, regulatory and technical considerations. The leading financier is KfW.

The African Development Bank, the lead financier of the second project, is providing the BOAD with a second line of credit of €64 million and will contribute a total of €3.05 million to the capital increase in order to stimulate infrastructure investments, in agriculture, industry, energy, mining, transport, and communications sectors. As many of these investments are expected to have negative social and environmental impacts, a €400 thousand grant for technical assistance was granted by the ITF to develop and implement a social and environmental management system in the BOAD operations. The aim is not only to enhance BOAD's internal capacities but also improve the sustainability of its infrastructure investments in the long run, enabling BOAD to undertake a systematic assessment at all stages of the project cycle, report and document its findings, and extract lessons learnt to guide the design and implementation of future infrastructure investments.

Similar to the ITF, the EC created the **Latin America Investment Facility (LAIF)** in December 2009.[438] It envisages the provision of €125 millions of grant support for the period 2009-2013. Combined with loans, the EC support can be used through various instruments including:

- Investment co-financing in **public infrastructure** projects

[434] Nunez-Ferrer, J. and Behrens, A. (2011) Innovative Approaches to EU Blending Mechanisms for Development Finance. CEPS Special report. May 2011, Brussels, http://www.dev-practitioners.eu/fileadmin/user_upload/EU_Blending_Mechanisms.pdf
[435] Pers. communication
[436] UNEP (2011) Innovative climate finance – examples from the Bilateral finance institutions climate change group.
[437] EC and EIB (2011) Annual report: EU-Africa Infrastructure Trust Fund 2011. http://www.eu-africa-infrastructure-tf.net/attachments/Annual%20Reports/eu_africa_infrastructure_trust_fund_annual_report_2011_en.pdf
[438] DG Development and cooperation (DEVCO) web site: Latin America Investment Facility, LAIF in Detail, http://ec.europa.eu/europeaid/where/latin-america/regional-cooperation/laif/in-detail_en.htm

- Loan **guarantee** cost financing
- Technical **assistance**
- **Risk capital** operations

The LAIF Board has approved 8 operations (majority of projects with a focus on sustainable energy and transport as well as climate change) in the Latin America Region, granting a total LAIF grant contribution of €34.85 million. This has leveraged around €1,600 million of financing from bilateral, multilateral a Latin American Finance Institutions and other donors (an average leverage effect of 1:46). As a first step to concretise its commitment to attract additional resources to the climate change windows, in 2011 the EU allocated an additional budget of € 17.3 million, to be shared between the windows of the LAIF and of the Neighbourhood Investment Facility.[439] The CCW aims at generating investments in both mitigation and adaptation measures (see Table 3).

Table 3. LAIF investments in climate change

Mitigation measures	Adaptation measures
Mitigation of climate change by limiting anthropogenic emission of GHGs	Reduction of vulnerability of human and natural system to the impact of climate change
Improved energy efficiency and energy savings	Promotion of climate change adaptation technologies, including necessary related infrastructure
Increased production and use of renewable energy	Emergency prevention and preparedness measures, including insurance schemes, to cope with climatic disasters
Protection and/or enhancement of GHG sinks and reservoir	

According to the Rio Markers tracking, € 30.3 million of LAIF contribution can be reported as climate action support, and these projects represent a total amount of €1.2 billion invested towards the fight against climate change.[440]

5.1.2 Equity

Global Energy Efficiency and Renewable Energy Fund of Funds (GEEREF)

The GEEREF is a public-private partnership in the form of a Fund-of-Funds providing equity finance through private equity funds to SMEs with a focus on energy efficiency and renewable energy projects or technologies outside the EU. It does not provide direct funding to companies or projects. Its objectives include the transfer, development and use of environmentally sound technologies in developing countries. GEEREF was initiated by the Directorate General for Environment and Directorate General for Europe Aid Co-operation Office (AIDCO) of the European Commission. It is sponsored by the European Union, Germany and Norway and is advised by EIB/EIF. As of September 2009 GEEREF had secured funding of €108 million but aimed for €200-250 million by the end of 2012. It is estimated that up to €1 billion could be mobilised through the funds in which GEEREF will participate and the final projects in which these funds will invest.[441] This would translate into a leverage effect of around 5.

[439] European Commission (2011) LAIF - Operational report 2010-2011

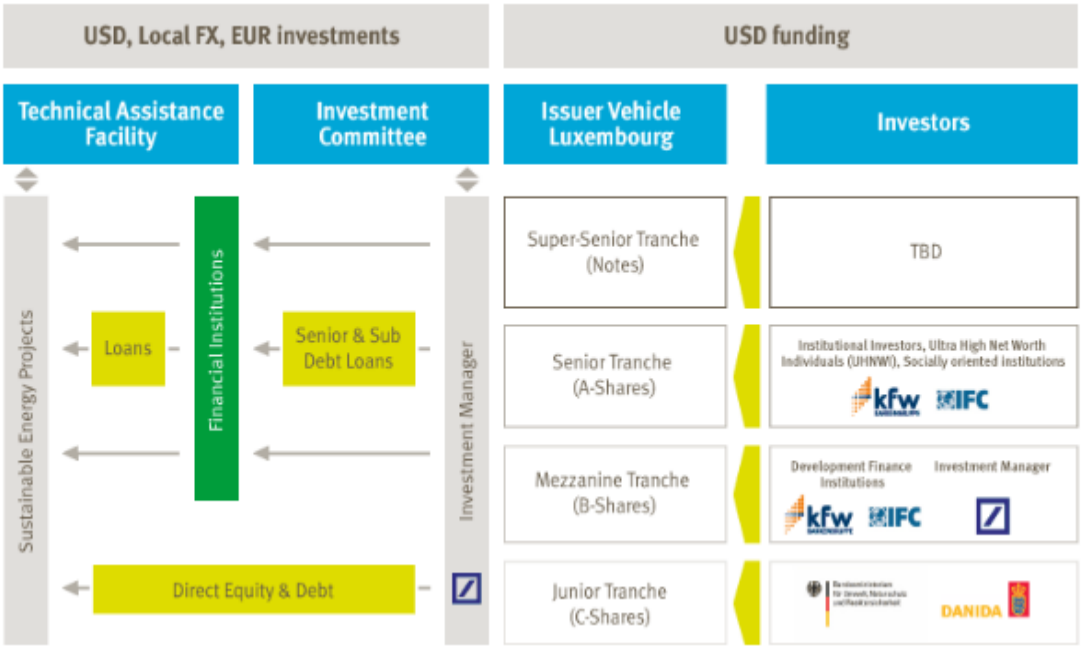
[440] European Commission (2011) LAIF - Operational report 2010-2011. http://ec.europa.eu/europeaid/where/latin-america/regional-cooperation/laif/documents/laif_operational_report_2010_11_web_en.pdf

[441] GEEREF, http://www.geeref.com/posts/display/2

Global Climate Partnership Fund (GCPF), German government

Another example for a layered fund is the GCPF which was initiated by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety and KfW Entwicklungsbank and is a public-private partnership open to investments from institutional investors and professional investors.[442] Targeted investors are donor agencies, governments, international financial institutions, and professional private investors. GCPF aims to provide commercial returns to its investors. The returns of its shares follow a waterfall principle and allow investments into three different categories: C-Shares, B-Shares and A-Shares. The shareholder structure of the GCPF is illustrated in Figure 5. GCPF offers refinancing, co-investments and technical assistance. Refinancing can be provided via long term senior loans at commercial rates and subordinated debt structures. GCPF can also invest in parallel with financial institutions. Technical assistance is linked to project financing from the GCPF.

Figure 5: Shareholder structure of the Global Climate Partnership Fund



Mezzanine funds

FIDEME was a privately run, publicly financed mezzanine fund that supplied subordinated debt for the deployment and diffusion of renewable energy in France.[443] It ran from 2003 to 2008. The French environment and energy management agency ADEME supplied €15 million, of which half was non-repayable, while €30 million was provided by large investors. The fund was managed by a private company with support from ADEME. The fund provided subordinated debt or convertible bonds to a maximum level of 5% of the funds and 25% of project costs. Project sponsors were required to take a 10% to 20% equity stake.

The public fund achieved an effective leverage of 20. The fund financed 27 projects, of which 23 were wind farms, one hydro plant, one biofuel plant, one waste-to-energy plant and a clean technology fund. Private investors are expected to recoup investments and interest by 2013, while

[442] http://www.gcpf.lu
[443] UNEP/SEF Alliance (2011) *Evaluating Clean Energy Public Finance Mechanisms*

ADEME is expected to make a €2.5 million more than the €7.5 million of its support that was repayable, as a result of the higher-than-expected returns on investment.

Since the funds closure, the existence of a commercial successor, as well as competitors in the market, suggests that the fund was successful in overcoming the market barriers that had been in place.

5.1.3 Bonds

Some literature already talks about the use of bonds for the purposes of investing in climate change. However, there are a range of different types of bonds that are already used to invest in infrastructure, some of which is climate-related[444]. For example, HSBC noted that bonds are already well used for purposes that are aligned with a low carbon economy. For example, HSBC Identified $174 billion of climate-themed bonds outstanding, of which $119 billion were in the transport sector (mainly in rail). A further $29 billion of bonds have been used for low carbon energy, with wind making up 38% of this figure and solar and hydro, a further 28% and 21%, respectively. The report argues that bonds are well suited for long-term investments that have stable revenue streams, such as rail and water, as well as some low carbon technologies.

In this respect, it is important to recognise that a range of different types of bonds might be considered to be 'climate bonds'. For example, corporate bonds issued by railway infrastructure companies could be considered to be at least 'climate-aligned'[445]. Other bonds of potential use for climate purposes tend to be asset-linked. A good example of such a bond that can be used for climate purposes are **'green bonds'** or **'climate bonds'**, which could be used to finance low carbon, climate resilient infrastructure, with supportive policies such as tax exempt green infrastructure bonds and green standards[446]. The EIB already issues climate awareness bonds whose proceeds are earmarked for renewable energy (e.g. wind, hydro, solar, geothermal) and energy efficiency projects[447]. The EIB launched a climate awareness bond for the first time in 2007 after the adoption of the EU's Climate and Energy package as an additional source of finance for renewable energy and energy efficiency projects. The latest EIB Climate Awareness Bond was completed in November 2012. This was an 11-year SEK 750 SEK Climate Awareness Bond of which 54% was invested by Fund Managers, 41% from bank treasuries and 5% by Retail and private banks, with the majority of the investment coming from Scandinavia[448].

Another example of an asset-linked bond that has been proposed for climate purposes are **covered bonds** ("Pfandbriefe" in German) as these could provide a stepping stone to a renewable energy bond market. These have two main advantages: i) they enable banks to access cheap and long-dated funds that they can lend to designated energy projects and ii) they enable bond investors to gain exposure to renewable energy assets with minimal changes to existing approaches, as a result of the high level of security offered by covered bonds[449]. It is important to note that these types of bonds are not the same as the project bonds, which is also an asset-linked bond linked to a specific project, which is the focus of the EU's PBI.

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[444] Personal communications; Sierra, K (2011) *"The Green Climate Funds: Options for Mobilising the private sector"*, report for the Climate and Development Knowledge Network.

[445] Network Rail *"Investor presentation – Returns from Rail"; see http://www.networkrail.co.uk/investor-relations/debt-issuance-programme-overview/*

[446] Kennedy, C. and J. Corfee-Morlot (2012), "Mobilising Investment in Low Carbon, Climate Resilient Infrastructure", OECD Environment Working Papers, No. 46, OECD Publishing. http://dx.doi.org/10.1787/5k8zm3gxxmnq-en

[447] EIB (2012) EIB Climate Bond Awareness Bonds – 2012 update

[448] EIB (2012) *"EIB issues new SEK Climate Awareness Bonds"*, EIB Press Release BEI/12/159; see http://europa.eu/rapid/press-release_BEI-12-159_en.htm

[449] Damerow, F., Kidney, S. and S Clenaghan (2012) *How Covered Bond markets can be adapted for renewable energy finance and how this could catalyse innovation in low carbon capital markets – unlocking bank lending in an era of capital constraint and limited public budgets*, Climate Bonds Initiative Discussion Paper

While the rail industry does issue bonds, as noted above, to date this has been the limit of private sector involvement in railway bonds. At a project level, there has been some engagement with the private sector, but these tend to take the form of public private partnerships (PPPs) where the private sector is actively engaged in the delivery and often the operation of the project (see Box 1). It was not possible to identify an example of the use of project bonds in the rail sector – e.g. where an investor provides financial support for a project but is not involved in its delivery or operation. However, there are a few examples of the use of PPPs in the rail sector in the EU, which shows that companies are looking to involve the private sector in the rail sector (see **Box 2**). Even though many of these projects have proved to be successful, they have still proved to be challenging, e.g. a third PPP on Belgian railways is not currently planned, partially as a result of the complexity of PPP projects[450].

One of the challenges of using bonds to support the construction of rail infrastructure is the cost structure and cost levels within the sector. Rail operators pay track access charges to the infrastructure providers, which typically only cover about 50% of the costs of maintenance. The remainder needs to be covered by a direct transfer from central government. If user charges were added on top of the track access charges in order to provide investors with a revenue stream, the costs of rail use would increase significantly, which would not be possible on many lines. Hence, in the rail sector, availability payments, such as those used in the Diabolo project are important (see **Box 2**)[451].

Box 1: Using PPPs for rail in Belgium: The Diabolo and Liefkenshoek projects

To date there have been only two PPPs used on the Belgian railways. The first was the Diabolo project, which aimed to link Brussels' Zaventem Airport with the high speed rail networks of Belgium and the rest of north-western Europe. The contracts were signed in 2007 and the link began operation in 2012. The project had two main parts: a publicly funded section costing around €250 million and a privately funded section costing €290 million. The publicly funded section of the project consisted of a 17.6km line between Schaarbeek and Mechelen, which was co-financed with a contribution of €15 million from the TEN-T programme. The privately-funded section was a 4.8km underground line linking the airport to the high speed rail system to the north. The project company Northern Diabolo NV, which financed the construction, consists of the investors HSH Nordbank AG and International Public Partnership GP Ltd, which provided 12.5% of equity and 87.5% of senior debt. The investors will recoup their investment over the next 35 years through a mixture of a levy on each ticket sold, an annual payment from the train operating company and an annual payment from INFRABEL, Belgium's railway infrastructure manager. The line will pass to INFRABEL at the end of the concession in 2047. The second PPP was the Liefkenshoek, which linked the port of Antwerp to the main rail network. This focused on freight and was financed with 50% financial support from the EIB and 50% from six commercial banks.

Sources (all accessed 25 January 2013):

http://tentea.ec.europa.eu/download/project_fiches/belgium/fichenew_2007be02030p_final_3.pdf

http://www.infrabel.be/fr/presse/diabolo-le-desenclavement-ferroviaire-nord-de-brussels-airport

http://www.railwaygazette.com/news/single-view/view/royal-train-opens-diabolo-link-to-brussels-airport.html

http://www.railway-technology.com/projects/diabloproject/

Personal communications

[450] Personal communication
[451] Personal communication

Box 2: PPPs for rail in Sweden, Netherlands and France

Arlanda Express, Sweden

One of the earliest rail PPPs in the EU was the Arlanda link from the Swedish capital Stockholm to its airport. While the PPP can be considered to a success, ridership was lower than anticipated and the public sector support was relatively large. Two thirds of the PPP financing came from low interest state loans (on which the concessionaire does not have to begin any repayments until it is makes sufficient profit) or from public banks, thus transferring a lot of the risk back to the public sector.

Source: Dehornoy, J. (2012) "PPPs in the rail sector – A review of 27 projects" MPRA Working Paper No 38415; see at http://mpra.ub.uni-muenchen.de/38415/

HSL Zuid, Netherlands

A PPP was used to construct the high speed line between Amsterdam and the Belgian border, under which the Infraspeed consortium designed, built, financed and maintains the line. The finance came from 90% bank debt and 10% equity from the project partners.

Source: Allen & Overy (2012) *"The Netherlands: Two case studies"* presentation to UNECE, CER and UIC seminar 'Public Private Partnership Schemes and Railway Financing'

France

RFF, which manages the French railway network, has €15 billion worth of PPP projects in its portfolio. The majority operate under the design, build, finance and maintain model that was used in HSL-Zuid (see above). The exception is the HSL SEA between Tours and Bordeaux, which was a concession contract and benefitted from support under the LGTT.

Source: Guiavarc'h, G (2012) "PPP Projects for the Railways Network in France" presentation to UNECE, CER and UIC seminar 'Public Private Partnership Schemes and Railway Financing' and personal communication

Institutional investors can invest in low carbon and climate resilient infrastructure in two ways: indirectly through intermediaries (e.g. via green bonds); or directly, which is currently limited. However, some pension funds, including ATP and Pension Danmark in Denmark, PPGM in the Netherlands and some South African funds, have invested in green infrastructure. However, there is still a massive potential in this respect, which has not yet been tapped[452].

Hence, the involvement of private sector finance in the rail sector is increasing, but experience, including with financial instruments, is still limited. In its response to the PBI consultation, CER called for a dialogue on the potential use of private sector investment in the rail sector[453].

Others underline that the bond market has remained largely untapped for climate finance, e.g. with respect to renewable energy, although note that it will take time for the market to grow, as experience with bonds develops, as institutional investors are generally conservative with respect to new asset classes.[454] In its response to the PBI consultation, the EWEA called for a change to the existing regulatory approach, but also welcomed the PBI as it was something that would be needed. In this respect, EWEA called for the inclusion of wind energy, particularly off shore projects, to be

[452] OECD (2012b) *G20/OECD Policy Note on Pension Fund Financing for Green Infrastructure and Initiatives*
[453] CER (2012)
[454] Damerow, F., Kidney, S. and S Clenaghan (2012) *How Covered Bond markets can be adapted for renewable energy finance and how this could catalyse innovation in low carbon capital markets – unlocking bank lending in an era of capital constraint and limited public budgets*, Climate Bonds Initiative Discussion Paper

included in the scope of the PBI, as a result of the level of investment that is needed[455]. The Commission's document accompanying the PBI consultation notes that some renewable energy projects may have characteristics that make them suitable for project bonds[456].

