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**COMMISSION STAFF WORKING DOCUMENT**  
*Accompanying the document*

**REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND  
THE COUNCIL**

**Financial support for energy efficiency in buildings**

{COM(2013) 225 final}

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## 1. WHY THIS REPORT?

Buildings are central to the EU's energy efficiency policy, as nearly 40%<sup>1</sup> of final energy consumption (and 36% of greenhouse gas emissions) is in houses, offices, shops and other buildings. Moreover, the building sector (including both residential and non-residential buildings) provides the second largest untapped and cost-effective potential for energy savings after the energy sector itself<sup>2</sup>. There are also important co-benefits from making buildings more energy efficient, including job creation and retention, health improvements, better energy security and industrial competitiveness<sup>3</sup> and fuel poverty alleviation (the latter being particularly relevant in the current financial and economic situation, where the number of vulnerable customers facing energy poverty is increasing).

The objectives of the report and this Staff Working Document are twofold. Firstly, under Article 10(5) of the Energy Performance of Buildings Directive recast (2010/31/EU<sup>4</sup>; hereafter called the "EPBD") the Commission is requested *"to present an analysis on, in particular;*

- (a) *the effectiveness, the appropriateness of the level, and the actual amount used, of structural funds and framework programmes that were used for increasing energy efficiency in buildings, especially in housing;*
- (b) *the effectiveness of the use of funds from the EIB and other public finance institutions;*
- (c) *the coordination of Union and national funding and other forms of support that can act as a leverage for stimulating investments in energy efficiency and the adequacy of such funds for achieving Union objectives."*

The report and this Staff Working Document present the main results of this analysis and draw conclusions as to how EU-level funding, funds from the European Investment Bank and other public finance institutions together with national support programmes could be better employed for increasing energy efficiency in buildings in the future.

Second, the new Energy Efficiency Directive<sup>5</sup> (hereafter called the 'EED') requires Member States to facilitate the establishment of financing facilities or use of existing ones for energy efficiency improvement measures to maximise the benefits of multiple streams of financing. More specifically for buildings, by April 2014, Member States must establish a long-term strategy for mobilising investment in the renovation of the national building stock, including policies and measures to stimulate cost-effective deep renovations.

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<sup>1</sup> In 2010. See "EU Energy in figures, 2012", European Commission

<sup>2</sup> Eichhammer, W. et al.: Study on the Energy Savings Potentials in EU Member States, Candidate Countries and EEA Countries. 2009;

Wesselink, B. et al.: Energy Savings 2020 – How to triple the impact of energy saving policies in Europe. Report to the European Climate Foundation, 2010

<sup>3</sup> Multiple benefits of investing in energy efficient renovation of buildings. Impact on Public Finances Copenhagen Economics, October 2012 (<http://www.renovate-europe.eu/Multiple-Benefits-Study>)

<sup>4</sup> OJ L 153, 18.6.2010, p.13

<sup>5</sup> Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC (OJ L315 of 14.11.2012, p.1)

The EED also stipulates that the Commission shall, where appropriate, directly or via the European financial institutions, assist Member States in setting up financing facilities and technical support schemes with the aim of increasing energy efficiency in different sectors.

Therefore, the report and this Staff Working Document also aim to indicate how financial support at European level for energy efficiency in buildings can be improved. As such, they complement the Commission Communication on a "Strategy for the sustainable competitiveness of the construction sector and its enterprises"<sup>6</sup>, published on 31 July 2012, which strongly advocates increased investments in the sector with a focus on the renovation and maintenance of buildings as a driving force in the creation of jobs.

## **2. BUILDINGS IN EUROPE**

### **2.1. The construction sector**

The construction industry is an important economic sector, generating almost 10% of GDP in the EU in 2011 and representing 51.5% of Gross Fixed Capital Formation. With close to 15 million employees it represents 7% of total employment and 30.7% of industrial employment in the EU. The sector includes 3.1 million enterprises of which around 95% have fewer than 20 employees.

Buildings-related construction activities represent by far the largest part of the sector, with non-residential being responsible for 33%, rehabilitation and maintenance for 25% and new home building for 19% in 2011 (the remaining 22% being civil engineering works)<sup>7</sup>.

### **2.2. The European building stock**

The Buildings Performance Institute Europe (BPIE) undertook a large survey of the European building stock in 2010. The study<sup>8</sup> estimated that there are 25 billion m<sup>2</sup> of useful floor space in the EU27, Switzerland and Norway, roughly equivalent to the land area of Belgium (30 528 km<sup>2</sup>). A quarter of the European building stock consists of non-residential buildings, around 50% of which are offices, wholesale and retail buildings.

It is estimated that public sector buildings constitute just over 10% of the total building stock in the EU<sup>9</sup>. A specific category of public sector buildings is that of buildings owned by the EU defence forces. The European Defence Agency estimates that this covers, collectively, infrastructure of a total estimated surface of about 200 million square metres<sup>10</sup>.

Regarding residential buildings, in 2009 42% of the EU-27 population lived in flats, 34% in detached houses and 23% in semi-detached/terraced houses, although there are large differences between countries (see figure 1).

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<sup>6</sup> COM(2012) 433 final

<sup>7</sup> Data for 2011. Construction activity in Europe. European Construction Industry Federation. June 2012

<sup>8</sup> Europe's buildings under the microscope. A country-by-country review of the energy performance of buildings. Buildings Performance Institute of Europe, October 2011.

<sup>9</sup> 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 and annexes (SEC(2011)779)

<sup>10</sup> European Armed Forces Go Green, European Defence Agency (for more information see: [http://www.eda.europa.eu/docs/documents/V3-Go\\_green\\_Factsheet\\_150312\\_CS5\\_vert](http://www.eda.europa.eu/docs/documents/V3-Go_green_Factsheet_150312_CS5_vert))

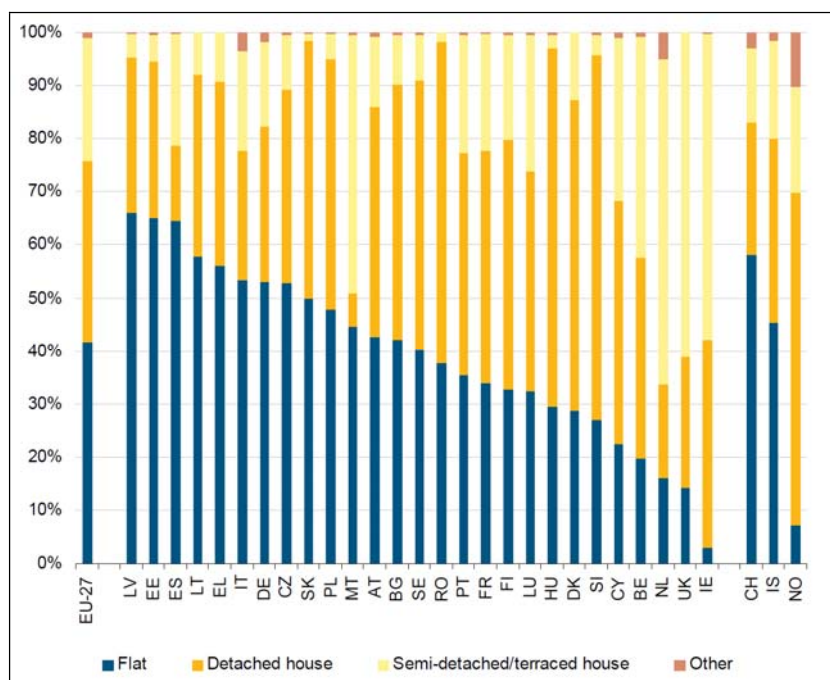


Figure 1: Distribution of population by dwelling type (% of population), 2009. Source: Eurostat (online data code: ilc\_lvho01)

In 2009, 73.5% of the EU-27 population owned their own homes, and 37% of the owners had a mortgage or a housing loan. In all countries at least half of the population owned their own homes, with figures ranging from 57.5% in Austria to 96.5% in Romania (see figure 2).

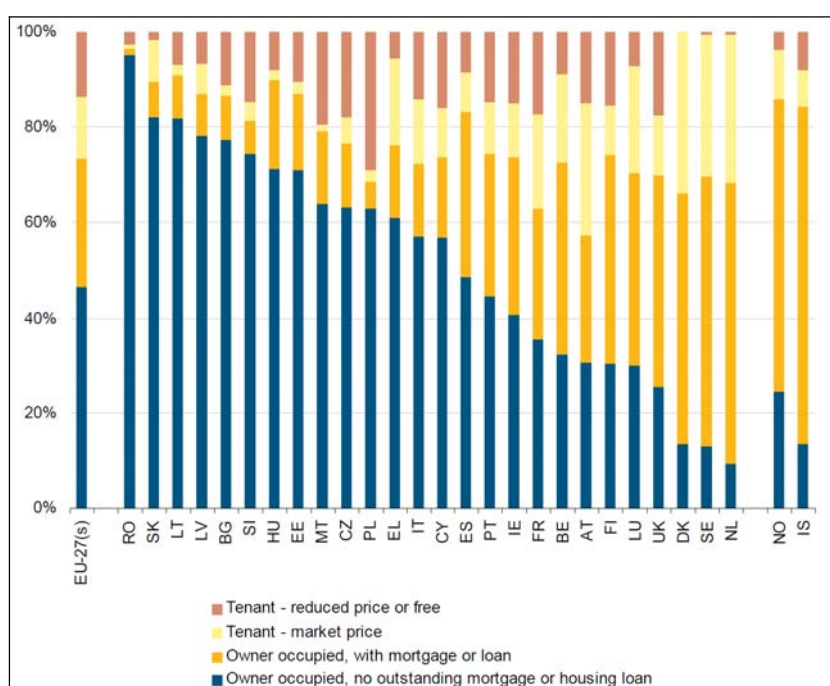


Figure 2: Distribution of population by tenure status (% of population), 2009. Source: Eurostat (online data code: ilc\_lvho02)

As regards the age of Europe's building stock, close to 40% of residential buildings were constructed before the 1960s and less than 20% during the last 20 years, although there are some differences between the different regions and countries in the EU (see figure 3).

