European Union
European Regional Development Fund

INTERREG IVC

step
Improving Communities' Sustainable Energy Policy Tools

Policy Guide

December 2014

Contents

Executive Summary

The aim of this policy Guide is to introduce the STEP project and outline experiences gained and good practice developed in a clear manner for a broad public audience. This document can serve as a good base for other project ideas, new project generation and implementation, which can directly contribute to achieving EU 2020 strategic objectives.

The project focussed on three ***thematic areas*** during implementation (**Chapters 1-3**). ***Good practices*** were compiled across a number of European countries representing cultural diversity and varied states of economic development. This policy guide charts the project implementation and illustrates issues encountered across the broad range of professional backgrounds involved all three thematic areas, in a short summary on the ***transfer*** and implementation of good practice area at the end of each chapter. **Chapter 4** contains a comprehensive set of instruments, which could contribute to the formulation of future EU energy strategy.

The first thematic area (**Chapter 1**) introduces policies and tools to comprehensively tackle ***energy efficiency at community level***. In this chapter, the role of local government in the market both as energy users and as service providers is presented and their importance outlined in relation to all aspects of sustainable energy planning and policy implementation. Local authorities and municipalities can significantly contribute to common energy policy goals[1]. Despite such involvement in energy usr and policy making, local actors do not have a high profile in EU legislation. Considerable diversity, including differing degrees of legal powers and responsibilities in climate and energy policy, was apparent among the municipalities and local authorities across the project partnership, raising particular challenges in the transfer of good practice in this area. *KAINUU Authority* (**P2**) and *SARGA* (**P10**) have identified a need to address the limited capacity of the Municipal Authorities to develop and implement energy efficiency solutions to exploit their renewable energy resources and reduce CO_2 emissions through energy consumption. The transfer of GP1 & GP2 (from **P1** *STRIA* & **P9** *Mohacs*) reflects the need to implement local policies in Kainuu and Aragon and introduce new methodologies to contribute in the development of new actions and activities that could enhance public awareness of energy efficiency and its role in enhancing the economy and environment of the municipality and its wider region and how this can contribute to global aims (EU2020).

[1] *sustainability* - living environment and health of citizens, *security of supply and competitiveness* - economy, employment etc. and *Environmental Impact*.

Thematic area 2 (**Chapter 2**) addresses ***policies and tools for energy management***. Urban, rural and peripheral municipalities face quite different challenges. It is estimated that 80% of the European population will live in urban and peri-urban areas by 2020 and this will have significant implications for sustainable energy planning at the policy development and planning stage. Municipalities in the partner regions are very diverse, with a range of cultural, developmental, historical, economical and environmental backgrounds. This diversity means that a one-size-fits-all solution cannot be developed and a variety of operational policies and measures, models, guidance and advice should be available in a toolkit from which municipalities can develop individually tailored solutions. This chapter examines barriers to energy efficiency and various structured approaches that have been developed to help local authorities to respond to climate challenges, some examples of which extend across national boundaries. Different platforms and networks provide advice and tools on sustainable energy solutions in Europe. National, local and regional energy agencies operate in most countries providing advice and tools. One of the relatively recent and very active initiatives is the Covenant of Mayors which was launched by the European Commission in 2008. Relevant definitions and standards are outlined to provide an overall introduction and context to the theme, including references to texts that deal with energy efficiency and dissemination of renewable energy in EU and identification of institutions, regulations and other relevant guidance and instruments.

Four GPs were identified under this thematic area out of the numerous examples available, two of these are based on physical interventions, while the remaining two are theoretical approaches.

Photo: Helsingin Energia

The "HelEn" project (GP4) is an operational example, where the district heating comes from the waste heat of the data centre and district cooling comes from the sea water, heat pump and absorption chillers, carried out in Helsinki, Finland by *Kainuun Etu* (**P2**). The "Replacement the Indoor Swimming Pool's heat gasoil system to Biomass and Solar Thermal system using a contract using an Energy Service Company (ESCO)" from *Murcia* (**P11**) is another GP that has been put into practice.

The Energy Performance Audit and the Energy Manager Training represent theoretical approaches to energy management, where participants receive training and can then go on to develop new energy management projects. The Municipal Energy Management Instrument is an example to be implemented by STRIA (**P1**), the South-Transdanubian Regional Innovation Agency in Hungary and ARLEG (**P6**) in Poland through "Municipal Energy Management Seminars", which were then developed as a good practice in Germany (GP5) by *SAENA* (**P3**).

In the Hungarian experience, STRIA focussed on the institutional aspect during the first part of the implementation, with a specific aim to increase government involvement in the course in the South-Transdanubian Region (GP6). The study found that workforce planning must be considered to ensure those selected for training are chosen to maximise training benefit to the whole organisation/governance unit. The most significant issue in the adaptation of best practice across a range of organisations was ensuring that the central message retained its clarity across the range of cultures and backgrounds encountered.

In case of the Polish implementation of the good practice (GP8 transferred to the German partner), the objective is to minimize the costs and energy through appropriate management of municipal facilities and public buildings in Lower Silesia.

The third thematic area (**Chapter 3**), the *"Innovative financing tools"* are explored that contribute to the achievement of stated the goals of increased energy efficiency and greater utilisation of renewable energy. Problems are also identified and targeted such as why member states are not using financial instruments to address energy management issues when this is a prioritised area of EU policy.

It was discovered that the financial market alone rarely finances energy management projects, therefore, new business models (as self-regulating mechanisms), are required for development in the financial are that will be successful and profit-oriented to foster the energy efficiency and renewable energy development agenda. These instruments should also focus on non-government and entrepreneur spheres to illustrate that energy is a universal requirement and a potential market across all sectors.

One of the important element of the thematic area is to introduce the development funds that provide financial framework for future development. This chapter outlines experience in Finland where the available funds and financial instruments are utilised effectively at a local level for energy efficiency and renewable source investments and improvements.

This chapter concludes with an overview of the characteristics of financial market in this sector and the barriers to the development of energy management solutions to achieve EU targets.

The STEP team selected the following 3 GPs under this thematic area:

Loans and thermo-modernisation premiums as innovative financial tools for thermo-modernization projects from Poland (GP8)

Innovative financing and operation of small scale biomass energy supply and energy efficiency upgrades in public facilities from Mid West Region, Ireland (GP9)

Financing EE/RES initiatives in local authority functional areas from Midland Region, Ireland (G10)

The range of GP transfers under this thematic area, illustrate the complexity and diverse range issues that affect project partners. It must be recognised that the adoption of a new policy, financing tool or contract model takes significant time to implement.

Introduction

The STEP project was developed and implemented by a group of nine ambitious partners to improve sustainable energy policies at local level in line with regional objectives and is supported by the European Regional Development Fund under the Interreg IVC program.

PROJECT OBJECTIVES

The following objectives set under the STEP project were successfully met through an effective and successful three-year period of partnership and cooperation:

1. To support the territorial cohesion between the partner regions in line with the EU climate and energy policies by promoting regional energy self-sufficiency and energy diversification. Foster the implementation of policies contributing to the "EU 20-20 by 20" targets.

It is a challenge in each partner region to achieve the set ambitious "20-20 by 20" targets. STEP focussed on the implementation of local level policies to support greater energy efficiency and self-sufficiency. To achieve this, the project matched 3 partners from less experienced regions with 6 partner regions with more developed local sustainable energy policies to enhance skill capacities and promote interregional knowledge exchange, thereby improving effectiveness of regional development policies in the field of energy

2. Networking and interregional capacity building of local authority staff in the field of sustainable energy planning and implementation

STEP partners engaged local authorities in the process of transfer of good practice and project implementation through a series of targeted and relevant regional and international events. Conferences (in Pécs and Brussels), thematic seminars (in Helsinki, Murcia and Limerick) and a series of information events and study visits were organized Europe-wide, where local authority staff, energy experts and relevant regional stakeholders had the opportunity to improve their knowledge, forge new links and enhance existing cooperation between policy actors in the field of energy.

3. Reduction of energy consumption and CO2 emissions and increase the rate of renewable energy sources in the partner regions

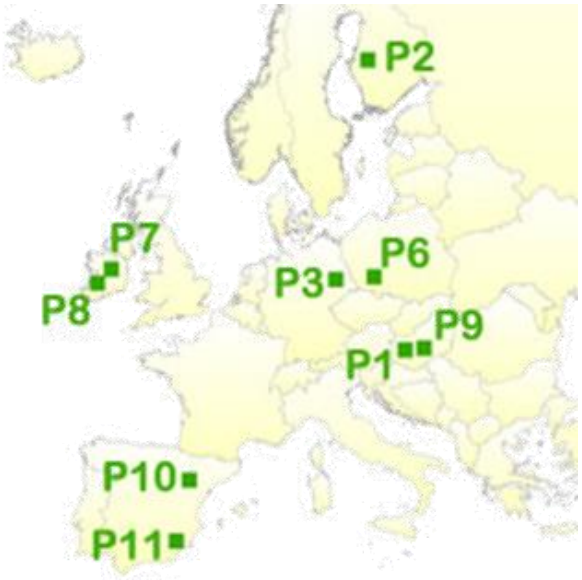
All project activities focused on the reduction of energy consumption and CO2 emissions, for example, the energy performance testing methodology (energy audit) prepared on a joint basis by the partners, provides sophisticated energy data on the energy consumption and performance of municipal buildings. The results of the audit and associated recommendations are useful guidelines in the design of energy saving refurbishments to improve energy efficiency.

4. Exchange and transfer of policy practices and development of a comprehensive interregional policy guide on local sustainable energy concepts and energy management systems Reduction of energy consumption and CO2 emissions and increase the rate of renewable energy sources in the partner regions

The partnership collected the 10 good practices across 3 defined thematic areas to monitor and illustrate progress in the development of local sustainable energy policies, promote effective energy sustainability solutions and support the implementation of sustainable energy actions by identifying adequate financing opportunities.

DOCUMENT STRUCTURE

The policy guide is divided into the three Thematic Areas, under which are outlined the following good practices developed and transfers carried out by the partners outlined hereunder



Partners

- Partner 1 – STRIA, Hungary
- Partner 2 – Kainuun Etu Oy, Finland
- Partner 3 – SAENA, Germany
- Partner 6 – ARLEG, Poland
- Partner 7 – MRA, Ireland
- Partner 8 – MWRA, Ireland
- Partner 9 – Gov. Mohacs, Hungary
- Partner 10 – SARGA, Aragon
- Partner 11 – INFO, Murcia

Good Practices

Thematic Area 1 - BETTER IMPLEMENTATION OF SUSTAINABLE ENERGY POLICIES AT LOCAL LEVEL

- *GP 1 - Sustainable energy action program of Budapest, Hungary.*
- *GP 2 - Local Sustainable Energy Action Plan of Martfű, Hungary.*
- *GP 3 - Pilot Plans for Rural Sustainable Development, clearly aimed at minimising energy consumption (less public expense). (Spain)*

Thematic Area 2 - SUSTAINABLE ENERGY MANAGEMENT SYSTEMS

- *GP 4 - HelEn District Heating and Cooling: District heating from the waste heat of the data center and district cooling from the sea water, heat pump and absorption technique. (Finland)*
- *GP 5 - Replacement of the Indoor Swimming Pool's heat gasoil system to Biomass and Solar Thermal system using a contract with an Energy Service Company (ESCO) (Spain)*
- *GP 6 - Energy performance audit (Support for local energy self-sufficiency, optimization and management tools for energy efficiency) (Poland)*
- *GP 7 - Implementation of a Municipal energy management approach (Germany)*

Thematic Area 3 - FINANCING TOOLS FOR SUSTAINABLE ENERGY INVESTMENTS

- *GP 8 - Loans and thermo-modernisation premiums as innovative financial tools for thermo-modernization projects. (Poland)*
- *GP 9 - Innovative Financing and Operation of Small Scale Biomass Energy Supply and Energy Efficiency Upgrades in Public Facilities. (Ireland)*
- *GP 10 - Financing EE/RES initiatives in local authority functional areas. (Ireland)*

With the experience gained from good practice descriptions and transfers, the partnership compiled this comprehensive interregional policy practice guide as one of the final deliverables of the STEP Project. The purpose of this document is to introduce the Good Practice examples, summarising the main lessons learned and issues addressed to provide an extensive overview of relevant policies, provisions and tools, their application and implementation.

1. Thematic area 1

Policies and tools addressing energy efficiency at community level

What do we know about the overall implementation of such tools and policies (at EU achievement level) and what are the known barriers?

1.1 EU FRAMEWORK AND BENCHMARKING

1.1.1 Local authorities can make a difference

2.1.1.1 *Role of local authorities*

Local authorities/municipalities can make a significant contribution to all common energy policy goals;

- *Sustainability, including living environment and health of citizens*
- *Security of supply and competitiveness, including economic and employment considerations*
- *Environmental Impact*

Despite these possibilities, local actors do not have a high profile in EU legislation.

Many Local authorities have significant capacity to deliver greater energy efficiency and sustainable energy supply. In their own operations, local authorities are energy consumers in the provision of services and the consumption of a range of products, services and the operation of facilities that entail energy impacts. Local Authorities can also impact on energy efficiency regimes of industries, businesses, services and individual citizens operating in their geographical area in their roles as planners, developers, regulators, advisors, motivators, role models, energy producers and suppliers.

1.1.1.2 *One size does not fit all*

There is considerable diversity among the municipalities across EU Member States. Local authorities have differing degrees of legal powers and responsibilities in climate and energy policy.

Urban, rural and peripheral municipalities face quite different challenges which need to be recognised in planning. It is estimated that 80% of the EU population will live in urban/peri-urban areas by 2020, an important consideration for integrating energy issues and energy efficiency in transport into urban planning and land use management policy.

Box 1 - Energy Cities

Energy Cities is a European association established to support local authorities in energy transition, has analysed these roles, summarised here. Local authorities occupy many buildings, using substantial amounts of energy and provide energy-intensive services such as public transport and street lighting. Improvements in efficiency lead to considerable savings. Outsourcing of services can include measures to reduce energy use implemented through procurement and service contracts. The role of local authorities beyond their own operations is even more important as local authorities directly control only a small part of greenhouse gases emitted in their area. For example, in Paris in 2007, only 2 % of GHG originated from local authorities' buildings or infrastructures, and municipal services[1].

Strategic decisions on land use planning and the transport system can reduce the energy consumption in the transport sector. Local and regional governments often act as regulators, for example, by setting energy performance standards, or stipulating the incorporation of renewable energy equipment in new buildings.

Local and regional governments can help to inform and motivate residents, businesses and other local stakeholders on energy matters. Awareness-raising activities could engage the whole community in supporting sustainable energy policies and the authorities can lead by example. Local energy production and the use of renewable energy sources, can be promoted by local and regional governments such as cogeneration or district heating systems using biomass. Citizens can be encouraged to implement renewable energy projects through financial support and enabling crowd funding schemes for local initiatives like sustainable energy cooperatives.

Procurement and service contracts can be used to boost emerging green markets. Public authorities in Europe spend around €2 trillion annually corresponding to almost 17% of the EU's GDP. This purchasing power allows them to push for a greater adoption of sustainable measures, for instance, by including energy criteria in all public procurement procedures. Green public procurement raises awareness of environmental issues and creates incentives for the industry and citizens to innovate. There are examples which have successfully pursued this agenda including Freiburg im Breisgau and Hanover in Germany; Vaxjo, Malmo, Gothenburg and Stockholm in Sweden; Bristol, Woking and the eco-district BedZED (Beddington Zero [fossil] Energy Development) in the United Kingdom; Copenhagen in Denmark; Boulder, Colorado in the United States; Masdar in the United Arab Emirates[2]. Yet another internationally recognised example is the district heating system and combined heat and power production in Helsinki in Finland which is one of the case studies in the STEP Project.

There are also differences in the degree to which energy efficiency has been integrated into Local Authority structures and policies. Some municipalities are forerunners and have taken energy efficiency into account in their decisions for decades and apply sound energy management and climate policies, while others are at the starting phase. Due to this diversity, one-size-fits-all solutions cannot be developed and a variety of operational policies and measures, models, tools and advice is required.

1.1.2 Barriers to Energy efficiency

Energy efficiency is often not a priority operational objective for municipalities however, in most cases enhanced energy efficiency and improved service levels are not conflicting goals and can be pursued simultaneously. There are various different barriers to achieving energy efficiency, some universal and others which are specific to the Local Authority situation.

Information barriers are common in all sectors. Few people work full-time in energy efficiency related matters, making a lack of knowledge and available time to address this deficiency, common constraints in achieving energy efficient operation. There may be lack of awareness and a very high perceived risk of new, more efficient technologies, creating an atmosphere of suspicion and mistrust in measures such as energy audits.