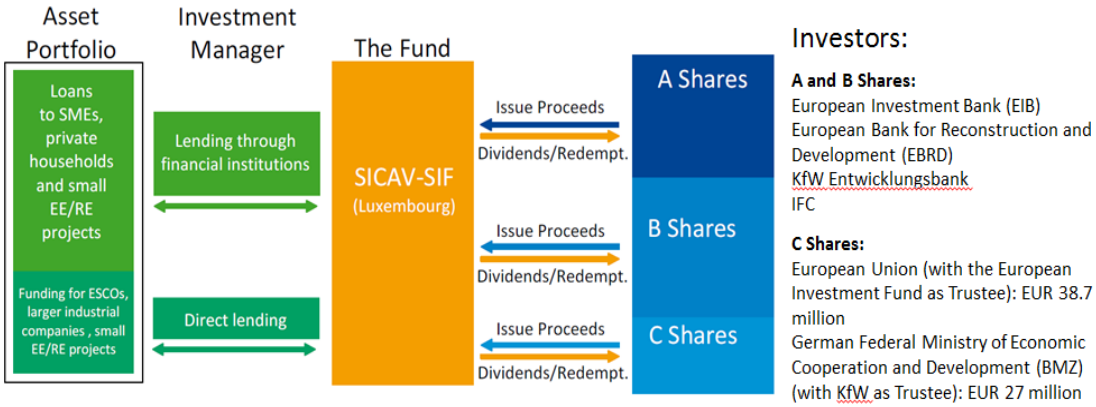
5.1.4 Risk sharing instruments

Green for Growth Fund (GGF)

In 2009, the GGF was launched by the EIB together with KfW to provide financing, including loans, equity and technical assistance, for sustainable energy projects in the Western Balkans and Turkey. It utilizes a **tiered risk sharing structure**, designed to attract commercial capital from multilateral and private institutional investors. It offers a wide range of financial instruments including medium to long-term senior loans, subordinated loans, syndicated loans, letters of credit, guarantees, mezzanine debt instruments, local debt securities. The Green for Growth Fund's leverage factor is 7. In relation to climate change, it provides **credit lines** to financial institutions in Southeast Europe for on-lending to private households, homeowners associations, businesses, municipalities and public sector entities to finance energy efficiency measures and renewable energy projects. In addition, the GGF provides **loans** directly to renewable energy companies and projects, energy service companies, small scale suppliers of energy efficiency and renewable energy services and equipment suppliers.

The GGF is a closed-ended investment company, set up for an unlimited duration and is open to institutional investors including donor institutions, international financial institutions. The European Union has contributed via EIF €38.7 million, and the German Federal Ministry of Economic Cooperation and Development (BMZ) via KfW €27 million in the form of C shares (junior debt). EIB and EBRD among others have contributed to A and B shares. The projects are monitored in terms of energy and carbon savings. The 1,390 projects (EUR 42.5 million) financed translated into estimated annual energy savings of 156,727 MWh or 34,281 metric tons of CO2 emissions.[457]

Figure 6: Schematic overview: Green for Growth Fund, Southeast Europe



Note: C Shares constitute the "First-Loss Tranche" (C Shares) providing risk protection for "Mezzanine Shares" (B Shares) and "Senior Shares" (A Shares) and eventually Note Holders

Sources: Green for Growth Fund, Southeast Europe at a Glance Q2 2012, http://www.ggf.lu/media/public/pdfs/downloads/factsheets/2012/ggf_at-a-glance_q2-2012.pdf and Green for Growth Fund, Southeast Europe, Annual Report 2011, http://www.ggf.lu/media/public/pdfs/downloads/annual_reports/2011/

[455] EWEA (2012)

[456] European Commission (2011) *"Stakeholder consultation paper/Commission Staff Working Paper on the Europe 2020 Project Bond Initiative"*, Brussels, 28.02.2011; see http://ec.europa.eu/economy_finance/consultation/pdf/bonds_consultation_en.pdf

[457] Green for Growth Fund, Southeast Europe, Annual Report 2011, http://www.ggf.lu/media/public/pdfs/downloads/annual_reports/2011/

Guarantees are one of the most common risk management instruments used in climate finance.[458] **Loan guarantees and partial risk/credit guarantees** are commonly provided by IFIs and have also proven useful in cases of 'on-lending' where governments underwrite loans provided through intermediaries, such as commercial banks or state utility companies. In cases of default, the government agency or the finance institution can absorb some or all of the risk. This is particularly beneficial for markets where private lenders are not initially comfortable or familiar with the technology in question. There is significant potential for the public sector to provide guarantees for higher-risk investments but guarantees alone are insufficient to improve the commercial viability of all investments. Thus, a **mix of de-risking instruments is often needed to reduce investment risk**.[459] Other de-risking instruments can include **political and regulatory risks guarantees and insurance** as well as **currency, liquidity and subsidy rate facilities**. Majority of the latter instruments are mostly applied in developing countries.

A particular concern relates to **policy risk**. Investors place risk premiums on investments that are dependent on government policies, e.g. in case changes in government lead to changes in policy. Governments perceive such risks to be low, but many policies, e.g. relating to renewable energy, have changed in recent years, including some retrospectively. This has adversely affected investor perceptions leading to less investment. Hence, there is a gap between government and investor perceptions of risk, which could be addressed by an insurance scheme to cover policy risk. Insurers are unlikely to provide such risk, so a 'co-insurance' policy risk scheme is needed in which governments would collectively cover the risks of changes in policy[460]. The public sector could also support 'guarantee pools', such as with the UK Green Deal financing model and regulatory measures to enable the securitisation of energy/climate friendly assets. Others have argued for the need to securitize bank loans, i.e. pooling assets and using the cash flows to back securities that will allow banks to recycle their increasingly limited capital and to lend more[461].

CPI discusses instruments that might be used to address policy risks, i.e. against retroactive changes to policy, which has become a concern for investors, as it affects the financial stability of investments, particularly in the renewable energy sector. It argues that there is a need for **effective policy risk insurance instruments** that need to achieve a number of objectives in order to address investors' concerns. In this respect, insurance instruments need to: streamline and define the risk and the conditions for coverage; be backed with strong enforcement power; include developed markets and smaller projects; reduce the transaction costs associated with existing instruments; and improve the creditworthiness of the projects concerned[462].

International Climate Bonds Standards and Certification Scheme

An International Climate Bonds Standards and Certification Scheme has been set up that has developed an environmental standard to assure investors that funds are being used to deliver a low carbon economy and so easily prioritise such bonds. Criteria for renewable energy, infrastructure and bio-energy amongst others have been developed.[463] Common definitions, as mentioned above, are important for such an approach, as these would ensure that investors know what they are investing in. The Climate Bond Initiative is developing such common indicators supported by some investors, agencies and NGOs[464]. The Initiative has also proposed a plan to mobilise bond markets for the low carbon transition. This includes: the aggregation of smaller projects in larger offerings for the bond market; government ensures investment grade offerings; the public sector shares the risks

[458] CPI (2011) The landscape of climate finance. A CPI Report: Venice
[459] WEF (2013) The Green Investment Report The ways and means to unlock private finance for green growth. A Report of the Green Growth Action Alliance, Published by World Economic Forum, Geneva.
[460] Climate Policy Initiative and Climate Bonds Initiative (2012) Report from policy risk insurance round table
[461] Personal communication
[462] Climate Policy Initiative (2013) *"Risk Gaps: Policy Risk Instruments"*
[463] Climate Bonds Initiative (no date) *Assurance/Integrity/Transparency – International standard for climate bonds to catalyse investment*
[464] Personal communication

in clever ways, e.g. loan guarantees, risk insurance and regulatory support; green enabling institutions, such as green investment banks, are set up; tax incentives are given for climate bonds; and using climate bond standards as a screening and preferencing tool[465]. A current barrier to the development of a bond market in the EU is the diverse approach within the EU, as each Member State has a different approach. This limits the scope for liquidity[466]. Other asset-lined bonds, such as Climate Bonds or covered bonds could also be supported. However, at the moment, legislation in many Member States does not allow the use of covered bonds for renewable energy projects[467].

5.2 What is interesting in terms of IFIs practice with regard to climate adaptation?

Compared to mitigation, the current trends and experiences with investments in climate change adaptation are fewer and less well documented. One major issue is the lack of a clear and commonly shared definition of what 'adaptation' project is. In fact, there is a lot of experience with financing for projects in the water sector but these have not necessary been considered adaptation.[468]

In the international context, adaptation to climate change is predominately financed through grants and loans. There are more experiences with financing traditional water infrastructure projects, which could be useful for other types of adaptation projects. OECD presents different financing mechanisms to unlock lending from private banks including blending mechanisms, guarantees and technical assistance to make projects 'bankable' as well as the issuing of bonds and projects finance.[469] Yet, the use of these instruments largely depends on the specific project, its risk reward profile and the specific context it is developed.

5.2.1 Loans

The **EIB** has identified integrated water resource management as a key objective of its lending operations in relation to climate change adaptation.[470] The bank provides direct loans for a variety of projects including river basin water resources management programmes, coastal zone management, protection of water resources including groundwater, irrigation and watershed afforestation including erosion protection, floods and droughts risk management programmes, augmentation of water storage (surface and subsurface) and supplies and water treatment; water demand measures and increase of system efficiency including leakage management, marine and freshwater pollution abatement programmes, wastewater treatment and re-use.

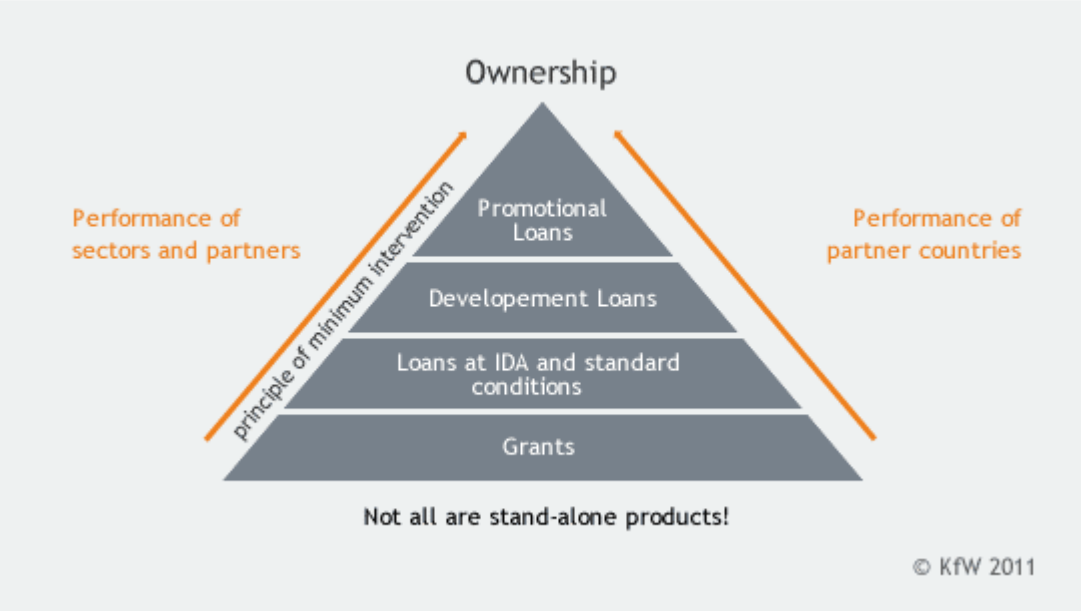
In 2004, the EU (€2.25 million) and the EIB (€0.75 million) launched the **ACP Water Project Preparation Facility**. The Facility funds technical assistance for the preparation of sound water and sanitation projects over a three-year period (2008-10). It supports the development of an appropriate pipeline of bankable projects and seeks to promote co-financing opportunities between the EIB and other co-financiers, such as local governments, the European Commission and multilateral and bilateral donors. The EIB provides long-term loan financing to both public and private clients in the water sector within and outside the European Union.

[465] Climate Bonds Initiative (2012) *Mobilising Bond Markets for the Low carbon Transition – An 8 point plan*
[466] Personal communication
[467] Personal communication
[468] Personal communication
[469] Kennedy, Ch. And Corfee-Morlot, J. (2012) Mobilising Investment in Low Carbon, Climate Resilient Infrastructure. OECD: Paris.
[470] http://www.eib.org/attachments/strategies/water_and_climate_change_adaptation_en.pdf

Sea level rise and high-intensity heavy precipitation events will have a significant impact on coastal locations, subsequently making coastal and port infrastructure climate resilient is a high priority area in climate change adaptation mainstreaming at **EBRD**. A pilot project in Georgia involves investing in the expansion of a major port on the Black Sea coast.[471] Besides grant financing loans are also provided for this project. MDB loan conditionality is used to make port operators adopt and employ effective adaptive management strategies (soft adaptation measures) and targeted concessional loans are given to remove barriers to investments in additional climate resilience features to help hard adaptation measures.

KfW's approach to climate adaptation finance includes a mix of financial instruments, such as grants, low-interest loans with long maturities (for instance development loans, promotional loans and credit lines) or equity participations depending on the characteristic of the project (Figure 7) [472]. The bank provides loans at subsidised interest rates for climate change adaptation measures. Such loans are most often provided for projects focusing on water supply and sanitation in residential areas. KfW also offers support to local banks in developing countries through grants, which then form the basis of loans provided by these banks. One example is the cooperation between KfW and the West African Development Bank (BOAD). KfW provides BOAD with grants from the German federal budget, which BOAD then offers as a low-interest loan to the governments to its member states, such as Burkina Faso, Mali, Niger and Senegal to spend on climate adaptation projects, especially on drought and flood protection. The funding grant of some EUR 10.6 million enables BOAD to offer favourable loans for climate change adaptation measures totalling a projected amount of EUR 60 million. [473]

Figure 7: Financing Pyramid



Source: KfW[474]

[471] EBRD, The EBRD and adaptation to climate change, 2011
[472] KfW, Instruments to Finance Climate Protection and Adaptation Investments in Developing and Transition Countries, October 2010
[473] KfW, Adaptation to Climate Change, June 2011
[474] http://www.kfw-entwicklungsbank.de/ebank/EN_Home/About_Us/Our_promotional_instruments/index.jsp

5.2.3 Insurance

Insurance products play a role in helping both individual investors address climate-risk and vulnerable countries hedge against some of the impacts of long-term climate change. In recent years, the international community has developed schemes to address the lack of insurance products that offer climate coverage mainly in developing countries. Novel insurance instruments are emerging to address problems of food insecurity, even for high frequency, slower onset disasters, such as droughts.[475] The success of such schemes depends on perceived stakeholder ownership, trusted distribution networks, a willingness of insurance markets to underwrite the risk, and host government commitment to address regulatory issues.

Insurance solutions for damage caused by climate change enable private households, companies and public institutions to better deal with the unavoidable economic consequences of extreme weather events, which are more frequent as a consequence of climate change. Examples of such schemes include initial pilot projects, such as the Caribbean Catastrophe Risk Insurance Facility (CCRIF) and the Ethiopian Drought Index Insurance (EDDI). Development and governmental institutions can make available equity capital, contingent loans or credit enhancements to assist in such mechanisms.[476]

Weather Index Insurance for Agriculture

One insurance model is the 'Weather Index Insurance for Agriculture', which is aimed at alleviating negative economic impacts of extreme weather on farming economies by transferring risks and compensating part of the damage cause to agricultural products. Under such schemes, insurance claims are paid according to the number of days when the temperature falls either above or below certain agreed levels. Actual damage to crops need not be measured and verified, allowing rapid pay-out and low transactions costs. The downside is that although these mechanisms can be powerful, they can also become a disincentive for adaptation. Therefore they should be used to promote activities consistent with projected climate trends, as well as with market conditions.

An important impediment to the expansion of insurance for poorer farmers is the cost of reinsurance to local financial institutions. In developing countries, for example, the World Bank Group has proposed a Global Index Insurance Facility (GIIF)—a risk-taking entity that would originate, intermediate, and underwrite weather, disaster, and commodity price risks in developing countries.

Insurance including public-private partnership

In the agriculture sector a probable incentive for farmers to take insurance against natural hazards could be the establishment of a partnership with the government in which the government would pay proportional payments of the insurance premium. For instance, this option was proposed in the CAP in 2005 provided that the governmental financial participation should not exceed 50% of the total premium. In Germany, the concept has been established by Munich RE. The insurance concept is called SystemAgro and it is based on four basic factors called BLOC, standing for backing, loss sharing, open and central uniform. Backing is the subsidy of the premiums given by the government to the farmers to incentives them to insure. In addition, in case of extreme losses the government takes share of the insured damages. The loss-sharing mechanism also includes a legal claim for the farmers to financial support. High market penetration and sustainability is guaranteed through the openness to every farmer and the central and uniform structure. Nevertheless, there is great concern regarding such insurance schemes. If the subsidies are as high as existing state aid, public expenditures could be even higher and farmers might not be sufficiently incentivised to adequately

[475] http://www.uibk.ac.at/fakultaeten/volkswirtschaft_und_statistik/forschung/natcatrisk/natcatrisk_linnerooth2.pdf
[476] KfW

focus on climate change adaptation measures. Overall, insurance concepts including private-public partnerships may lead to higher insurance coverage, however careful design should be taken during its implementation.[477]

All-risk insurance coverage

In the agriculture sector typically insurance companies select the types of risks and cultures, thus it is rare that all possible natural hazards are covered by the insurance. To overcome this problem the German Insurance Association made a proposal for crop insurance for common cultures with all-risk coverage. Risks are divided into two categories. The first one includes the risk of hail, storm, continuous rain and early and late frost, and the second one covers floods, droughts and damage caused by frost, ice and snow. Risks in the first group have a local nature and casualty to short-term occurrence of extreme weather events. Subsequently, the integral franchise method by 8% is used, meaning that the first 8% of the insured yield losses should be taken by the producer and only further damages are covered by the insurance. In the second group risks are extensive and typically not local or regional, thus threshold values are proposed to be used.[478]

5.2.4 Micro-finance

Microfinance has been increasingly used in relation to climate change adaptation. Microfinance provides access to basic financial services to communities through small loans, savings, insurance and money transfer. Additionally, education and training, health and nutrition workshops and advice on agricultural practices can be also included in Microfinance Institutions (MFIs). Microfinance institutions aim to fill the market gaps left open by traditional banks and state-run development programmes, which have been unwilling or unable to effectively provide financing for the low income groups. Microfinance has been already channelled to the poorest segments of communities in developing countries, who are most vulnerable to climate change. In Bangladesh 70% of existing microfinance portfolio is spent on agriculture, disaster relief and preparedness, and water and sanitation – which are particularly affected by climate change.

Microfinance is being increasingly used in OECD countries[479] but it is not as developed as in developing countries. It can play a greater role in disaster preparedness, early warning systems, promotion of crop varieties, technical training and education on community level adaptation. Microfinance can be equally effective for mitigation projects as well. Microfinance institutions could be scaled up to attract private investments. Wholesale organisations and private investors (Dexia Bank, Deutsche Bank, Citibank, ABN and AMRO Bank are already engaged) are important in this respect. Public finance might be needed for start-up funding for microfinance.[480]

EcoMicro Program

In 2012, the Multilateral Investment Fund (MIF), a member of the Inter-American Development Bank Group, in partnership with the Nordic Development Fund (NDF), launched a $7 million USD Program called EcoMicro to expand financing for micro, small, and medium enterprises (MSMEs) and low income households in Latin America and the Caribbean (LAC). The goal of this four-year Program is to increase access to renewable energy and energy efficient products for MSMEs and low income households, and to assist them in financing adaptation to climate change. The Program aims to do so by working directly with microfinance institutions (MFIs) - the main financial providers of MSMEs and low income populations – to increase their green finance offerings.