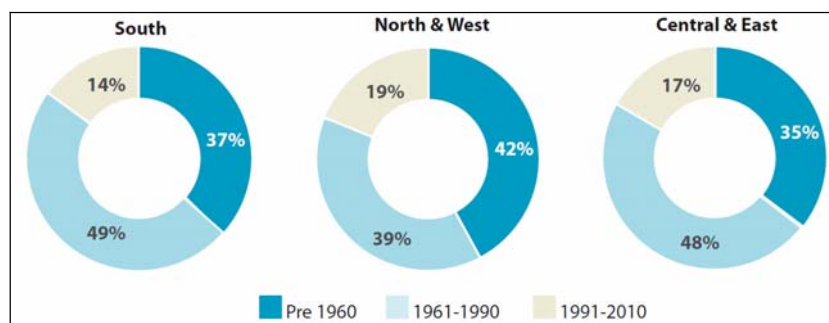


Figure 3: Age categorisation of housing stock in Europe. Source: BPIE

### 2.3. Energy performance of the European building stock

Buildings consumed 41% of total final energy consumption in Europe in 2010. This is the largest end-use sector, followed by transport (32%) and industry (25%). Average annual energy consumption was around 220 kWh/m<sup>2</sup> in 2009, with a large gap between residential (around 200 kWh/m<sup>2</sup>) and non-residential buildings (around 300 kWh/m<sup>2</sup>)<sup>11</sup>

The average energy consumption of the building sector has increased by around 1% per year since 1990, with non-residential buildings representing a 1.5% per year increase compared to 0.6% per year for residential buildings. This development is characterised by two main trends (see figure 4): a significant increase in the use of gas and electricity (by around 50%) and a strong decline in the use of solid fuels and oil (by 75% and 27% respectively).

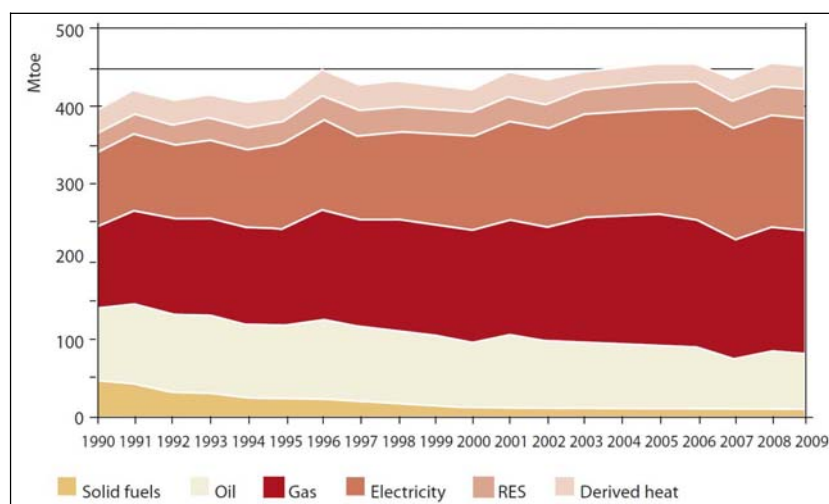


Figure 4: Historical final energy consumption in the household sector. Source: BPIE

In terms of CO<sub>2</sub> emissions from buildings, there are large differences between countries which are largely due to the energy mix and climatic conditions, and to a lesser extent to the deployment of renewable energy in buildings and the use of district heating and co-generation (see figure 5).

<sup>11</sup> Energy Efficiency Trends in Buildings in the EU, Lessons from the ODYSSEE/MURE project, 2012

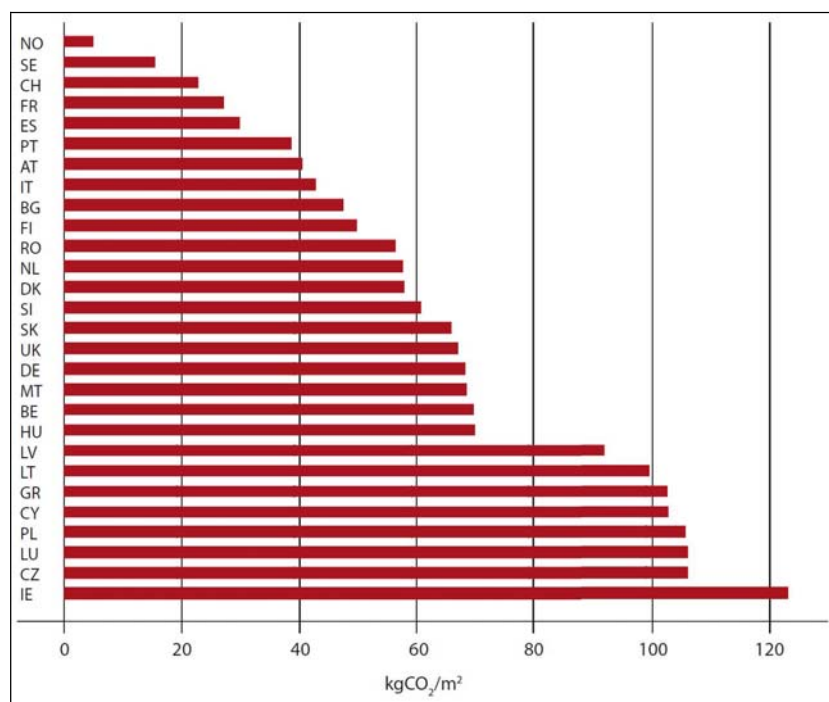


Figure 5: CO2 emission per useful floor area. Source: BPIE

Concerning the renovation rates of the building stock, there are little consistent data available about the number of renovations, their depth or developments over time. Most sources indicate a renovation rate between 1% and 2% per year as an average for the EU, while some individual countries have reported higher rates often as a result of specific renovation programmes in a given period<sup>12</sup>.

The above data show that the characteristics of the building stock differ significantly between Member States in terms of age, type, ownership and energy performance<sup>13</sup>. As a result, while policy and regulatory frameworks share common themes among countries, specific measures to improve the building stock will have to take into account these differences and a 'one-size-fits-all' approach is not appropriate.

### 3. EU FINANCIAL SUPPORT FOR ENERGY EFFICIENCY IN BUILDINGS

The European Union has been supporting the improvement of the energy performance of buildings for many years with a range of legislative and financing mechanisms and instruments. The table below gives an overview of the main instruments and available funding in this context:

<sup>12</sup> Europe's buildings under the microscope. A country-by-country review of the energy performance of buildings. Buildings Performance Institute of Europe, October 2011.

<sup>13</sup> Note that the figures for the energy performance of the building stock are based on an aggregation of the energy consumption figures for the residential and commercial sectors and also include non-building related consumption (e.g. electricity used for appliances such as televisions and refrigerators).

<b>Funding Source</b>	<b>Instruments/mechanisms</b>	<b>Total funding available</b>	<b>Funding for EE</b>
Cohesion Policy Funding	Operational Programmes incl. financial instruments (e.g. JESSICA)	EUR 10.1 billion planned for sustainable energy (RES & EE)	EUR 5.5 billion planned for EE, co-generation and energy management
Research Funding	FP 7 (e.g. Concerto, E2B PPP, Smart Cities)	EUR 2.35 billion for Energy research	EUR 290 million for energy efficiency
Enlargement Policy Funding	IFI facilities (SMEFF, MFF, EEFF)	EUR 552,3 million (381,5 +117,8 +53 respectively)	About one third of total funding for projects in industry and buildings
Programme for European Energy Recovery (EPR)	European Energy Efficiency Fund (EEEF)	EUR 265 million <sup>14</sup>	70% of funding to be dedicated to energy efficiency
Competitiveness and Innovation Funding (CIP)	Intelligent Energy Europe Programme (including ELENA) Information and Communication Technologies Policy Support Programme (ICT PSP)	Approximately EUR 730 million for each programme <sup>15</sup>	About 50% of the funding was dedicated to energy efficiency in all sectors

Table 1: Funding for energy efficiency under the current Multiannual Financial Framework (2007-2013)<sup>16</sup>

The following sections give further details about these instruments.

### 3.1. Cohesion policy funding

In the current 2007-2013 programming period, within the Cohesion Policy budget<sup>17</sup> significant funding is dedicated to sustainable energy, with about EUR 10.1 billion planned for energy efficiency and renewable energy investments across the EU as a whole, of which approximately EUR 5.5 billion for energy efficiency. Relative shares allocated to energy efficiency differ between Member States, to be seen in the light of the total volume of funds available, national needs and priorities set by each Member State. Based on the principle of shared management, the management of programmes supported by these funds is the responsibility of the Member States. Up to the end of 2011, almost EUR 3.8 billion had been allocated to specific energy efficiency projects, including revolving funds, representing an implementation rate of 68% (see table below).

<sup>14</sup> Note that the EU budget conferred to the Fund the amount of EUR 125 million (+EUR 20 million for Technical Assistance and EUR 1,3 million for awareness raising activities). The remaining EUR 140 million represents a contribution from the other founding partners of the Fund and not from the EU budget.