An important barrier centres around ***decision making***. According to the Council of European Municipalities & Regions (CEMR) municipal merger policies have been implemented in many European countries for decades, one of the objectives being to compensate for the economic disadvantages linked to the small size of municipalities. In municipalities, decision making has a political aspect in contrast to businesses where the number of decision makers is large, the process can be prolonged and decisions are often made for short-term gain without due attention to life cycle costs.

Another set of barriers are ***budgetary*** in character, some of them which have been identified in a study by the EC's Joint Research Centre[2] in **Box 2**.

Box 2 – *Budgetary constraints (EU Joint research Centre)*

There are many competing but justified objectives, such as health care, social services, environmental protection and energy efficiency. All compete over the limited resources.

The budget share of energy efficiency tends to be among the smaller ones, which makes it also a lower priority activity when more focus is put on the larger budget items and their effectiveness.

Budget items are usually ear-marked to certain functions which can lead to silo mentality. In such a case, budgetary appropriations are used to a very particular function, instead of more horizontal activities such as energy efficiency or energy management.

The rules of public budgeting – including the annual budget cycle and multiannual savings cash flow – make it difficult for public entities to finance energy efficiency investments from savings in energy costs.

Local authorities may be unable to retain the monetary savings due to efficiency improvements. If the energy costs are reduced through, e.g., Energy Performance Contracting, the total budget of the local authority will also decrease, which affects the incentives for the public authorities to use less energy are missing.

Local authorities may have to finance energy efficiency investments from their investment budget whereas the resulting savings are credited to the operational budget.

Public procurement legislation, both European and national, has been developed to create a level playing field and improve efficacy. Yet, it can counteract in energy efficiency measures. Competition requirements may even disable energy efficiency measures when decisions cannot be made in the long run. While this may not be so evident anymore in the procurement of more common goods and services, it is still true particularly in relation to new technology.

[2] http://ec.europa.eu/energy/efficiency/doc/financing_energy_efficiency.pdf

1.1.3 The role of municipalities in EU legislation

The European Commission has given the public sector a specific role at strategic level, in the 'Energy 2020 – a strategy for competitive, sustainable and secure energy' (2010) and in the 2050 Energy Roadmap (2011). 'Regional policy contributing to sustainable growth in Europe 2020' (2011)[3] states that

"Regional policy plays an essential role in driving the shift to investment in smart and sustainable growth through the actions it can support to tackle climate, energy and environmental issues".

The 20/20/20 objectives are implemented in a regulatory regime consisting of several directives;

- *the Energy Efficiency Directive (EED),*
- *Renewable Energy Directive (RES Directive), Energy Performance of Buildings Directive (EPBD)*
- *and the Eco-design and Energy Labelling Directives on energy related products.*

In the transport sector there are directives addressing vehicle emissions and, therefore, reducing energy use in vehicles. Commission's Strategic Energy Technology plan (SET-plan)[4] calls for technological innovation via the development and demonstration projects for new technologies, for instance smart grids and smart cities[2]. While at the strategy level the role of local authorities is highlighted, this role can appear less clear at the directive level.

The former Energy Services Directive, its successor the Energy Efficiency Directive and the RES Directive put the public sector in a leadership role. For example, the RES Directive (Art 13.5) encourages the roofs of public or mixed private-public buildings to be used by third parties for installations that produce energy from renewable sources.

According to the EED, the Member Countries shall support the public sector in taking up energy service offers, in particular for building refurbishment, by providing model contracts for energy performance contracting. Information is to be provided on best practices for energy performance contracting (EPC), including, if available, cost-benefit analysis using life-cycle approach. For example, in Finland there are model contracts for EPC, new guidelines for public ESCO procurement; and the need for new revisions of model EPC-contracts is now under discussion.

EED also stipulates that energy audits must be available to all sectors, including municipalities. This includes the availability of audit models, energy auditors and minimum requirements for them. For example in Finland there are energy audit models for buildings and processes, also applicable in municipalities, and another model for renewable energy audits in municipalities.

EED addresses purchasing by public bodies. It requires that Member States shall encourage public bodies, also at regional and local levels, with due regard to their respective competences and administrative set-up, to follow the exemplary role of their central governments to purchase only products, services and buildings with high energy-efficiency performance. Member States shall encourage public bodies, when tendering service contracts with significant energy content, to assess the possibility of concluding long-term energy performance contracts that provide long-term energy savings. At country level, public authorities need to know from where to find information on energy efficiency in procurement. Therefore, advisory services have been developed to help.

District heating and cooling as well as use of waste heat are focus areas in both the EED

[3] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2011:0017:FIN:EN:PDF

[4] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2007:0723:FIN:EN:PDF

(Art 14 + Annex VIII) and the RES Directive (Art 13.3). The EED requires national assessments for co-generation and district heating potential and measures for its uptake to be developed by 31 December 2015, including recovery of waste heat. According to the RES Directive, the Member States should recommend the installation of energy systems based on renewable energy and district heating and cooling when planning, designing, building and renovating industrial or residential areas. This focuses particularly on the planning of city infrastructure.

Finland is a country where district heating and co-generation, stipulated by the EED, are already used widely. An example of early action in waste heat utilisation can be found in Germany, where Bayern State has prepared an Energy Atlas which contains nearly 300 sources of surplus heat, besides the additional sources of heat from municipal waste water. Further development is based on presenting good practice examples combined with public relations to motivate industrial and municipal bodies as well as plant operators to integrate additional data and to foster networking to get in touch and create projects for the exchange of surplus heat.

The most obvious implications of the Energy Performance of Buildings Directive (EPBD) are the building regulations covering also public buildings. However, directives have other less obvious implications, involving particularly local building supervision. The building permit process can be extended from mere permission and supervision function to more advisory direction, e.g., by organising energy efficiency training to builders. An example can be found from the City of Oulu in Finland. Building supervision can also have a significant role in the extension of small-scale production of renewable energy. The flip side of the coin is that it can also make it unnecessarily difficult if administrative processes are not streamlined.

1.1.4 Leverage from networks, tools and national policies

Various structured approaches have been developed to help local authorities to respond to climate challenges. Support has been given by associations or active networks such as Local Governments for Sustainability (ICLEI) in the 1990's, Climate Alliance and Energy-Cities. Some have become voluntarily involved in Local Climate Plans, energy-transition experiments, eco-district projects, voluntary agreements, the European Sustainable Energy Week [5] and more recently, the global forum "Resilient Cities"[6]. In some of these activities operation extends over national boundaries but international co-operation is particularly prominent in Medener in the Mediterranean area, BASREC around the Baltic Sea and the Nordic Council of Ministers in Scandinavia.

A new concept gaining momentum is 'post carbon cities'. Post carbon cities must reach a massive reduction of greenhouse gas emissions by 2050, a near self-sufficiency in fossil fuels and develop the capacity to adapt to climate change[2]. The main objective of the European project POCACITO (POst-CArbon CIties of Tomorrow, 2014-2016) is to produce a long-term outlook (roadmap) into the future of EU sustainable post-carbon cities in a global context. A national example of a post carbon initiative is the French foresight programme 'Rethinking cities in a post carbon society', launched in 2008 by the Ministry of Sustainable Development and the French Environment and Energy Management Agency (ADEME).

Different platforms and networks provide advice and tools on sustainable energy solutions in Europe. National, local and

[5] Annual campaining at local level in many European countries: http://www.eusew.eu/
[6] http://resilient-cities.iclei.org/

regional energy agencies operate in most countries providing advice and tools[7] [8]. The Smart Cities Stakeholder Platform[9] initiated by the European Commission aims at identifying and spreading relevant information on technology solutions and needs required by practitioners and providing information for policy support to, e.g., the European Commission. At the same time some countries are moving ahead with their own smart city projects. For example, the Dutch Initiative Sustainable Cities (DISC) aims to develop sustainable urban projects in the four major cities of Romania, namely Bucharest, Cluj, Constanta and Timisoara. DISC is a public-private cooperation programme between Dutch and Romanian companies, knowledge institutes and the Netherlands Ministry of Economic Affairs. Another European platform is the Energy Cities which is the European Association of local authorities in energy transition. It was created in 1990 and represents now more than 1 000 towns and cities in 30 countries.

One of the relatively recent and very active initiatives is the Covenant of Mayors which was launched by the European Commission in 2008. Almost 5200 (March 2014) municipalities have joined. Those who join, commit to prepare a Sustainable Energy Action Plan (SEAP) outlining how the participant intends to reach its CO_2 reduction target by 2020. The SEAP defines the activities and measures set up to achieve the targets, together with time frames and assigned responsibilities. To date, almost 3500 SEAPs have been submitted to the Commission.

According to a study by the Joint Research Centre of the European Commission, the signatory cities release about eight tonnes of CO_2 equivalent per capita each year. However, through the implementation of their SEAPs, cities commit to emission reductions by about 28% by 2020, thus voluntarily exceeding the 20% objective of the European Union.

There are some reasons which may limit the eagerness to join the Covenant. Some may consider it to incite reporting requirements but not to provide real gain. Forerunners have already made considerable effort in sustainable energy solutions and energy efficiency and the Covenant is not perceived to bring much new.

Municipalities in some countries appear to prefer national measures over the Covenant. This has limited the number of participating municipalities in these countries. For example, in Finland municipalities are able to join a voluntary energy efficiency agreement or programme for municipalities which cover 75% of the population. The agreements are considered to foster continued improvement and long-term view, integrated and embedded in all municipal operations. Every municipality in the agreement have a named contact point responsible of activating and committing the decision makers to allocate resources in order to achieve the targets and energy saving activities listed in the agreement. The agreements also facilitate exchange of experience among municipalities.

In addition to holistic approaches covering the whole spectrum of energy, there are also sectoral initiatives and tools. Sustainable (urban) mobility plans[10] define a set of interrelated measures designed to satisfy the mobility needs of people and businesses at present and in the future. The policies and measures defined in a Sustainable Urban Mobility Plan cover all modes and forms of transport in the entire urban agglomeration, including public and private, passenger and freight, motorized and non-motorized, moving and parking. France and UK with their legally binding frameworks and widely applied

[7] Voluntary network of European energy agencies: http://www.enr-network.org/

[8] Energy agencies at ManagEnergy's web-site. http://www.managenergy.net/ea

[9] http://www.smart-cities.eu/

[10] http://www.mobilityplans.eu/index.php?ID1=4&id=4

mobility plans are considered to be among the forerunners in this area but others are following suit. At European level, an Action Plan on Urban Mobility is in the pipeline. The European Platform on Mobility Management (EPOMM)[11] is a network of governments in European countries that are engaged in mobility management.

Transport, as well as energy production and use of renewable energy in buildings are issues, which can be addressed in urban planning. Yet, integration of energy in urban

planning education is still very rare in Europe and skills need to be developed.

[11] http://www.epomm.eu/index.php

1.2 GPs Identified under Thematic area 1

The STEP project partnership identified 3 Good Practices under Thematic Area 1 listed and outlined hereunder:

1.2.1 GP 1: Local sustainable energy action plan of Martfü

This Good Practice is put forward by Municipality of Martfü, Hungary.

The National strategy framework of Hungary, priority axis 4 in particular, has identified the need for improvement of urban and suburban public transport and the quality of the communal infrastructure and its services in an surrounding the larger rural cities.

Under this framework, the municipality of Martfü needs to increase the proportion of renewable energy in the municipal energy supply and reduce high rates of CO2 emissions. In support of this, the municipality has adopted the SEAP that deals principally with renewable energy resources at company and householder level.

As a result, the municipality of Martfü boasts a well-defined plan that regulates the energy management of the municipality and contains all relevant documentation and data, the action plan focus principally on:

- Increased proportion of renewable energy input into the municipal energy supply and substitution of fossil fuels.
- Enhanced collaboration with civil organizations to promote renewable energy and increased awareness among citizens and students in particular.
- Improved quality of life.
- Creation of a healthier city environment.
- Improved touristic attractiveness of the city.

Outputs

In the implementation of the SEAP, the municipality of Martfü has implemented several projects within the renewable energy programme including the development of photovoltaic system in 5 institutional entities that have high energy consumption rates; the Mayor´s office, cultural center and library, two kindergartens and the elementary school.

Since the SEAP has been introduced, the municipality of Martfü has achieved a significant improvement in the green energy production up to 136 MGW and a reduction in CO_2 emission by 90t. An analysis of the main outputs of this good practice illustrates that the action plan implemented by municipality of Martfü has had a significant positive impact at the local level, however, real engagement from the municipal authorities of partner´s regions would be required in order to facilitate a feasible GP transfer.

1.2.2 GP 2: Sustainable Energy Action Programme of Budapest

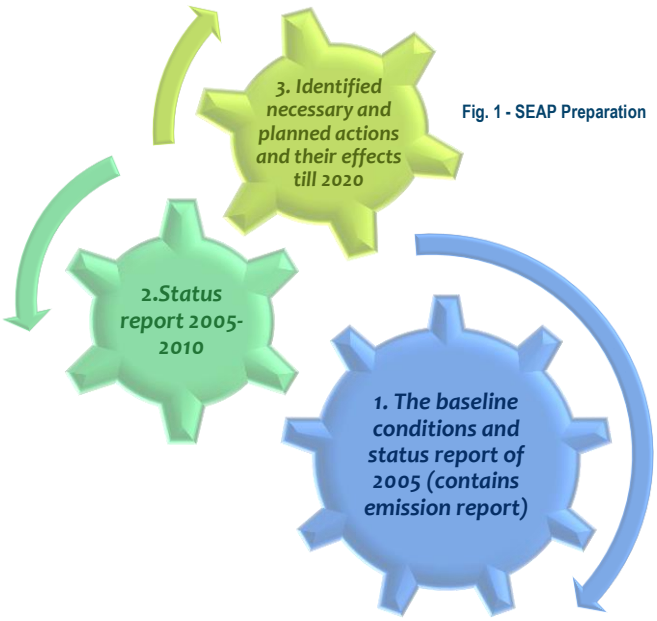


Fig. 1 - SEAP Preparation

This Good Practice is put forward by Government of Budapest, Hungary, this GP is driven by the need to develop new strategies and actions that reduce the high energy consumption and associated costs to the city, and to improve the quality of life by reducing the high rates of CO_2 emissions. The General Assembly approved the Energy Conception (2008), and an energy action plan (2009) with activities of next decade. The Lord Mayor of Budapest was among the first in Hungary to sign the Covenant of Mayors Agreement in 2009. The Sustainable Energy Action Plan was prepared in line with this agreement, and subsequently approved. The SEAP was prepared in three phases outlined in ***Fig.1***.

The main targets identified in the adopted SEAP are:

- *Reduction of CO2 emissions by 20%.*
- *Promote energy efficient solutions that include the modernization of municipal buildings and services.*
- *Establish an energy efficient, environmentally friendly stock of vehicles..*
- *Promote environmentally friendly transportation system by using of non-fossil fuels (Green Transport)*
- *Effective awareness-raising with active and interactive tools*
- *Create a complementary education programme that reaches students directly with information about energy efficiency at home and other activities.*
- *Create high standard lighting and heating systems with reduced energy consumption and maintenance costs.*

The city of Budapest has developed comprehensive systems and targeted actions for maximum impact such as Tram development in Budapest (routes & infrastructure); retrofit of municipal buildings; intelligent street lightning; modernization (environment) of municipal vehicle fleet; environmentally friendly, energy-saving district heating; awareness-raising with active and interactive tools, sustainable & attractive public transport system. These actions among others have helped the city to:

The implementation of the SEAP has a significant environmental impact on the city. Since the launching of the SEAP, the energy consumption dropped by approximately 40%, the CO_2 emissions were reduced by approximately 3,000t per year and energy efficiency has increased through replacement of traditional lighting with low energy consumption alternatives.

Analyzing the main outputs of this good practice, the strategies and actions implemented by city of Budapest under its SEAP have had a significant impact at the local level and would require a real engagement from the municipal authorities in order to effectively transfer GP to a partner region.

1.2.3 GP 3: Pilot plan for Rural Sustainable Development minimizing Energy Consumption

This Good Practice has been developed by SARGA (P10) in the Region of Aragon, Spain. The Renewable Energy policies of Aragon are reflected in the Aragon Energy Plan 2005-2012. The implementation plan 2013-2020 puts forward an energy strategy for Aragon to achieve sustainable development in the region.

The actions defined by the plan are as follows:

- *The promotion and development of renewable energies, focused on those that generate electric energy;*
- *The promotion of energy saving, diversification and efficient use (largely related to building energy certification);*
- *Electricity and gas network optimization and development; and*
- *RDI strategy: to strengthen the Research Centre for Energy Resources and Consumption (CIRCE), Foundation for the Development of New Hydrogen Technologies in Aragon and its Hydrogen Plan 2011-2015, as well as the Aragon Institute of Technology (ITA).*

SARGA (on behalf of Regional Government of Aragon) identified primary short term targets for the reduction of energy consumed by the local administration and the substitution of fossil energy sources by renewable energies. A series of activities and actions have been carried out by the Aragon Government in the field of renewable energy and energy efficiency with objectives of:

- Auditing, execution, direction and management of all investments made in the framework of renewable energies.
- Reduction of the energy consumption of the local administration and substitution of fossil energy sources by renewable energies.
- Increase the capacity of the municipalities to manage more energy resources for the benefit of citizens.
- Increase the amount of electricity production facilities, development of energy infrastructure, promote usage of renewable energy resources and enhance energy saving and efficiency.