[477] CEPS, ZEW, The Fiscal Implications of Climate Change Adaptation, 2010
[478] CEPS, ZEW, The Fiscal Implications of Climate Change Adaptation, 2010
[479] For example, in the US (promoting entrepreneurship), Korea (low income households) and Mexico (micro insurance for subsistence farmers, help to recover from catastrophic weather events)
[480] OECD: Assessing the role of microfinance in fostering adaptation to climate change (2010)

The EcoMicro Program will support technical assistance projects for twelve microfinance institutions, each of which will take between 12-18 months to implement. Microfinance institutions will submit applications to participate. Winning microfinance institutions selected to participate will be provided with a short list of consulting companies who will deliver consulting services directly to them in the EcoMicro three-module approach: (i) developing market-driven green microfinance instruments1, (ii) incorporating climate change risk into MFI portfolio risk management models, and (iii) reducing MFI climate change impacts through adjustments to their daily operations and internal policies.

Source: EcoMicro, Multilateral Investment Fund

Microfinance Ecosystem-based-Adaptation to Climate Change

The objective of the Microfinance for Ecosystem-based-Adaptation to Climate Change (MEbA) project is to provide customised technical assistance (TA) and funding to microfinance institutions (MFIs) to spur innovative financial products and services tailored to rural populations that are vulnerable to the effects of climate change (e.g. small agricultural producers and other local actors of the North Andean Region).[1]

One of MEbA's aims is to assist MFIs in the development and implementation of new microfinance products and services that are tailored to address climate change adaptation, including innovative approaches to risk management. In addition, MEbA places a focus on awareness raising, carrying out training activities which address identified knowledge gaps and meet MFI client needs to increase climate change resilience with a focus on Ecosystem based Adaptation (EbA).

Source: The Frankfurt School–UNEP Collaborating Centre for Climate & Sustainable Energy Finance

5.2.5 Risk management instruments

Pilot Programme for Climate Resilience

The PPCR an initiative under the Climate Investment Funds, which is implemented by a range of IFIs including AfDB, ADB, EBRD, IDB, IBRD, and IFC.[481] It is designed to deliver additional finance to countries for integrating climate risk and resilience into development planning and investments. A number of financing products (such as grants, concessional loans, guarantees and risk sharing) are available under the PPCR, but it is expected that a significant proportion of the funding will be provided in the form of grants. These products are available to both IFIs as well as private investors.

In order to mobilise the private sector, the PPCR will use grants to decrease project costs through buy-downs and to increase revenue or reduce volatility through performance based payments in order to make a project climate resilient. Concessional loans will be used to address barriers such as high up front cost for early entrants as well as real and perceived risks. Subordinated debt structures could also be used to further mitigate the risks for financiers who would not otherwise participate in a project. Guarantees and risk sharing products will also be used to mitigate risks and improve the investment conditions (risk-reward balance) for initial market projects and establish a project performance track record.[482]

The experience with the programme has showed that both conventional and more innovative use of financial instruments is used[483]. Conventional instruments include:

[481] For more information, please see: https://climateinvestmentfunds.org/cif/designprocess
[482] Climate Investment Funds (2010) Pilot Programme for Climate Resilience: Financing modalities
[483] Climate Investment Funds (2011) The use of concessional finance under the PPCR.

- *Grants for knowledge services*, which provide the analytical underpinnings that inform government strategy and identify potential investments;
- *Grant and lending operations*, including investment and development policy lending; and
- *Financial risk-mitigation instruments*, including political risk insurance and guarantees, to help facilitate the flow of investment to sectors and countries considered risky by the private sector.

More innovative forms of support include:

- *Grant facilities and concessional lending instruments targeting climate change adaptation* by reducing barriers to, and buying down the cost of, climate investment;
- b) *Climate-specific risk management instruments* to transfer risk and provide emergency liquidity; and
- c) *Results-based payment schemes* which pay for environmental services.

World Bank's Disaster Risk Financing and Insurance (DRFI) Program

The DRFI Program assists developing countries in increasing their financial resilience to natural disasters. The DRFI Program partners with developing countries in a variety of ways; from establishing natural disaster micro-insurance programs to intermediating between governments and international financial markets, the DRFI Program seeks innovative ways to mitigate the financial impacts of natural disasters on individuals, small- and medium-enterprises, agricultural sector participants, and governments.

5.2.6 Crowd equity

Crowd Equity is an entirely new funding model designed for smaller businesses in rural areas.[484] A public limited company, Local Investment Company (LIC), is formed in the actual geographical area (e.g. municipality). The owners consist primarily of experienced local business community but may include banks and other partners. The company's network includes access to expertise in business, economics, law, etc. In practice, how it works is that a local family business needs capital to investment in new facilities and equipment. It turns to the LIC, which in cases where it find the companies conditions to attract capital are good, prepares an offer to the public. In case there are investors interested, the LIC borrows the money in the form of an equity loan and use it to buy shares in the company. The investment strengthens the company's balance sheet and hence its solvency. The LIC appoints one or more board members, conveys a mentor and supports the company in its business efforts in collaboration with other partners (the LICs network). This will reduce the risk for bank, which would be more willing to provide lending without the need for personal security. Investors receive annual return on their investment while also developing their community business. In a case the company goes bankrupt, investors lose their capital (the amount borrowed to the LIC).

The model offers several advantages to the different stakeholders. From the public finance perspective, the model allows the public sector the opportunity to move away from a subsidy-based business support to a more market-driven local (risk) capital system. Using the model, the public sector can transform loans to equity without becoming a shareholder.

[484] Crowd Equity. "A new funding model for local entrepreneurs and other market operators", Information note by the Swedish Rural Network

5. What kinds of instruments are used to integrate climate risks into investment planning?

Climate change adaptation should be understood as a process which enables better investment planning. This means that long term climate change risks and impacts need to be increasingly taken into account when developing and financing projects in different sectors. There is a growing experiences and practice among IFIs and governmental development agencies with establishing risk prevention and management tools. Some of the most prominent ones are reviewed.

The **EIB's** approach to adaptation finance assessment and tracking requires that the project promoters identify and apply adaptation measures to ensure the sustainability of their projects.[485] Climate change considerations are being progressively mainstreamed into sectoral policies and operational activities and systematically included in all EIB project appraisals.[486] EIB has an in-house guide that outlines general principles and methodologies that can be followed to build resilience to current climate risks, build adaptive capacity and planning and take action to address future climate risks. It builds on 5 key principles: [487]

1. Identifying critical assets and interdependencies
2. Assessing direct and indirect risks and vulnerabilities to climate impacts
3. Identifying and assessing adaptation measures
4. Implementing adaptation measures.
5. Monitoring and performance evaluation[488]

In 2010, the EBRD developed a "toolkit" for identifying and managing climate change risks to investments. This includes guidelines for climate change screening and risk-profiling, as well as guidance on integrating risk assessment and adaptation into project feasibility studies, environmental and social impact assessments (ESIAs), environmental action plans and water audits. This toolkit will be used to screen all potential investments for sensitivity to climate change.[489] Using a simple arithmetic calculation, the three risk scores are used to categorise projects:

- *Red project*: likely to be significant climate risks – the project will require further investigation (project development and feasibility studies etc. will need a lot of work to assess the climate risks)
- *Amber project*: possible climate risks
- *Green project*: no climate risks – these will be let through.[490]

The **World Bank** has developed 'climate screening' methodologies and tools for the main climate sensitive sectors. Climate vulnerability and risk management is integrated into the bank's operations, especially in key sectors affected by climate change, such as agriculture, energy, transport and water supply. Examples include Mainstreaming Adaptation to Climate Change in Agriculture and Natural Resources Management Projects and Urban Risk Assessments. A new online screening tool, the ADAPT - Assessment & Design for Adaptation to Climate Change: A Prototype Tool provides details on climate related vulnerabilities and risks for particular regions. **The** software

[485] EIB Statement of Environmental and Social Principles and Standards, 2009
[486] EIB Promoting Climate Action, April 2012
[487] EIB External Adaptation Guidance II, July 2012
[488] Further information on EIB's work on climate mainstreaming can be obtained at: http://www.eib.org/projects/topics/environment/climate-action/index.htm
[489] EBRD
[490] AEA study

based tool helps assessing development projects for potential sensitivities to climate change. Further work is also being done on sector specific guidance and tools. Climate change adaptation considerations are also integrated into Country Assistance Strategies, from which in 2009 overall more than 60% of the strategies addressed climate-related issues. It is envisaged that in the near future, screening of projects to reduce their vulnerability to climate change impacts will become part of doing business for the World Bank.[491]

The Asian Development Bank (ADB) has introduced guidelines for climate proofing all projects in the transport sector, agriculture, rural development and food security. The guidelines aim to present a step-by-step methodology to help project teams incorporate climate change adaptation into investment projects in the specific sectors.[492] These guidelines are applied at the same time as the safeguards review / EIA completion, and influence the classification of the project in the context of the Safeguards Categories. The ADB is in the process of finalising Guidelines for Climate Proofing Investments in the Electric Power Sector (to be released in 2012). Guidelines for Water and Urban development are to be released soon too.

Drawing on its experience in adaptation initiatives **UNDP** developed a step-by-step generic guidance to provide support for developing countries to effectively design their traditional development initiatives with a focus on climate change adaptation. It addresses professionals at all levels, community-based organisations and local communities, NGOs and development agencies.[493]

Although in most development projects climate change adaptation is not the main objective, **KfW** aims to integrate adaptation measures into the projects through its two-stage climate change assessment. This assessment guarantees that the outcome of the project is not endangered by climate change and the possible opportunities are fully exploited. The first screening step examines whether the planned project depends on climate parameters and there are any potentials to increase the adaptive capacity of people or ecosystems. If the initial assessment shows that there is no significant impact on the project and there are no significant opportunities to increase resilience, the assessment ends, however in the remaining steps close attention is paid on the precautionary principle. If the results show that the project might be relevant to climate change adaptation, the assessment proceeds to the second step. This includes the analysis of climate development, the examination of potential impacts on the project, the analysis of climate risk and climate potential, the identification of adaptation options and the prioritisation and selection of adaptation opportunities in the project.[494]

GTZ on behalf of the German Federal Ministry for Economic Cooperation and Development has also developed a climate screening tool called Climate Proofing for Development. This methodological approach aims to integrate climate change adaptation considerations into development planning. It is based on special principles and incorporates methodological steps which can be accompanied by technical assistance measures. The 4-step approach analyses the climate risks and opportunities of climate change and identifies adaptation options. GTZ is using the screening tool in 10 countries and

[491] Further information on the ADAPT can be found at: http://sdwebx.worldbank.org/climateportal/index.cfm

[492] ADB Guidelines for Climate Proofing Investment in the Transport Sector, August 2011 (http://www.adb.org/sites/default/files/guidelines-climate-proofing-roads.pdf) and Guidelines for Climate Proofing Investments in Agriculture, Rural Development and Food Security, November 2012 (http://www.adb.org/sites/default/files/guidelines-climate-proofing-investment.pdf)

[493] For more information see: http://www.undp.org/content/dam/aplaws/publication/en/publications/environment-energy/www-ee-library/environmental-finance/low-emission-climate-resilient-development/designing-adaptation-initiatives-toolkit/Toolkit%20FINAL%20%28new%20cover%29.pdf

[494] KfW Adaptation to climate change – Cooperation with developing countries, June 2011

feedback showed that Climate Proofing for Development increased the efficiency and effectiveness of the projects. It can be applied on both national, sectoral, project and local level. [495]

[495] For more information see: GTZ Climate Proofing for Development, 2011

ANNEX 6 – OVERVIEW OF COMMISSION PROPOSALS ON THE 2014-2020 EU FINANCIAL INSTRUMENTS

This Annex presents an overview of Commission proposals on the EU financial instruments in the 2014-2020 MFF. These include:

- Horizon 2020
- COSME
- Cohesion Policy
    - ERDF and CF, including FI
- CEF
    - Project Bonds
- Rural development
    - EAFRD, including FI
- LIFE

Horizon 2020	
Grant scheme **Union Equity Instruments for research and innovation** **Union loan & guarantee service for research and innovation/ RSI-II Facility**	
Instrument type	Pursuant to Article 10 of the proposed framework for Horizon 2020 forms of Union support can take different forms including grants and financial instruments.
Objective and rationale of the instrument	The proposed 2014-2020 Horizon 2020 Framework programme aims to maximise Union added value by focusing on objectives and activities that cannot be efficiently realised by Member States acting alone. It is assumed that funding at EU level is in a better position to take on high risk and long-term R&D, thereby sharing the risk and generating a breadth of scope and economies of scale that could not otherwise be achieved. Horizon 2020 has three priorities: Excellent Science, Industrial Leadership and Societal Challenges. The latter aims to address policy priorities for Europe 2020.[496] Improved access to finance via a facility for debt and a facility for equity aims to overcome market gaps in the provision of finance for innovations that are considered relevant to achieve set policy goals but are at the same time perceived as too risky for market participants to provide the necessary finance. Access to finance should increase the private sector's willingness to invest in research and innovation and support the full innovation cycle until commercialisation.
Target group / Final beneficiary	Under the grant scheme any legal entity is eligible for funding provided that the conditions laid down in the Horizon 2020 Regulation have been met as well as any conditions laid down in the relevant work programme or work plan.[497] Particular attention shall be paid to SMEs which should receive around 15% of the total combined budget for the specific objective on "Leadership in enabling and industrial technologies" and the priority "Societal challenges" according to the Commission proposals.[498]

[496] IEEP briefing, 07 December 2011, Horizon 2020: Commission proposed Framework Programme for Research and Innovation

[497] Proposal for a Regulation of the European Parliament and of the Council laying down the rules for the participation and dissemination in 'Horizon 2020 – the Framework Programme for Research and Innovation (2014-2020)', COM(2011) 810 final, 30.11.2011, Brussels Art. 6

[498] EC (2011), Proposal for a Regulation of the European Parliament and of the Council establishing Horizon 2020 – The Framework Programme for Research and Innovation (2014-2020), COM(2011) 809 final 30.11.2011, Brussels, Art 18

	Debt facility: Legal entities of all sizes that can borrow and repay money and, in particular, SMEs with the potential to carry out innovation and grow rapidly; mid-caps and large firms; universities and research institutes; research infrastructures and innovation infrastructures; public-private partnerships; and special-purpose vehicles or projects.[499] There will be a SME window (so called "RSI-II Facility") under the Debt facility which shall target R&I-driven SMEs and small mid-caps with loan amounts exceeding €150 000, thus complementing finance to SMEs by the Loan Guarantee Facility under the Programme for the Competitiveness of Enterprises and SMEs. The SME instrument will provide simplified and staged support. Its three phases will cover the whole innovation cycle. Transition from one phase to the next should be seamless provided the SME project has proven to be worth further funding during a previous phase. [500] Equity facility: The target final beneficiaries shall be potentially enterprises of all sizes undertaking or embarking on innovation activities, with a particular focus on innovative SMEs and mid-caps.[501]
Implementation level	EU level - Direct and indirect management
Implementing body	European Commission, executive agencies, bodies set up by the Commission, national public-sector bodies and international organisation
Total Budget	€70 billion of which approx. €3.8 billion will be available via the debt and equity facilities[502]. The total budget for financial facilities is by purpose not specified for each facility in order to keep flexibility over the whole MFF and hence to be able to respond to market demand.

[499] EC (2011), Proposal for a Regulation of the European Parliament and of the Council establishing Horizon 2020 – The Framework Programme for Research and Innovation (2014-2020), COM(2011) 809 final 30.11.2011, Brussels, p. 56

[500] EC (2011), Proposal for a Council decision establishing the Specific Programme Implementing Horizon 2020 - The Framework Programme for Research and Innovation (2014-2020), COM(2011) 811 final 30.11.2011, Brussels, pp. 45 and 48

[501] EC (2011), Proposal for a Regulation of the European Parliament and of the Council establishing Horizon 2020 – The Framework Programme for Research and Innovation (2014-2020), COM(2011) 809 final 30.11.2011, Brussels, p. 56.

Eligible activities	For the grant scheme eligible activities will be further specified in the work programmes/ calls for proposals. The Equity and Debt facilities may be supported by budgetary contributions from other parts of Horizon 2020; other frameworks, programmes and budget lines in the Union budget; particular regions and Member States; and specific entities or initiatives. [503]

Climate change relevance

Rationale

H2020 is designed to address market failures in that R&I funding supports high risk and long-term R&D that would not necessarily pursued otherwise.

The Debt facility aims to address a current gap in the market between the demand for and supply of loans and guarantees for risky R&I investments, as has already been addressed by the current Risk-Sharing Finance Facility (RSFF) and the RSI pilot but is expected to persist.

The Equity facility aims to help improve the availability of equity finance for early and growth-stage investments and to boost the development of the Union venture capital market. This should in particular help the technology transfer and start-up phase, when new companies face a 'valley of death' where public research grants stop and it is not possible to attract private finance. This should also address a strong decline in the availability of venture capital funds invested in SMEs which dropped from €7 billion a year to around EUR 3-4 billion in 2009 and 2010. [504]

Objectives and activities

The programme is considered by the Commission as being of strategic importance for tackling challenges such us climate change, biodiversity loss, energy and resource inefficiency. Four out of the six grand societal challenges have a strong relevance for environmental and climate change policy: food security, sustainable agriculture, marine and maritime research and the bio-economy; secure, clean and efficient energy; smart, green and integrated transport; climate action, resource efficiency and raw materials.[505]

[502] European Council (2013) Conclusions (Multi-annual Financial Framework) EUCO 37/13, 08.02.2013, Brussels and EC (2013) MFF 2014-2020: EC conclnusions (proportional cuts + partial adjustment to DG requests. Also, note that the budget for financial instruments can be subject to further changes depending on the outcomes of the agreement between the Council and Parliament.

[503] EC (2011), Proposal for a Council decision establishing the Specific Programme Implementing Horizon 2020 - The Framework Programme for Research and Innovation (2014-2020), COM(2011) 811 final 30.11.2011, Brussels

[504] EC (2011), Proposal for a Regulation of the European Parliament and of the Council establishing Horizon 2020 – The Framework Programme for Research and Innovation (2014-2020), COM(2011) 809 final 30.11.2011, Brussels, p. 55

[505] IEEP briefing, 07 December 2011, Horizon 2020: Commission proposed Framework Programme for Research and Innovation

Taking all the available instruments together, including access to risk finance, Horizon 2020 can provide finance for R&D, pilot testing and early deployment. Horizon 2020 will also finance Knowledge and Innovation Communities (KICs) under the European Institute of Innovation and Technology. One existing KIC is on climate change, another one is on sustainable energy.

Both finance facilities should address R&I objectives of other programmes and policy areas including climate action (transition to a low-carbon economy and adaptation to climate change).

Climate earmarking

The Commission proposes that at least 60% of the total Horizon 2020 budget will be in support of sustainable development objectives, out of which around 35% will be climate change related. This would amount to €18.5 billion of the proposed budget.

Key contributions should come from the following 'societal challenges' with a proposed total budget of €22.5 billion.

- Food security, sustainable agriculture, marine and maritime research and the bio- economy with a proposed budget of €4.7 billion
- Secure, clean and efficient energy with a proposed budget of €6.5 billion
- Smart, green and integrated transport with a proposed budget of €7.7 billion
- Climate action, resource efficiency and raw materials with a proposed budget of €3.6 billion

Additional budget should come from the two priorities 'Excellent science' and 'Industrial leadership'. In the latter case in particular via its Debt and Equity facilities for access to risk finance. Ring-fenced budgetary contributions under the Debt and Equity facilities may come from other parts of Horizon 2020; other frameworks, programmes and budget lines in the Union budget; particular regions and Member States; and specific entities or initiatives:[506] Such budgetary contributions may be made or topped up at any time during the course of Horizon 2020.