<sup>15</sup> Under Decision No 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), a total of EUR 3.62 billion was made available with an indicative share of 20% for both programmes.

<sup>16</sup> Relative shares allocated to RES and EE differ among Member States and have to be interpreted in the light of total volume of funds available. Note that it has typically not been possible to identify the specific share of this funding allocated to building-related projects.

<sup>17</sup> The European Regional Development Fund (ERDF), the Cohesion Fund (CF) and the European Social Fund (ESF).



*EU allocated decided amount*

*Last Annual Implementation Report  
selected projects 2011*

Member States	Structural Funds Community amount (€) (A)	EU Allocated amount (€) (B)	Intensity of total % (B) / (A)	Total projects selected EU Amount (€) (C)	Rate of selection % (C) / (B)
AT	1,204,478,581	6,156,013	0.5%	17,383,781	282.4%
BE	2,063,500,766	18,976,147	0.9%	9,675,338	51.0%
BG	6,673,628,244	258,104,621	3.9%	74,144,427	28.7%
CY	612,434,992				
CZ	26,539,650,285	962,852,453	3.6%	450,120,153	46.7%
DE	25,488,229,555	386,619,604	1.5%	307,047,003	79.4%
DK	509,577,239				
EE	3,403,459,881	28,760,241	0.8%	27,844,967	96.8%
ES	34,650,749,454	114,511,937	0.3%	33,326,165	29.1%
FI	1,595,966,044	24,243,917	1.5%	6,926,847	28.6%
FR	13,449,221,051	293,167,688	2.2%	225,425,306	76.9%
GR	20,210,261,445	261,075,251	1.3%	492,363,482	188.6%
HU	24,921,148,600	328,531,227	1.3%	163,856,263	49.9%
IE	750,724,742	15,500,000	2.1%	22,346,186	144.2%
IT	27,955,874,054	924,104,862	3.3%	416,896,101	45.1%
LT	6,775,492,823	370,508,149	5.5%	439,300,937	118.6%
LU	50,487,332	504,873	1.0%	1,744,838	345.6%
LV	4,530,447,634	60,220,000	1.3%	106,078,878	176.2%
MT	840,123,051	12,550,000	1.5%	3,096,758	24.7%
NL	1,660,002,737	34,250,000	2.1%	19,917,049	58.2%
PL	67,185,549,244	499,012,133	0.7%	389,379,855	78.0%
PT	21,411,560,512	74,824,271	0.3%	49,599,067	66.3%
RO	19,213,036,712	403,241,727	2.1%	60,131,969	14.9%
SE	1,626,091,888	9,173,788	0.6%	1,057,737	11.5%
SI	4,101,048,636	105,700,000	2.6%	73,707,906	69.7%
SK	11,498,331,484	78,584,184	0.7%	64,760,737	82.4%
UK	9,890,937,463	150,657,204	1.5%	165,215,566	109.7%
CB	7,905,148,128	119,762,374	1.5%	164,027,992	137.0%
<b>EJ27 + cross-border (CB)</b>	<b>346,717,162,577</b>	<b>5,541,592,664</b>	<b>1.6%</b>	<b>3,785,375,309</b>	<b>68.3%</b>

Table 2: Annual implementation of Cohesion Policy funding for Energy Efficiency up to end 2011. Source: European Commission

As regards buildings, in the past cohesion policy financed energy efficiency investments only in public and commercial buildings. Following an amendment of the ERDF Regulation in 2009, up to 4% of total national ERDF allocations may now be used for energy efficiency improvements and renewable energy investments (that support social cohesion) in existing housing in all Member States. Several Member States have taken this opportunity to invest in energy efficiency in housing, contributing to an increase of the total planned allocations of cohesion policy funds to energy efficiency (not only in buildings) for 2007-2013 from EUR 4.2 billion in 2008 to EUR 5.5 billion in 2013.

Experience over the last few years shows that Member States are making increasing use of cohesion policy funding for energy efficiency, especially in buildings, and that the use of financial instruments is growing.

A good example is France, which allocated its maximum envelope of EUR 320 million for energy investments in social housing in accordance with the revised ERDF Regulation. A

mid-term assessment of the programme found that EUR 200 million allocated to projects generated over EUR 1 billion of investment and created around 15 000 jobs with the renovation of more than 50 000 dwellings. The estimated average reduction of energy consumption amounted to 40%<sup>18</sup>.

The ERDF regulation allows Member States to set up financial instruments with their allocations for energy efficiency and renewable energy. When working towards urban development they can do so under Article 44(b) of the General Regulation, with support from the JESSICA initiative.

At the end of 2011, financial engineering instruments (FEIs) for urban development supported through cohesion policy constituted EUR 1 533 million of Operational Programmes' contributions in ten Member States with most of the support channelled through 18 holding funds (which may comprise support to energy-related components of projects which are part of integrated plans for sustainable urban development).

Cohesion policy also supported FEIs specifically for energy efficiency and renewable energy sources, which constituted EUR 345 million of operational programmes contributions in five Member States.

Financial instruments can contribute to making cohesion policies more effective and sustainable, thus helping regions to face their long-term challenges and increasing the long term impact of the policy. Experience has shown that more clear rules and more guidance are necessary to ensure sound financial management of financial instruments. In many respects, the management of financial instruments has already improved on the basis of guidance given and as a result of the regulatory amendments introduced.

Moreover, building on the implementation experiences with financial instruments in current and past cohesion policy cycles and reflecting the importance attached to them in the multiannual financial framework 2014-2020, the European Commission proposes to further expand and strengthen the use of such instruments in the next programming period as a more efficient and sustainable alternative to complement traditional grant-based financing.

One good practice example is the KredEx facility in Estonia which provides low interest rate loans for building refurbishments through a revolving fund. Since it started in mid-2009 until the end of 2012, 493 buildings with 18,281 apartments have been upgraded involving the renovation of 1,189 398 m<sup>2</sup> with an average expected energy reduction of 38%.<sup>19</sup>

Specifically with respect to the use of cohesion policy funding for energy efficiency in buildings, a recent special report of the European Court of Auditors<sup>20</sup>, based on audits of four operational programmes including a sample of 24 energy efficiency investment projects in public buildings, found that the audited projects in public buildings did not generate a good ratio between energy savings and the corresponding investment cost. The average planned payback period for the investments was around 50 years, although in 18 out of 24 audited projects actual energy savings could not be verified since they had not been reliably measured.

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<sup>18</sup> European Economic Recovery Plan COM(2008) 800 Final Measure n°6: Improving energy efficiency in buildings Reprogramming regional Structural Fund operational programmes to prioritise social housing. 2009-2011 MID-TERM ASSESSMENT - FRANCE

<sup>19</sup> Source: KredEx

<sup>20</sup> Cost-effectiveness of Cohesion Policy Investments in Energy Efficiency. Special Report No 21 2012. European Court of Auditors

While some of the audited projects may indeed have been less efficient in terms of the relation between cost and energy savings, several of them were designed before the current, stronger legislative framework was in place and carried out by public authorities with little experience in energy efficiency measures. Moreover, the multi-objective nature of cohesion policy, contributing to economic, social and territorial cohesion, requires an integrated approach and should be used in support of the deep renovation of buildings in order to meet the energy efficiency targets for 2020 and beyond. As such, the sole focus on a simple payback period is not appropriate in the context of long term energy efficiency investments.

Rather, the aim should be to encourage deep renovations leading to significant (typically more than 60%) efficiency improvements. This can be supported with a combination of both market-based instruments (loans, guarantees, Energy Performance Contracting schemes, etc.) for measures with a shorter payback time and grants for capital intensive measures with a longer payback time.

### **3.2. Research funding**

Under the current EU Research & Development Framework Programme (FP7 2007-2013), two research projects have been established focusing specifically on the building sector:

#### *3.2.1. 'Energy-efficient Buildings' Public-Private Partnership*

As part of the European Economic Recovery Plan, adopted in November 2008, the Commission launched in 2009 three Public-Private Partnerships (PPPs), to tackle the consequences of the global economic downturn. The aim of the three PPPs was to fund research and innovation in three key industrial sectors - manufacturing, construction and automotive - in order to boost competitiveness and support employment, while at the same time significantly contribute towards a more green and sustainable economy.

The construction sector PPP, which focuses on 'Energy-efficient Buildings' (EeB) has been allocated EUR 1 billion to promote green technologies and the development of energy efficient systems and materials in new and renovated buildings (including historic buildings) to radically reduce their energy consumption and CO<sub>2</sub> emissions. The programme is financed jointly by industry and the European Commission under the Seventh Framework Programme for Research (FP7) and is implemented through coordinated calls for research proposals. While the PPPs are still on-going, some preliminary conclusions can be drawn:

- The strategic alignment of private and public research objectives has facilitated increased industrial participation in the European R&D efforts (industrial participation in the PPP is as high as 55%, with SMEs receiving more than 20% of the total funding);
- A number of projects have already filed patent applications (with more expected), and results and exploitation plans are becoming more tangible, with target markets more clearly defined to enable market uptake of the new technologies;
- However, bridging the gap to the market remains one of the main challenges, with most of the obstacles to industrial uptake of results being of a non-technical nature (e.g. the lack of appropriate business models and financing mechanisms for the exploitation of new technologies).