In the framework of this good practice, the government of Aragon has developed strategies and actions that include increased roles for solar, thermal, and biomass as alternative energy resources. In particular the facilities being built in the framework of this good practice are:

96 photovoltaic facilities with an output of 5 to 20 Kw • 63 thermal solar facilities • 156 solar lanterns • 85 energy efficiency measures • 1 biomass plant planned • a 400 Kw wind farm • Reconditioning of boiler rooms to replace fossil fuels with biomass.

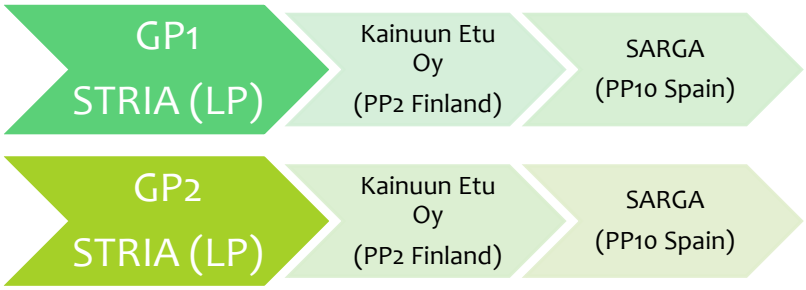
The implementation of this good practice involves the central government, through the Ministry of Rural and Marine Environment as a co-financing and supervising entity, the regional (autonomous) government as an entity that co-finances and directly makes the investments that go hand in hand with good practice and the local government as a beneficiary of these investments in its properties. The latter must subsequently take care of the appropriate maintenance and ongoing operation.

This Good Practice highlights the role of the ESCOs in energy saving and the use of renewables. The ESCO's activities focus on the design and launch of projects that promote efficient energy management, financially committing themselves to the results. Moreover, they are specialists in monitoring, measuring and controlling the energy cost and quantifying the energy savings obtained after launching each project.

Analyzing the main outputs of this good practice, the strategies and actions implemented by Regional Government of Aragon have a significant impact on the local level and would require a real engagement from the municipal authorities of partner´s regions in order to be a feasible GP transfer.

1.3 GP TRANSFERS UNDER THEMATIC AREA 1

The following analysis relates to the principal good practices under Thematic Area.1 (Better implementation of sustainable energy policies at local level) that it is planned to transfer among STEP´s partners.



1.3.1 Good Practice Transfer, Kainuu Etu Oy (PP2):

The Kainuu partner (PP2) has transferred GP1 & GP2 from STRIA partner (Lead Partner). The transferred Good practices as mentioned above, relate to the development of regional and local policies that regulate the municipal actions towards the improvement of energy efficiency and setup new tools that reduce energy consumption and the CO_2 emissions.

This transfer will allow the City of Kainuu to:

- *Improve municipal/ regional energy planning tools.*
- *Benefit from proven good practices from comprehensive community planning tools.*
- *Liaise with European initiatives and benefit from a larger development context, tools, and opportunities.*
- *Better implement Energy Policy.*

The Municipal authority of Kainuu has commenced the adoption and the implementation of this policy in the 2nd half of 2013 and it is estimated that the dissemination will take place at the end of 2014.

1.3.2 Good Practice Transfer, SARGA (PP10):

The SARGA (PP10) has also transferred GP1 & GP2 from STRIA partner (LP). The transferred Good practices as mentioned above relate to the development of regional and local policies that regulates regional actions towards the improvement of energy efficiency, setup new tools that reduce energy consumption and CO_2 emissions and an increase in the proportion of Renewable Energy Sources in the Regional energy supply. The adoption of this policy took place in May 2014 and it is anticipated that the dissemination of results will take place at the end of year 2014.

This transfer will allow the Region of Aragon:

- Introduce the Sustainable Energy Development Plan implemented in Hungary as a new strategic model in the Aragon region.
- Develop a SEAP implementation methodology, specifically adapted to the Aragon municipalities.
- Introduce the technologies and methodologies implemented through the Hungarian plans as a useful reference for Aragonese Municipal Energy Plans.
- To disseminate the benefits of incorporating more Aragon City Councils to the Covenant of Mayors, and other common project methodologies and EU support mechanisms (such as the ELENA project).
- To investigate the potential of new energy management solutions in Aragon such as geothermal energies and district heating, broadening the focus from energy saving to electricity production from renewable sources with lower CO2 emissions.
- To assess those funding instruments, tools and temporal planning developed in Hungary for the implementation of the SEAP.
- Target investment toward geothermal energy resources, as an underdeveloped sector in Aragon with high growth potential.

1.4 ACHIEVEMENTS AND PROGRESS UNDER THEMATIC AREA 1

Under the Thematic Area 1, PP2 (Kainuu Etu Oy) and PP10 (SARGA) have expressed their need to address efficiency challenges caused by the limited capacity of the Municipal Authorities to implement environmentally based solutions and exploit their renewable energy resources in a form that will facilitate a reduction in energy consumption and CO_2 emissions rates.

The transfer of GP1 & GP2 reflect the need to develop and implement regional and local energy policies in Kainuu and Aragon and introduce new methodologies to contribute to the development of new actions and activities to enhance public awareness of energy efficiency and its role in the environment and economy of the region and its municipalities.

The proposed transnational Good Practice transfer will provide partners with the ability to strengthen their local/regional sustainable energy plans and programmes, and to improve their knowledge and ultimate outcomes.

Both partners (PP2 & PP100 have developed legal and infrastructure frameworks that facilitate timely adoption of transferred GPs. KAINUU Authority and SARGA have identified the necessary tools for the implementation of the GPs within the timelines defined by STEP project and progressing at an advanced level. It is estimated that at the end of 2014, all partners involved will finalise the good practice transfer processes and begin with mainstreaming and implementation steps.

1.5 CONCLUSIONS AND RECOMMENDATIONS FROM THEMATIC AREA 1

GP1 & GP2 transfer will contribute in the improvement of the energy efficiency in the municipalities of the Kainuu and Aragon Regions through their integration into the regional strategies of both partners, and the development of innovative implementation solutions.

The EU has defined Energy Efficiency as a fundamental component of energy and environment policies and considered it as one of the most effective means toward improved energy security – cheaper and cleaner than investments in pipelines and shale gas.

The main recommendations that follow facilitate the implementation of a high quality energy efficiency system and could be useful tools for the partners:

- ***Transport:***
- *New standards are required that control the fuel-efficiency of public transport vehicles.*
- *Implement measures that allow the improvement the ECO-Driving system.*
- *Frequent review is required of the efficiency of the public transport system.*
- ***Lighting:***
- *Local/ regional entities should phase-out inefficient lighting products.*
- *Energy-efficient lighting systems should be implemented*
- ***Investments:***
- *The local/Regional governments should enhance the investments in the renewable energy sector through designing new attractive measures that encourage private investments and improve the legislative frameworks facilitating these measures.*

2. THEMATIC AREA 2

Policies and Tools for Energy Management

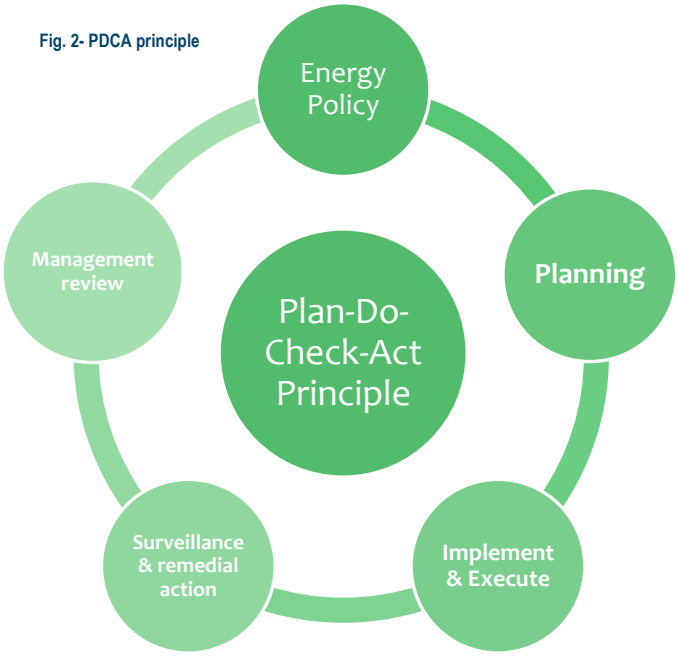
What do we know about the overall implementation of such tools and policies (overall achievement of EU objectives and targets) and what are the known barriers?

2.1 EU FRAMEWORK AND BENCHMARKING

2.1.1 Definition and standards

The energy management process of any organisation, including Local Government, should adopt the iterative "Plan-Do-Check-Act" (PDCA) approach with a view to ensure continuous monitoring, assessment, review and improvement on this basis. Formalised approaches, such as the international standard ISO 50001 (2011), the European standard EN 16001 (2009) and upon which national standards e.g. in Denmark, Ireland and Sweden are based, have been developed to support sustainable energy management. Developing an energy management system certified to these standards is likely to be beyond the means of most communities, but the PDCA approach itself can be applied at all levels in a cost effective manner.

Fig. 2- PDCA principle



The PDCA approach is a continuous cycle. Its elements are described (by ISO) in the following manner.

***Plan**: conduct the energy review and establish the baseline, energy performance indicators (EnPIs), objectives, targets and action plans necessary to deliver results in accordance with opportunities to improve energy performance and the organization's energy policy.*

***Do:** implement the energy management action plans.*

***Check:** monitor and measure processes and the key characteristics of its operations that determine energy performance against the energy policy and objectives and report the results.*

***Act:** take actions to continually improve energy performance and the energy management system.*

The PDCA cycle consists of five concrete steps (see Fig. 2), namely:

Energy policy: The organization formulates energy policy as a written statement which outlines the direction of its energy policy, which is communicated within the organization and an energy team appointed for implementation purposes. Overall responsibility for implementation ultimately lies with the management of the organisation.

Planning: The organization identifies significant energy uses and prioritises the opportunities for energy performance improvement (see the definition of step "plan" above).

Implementation and execution: The stated objectives and processes are introduced and implemented, resources are made available and responsibilities determined. This is the beginning of the energy management system.

Surveillance and remedial action: It should be ensured that the energy management system is functioning properly and generating the planned results. Internal audit can help to verify this. The processes need to be monitored with regard to legal and other requirements (customer requirements, internal policies) and the objectives of the energy management of the organization.

Management review: A management review is a written evaluation document prepared by the management of the organisation based on an internal audit. Corrective or preventive actions should be initiated and goals can be revised, if necessary.

Standardisation is also used to support the implementation of European directives. The European standardisation body CEN/CENELEC is constantly reviewing how European standards and other tools can support the implementation of, for example, the Energy Efficiency Directive.

2.1.2 Policies and tools for energy management

According to the EED (Article 5), the Member States shall encourage public bodies, including those at regional and local level, to adopt an energy efficiency plan, either on an individual basis or as part of a broader climate/environmental management plan. Member states are also required to encourage the adoption of energy management systems, including energy audits, as part of the implementation of these plans. The directive also makes reference to the sustainable energy efficiency plans developed under the Covenant of Mayors initiative, outlining how such plans can yield considerable energy savings, especially if they are implemented by energy management systems that allow the public bodies concerned to better manage their energy consumption.

At national level, policies and measures pursuing sound energy management vary from more overarching programmes, such as voluntary energy efficiency agreements or mandatory energy efficiency plans to statutory use of individual energy management tools or practices, such as energy audits or appointment of energy managers. Some of these are outlined below.

2.1.2.1 *Mandatory energy efficiency plans*

While the EED strongly encourages the preparation of energy plans and they are also promoted by the Covenant of Mayors, there are also numerous national policies for energy efficiency plans in the public sector in Europe. Examples of mandatory preparation of energy efficiency plans in municipalities can be found, e.g., in Bulgaria (2009), Norway (since 2010), Spain (2008) and the Brussels Region in Belgium (2012). In Bulgaria, the central government bodies and the local self-government bodies submit annual reports on the implementation of their plans to the Sustainable Energy Development Agency (SEDA); in 2012, SEDA received 232 annual reports.

2.1.2.2 *Mandatory energy management systems*

Greece has reported into the European energy efficiency policies database MURE[12] that it is planning to require the gradual implementation of an energy management system in the tertiary and public sectors starting in 2014. This is stipulated by Law (3855/2010, Art. 8)

"Measures to improve energy efficiency in end-use energy services and other provisions" which also states that the principles, requirements and guidelines of the energy management system will be determined in accordance with International or European Standard (ISO 50001 or EN 16001)."

Slovenia has reported a measure in the MURE database on energy management commenced in 2012. Slovenia requires the introduction of energy management system in ministries and municipalities and public sector organisations must appoint energy managers and carry out energy audits in public sector buildings larger than 500 m^2. To increase motivation, a reward system with an efficiency dividend, based on energy savings achieved, is to be formulated and implemented.

2.1.2.3 *Voluntary energy efficiency agreements*

In Finland, energy efficiency plans are required by a Government Decision in Principle (2010) for central government bodies and recommended for municipalities. Municipalities typically issue their plans in connection to the voluntary energy efficiency agreement and programme for the municipal sector. The voluntary agreements are to achieve energy savings by 2016 amounting to 9% of earlier annual energy use. The primary objectives lie in energy efficiency but the municipal plan also includes targets and actions for renewable energy. Energy Efficiency Agreements primarily target improved energy efficiency of the organisations involved but the participation of municipalities also emphasizes their leadership role in sustainable energy consumption across the whole community. The Energy Efficiency Agreement of energy utilities has an important target to support energy efficiency measures in households by a wide variety of information dissemination activities.

In 2007, the Danish Electricity Saving Trust (today Energy Saving Trust) introduced its new 'Curve Breaker Agreement' concept. By December 2008 the list of signatories included one third of all Danish municipalities, government ministries and public sector institutions, as well as a number of large private companies. Once signed, an agreement binds an organisation to fulfil a target to reduce the total annual electricity consumption in relation to a defined baseline year. The reduction target is typically 3-15% over a 3-5-year period.[13] By 2010, 177 curve breaker agreements were signed and by 2011, signatories had achieved an average 7.5% of electricity demand reductions.

2.1.2.4 *Energy audits*

The Concerted Action EED report on energy audits[14] defines an energy audit as a procedure to evaluate the state of "energy health" of an organisation, service or system and to identify potential energy and economic saving opportunities. It is the first step in implementing energy saving measures which, at least in Finland, are typically carried out and financed by the energy audit object organisations themselves. It is also the first step in an energy services approach (e.g. for third-party financing) and in energy planning (e.g., energy review in the energy planning phase of ISO 50001 and emissions inventory in the Covenant of Mayors). Energy audits were considered a very important tool in the Energy Efficiency Directive which encourages their use by public authorities, sets an audit obligation for large enterprises and

[12] http://www.measures-odyssee-mure.eu/

[13] http://www.eceee.org/library/conference_proceedings/eceee_Summer_Studies/2009/Panel_4/4.111/paper

[14] http://www.esd-ca.eu/reports/working-group-excutive-summaries: Energy audits: obligations, minimum criteria and qualification, accreditation and certification schemes. Executive summary. Report 23 April 2013.

contains a set of minimum criteria for energy audits.

Audits in the Member States are commonly carried out by qualified or accredited/certified experts as required by the EED. There is a further option whereby audits are implemented and supervised by independent authorities under national legislation but this is less common.

A variety of complementary methods have been adopted to assure the quality of energy audits. Auditor training, guidelines, tools and templates are widespread and qualification/ accreditation/certification procedures are also used by a large number of Member States.

Energy audit obligations were already present in five Member States, in different sectors and with different thresholds, timeframes and additional requirements. While voluntary audits are very common in industry, according to the MURE database not many countries have had them available for the public sector.

It should be recognised that the energy audit itself is only a first step and normally does not include implementation of saving measures that need investments and extra financing. The reliability of information given in the audit reports about the proposed saving measures is crucial especially if investments are needed, the economics of the measures proposed must be described with high degree of reliability and transparency. If none of the opportunities identified in the energy audit are implemented, it is a sign of a bad quality of the energy audit and/or the report and then the audit turns out to be a mere cost without any positive effect on energy consumption and expenditure.[15]

2.1.2.5 *Energy managers*

An energy manager is typically responsible for overseeing the development and implementation of the energy management system. The incumbent typically acts as a liaison between top management and the rest of the organisation.