[506] EC (2011), Proposal for a Council decision establishing the Specific Programme Implementing Horizon 2020 - The Framework Programme for Research and Innovation (2014-2020), COM(2011) 811 final 30.11.2011, Brussels, p. 45f

Coordination and coherence with other EU instruments

Taking account of the state of science, technology and, innovation at national, Union and international level and of relevant policy, market and societal developments, the work programmes shall contain information on coordination with research and innovation activities carried out by Member States, including in areas where there are joint programming initiatives. [507]

Monitoring and reporting

The new system for the evaluation and monitoring system of the indirect actions of Horizon 2020 will include information concerning cross-cutting topics such as sustainability and climate change. It is proposed that climate related expenditure will be calculated in accordance with the tracking system based on Rio markers.[508] In this respect relevant work programmes shall set out the objectives pursued, the expected results, the method of implementation and their total amount, including indicative information on the amount of climate related expenditure, where appropriate.[509]

Expected policy outcomes

It is estimated that by 2030 Horizon 2020 is expected to generate an extra 0.92% of GDP, 1.37% of exports, -0.15% of imports, and 0.40% of employment.

For the priority 'Societal Challenges' the following climate relevant indicators are specified in the Horizon2020 proposal:

- Secure sufficient supplies of safe and high quality food and other bio-based products, by developing productive and resource-efficient primary production systems, fostering ecosystem services, alongside competitive and low carbon supply chains.
- Make the transition to a reliable, sustainable and competitive energy system, in the face of increasingly scarce resources, increasing energy needs and climate change.
- Achieve a European transport system that is resource-efficient, environmentally-friendly, safe and seamless for the benefit of citizens, the

[507] EC (2011), Proposal for a Council Decision establishing the Specific Programme Implementing Horizon 2020 - The Framework Programme for Research and Innovation (2014-2020) COM(2011) 811 final, Brussels, 30.11.2011, Art. 5(3)
[508] EC (2011), Proposal for a Regulation of the European Parliament and of the Council establishing Horizon 2020 – The Framework Programme for Research and Innovation (2014-2020), COM(2011) 809 final 30.11.2011, Brussels, legislative financial statement, p. 98
[509] EC (2011), Proposal for a Council Decision establishing the Specific Programme Implementing Horizon 2020 - The Framework Programme for Research and Innovation (2014-2020) COM(2011) 811 final, Brussels, 30.11.2011, Art. 5(6)

economy and society.

- Achieve a resource efficient and climate change resilient economy and a sustainable supply of raw materials, in order to meet the needs of a growing global population within the sustainable limits of the planet's natural resources.

Leverage effect

The leverage of the Debt facility —defined as the total of investments made by supported beneficiaries divided by the Union financial contribution — is expected to be 5 to 20, again depending on the type of operations involved. [510]

The leverage of the Equity facility — defined as the total of investments made by supported beneficiaries divided by the Union financial contribution — of, on average, 18.[511]

[510] Please note that the original Commission proposals refer to term 'multiplier' effect. However, in line with the new Financial Regulation and the definition of the term leverage effect, we use the term leverage effect to express the total investment made by supported beneficiaries divided by the Union financial contribution

[511] EC (2011), Proposal for a Council decision establishing the Specific Programme Implementing Horizon 2020 - The Framework Programme for Research and Innovation (2014-2020), COM(2011) 811 final 30.11.2011, Brussels, p. 47

Programme for the Competitiveness of enterprises and SMEs (COSME)	
Grant scheme Equity Facility for Growth (EFG) Loan Guarantee Facility (LGF)	
Instrument type	Financial assistance in the form of grants and financial instruments
Objective and rationale of the instrument	The general objectives are as follows: • strengthening the competitiveness and sustainability of the Union's enterprises including in the tourism sector; • encouraging an entrepreneurial culture and promoting the creation and growth of SMEs. The specific objectives of the **grants** are as follows: • To improve framework conditions for the competitiveness and sustainability of Union enterprises including in the tourism sector; • To promote entrepreneurship, including among specific target groups; • To improve access to finance for SMEs in the form of equity and debt (FI); • To improve access to markets inside the Union and globally. COSME will specifically tackle transnational issues that – thanks to economies of scale and the demonstration effect – can be more effectively addressed at European level. It is aimed that COSME ensures continuity with initiatives and actions already undertaken under the Entrepreneurship and Innovation Programme (EIP), such as the Enterprise Europe Network, building on results and lessons learnt. It is also supposed to support, complement and help coordinate actions by EU member countries. COSME's EU added value is based on five elements: [512] • strengthening the Single Market, i.e. financing expansion of growth-oriented enterprises that are aiming at international

[512] EC (2011): Proposal for a regulation of the European Parliament and of the Council establishing a Programme for the Competitiveness of Enterprises and small and medium-sized enterprises (2014 - 2020), COM(2011) 834 final, Brussels, 30.11.2011, p. 4f

	expansion, cross-border activities and to develop a cross-border SME finance market. • demonstration and catalytic effects through the dissemination of industrial and policy best practices. • economies of scale in areas where it would be difficult for individual Member States to achieve the required critical mass, e.g. support to IPR enforcement such as the already existing China IPR SMEs Helpdesk. • coherence and consistency in national measures through the exchange of best practices at European level and benchmarking. • unique expertise acquired by EU institutions, e.g. EIF and Enterprise Europe Network A specific objective of COSME's FIs is to improve access to finance for SMEs via **financial instruments** in the form of equity (EFG) and debt (LGF).
Target group / Final beneficiary	<u>Grants:</u> • Existing entrepreneurs (small businesses in particular) • Future entrepreneurs (including young people) • National, regional and local authorities – tools for effectively reforming policy: reliable, EU wide data and statistics, best practice and financial support to test and scale up sustainable solutions for improving global competitiveness. <u>EFG:</u> Expansion and growth-stage SMEs, in particular those operating across borders, while having the possibility to make investments in early stage enterprises in conjunction with the equity facility for RDI under Horizon 2020. <u>LGF:</u> • SMEs • Financial intermediaries (direct guarantees and other risk sharing arrangements)
Implementation level	EU level - direct and indirect management

Implementing body	• Commission, executive agencies ('direct management') [513] • European Investment Fund[514] and bodies set up by the Communities ('indirect management')
Total Budget	Planned budget: €2bn of which approximately €1.4 billion shall be allocated to financial instruments: EFG: €746 million and LGF: €690 million.[515]
Eligible activities	<u>Grants:</u> • Actions to improve and strengthen the competitiveness and sustainability of Union enterprises, particularly SMEs, so as to enhance the effectiveness, coherence and consistency of national policies promoting competitiveness, sustainability and the growth of enterprises in Europe. • Actions intended to develop new competitiveness strategies. Such actions may include the following: ○ measures to improve the design, implementation and evaluation of policies affecting the competitiveness and sustainability of enterprises, including disaster resilience, and to secure the development of appropriate infrastructures, world class clusters and business networks, framework conditions and development of sustainable products, services and processes; ○ measures to encourage cooperation in policy making and exchange of good practices among the Member States, other countries participating in the Programme and the Union's main competitors, and to address international aspects of competitiveness policies. ○ support for SME policy development and cooperation between policy makers, particularly with a view to improving the ease-of-access to programmes and measures for SMEs. • Initiatives accelerating the emergence of competitive industries based on cross-sectoral activities in areas characterised by a high proportion of SMEs and with a high contribution to the Union's GDP. Such initiatives shall stimulate development of new markets and the supply of goods and services based on the most competitive business models or on modified value-chains. They shall include initiatives to enhance productivity, resource efficiency, sustainability and corporate social responsibility.

[513] Whereas the legislative financial statement for the COSME proposal lists executive agencies under 'indirect management' (p. 39), the new Financial Regulation includes executive agencies under 'direct management' (Art. 58(1)(a) of Regulation (EU, EURATOM) No 966/2012 of the European Parliament and of the Council of 25 October 2012 on the financial rules applicable to the general budget of the Union and repealing Council Regulation (EC, Euratom) No 1605/2002).

[514] The financial instruments will be implemented by the European Investment Fund, EC (2011): Proposal for a regulation of the European Parliament and of the Council establishing a Programme for the Competitiveness of Enterprises and small and medium-sized enterprises (2014 - 2020), COM(2011) 834 final, Brussels, 30.11.2011, p. 40

[515] European Council (2013) Conclusions (Multi-annual Financial Framework) EUCO 37/13, 08.02.2013, Brussels and EC (2013) MFF 2014-2020: EC conclnusions (proportional cuts + partial adjustment to DG requests. Also, note that the budget for financial instruments can be subject to further changes depending on the outcomes of the agreement between the Council and Parliament

	<u>Financial instruments:</u> The **EFG** shall focus on funds that provide venture capital and mezzanine finance, such as subordinated and participating loans, to expansion and growth-stage enterprises, in particular those operating across borders. [516] Under **LGF** two actions are foreseen[517]: • debt financing via loans, including subordinated and participating loans, or leasing, the LGF shall, except for loans in the securitised portfolio, cover loans up to EUR 150.000 and with a minimum maturity of 12 months; • securitisation of SME debt finance portfolios, shall mobilise additional debt financing for SMEs under appropriate risk-sharing arrangements with the targeted institutions
Leverage effect[518]	For **EFG** it is envisaged that €4.7 billion are leveraged by this financial instrument. This would translate in a leverage effect of around 6.8 (4.7/0.69).[519] For **LGF** the expected leverage of EU budget resources is about 1:30, based on experiences from current and previous programmes.[520]

[516] EC (2011): Proposal for a regulation of the European Parliament and of the Council establishing a Programme for the Competitiveness of Enterprises and small and medium-sized enterprises (2014 - 2020), COM(2011) 834 final, Brussels, 30.11.2011, p. 54

[517] EC (2011): Proposal for a regulation of the European Parliament and of the Council establishing a Programme for the Competitiveness of Enterprises and small and medium-sized enterprises (2014 - 2020), COM(2011) 834 final, Brussels, 30.11.2011, p. 54

[518] In the case of FI; leverage effect is defined as the amount of finance to eligible final recipients divided by the amount of the Union contribution pursuant to Art. 223(1) of the rules of application of the new Financial Regulation, C(2012) 7507 final.

[519] Based on updated figures from DG ENTR, correcting the published legislative financial statement for the COSME proposal.

[520] EC (2011): Commission Staff Working Paper, Impact Assessment, Accompanying the document Proposal for a regulation of the European Parliament and the Council establishing a Programme for the Competitiveness of enterprises and small and medium-sized enterprises (2014 to 2020), Brussels, 30.11.2011, SEC(2011) 1452 final

Climate change relevance

Rationale

The proposed instrument is to address policy failures such as the lack of coordination and effective networking and market failures such as information asymmetries which, according to the proposal, can only be tackled at EU level. [521] It shall also provide access to finance to SMEs.

Objective and activities

Pursuant to Art. 3 of the COSME proposal one of the 'specific objectives' is 'the need of enterprises to adapt to a low-carbon, climate-resilient, energy and resource-efficient economy shall be promoted in the implementation of the Programme.' The COSME proposal mentions as one difficulty the 'limited capacity of SMEs to adapt to a low-carbon, climate-resilient, energy and resource efficient economy due to limited financial means and limited expertise'[522].

There is no concrete earmarking/allocation to climate change related activities foreseen. It is not considered useful to direct the overall limited resources towards specific policy objectives. There is however the option to earmark money for a specific policy objective if dedicated budget was provided by other Commission services.

Coordination and coherence with other EU instruments

The COSME proposal underlines that synergies with other programmes should be maximised. For example, the guarantee activities proposed in the new Programme will operate alongside guarantee activities funded under the Structural Funds and the Progress Microfinance Facility. The equity and debt instruments will complement the ones provided under Horizon 2020. The Programme will also avoid overlaps with other programmes, in particular in the areas of entrepreneurship promotion and skills. Careful consideration will also be given to the complementarity of the new Programme with the proposed Partnership Instrument.[523]

[521] EC (2011): Proposal for a regulation of the European Parliament and of the Council establishing a Programme for the Competitiveness of Enterprises and small and medium-sized enterprises (2014 - 2020), COM(2011) 834 final, Brussels, 30.11.2011, p. 11

[522] EC (2011): Proposal for a regulation of the European Parliament and of the Council establishing a Programme for the Competitiveness of Enterprises and small and medium-sized enterprises (2014 - 2020), COM(2011) 834 final, Brussels, 30.11.2011, p. 3

Both EFG and LGF are expected to use the same delivery mechanism as the complementary instruments under Horizon 2020, *i.e.* the equity facility for RDI and the SME demand-driven window of the debt facility under Horizon 2020 (RSI II). [524] Investments in early stage enterprises under the **EFG** can be made in conjunction with the equity facility for RDI under Horizon 2020. In this case, the investments from EFG shall not exceed 20% of the total EU investment except in cases of multi-stage funds, where funding from EFG and the equity facility for RDI will be provided on a pro rata basis, based on the funds' investment policy.

While the Horizon 2020 debt instrument can provide guarantees for loans above the €150.000 threshold, the **LGF** can only provide both counter and direct guarantees for loans (including subordinated loans) up to this threshold. The €150.000 threshold corresponds to 94% of the loans provided under the existing SME Guarantee Facility in the CIP programme.[525]

Monitoring and reporting

The achievement of the objectives referred to in paragraph 1 shall be measured by the following indicators:[526]

- percentage of growth of the Union's industrial sector in relation to total Gross Domestic Product (GDP) growth,
- Union manufacturing output growth in eco-industries,
- changes in administrative burden on SMEs,
- SME growth in terms of added-value and number of employees,
- and SME turnover rate.

These are further specified in Annex I of the proposal. It includes the following climate related indicators to be achieved by 2017: [527]

- Significant number of companies monitors their performance, apply environmental management systems and achieve improvement in resource productivity and environmental performance. Significant parts of production are resource efficient and environmentally friendly products.
- 200 and more destinations adopting the sustainable tourism development models promoted by the European Destinations of Excellence (up to

[524] EC (2011): Proposal for a regulation of the European Parliament and of the Council establishing a Programme for the Competitiveness of Enterprises and small and medium-sized enterprises (2014 - 2020), COM(2011) 834 final, Brussels, 30.11.2011, p. 32

[525] Lajarthe, F. and Porrino, F. (2012) Financial instruments in COSME and Horizon 2020. Workshop Proceedings. 12.4.2012. European Parliament, Brussels, p. 12

[526] EC (2011): Proposal for a regulation of the European Parliament and of the Council establishing a Programme for the Competitiveness of Enterprises and small and medium-sized enterprises (2014 - 2020), COM(2011) 834 final, Brussels, 30.11.2011, Art. 2(2)

[527] EC (2011): Proposal for a regulation of the European Parliament and of the Council establishing a Programme for the Competitiveness of Enterprises and small and medium-sized enterprises (2014 - 2020), COM(2011) 834 final, Brussels, 30.11.2011, Annex I

30 per year).

If additional budget is made available and ring-fenced for specific policy objectives, specific reporting and monitoring indicators would need to be included.

Expected policy outcomes

COSME is expected to contribute to an annual increase of €1.1bn in the EU's GDP. Access to finance will be easier for entrepreneurs, in particular those willing to launch cross-border activities, resulting in an expected annual increase of €3.5bn in additional lending and/or investment for EU companies. The Enterprise Europe Network is expected to assist 40,000 companies with partnership agreements, resulting in:

- 1,200 new business products, services or processes annually
- €400mn annually in additional turnover for assisted companies.

EU Cohesion Policy	
ERDF, CF, ESF	
Instrument type	Grants and financial instruments The Commission proposals for the 2014-2020 EU Structural and Cohesion Funds expand and strengthen the use of financial instruments, building on experience gained during the 2007-2013 period and introducing a number of novelties. A separate section on financial instruments – Title IV (Articles 32 to 40) is included in the proposal for a regulation laying down common provisions for the five Common Strategic Framework (CSF) Funds (European Regional Development Fund (ERDF), European Social Fund (ESF), Cohesion Fund, European Agricultural Fund for Rural Development (EAFRD) and European Maritime and Fisheries Fund (EMFF)[528].This provides a common set of rules governing financial instruments for all five CSF Funds and allows for a clearer presentation of the instruments' specificities and regulatory requirements, thus responding to the European Parliament's request for financial instruments in Structural and Cohesion Funds to be simplified but also subjected to greater democratic scrutiny[529]. Implementation details will be laid down in related secondary legislation i.e. Delegated Acts and Implementing Acts. All CSF funds could be implemented through different FI including **equity, loans, loan guarantees, micro-finance and other forms of revolving finance**. The Commission's proposals remove the current provision that a project cannot be financed by more than one source and set out rules to enable the **combination of financial instruments with other forms of support**, in particular with grants. According to article 32, financial instruments may be combined with grants, interest rate subsidies and guarantee fee subsidies.[530] Thus **blending** of

[528] EC (2011) Proposal for a Regulation laying down common provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund, the European Agricultural Fund for Rural Development and the European Maritime and Fisheries Fund covered by the Common Strategic Framework and laying down general provisions on the European Regional Development Fund, the European Social Fund and the Cohesion Fund and repealing Regulation (EC) No 1083/2006, COM(2011)615, 6.10.2011, Brussels

[529] European Parliament (2011), *Report on Investing in the future: a new Multiannual Financial Framework (MFF) for a competitive, sustainable and inclusive Europe* (2010/2211(INI)), 26.05.2011, Special committee on the policy challenges and budgetary resources for a sustainable European Union after 2013, Rapporteur: Salvador Garriga Polledo

[530] EC (2011) Proposal for a Regulation laying down common provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund, the European Agricultural Fund for Rural Development and the European Maritime and Fisheries Fund covered by the Common Strategic Framework and laying down general provisions on the European Regional Development Fund, the European Social Fund and the Cohesion Fund and repealing Regulation (EC) No 1083/2006, COM(2011)615, 6.10.2011, Brussels