### 3.2.2. *CONCERTO*

CONCERTO is a European Commission initiative within the European Research Framework Programme (FP6 and FP7) which aims to demonstrate that the optimisation of the building sector of whole communities is more efficient and cheaper than optimisation of each building individually, by elaborating a common measurement methodology and a common set of key performance indicators on energy efficiency improvements for all their projects. Since 2005 the initiative has co-funded, with around EUR 180 million, 58 communities in 22 projects in 23 countries, with the following results<sup>21</sup>:

- CONCERTO communities have halved the CO<sub>2</sub> emissions in their building sector, saving together around 310,000 tonnes of CO<sub>2</sub> per year;
- 1,830 million m<sup>2</sup> of building floor area have been built or renovated;
- The total electricity consumption of the CONCERTO communities has been reduced by 20% and the share of renewable energy in the electricity has increased significantly. 150 GWh of electricity and 250 GWh of heat are now produced annually from renewable energy.

The CONCERTO Initiative is continuously monitored and data are made accessible through a technical monitoring data base (TMD), permitting to assess the performances of different technology mixes as a decision-support tool for urban energy planning. As such it supports more accurate and standardised information on the savings and economic performance of improvement measures and energy efficiency projects (e.g. through a standard evaluation tool), and a wider sharing of successful practices.

### 3.3. **Enlargement funding through IFI facilities**

The European Union has a number of financing programmes in place which it implements in co-operation with International Financial Institutions (IFIs): the European Investment Bank (EIB), the European Bank for Reconstruction and Development (EBRD), the Council of Europe Development Bank (CEB) and the Kreditanstalt für Wiederaufbau (KfW).

These intermediated financial facilities were established under the PHARE instrument and blend EU grants with IFI funding. Of the total EU allocation of approximately EUR 550 million, around one third has been earmarked for energy efficiency related projects targeting both the industry and buildings sectors. Through these facilities, the IFIs leverage their relationships with local banks, reaching smaller projects to which they otherwise could not lend directly.

Each credit line is supported by a substantial and complex technical assistance package that builds capacity in the local market and helps investors and local banks overcome some of the barriers that hinder the implementation of these energy efficiency investments. The programme is delivered through three main facilities:

- The Energy Efficiency Finance Facility (EEFF): The EEFF aims at increasing investments in energy efficiency in order to improve the energy performance of buildings and the industrial sector in Romania, Bulgaria, Croatia, and Turkey.

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<sup>21</sup> CONCERTO Technical Monitoring Database

- The Municipal Finance Facility (MFF): The objective of the MFF is to develop and stimulate commercial bank lending to small and medium-sized municipalities in most of the EU12 countries and in certain applicant countries. Following early indications from the EEFF, this facility was recently extended to include a specific energy efficiency finance window.
- The SME Finance Facility (SMEFF): The objective of the SMEFF is to encourage banks, leasing companies and investment funds to expand and maintain long-term financing of SME operations in the EU12 countries and certain applicant countries. Following early indications from the EEFF, this facility was also recently extended to include a specific energy efficiency finance window.

The energy efficiency programmes only became fully established in 2010 but have nevertheless made notable progress with investments of EUR 518 million leveraged from EUR 112 million of EU grant support. A typical project will involve EU funded technical assistance in the form of energy audits, technical advice etc. along with financial incentives, of typically 15% of investment costs, which are designed to overcome related market barriers in these countries. While the projects vary considerably, the potential impact of such facilities can be judged from the following two examples<sup>22</sup>:

- The 2006 EEFF facility with the EBRD is now fully allocated involving a €100 million credit line combined with EUR 24 million EU support for technical assistance and incentives. As of mid-2012, approximately 80% of the loan volume has been utilised resulting in energy and emissions savings of ~1 GWh/y.
- Following the introduction of an energy efficiency window in the SMEFF, a number of projects have been agreed such as RoSEFF in Romania. This project involves a EUR 60 million IFI credit line and EUR 10.5 million EU grant support. This facility has benefited from lessons learned from EEFF in particular and involves smaller projects with simplified energy audits, lists of eligible measures and potential ESCO support. While only approved one year ago, the project indicates a rapid uptake and forecast energy savings of ~1.5 GWh/y.

### **3.4. EEE-F**

The European Energy Efficiency Fund (EEE-F) was established in 2011 with a volume of EUR 265 million, with funding coming from the European Union (through the European Economic Recovery Plan<sup>23</sup>), the European Investment Bank, the Italian public bank Cassa dei Depositi e Prestiti and Deutsche Bank. The fund provides debt, equity and guarantee instruments for commercially viable projects, as well as technical assistance grants to support project development (legal, financing and technical structure of the project). Around 70% of the funding is intended for energy efficiency projects, with the remainder going to renewable energy and clean urban transport actions. Beneficiaries are local and regional public authorities or private entities acting on their behalf. Projects must achieve at least 20% savings in primary energy demand, with requirements for buildings being stricter as they must achieve a performance improvement of at least two categories related to the energy performance certificate. The fund does not target pilots for new technologies but is focused on bringing already well-proven technologies to the mainstream, as well as strengthening the

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<sup>22</sup> Source: EBRD

<sup>23</sup> The EU budget conferred to the Fund the amount of EUR 125 million + EUR 20 million for Technical Assistance and EUR 1,3 million for awareness raising activities.

European ESCO market and the use of energy performance contracting. At present there is one project signed with 39 more projects in the pipeline.

The projects co-financed under this fund can serve as a generator of ideas for the next round of cohesion policy funding (2014-2020), for which the European Commission has proposed a significant increase of the funds allocated specifically to energy efficiency and renewable energies, also aiming for a much more intensive use of Financial Instruments (public funds leveraging the private capital) instead of relying mainly on grants.

The effectiveness of the fund will be subject to evaluation in 2013.

### **3.5. Intelligent Energy Europe II**

On 24 October 2006, the European Parliament and the Council approved the establishment of a EUR 3.6 billion Competitiveness and Innovation Framework Programme (CIP) (2007-2013). The Intelligent Energy Europe II (IEE II) programme was included in this framework programme (with a budget of EUR 730 million) to contribute to achieving the objectives of EU energy policy and to implementing the Lisbon Agenda. More specifically, IEE II's objective is to support the overcoming of non-technological barriers to the innovation, uptake, implementation and dissemination of solutions that contribute to sustainable, secure and competitively priced energy for Europe.

Between 2007 and 2011, IEE II supported more than 300 promotion and dissemination projects, representing more than EUR 300 million, allocated as follows:

- INTEGRATED (projects addressing both energy efficiency and renewable energy): 27%
- STEER (energy efficiency in transport): 17%
- SAVE (energy efficiency in buildings, products and industry): 25%
- ALTERNER (renewable energy sources): 31%

As regards its effectiveness, projects selected in 2009-2011 are estimated to have triggered cumulative investment by European stakeholders in sustainable energy of more than EUR 1500 million. This is mainly due to IEE projects preparing the ground for investment by increasing skills, publishing information for investors, supporting policy implementation, mobilising decision makers, and funding technical assistance. The estimated fossil fuel energy savings and greenhouse gas emissions reductions for all those projects were at least 350 000 tonnes of oil equivalent per year and 1 200 000 tonnes of CO<sub>2</sub> equivalent per year<sup>24</sup>.

Nearly a quarter of IEE II projects have targeted the building sector.

An evaluation of the programme in 2011<sup>25</sup> concluded that *"the programme is relevant and useful as it replies to the evolving needs, problems and barriers related to sustainable energy issues that Europe is facing. The combination of the actions which covers a wide spectrum of priorities, the involvement of different type of actors ... and in particular the combination of*

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<sup>24</sup> Annual Management Plan 2012 of the Directorate General for Energy: [http://ec.europa.eu/atwork/synthesis/amp/doc/ener\\_mp\\_en.pdf](http://ec.europa.eu/atwork/synthesis/amp/doc/ener_mp_en.pdf)

<sup>25</sup> Final Evaluation of the Intelligent Energy-Europe II Programme within the Competitiveness and Innovation Framework Programme. June 2011. Deloitte

*market solution oriented projects and projects targeting policy adaptation ... contribute to the effectiveness of the programme."*

Moreover, the evaluation stated: *"The assessment of the effectiveness of the actions supported, and taken individually, demonstrates that the activities co-funded/funded by the programme are likely to reach their objectives and to achieve expected results and lasting effects."*

### 3.5.1. ELENA Facility

The European Local Energy Assistance (ELENA) Facility, which is financed under IEE, provides grants to local and regional public authorities for developing, structuring and launching investments in energy efficiency and renewable energy. The facility is implemented through IFIs (EIB, KfW, CEB and EBRD), and covers up to 90% of costs incurred for technical support needed for feasibility and market studies, programme structuring, energy audits and the preparation/launch of tendering procedures. From its launch until the end of 2012 the facility had the following budget allocations (in EUR million):

	<b>EIB</b>	<b>KfW</b>	<b>CEB</b>	<b>EBRD</b>	<b>Total</b>
2009	15	0	0	0	<b>15</b>
2010	15	0	0	0	<b>15</b>
2011	19	8	3	0	<b>30</b>
2012	22	8	2	5	<b>37</b>
<b>Total</b>	<b>71</b>	<b>16</b>	<b>5</b>	<b>5</b>	<b>97</b>

**Table 3: IEE II budget contributions to the ELENA Facility windows**

An analysis of the performance of the ELENA - EIB facility<sup>26</sup> shows that the leverage effect for current projects is **54**, i.e. more than double the required level of 20, potentially leading to investments of over EUR 1.5 billion. It is estimated that energy savings from signed and approved projects could reach 919 GWh per year, with total avoided CO<sub>2</sub> emissions reaching 588,357 tonnes per year.

### 3.6. Information and Communications Technologies Policy Support Programme

Another component of the Competitiveness and Innovation Programme (CIP) is the Information and Communications Technologies Policy Support Programme (ICT PSP), with a budget of EUR 730 million.