Mandatory requirements for the appointment of energy managers in the public services sector can be found in Slovenia and within the CRC Energy Efficiency Scheme[16] in the UK. However, the latter applies to government bodies, not municipalities.

It is important that the energy managers actually have sufficient knowledge of the principles and practices of energy management, including applicable legislation. Training schemes have been established to address these needs. One example is the European Energy Managers (EUREM) [17], which started as a project co-funded by the European Commission. EUREM is now a continuing education programme and a networking community of energy efficiency experts.

2.1.2.6 *Information instruments*

Information as a policy instrument ranges from regulatory initiatives to energy efficiency training, tools, motivation of personnel and information campaigns. Sometimes also energy audits are classified as an information instrument.

Well known examples of regulatory information instruments are the energy efficiency certificates for buildings, also applicable to the public sector. While the Energy Performance of Buildings Directive (2010/31/EU) requires public buildings above a certain size to display their energy efficiency certificates, some countries, such as Denmark, have gone a step further by requiring a certificate from all public buildings irrespective of their size.

Energy management requires the involvement of staff from many different areas and functional roles across the organization. Various tools, guides and instructions are widely disseminated to support putting energy management in

[15] After the audit: encourage the implementation of the identified measures. Executive summary. Report December 2013.

[16] https://www.gov.uk/government/policies/reducing-demand-for-energy-from-industry-businesses-and-the-public-sector--2/supporting-pages/crc-energy-efficiency-scheme

[17] http://www.ihk-eforen.de/display/eurem/About+EUREM

practice. For example, ManagEnergy[18] is a technical support initiative of the Intelligent Energy - Europe (IEE) programme of the European Commission which aims to assist actors from the public sector and their advisers working on energy efficiency and renewable energy at the local and regional level.

The network for the development of real estate business in the public sector, UFOS Energi (Utveckling av Fastighetsföretagande i Offentlig Sektor), commenced a programme of cooperation with the Swedish Energy Agency in 2004 on energy and climate related projects. The purpose is to increase the knowledge of energy-related measures in the participating organisations, such as the Swedish Association of Local Authorities and Regions, the National Property Board, and some major owners of property. In 2009, UFOS Energi was awarded "Best European Energy Service Promoter" by the European Energy Service Initiative[19].

2.1.2.7 *Energy services*

The EED asks Member States to remove regulatory and non-regulatory barriers (Art. 18 and 19) and to promote and support the energy services market (Art. 18). Energy services are a combination of energy with energy efficient technologies and/or with action, which in normal conditions lead to an increase of the energy efficiency. There are some variations in the energy services offered but there is a general tendency towards energy performance contracting (EPC) and supply contracting (SC).

The new business models, including their benefits and barriers, are discussed in more detail in relation to Thematic Area 3.

[18] http://www.managenergy.net/
[19] http://www.european-energy-service-initiative.net/

2.2 GPs IDENTIFIED UNDER THEMATIC AREA 2

Several and diverse Good Practices have been proposed under Thematic Area 2, related to Energy Management Systems (Sustainable energy management tools for communities & municipalities), by the project partners.

2.2.1 GP4: HelEn District Heating and Cooling

This good practice carried out by Kainuun Etu, Finland provides district heating from the waste heat of a data centre and district cooling from the sea water utilising heat pump and absorption chillers.

An important project has been developed in Helsinki, Finland related to the use of Renewable Energy Sources in District Heating and Cooling facilities. Many companies try to place their centralised data centre facilities in the Scandinavian countries due to favourable climactic conditions for such facilities. The operation of these centres generates significant amounts of waste heat, which, in this instance, has been utilised for heating distribution through a pipeline network. The thermal generating element of the plant also produces cooling from the sea water, heat pumps and absorption chillers. This good practice provides a complete sustainable District Heating and Cooling by utilising using waste heat.

The Good Practice aims to improve energy efficiency and RES uptake (target 38% by 2020), taking the global target for zero CO2 emissions by 2050 into account and the higher energy costs this will entail. The project benefits from the co-location of activities that utilise and generate the energy produced through advanced technological innovation. Its main objective is to use energy-release intensity from data centres (DC) for district heating and cooling (14 000 customers).

In the HelEn case, the District Heating network was in place, and the SEAP developed by the municipality included this measure. Finland has significant experience in the demand led approach towards energy efficiency and has established a range of public–private partnerships and ESCO solutions in support of this. The beneficiaries are homes and businesses in the Helsinki central area, which are part of the district heating network. This new solution for reuse of energy released from one of the city's data centres decreases CO_2 emissions and saves some 20 % of costs.

2.2.2 GP5: Swimming Pool heating system retrofit

This good Practice was carried out by ARGEM (Regional Energy Agency of Murcia, Spain) and involved the replacement of the Indoor Swimming Pool's gasoil heating system to Biomass and Solar Thermal system using a contract using an Energy Service Company (ESCO).

The implementation of Municipal Energy Management instruments at a local level are another good practice example under this Thematic Area. Best practice would indicate a requirement for Energy Management Systems based on international standards in all municipalities, however some good practice has been developed in the areas of Municipal Energy Management, using the existing public technical staff supported by energy consultancies that specialise in energy management.

The ESCO model facilitates municipalities in the reduction of energy costs, by engaging them with highly skilled energy experts in order to improve the local energy efficiency while not entailing excessive financial burden. In this solution, the ESCO has energy expertise and defines the best cost effective solution to be implemented in the municipal facilities, reducing the conventional energy demand. The ESCO makes the investment and recovers it through the energy savings for a fixed agreed timeframe. At the end of an investment return period, the energy efficiency benefits revert back to the municipality. This good practice model has allowed Beniel municipality in the Region of Murcia (Spain) to retrofit a municipal indoor swimming-pool with biomass and solar thermal energy technology instead of gasoil.

The project produces saving costs for the City Council and reduces CO_2 emissions. The gasoil system has been replaced with a new parallel system using biomass boiler and 20 solar thermal collectors. The new solution requires a 10-year contract between the City Council and the ESCO. The ESCO funded the project and sells the energy to the City Council as per agreed price (initially 0,056 €/kWh). The ESCO manages the installation ensuring its performance, availability and maintenance over the contract period.

This Good Practice gives as result an annual energy consumption saving of: 686.133,4 kWh/year (gasoil, 67.934 litres). Comparative figures, before & after ESCO:

***Energy cost**: 0,090 €/kWh (ever growing) → 0,056 €/kWh (during 10 years).*

***Annual energy cost**: 61.758,18 €/year + VAT (21%) → 38.423,47 €/year + VAT.*

***CO_2 emissions**: 196,92 tn CO2/year → No CO_2 emissions.*

***Important maintenance costs** → No maintenance costs, they are included into the energy price.*

2.2.3 GP6: Energy performance audit

This Good Practice was carried out by the Regional Development Agency ARLEG, Poland. (Support for local energy self-sufficiency, optimization and management tools for energy efficient).

The practice addresses energy efficiency (EE) in construction and reduces CO_2 emissions. The objective is EE-based sectoral upgrade through the development of projects related to EE investments; an increased specialised knowledge, applications and institutionalised tools; and enhanced involvement of local authorities in EE issues.

All this is based on the Energy Performance in Buildings Directive 2010/31/EU, transposed to national (Polish) level. The main targets are local/regional/national authorities, private and public investors, building owners, etc. The Practice consists of the following steps:

1. *An analysis of current EE performance of building;*
2. *Verification of adopted parameters;*
3. *Overview of possible improvements;*
4. *Investments' cost;*
5. *Calculation of savings from projects;*
6. *Economic analysis (to determine viability);*
7. *Determination of recommended scope of work.*

As a result of its implementation, the energy savings amount on the average is 30%, but the potential savings are usually higher. However, it is crucial that operational Life Cycle Costing (LCC) rather than specific-use costing calculations are used in the construction investment plan. Adjusting construction funding/financing to this approach & raising awareness about it, is crucial for achieving EE in buildings.

2.2.4 GP7: Municipal Energy Management.

Good Practice carried out by SAENA (Saxony's Energy Agency), in Germany and aims to achieve energy self-sufficiency in rural areas through the integration of a rural development-concept and the sustainable use of energy. The problems addressed are the development of an energy-concept, use of substantially renewable primary products and the establishment of an energy advisory centre.

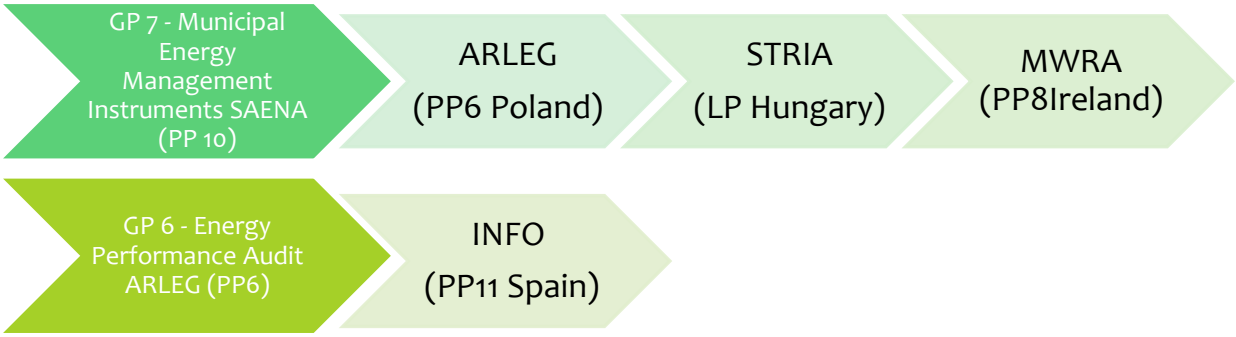
Energy self-sufficiency is a target for the region of Saxony, concentrating on electrical and thermal energy. In November 2008 a meeting of members (mayors from municipalities) decided on the objective "Energy self-sufficiency of the region Westlausitz" and commissioned an energy concept, which was developed from April to December 2009. This analysed the status quo, forecast demand and presented an evaluation of methods and implementation recommendations on identified actions. The conclusions were to concentrate on the energy-mix, taking into account that biomass can just be a minor component, so concentrated on energy-efficiency (non and low-investment measures) and establishing networks.

The pilot project commenced April 4th 2012. Energy officers were nominated in each municipality, working on data collection from municipal buildings (i.e. energy consumption, metering structures, system installations) having participating in advanced training as municipal energy managers and regular workshops on different topics (e.g. optimising heating systems, maintenance guidelines etc.) As a result, all heating systems have decreased energy consumption between 10-30% (in some cases even more, however levels of commitment, qualification, training and motivation were found to differ considerably between municipalities.

Cooperation between municipalities and their combined effort to work together on renewable energies and energy-efficiency has been a overall success. Since the concept of municipal energy management has been implemented in German federal states (Gemeinde Nordheim 7.500 inhabitants; Gemeinde Rielasingen – Worblingen 12.000 Inhabitants; Stadtverwaltung Murrhardt 14.000 inhabitants etc.), savings between 10-20% can be expected.

2.3 GP TRANSFERS UNDER THEMATIC AREA 2

Some of the above mentioned good practices have been implemented in other European regions and municipalities.



2.3.1 GP Transfer STRIA (PP1), ARLEG (PP6)

In this sense, the Municipal Energy Management Instruments are to be implemented by STRIA, the South-Transdanubian Regional Innovation Agency in Hungary and ARLEG (Regional Development Agency) in Poland, adopting "Municipal Energy Management Instruments", which was introduced and used as a good practice in Germany.

In Hungary there are few energy professionals and low citizen awareness of the need for sustainable energy management or how this affects the environment and economy of these areas. This meas that investment in new technology in this area is not considered a priority, particularly given the prohibitive price of many of these solutions. This program provides qualified employees and fosters environmental

awareness (in the field of energy). The Municipal Energy Management Seminar program, which will be implemented by South-Transdanubian Regional Innovation Agency is closely linked to the national Energy Strategy – for example the "Establishment of a network of energy engineers".

While the target group of the project is local government, use of energy rationalisation knowledge can be applied on a broader scale outside of this sector. It is anticipated that the implementation of this GP will decrease energy dependency, reduce CO_2 emissions and result in a healthier environment. This implementation links to other expectations of the ministry, as these qualified people will be able to generate projects, which will contribute to reaching and fulfilling these expectations.

2.3.2 GP Transfer SAENA (PP3)

SAENA has also transferred the Municipal Energy Management System to the Mid West Regional Authority (MWRA). The Irish National Energy Efficiency Plan 2009-2020 reaffirms Ireland's commitment to a 20% energy savings target in 2020. Recognising that Government must lead by example, a 33% reduction target is set for public sector energy use. Within the buildings/facilities stock of the local authorities in the mid-west region leisure centres are the highest energy consumers. These facilities may be operated directly by the local authorities or by management companies on their behalf. In either case the 33% reduction target applies directly to each of the three local authorities in the region. To date there has been no direct initiatives for these facilities to deliver either energy efficiency improvements or asses the opportunity for renewable energy opportunities. By transposing this good practice into the region the initiative will assist in the delivery of the 33% reduction under the national energy efficiency action plan. In addition the GP will address energy action at a local level which was clearly identified as a deficit in the most recent MWRA regional needs assessment.

This Good Practice transfer offers the MRWA the opportunity to learn from the proven good practice implementation in SAENA and avail of the knowledge and expert advice from this project partner. Directly in-line with GP9, the Community of Practice starts with non-investment measures which can reduce energy consumption by 10%-20%. In the future, capital investments for energy efficiency and renewable energy will be required.

Finally, the use of a proposed methodology for proceeding with Energy Audits in municipal facilities is being transferred from ARLEG (Poland) to INFO, the Development Agency of the Region of Murcia, in Spain.

2.4 Achievements and Progress, Thematic Area 2

The Hungarian experience, implemented by STRIA, focused on governments during the first implementation phase, with the aim to involve more governments into the programme in the South-Transdanubian Region. National regulations must be taken into account to ensure that those to be trained are selected on a strategic basis considering the entire organisation to maximise training efficiency and benefit. Medium and long term, non-government and entrepreneur spheres have been considered in the programme as energy is for everybody, it is part of our life all areas are a potential market. The implementation project includes a pilot seminar and a training program for a total of 40 qualified professionals.

The South-Transdanubian Regional Innovation Agency has benefitted from the German experience in the benchmarking of training actions. Courses are included that relate to existing energy policy and its practical benefit at global and local scales.

The main barriers encountered related to the adaptation of the German good practice to the Hungarian situation, an adaptation strategy consisting of 2 steps was employed to facilitate this process. First of all we had to adopt the core

principle, i.e. that the training is good and we need it in Hungary. The second step was to adopt the practice by getting acquainted with the training plan.

Another barrier related to the different local government systems in Germany and Hungary due to diverse cultural and economic backgrounds.

In case of the Polish implementation of the German good practice, the objective was to minimize the costs and energy consumption in objects and public buildings in Lower Silesia through appropriate management. For this purpose, an appointment of certified energy managers was required.

ARLEG has taken into account the main stakeholders for this purpose:

Institutional stakeholders: for coordinating the course of the implementation of good practice, municipality committed to the implementation of good practice, municipalities in Lower Silesia and external experts.

Impact stakeholders: like users schools, kindergartens, public administration buildings-users of the facilities and public buildings, energy supplier.

Cooperation agreements have been signed between the institution coordinating the implementation of training and policy makers (Vogt/Mayor). The qualification of these employees as energy managers increases the competence, knowledge and experience and overall capacity of the target groups.

Another good practice transferred has been the Energy Audit Program, developed in Ireland (Mid-West Regional Authority) and to be implemented in the Region of Murcia (Spain) through INFO (Instituto de Fomento de la Región de Murcia). This transferred good practice is supported by an ELENA facility (financed by IEE Program through the European Investment Bank).

The ELENA FUENSANTA project will make significant investments to municipalities and other public bodies in the Murcia region, which will mean significant savings in energy cost to the local authorities and other public bodies involved.

The project anticipates the realization of different services, mainly the launch of a service to carry out energy audits in public buildings, requiring the adoption of a common methodology by the different agencies involved. This will facilitate and standardize the conduct of the audit as well as ensure their reliability.

Adopting the methodology proposed by the Mid-West Regional Authority within the STEP project and its subsequent application in FUENSANTA ELENA project is a result of the validation this methodology by different partners involved in the project. From the point of view of resources, to improve the energy efficiency of municipalities, FUENSANTA ELENA project, is planning a total investment of € 52,811,219.00.

Adaptation of the methodology is required as the MWRA project has been developed in an area where weather conditions differ significantly from those in the Region of Murcia, and as such, some modifications are needed in order to achieve results that are both reliable and comparable.The proposed methodology has also been modified to fit the existing legal framework in the region relating to the energy audits.

