

Financing energy efficiency investments in the housing sector and small-scale energy systems

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Abstract

There is a huge 'win-win' potential for investments in small-scale sustainable energy projects throughout Europe. This highly feasible potential is found in existing housing as well as local infrastructure. But financing of such investments, especially in the less developed regions of Europe, needs 'facilitation' to happen. Financial instruments are now being devised along the lines of the clearinghouse facilities used in other sectors. A European working group with stakeholders, involving financial institutions, regional funds, EU Member States and local and regional authorities, has been established in order to consider and propose rearrangement of existing financing instruments, including focused organisation of clearinghouse-type instruments and measures to overcome barriers in Member States.

A number of newly initiated studies are supporting this work, including two projects called "Regenergy" and "ClearinghouseSupport". The projects are carried out in co-operation between participants from many European countries, and they focus on energy efficiency investments in small-scale energy systems and in the housing sector. The studies are analysing the potential and feasibility of energy efficiency investments (especially the housing sector and small-scale infrastructure), giving input to the work on financial instruments and barriers, and proposing design of clearinghouse-type instruments, tailored for individual regions and local conditions. The studies are co-ordinated with similar studies and based on experience from previous European schemes and projects.

Introduction

A major part of total energy supply in Europe is consumed for heating of buildings. Other energy consumption in buildings is cooling, lighting, pumping/ventilation, and hot tap water. The building-related energy consumption may amount to 30-50 % of total energy use, and seen as a whole, the consumption is far from energy efficient; - on the contrary, there are huge saving potentials.

The specific energy use for space heating is varying across Europe. E.g. in Poland, specific energy use is 5 times higher than in Norway (fig. 1).

The differences in specific consumption indicate that there are huge unexploited saving potentials in part of the European building stock, especially in the new EU member states.

Even in countries with a long tradition in energy conservation, there are important potentials. Denmark has carried conservation efforts out since the 1970s and made Denmark one of the most energy efficient countries inside Europe. A Danish assessment (2) reveals further socioeconomic saving potential:

- In 2003, the energy consumption for space heating amounted to 218 PJ, or 51 % of total national energy consumption (excl. transportation).
- Correspondingly, almost half of socioeconomic saving potential was related to space heating, assessed to be 51 PJ/year.
- This potential would be much higher today since oil and gas prices as well as Danish electricity prices have increased substantially over the last few years.

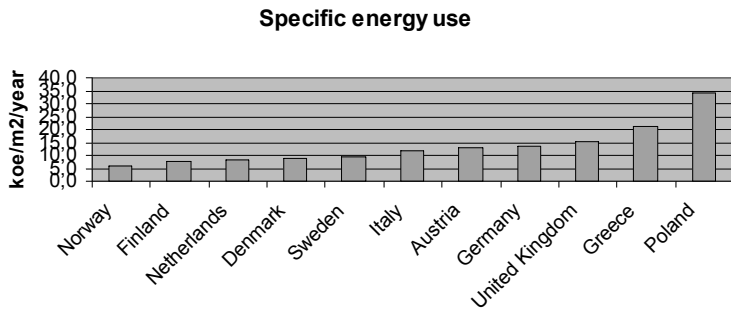


Figure 1. Specific energy use in European countries. Space heating koe/m²/year, adjusted to climate zones (1).