The ICT PSP aims at stimulating smart and inclusive growth by accelerating the wider uptake and best use of innovative digital technologies and content by citizens, governments and businesses. Between 2007 and 2013 more than EUR 74 million was allocated to actions in the area of energy efficiency and sustainability, resulting in 35 pilots and 5 thematic networks. Projects covering residential and non-residential buildings (including social housing and public buildings) have built common methodologies to calculate energy savings via ICT and

<sup>26</sup> Technical assistance support provided for project development services European Local Energy Assistance – ELENA and Mobilising Local Energy Investments – MLEI. Information to the IEE Management Committee, May 2012

the results are showing significant reductions in energy consumption and CO<sub>2</sub> emissions of up to 20%.

Experience also shows that there are certain barriers to the uptake of ICT solutions, often not of a technical but organisational nature, including lack of access of third parties to gas or electricity meters for gathering energy consumption data and increased cost for energy management services if additional meters would have to be installed. These barriers can be overcome through direct involvement of responsible grid operators and utilities in the development and operation of the ICT based solutions/services.

#### **4. FUNDING FOR ENERGY EFFICIENCY IN BUILDINGS BY INTERNATIONAL FINANCIAL INSTITUTIONS**

Besides their role in implementing EU funding programmes (see above), the European international financial institutions operate their own investment instruments for energy efficiency in buildings. The sections below provide insight into these instruments.

##### **4.1. EIB funding**

From 2008 onwards, the European Investment Bank (EIB) has “mainstreamed” energy efficiency into its operations, based on the following criteria:

- (a) Investments where energy cost savings can justify at least 50% of the investment cost or investments resulting in energy savings of at least 20% compared to the baseline energy consumption;
- (b) Investments aimed at reducing the energy consumption towards cost-optimum refurbishment levels in existing buildings. For new buildings, the (incremental) part of the investment cost in relation to the minimum standard considered in the national legislation, in application of the relevant EU Directive.
- (c) Investments in high efficient cogeneration (CHP) and small scale cogeneration and micro-generation, meeting the criteria of the relevant EU Directive, and investment in sustainable district heating/cooling networks.

This has resulted in the following funding volume per sector in the EU (in EUR million):

<b>Year</b>	<b>Buildings</b>	<b>CHP</b>	<b>DH</b>	<b>Industry</b>	<b>Multi-sector</b>	<b>Total</b>
2008	68.3	218.5			392.5	<b>679.2</b>
2009	473.9	546.5		60.0	447.5	<b>1528.0</b>
2010	759.2	125.0	116.0	391.0	226.8	<b>1618.0</b>
2011	424.4	205.1	95.0	50.5	263.8	<b>1038.8</b>
<b>Total</b>	<b>1725.8</b>	<b>1095.1</b>	<b>211.0</b>	<b>501.5</b>	<b>1330.7</b>	<b>4864.0</b>

**Table 4: EIB Funding to energy efficiency projects the EU (2008 – 2011). Source: EIB**

As regards the effectiveness of these funds, the EIB has developed a carbon footprint methodology over the period of 2009-2011. Although the methodology does not capture all



energy efficiency lending, it is estimated that the annual greenhouse gas emissions avoided as a result of the energy efficiency projects are 3523 ktCO<sub>2</sub>e (or 1005 ktCO<sub>2</sub>e if prorated to EIB financing) in 2010 and 679 ktCO<sub>2</sub>e (or 379 ktCO<sub>2</sub>e when prorated to EIB financing) in 2011.

#### 4.2. EBRD funding

Since 2002, the European Bank for Reconstruction and Development (EBRD) has invested EUR 2.3 billion in 153 energy efficiency projects in its EU countries of operations, including Bulgaria, Czech Republic (which stopped receiving EBRD financing as of 31 December 2007), Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic, Slovenia, and Estonia.

EE Investments	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total
EUR (million)	184	50	197	352	223	158	98	191	470	400	2,321

Table 5: EBRD Funding to energy efficiency projects the EU (2002 – 2011). Source: EBRD

EU funding in support of these investments amounted to approximately EUR 463 million since 2002 through various sources. These funds are typically used to fund Technical Assistance (TA) and grants.

Since 2002, the EBRD has provided loans and equity to 104 energy efficiency projects in the EU, amounting to EUR 1.8 billion. The total funding mobilised on the market during this period amounts to EUR 14.9 billion which indicates a leverage of approximately 1:7.

As regards the effectiveness of these investments, the loans disbursed and equity issued in the amount of EUR 1.8 billion in the EU since 2002 have delivered estimated emission reductions of 5 million tonnes of CO<sub>2</sub> per year. Energy savings are estimated at 1.8 mtoe per year.

#### 4.3. CEB funding

Since 2002, the Council of Europe Development Bank (CEB) has approved a total of approximately EUR 2.4 billion in favour of projects wholly or partially concerning energy efficiency. Out of this total, more than EUR 1.9 billion (i.e. more than 75%) was devoted solely to energy efficiency.

EU funding in support of these investments amount to approximately EUR 181 million since 2002 through various sources. No data about the impact of this funding are available.

### 5. FUNDING FOR ENERGY EFFICIENCY IN BUILDINGS BY NATIONAL PROGRAMMES

National governments also use their own budgets to support energy efficiency in buildings. All EU Member States have financial support measures for this purpose, ranging from fiscal incentives and grants to loan and guarantee schemes. Many of these measures have been reported to the Commission through National Energy Efficiency Action Plans (NEEAPs)<sup>27</sup> and under the EPBD.

These reports show that building-related measures represent a very high share of the reported energy savings (e.g. 58% for Italy, 63% for Ireland, 71% for Slovenia and 77% for Austria).

<sup>27</sup> NEEAPs are a reporting obligation under Directive 2006/32/EC on energy end-use efficiency and energy services. All NEEAPs (and if relevant their translation in English) can be found on: [http://ec.europa.eu/energy/efficiency/end-use\\_en.htm](http://ec.europa.eu/energy/efficiency/end-use_en.htm)

Further analysis of these instruments shows that the vast majority are grants, followed by 'soft' loan schemes and tax incentives (see figure below). Instruments such as energy performance contracting, the use of assigned amount units (AAUs) under the Kyoto Protocol, tax incentives (e.g. property taxes) and energy suppliers' obligations are also being used.

Member State	Grants	Soft loans	Tax incentives	Sale of AAUs to finance EE	Energy Performance Contracting	EU Structural and Cohesion Funds
AT	x	x	x		x	
BE	x	x	x		x	
BG	x	x			x	x
CY	x	x				
CZ	x	x	x	x	x	x
DK	x		x			
EE	x	x	x	x		x
FI	x	x	x			
FR	x	x	x		x	x
DE	x	x	x		x	
GR	x	x	x			x
HU	x	x		x		x
IE	x		x		x	
IT	x	x	x		x	x
LV	x	x	x	x	x	x
LT	x	x	x	x	x	x
LU	x	x	x			
MT	x	x	x		x	x
PL	x	x		x	x	x
PT	x		x		x	x
RO	x	x	x		x	x
SK	x	x	x			x
SI	x	x	x		x	x
ES	x	x	x		x	
SE	x		x	x	x	
NL	x	x	x		x	
UK	x	x	x		x	x

Table 6: Financing tools reported by Member States in their second NEEAPs (note that as regards the use of Structural and Cohesion Funds the situation may have changed since the NEEAP was submitted)

In terms of the numbers of programmes in place, over three quarters are grants and loans, with tax incentives making up the remainder<sup>28</sup>. Further analysis by the International Energy Agency (IEA) shows that in buildings, financial tools (in particular grants and tax relief) are most often used to encourage the installation of individual energy-efficient components in buildings (leading to reductions of 10-30% in energy consumption in the buildings addressed), rather than the more comprehensive retrofits (delivering improvements in the 50-80% range) which are needed<sup>29</sup>.

Few Member States have provided details of the effectiveness of national support measures, making it difficult to obtain a good overview of their impact. Studies that have looked at the use of financial instruments by governments<sup>30,31,32</sup> confirm this finding and indicate that this is

<sup>28</sup> Energy efficiency policies in buildings – the use of financial instruments at Member State level. BPIE, August 2012

<sup>29</sup> Mobilising investment in energy efficiency: economic instruments for low-energy buildings, *IEA Insights paper*, OECD/IEA, 2012, Paris

<sup>30</sup> Ibid 21, 22

largely due to the lack of *ex-ante* energy efficiency objectives, monitoring requirements and/or *ex-post* evaluation. This is compounded by the fact that if *ex-ante* or *ex-post* evaluations do take place, they are difficult to compare due to the use of different indicators, measurement methodologies and scope of the instruments.

Of those Member States that do report on effectiveness, the key performance indicators most used are energy and CO<sub>2</sub> savings (both *ex-ante* and *ex-post*), and number of applications (mostly *ex-post*).