2.5 Conclusions and recommendations Thematic Area 2

Project STEP has been an extraordinary framework to exchange very useful good practices between the different partners within Thematic area 2 (Policies and Tools for Energy Management). In this sense it is obvious that this thematic area is attached to very particular aspects of its region, because it deals with the national, regional and local policies. That is why some of the good practices have encountered implementation difficulties and required important adaptive changes to fit with the specific local situations.

3. THEMATIC AREA 3

Innovative financing tools

Policies, provisions and tools promoting innovative financing solutions. What do we know about the overall implementation of such tools and policies (overall EU achievement level) and what are the known barriers?

3.1 EU FRAMEWORK AND BENCHMARKING

The need for upfront capital investment can be a barrier for energy efficiency projects. While traditional financing market can be a viable option in many cases, energy services using new business models are emerging. According to the findings based on experiences in the Member Countries reported in the Concerted Action EED Project, the main steps of an ideal national approach to foster energy services are:

- An independent study, involving stakeholders, on barriers and proposals;
- Modification of legislation and rules on public tendering and accounting;
- Informative campaigns for clients and training for clients and service providers;
- Guides and models for contracting;
- Market facilitators (e.g. public energy agency) to support the tendering of complex public projects;
- Subsidies to start and develop the market;
- Guarantee/revolving funds to start and sustain the third party financing;
- Third party (e.g. public energy agency) involved in energy audit and business plans;
- Instruments to increase the quality of the offer and trust on the market (e.g. official public website containing updated list of ESCOs and their references, ESCOs certification, etc.).[20]

Different measures have to be considered for different stages of the energy services market. In an under-developed market, a systematic approach is needed, through simpler projects with concrete and visible results in the short term or through a global approach to contracts, risk assessment and guarantees. In more developed markets, there is no need for new business models; it is more important to identify gaps and barriers, whether these are legal, budget/accounting or economic/financing.[21]

Using EU financial resources can support national energy efficiency programmes. According to the Concerted Action EED Project's findings, three quarters of the Member Countries use Structural and Cohesion Funds to finance energy efficiency programmes and that the funds are used most successfully for non-residential buildings in the public sector. Technical Assistance facilities were also created to help improve implementation of Operational Programmes and preparation of projects.

The application process for EU funding can be a barrier for using it. It can be too difficult for small municipalities to apply.

[21] Concerted Action EED. New and existing business models for energy services. Excecutive Summary. Report 23 April 2012

3.1.1 Energy performance contracting

The Joint Research Centre of the European Commission defines EPC in the following manner: "Energy Performance Contracting (EPC) is a form of 'creative financing' for capital improvement which allows funding energy upgrades from cost reductions. Under an EPC arrangement an external organisation (ESCO) implements a project to deliver energy efficiency, or a renewable energy project, and uses the stream of income from the cost savings, or the renewable energy produced, to repay the costs of the project, including the costs of the investment. Essentially the ESCO will not receive its payment unless the project delivers energy savings as expected."[22]

A fundamental difference between two business models, the Energy Performance Contracting (EPC) and Supply Contracting (SC) is the energy saving guarantee present in EPC. In SC guarantees are limited to specific aspects of the service (level of service, quality, costs, etc.).

EPC has many benefits. In addition to bringing guaranteed and verified savings, thus reducing risk, and providing a way to overcome the financial barrier it is a way to outsource energy, which is, after all, just an auxiliary function in the operation of a local authority. Energy supply, energy efficiency investment and management process (including expertise) can be outsourced as a total package.

EPC is not widely used across the EU yet because there are still problems in many Member States around public tendering for EPC, mainly due to its complexity and to various problems with legislative frameworks1. The procurement and tendering process is very complex and heavy requiring specific information and skill. Specification of EPC in tendering documents is much more difficult than specifying more "concrete" goods whose characteristics can be defined and quantified in detailed manner. There is also still a degree of general confusion about definitions and contract provisions. There is even a lack of general awareness of the service. The number of service providers is still quite limited. When a public body has an existing operational organisation and staff for energy management it cannot instantly jump to outsourcing energy management. Yet another difficult area is accepting that a third-party will enjoy part of the monetary benefits arising from savings.

The Directorate General for Energy of the European Commission with the European Investment Bank's PPP expertise centre (EPEC), ManagEnergy Initiative and the Covenant of Mayors have launched an EU Energy Performance Contracting Campaign[23] to support Member States and market actors with rolling out of functioning energy services market.

One example of national initiatives to promote EPC is the Energy Performance Contracts Handbook[24] issued by Sustainable Energy Authority of Ireland (SEAI). The Handbook is a set of project development documents for EPC projects. It provides, for public sector and commercial organisations, a standard and structured approach, supported by a suite of tools including comprehensive guidance documents, templates, model contracts and monitoring & verification requirements to support the efficient procurement and delivery of energy efficiency projects.

22 http://iet.jrc.ec.europa.eu/energyefficiency/european-energy-service-companies/energy-performance-contracting

23 http://ec.europa.eu/energy/efficiency/financing/campaign_en.htm

24 http://www.seai.ie/Your_Business/National_Energy_Services_Framework/EPC_Handbook/

3.1.2 Public-private partnership

A Public Private Partnership (PPP) has potential to boost the economy though infrastructure investment. This form of cooperation between public authorities and the private sector is a long-term contractual relationship where risks are shared. Increased financing for energy efficiency is mobilised within the private sector to carry out modernisation projects in the public sector, with the public partner paying for delivered services in the long term. EPC can be also considered as a form of PPP, but only when both public and private partners are involved. This is relatively common with well established procedures in some countries. In less mature markets, governments can facilitate the availability of financing for energy efficiency in local financing institutions (e.g. banks) by establishing Dedicated Credit Lines or Risk-Sharing Facilities, which - in the case of public involvement - can also be considered kinds of PPP.[25]

Most common forms of PPP are at the local level in buildings and street/road lighting. Ten countries included a specific reference to PPP in their National Energy Efficiency Action Plans (NEEAP), required by the Energy Services Directive. In most countries it has not been adopted yet but they consider this an interesting and cost-effective way to implement EPC and are planning to use PPP for energy efficiency in the future, mainly in the buildings and transport sectors.

About half of the Member States have a national definition of PPP and about as many have a specific ministerial PPP department, usually in tandem with finance or economy. Some countries have a specific PPP agency while over half Member States have national internet sites where displaying PPP information. Barriers to PPP are quite similar as for EPC in general. PPP is not a traditional way of funding and is often overlooked due to lack of expertise in the public sector and where the existing legislative framework makes it difficult to fit PPP for energy efficiency into public procurement rules. Because of the immature market in many countries, the private sector often fails to deliver a comprehensive service (design, implementation, operation, financing). The lack of clear definition of roles and responsibilities between partners also causes problems. There is also some scepticism over the need for such a financial solution because other tools and measures exist that can finance energy efficiency. Negative experiences of PPP for energy efficiency are not common, however, insufficient political support and the misinterpretation of results are reported.

Better quantities of high quality data are required including advice on how to set energy efficiency requirements; contracting and negotiation; information on how to structure PPP for energy efficiency and model contracts; and good case study examples from other countries. Organising training courses and establishing a website with a database of examples of energy efficiency in PPP by sector would be also a great help. Success factors for PPP have been identified in the Concerted Action EED Project:

- Clearly defined objectives at the beginning of the process
- Profitability and guarantee of return
- The selection of the right private partner with technical, professional and economic competence to manage the implementation of the project is critical
- Continuous dialogue between partners and a willingness to work together throughout the contractual timeframe
- Providing reliable baseline data and reference values is essential to planning the whole investment and the required energy efficiency improvements
- Creating 'building pools', i.e. clustering small buildings together under one framework, has proven to be an efficient and profitable approach
- The involvement of a professional project management institution (e.g. an energy agency) as an interface between the public owner and the private company

[25] Concerted Action EED. Public Private Partnership for Energy Efficiency. Executive Summary. Report 23 April 2012.

3.1.3 Funds and other financing mechanisms

EU regional policy supports countries and regions with investments targeting economic growth, competitiveness, job creation and sustainable development, delivered through European Structural and Investment Funds, e.g. European Regional Development Fund (ERDF), European Social Fund (ESF) and Cohesion Fund (CF - see the appendix for a detailed description). All regions can be beneficiaries of the funds, except the Cohesion Fund, which supports only the less developed regions in the EU.

In addition to funds the European Commission provides public entities as beneficiaries, technical and financial support through technical assistance facilities (ELENA, JASPERS, and EEEF), dedicated credit lines (EEEF) and revolving funds (JESSICA) in forms of grants, loans, guarantees or equity.

European Commission provides grants towards achievement of EU energy objectives. The current Horizon2020 programme and its predecessors, Energy Framework Programmes and Intelligent Energy Europe (IEE), grant project funding through competitive processes.

The new multiannual financial framework 2014-2010 and legislative and policy framework for the period of 2014-2020 encourages more efficient use of the financial instruments on the basis of experiences from the previous period. The new framework contains clear rules to enable better combination of financial instruments with other forms of support, in particular with grants**,** to better meet the specific needs of Member States or regions.

3.1.4 Studies on effectiveness of financial instruments

The study "Overview of financial instruments used in the EU multiannual framework 2007-2013 and the Commission's proposals for 2014-2020"[26] commissioned by the European Parliament's Committee on Budgets, published in 2012, outlines the impact of financial instruments and their strengths and weaknesses from the previous period and gives recommendations for improvements and adjustments for the current period.

The Member States have approached the complexity and effectiveness of funds and financing instruments in the CA ESD work by analysing financial measures for energy efficiency and finding good examples of funding and financial mechanisms. [27]

Most MS find that the Structural and Cohesion Funds allocated for energy efficiency are effectively applied, while others have yet to capitalise on these funds effectively. Successful use of funds requires well-designed and well-prepared programme setup with clear and transparent procedures and rules, appropriate fund allocation and active, consistent information to potential beneficiaries in cities and regions. The study recommendations include national, regional and local integration of funds to foster local actions with increased information transfer, improved transparency and clarity of application processes and efficient management procedures. Demand for the establishment of a knowledge sharing platform at EU level was also indicated by the study. [7]

Effective use of funding and financial instruments from a range of resources calls for improvements at the European and national level. The demand does not often meet the supply. Information sharing of good examples, combination of funding sources, and good planning by also using of expert assistance from the funding bodies are the first steps for improved use of available funding.

Poland and Greece have been significant beneficiaries of EU funding in recent years, while the Baltic countries Estonia, Latvia and Lithuania are on the top of the list in relation to gross national income.

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[26] http://www.europarl.europa.eu/RegData/etudes/etudes/join/2012/453232/IPOL-JOIN_ET(2012)453232_EN.pdf

[27] Concerted Action ESD. Funds and Financing for Energy Efficiency. Report June 2012

3.1.5 Underuse of financial instruments – Case Finland

Finland is an example of countries not using the available funds and financial instruments effectively for energy efficiency and use renewable source investments and improvements on local level.[28]

Technical assistance sources for preparation of investments are poorly used mostly due to the fact that investments oftentimes are not high enough to meet the eligibility of technical assistance criteria, especially in the smaller municipalities. In bigger cities the departments are quite independent and manage their own planning and resources and thus bigger investments, under different departments have greater efficiencies through economies of scale.

Resources are often limited to investment in the preparation of applications and proposals to gain European funding. The same applies to implementation of projects, personnel are fully employed with existing tasks and allocation of resources to additional project management is often impossible. Another factor hindering application of project grants is lack of required national/own funding.

A limited knowledge of funding options, their suitability for different purposes and how to combine different instruments can also contribute to underutilisation. Energy efficiency projects are usually planned and managed by energy experts who do not have the skills to compare financing options and their effectiveness and suitability. Financial experts should be more involved in the planning phase to optimise best funding options for the project. Moreover the financial terms from local banks are usually better, and procedures are familiar and easier than those of European funding sources. That applies often to ESCO funding too.

Management of European projects and funding contracts is quite onerous, with substantial reporting, hourly time monitoring, and detailed technical project descriptions. Different funding instruments have different application forms and thus management procedures. Language is an additional factor, with applications published only in major European languages.

3.1.6 Improvements in the horizon

On European level, streamlining of application procedures, management requirements, reporting and associated forms would be substantial improvement. Cooperation and sharing of knowledge and experiences among MS will benefit all. A common European knowledge sharing platform as initiated by the CA ESD study could be a flexible solution. National expert assistance in mapping the funding options is essential and could be derived from and linked to the European platform.

Financial institutions could be more active in communicating the good practices as well as the most common mistakes in acquiring and managing EU funding. Structured, descriptive examples of the procedure, from planning of the project with mapping of financial instruments, application process, resources and expertise needed in therein, continuing to contract and implementation phase and reporting to finalise the project would be welcomed.

Improvements and developments are apparent in the new framework of Cohesion Policy 2014-2020 to promote greater uptake and more efficient use of financial instruments. The framework offers more flexibility to MS and regions in terms of target sectors and implementation structures; provides clear and detailed set of rules based on existing guidance and experiences; offers synergies between financial instruments and other forms of support like grants; and ensures compatibility with financial instruments implemented at the EU level regarding management rules.

[28] Interviews of Finnish municipal stakeholders: Mr Kalevi Luoma, Energy Engineer at the Association of Finnish Local and Regional Authorities, 27 June 2014; Mr Jouni Arola, Real Estate Manager of City of Lahti, 1 July 2014; Ms Katri Kuusinen, Senior energy Expert, Construction Management of City of Helsinki Public Works Department, 1 July 2014; and Ms Suvi Holm, Managing Director of Ekokumppanit Oy (Tampere Energy Agency), 1 July 2014.

The aspired effects are to give flexibility to MS in designing programmes by combining different instruments. The capacity of Region's to achieve strategic goals will be enhanced through strong financial instruments. If financial instruments are used more widely and tailored to specific needs on regional level, they contribute to wider improvement of the society, e.g. socio-economic aspects.

3.2 FINANCIAL MARKETS

Where lenders conventionally offer loans for energy efficiency to end users a key barrier to success may often be higher than usual interest rates on these loans, or high fees and charges. Reasons for the wariness of investors and lenders about financing energy efficiency[29]:

- high perceived risk exposure, i.e., the riskiness relative to the potential return on an investment
- under-appreciation of some of the wider financial benefits such as reduced exposure to fuel price volatility
- long payback periods: Often non-energy benefits, such as increased employment, improved health and comfort, and reduced pollution need to be quantified in order to make long-term investments such as deep retrofits attractive
- lack of awareness: lending institutions are not typically trained in understanding energy efficiency investments; the absence of established methods for assessing the value of investments
- standardised measurement and verification methods are critically important to ensure lenders do not need to spend a disproportionately large amount of time assessing the value of energy efficiency investments compared to other options, which would increase transaction costs in the form of higher administrative fees and/or interest rates.
- high administrative costs originating to investments' often small-scale and high specificity

3.3 GOOD PRACTICES UNDER THEMATIC AREA 3

The STEP project partnership has identified a total of 4 Good Practices under Thematic Area 3, **Innovative Financing Tools**.

3.3.1 GP8: Loans and thermo-modernisation premiums as innovative financial tools

In Poland, the thermo-modernization (TM) program of buildings was introduced in 1999 on the basis of the Act on supporting thermo-modernization projects. This continues to the present day. The Thermo-modernisation Fund constitutes the largest mechanism for financing energy efficiency improvement in the building construction sector. New legislation on the energy performance of buildings came into force in January 2009. In practical terms, however, the above regulations do not function properly. Adoption of the Act on Energy Efficiency constitutes an important step that may help implement the above mentioned measures. The act was signed by the President in April 2011. It introduces the system of "white certificates", i.e. energy efficiency certificates.

In Poland, there was serious underperformance of the energy efficiency of the Polish economy. There was also a recognition that there would be an increased demand for energy (by some 60%). It was clear therefore to the authorities that supports were needed in order to finance the retrofit of the existing buildings in the country. The support is intended for entities that do not have their own means for TM. The loan is called TM premium & represents 20% of the outstanding loan taken for the specific project.

The following steps are taken to avail of the thermo modernisation loan:

[29] eceee. Financing energy efficiency in buildings: an international review of best practice and innovation. A report to the World Energy Council, funded by ADEME. October 2013. http://www.eceee.org/all-news/press/2013/2013-10-22/WEC-EEC-Final

- The owner of the property decides if they will invest in thermo-modernisation,
- An auditor is chosen and an energy audit of the property is undertaken
- A bank is chosen to work with & a credit agreement is put in place
- The application for TM premium is made
- The bank must verify the audit, then the TM premium is allocated
- Once the pay-back on investment is realised, the TM premium loan is transferred to the bank.