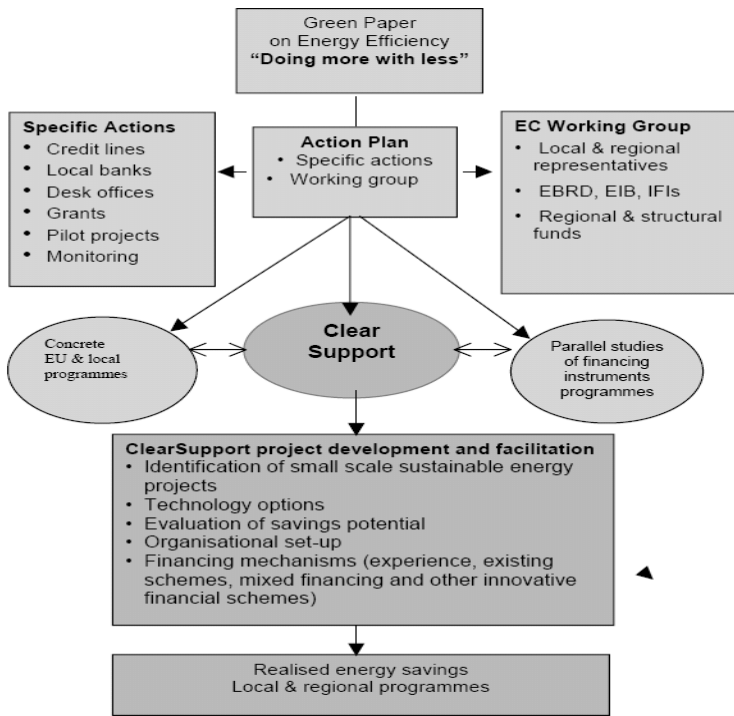


Figure 2. Process of clearinghouse elaborations. Interaction in the process to create both EU & local bases for financing of energy efficiency investments (4).

Energy policy should give highest priority in facilitating and stimulating efforts to reduce energy consumption in buildings. These efforts could focus on two aspects:

1. Reducing energy losses on the supply side, i.e. conversion of fuels to useful energy, and distribution of heat and electricity by using high efficient technology and distribution.
2. Reducing energy demand by better insulation and more efficient design of buildings and end use patterns.

Inside the new EU member states, actions have been taken on national and local levels over the last decade. These actions were in the 1990s supported by bilateral assistance programmes (e.g. Baltic Sea programmes carried out by Sweden, Denmark, and Norway). Also initiatives from the international financial institutions (World Bank, Nordic Investment Bank, EBRD, etc.) had this focus. All in all, these local and national options could be combined with these supporting sources, and the financial basis for energy efficiency investments gained attention. New financial arrangements were introduced, as 3rd party financing, energy service companies, project preparation facilities, revolving funds, clearinghouses and guarantee funds, public-private partnerships, etc.

European initiatives

The enlargement of EU in 2004 has formed a changed basis for financial arrangements. Now the programmes must rely on national and local initiatives from government, investors, banks, municipalities, house owners, and energy companies. Activities are prescribed and regulated by new EU directives and supported by different EU funding options, including European and local banks. The EU Green Paper on Energy Efficiency from 2005 and the Energy Efficiency Action Plan from October 2006 (3) focuses on the creation of economic and financial arrangements for energy efficiency investments.

The projects called "Regenergy" and "ClearinghouseSupport" can be seen as contributions to such proposals. The ambition in both projects is to develop practicable solutions in order to facilitate energy efficiency investments and create clearinghouse-type organisations. Interaction between the studies and the overall process is shown in fig. 2.

Supply side efforts in the Regenergy study

When looking at the first aspect, the energy supply side, it is obvious that old infrastructures as outdated district heating systems and inefficient boilers and old-fashioned power stations give rise to excessive energy losses in parts of the new EU member states. In the Regenergy project¹, a dozen partners from eight countries are joining forces in pushing the process of new projects in heat supply and district heating systems all around Europe. The project is looking at all elements of investing in new energy projects, both the energy planning and policy-making, the organisation of local heat supply, the financial processes, and the elaborations on pilot projects. The five components of Regenergy are illustrated in the diagram (figure 3).

1. Regenergy is supported by the participating partners and EU regional funds, see www.regenergy.org.

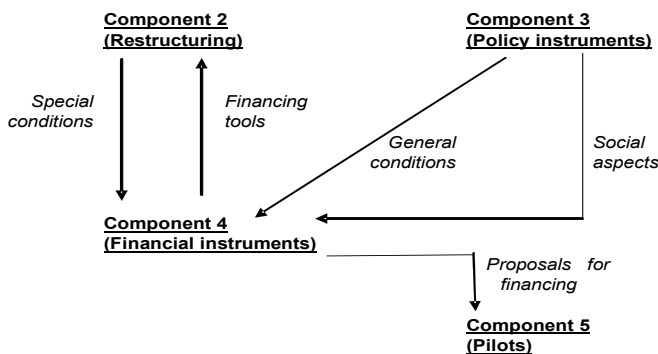


Figure 3. Interaction of components of Regenergy. Components include organisational matters (component 2), policy instruments (component 3), financial instruments (component 4), and pilot projects for financing (component 5). Not shown in the diagram is component 1 (the overall management of the project) (5).