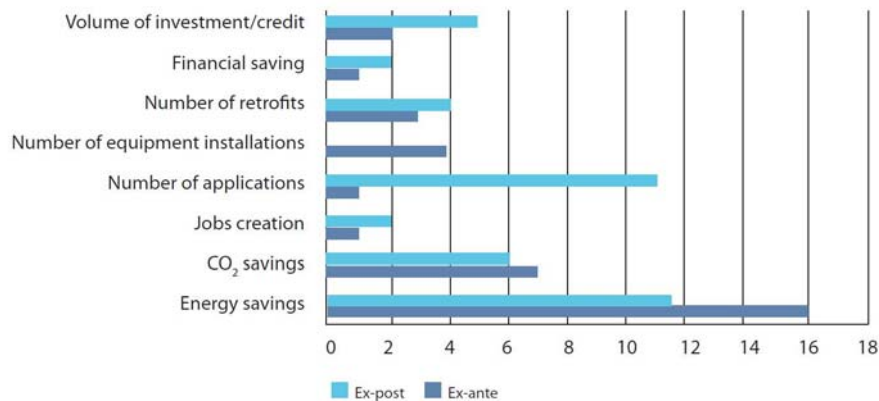


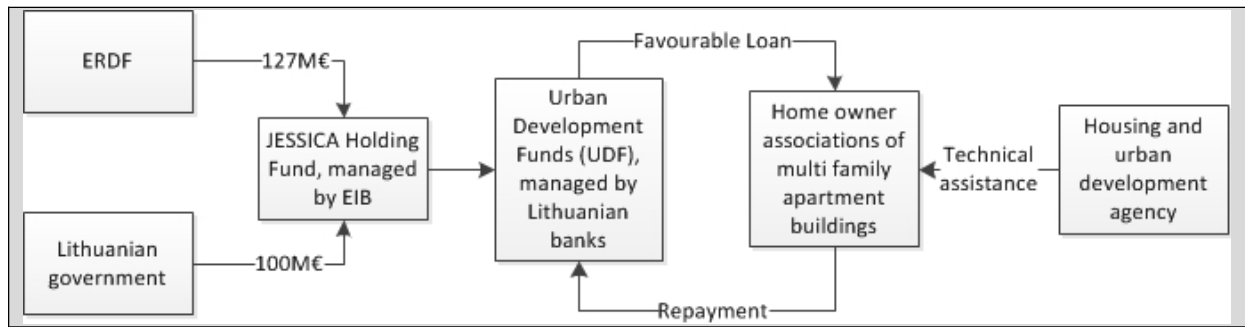
Figure 6: Number of programmes that reported (i.e. 37 out of 100) ex-ante and/or ex-post impacts by different key performance indicators. Source: BPIE

As regards the link with EU funding, 16 Member States reported the use of cohesion policy funding for energy efficiency investments in their NEEAPs and there are some good practice examples of the use of EU funds to support energy efficiency in buildings at national level (see above). These and other good practice examples indicate that EU funds can trigger additional national public as well as private investments, although experience has shown that there is a need for further capacity building and development of relevant expertise in this area in order to design the investments in an optimal way.

A good example of blending cohesion policy funding with national funds, is the Jessica Holding Fund in Lithuania. The fund offers long term loans, through two Lithuanian banks, with fixed interest rate (3%) for the improvement of energy efficiency in multifamily buildings. 15% of the loan can be deducted from taxes if a certain energy efficiency level has been achieved upon completion. For applicants/families with a low income, up to 100% of the loan can be converted into a grant, allowing the programme to mitigate against the risk of energy poverty.

<sup>31</sup> Making money work for buildings. Financial and fiscal instruments for energy efficiency in buildings. EuroACE, September 2010

<sup>32</sup> Lead Market Initiative - Assessing the impact of national recovery measures on construction in the EU-27, ECORYS et al. November 2012



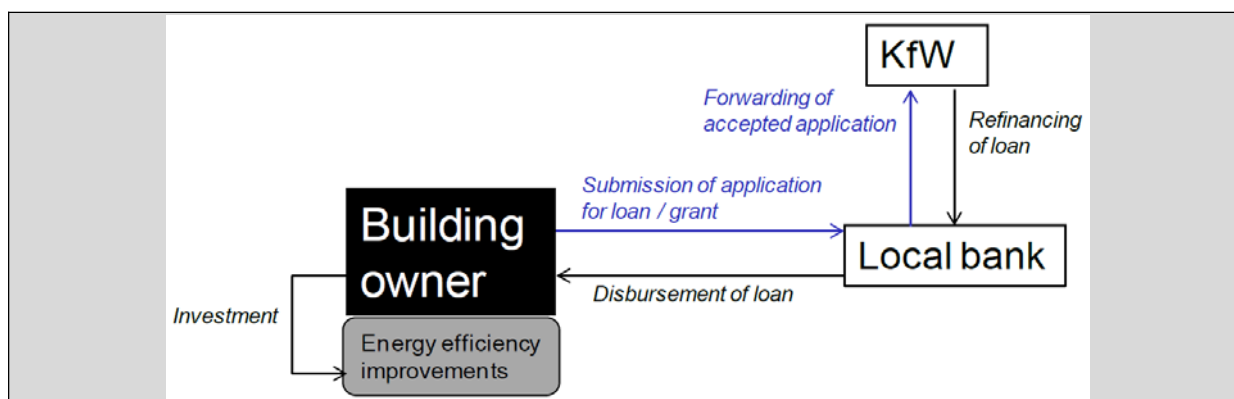
The experience with these and other similar programmes shows that it is important for Member States to plan for the combination of cohesion policy and national funds well in advance and design their operational programmes appropriately.

A study for the Commission looking at 25 financial support schemes for energy efficiency<sup>33</sup>, with the aim to identify best practices and bottlenecks in their implementation, concluded that most successful programmes are based on preferential loans, often complemented with a grant and/or technical assistance package, but that their success depends on more factors than just the financial terms and conditions, including:

- A simplified, possibly one-stop-shop, administrative procedure to reduce entry barriers and bureaucracy;
- Inclusion of local actors (e.g. municipality, banks, companies) to build trust and capacity;
- Information to citizens to enhance demand and remove fear and perceived risks;
- Flexibility in (European) funding conditions to adapt the national/local schemes to the specific barriers and opportunities in that region;
- Imposing minimum performance thresholds for eligibility to create incentives.

A good example of a national model for financing energy efficiency in buildings that follows many of these recommendations are KfW's Energy efficient Refurbishment Programmes in Germany. Through this programme, KfW (a government-owned development bank) provides soft loans to local banks, which on-lend these funds to: private homeowners, homeowners' associations and housing companies. The programme applies a mixture of soft loans and grants, and the more efficient the house becomes after refurbishment, the less of the loan the building owner has to repay.

<sup>33</sup> Local investments options in energy efficiency in the built environment – Identifying best practices in the EU. Ecorys, November 2012



Between 2006 and 2012, these programmes had a total volume of close to EUR 51 billion (covering more than 1.1 million loans and grants), resulting in an accumulated GHG reduction of roughly 6 million tonnes of CO<sub>2</sub> equivalent.

As regards the effectiveness of this funding, KfW commissioned a study in 2011 to look at the impacts of the programmes targeted at energy efficiency in buildings, which showed significant benefits not only in terms of energy saved but also with respect to wider societal gains mainly in the form of jobs created and/or maintained. The study estimated that for every euro invested in these programmes 2 to 5 euros were flowing back to state coffers mainly due to increased tax revenues and reduced unemployment benefit payments.

## 6. PRIVATE SECTOR FUNDING FOR ENERGY EFFICIENCY IN BUILDINGS

The private sector provides the majority of financing for energy efficiency projects in buildings. Next to building owners and occupiers who invest in upgrading their properties and homes, commercial banks are increasingly also showing interest in this sector even though the level of commercial financing is still relatively low.

A good example of a private sector scheme, albeit one imposed by government, is the energy supplier obligations scheme in the UK. Under this scheme, energy suppliers are obliged to meet CO<sub>2</sub> reduction targets by encouraging households to voluntarily take-up energy saving measures. Energy suppliers are free to decide how to achieve their targets, but have typically promoted the most cost-effective measures such as cavity wall and loft insulation. The households eventually pay for the suppliers' investments via higher energy prices.

As such, the utilities act similarly to ESCOs by paying the upfront costs and recouping their investments through monthly bills, while guaranteeing an overall cost reduction for their clients. The programme is expected to result in EUR 6.25 billion of energy efficiency investments over the whole project period (2008-2012). The investments are completely covered by the energy supply companies and the programme requires no public funding.

However, as a result of the large number of relatively small-scale and widely differing size of investments by private home owners, there is no comprehensive overview of the funds being allocated to energy efficiency improvements in dwellings. Although investments tend to be larger in the non-residential sector, given the wide variety in the type of non-residential buildings (ranging from hospitals to offices and from swimming pools to shops) also here robust data about the scale of investments into energy efficiency are absent.

More generally, in its World Energy Outlook 2012<sup>34</sup> the International Energy Agency estimates that global investment in projects aimed principally at improving energy efficiency amounted to EUR 150 billion in 2011 in all sectors. Investment in the European Union reached approximately EUR 55 billion.

However, as the IEA indicates in its report: *"Investments in energy efficiency (whether by the public or private sector) are seldom tracked systematically and no comprehensive estimate is available of current global investment in energy efficiency. This is due to the fact that energy efficiency investments are undertaken by a multitude of agents, households and firms, often using their own funds. Moreover, there is no standard definition for what constitutes an energy efficiency investment."*

## 7. WHAT COULD BE DONE TO STIMULATE MORE AND MORE EFFECTIVE INVESTMENTS?

The picture that is emerging from the examination of the European building stock, the existing financial support measures for building renovation and the different market barriers, shows that:

- The situation differs significantly between Member States in terms of their building stock (e.g. age, energy performance, tenure, etc.), the financial support measures in place (e.g. amount of funding, types of measures, effectiveness, etc.) and the relevant market barriers (e.g. capacity and awareness, support structures, regulatory framework, etc.);
- While the investments in building energy efficiency are increasing and there are many best-practice examples of existing instruments that are delivering cost-effective energy savings, there is only limited information on the effectiveness of the different financial support measures for energy efficiency in buildings, both at EU and national levels;
- There continue to be important barriers that hamper further uptake of energy efficiency investments in buildings, including a lack of awareness and expertise regarding energy efficiency financing on the part of all actors (e.g. authorities, construction companies, local banks and end borrowers); high initial costs, relatively long pay-back periods and (perceived) credit risk associated with energy efficiency investments; limited availability of funding due to overall deleveraging by banks and increasing capital adequacy requirements; and competing priorities for final beneficiaries.