Since the TM Premium loan has been introduced, the annual average energy savings amounted to 3765 GWh & the energy cost savings increased to 600 Million Zloty (€143 Million). These figures alone show that this Good Practice is indeed working in Poland. This is a national policy in Poland, and would require significant commitment from National government in other partner regions in order to be a feasible GP Transfer.

3.3.2 GP9: ESCO to replace Gasoil heating with Biomass/Solar Thermal system

This GP was developed over the course of the project using a contract with an Energy Service Company (ESCO) to replace the Indoor Swimming Pool's heat gasoil system to Biomass and Solar Thermal system. (ARGEM/INFO Murcia)

An Energy Services Company (ESCO) is a tool to enhance the sustainable use of energy through promoting energy efficiency and renewable energy resources. The European Institute for Energy (2007) defines an ESCO as: "a natural or legal person that delivers energy services and/or other energy efficiency improvement measures in a user's facility or premises, and accepts some degree of financial risk in so doing. The payment for the services delivered is based (either wholly or in part) on the achievement of energy efficiency improvements and on the meeting of the other agreed performance criteria." The function of an ESCO is commonly known as Energy Performance Contracting (EPC). In other words, an ESCO takes the financial risk of developing and performing measures for an improvement in energy efficiency, and recovers the investment through the savings derived from that intervention.

The basic steps of an ESCO project can be divided into two major phases: before and after the installation. At the beginning, a preliminary analysis of energy consumption patterns is carried out to evaluate the savings potential. Then, a detailed technical analysis is executed to detect inefficiencies. If the client decides to continue with the installation, a formal contract is prepared and the project is executed. Once the equipment is operating, a continuous guarantee phase starts and lasts until the contract terminates. During this period, the ESCO monitors the installation and takes any necessary corrective actions. In addition, a clause is usually included stipulating a periodic revision of energy consumption in order to correct for any deviations. For instance, if the actual consumption is less than expected, the energy cost savings may be shared between the ESCO and the client. On the contrary, if the client exceeds the expected consumption, the ESCO may assume the difference or, if stipulated in the contract, the client must pay the difference.

The use of the ESCO model is a fairly new concept in Spain, and is proving to be a very successful one. In the Murcia region, the STEP partnership visited a municipal swimming pool that had availed of ESCO to retrofit the existing gasoil heating system to Biomass and Solar Thermal system. The maintenance costs along with the polluting effects of the gasoil system were the reasons this decision was made. Therefore, savings were made by the City Council and perhaps more importantly, Co2 emissions were reduced.

The process in this particular example was implemented as follows:

- Old gasoil system replaced by new parallel system using 2 biomass boilers & 20 solar thermal panels.
- The City Council then entered into a 10-year contract with the ESCO Company. ESCO funded the project in full and the energy is sold to the City Council as per agreed price ((initially 0,056 €/kWh).
- The ESCO manages the installation ensuring the performance, availability and maintenance during the contract.

The benefits of using the ESCO model in the municipal swimming pool are clear to be seen - Energy cost prior to the ESCO were €0.90/KWh; now that figure has decreased significantly to €0.56/KWh. Actual energy costs before the ESCO were €61,758.18; and after they have reduced to €38,423.47 per year. Co2 emissions before the ESCO were 19,692 tonnes per year. Now there are no Co2 emissions discharged from the swimming pool. Maintenance costs have also reduced to Zero as the ESCO contractor had included the maintenance costs into the contract.

3.3.3 GP 10: Financing and operation of small scale biomass energy supply and energy efficiency upgrades in public facilities

This is the good practice demonstrated by PP8, MWRA (which now forms part of the Southern & Eastern Regional Assembly). Biomass presents strong potential to significantly reduce the heating bill for public body facilities as a whole and to bring the heating and hot water portion of each site's energy consumption to zero carbon emissions. To date, financial restrictions on public bodies in the MWRA has significantly deterred uptake of Renewable Energy Systems (RES), including Biomass. The innovative financial model developed by the Tipperary Energy Agency offers public bodies the opportunity to reduce their annual energy costs along with their carbon footprint, without the need for significant capital investment. The benefits of this risk removal model for the authority have been successfully demonstrated in four case studies within the region to date (Nenagh Leisure Centre, Thurles Leisure Centre, LIT Tipperary and Coolbawn Water Treatment Facility). The Bio Energy Action Plan for Ireland sets a target of 12% RES share in the heating sector for 2020; therefore this is an area that needs to be addressed. The problems faced included addressing challenges in RES implementation: Capital costs of investment; project risk factors; lack of demonstration of successfully implemented, alternative financial models; lack of market demand for energy service companies; public private partnerships are rare in the energy supply market. The main objectives are:

The conversion of biomass forestry residues into heat, thus replacing imported fossil fuel energy with locally grown timber.

The generation of viable demand for RES: regional market formation, from forestry-to-boiler marketplace.

In order to implement this Good practice an ESCO contract and woodchip boiler installation is required. The table below shows the energy savings and increase of RES participation in the Regional heating energy mix:

	Thurles Leisure Centre	Nenagh Leisure Centre
Rate per kWh on heat meter. (€)	0.038	0.039
Capital Cost	146,330	180,147
Annual Load in kWh	1,800,000	840,000
Annual heating cost – Biomass	68,400 3	32,760
Annual Heating Cost Oil/LPG Equivalent	152,000	79,800
Annual Heat Saving € (%)	83,600 (55%)	47,040 (58%)
Simple Payback (yrs.)	1.75	3.8

3.3.4 GP11: Financing EE/RES initiatives in local authority functional areas

This is the Good practice presented by the former MRA which now forms part of the interim Border, Midland Western Regional Assembly.

The good practice relates to a framework of documents and practices that have demonstrated the potential to accelerate the deployment of energy efficient technologies and achieve the EU 2020 targets. The framework consists of a number of essential elements which ultimately support a business case for the technology and can assist Local Authorities (or any company) to apply for grant aid, internal funds or ESCOs.

This good practice has been successfully applied in the functional area of the Midland Regional Authority on a total of 8 projects, resulting energy reductions of 31% (11% more than required by EU targets). The good practice has also increased the energy management capacity of Local Authority staff and local companies. The good practice has evolved out of the identification of Water Services large energy users in Local Authorities, accounting for 53% of the energy expenditure (CCMA, 2011).

The most significant barrier to implementing EE in the sector was the nature of capital funding which typically funds large projects designed for 20+ years rather than smaller EE type upgrades. The Midland region developed an EPI benchmarking system for pump systems, which allowed Local Authorities to assess the energy performance of water pumping systems in a standard way. The process is supported by a national training programme and collaboration portals that allow staff to share knowledge and best practice. The training programme consists of EPI evaluation for a number of plants, a financial assessment of current costs against the theoretical EPI limit, the preparation of tender documents which results in a tender process.

Fig 3. Implementation Process GP10

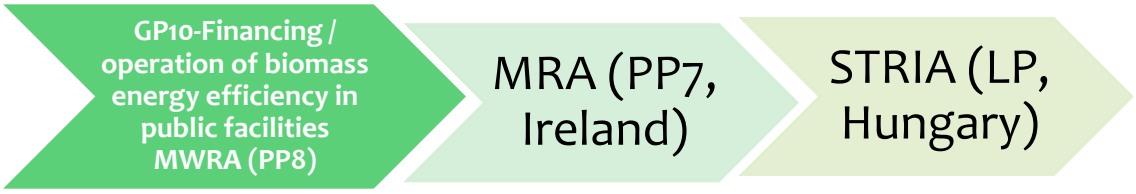
The interesting element of this good practice is the paybacks have been so short (6-24 months), the experience has been that the process leads Local Authorities to fund the EE initiative from in-house funds, effectively acting like an internal ESCO. If projects are carried out early in a financial year, they can be solely funded by the reduced energy expenditure. Over 300 Local Authority staff have been trained, in this area and the result is a reduced reliance on grant aid and a higher level of internal financing and a number of SME's approaching Local Authorities with ESCO initiatives that both parties can understand and use a template to evaluate the investments performance.

The process as outlined in Fig. 3 was employed to implement this GP. The main benefit in implementing this Good practice is the energy savings possible; A total of 808,872kWh Annual Savings for projects already completed using the Good Practice in the Midlands region; estimated energy savings of over 1.600GWh nationally.

There is also a very short pay-back period, which makes the practice an "easy sell" so to speak. Some projects have been supported by the SEAI Better Energy Workplace fund by 35%.

3.3 Good practice transfer under Thematic area 3

Border, Midland Western Regional Assembly [BMWRA] have implemented a Policy Change and their GP transfer implementation plan relates to Innovative Financing of energy efficient upgrades in Public facilities.



Border, Midland Western Regional Assembly have transferred GP10 from Southern & Eastern Regional Assembly. Good practice 7 as stated above, relates to Innovative financing and operation of small scale biomass energy supply and energy efficiency upgrades in public facilities. The MRA plan to transfer this good practice through adopting a policy at Regional level that will assist local authorities and other stakeholders in developing Energy efficiency solutions and stimulating the increased uptake of renewable energy sources through the Energy Performance Contracting (EPC), by operating small scale biomass energy supply in public buildings.

The Implementation plan was presented to the board of the Midland Regional Authority in March 2014, where the EPC model was presented as a viable alternative option for financing energy efficient projects in the Midland Region and that such projects were in line with national policy and supported by the National Energy Services Framework. The Minutes of the board meeting for March 2014 state: "The Midland Regional Authority adopts the Innovative Financing of Energy Efficient Upgrades in Public Facilities as a regional policy to assist local authorities and other stakeholders in developing energy efficient solutions and stimulating the increased uptake of renewable energy sources through the Energy Performance Contracting market ". The EPC model was also presented to the policy makers of the region in June 2014.

The Midland Region also utlised the model within the Regional Public Lighting Project whereby an EPRP used - (Energy Performance Related Payment - was part of the supply contract for the LED lanterns) – where 5% is held back until energy saving are verified.

The BMWRA have adopted and implemented this policy change and it was adopted at the Regional Authority meeting in March 2014. It is worth noting that there is a time lag in the adoption of Policy and the implementation of same in most partner regions. In Ireland, Development Plans (Local & Regional) have statutory time periods for review, (6 years for Local & 12 years for Regional). The prescribed timelines are indicated in the Planning & Development Act 2010.

3.4 Achievements and Progress under Thematic Area 3

As there was just one GP transfer under Thematic area 3, perhaps illustrating that policy in this area is not readily transferable across administrative areas and/or not as easy to implement for all project partners. The reasons for this seem to be down to differences in each region, mainly due to national policy rather than regional policy.

In terms of verifiable results, it appears that the transfer of GP's has not occurred, further consideration may suggest otherwise, however this is not possible to quantify. A potential reason why more good practices were not transferred could be that the project's time frame is not long enough to influence established methods of delivering projects.

It must be recognised that the adoption of a new policy or financing tool or contract model takes significant time to implement. It is very possible that the good practices identified and disseminated in STEP will be adopted in time to the partner regions, or they may alter the way energy efficiency is delivered as a result of educating the people involved in the project.

The situation in Ireland at a national level has been developing in parallel to the STEP project implementation. The government has announced a national energy efficiency fund of €35 million, which is backed up with an equal fund from the private sector. In May 2014 the details of how this fund will be administered started to be clarified. An investment company has been appointed to manage the fund. This is an example of a model which may grow into something similar to that of GP6, it may also enable up take of GP 4 and 7 by making finance available to ESCOS for viable projects.

3.5 Conclusions and recommendations Thematic Area 3

As we move closer to 2020, the need to reduce Co2 emissions across the EU will become more of a priority for all member states.

Through the STEP project, the Good Practices that have been identified under Thematic Area 3 mostly deal with the ESCO model for alternative Financing Tools for Energy Efficiency. We need to question therefore, the reasons why more member states are not using this model.

ESCO implementation requires a number of stakeholders outlined hereunder.

The ESCO Provider

The lack of uptake of the ESCO related good practices is due to low capacity of all stakeholders in the partner regions. It is not possible to deliver an ESCO without companies that are willing and able to carry out the contract.
It is very likely there are plenty of companies in all regions with most of the technical capabilities to deliver ESCOS, however many of these do not have the ability to finance projects.
They do not have experience or confidence in offering ESCO contracts
In some cases it may be necessary for a number of SME's to join together to offer a total solution.
The cost of finance is high in some cases

The client

Without a demand from clients there cannot be ESCOS, this must be addressed with education and marketing.
In the recession clients had and many still have poor credit ratings, therefore they are not suitable for ESCO's to finance projects.

The Finance provider

In the recession banks have practically stopped lending, therefore they are very reluctant to lend to 'new' concepts where the risk is not understood. This must be addressed by education.

The legal backup / framework

While the STEP project provided the model for partner regions to follow, it takes a long time for public and private sector legal departments to become comfortable with a form of contract so that they can assess the risk for their clients. Until this happens the whole process is slowed significantly, it also increases the cost of ESCO as all parties' price risk of unknowns into their proposals.

An Intermediary (May be required)

In the early stages of ESCO market development it will be necessary for third party independent intermediaries to act as a coordinating point between all parties.

4. Towards comprehensive policy tools, conclusions

In terms of climate protection and energy efficiency, municipalities play a central role - as an actor, mediator, advisor and role model.

To achieve the 20-20-20 targets of the European Union and the long-term transition towards a decarbonized energy system, the redirection and acceleration of technological change with appropriate policy tools plays a key role. Here, municipalities as local actor have to accept and take charge of their responsibility.

The STEP project identified and transferred good practices of three topic areas:

- Policies and tools comprehensively addressing energy efficiency at community level
- Policies and Tools for Energy Management
- Innovative financing tools

The creation of appropriate conditions for wider application of energy efficiency systems presents a challenge for municipalities into the future.

The energy management and energy audit GPs proved applicable instruments to effectively tap energy efficiency potential within the operation of municipal buildings. Knowledge building within the community structures and the systematic realization of non and low investment-potentials can be adapted to particular conditions and therefore also applicable in municipalities that have limited resources. Therefore, the instrument should consider future funding projects.

Regarding innovative financing tools was found that ESCO represents an appropriate instrument to foster energy efficiency in municipalities, but at the same time found little application. In future projects should be elicited, what are the reasons for this and what actions can be taken to bring the instrument into a broader application.

STEP has been an extraordinary framework to exchange very useful good practices between the different partners. The identified and transferred Good practices are new tools and policies towards the improvement of energy efficiency and reducement of energy consumption and CO2 emissions. The results of the STEP project proved that local authorities, e.g. municipalities, can make a significant contribution to achieve common climate targets, namely sustainability, security of supply and competitiveness.

With respect to differences in the stages of achievement in energy efficiency and the different requirements and conditions on national and local level, further operation policies and measures, models, tools and advice needs to be available to achieve climate goals. Therefore, the identification of further good practices is of great importance as basis for current funding programs. Here STEP made an important contribution by developing and optimizing a methodological approach.

Annexes

- ANNEX 1 SUMMARY OF ALL GPS

GOOD PRACTICE 1 SUSTAINABLE ENERGY ACTION PROGRAMME OF BUDAPEST, HUNGARY

General information

1. Name of the good practice	Budapest Főváros Fenntartható Energia Akció Programja (SEAP) Sustainable energy action program of Budapest	
2. Thematic area (TA)	TA1 Better implementation of sustainable energy policies at local level	**X**
	TA2 Development and implementation of sustainable energy management systems	
	TA3 Innovative financing tools for boosting local EE/RES investments	
3. Type of good practice - check all relevant criteria	3.1 Permanent initiative	
	3.2 Project	**X**
	3.3 Methodology	
	3.4 Technology	
	3.5 Others	
4. What are the most important aspects of the good practice ? check all relevant criteria	4.1 Performance of GP achieves EC set benchmarks for RES utilisation	
	4.2 Performance of GP contributes considerably to the achievement of EC set benchmarks (please mention how much)	
	4.3 Energy costs have gone down (locally / regionally/ nationally)	**X** **46,45%**
	4.4 RES % participation in the «energy mix » of the community has increased (please mention by how much)	**X**
	4.5 Provable technological innovation	
	4.6 Creation of organizational structures, dealing with energy matters.	

5. Contributing partner	Members of the consortium: "CAMINUS" Zrt. - www.caminus.hu OTP Csoport - www.otp.hu GE Hungary Zrt. - www.ge.com Viessmann Kft - www.viessmann.de GE "RÁTHERM Kft - www.ratherm.hu
6. Location	Budapest, Hungary
7. Start and end date of the good practice –if relevant	2006 - contiguous

Regional context, all partners please fill in

8. Energy performance of the region

All partners please fill in Table 1 in Annex 2

Quantitative figures: % of RES in the overall energy production (if any) in the region; RES applications as % of the overall energy needs in the region; RES applications in the public sector, especially in buildings; RES in industries; energy intensity of the region; unit cost of energy per consummer in the region.