	(different) grants and loans from the EU will be allowed. Final recipients of financial instruments will also be able to receive grants or other assistance from another programme or instrument supported by the EU budget. This provision is in line with the recommendation of the European Parliament[531] which *inter alia* stressed the fact that a better mix of financing instruments, including grants, loans or revolving funds could support more the efficient use of EU resources.
Objective and rationale of the instrument	The Treaty on the Functioning of the European Union sets out the objectives to strengthen its **economic, social and territorial cohesion** and promote overall harmonious development by reducing disparities between the levels of development of regions and promoting development in least favoured regions. Article 176 of the TFEU specifies the aim of the European Regional Development Fund (**ERDF**) which is to promote the development and structural adjustment of lagging regions and of declining industrial regions.[532] The TFEU states that the **Cohesion Fund** (CF) shall be set up with the aim of contributing to projects in the fields of environment and trans-European networks in the area of transport infrastructure. Article 192 of the TFEU also refers to the use of the Cohesion Fund for environment in cases where the polluter pays principle cannot be applied due to disproportionate costs for the public authorities of a Member State. The European Social Fund (**ESF**) is established by Article 162 of the TFEU. Its aim is to render the employment of workers easier and to increase their geographical and occupational mobility within the Union, and to facilitate their adaptation to industrial changes and to changes in production systems, in particular through vocational training and retraining. The instruments under the 2014-2020 Cohesion Policy, including the ERDF, Cohesion Fund and the ESF, shall contribute to the implementation of the **Europe 2020 Strategy** and related Flagship Initiatives and contribute to the objectives of smart, sustainable and inclusive growth. To bring the future Cohesion Policy, together with other structural assistance in the agricultural and fisheries sectors, closely aligned with the Europe 2020 objectives and headline targets, the European Commission has proposed for a first time a Common Strategic Framework (CSF), that sets out 'indicative actions of high European added value and corresponding principles for delivery, and priorities for cooperation'[533]**.** All CSF funds shall contribute to 11 thematic objectives (TO). These include: 1) strengthening research, technological development and innovation;

[531] European Parliament (2011), *Report on Investing in the future: a new Multiannual Financial Framework (MFF) for a competitive, sustainable and inclusive Europe* (2010/2211(INI)), 26.05.2011, Special committee on the policy challenges and budgetary resources for a sustainable European Union after 2013, Rapporteur: Salvador Garriga Polledo

[532] TFEU

[533] EC (2012) Amended proposal for a Regulation laying down common provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund, the European Agricultural Fund for Rural Development and the European Maritime and Fisheries Fund covered by the Common Strategic Framework and laying down general provisions on the European Regional Development Fund, the European Social Fund and the Cohesion Fund and repealing Council Regulation (EC) No 1083/2006, Communication from the Commission, (COM(2012)496), 11.9.2012, Brussels

	2) enhancing access to and use and quality of information and communication technologies; 3) enhancing the competitiveness of small and medium-sized enterprises; **4) supporting the shift towards a low-carbon economy in all sectors;** **5) promoting climate change adaptation, risk prevention and management;** 6) protecting the environment and promoting resource efficiency; 7) **promoting sustainable transport** and removing bottlenecks in key network infrastructures; 8) promoting employment and supporting labour mobility; 9) promoting social inclusion and combating poverty; 10) investing in education, skills and lifelong learning; and 11) enhancing institutional capacity and an efficient public administration. In order to improve the priority-setting and thematic concentration, the Commission has proposed that a quantified earmarking of funds is applied so as to ensure that majority of national **ERDF** allocations target three of the 11 CSF thematic objectives: • In more developed and transition regions, at least 80% of resources are focused on energy efficiency and renewables, research and innovation and SME support of which 20% for energy efficiency and renewables. For regions phasing out from the Convergence objective, the minimum percentage shall be reduced to 60%. • In less developed regions, at least 50% of resources are focused on energy efficiency and renewables, research and innovation and SME support of which 6% for energy efficiency and renewables. At least 20% of **ESF** allocations shall target thematic objective 9 on 'promoting social inclusion and combating poverty'. **Financial instruments** supported by the CSF Funds should be used to address specific market needs in a cost effective way, in accordance with the objectives of national/regional expenditure programmes, and should not crowd out private financing. Financial instruments should be designed and implemented so as to promote substantial participation by private sector investors and financial institutions on an appropriate risk-sharing basis. To be sufficiently attractive to private sector, financial instruments need to be designed and implemented in a flexible manner. Managing authorities should therefore decide on the most appropriate forms to

	implement financial instruments to address the specific needs of the target regions, in accordance with the objectives of the relevant programme.[534] In the case of **ESF**, funds can be used to enhance access to capital markets of public and private bodies implementing actions under Operational programmes through '**ESF policy-based guarantees'(PBG)**[535] in areas such as to job creation, mobility of workers and students, social inclusion. The EC shall adopt a Delegated Act to regulate the use of FI, for example, setting out provisions the rules and conditions, ex-ante assessment, minimum leverage effect and ceilings to ensure that their use does not increase the level of debt for public bodies. The establishment of 'ESF policy-based guarantees' shall be assessed and approved by the Commission.[536] The ESF policy based guarantee can be either collateral (allocations are placed in a fiduciary account of a financial institutions (i.e. the Treasury) and serve wither full or partial collateral) or a risk sharing instrument (by sharing credit risk with a national or international financial institutions), through which managing authorities can mobilise funding either through a private commercial loan or issuing a bond on the capital market. The risk is capped to the total amount of the PBG. Upon maturity, the generated revenues can be reinvested in another FI.
Target group / Final beneficiary	The CPR sets out the main terms to be used. 'Beneficiary' is a public or private body responsible for initiating and implementing operations, which can be various public and private entities. In the context of financial instruments, the term 'beneficiary' means the body that implements the financial instrument while the 'final recipient' is a legal or natural person that receives financial support from a financial instrument.
Implementation level	The ERDF, CF and ESF is managed under the principle of shared management where Member States and regions are entrusted with the implementation of expenditure programmes and investment projects at national and regional levels of governance.
Implementing body	Managing authorities at national / regional level

[534] EC (2011) Proposal for a Regulation laying down common provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund, the European Agricultural Fund for Rural Development and the European Maritime and Fisheries Fund covered by the Common Strategic Framework and laying down general provisions on the European Regional Development Fund, the European Social Fund and the Cohesion Fund and repealing Regulation (EC) No 1083/2006, COM(2011)615, 6.10.2011, Brussels

[535] EC (2012) Proposal for a Regulation on the European Social Fund and repealing Council regulation (EC) No 1081/2006, COM(2012)607, 14.3.2012, Brussels

[536] EC (2012) European Social Fund 'Policy based guarantees' – objectives, specificities, conditions and elements related to proposed Delegated Act referred to in the ESF Regulation, Fiche 13, 28.2.2012, Brussels

FI can be set up indirectly (through Holding Funds) or directly (through direct contributions to equity funds, loans funds and guarantees fund mechanisms).[537] The newly proposed implementation options indicate that in the future FI could be implemented at all governance levels – EU, national and regional.

Commission proposes three implementation options[538] for using financial instruments:

1) **Option 1: Financial instruments set up at EU level** managed directly or indirectly by the Commission: Under this option, Member States invest part of their Structural Funds in EU level instruments (e.g. the EEEF) which will be ring -fenced for investments in regions and actions covered by the OP from which the contributions were made. The instruments will be used to support actions and final recipients consistent with the programme or programmes from which such contributions are made.

2) **Option 2: Financial instruments set up at national/regional level** managed in line with the draft common provisions regulation and related secondary legislation (shared management). Under this option, managing authorities can contribute programme resources to:
   a. *Standardised (so-called 'off-the-shelf'*) instruments for which the terms and conditions will be laid down in a Commission Implementing Act. Standardised templates will be developed which will be ready to use. The intention of the Commission is for the templates to indicate what financial instruments are suitable for different types of investment projects[539] and address issues such as alignment with state aid guidelines. These standardised instruments should also go some way to responding to addressing some of the hurdles that resulted in implementation delays of existing instruments; and

   b. *Already existing or newly created financial instruments* tailored to specific conditions and needs.

3) **Option 3: Financial instruments consisting solely of loans or guarantees:** under this option, managing authorities can provide loans or guarantees directly to the final beneficiary, e.g. regional development agency. Managing authorities will be reimbursed on the basis of the actual loans provided or guarantee amounts blocked for new loans. Management costs or fees

[537] EC (2012) Financial instruments in Cohesion Policy. Commission Staff Working Document, SWD(2012)36, 27.2.2012, Brussels
[538] EC (2012) *Financial instruments in Cohesion Policy*. Commission Staff Working Document, SWD(2012)36, 27.2.2012, Brussels
[539] Personal communication

cannot be charged to the CSF Fund.

When supporting financial instruments under **option 2** above, the managing authority may:

(a) invest in the capital of existing or newly created legal entities,
(a) entrust implementation to the EIB, international financial institutions in which a Member State is a shareholder, financial institutions established in a Member State, or a body governed by public or private law selected in accordance with applicable Union and national rules,
(b) directly implement financial instruments consisting solely of loans or guarantees.

Forthcoming delegated acts will set out rules concerning funding agreements, the role and responsibility of the entities to which the implementation tasks are entrusted, as well as management costs and fees.

Total Budget

Proposed budget 2014-2020	**EUR million in 2011 prices**[540]
Convergence regions	164 279
Transition regions	31 676
Competitiveness regions	49 492
Territorial cooperation	8 948
Cohesion fund	66 362
Extra allocation for outermost and sparsely populated regions	1 386
TOTAL	**325 149**

[540] The figures reflect the latest available budget as agreed by the European Council: European Council (2013) Conclusions (Multi-annual Financial Framework) EUCO 37/13, 08.02.2013, Brussels

	A maximum of €183,3 billion is proposed for the **ERDF** for the period 2014-2020[541] A maximum allocation of €84 billion is proposed for the **ESF** for the period 2014-2020[542] The share of the ERDF, ESF and ESF which will be used for FI will only be known at the end of the 2014-2020 programming period. Some initial Commission estimates suggest that the volume of ERDF resources that could potentially be delivered through financial instruments in the next programming period could increase by up to three times (i.e. to approximately 15%)[543]. However, the exact amount will be known only after Managing Authorities adopt their Operational programmes and make specific allocations to FI.
Eligible activities	The **ERDF** includes a fairly broad range of activities that are eligible for financing, notably: • productive investment, particularly job creation and SMEs support; • investments in infrastructure in the areas of energy, environment, transport, and ICT (the Commission however has specified that basic infrastructure shall not be co-financed in more developed regions); • social, health and educational infrastructure; • development of endogenous potential by supporting regional and local development and research and innovation; • technical assistance. The **Cohesion Fund** shall continue to finance activities in two main areas – transport and environmental infrastructure. In the scope of the latter has been broadened to activities could include - investment in climate change adaptation and risk prevention, investment in the water and waste sectors and the urban environment.[544] The CF can also finance technical assistance. The scope of support of the **ESF** includes: promoting employment and supporting labour mobility, investing in education, skills and life-long learning, promoting social inclusion and combating poverty; and enhancing institutional capacity and efficient public

[541] EC (2011) Proposal for a regulation on specific provisions concerning the European Regional Development Fund and the Investment for growth and jobs goal and repealing Regulation (EC) No 1080/2006, (COM(2011)614), 6.10.2011, Brussels

[542] EC (2012) proposal for a Regulation on the European Social Fund and repealing Council regulation (EC) No 1081/2006, COM(2012)607, 14.3.2012, Brussels

[543] EC (2012b), *Presentation by the European Commission – Innovative Financial Instruments 2014–2020 – Doing more with less*

[544] EC (2012) Proposal for a Regulation on the Cohesion Fund and repealing Council Regulation (EC) No 1084/2006, COM(2012)612, 14.3.2012, Brussels

	administration. Under the 2007-2013 legislative framework, the use of **financial instruments** is limited to specific types of projects, e.g. SMEs and sustainable urban development under the ERDF and business start-ups under the ESF.[545] The proposals for the 2014-2020 period remove this limitation, thereby expanding the scope of financial instruments to all types of projects and activities, sectors and beneficiaries. The use of financial instruments will also be allowed under the Cohesion Fund for the first time. Member States and managing authorities may thus use financial instruments in relation to all thematic objectives and priorities covered by Operational Programmes (OPs), provided that the economic viability of final recipients and the repayment capacity of projects are demonstrated. This means that in principle all types of projects and activities related to climate change could be financed through FI as long as they meet the two operational criteria – economic viability and revenue generation.

Climate change relevance

Rationale

The goal of economic and social cohesion was set in the Single European Act to address regional disparities and drivers of structural change. At that time, these were mainly related to the establishment of the single market and currency, and the restructuring of industrial sectors such as coal, steel or textiles. Cohesion policy played an essential role in these processes. With the creation of the Cohesion Fund, the policy included as solidarity objective to help poorer Member States develop. It has increasingly been acknowledged however that the context and drivers for regional development have been changing. Current challenges include issues of globalisation, ageing population, energy supply and climate change.[546] Impacts of climate change are projected to be asymmetric across European regions, depending on the scale of impacts, the exposure and sensitivity of ecological and socio-economic systems, and the ability of communities to adapt to these changes, which in turn is expected to exacerbate regional disparities. More than one third of the EU population (approximately 170 million) lives in the regions which are likely to be most affected by climate change. In the context of an increased focus on climate change on the EU policy agenda, the need to rethink competitiveness measures and growth strategies to take into account the constraints and opportunities of a low carbon economy and climate proofing of infrastructure investment has been underlined. It has been argued that Cohesion Policy must play a strong role in encouraging the internalisation of costs by public and private sector actors.[547]

Operations supported through **financial instruments** shall contribute to the objectives of EU Cohesion Policy, which include addressing market failure and supporting structural adjustment in European regions. In order to stimulate better targeting of future financial instruments, their deployment will

[545] Article 44 on financial engineering instruments of Council Regulation (EC) 1083/2006 of 11 July 2006 laying down provisions on the European Regional Development Fund, the European Social Fund and the Cohesion Fund and repealing Regulation 1260/1999

[546] EC (2008) Regions 2020. European Commission, December 2008, Brussels

[547] Lázne, M. (2009) Reflection paper on the future Cohesion Policy. Informal meeting of Ministers of Regional policy.

be based on an ex ante assessment which will *inter alia* evaluate the value added of the financial instrument on an individual basis. Financial instruments should be used in line with the objectives set out in the OP which in turn are to be aligned with the Europe 2020 Strategy and ensure best possible use of the EU funds. As noted in the Commission's response to the 2012 ECA report[548], when approving the operational programmes emphasis will be placed on ensuring alignment with EU2020 strategic priorities, identification/fulfilment of ex ante conditionalities and evaluation of the rationale for the form of support proposed. The ex ante assessment will also identify market failures or suboptimal investment situations, and investment needs' and will thus be important in evaluating whether there is a need in the market to invest EU money so as to not crowd out private investments. The ex ante assessment will also assess whether any other EU instruments are active in the area so as to reduce potential overlaps and ensure better disbursement of EU funds. The ex-ante assessment should identify whether the individual financial instrument is addressing a market failure/gap.

Objective and activities

All funds under the 2014-2020 EU Cohesion Policy will be used to support climate change action. The Common Provisions Regulations (CPR) includes a recital according to which '*The objectives of the CSF Funds should be pursued in the framework of sustainable development and the Union's promotion of the aim of protecting and improving the environment as set out in Article 11 and 19 of the Treaty, taking into account the polluter pays principle. The Member States should provide information on the support for climate change objectives in line with the ambition to devote at least 20% of the Union budget to this end, using a methodology adopted by the Commission by implementing act'.*

Both the **ERDF** and the **Cohesion Fund** are set to promote activities in support of climate change mitigation and adaptation objectives. The ERDF and the CF shall co-finance projects in line with two of the CSF thematic objectives that directly address climate change notably:

- Thematic objective 4 – Supporting the shift towards a low-carbon economy in all sectors;
- Thematic objective 5 – Promoting climate change adaptation, risk prevention and management;

The recital of the Commission proposal on the **ESF** states that the funds shall be used to support the labour force transition towards greener skills and jobs, in particular in the energy efficiency, renewable energy and sustainable transport sectors. Article 3 of the draft ESF Regulation sets out that the ESF shall contribute to supporting the shift towards low carbon and climate resilient economy, through reform of education and training systems, adaptation of skills and qualifications, up-skilling of the labour force and the creation of new jobs In sectors related to the environment and energy.

For a first time, the EC proposed a specific share of the national allocations of the **ERDF** to be ring-fenced for climate change mitigation objectives, notably by concentrating resources on thematic objective 4 in the following way:

[548] European Court of Auditors (2012), *Innovative Financial Instruments for SMEs co-financed by the European Regional Development Fund*, Special report No 2, 2012

- 20% in more developed and transition regions; and
- 6% in less developed regions on activities such as renewable energy and energy efficiency. This could amount to approximately 17 billion for renewable energy and energy efficiency projects.[549]

In addition, it has been proposed that at least 5% of the ERDF resources allocated at national level shall be allocated to integrated actions for sustainable urban development, which could entail actions related to climate change as well. More specifically, 0.2% of the ERDF allocation shall target innovative actions (i.e. studies and pilot projects to identify or test new solutions for sustainable urban development).

The Commission has set out investment priorities for the future **ERDF** and the **CF.** Two TO set out specific priorities for climate change mitigation and adaptation activities. Climate change related priorities could also be promoted under other To as well. These include:

- *Thematic objective 4*
  - promoting the production and distribution of renewable energy sources;
  - promoting energy efficiency and renewable energy use in SMEs;
  - supporting energy efficiency and renewable energy use in public infrastructures and in the housing sector (the housing sector is eligible only under the ERDF;
  - developing smart distribution systems at low voltage levels;
  - promoting low-carbon strategies for urban areas;
- *Thematic objective 5*
  - supporting dedicated investment for adaptation to climate change;
  - promoting investment to address specific risks, ensuring disaster resilience and developing disaster management systems;
- *Thematic objective 6*
  - protecting biodiversity, soil protection and promoting ecosystem services including NATURA 200 and green infrastructure (soil protection, ecosystem services and NATURA 2000 are only eligible under the ERDF);
- *Thematic objective 7*
  - developing environmentally-friendly and low carbon transport systems including promoting sustainable urban mobility
  - developing comprehensive, high quality and interoperability railway systems

[549] These are currently subject to negotiation between the Council and the Parliament; therefore, the figures for the earmarking can be subject to modification.

The **CF** and **ERDF** shall not support activities aimed to reduce GHG emissions in installations falling under Directive 2003/87/EC (EU ETS).

Commission proposals for the 2014-2020 period expand the scope of **financial instruments** to all types of projects and activities, sectors and beneficiaries. The use of financial instruments will also be allowed under the Cohesion Fund for the first time. Member States and managing authorities may thus use financial instruments in relation to all 11 thematic objectives, including climate change related ones. This means that in principle all types of projects and activities related to climate change could be financed through FI as long as they meet the two operational criteria – economic viability and revenue generation.

Commission proposals also stpulate that any resources (e.g. interest, guarantee fees, dividends, capital gains or any other income receipts) paid back to financial instruments from investments or from the release of resources committed for guarantee contracts, which are attributable to the support from the CSF Funds, shall be re-used for further investments through the same or other financial instruments, in accordance with the aims of the programme or programmes (article 38).[550] In other words, the revolving nature of financial instruments is retained. This means that resources will be re-invested in activities in line with the objetcives of the programme, which could include cimate change related activities as well.

Expected leverage effect for the financial instruments

The leverage effect will be dependent on the financial instrument used, the specific financial products developed, and the sector in which it is applied. Estimates on the expected leverage effect could be made only after Managing authorities have set adopted Operational programmes (mid-late 2013) and the instruments have been set up (after 2014).

Coordination and coherence with other EU instruments

On the basis of Commission proposals, it is difficult to determine the coherence between **financial instruments** and possible overlaps. In general, the scope will be too broad. However, based on past experience it is possible that there are some overlaps with the COSME with regards to support for SMEs. Implementation of energy efficiency and micro generation of renewable energy could also be financed under the future LIFE hence there are possible overlaps there too.