This picture was broadly confirmed by the views of stakeholders submitted to the Commission in response to a public consultation which ran between February and May 2012<sup>35</sup>. During this period, a total of 116 responses were received, with around 40% coming from European organisations (mainly trade associations and NGOs). Of the remaining 69 responses, most (53) came from the five most populous EU Member States (i.e. Germany, France, United Kingdom, Italy and Spain).

The following sections outline the actions and initiatives that are and could be undertaken to improve the current situation, integrating stakeholders' comments.

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<sup>34</sup> International Energy Agency. World Energy Outlook 2012. November 2012

<sup>35</sup> The consultation questions, responses and overview of results can be found on: [http://ec.europa.eu/energy/efficiency/consultations/20120518\\_eeb\\_financial\\_support\\_en.htm](http://ec.europa.eu/energy/efficiency/consultations/20120518_eeb_financial_support_en.htm)

## 7.1. Strengthening the regulatory framework

With the recently adopted Energy Efficiency Directive (EED), the recast of the Energy Performance of Buildings Directive and the relevant implementing measures under the Ecodesign and Energy Labelling Directives (e.g. for boilers and lighting), a comprehensive regulatory framework for energy efficiency in buildings is now in place at the EU level.

Many stakeholders responding to the public consultation consider that there is no immediate need for further EU regulation, although they stressed the need for a long-term vision and commitment to energy efficiency, with some arguing for binding targets. Rather, an ambitious implementation and strict enforcement of existing European energy efficiency legislation by the Member States (in particular requirements related to renovation roadmaps, addressing the existing market failures and barriers, ensuring a qualified and well-trained workforce, and how to make best use of EU funding and financial instruments), was seen by many respondents as a key precondition for success. This was confirmed by a recent global survey of over 400 executives in the building sector by the Economist Intelligence Unit<sup>36</sup>, which shows that 75% of respondents believe that a lack of enforcement is the main obstacle to full implementation of energy efficiency regulations.

Moreover, the need for a better coordination between different policy areas (e.g. energy efficiency and regional policy) and among policy makers was raised (e.g. link between ministries in charge of energy efficiency and SCF Managing Authorities). Other suggestions included allowing the use of the VAT and broader taxation regime to promote energy efficiency measures and services, changing the public procurement and state aid rules to promote energy efficiency, and adopting a single EU-wide calculation and certification scheme for energy efficiency in buildings.

The Commission will closely **monitor Member State implementation** and take all necessary steps to ensure full compliance with the relevant EU regulatory framework, including the EPBD, the EED, the Ecodesign and energy labelling Directives, the Commission Recommendation on preparations for the roll-out of smart metering systems, etc.). The Commission will also continue to facilitate exchange of best practices between the Member States through dedicated **Concerted Actions for the implementation of the EPBD and the EED**.

As regards state aid control, the Commission is **reviewing whether the rules for state aid** as applying to energy efficiency need to be adapted in light of the provisions of the EED to maintain a clear framework for allowing financial support for energy efficiency measures.

As regards public procurement, the new Energy Efficiency Directive already requires Member States **to ensure that central governments purchase** (under certain conditions) **only products, services and buildings with a high energy-efficiency performance**, as applicable to contracts above the thresholds laid down in Article 7 of Directive 2004/18/EC<sup>37</sup>. Moreover, public bodies at regional and local levels are to be encouraged to do the same.

The Commission is developing **a common EU-wide certification scheme for the energy performance of non-residential buildings**, with the aim to define a common methodology to

<sup>36</sup> Energy efficiency and energy savings. A view from the building sector. Economist Intelligence Unit Ltd. 2012

<sup>37</sup> Directive 2004/18/EC on the coordination of procedures for the award of public works contracts, public supply contracts and public service contracts (OJ L134 of 30.4.2004, p. 114)

express the energy performance of non-residential buildings at European Union level in order to enhance the transparency of the Union's non-residential property market. The development of a common EU calculation method will be based on a revised set of EPBD-related CEN standards, which represents a unique opportunity to harmonise the energy performance certification of buildings across Europe on a voluntary basis.

## 7.2. Improving access to financing

As the analysis of EU funding and the link with national instruments in the previous chapters has shown, despite many positive experiences, there is still significant scope to improve the uptake and effectiveness of EU financial support. This was confirmed by the responses to the public consultation which were overwhelmingly positive about the available financial tools at EU level (including the Cohesion Fund, ERDF (including financial instruments for urban development set up with the support of the JESSICA initiative), ELENA, MLEI, EEE-F and the IEE programme), while decrying the complexity and bureaucracy of the application procedures, and pointing to a lack of awareness about funding opportunities, especially at local level.

Suggestions to improve this situation included building in more flexibility in how cohesion funding is used (e.g. by blending loans with grants) so that solutions can be better targeted to individual Member States' needs, greater bundling opportunities for smaller projects and the establishment of national or regional funds or financing schemes with EU funding that provide loans to the owners or end-users of buildings for investments in energy efficiency. More guidance for policymakers (especially at local level) on how to make better use of ERDF funding, including information about best practices in other Member States, was also seen as important.

One of the main barriers to scaling up investment in energy efficient building is insufficient demand for such investment from building owners. Identifying and developing a pipeline of financially attractive projects is a key challenge that Member States must work to address. In pursuit of this aim, stakeholders advocated the use of public funds to provide technical assistance, ensure the provision of loans on attractive terms (through subsidies or guarantees). Public funds can also stimulate the ESCO/EPC market, for example, by providing a source of finance for measures installed in public sector buildings.

Moreover, the need to provide investors with more objective, reliable and standardised information on loan performance (e.g. payback periods, Return on Investment, default rates) was cited as being key to scaling up private sector interest in this area.

As regards national financial instruments more generally, stakeholders reported a need for more stable support measures, and a better use of taxation (e.g. reduced property taxes or stamp duties for more energy efficient buildings), state aid and public procurement mechanisms to create sustained demand.

The Commission is working to ensure greater availability of EU funding to support scaled-up investment in energy efficiency. In its proposals for the next Multi-Annual Financial Framework (MFF), the Commission has proposed to **increase cohesion policy funding for low carbon economy measures** (mainly through the ring-fencing of 20% of the ERDF for energy efficiency and renewable energy in more developed and transition regions and 6% in less developed regions), to **expand the use of financial instruments** and to **remove the 4% limit on support for sustainable energy investments in housing**.



Furthermore, the Commission will develop further **technical guidelines on the use of innovative financial instruments** during the first half of 2013 to facilitate a wider uptake, and a better coordination and implementation of such instruments.

Member States now have to **ensure that the operational programmes elaborated under the new MFF are designed to make optimal use of cohesion policy funding for investments in energy efficiency**, in combination with national (and possibly IFI) funding and financial instruments.

The new EED creates an opportunity for Member States to introduce a step-change in the levels of investment into energy efficient buildings, as it requires the Member States to establish by April 2014 **a long-term strategy for mobilising investment in the renovation of the national stock of residential and commercial buildings, both public and private**. Such a strategy will have to encompass;

- (a) *an overview of the national building stock based, as appropriate, on statistical sampling;*
- (b) *identification of cost-effective approaches to renovations relevant to the building type and climatic zone;*
- (c) *policies and measures to stimulate cost-effective deep renovations of buildings, including staged deep renovations;*
- (d) *a forward-looking perspective to guide investment decisions of individuals, the construction industry and financial institutions;*
- (e) *an evidence-based estimate of expected energy savings and wider benefits.*

Moreover, the EED requires Member States to **facilitate the establishment of financing facilities**, or use of existing ones, **for energy efficiency improvement measures** to maximise the benefits of multiple streams of financing. Such a strategy should make optimal use of the financial resources available at EU level and should also systematically explore the role of fiscal instruments and public procurement in stimulating energy efficiency in buildings.

To support the Member States with this task, the Commission intends to **establish a specific support and capacity-building initiative**, possibly in the mould of the IEE II Build-UP Skills initiative.

To improve information about the effectiveness of existing and planned financial instruments and projects, ex-ante and ex-post evaluations, and on-going monitoring of their impacts, should systematically be undertaken. To assist the Member States with this task, the Commission will, during 2013, develop **guidelines for the selection and evaluation of energy efficiency projects in the context of cohesion policy funding**, with the aim to establish a more standardised approach. This will also seek to develop a harmonised set of performance indicators for energy efficiency improvements (possibly including a wider resource efficiency and life cycle approach) which Member States can use in their respective programmes/projects as appropriate and that build on state-of-the-art knowledge, including from EU funded research projects.

Moreover, the Commission intends to continue its **support for project development assistance** in this area through the continuation of the ELENA Facility under Horizon 2020.

The next edition of this assistance will be open to a wider range of beneficiaries, both from public and private sectors, to support the development and launch of innovative sustainable energy financing schemes. In parallel, the Commission will establish a monitoring and evaluation framework to facilitate the standardisation of energy efficiency investments thus enabling benchmarking of supported investment projects.

Finally, by **providing support for pre-commercial and first-commercial public procurement of innovation under Horizon 2020**, the Commission aims to incentivise industry to invest in new research and innovation for solutions fitting public service needs, or to invest in adapting the outcome of such research to meet larger market price/quality requirements from the public sector.

### 7.3. Addressing market failures

There are many market failures preventing improvements to the energy performance of buildings, ranging from technical and financial barriers to informational and behavioural hurdles (for an overview of the main ones, see EC, 2012).