Before the implementation:
Total energy consumption: **6.420,3715** kW
After the implementation:
Total energy consumption: **3.470,77** kW
CO2 emission reduction: **3.561,12 t/year**
251 institutions took part in the project in Budapest, during the implementation 71.005 pieces lights were changed. After the implementation 56.734 pieces new lights were operated with lower consumption, which achievement on the average 46,45% savings.
The total number of the reimbursement is 455 million HUF = 1,5 million EUR.

Sustainable energy policy tools: which is the local / regional energy policy tool, and what types of issues it addresses among the following categories: 1. Target setting; 2. Regulation based on legal responsibilities and jurisdiction; 3. Operation of municipal infrastructure; 4. Voluntary actions and government serving as role model; 5. Information, promotion and raising awareness.

Budapest's Environmental Programme is renewed and controlled regularly, furthermore the General Assembly approved the Energy Conception (2008), and an energy action plan (2009) with activities of next decade. The Lord Mayor of Budapest signed the Agreement of Covenant of Mayors in 2009. among the first in Hungary. According to this Agreement Sustainable Energy Action Plan was made, which was approved.The date of formal approval of Sustainable Energy Action Plan was 16.11.2011.

1. Target setting:

- decrease the CO2 emission with 20%
- complete of he 1. part of 4th metro implementation,
- tram development in Budapest (1 and 3 tram lines development, creation a tram system of Buda, vehicles of tram and trolleys development

Interest of the climate protection, the next steps are as follows:

- modernization of the institutions/building of municipal

- modernization of flats of municipal
- ensure the intelligent street lightning
- modernization of vehicle fleet of municipal in environmental and sustainable way
- creation an environmental trasport system, which is environmentally friendly, easy available and comfortable, affordable and attractive public transport
- environmentally friendly and energy-saving district heating, which is available, the municipality aim to expansion the range of cunsumers specially in the inner aldermanries
- effective awareness-raising with active and interactive tools

2. Regulation based on legal responsibilities and jurisdiction: The local government is the responsible person according to the financing and implementation also.

3. Operation of municipal infrastructure:

Regulations, actionplan, conceptions and programmes determine the operation of town of Budapest, which include the operation of municipal infrastructure. For example district heating, street lighting, roads, electicity systems, etc.

4. Voluntary actions and government serving as role model:

The voluntary actions are not relevant in Hungary. One of the most important aim of the SEAP is to be a best practise.

5. Information, promotion and raising awareness:

The local government planned/plans and implemented/implements the programmes with wide range of social communication. The level of the communication was/is the website of Budapest, www.budapest.hu, where you can find all information and you can make a motion and dispute according to the different project in the framework of Forum.

RES production & applications, extent, barriers, any specialisation: Is there any organisation responsible for promoting applications of RES in the region?

1. How active is the local / regional RES progamme? What are the RES sources in your region? Where is the RES sold?

In Hungary the regional plans are uncharacteristic, but during the application the renewable energy gives for the applicant flying start. According to the national level, there is an Environment and Energy Operational Programme, which is the based of the HU RES programmes. Its fourth priority deals and supports with the RES. The aim of the EEOP is to reach till 2020 the 13% according to the simmetry of all energysource. But Hungary targets the 14,65%.

2. Does it create a regional income?

This project creates an income only on local level.

3. Is there a business sector associated with it?

If there are any suitable programmes for the business sector, they will be active and intrested. Unfortunatelly it is a hungarian behaviour. In our opinion the government tasks and undertaking to egg the business sector to rationalize the energysource. One of the tools are tax relief, credit relief.

4. Has there been any effect in the energy prices?

With these implementations there aren't any effect in the energy prices.
The RES sold has two ways. The first way is to be own use and (over the ownuse) is to be sold external energysupplier. The second way is the energypark, minipower plant, who sell the

100% of the producted energy.

5. How much of the regional / municipal energy needs are covered by RES?

Total energy savings 46,45%.

6. Which are the organisations coordianting the RES production in the region? Which are (if any) the organisations dealing with the RES research?

National Development Agency, powerplants of the region, National Environment and Energy Centre. They undertake a finance and support.

7. What have been the biggest problems in disseminating RES applications in the housing, public and ecoonmic productive sectors (services and manufacturing)?

As we mentioned the hungarian behaviour, this is the one of biggest problem. The first reason is, that this technology is very expensive for hungarian people and business sector and the time of the return is long. The hungarian state try to help on it, but sometimes the tenders are very complex, which need external experts.

9. Context of the implementation of the good practice

Country	Hungary, Budapest
Region	Central Hungary Region
Population	2.009.991 inhabitants

Detailed description of the good practice

10. Description of the good practice (background, objectives, problem addressed, key aspects, activities it includes, institutions involved, costs entailed, financers (who is paying? For how long? How much?).

1. Background:

Environmental situation of Budapest is the same as an European large towns. According to the Siemens Green City index Budapest has a 17. place among the 30 large towns, according to the Green Capital Awards Budapest has a 10. place among 17 large towns. These mentioned facts don't give a handle to be contentment, so the political and professional management of Budapest puts a premium on improving the environmental status.

In the interests of above Budapest's Environmental Programme is renewed and controlled regularly, furthermore the General Assembly approved the Energy Conception (2008), and an energy action plan (2009) with activities of next decade. The Lord Mayor of Budapest signed the Agreement of Covenant of Mayors in 2009. among the first in Hungary. According to this Agreement Sustainable Energy Action Plan was made, which was approved. The planning was prepared in three steps:

– conditions, status report of year 2005 (contains emission report)

– status report of between 2005-2010 during the wide strategy planning

– identified the necessary and planned actions and theirs effects till 2020

2. Objectives:

- decrease the CO2 emission with 20%
- complete of he 1. part of 4th metro implementation,
- tram development in Budapest (1 and 3 tram lines development, creation a tram system of Buda, vehicles of tram and trolleys development

Interest of the climate protection, the next steps are as follows:

- modernization of the institutions/building of municipal
- modernization of flats of municipal
- ensure the intelligent street lightning
- modernization of vehicle fleet of municipal in environmental and sustainable way
- creation an environmental trasport system, which is environmentally friendly, easy available and comfortable, affordable and attractive public transport
- environmentally friendly and energy-saving district heating, which is available, the municipality aim to expansion the range of cunsumers specially in the inner aldermanries
- effective awareness-raising with active and interactive tools

3. Problem addressed:

The energy consumption of Budapest arises from the consumption of population, sectors of industry and agrarian, the services, the transport, heating powerplant. The summer and the winter energy consumptions are almost equal, the level of the emission is all the same in all part of the year.

4. Key aspects: the SEAP took notice of the political, professional, efforts, achievements and versatility environmental planning.

5. Activities it includes:

Description of a project in the frame of the SEAP: GE began the 'Schools Illumination Programme' in Hungary in March 2006 with one school in Budapest. In just 6 years, more than 1400 primary and secondary schools across the country have been retrofitted, and another 1500 upgrades are foreseen.

The purpose of this programme is to create high standard lighting and heating systems GE installed light fixtures and lamps with reduced energy consumption and maintenance costs.

This has resulted in energy savings of 40% for lighting alone. The entire heating and lighting project is expected to save the Hungarian Ministry of Education $310 million (€210 million) throughout the duration of the programme.

The energy savings of 40% for lighting in these Budapest buildings will significantly reduce the CO2 emissions of the buildings and will play a big part in meetings the city's voluntary commitment. Furthermore, this is just a small part of a much wider school's programme that GE is working on with the Hungarian government, which is on-going, and has already resulted in energy savings of over 100 GWh in Hungary. This is quite an impressive figure given that 1GWh energy saving is the equivalent of 500T Co2 emissions reduction.

The main goal of the programme is to implement such building lightening and heating renovation without state financing, that help reduce CO2 emissions and ensure quality environment for the building users.

GE also has a complementary education programme that reaches students directly with information about energy efficiency in the home. Activities include classroom discussions, lectures, factory visits and a national schools competition to recognize outstanding ideas.

Involved areas:
– Buildings of local governments energy consumption
– Other supplier institution, buildings
– Town houses
– Street lightning
– Industry
– Vehicles of local governments and transport
– Private and commercial transportation and delivery

Financers are the members of consortium:
Members of the consortium:
"CAMINUS" Zrt. - www.caminus.hu
OTP Csoport - www.otp.hu
GE Hungary Zrt. - www.ge.com
Viessmann Kft - www.viessmann.de
GE "RÁTHERM Kft - www.ratherm.hu

251 institutions took part in the implementation.
The total cost: 903 million HUF = 3 million EUR
The own contribution: 780 million HUF = 2,6 million EUR
The state aid: 123 million HUF = 0,41 million EUR

3. Questions spefic to the thematic areas of the good practices (TA:s)

TA1 Better implementation of sustainable energy policies at local level.

The focus of this thematic area is on comprehensive approaches promoting the uptake of regional sustainable energy policies at local level.

Local policies and activities to promote renewable energy can be grouped into five main categories: 1. Target setting; 2. Regulation based on legal responsibilities and jurisdiction; 3. Operation of municipal infrastructure; 4. Voluntary actions and government serving as role model; 5. Information, promotion and raising awareness. **Partners with GPs in this Thematic area please fill in Annex 2 Table 1 with special care and please link to the questions underneath.**

TA1.1

1. Is there a national policy promoting comprehensive approaches? Is there a pronounced regional sustainable energy policy?

National Strategy Reference Frame of Hungary and its EEOP programme with the 4. priority. National Sustainable Development Strategy deals with this problem also.

2. If yes, what are its objectives and main action lines?

- reduce the energy consumption
- increase of domestic non-fossil fuels
- reconstruction the energy systems
- decrease the energy consumption of transport
- should be encouraged to use more renewable energy to replace fossil fuels in transport
- international policy coordination and cooperation with companies in the energy sector
- change of construction patterns and standards

3. Are there any measurable results? If yes, what are they?

Yes, it has a plans, strategies and some implementation also, it can be see, that in Hungary the usega of renewable energy is increasing.

Yes, it has a plans, strategies and some implementation also, it can be see, that in Hungary the usega of renewable energy is increasing. In Hungary according to the year of 2000 the primary production of renewable energy was **830** (1000 tonnes of oil equivalent), according to the year of 2010 this number reached the **1922** (1000 tonnes of oil equivalent). So this change is more than twice as much in 2000.

Source:
http://epp.eurostat.ec.europa.eu/statistics_explained/index.php?title=File:Primary_production_of_renewable_energy,_2000_and_2010.png&filetimestamp=20121012133631

As you see in the below table, you can find datas of Share of renewable energy in gross final energy consumption in Hungary:

2004	2005	2006	2007	2008	2009	2010	TARGET
4.4	4.5	5.1	5.9	6.6	8.1	8.7	13

Source:

http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=t2020_31&plugin=1

4. When was it established? Is there a comprehensive policy background for RES support?

There were established 2006 – EEOP, 2007 National Strategy Reference Frame of Hungary.

TA1.2 Have sector specific RES targets and action plans for 2020 been set up –as required by the RES Directive, in your region?

According to the SEAP of Budapest of course it contains the 2020 plans according to sector specific RES. The actionplan deals by chapters with climateprogrammes, sweeping changes in industry sector, modernization of residential buildings, local energy production, service of district heating, creation of heating system, integration of new, not natural gas-based heat source, supplier building (where the owners are not the municipality), municipality buildings, street lightning, vehicles of municipal, public transport, private and commercial transport. On national level, we can find the above mentioned National Strategy Reference Frame of Hungary and its EEOP programme with the 4. priority and National Sustainable Development Strategy.

TA1.3 What are the existing support instruments for RES in your region? Have policy alternatives for RES been formulated in your region?

The most important and purposeful support instruments are the programmes of EU and hungarian state aid, which contains EEOP - structural fund - programmes. Appeared Green Investment system and credit facilities.

TA1.4 Have RES criteria been integrated into the relevant public procurement policies/procedures in your region?

The cabinet is interested in this OP (Operational Programmes) application, the sustainable development is integrated into the programmes, one of this point/factor is a green supply, but it is not compulsory it is only an optional part of the tender. It depends on the investors.

TA1.5 Why do you feel that these tools are actually good practices?

The Action plan seems as a good practise, because it based on own facilities and surveyed datas. According to the implementation it is a real action plan. The quality of the action plan has a professional level, because the Convent of Mayors approved the action plan and the contains were realizable. This action plan is an single in Hungary, because it deals not only the present status and the planned activities. The plan tries to solve the problems on own level without any EU support. It can be see, how we can co-operation with the companies.
TA2.6 How did the construction industry and consumers receive the new regulations? What have been the incurred costs on the overall construction investment and also on the maintenance of the buildings?
TA2.7 Is an energy management and controlling system implemented which assures a continuous monitoring of energy consumption of buildings? Describe in terms of organizational and financial aspects. Are responsibilities clearly defined?
TA2.8 Is the pool of municipal buildings evaluated in terms of energy performance (Energy Performance Indicators, Saving Potential, Energy supply and energy supply contracts etc.)?
TA2.9 On the basis of the evaluated pool of buildings, does a mid- and longterm planning exist concerning refurbishments of buildings? Are RES considered? Is there a detailed description of measures in terms of timeline, responsibilites and budget?
TA2.10 Are there regular educational measures for municipal staff responsible for the operation of buildings and its equipment/installations? Describe in terms of organizational means, content, frequency and persons concerned.

4. Evidence of success (evaluation of the good practice and its results)

- reduction the maintenance cost, stabilized the running
- CO2 avoided more than 3.000 t/year
- saving is more than 455 million HUF = 1,5 million EUR
- became best practise for other towns, settlements
- provided a promotion for the citizens and companies
- won 123 million non-refundable amount to implement the project
- the energyconsumption is 3.470 kW instead of 6.420 kW, so the saving is 46,45%.

5. Transferability of the good practice: Is the good practice transferable? Are there any specific projects incldued in the good practice ? Please justify

The project is good practise for other cities, towns, settlements, who have high costs. The istalations should be designed according the needs in order to reduce the pay back energy maintenance cost. Budapest with more than 2 million peole does the activities in bigger place, bigger amount, higher level and with this implementations the city will be much more environment friendly, clear and more lifeable.

6. Any other comments you wish to make

-

7. For more information

Name of contact person	Ivett Tatarne Varga, Coordinator International and EU Affairs, Municipal Advisor Tamás Gonczlik, energy manager
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e-Mail	tatarnevi@budapest.hu
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ANNEX 2 STEP project THEMATIC AREA 1 Local sustainable energy plans

Table 1.Local Government Policies/Activities that Can Influence Renewable Energy[30]

Policy/ Activity Category	Areas	Descriptions of Policies/Activities by Sub-Category	
1. Target setting …	Target setting …	(a) CO2 reduction targets	CO2 reduction with 20%
		(b) Future shares/amounts of renewable electricity or energy for all consumers in city	
		(c) Future shares/amounts of renewable electricity or energy for government operations and/or buildings	use renewable energy
		(d) Future shares or absolute numbers of buildings or homes with renewable energy installations	
		(e) Future shares/amounts of biofuels for the government vehicle fleet and/or for public transport	
		(f) Other types of targets, for example to become fossil-fuel free or "carbon neutral"	
2. Regulation based on legal responsibilities and jurisdiction ..	Urban	(a) Urban planning and zoning that encourages and integrates the local generation, distribution and use of renewable sources of power in the local jurisdiction--including planning and zoning for public transportation and electric vehicle infrastructure.	
	Building	(b) Building codes and/or permitting that applies to, or incorporates renewable energy in some manner. Examples: mandates for solar hot water and solar PV installations, zero-net-energy homes, shading legislation, and mandated design review/scoping of opportunities and potentials for renewable energy.	
	Taxes	(c) Tax credits and exemptions within tax systems: for example, sales, property and fuel taxes, permitting fees, and carbon taxes.	
	Other	(d) Other regulation, including municipal departments mandated to promote or plan for renewable energy, mandates for biofuels use in vehicles or biofuels blending, and mandatory carbon cap-and-trade.	
3. Operation of municipal infrastructure ..	Purchase	(a) Local government purchasing (and joint-purchasing with other municipalities or with private sector) to integrate renewable energy into government operations. Includes renewable electricity, biofuels, and bulk purchasing for market transformation programs.	local government of Budapest does the best in this act

[30] SOURCE: Global Status Report on Local Renewable Energy Policies, Working Draft, 12 June 2009 A Collaborative Report by: REN21 Renewable Energy Policy Network for the 21st Century Institute for Sustainable Energy Policies (ISEP) ICLEI–Local Governments for Sustainability, page 10.