Therefore, a new provision proposed by the Commission envisages that financial instruments will be designed on the basis of an **ex ante assessment.**

[550] EC (2011) Proposal for a Regulation laying down common provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund, the European Agricultural Fund for Rural Development and the European Maritime and Fisheries Fund covered by the Common Strategic Framework and laying down general provisions on the European Regional Development Fund, the European Social Fund and the Cohesion Fund and repealing Regulation (EC) No 1083/2006, COM(2011)615, 6.10.2011, Brussels

This assessment should identify market gaps/failures or sub-optimal investment situations, investment needs, potential private sector involvement, the added value of the financial instrument as well as questions of critical mass and possibilities for economies of scale[551]. The aim is to avoid overlaps and inconsistencies between funding instruments implemented by actors across different levels[552]. The ex ante assessment should also go some way to responding to criticisms of the functioning of existing instruments[553].

Monitoring and reporting

The draft Regulation put forward a number of common indicators, which shall be accompanied by Programme-specific indicators. These include:

- Transport: Increase of passenger trips using supported urban transport service
- Risk prevention and management: Population benefiting from flood protection measures and Population benefiting from forest fire protection
- and other protection measures
- Energy: Additional capacity of renewable energy production; Number of households with improved energy consumption classification, Decrease of primary energy consumption of public buildings, Number of additional energy users connected to smart grids and Estimated decrease of GHG in CO2 equivalents

For **financial instruments**, the new framework requires managing authorities to submit a specific report on operations relating to financial instruments as an annex to the annual implementation report sent to the Commission. This report is to cover:

- identify programme and priority from which support from the CSF Funds is provided;
- describe the financial instrument and implementation arrangements;
- identify bodies to whom implementation tasks have been entrusted;
- support paid into financial instrument;
- support paid or committed in guarantee contracts by the financial instrument to the final recipients by programme and priority or measure;
- revenues of and repayments to the financial instrument;
- leverage effect of investments made by the financial instrument, value of investments and participations;
- contribution of financial instrument to the achievement of the indicators of the programme and of the priority concerned[554].

[551] EC (2012) Financial instruments in Cohesion Policy. Commission Staff Working Document, SWD(2012)36, 27.2.2012, Brussels

[552] EC (2011), *Factsheet on Innovative Financial Instruments in Cohesion Policy 2014–2020*, European Commission – DG Regional Policy

[553] European Court of Auditors (2012), *Innovative Financial Instruments for SMEs co-financed by the European Regional Development Fund*, Special report No 2, 2012

[554] EC (2011) Proposal for a Regulation laying down common provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund, the

According to the latter provision, in the case of indicators related to climate change set out in the respective Operational programme, it can be assumed that reporting on the operations supported by financial instruments will need to report on those indicators as well. More detailed conditions for the monitoring and provision of information to the Commission including for financial instruments however are to be set out in a forthcoming implementing act (2013). The set up and implementation of financial instruments will be subject of discussions by the Monitoring committees for EU structural and cohesion funds (article 100).[555]

Expected policy outcomes

Financial instruments are envisaged to contribute to the achievement of objectives and priorities as set out in national and regional Operational programmes. Hence, they should contribute to the respective indicators and targets correspondingly. If OPs include targets and indicators related to climate change, financial instruments shall contribute to their achievement and report on these. The anticipated policy outcome therefore could be determined only after the adoption of OPs at the end of 2013.

European Agricultural Fund for Rural Development and the European Maritime and Fisheries Fund covered by the Common Strategic Framework and laying down general provisions on the European Regional Development Fund, the European Social Fund and the Cohesion Fund and repealing Regulation (EC) No 1083/2006, COM(2011)615, 6.10.2011, Brussels

[555] EC (2011) Proposal for a Regulation laying down common provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund, the European Agricultural Fund for Rural Development and the European Maritime and Fisheries Fund covered by the Common Strategic Framework and laying down general provisions on the European Regional Development Fund, the European Social Fund and the Cohesion Fund and repealing Regulation (EC) No 1083/2006, COM(2011)615, 6.10.2011, Brussels

Connecting Europe Facility – Transport, energy and ICT	
Instrument type	It is proposed that grants, procurements and financial instruments could all be used to implement the Connecting European Facility (CEF)[556]. A range of different types of financial instruments may be used, i.e.: equity instruments (e.g. investment funds focusing on the provision of risk capital); 'loans and/or guarantees facilitated by risk sharing instruments, including enhancement mechanism to project bonds, issued by a financial institution on its own resources with a contribution Union contribution to the provisioning and/or capital allocation'; and any other financial instruments[557]. Effectively, the CEF proposal would allow all of the instruments used in the current period to continue in the 2014-2020 period, although whether the eventual Regulation would allow this depends on the outcome of the negotiations with Member States and the Parliament. This fiche focuses on the grant support scheme under the CEF.
Objective and rationale of the instrument	The objective of the CEF is to enable the preparation and implementation of 'projects of common interest' (see below for more detail on these) within the framework of TEN policy. In this respect, the CEF pursues the following objectives: to contribute to smart, sustainable and inclusive growth by developing modern and high performing transport networks; and to enable the Union to meet its climate change and energy objectives, i.e. a 20% of GHG emissions, a 20% increase in energy efficiency and a 20% share of renewables by 2020[558].
Target group / Final beneficiary	In defining a 'beneficiary', the draft Regulation specifies that these can be Member States, international organisations, or a public or private undertaking or body[559].
Implementation level	The CEF will be implemented at the EU level by the European Commission through multi-annual and annual work programmes for each sector[560]. However, the draft Regulation proposes that the Commission be allowed to entrust the implementation of part of the CEF to other bodies[561].

[556] Article 6(1) of European Commission (2011) *Proposal for a Regulation establishing the Connecting Europe Facility*, COM(2011) 665/3

[557] Article 14(3) of COM(2011) 665/3

[558] COM(2011) 665/3

[559] Article 2(8) of COM(2011) 665/3

[560] Article 17(1) of COM(2011) 665/3

[561] Article 6(2) of COM(2011) 665/3; "other bodies" as set out in Article 55(1)(c) of the new Financial Regulation.

Implementing body	The CEF would be under direct management by the European Commission. For transport, DG MOVE would set the policy framework, while the TEN-T Executive Agency (TEN-TEA) would be responsible for the day-to-day management[562]. For energy, the Agency for the Cooperation of Energy Regulators (ACER), would take on similar responsibilities, including in relation to the selection of projects of common interest (PCIs)[563].
Total Budget	The European Council agreed a total budget of €19.3 billion for the 2014-2020 CEF. Of this, the majority would be allocated for transport, which has a proposed budget of €13.2 billion (plus a €10 billion to be transferred from the Cohesion Fund to be spent in line with the Cohesion Fund Regulation). The agreed budget for energy is €5.1 billion[564]. This is a significant reduction compared to the original Commission proposals where the total budget of CEF was approximately €40 billion. For transport and energy, the resources required from the EU budget for financial instruments should be no more than €2 billion and €1 billion, respectively[565].
Eligible activities	Only activities contributing to projects of common interest that are consistent with the amended TEN-T and TEN-E Guidelines would be eligible for financial aid (including in the form of financial instruments) under the CEF[566].
Leverage effect	For transport, the leverage effect is anticipated to be at least 6 times. This was the leverage effect of the first €7 billion of TEN-T funding (see TEN-T fiche). However, it is likely that this figure will be higher with the increased use of financial instruments and their potential for higher leverage (see, for example, the LGTT fiche)[567].

[562] van Essen, H., Brinke, L., Bain, R., Smith, N. and I. Skinner (2012) *Financing instruments for the EU's transport infrastructure* Report IP/B/TRAN/FWC/2010-006/LOT4/C2/SC1 for the European Parliament's Transport and Tourism Committee.

[563] ACER (2012) ACER *2013 Work Programme of the Agency for the Cooperation of Energy Regulators*; see http://www.acer.europa.eu/The_agency/Mission_and_Objectives/Documents/ACER%20Work%20Programme%202013.pdf

[564] European Council (2013) Conclusions (Multi-annual Financial Framework) EUCO 37/13, 08.02.2013, Brussels and EC (2013) MFF 2014-2020: EC conclusions (proportional cuts + partial adjustment to DG requests. Also, note that the budget for financial instruments can be subject to further changes depending on the outcomes of the agreement between the Council and Parliament.

[565] These figures are based on Commission proposal (Recital 38 of COM(2011) 665/3) but could be subject to changes following the adoption of the MFF Regulation later in 2013.

[566] Article 7(1) of COM(2011) 665/3

[567] Annex 3 of SEC (2011) 1262 Impact Assessment accompanying the Proposal for a Regulation establishing the Connecting Europe Facility, Commission Staff Working Document

	For energy, the combination of EU funds with financial instruments is aimed at achieving a leverage effect of 1:15 to 1:20.

Climate change relevance

Rationale

The European Commission has estimated that the investment needed to ensure that EU transport infrastructure development matches the demand for transport is over €1.5 trillion in the period 2010 to 2030, with €550 billion needed by 2020 in order to complete the TEN-T, of which around €215 billion is needed to complete missing links and to remove bottlenecks on the core network[568]. Additionally, energy Roadmap sets out grid investment costs for 2011-2050. The additional costs under the decarbonisation scenarios compared to the current policy and initiatives (CPI) scenario are generally between €40 and €50 billion of which around €40 billion would predominantly concern the distribution grid[569]. As noted above, the objective of the CEF is to enable the preparation and implementation of projects of common interest within the framework of TEN-T and TEN-E policy in line with the objectives of the Europe 2020 strategy and to help the Commission meet its 20-20-20 climate and energy targets. Hence, the Union's TEN policy, as set out in the TEN-T and TEN-E Guidelines, is an important driver for the CEF. Revised TEN-T and TEN-E Guidelines have been proposed alongside the proposed CEF Regulation.

EU policy on the TEN-T aims to address five main problems, most of which are barriers to the free movement of people and goods: the existence of missing links, particularly on cross-border sections; disparities in the quality and availability of transport infrastructure between and within Member States; infrastructure linking the different transport modes is fragmented; investments in transport infrastructure need to contribute to the long-term GHG emissions reduction target for transport; and different operational requirements in different Member States, e.g. a lack of interoperability[570]. One of the main issues in the current programming period has been a funding/financing gap, which has meant that the TEN-T has not been developed as much as had been hoped[571]. The proposed CEF, including the potential use of financial instruments, aims to address this issue by increasing the leverage of EU funds in attracting public and private investment, which should lead to a more timely delivery of such projects[572].

[568] European Commission (2011) Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system. Communication from the Commission, COM(2011) 144, 28.3.2011, Brussels.

[569] EC (2011) Commission Staff Working Paper - Impact Assessment Accompanying the Energy Roadmap 2050, SEC(2011) 1565, Part1/2, 15.12.2011, Brussels

[570] Proposal for a Regulation on Union guidelines for the development of the trans-European transport network, COM (2011) 650/2

[571] van Essen et al (2012)

[572] COM (2011) 665/3

The new framework for the TEN-E aims to deliver the objectives of the Union's energy policy, i.e. competitiveness, sustainability and security of supply. The proposed TEN-E guidelines aim to set the framework for "timely development and interoperability" of the TEN-E to ensure the functioning of the internal market and security of supply in the EU and to promote energy efficiency, renewable energy and the interconnection of energy networks[573].

Objective and activities

The preamble of the draft Regulation refers to the proposed commitment to direct 20% of the Union budget to climate-related objectives. In this respect, it states that infrastructure investments under the CEF should contribute to promoting the transition to a low-carbon and climate-resilient economy by incorporating mitigation and adaptation measures in the preparation, design and implementation of projects of common interest[574]. The preamble also refers to the 60% greenhouse gas reduction target for transport contained in the 2011 White Paper, as well its commitment to completing the core TEN-T network by 2030 and its targets for modal shift[575]. For energy, the preamble notes the investment needs required to meet the 2020 energy and climate targets, as well as the aim of completing the internal energy market and the integration of renewable energy sources into this market, in order to meet longer-term decarbonisation objectives[576].

As noted above, one of the general objectives of the CEF is to enable the EU to reach its 20-20-20 climate and energy targets while ensuring greater solidarity among Member States. Furthermore, a specific objective of the CEF relating to transport is to support projects of common interest that ensure 'sustainable and efficient transport'[577]. Additionally, the proposal contains a number of elements that aim to increase the attractiveness of climate projects. For example, the proposal sets out maximum co-financing rates for various types of projects; these can be 10% higher for actions that inter alia contribute to climate mitigation objectives, enhance climate resilience or reduce greenhouse gas emissions (although this higher rate does not apply to the €10 billion earmarked from the Cohesion Fund)[578].

A 'project of common interest' in the proposed CEF would have the same meaning as defined in the proposed revision of the TEN-T and TEN-E Guidelines. For transport, this would mean a piece of planned, existing or modified transport infrastructure, and measures providing the efficient use of these, that comply with the priorities and other conditions set out in Chapter II of the proposed TEN-T Guidelines Regulation.

[573] COM(2011) 658 Proposal for a Regulation on guidelines for trans-European energy infrastructure

[574] Recital 5 of COM(2011) 665/3

[575] Recital 7 of COM(2011) 665/3

[576] Recital 14 of COM(2011) 665/3

[577] Articles 3(b) and 4(1)(a)(ii) of COM(2011) 665/3, respectively

[578] Article 10(5) of COM(2011) 665/3

Transport priorities include:

- deploying intelligent transport systems (ITS), including for the purpose of traffic management;
- bridging missing links and removing bottlenecks;
- ensuring the optimal integration of all modes; ensuring appropriate accessibility for all regions; improving, or maintaining, the quality of infrastructure in terms of inter alia efficiency, safety, climate (including disaster resilience), environmental performance, social conditions and accessibility for all users; and
- allowing the use of alternative, in particular low and zero carbon, energy sources and propulsion systems.

For each mode (i.e. rail, inland waterways, roads, maritime, air and multimodal transport), Chapter II also includes maps detailing the TEN-T comprehensive network and the components and requirements of the respective infrastructure, as well as a framework for developing priority infrastructure that complements the general priorities with respect to each mode. The later shall be given "particular consideration" by Member States and other project promoters. For roads, these focus on ITS, new technologies for prompting low carbon transport, secure parking and road safety[579]. Proposals may be submitted by one or more Member States, international organisations, joint undertakings, or public or private undertakings or bodies established in the Member States. Most project proposals for transport must have the agreement of the Member States concerned – the only exception to this is for project proposals relating to air traffic management[580].

A Multi-Annual Programme for transport, which would set the framework for the projects to be funded, should be adopted for the projects of common interest listed in Part I of the Annex to the draft Regulation. The financial resources allocated to this Programme should be between 80% and 85% of the total budget (i.e. €13.2 billion) for transport[581]. The transport projects are presented in the Annex as sections of corridors. Of the 119 sections listed, 86 are rail, 16 inland waterways, 12 maritime and/or ports, while the remaining five are multimodal sections usually focusing on rail and ports. The only mention of "road" and "airports" are in the context of traffic management systems. For all modes, these are included in a horizontal priority that focuses on "innovative management and services" [582]. Annual work programmes are to be developed for projects of common interest not included in

[579] Proposal for a Regulation on Union guidelines for the development of the trans-European transport network, COM (2011) 650/2

[580] Articles 9(1) and 9(5) of COM(2011) 665/3

[581] Article 17(3) of COM(2011) 665/3

[582] Part I of the Annex of COM(2011) 665/3; the numbers were authors' additions based on counting the projects listed

multi-annual work programmes, which could also contribute to climate objectives, as long as these are consistent with the TEN-T Guidelines (see below for more detail on these) [583]. The aim has been to focus grants on those projects that are not likely to attract private investment, i.e. those for which there is no reliable revenue stream on the basis of which a loan or an investment could be repaid. Such projects tend to be for modes that could be considered to be "climate change projects", i.e. railways, inland waterway and maritime infrastructure[584].

For energy, a project of common interest is one that helps to implement the "energy infrastructure priority corridors and areas", which are set out in Annex I of the proposed TEN-E Guidelines Regulation. **Energy priorities** include: Projects that Member States would not otherwise support, as they bring added value to the EU as a whole than to Member States individually. The need to expand the connectivity of energy supply and distribution is based on a number of cross-cutting policy objectives. The justification for allocating additional funding for distribution will help improve the potential to create an internal EU energy market, and the management of energy flows particularly given the increasing rate of integration of renewables. Without access to a broader energy market, it may be difficult for a number of countries within the EU to meet their renewable energy targets particularly in cases where they are not endowed with renewable energy sources. Poland for example, currently has a limited supply of hydro, and given its reliance on coal, may be less inclined to access renewable energy without access to other grids. Construction of the network on the Baltic Sea for example will help overcome these types of challenges. A similar rationale can be applied to the improved distribution of natural gas, and to the development of a pipeline infrastructure for CO_2 from CCS projects.

An interview with DG ENER indicates that proposed revisions to the TEN-E legislation may increase the rates of co-financing to at least 50%, possibly going as high as 80. This interview also provided an overview of DG ENER's position with respect to financing investment needs for mitigation as opposed to adaptation. In short, it will not be necessary to fund adaptation measures given that they are typically implemented by the private sector. It is expected that private entities will respond autonomously.[585]

Additionally, any expenditure related to **environmental studies** on the protection of the environment, or on compliance with EU legislation, may be eligible for receiving a grant under the CEF[586].

Earmarking for climate change activities

As noted above, the CEF would allocate €13.2 billion to transport, of which €10 billion is for projects in the Member States eligible for Cohesion Fund,

[583] Article 17(5) of COM(2011) 665/3

[584] Personal communication

[585] Personal communication

[586] Article 8(5) of COM(2011) 665/3

and €5.1 for energy project. For transport, there is no explicit earmarking of funds between modes; however, the projects listed in the Annex for which a multi-annual work programme is to be developed, should focus exclusively on rail, ports and inland waterways infrastructure projects, or traffic management systems for all modes. This multi-annual programme should use up at least 80% of the funds allocated to transport. Additionally, other projects that could be considered to be climate projects could be funded by other work programmes that will focus on the remaining expenditure (e.g. see below for more detail on the TEN-T Guidelines).

For energy, there is also no explicit earmarking of funds for projects that could be considered to be "climate projects". The priority corridors in Annex I of the proposed TEN-E Guidelines include corridors for electricity, gas and oil. However, some of the former do focus on integrating renewable generation to the grid, while "priority thematic areas" include the development of smart grids and carbon dioxide networks. All of these could be considered to be "climate projects" to some extent[587].

Coherence and coordination with other EU instruments

As noted above, grants, procurement and financial instruments (including guarantees and project bonds) can all be used to implement the CEF. The draft Regulation foresees that any financial instrument set up under Regulation (EC) No 680/2007, which is the Regulation governing the financial aid from the TEN-T budget, could be merged with those created under the CEF, if this is applicable[588].