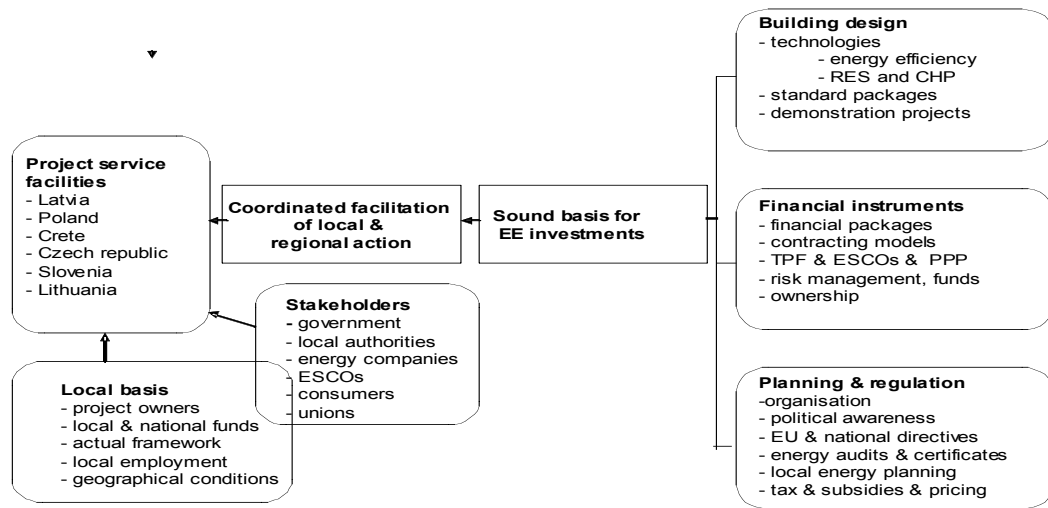


Figure 4. Organisation of the Clearinghouse Support project (6)

E.g. it has been assessed that energy losses in the Polish district heating system have been around two third of the energy fed into the primary supply. So one field of activity should be to either modernise or substitute the district heating systems.

Experience from the Regenergy project indicates that investments in modernisation and renovation of district heating systems should rely on a multi annual programme, supported by low-interest investment funds, offered by banks and/or government. In Latvia, favourable multi annual national funds have paved the way for municipalities to draw up plans for the district heated urban areas, and to accompany this with a balance budget including energy costs and consumer prices. It is generally recommended that the district heated zones are clearly defined by local energy plans, and that the district heat market is distinctively separated from heat supply by gas, electricity or individual heating. Local energy plans should form the basis for local decisions and for considerations on business planning and feasible investments.

Another field of activity should be to substitute traditional heat production on the basis of heavy fuel oil, coal or gas with new supply from modern high-efficient CHP stations and renewable energy sources. Euroheat & power has in 2005 carried out an assessment of the CHP potential with focus on the new member states. According to this, it will be possible by quite simple measures to double the share of CHP electricity in these countries, either by substituting heat from HOBs, or by replacing old inefficient coal or oil fuelled CHPs with new ones with a good power-to-heat ratio.

Initiation and financing of small scale heat supply (renewable energy, CHP, heat pumps, etc.) could be based on a local energy planning process that involves both consumers, municipalities and other stakeholders, including suppliers of renewable energy and energy companies. Financial packages could be designed as part of the planning and implementation process, including support from national, local and EU funds, emission and certificate trading, price subsidies, etc. The implementation process may be based on traditional municipal/public leadership, or it may be based on efforts made by privatised energy companies. What is the most preferable, may be left to the political considerations.