A large majority of the respondents to the public consultation considered that financial barriers are the most urgent to address, particularly:

- High upfront investment costs and limited access to credit;
- Too long payback times and credit risks;
- Split incentives between owners and tenant and problems in multi-apartment buildings.

Nevertheless, several responses stressed that the relative importance of the various barriers will differ per Member States and per sector (e.g. residential, commercial, public).

Moreover, stakeholders identified a need for a more robust certification framework and support for energy service providers, such as ESCOs and auditors, to increase the quality of their services and improve trust in the energy performance contracting concept.

Furthermore, the lack of appropriate and trustworthy information about energy savings, efficiency measures and financial support instruments (for building owners, building professionals and the financial sector) was seen by many respondents as the most urgent other barrier to address.

Finally, stakeholders also identified education and training, as well as standardised monitoring of energy savings as important areas for further improvement.

With respect to market barriers, the new EED requires Member States to evaluate and take appropriate measures to remove regulatory and non-regulatory barriers to energy efficiency, in particular as regards:

- *"the split of incentives between the owner and the tenant of a building or among owners, with a view to ensuring that these parties are not deterred from making efficiency-improving investments that they would otherwise have made by the fact that they will not individually obtain the full benefits or by the absence of rules for*

*dividing the costs and benefits between them, including national rules and measures regulating decision-making processes in multi-owner properties; and*

- *legal and regulatory provisions, and administrative practices, regarding public purchasing and annual budgeting and accounting, with a view to ensuring that individual **public bodies are not deterred from making investments in improving energy efficiency** and minimising expected life-cycle costs and from **using energy performance contracting and other third-party financing mechanisms on a long-term contractual basis.**"*

While the provision of tailored advice regarding financial support instruments and technical solutions for energy efficiency in buildings (especially towards home-owners and SMEs) should preferably be organised at national, regional and/or local level (e.g. through the creation of 'one-stop-shop' services which exist already in several Member States), the Commission will investigate whether the information provided at EU level could be improved (mainly through the **Build UP web portal**: [www.buildup.eu](http://www.buildup.eu)).

The Commission will also launch a study in 2013 to obtain a **comprehensive overview of the financial support for energy efficiency in the Member States**, *inter alia* addressing the lack of information on the impact of financial measures on the energy performance of buildings.

Within the next Multi-annual Financial Framework, the Commission has proposed to continue its **support for tackling non-technological barriers** through the Horizon 2020 programme, under which €6.1 billion would be allocated to research and innovation under "Secure, clean and efficient energy" in 2014-2020. A significant share of this budget would focus on non-technology aspects and removal of existing regulatory, financial, market and behavioural barriers, under the 'Market uptake of energy innovation' priority, continuing the positive experience with the Intelligent Energy Europe Programme.

Member States should also make progress with the implementation of Commission Recommendation of 9 March 2012 on preparations for the roll-out of smart metering systems (2012/148/EU).

#### **7.4. Strengthening the energy services market**

The further development of the energy services market is often seen as one of the most effective ways of triggering measures to reap the cost-effective potential on the energy demand side, particularly in public buildings and industry. The business model in this market is based on the delivery of energy services (i.e. the rational use of energy rather than the delivery of energy per se) often through so-called Energy Performance Contracting (EPC)

Under an EPC the service provider delivers energy efficiency improvements, accepting financial risk by financing – or facilitating the financing - upfront investment costs and refinancing this through the savings achieved. The payment for the services delivered is based on meeting agreed performance criteria, including a level of energy performance and resulting energy and cost savings. Energy performance contracting can thus be seen as a financial instrument for improving energy efficiency without up-front capital cost to be invested by the public or industrial client.

The new Energy Efficiency Directive recognises the important role that EPCs can play and requires Member States to remove barriers to using energy performance contracting and other third-party financing mechanisms on a long-term contractual basis. It provides the following definition for energy performance contracting; "*a contractual arrangement between the*

*beneficiary and the provider of an energy efficiency improvement measure.... where investments in that measure are paid for in relation to a contractually agreed level of energy efficiency improvement...".*

An energy service provider (often referred to as an energy service company or ESCO) is subsequently defined as "*a natural or legal person that delivers energy services or other energy efficiency improvement measures in a final customer's facility or premises*".

Typically, the ESCO offers its technical expertise to provide a comprehensive suite of retrofitting measures, which can range from energy efficiency alone to the inclusion of renewables, water and operational efficiency. The ESCO carries out an assessment of the potential energy savings, site audits, measurement and verification (M&V), design and engineering, installation, and follow-up evaluation and intervention where energy savings are not achieved. The ESCO thus assumes the technical and performance risk for the project in the form of a long-term performance guarantee ensuring the savings.

Assessing the size of the ESCO market in the EU is difficult, mainly due to the highly individualised nature of Member State markets and to the fact that the concept of an 'ESCO' is understood differently in different Member States<sup>38</sup>. Nevertheless, the Impact Assessment for the Energy Efficiency Directive<sup>39</sup> gives a rough estimate for turnover in the ESCO market of between EUR 5bn to EUR 10bn. It also notes that this is "well behind its estimated potential to reach a turnover of EUR 25bn per year which would translate into additional hundreds of projects all over Europe".

Several stakeholders identified the need for stronger support for the ESCO/EPC market by setting up more loan guarantee systems (including for the provision of EPC by small size contractors) to allow financial institutions to see EPC as secured lending, possibly using EU funds as a guarantee. Another possibility to open the market of EPC to small size contractors could be the development of specific insurance products<sup>40</sup>. In the public sector, the potential for off-balance sheet financing has been identified as driver for investment in public buildings, particularly in light of obligations to renovate 3% of central government buildings per annum.

To facilitate the further development of the ESCO/EPC market, the Commission will progressively implement its **campaign to promote and build capacity for energy performance contracting and ESCOs throughout Europe**. The campaign is being implemented mainly through capacity building workshops, organised by three partners including the EIB's European Public-Private Partnership Expertise Centre (EPEC) targeting central governments, the ManagEnergy initiative targeting regional actors, and the Covenant of Mayors initiative targeting local actors.

## 8. CONCLUSIONS

The picture that is emerging from the examination of the European building stock, the existing financial support measures for energy efficiency in buildings and the different market barriers, shows that:

<sup>38</sup> Energy Service Companies Market in Europe, Status Report, JRC, 2010

<sup>39</sup> Ibid 9

<sup>40</sup> The ELIOS pilot project (<http://www.elios-ec.eu/en/introduction>) is investigating the scope for deploying insurance schemes that could cover contractual performance guarantees and cross-border services, especially for small building contractors.

- The situation differs significantly between Member States in terms of their building stock (e.g. age, energy performance, tenure, etc.), the financial support measures in place (e.g. amount of funding, types of measures, effectiveness, etc.) and the relevant market barriers (e.g. capacity and awareness, support structures, regulatory framework, etc.);
- While the investments in building energy efficiency are increasing and there are many best-practice examples of existing instruments that are delivering cost-effective energy savings, there is only limited information on the effectiveness of the different financial support measures for energy efficiency in buildings, both at EU and national levels;
- There continue to be important barriers that hamper further uptake of energy efficiency investments in buildings, including a lack of awareness and expertise regarding energy efficiency financing on the part of all actors (e.g. authorities, construction companies, local banks and end borrowers); high initial costs, relatively long pay-back periods and (perceived) credit risk associated with energy efficiency investments; limited availability of funding due to overall deleveraging by banks and increasing capital adequacy requirements; and competing priorities for final beneficiaries.

If the EU is to meet its 2020 energy efficiency target and its ambitions for further savings towards 2050, it is imperative to improve the financial support for energy efficiency in buildings. For this to happen it is necessary to ensure that the regulatory framework is properly implemented, more financing is made available and key barriers are addressed.

As outlined above, the Commission is engaged in a variety of initiatives and activities to support these objectives. However, given the nature of the building stock and sector, and their responsibility for implementing the relevant legislation and addressing national market barriers, the Member States are in the driving seat to ensure that more cost-effective investments in building renovation take place.

Moreover, the importance of a tailor-made approach to energy efficiency financing and of a building sector able to deliver high-quality renovations means that close cooperation between public authorities (at national, regional or local level), finance providers (e.g. IFIs, banks, institutional investors, obligated companies under an energy savings obligation scheme, ESCOs) and the building sector (e.g. construction companies, equipment providers, architects) is essential.

Last but not least, building owners (whether companies, public authorities or private home owners) will have to be convinced of the benefits of making their properties more energy efficient, not only in terms of a lower energy bill but also improved comfort and property value. This has not been made easier by the current economic and financial crisis and may well be one of the most important hurdles to overcome in making Europe's buildings more energy efficient. However, the macroeconomic case for doing this is strong<sup>41</sup> and targeted incentives and awareness raising efforts to changing attitudes will be necessary. The building renovation roadmaps that Member States will have to establish under the new energy efficiency Directive should explicitly address these issues.

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<sup>41</sup> Non-paper of the services of the European Commission on the Energy Efficiency Directive. Presented at the Informal Energy Council, 19-20 April 2012, European Commission. The Paper can be found on: [http://ec.europa.eu/energy/efficiency/eed/doc/20120424\\_energy\\_council\\_non\\_paper\\_efficiency\\_en.pdf](http://ec.europa.eu/energy/efficiency/eed/doc/20120424_energy_council_non_paper_efficiency_en.pdf)

Going forward the Commission will continue to engage with Member States and relevant stakeholders on how barriers to energy efficiency investments in buildings can be overcome and how financial support for energy efficiency in buildings could be further improved.