The Impact Assessment accompanying the proposed CEF Regulation noted that there was a possible risk of crowding out as a result of the increased budget under the CEF. However, the resources allocated under the CEF to transport and energy are small compared to the estimated investment needs in the transport and energy networks (e.g. €13.2 billion compared to the €550 billion needed for the TEN-T by 2020; see above). Additionally, the CEF will focus on projects of high European added value in which Member States and private investments are not willing to invest. For transport, such projects include cross-border projects for all modes, projects focusing on the railways, inland waterways and maritime transport, as well as horizontal aimed at improving the efficiency of the network[589].

In practice, the detail of how the crowding out of private finance will be avoided needs to be worked out, which is one of the issues on which experience can be gained in the pilot phase. In assessing project proposals, the TEN-TEA would identify whether a transport project that has not used private financing has the potential to do so. For example, if a project has the potential for a reliable revenue stream that could be used to repay a loan or to provide a return on an investment, it is likely that the project could attract private finance. In such cases, the TEN-TEA could ask the project promoter to explore whether it might be possible to use private finance for the project. At some point, a decision would have to be made, with the project promoter

[587] Annex I of COM (2011) 658

[588] Article 14(2) of COM(2011) 665/3

[589] SEC (2011) 1262 Impact Assessment accompanying the Proposal for a Regulation establishing the Connecting Europe Facility, Commission Staff Working Document

and the EIB, on the appropriate balance between financial instruments and other sources of finance, which could include a grant from the CEF (see also project bond fiche)[590].

Monitoring and reporting

Member States would also have to inform the Commission 'continuously' of *inter alia* the amount of support used for climate change objectives[591]. This implies the need for on-going tracking and reporting of such expenditure. Further to this, the Commission should undertake an ex-post evaluation of CEF objectives, including the scale and results of support used for climate change objectives. The evaluation should take account of progress against performance indicators specified in Articles 3 (the general objectives noted above) and 4 (specific sectoral objectives)[592].

For transport, the specific objective of 'ensuring sustainable and efficient transport in the long-run' will be measured by the length of the conventional and high speed rail networks in the EU-27m while the operational objective 'optimise the integration and interconnection of transport modes and enhancing interoperability of transport services' will be measured by the number of ports and airports linked to the rail network.

For energy, the performance of CEF will be monitored not only with respect to the diversification and security of supply, but with respect to the increased installed capacity for renewable energy, and the volume of avoided CO_2 emissions associated with this increase.

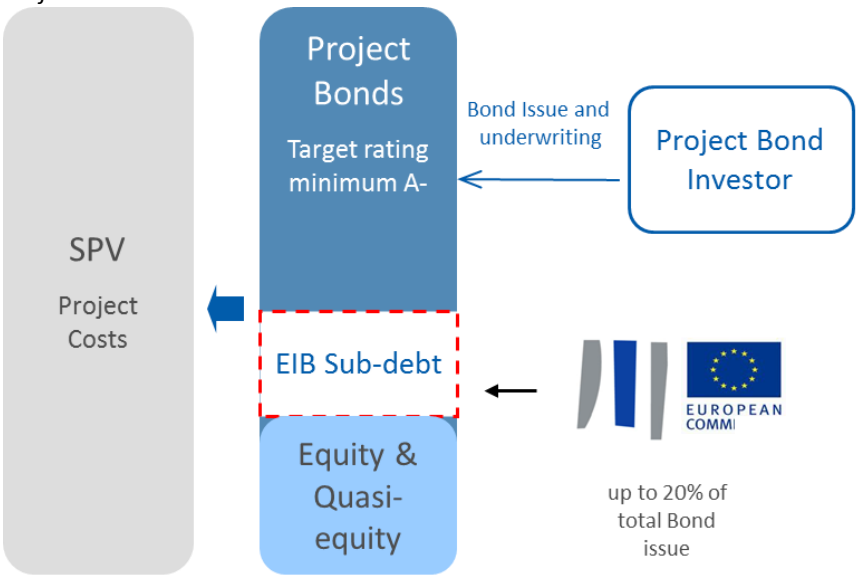
Expected policy outcomes

From the perspective of transport, the anticipated outcome of the CEF is the development of projects of common interest within the TEN-T. The benefits of the latter include the freer movement of goods and services, overcoming market segmentation, fostering accessibility and territorial cohesion, as well as fostering research and innovation. There will be increased choice for consumers. The investment in infrastructure will boost growth and create jobs, although the impacts are difficult to estimate. Cleaner transport solutions will be beneficial for the environment[593]. For energy, it is hoped that there will be a timely development and interoperability of the EU's energy networks to ensure the functioning of the internal market and security of supply in the EU and to promote energy efficiency, renewable energy and the interconnection of energy networks[594].

[590] Personal communication with DG MOVE
[591] Article 21 of COM(2011) 665/3
[592] Articles 26(2) and (3) of COM(2011) 665/3
[593] SEC 2011 1262 *IA of COM (2011) 665*
[594] COM(2011) 658

Connecting Europe Facility	
EU Project Bond Initiative	
Instrument type	Financial instrument Project bonds are a credit enhancement mechanism designed to use EU funds to attract additional private sector financing for individual infrastructure projects through capital markets and project finance techniques. The project bond initiative is based on the idea of 'tranching' (i.e. dividing) an issuers debt into layers of different seniority,[595] thus dividing debt into separate slices each with their own risk/return profile, thereby attracting investors to this "senior tranche". Once a project company has been set up (a single purpose vehicle), finance for a particular infrastructure project can be divided into: • A senior tranche issued as bonds to institutional investors such as insurance companies and pension funds; and • A subordinated tranche provided by the EIB in the form of a subordinated loan or a stand-by liquidity facility with the support of the EU. The concept of part b) is similar to the system in place for the RSFF and LGTT and helps to reduce risks and borrowing costs and ultimately to attract investors and buyers of bonds. Large projects would end up with three components. The guarantees and loans from the EIB and other financiers (equity and quasi-equity) are similar to the RSFF and LGTT. The third component is the projects bonds which is the novelty factor.

[595] European Investment Bank (2011), 'Supporting the EU budget: the EIB contribution', presentation at the CEPS Task Force meeting, power point presentation, version of 22 June 2011.

	Project Bond Instruments  *Source: EIB (2011) 'Supporting the EU budget: the EIB contribution', presentation at the CEPS Task Force meeting, power point presentation, version of 22 June 2011.* The risk of the portfolio is then divided, as is the case with RSFF and LGTT, in tranches with the EU budget taking up the First Loss Portfolio Guarantee (FLPG). The EIB would de facto be at the second loss position leaving further residual risks to other investors and bond holders. The exact design of the system has not yet been decided and the level of risks and scope of the scheme could be altered with the joining of other institutions. Ultimately the objective is to raise the project's credit rating to AA/A levels which is the asset class conservative institutional investors would consider. In the current programming period, there is a pilot phase of the initiative that will continue until 2014 (see the fiche in Annex 3). Once reviews have been undertaken of the pilot phase, amendments to instrument could be made that will be implemented in the 2014-2020 programming period.
Objective and rationale of the	The Project Bond initiative aims to make project bonds more attractive to a larger investor base. Improving the liquidity of the bond market in the longer term, it will increase the ability of projects to attract private sector investment. The Project Bonds are intended

instrument	to attract funding from more conservative long-term investors, such as pension funds.
Target group / Final beneficiary	The target group are project promoters, which could be Member State authorities or private companies (supported by Member States). Often a special purpose vehicle, which has been set up for a specific project in order to shield private companies from the risk of project failure, is the recipient of the funds[596].
Implementation level	EU
Implementing body	EIB, other IFIs might become involved
Total Budget	It is estimated that €2 billion under the CEF will be dedicated to all new financial instruments for transport projects and a further €1 billion for energy projects, of which the project bond is one potential option.[597]
Eligible activities	Projects that are consistent with the TEN-T and TEN-E Guidelines and have stable and strong cash flows, as well as being economically and technically feasible. The bonds will finance projects that rely on payments from state agencies, not just those that rely on user charges for revenues.
Leverage effect	It is anticipated that the provision of grant funding will result in a leverage effect of 15-20 based on information available in the IA, which is based on experience with the LGTT. The actual leverage factor will vary by project.
Climate change relevance **Rationale** Project bonds are essentially a credit enhancement mechanism designed to use EU funds to attract additional private sector financing for individual	

[596] EIB and the European Commission (2008); van Essen, H., Brinke, L., Bain, R., Smith, N. and I. Skinner (2012) *Financing instruments for the EU's transport infrastructure* Report IP/B/TRAN/FWC/2010-006/LOT4/C2/SC1 for the European Parliament's Transport and Tourism Committee

[597] Please note that this figure is based on Commission proposal for CEF and could be subject to changes following conclusions of the European Council on the 2014-2020 MFF from 8 February 2013.

infrastructure projects through capital markets and project finance techniques. They serve to expand the investor base for private debt funding of projects from loan providers to bond investors.[598] Project bonds are considered to be one solution to the current lack of finance for infrastructure projects due to the reduction in long-term lending by banks and the downgraded or liquidated monoline insurance companies which traditionally offered debt service guarantees to institutional investors.

Objective and activities

The instrument is indirectly related to climate change given its integration in to the CEF mandate. Stakeholders that responded to the Proposal for the Initiative indicated the need to finance low carbon power generation. The Commission response to this comment (as outlined in the accompanying impact assessment) emphasised the notion that grant funding would be provided on an EU value added basis, while also indicating that 'however, it will leave open the possibility of adding the water sector and low carbon generation which will facilitate the adaptation and mitigation of climate change and is thus in line with the goal of creating a sustainable European economy, while meeting the greenhouse gas emission reduction goals.'

The details of the EU Project Bond initiative are yet to be determined. Results from their Pilot Phase (see Annex 4) will also feed into their development.

[598] EC (2011) A pilot for the Europe 2020 Project Bond Initiative, (COM(2011)660), 19.10.2011, Brussels

CAP	
EAFRD – grants and FI	
Instrument type	The European Agricultural Fund for Rural Development (EAFRD) has been in place since 2007, following from the previous 'Rural Development Regulation' in the 2000-2006 programming period. The 2014-2020 legislative proposals for the European Agricultural Fund for Rural Development (EAFRD) continue to provide one funding instrument which is translated into 88 rural development programmes in the EU-27[599]. As previously, the proposed revisions to the EAFRD provide support to farmers, foresters and other actors in rural areas for a range of activities, mainly in the form of **grants**. Some support is made on an annual basis for on-going environmental management on agricultural or forestry land, whereas others are provided as one off grants to support, for example capital investments, setting up advice and training services or supporting activities in rural communities. Funding through EAFRD can also be delivered through **Financial Instruments**. The rules regarding what sort of FIs are possible have been harmonised under the Common Provisions Regulation and are now the same for all funds under shared management (Title IV of the CSF Regulation (Articles 32-40) + provisions in the delegated Act and in Implementing rules, which have yet to be produced).
Objective and rationale of the instrument	The forthcoming EAFRD is structured around six overarching strategic priorities with 18 sub-priorities currently being called 'focus areas' that are intended to reflect EU priorities in line with the Europe 2020 strategy and the Common Strategic Framework: • **1. Fostering knowledge transfer in agriculture and forestry through:** o Promoting human capital and smart networking in agriculture and forestry; o Fostering innovation and the knowledge base of agriculture and forestry; o Strengthening the links between agriculture and forestry and research and development; • **2. Enhancing competitiveness of agriculture and farm viability through:** o Facilitating restructuring of farms facing major structural problems; o Facilitating generational renewal in the agricultural sector; • **3. Promoting food chain organisation and risk management in agriculture through:**

[599] European Commission (2011) *Proposal for a Regulation of the European Parliament and of the Council on support for rural development by the European Agricultural Fund for Rural Development (EAFRD)*, COM(2011) 627/3, 2011/0282(COD)

	○ Integrating primary producers into the food chain; ○ Supporting farm risk management; • **4. Preserving and enhancing ecosystems dependent on agriculture and forestry with a focus on biodiversity/landscapes, carbon sequestration, water management and soil management;** • **5. Promoting resource efficiency and the transition to a low carbon economy in the agri-food and forestry sectors through:** ○ Increasing efficiency in water and energy use; ○ Facilitating production of feedstocks for renewable energy in agriculture and forestry; ○ Reducing nitrous oxide and methane emissions from agriculture; and • **6. Job creation and the renewal of rural areas including facilitating diversification and fostering local development.** It has been suggested that the added objective and rationale of introducing financial instruments is be to offset the additional financial burden on farmers, foresters and other rural actors, in particular SMEs and young entrepreneurs among this group, caused by the current financial crisis.[600] Essentially however, the use of FIs within EAFRD are simply another means of delivery of support provided for under specific measures and will need to meet the same priorities
Target group	The EAFRD targets farmers, foresters and other land managers as well as communities and individuals in rural areas.
Implementation level	Shared management at national and regional levels
Implementing body	The Rural Development Programmes are implemented through 'Managing Authorities' – one for each programme. These are usually part of the Agriculture Ministries although responsibility for implementation can sometimes be devolved to a more local level under strict rules of accountability.

[600] D'Auria, R, Guido, M, Cardini, G and Venceslai, G (2012) *Future Rules on Financial Instruments, EAFRD 2014-2020.* Presentation for ENRD workshop 'Facilitating access to finance for rural micro-enterprises', 28 June 2012, Riga, Latvia

Total Budget	For **EAFRD** in general: The total EAFRD budget for 2014-2020 is still not agreed. Based on the conclusions of the European Council from 8 February 2013, the total budget for Rural Development would be €84.9 billion.[601] **FIs**: payments into funds must be limited to the amount of resources expected to be used for payments to beneficiaries within a period of two years.
Eligible activities (types and scale)	The proposed **EAFRD** is intended to continue to support a large range of activities which include physical investments for rural infrastructure (such as investments for the installation of biogas plants, building insulation, modern machinery, etc.), area based payments for land management (such as reduced tillage, establishing and maintaining agro-forestry systems, etc.) and development of human capacity (such as training and the provision of advice). Additionally, it is proposed to include financial support for risk management (proposed Article 37 and previously under Article 68) and a greater emphasis on the use of research and innovation in rural development (proposed Article 66) For **FIs**: The ex ante assessment must highlight the situations where market failure exists and only introduce FIs where this is the case. Eligible activities could be any of those that are possible within the context of the EAFRD

Climate change relevance

Rationale

EAFRD provides public support to help address climate issues in instances where markets are not operating to deliver the outcomes required. Under the EAFRD public support is provided to facilitate the on-going delivery of public goods by EU agriculture for a stable climate, such as the reduction of greenhouse gas emissions and protecting and enhancing carbon sequestration in agricultural soils.[602] To date there has been much less of a focus on climate adaptation, apart from through support to increase the efficiency of water use and address issues of water scarcity. The territorial and environmental balanced provision of these public goods at an EU level is important and is currently enabled by public support via the CAP.[603] The latest evaluations of the RDPs are the mid-term evaluations, carried out during 2010. The synthesis of this information is being carried out currently under contract to DG Agriculture and is not yet in the public domain. As a result it is difficult to assess the degree to which RDPs have succeeded in delivering climate outcomes. Due to the fact that most measures under the EAFRD are multi-objective, often it is difficult to disentangle the climate impacts of

[601] European Council (2013) Conclusions (Multi-annual Financial Framework) EUCO 37/13, 08.02.2013, Brussels

[602] Cooper, T, Hart, K and Baldock, D (2009) *The Provision of Public Goods Through Agriculture in the European Union*. Report prepared for DG Agriculture and Rural Development, Contract No 30-CE-0233091/00-28, Institute for European Environmental Policy, London.

[603] European Commission (2011) The future of CAP direct payments, Agricultural Policy Perspectives Briefs, Brief No 2, 04/2011

particular interventions, particularly if this has not been stated as their primary objective. This does not mean, however, that climate benefits have not been achieved.

For the FIs, the rationale, as set out in the Common Provisions regulation can be stated as follows: 'Financial instruments supported by the CSF Funds should be used to address specific market needs in a cost effective way, in accordance with the objectives of the programmes' (preamble 23) and 'Financial instruments are increasingly important due to their leverage effect on CSF Funds, their capacity to combine different forms of public and private resources to support public policy objectives, and because revolving forms of finance make such support more sustainable over the longer term' (preamble 22).

Objective and activities

The EAFRD proposals pay more attention to climate change than in the past. There are three ways in which it could be used to promote climate change. These are:

- First, four of the six EU priorities for rural development relate to climate change:
    - Fostering knowledge transfer and innovation (Priority 1);
    - Enhancing the competitiveness of agriculture and farm viability (Priority 2)
    - Restoring, preserving and enhancing ecosystems (Priority 4); and
    - Promoting resource efficiency and transition to a low carbon economy (Priority 5).
- Second, the Community Strategic Framework cross-cutting objective that currently stresses the need for climate change adaptation and mitigation to be integrated not just across rural development policy, but across all EU funds for which there is shared competence.
- Third, EAFRD refers to the following measures to promote climate change:
    - Support to farmers for adopting environmental or climate related management on their land under the **agri-environment-climate** measure (Article 29). The specific types of activities are listed in the previous section;
    - Support for investments in 'tangible and/or intangible investments which can improve the competitiveness of the business or be non-productive in nature, linked to achieving requirements under the agri-environment-climate or forest-environment measures' under **investments in physical assets** (Article 18);
    - Compensation for beneficiaries for the restrictions placed on them in these areas which are not experienced by those farmers/foresters outside these areas from **Natura 2000 and Water framework directive payments** (Article 31);
    - Support for various **forestry measures**, in particular for the afforestation and creation of woodland (Article 23), for the establishment of agri-forestry systems (Article 24) and for forest-environmental and climate services and forest conservation (Article 35); and
    - **Knowledge transfer and information** actions (Article 15) and providing support for **advisory services**, farm management and farm relief services (Article 16)

- Support for bottom-up capacity building that could lead to innovative approaches to meet climate change challenges with the **Leader** approach. An important development from the previous programming period is the minimum 5% spending requirement stipulated (Article 65 (5)).
- Support for partnerships and networks to share knowledge and improve the delivery of climate change mitigation and adaptation through the European Network for Rural Development (ENRD) and for all Member States to establish National Rural Networks (NRN) and new partnerships under the auspices of the European Innovation Partnership (EIP) on Agricultural Productivity and Sustainability through the development of an EIP network and operational group. These networks will be a critical resource that can be used to improve the climate proofing of CAP expenditure in the future.

This means that there is a clear opportunity for FIs to address climate change through the funds they provide, but this need not be a specific focus.

Earmarking funds for climate change activities

It will be impossible to know how much funding ultimately is allocated to climate change until RDPs are finalised. However, the proposals for 2014-2020 suggest that Member States should earmark 25% of the total EAFRD contribution for action on climate change mitigation and adaptation and land management by supporting agri-environment-climate, organic farming payments, and payments to areas facing natural or other specific constraints measures. Although not legally binding, 'given that many of the high priority options to increase the resilience of rural areas are in fact land management options (rather than infrastructure investments), this requirement could help ensure that Member States place sufficient emphasis on land management options. Conversely, the absence of such a requirement could risk such measures losing out in terms of their prioritisation and expenditure to other measures'.[604]

Expected leverage effects of FI

It is impossible to know what the likely leverage effect of the FIs might be, given that experience with such instruments in the current programming period is limited. However, although not directly linked to climate change, please note that there are figures demonstrating leverage effects for the Lithuanian example in the current programming period. It is difficult to know if this is or would be a good indicator for other FIs used in other MSs for similar purposes in the future.