An important aspect of larger investments is risk management and project quality. Project service and clearinghouse-type facilities may be of great value.

Demand side efforts in the Clearinghouse Support study

Since there is a huge, feasible potential in energy conservation in buildings, the main task will be to establish programmes that facilitates such activities. One idea is to create clearinghouse-type financial instruments.

The project Clearinghouse Support aims at this. The idea is to create small organisations in a number of new EU member states, so-called project service facilities, and to equip these units with tools and skills in building design, financial instruments and supporting regulatory framework. Thus, the task is:

- to establish specific financing instruments at the regional and local level
- to create focused organisation of clearinghouse-type instruments (project service facilities)
- to review the investment potential in small-scale sustainable energy projects, and
- to consider ways to overcome barriers to investment, including the role of energy companies, recovery of energy bill savings, pricing, etc.

There are thirteen partners in Clearinghouse Support, covering eight countries, of which six may create local/regional clearinghouses (project service facilities). The content of the project is indicated in figure 4.

The project is still in its inception phase, and the main task in spring 2007 will be to establish the project service facilities and provide them with input regarding building design, financial instruments and regulatory basis. The target is to have the facilities ready for operation within the first year, in order to carry out project preparation for a considerable number of generic projects for energy conservation in buildings over the next 2-3 years.

Project service facilities:

- In Latvia, the project service facility will be hosted by IPE in Riga. IPE is leading institution in energy research and strategies for long-term energy policy. IPE will establish an advisory group with representatives from public institutions and stakeholders. Residential energy use for heating etc. amounts to 30 % of total energy use in Latvia.
- In Lithuania, the project service facility will be hosted by UAB ĀF-Terma in Kaunas. The facility will offer energy audits and economic advice. The advisory group will involve the municipality of Kaunas and homeowners' association. The saving potential in residential sector has been assessed to amount to 40 % of residential energy use. The facility will not only address the residential sector, but also public owned buildings, including municipal.
- The Czech project service facility will be created by SEVEN who has a long and genuine experience in third party financing inside the Czech Republic. The anchoring of the facility will be broad, involving organisations on both local and central level.
- The regional project service facility in the Pomeranian Region, Poland, will be hosted by BAPE in Gdansk. BAPE will offer assistance to 20 municipalities, including 10.000 inhabitants, and will focus on public buildings (e.g. schools and hospitals). Efforts will include assistance to housing associations and co-operatives.
- In Crete, Greece, the project service facility will be located to the Technological Educational Institute of Crete (TEI) in Chania and Heraklion. Experience covers a wide spectre of skills in buildings, renewable energy, and energy efficiency. TEI will give advice on technical solutions, regulatory issues and finance.

Fortunately, from the starting point, Clearinghouse Support can rely on experience gained through previous projects.

- Baltic Chain developed the project preparation and clearinghouse idea in a number of European countries. This was focused on larger energy projects and ended in 2001. Many of the ideas have been carried on into new projects, both between several countries, and in more targeted situations as e.g. building rehabilitation in Estonia.
- Third party financing projects and performance contracting have also gained a lot of positive results, and this experience can be fed into ClearinghouseSupport.
- Operation of energy service companies (ESCOs) has been a success in some countries and regions, e.g. in Hungary. This experience may be useful in Clearinghouse Support.

Most important though, is the momentum that is created by the initiatives of EU and the Commission, and the efforts channelled through the new European working group with stakeholders, financing institutions and commercial banks, regional funds, and Member States. The interaction is essential.

References

1. Data from 2003, Danish Energy Authority.
2. Potential assessment 2005 in the Danish Energy Efficiency Action Plan.
3. Action Plan for Energy Efficiency: Realising the Potential (SEC (2006) 1173, 1174 & 1175)
4. Diagram elaborated in ClearinghouseSupport by Birch & Krogboe 2005.
5. Diagram elaborated in Regenergy by Andreas Jahn.
6. Modified diagram from Clearinghouse Support by Ture Hammar