Monitoring and reporting

The proposals indicate that an ex ante and ex post evaluation of all Rural Development Programmes will be a necessary requirement. However, the

[604] Hjerp, P, Volkery, A, Lückge, A, Medhurst, J, Hart, K, Medarova-Bergstrom, K, Tröltszsch, J, McGuinn, J, Skinner, I, Desbarats, J, Slater, C, Bartel, A, and ten Brink, P, (2012), *Methodologies for Climate Proofing Investments and Measures under Cohesion and Regional Policy and the Common Agricultural Policy*, A report for DG Climate, August 2012.

details of what these evaluations will need to contain have not yet been determined as they are set out in the relevant implementing acts and not in the legislative proposals. In terms of monitoring, the EAFRD proposals require both Monitoring Committees and a European Network for Rural Development Coordination Committee. Although neither requirement specifically relates to climate change performance and impact, both could be mobilised for this purpose.[605]

There are also a suite of result / target and impact indicators being developed to monitor performance and impact in relation to climate change objectives. These currently include:

- The physical area supported by agri-environment/climate payments (relying on IACS);
- Net GHG emissions;
- Renewable energy produced;
- Reduced carbon emissions;
- Carbon savings through forestry and agricultural practices supporting sequestration;
- Energy savings in the processing sectors;
- Energy efficiency; and
- Water efficiency.[606]

There are no additional specific climate related indicators for FIs.

Commentary on FI

Whereas in the previous programming period financial instruments were implemented at the Member State level, for 2014-2020 under the CSF there will be an additional opportunity for financial instruments to be developed at an EU level. However, in the case of the EAFRD, 'the FI does not seem to have a clear role in the rural development policy. This is an existing issue in the current programming period and the new Commission proposals are not providing any answers'. The issues that have been raised are that if financial instruments are introduced to support delivery within EAFRD, they should be fully incorporated within the measures. If they are intended as independent financial mechanisms (i.e. outside the EAFRD framework) to encourage a

[605] Hjerp, P, Volkery, A, Lückge, A, Medhurst, J, Hart, K, Medarova-Bergstrom, K, Tröltszsch, J, McGuinn, J, Skinner, I, Desbarats, J, Slater, C, Bartel, A, and ten Brink, P, (2012), *Methodologies for Climate Proofing Investments and Measures under Cohesion and Regional Policy and the Common Agricultural Policy*, A report for DG Climate, August 2012.

[606] European Evaluation Network for Rural Development (2012) Draft intervention logic for rural development post-2013, and possible associated indicators. Technical paper for the joint CC and ExCo workshop, 15 March 2012.

more fluid investors' market for rural development, more flexibility is required. For example, they would require independent budgets within the programmes (currently not provided for) and they would require the possibility to finance the working capital in development projects[607].

[607] D'Auria, R, Guido, M, Cardini, G and Venceslai, G (2012) *Future Rules on Financial Instruments, EAFRD 2014-2020.* Presentation for ENRD workshop 'Facilitating access to finance for rural micro-enterprises', 28 June 2012, Riga, Latvia

LIFE 2014-2020	
Instrument type	On 12 December 2011, the European Commission published its proposed Regulation on the establishment of a programme specifically dedicated to funding the environment and climate action (LIFE). Also, according to Article 17 (1) of the proposed LIFE Regulation European Union funding may take the following legal forms: • **grants**; • public procurement contracts; • contributions to **financial instruments** in accordance with the general provisions for financial instruments set out in Regulation (EC, Euratom) No 1605/2002 and with more operational requirements set out in specific European Union acts; • any other interventions needed for the purpose of achieving the objectives referred to in Article 3.
Objective and rationale of the instrument	According to the proposed Regulation other EU funding programmes cannot address all environmental and climate action specific needs. In addition the objective of the LIFE Programme is to be a catalyst for promoting implementation and integration of environmental and climate objectives in other policies and Member State practice. Special emphasis is placed on better governance, as it is inextricably linked to improving implementation. For FI: The recital to the proposed Regulation points out that there is a gap in the market between the demand for and supply of loans, equity and risk capital and it is likely to persist in the context of a financial crisis. Therefore, it is deemed appropriate to use financial instruments to support projects with revenue generating capacity in the areas of environment or climate. Financial instruments supported by the LIFE Programme should be used to address specific market needs in a cost effective way, in line with the objectives of the Programme, and should not crowd out private financing. Financial instruments may be combined with grants funded from the Union budget, including under this Regulation.
Target group	The LIFE Programme may fund public and private bodies.
Implementation level	EU level As regards the approach and management of expenditures under the new LIFE programme, the European Commission has opted for a flexible top-down approach for all types of projects. An important change to improve the efficiency of the LIFE Programme and to create closer links to Union policy priorities is the shift from a pure bottom-up approach to a flexible top-down approach. Work

	programmes valid for at least two years will be drawn up by the Commission in consultation with the Member States. These will cover e.g., priorities, allocation of resources between types of funding, and targets for the period. The priorities included therein will not be exhaustive in order to allow applicants to submit proposals in other areas as well and to incorporate new ideas and react to new challenges. The Commission will thus be assisted by the Committee for the LIFE Programme for the Environment and Climate Action, which will have a dual nature with, in particular, different chairs and different composition depending on whether the issues dealt with are related to the sub-programme for Environment or the sub-programme for Climate Action.
Implementing body	According to the proposed Regulation the LIFE Programme will remain centrally managed to maximise policy links, quality of interventions, sound financial management and stable resources, and to ensure that findings of LIFE projects are taken up in Union policy shaping. However, current management could be improved by delegating many of the tasks to an existing Executive Agency. Given the characteristics of the LIFE Programme and to increase synergies with other Union funding programmes, the Commission will explore the possibility of delegating to a large extent the selection and monitoring tasks to the European Agency for Competitiveness and Innovation, while keeping the governance of the LIFE Programme within the Commission.
Total Budget	The budget will include €3,057 million in 2011 prices[608] to finance a new sub-programme on climate action (~€800 million) and a sub-programme on the environment (~€2,200 million).
Eligible activities (types and scale)	In order to improve the implementation of environmental and climate policy and enhance the integration of environmental and climate objectives in other policies, the LIFE Programme aims to promote projects that support integrated approaches to the implementation of environmental and climate legislation and policy. For the sub-programme for Environment, those projects should focus primarily on the implementation of the Union Biodiversity Strategy to 2020, with particular regard to the effective management and consolidation of the Natura 2000 network. It should also improve the implementation of the Water Framework Directive and waste and air legislation. For the sub-programme for **Climate Action**, projects should in particular concern climate change mitigation and adaptation strategies and action plans. These projects should support only a series of specific activities and measures, while other activities that complement those included in the project should be sourced from other Union funding programmes, as well as from national, regional and private sector funds. Hence, funding through the LIFE Programme should exploit synergies and ensure consistency between different Union funding sources by providing a strategic environmental and climate focus.

[608] European Council (2013) Conclusions (Multi-annual Financial Framework) EUCO 37/13, 08.02.2013, Brussels and EC (2013) MFF 2014-2020: EC conclusions (proportional cuts + partial adjustments to DG requests).

Climate change relevance

Rationale

The rationale for the LIFE proposal is based on market failure but also on the acknowledgement that EU funding programmes cannot address all climate action specific needs. For environment and climate action, specific approaches are required to deal with uneven integration of their objectives into Member States practice, uneven and inadequate implementation of the legislation in the Member States, and insufficient dissemination and promotion of policy goals. Therefore the rationale for the LIFE Programme is to better distribute solidarity and responsibility sharing in preserving the EU environmental and climate common good.

Objectives and activities

The sub-programme for Climate Action have the following objectives:

- to promote awareness raising on climate matters, including generating public and stakeholders support to Union policy-making in the field of climate, and to promote education for sustainable development;
- to support communication, management, and dissemination of information in the field of climate and to facilitate knowledge sharing on successful climate solutions and practice, including by developing cooperation platforms between stakeholders and training;
- to promote and contribute to a more effective compliance with and enforcement of Union climate legislation, in particular by promoting the development and dissemination of best practices and policy approaches; and
- to promote better climate governance by broadening stakeholder involvement, including NGOs, in policy consultation and implementation.

Specific priority areas for activity include:

- *Climate Change Mitigation* – activities should contribute to the development and implementation of Union climate-related policy and legislation, in particular with regard to greenhouse gas monitoring and reporting, policies related to land use, land use change and forestry, emissions trading system, Member States' effort to reduce greenhouse gas emissions, carbon capture and storage, renewable energy, energy efficiency, transport and fuels, ozone layer protection and fluorinated gases
- *Climate Change Adaptation* – activities should contribute to adapt to such impacts across populations, economic sectors and regions to ensure a more resilient Union through specific adaptation measures and strategies.
- *Climate Governance and Information* – activities should in both sub-programmes support the development of platforms and sharing of best practices for better compliance and enforcement, and to generate support from the public and stakeholders for Union's policy making efforts in the areas of environment and climate

A new feature of the proposed LIFE Regulation is **Integrated Projects**, which will operate on a large territorial scale (in particular regional, multiregional,

or national, and in a cross-sector manner) and will be oriented towards the implementation of environmental and climate action plans or strategies required by environmental or climate legislation. For the sub-programme for Climate Action, Integrated Projects may focus on the implementation of mitigation and adaptation strategies and action plans. Integrated Projects will also aim, when possible, at mobilizing other European Union funding sources by exploiting synergies and ensure consistency between different Union funding programmes.

The added value of the LIFE Programme derives from the specificity of its approach and focus which make its interventions especially adapted to the environmental and climate needs. The proposed Regulation states that the LIFE Programme can contribute to a more effective implementation of environmental policies than Member State single action through increased pooling of resources and expertise. It also provides the platform for developing and exchanging best practices and knowledge, improving, catalysing, and accelerating changes in the implementation of the acquis, and building capacity, supporting private actors in testing small-scale technologies and solutions, especially by SMEs, and allowing Member States and stakeholders to learn from each other. The proposed Regulation also envisages that the LIFE Programme creates synergies across Union and national funds while leveraging additional private sector funds, thereby increasing the coherence of Union intervention and promoting a more homogenous implementation of the acquis.

In addition, the LIFE Programme will strengthen its catalytic and leveraging role by becoming a driver for mobilising other Union Funds e.g., through Integrated Projects. For this, a more coherent approach with other Funds will be required. The MFF Communication established a structured relation by making a reference to "Integrated Projects" in the Common Strategic Framework (CSF). This structured relation for Integrated Projects will be developed in detail when drafting the CSF and may include creating a steering committee and structured information channels.

Coordination and coherence with other EU instruments

According to the proposed LIFE Regulation climate change requirements should be integrated into Union's policies and activities. The Commission and Member States should ensure such complementarity at all levels. At European Union level, complementarity should be ensured by establishing a structured cooperation between the LIFE Programme and the shared-management Union funding programmes in the Common Strategic Framework.

They will provide examples to the responsible authorities of how coordination of different funding instruments is possible to achieve better implementation of Union environmental and climate legislation. At Union level, this coordination between the LIFE Programme and other Union funding programmes could be established within the Common Strategic Framework.

Part 2 of the Commission's staff working document on the proposal for a Common Strategic Framework[609] highlights the opportunities that exist in the coordination and complementarity between the CSF funds and Integrated Projects. It points out that complementarity and coordination with LIFE, in

[609] http://ec.europa.eu/regional_policy/sources/docoffic/working/strategic_framework/csf_part2_en.pdf

particular with integrated projects in the areas of climate change mitigation, should be ensured at national and regional level. It also points out that the European Social Fund can complement activities in this area through targeted education, training and up-skilling of the labour force with regard to risk prevention, risk management and adaptation to climate change.

Monitoring and reporting

At project level, there is a requirement for projects to accompany their proposals with tables of expected outputs. These tables will serve as basis for monitoring project progress. The output indicators will be adapted according to the indicators listed in the Annex of the proposed Regulation. It lists several result and impact indicators for both climate change mitigation and adaptation. It will be compulsory to update output tables and re-submit them with the mid-term and final reports.

At programme level, the multiannual work programmes will set out specific thematic priorities for their duration and specific targets for each priority within each area, including expected outputs (i.e., expected number of Integrated Projects, coverage of Natura 2000 by LIFE projects, coverage of River Basin District by LIFE projects, and so on). At the end of each year's call for proposals, the Commission will analyse whether sufficient number of projects for a given area of action have been funded and will make adjustments as required to achieve the work programme and mid-term targets.

Other particular aspects of the LIFE Programme, such as further specifying eligibility criteria for project selection, criteria for the application of geographical balance to Integrated Projects, and performance indicators applicable to specific thematic priorities, will be adopted by the Commission through delegated acts.

Expected policy outcomes

The anticipated policy outcomes are listed in the legislative statement of the proposed regulation and include the following expected policy outcomes for the climate change sub-programme:

Increased development and implementation of climate change mitigation strategies or action plans.
Increased innovative technologies, systems and instruments and/or other best practice solutions for the reduction of greenhouse gas emissions.
Increased development and implementation of climate change adaptation strategies or action plans.
Increased innovative policy approaches, technologies, systems and instruments and/or other best practice solutions for more climate resilience.

ANNEX 7 – ASSESSMENT CRITERIA FOR FI

7.1 Establishing criteria for assessing instruments for climate change mitigation and adaptation

This chapter establishes the criteria that informed the assessment of the suitability of future FI for contributing to achieving EU climate policy objectives. Since the Commission proposals for the 2014-2020 EU FI have not been formally adopted yet there is still considerable uncertainty with regard to the final regulatory framework for the FI. Parts of our assessment are hence rather precursory.

The following criteria are used:

- Effectiveness
- Efficiency
- EU added value

Each criterion is defined in more detail below. Specific indicators are provided that underpin the assessment.

7.2 Effectiveness

The criterion of effectiveness indicates to what extent a financial instrument is perceived to achieve its original objectives. This can be assessed in terms of different indicators which relate to both key outcomes and the process by which these outcomes are achieved. For the assessment of finance instruments the following indicators can be applied to measure their expected effectiveness:[610]

- **Scale:** the amount of public finance provided for the instrument;
- **Multiplier effect:** the scale of final investments compared with the scale of initial public monies – where the additional funding mobilised can be other public finance and private sector investment;
- **Scope of action**: the potential to promote climate action in terms of identifying financing opportunities for the proposed sectoral projects types under this study;
- **Flexibility:** whether the instruments is able to be tailored to better address specific needs and circumstances; and
- **Monitoring:** the extent to which the intended climate objectives are monitored during the project's lifetime.

7.3 Efficiency

The criterion of efficiency indicates the extent to which a financial instrument is perceived to reach its objectives to the least cost possible, or achieve the greatest amount of benefits. From an economic viewpoint a cost-benefit analysis can help to determine whether the benefits of a FI outweigh its cost, and which FI among all FIs possible show the best results in this regard.[611]

The efficiency assessment includes the following indicators:[612]

[610] The following indicators build on UNEP (2011) Innovative climate finance. Examples of UNEP Bilateral Finance Institutions Climate Change Group. UNEP, p. 11.
[611] OECD (2007) OECD Principles for Private Sector Participation in Infrastructure, OECD, Paris
[612] The following indicators build on UNEP (2011) Innovative climate finance. Examples of UNEP Bilateral Finance Institutions Climate Change Group. UNEP, p11

- **Least (lower) economic cost**: Maximising the achievement of lower cost outcomes to meet the set objectives; and
- **Low transaction costs:** minimising organisational costs and 'friction losses' (costs of intermediation) which add to overall project costs and mean less of the public finance gets to 'the ground' of the actual project or program.

In addition the following elements need to be considered for the efficiency analysis of a financial instrument:[613]

- **Risk allocation** between the contractual parties, *i.e.* which party bears which risks and over which time horizon and what are the ramifications for the underlying incentive structure to ensure appropriate delivery of the agreed outputs.

An appropriate and adequate risk allocation is of particular importance since financial instruments should not reduce the risks beyond the level necessary to attract private funding. This is however a challenging task due to the inherent difficulty related to a proper risk assessment in particular for large and complex infrastructure projects.[614]

In addition to comparing the design features of different financial instruments in view of their individual efficiency, it needs to be assessed the extent to which the interplay between different existing financial instruments is efficient in delivering climate policy objectives. For example, a possible combination of different financial instruments might gather sufficient financial support for the implementation of a project. But channelling the same amount through one financial instrument might have provided an even better and hence more efficient outcome, particularly due to avoided transaction costs.

7.4 EU added value

Maximising the 'European added value' (EAV) is a key objective of the European Commission for the MFF 2014-2020 and related funding instruments. The Commission therefore proposes to use EAV as a 'key test' to justify spending at the EU level'[615]. An approach has been suggested that distinguishes between different stages in the policy process when analysing EAV. Once a proposed EU expenditure is justified on the basis of the political principles (e.g. subsidiarity and proportionality), in a second step, the specific design of a proposed funding instrument to implement the EU expenditure needs to be assessed on whether it provides EAV. For this purpose, the following two assessment criteria are used: complementarity as well as synergetic effects. Complementarity is achieved by adding to existing instruments at all levels of governance and hence addressing existing gaps but not duplicating already existing instruments. An important design feature is to 'crowd in' private investments and to avoid 'crowding out' of private investments. Finally, the financial instrument should result in synergies by providing win-win solution and address cross-border actions and hence exploit trans-national opportunities and partnerships.

Therefore we put forward the following indicators for assessing EAV:

[613] The following indicators build on OECD (2007) OECD Principles for Private Sector Participation in Infrastructure, OECD, Paris.

[614] Withana, S., Núñez Ferrer, J., Medarova-Bergstrom, K., Volkery, A., and Gantioler, S. (2011) Mobilising private investment for climate change action in the EU: The role of new financial instruments, IEEP, London/Brussels

[615] EC (2010) EU Budget Review. Communication form the Commission, COM(2010)700, 19.10.2011, Brussels.

- **Complementarity**: whether actions are complementary to already existing instruments / programmes at different levels of governance, thereby seeking to fill gaps and avoid duplications (ensuring additionality and avoiding crowding out); and
- **Synergetic effects:** whether actions seek to achieve synergetic effects (i.e. win-win solutions for low-carbon development, employment, the mitigation of greenhouse gas emissions and adaptation to climate change impacts). Actions should target cross-border challenges and exploit trans-national opportunities and partnerships (including integrated territorial initiatives and actions at the level of functional geographies, e.g. river basins, mountain areas and coastal zones).

It is important to note that climate change challenges are often of a trans-national nature which in many cases requires cross-border action. No single entity at the local, regional or national level is able to address this problem at sufficient scale.

Financial Instrument	
Criteria	**Indicators**
Effectiveness	• Scale • Multiplier of co-finance • Scope of action in relation to the typology of projects for climate change mitigation and adaptation • Flexibility • Monitoring
Efficiency	• Last (lower) economic cost • Low transaction costs • Risk allocation
EU added value	• Complementarity • Synergetic effects and cross-border action