Policy/ Activity Category	Areas	Descriptions of Policies/Activities by Sub-Category	
	Invest	(b) Local government investment in renewable energy for government buildings, schools, vehicle fleets, and public transport.	local government will provide the own contribution, if EU or state aid will support the project
	Utility	(c) Public utility regulation, including tariff regulation, renewable energy targets, feed-in tariffs, interconnection standards, net metering, and portfolio standards; also designates private utility policies of these types.	
4. Voluntary actions and government serving as a role model …	Demo	(a) Demonstration projects, including participation in national pilot and demonstration projects. Often done with private sector.	
	Grants	(b) Grants, subsidies, and loans for investments in renewable energy by homeowners or businesses	
	Land	(c) Using local government land/property for renewable energy installations (leasing/selling/permitting). Can also include deals that require developer promises for renewables and efficiency.	if this request appears, the government will be open
	Other	(d) Examples: joint ownership of private projects, city-financed investment funds, bond issues, and green certificates and trading.	
5.Information promotion, and raising awareness	Info/ promo	Includes public media campaigns and programs; recognition activities and awards; organization of stakeholders; forums and working groups; training programs; enabling access to finance by local stakeholders; enabling stakeholder-owned projects; removing barriers to community participation; energy audits and GIS databases; analysis of renewable energy potentials; information centers; and initiation and support for demonstration projects.	won a Sustainable Energy award from the EU

GOOD PRACTICE 2 LOCAL SUSTAINABLE ENERGY ACTION PLAN OF MARTFU, HUNGARY

General information

11. Name of the good practice	MARTFŰ FENNTARTHATÓ ENERGETIKAI AKCIÓTERVE Local Sustainable Energy Action Plan of Martfű	
12. Thematic area (TA)	TA1 Better implementation of sustainable energy policies at local level	**X**
	TA2 Development and implementation of sustainable energy management systems	
	TA3 Innovative financing tools for boosting local EE/RES investments	
13. Type of good practice - check all relevant criteria	3.1 Permanent initiative	
	3.2 Project	**X**
	3.3 Methodology	
	3.4 Technology	
	3.5 Others	
14. What are the most important aspects of the good practice ? check all relevant criteria	4.1 Performance of GP achieves EC set benchmarks for RES utilisation	
	4.2 Performance of GP contributes considerably to the achievement of EC set benchmarks (please mention how much)	
	4.3 Energy costs have gone down (locally / regionally/ nationally)	**X locally**
	4.4 RES % participation in the «energy mix » of the community has increased (please mention by how much)	**X**
	4.5 Provable technological innovation	
	4.6 Creation of organizational structures, dealing with energy matters.	

15. Contributing partner	Contractor : MÉSZÁROS Udvar-Ház Kft. H-1116 Budapest, Hunyadi M. út 48. tel: + 36 30/ 9640-352 www.udvar-haz.hu SEAP maker: ENEREA Észak-Alföldi Regionális Energia Ügynökség Nonprofit Kft. H-4400 Nyíregyháza, Sóstói út 31/B "A" épület III. emelet, 344-es szoba www.enerea.eu
16. Location	Martfű, Hungary
17. Start and end date of the good practice –if relevant	15.11.2011.

Regional context, all partners please fill in

18. Energy performance of the region

All partners please fill in Table 1 in Annex 2

Quantitative figures: % of RES in the overall energy production (if any) in the region; RES applications as % of the overall energy needs in the region; RES applications in the public sector, especially in buildings; RES in industries; energy intensity of the region; unit cost of energy per consummer in the region.

Before the implementation:
Total energy comsumption (2010): 366.111.111 kWh
CO2 emission (2010): 48.220 t
After the implementation:
Total energy production (11.04.2011-31.12.2012.): 136.126,67 kWh
CO2 avoidance (11.04.2011-31.12.2012.): 95,29 t
The total number of the reimbursement from the project implementation (11.04.2011) till 31.12.2012. is **6.397.950 HUF ~ 22.850.-EUR**

Sustainable energy policy tools: which is the local / regional energy policy tool, and what types of issues it addresses among the following categories: 1. Target setting; 2. Regulation based on legal responsibilities and jurisdiction; 3. Operation of municipal infrastructure; 4. Voluntary actions and government serving as role model; 5. Information, promotion and raising awareness.

In the year 2011 the municipality received the SEAP, which contains the most important aims/proposals in longterm (till 2020). The municipality of Martfű committed to renewable energy and the prepared SEAP deals with RES on the level of companies and households also.

1. Target setting: The aim of the project is to increase the proportion of renewable energy sources in the energy supply. One of the most important aim of the programmes it to promote the renewable energy and its introduction to the students and inhabitants with involving the civil organizations. Furhter targets are to increase of quality of life, create a healthier city environment, increase the touristic attraction.
2. Regulation based on legal responsibilities and jurisdiction: The local government is the responsible person according to the financing and implementation also.

3. Operation of municipal infrastructre: Regulations, actionplan, conceptions and programmes determine the operation of town of Martfű, which include the operation of municipal infrastructure.

4. Voluntary actions and government serving as role model: the voluntary actions are not relevant in Hungary. One of the most important aim of the SEAP is to be a best practise.

5. Information, promotion and raising awareness: One of the most important aim of the programmes it to promote the renewable energy and its introduction to the students and inhabitants with involving the civil organizations. In Hungary the most important tools to reach the goals are the programmes of EU and hungarian state aids, which support and finance the project. According to this programmes the information and publicity activities were commitmented by local government of Martfű. Any other information you can find on the website of www.martfu.hu

RES production & applications, extent, barriers, any specialisation: Is there any organisation responsible for promoting applications of RES in the region?

8. How active is the local / regional RES progamme? What are the RES sources in your region? Where is the RES sold?

In Hungary the regional plans are uncharacteristic, but during the application the renewable energy gives for the applicant flying start. According to the national level, there is an Environment and Energy Operational Programme, which is the based of the HU RES programmes. Its fourth priority deals and supports with the RES. The aim of the EEOP is to reach till 2020 the 13% according to the simmetry of all energysource. But Hungary targets the 14,65%.

9. Does it create a regional income?

This project creates an income only on local level.

10. Is there a business sector associated with it?

If there are any suitable programmes for the business sector, they will be active and intrested. Unfortunatelly it is a hungarian behaviour. In our opinion the government tasks and undertaking to egg the business sector to rationalize the energysource. One of the tools are tax relief, credit relief. According to the SEAP of Martfű these systems generate 66,5% and 42,3% of the annual energy consumption.

11. Has there been any effect in the energy prices?

With these implementations there aren't any effect in the energy prices.
According to the North-Flat Region the RES sources are solarenergy, windenergy, geotermical energy. The RES sold has two ways. The first way is to be own use and (over the ownuse) is to be sold external energysupplier. The second way is the energypark, minipower plant, who sell the 100% of the producted energy.

12. How much of the regional / municipal energy needs are covered by RES?

According to the accounts these institutions generate 66,5% and 42,3% of the annual energy consumption.

13. Which are the organisations coordianting the RES production in the region? Which are (if any) the organisations dealing with the RES research?

National Development Agency, powerplants of the region, National Environment and Energy Centre. They undertake a finance and support.

14. What have been the biggest problems in disseminating RES applications in the housing, public and ecoonmic productive sectors (services and manufacturing)?

As we mentioned the hungarian behaviour, this is the one of biggest problem. The first reason is, that this technology is very expensive for hungarian people and business sector and the time of the return is long. The hungarian state try to help on it, but sometimes the tenders are very complex, which needs external experts.

19. Context of the implementation of the good practice	
Country	Hungary
Region	North-Flat Region
Population	6593 (Martfű)

Detailed description of the good practice

20. Description of the good practice (background, objectives, problem addressed, key aspects, activities it includes, institutions involved, costs entailed, financers (who is paying? For how long? How much?).

1. Background: Concerning of geographical located, natural resources, climate and other factors, it can be said, that Martfű can draw the solarenergy, windenergy and geothermal energy, which are the based of the short- and longterm proposals.

Comparability and exhaustiveness of datas are the most important tasks, if we want to get reliable achievements and forecasts. During the preparation of the action plan datas were collectd, which contained total heat and electricity consumptions and theirs distributions between the sectors according to the town of Martfű.

The source of based datas were as follows:

- database of the local govermnet (2004-2010)
- energy datas of the year of 2004. of institutions of local government by Tisza Joule Ltd. and Energy Audit (2005, which includes the development facilities)
- regional and local datas of KSH (Hungarian Central Statistical Office; 2004-2010)
- regional and local datas of VÁTI (TEIR; 2004-2010)
- operating datas of Heineken Zrt, Bunge Zrt, Tisza-Joule Kft and Toma-Bau Kft, and theirs further information in theirs website
- feasability study of Geothermal development facilities of Martfű (Babér 2001 Bt, year of 2009)
- Urban Planning of Martfű (2008)
- Rural Developmnet Concept and ecomonic programme of Martfű, which contains the year of 2011-2014 (2011)
- Environmental Programme of Martfű, year of 2009-2015 (2008)
- Local Waste Management Plan of Matfű, year of 2009-2015 (2008)
- regulations of representative body of Martfű Local Government concerning this theme, meeting minutes of municipal seats, financial reporting in the investigation

period.

The SEAP analyzed the energy consumption in 3 segments, aspects of the local government, inhabitants and companies, which contains the consumption datas of timbers, heavy oil, biodiesel, petrol/gas, fuel, furthermore it includes electricity supply datas based on fossil data-bound.

2. Objectives:

The aim of the project is to increase the proportion of renewable energy sources in the energy supply. One of the most important aim of the programmes it to promote the renewable energy and its introduction to the students and inhabitants with involving the civil organizations. Furhter targets are to increase of quality of life, create a healthier city environment, increase the touristic attraction.

3. Problem addressed:

The problem is, that the emission datas are worse and worse in the town and in Hungary also. The two most important climate protection tasks are as follows: conservation of energy and utilization of the local renewable energy.

4. Key aspects:

The utilization of renewable energy involves an energy policy question, competitiveness question, environmental question, rural development question, so during the increase of utilization it must comply with the efficiency, technical/technology, sustainability and social concerns.

5. Activities it includes:

Description of a project in the frame of the SEAP: Town of Martfű has several implemented projects in the renewable energy programme. For example town of Martfű won a support in programme of "KEOP-4.4.0/A/09-2010-0006" with the name of „Photovoltaic system on public institutions of Martfű". Within this project 5 institutions gave photovoltaic system, these institutions had significant energy consumption. As a result of the development, photovoltaic systems are working on the building of mayor's office, cultural centre and library, two kindergartens and on the elementary school. The town has an extremely high renewable energy potential including the solar energy and the wind energy also. With these types of renewable energy the town will increase its savings and of course it is worth from economic aspects and from harmful substances aspects also. Furthermore town of Martfű submitted a tender to non-refundable support within the Programme of New Széchenyi Plan "KEOP-4.2.0/A/11". And town of Martfű won again. So solar systems are on the surgery and on the secondary school also.

Objectives: The aim of the project is to increase the proportion of renewable energy sources in the energy supply.

Financers: The Hungarian State and the European Regional Development Fund provided the non-refundable support with the following datas:
During the 1. implementation, establish a photovoltaic systems into the building of mayor's office, cultural centre and library, two kindergartens and on the elementary school.
The total cost: 69 million HUF
The own contribution: 27,6 million HUF
The EU and state aid: 41,4 million HUF
During the 2. implementation, establish a photovoltaic systems into Health House and on the secondary school.
The total cost: 58,5 million HUF
The own contribution: 8,8 million HUF
The EU and state aid: 49,7 million HUF

6. Questions spefic to the thematic areas of the good practices (TA:s)

TA1 Better implementation of sustainable energy policies at local level.

The focus of this thematic area is on comprehensive approaches promoting the uptake of regional sustainable energy policies at local level.

Local policies and activities to promote renewable energy can be grouped into five main categories: 1. Target setting; 2. Regulation based on legal responsibilities and jurisdiction; 3. Operation of municipal infrastructure; 4. Voluntary actions and government serving as role model; 5. Information, promotion and raising awareness. **Partners with GPs in this Thematic area please fill in Annex 2 Table 1 with special care and please link to the questions underneath.**

TA1.1

5. Is there a national policy promoting comprehensive approaches? Is there a pronounced regional sustainable energy policy?

National Strategy Reference Frame of Hungary and its EEOP programme with the 4. priority. National Sustainable Development Strategy deals with this problem also.

6. If yes, what are its objectives and main action lines?

- reduce the energy consumption
- increase of domestic non-fossil fuels
- reconstruction the energy systems
- decrease the energy consumption of transport
- should be encouraged to use more renewable energy to replace fossil fuels in transport
- international policy coordination and cooperation with companies in the energy sector
- change of construction patterns and standards

7. Are there any measurable results? If yes, what are they?

Yes, it has a plans, strategies and some implementation also, it can be see, that in Hungary the usega of renewable energy is increasing. In Hungary according to the year of 2000 the primary production of renewable energy was **830** (1000 tonnes of oil equivalent), according to the year of 2010 this number reached the **1922** (1000 tonnes of oil equivalent). So this change is more than twice as much in 2000.

Source:
http://epp.eurostat.ec.europa.eu/statistics_explained/index.php?title=File:Primary_production_of_renewable_energy,_2000_and_2010.png&filetimestamp=20121012133631

As you see in the below table, you can find datas of Share of renewable energy in gross final energy consumption in Hungary:

2004	2005	2006	2007	2008	2009	2010	TARGET
4.4	4.5	5.1	5.9	6.6	8.1	8.7	13

Source:

http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=t2020_31&plugin=1

8. When was it established? Is there a comprehensive policy background for RES support?

There were established 2006 – EEOP, 2007 National Strategy Reference Frame of Hungary.

TA1.2 Have sector specific RES targets and action plans for 2020 been set up –as required by the RES Directive, in your region?

According to the SEAP of Martfű of course it contains the 2020 plans, actions, proposals with short- and longterm also and which was extended to the companies, households. But regional action plan is not available. On national level, we find the above mentioned National Strategy Reference Frame of Hungary and its EEOP programme with the 4. priority and National Sustainable Development Strategy.

TA1.3 What are the existing support instruments for RES in your region? Have policy alternatives for RES been formulated in your region?

The most important and purposeful support instruments are the programmes of EU and hungarian state aid, which contains EEOP - structural fund - programmes. Appeared Green Investment system and credit facilities.

TA1.4 Have RES criteria been integrated into the relevant public procurement policies/procedures in your region?

The cabinet is interested in this OP (Operational Programmes) application, the sustainable development is integrated into the programmes, one of this point/factor is a green supply, but it is not compulsory it is only an optional part of the tender. It depends on the investors.

TA1.5 Why do you feel that these tools are actually good practices?

The action plan is a good practise for others town, settlements, because it was made (in Hungary the utilization of renewable energy is in child shoes), furthermore the strategy are feasible. A well identified plan was created including facilities of the town. This strategy deals with the parameters of energy consumption from the electricity to the agriculture, furthermore engages in the energy modernization of large companies.
The action plan contains the regulation of energy management in Martfű, furthermore contains the financial background, the local budgets, possible external sources, relevant documentations, local rules, conditionings, the national regulation an EU objectives and expectations also.

TA2 Development of sustainable energy management systems

TA2 is essentially about the implementation of the EPBD, DIRECTIVE 2010/31/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 19 May 2010 on the energy performance of buildings, EU Energy Efficiency Action Plans (2006 and 2011)• EU Directive 2006/32/EC on energy end-use efficiency and energy services (ESD) and the most recently endorsed (26.9.2012) Energy Efficiency Directive[31].

[31] **Mandatory energy-saving measures**, including renovating public buildings, energy-saving schemes for utilities, and energy audits for all large firms, will be required by an EU energy efficiency directive approved in plenary on Tuesday. Cutting energy consumption by 20% could save the EU €50 billion per year. Focus of the mandatory measures: Renovation of public buildings; Saving plans for utilities; Energy audits (all large enterprises); Financing facilities

TA2.1 When did you start implementing sustainable management systems in your region?
TA2.2 Has the recast EPBD (2010) been transposed in your country? Is the recast EPBD enforced in your region? Is its enforcement monitored? Which are the institutions and what are the tools used to monitor the recast EPBD enforcement? Does the public sector in your region explicitly promote energy efficiency in private and public construction?
TA2.3 Do building regulations require that an energy performance certificate (EPC) must be produced whenever a building is sold, constructed or rented out? Does the EPC show the energy efficiency of a property and include recommendations on how it can be improved? Your EPC models?
TA2.4 Is a display energy certificate (DEC) obligatory on an annual basis for public buildings with a footprint larger than 1,000 m2? Does the DEC show the actual running costs of the building and is it displayed in a prominent place?
TA2.5 Are there requirements to set targets for an increase in the use of LZC (low/zero energy consumption) buildings with separate targets for new and refurbished dwellings; new and refurbished commercial buildings; buildings occupied by public authorities? Have you adopted a Local Energy Management System? Do you utilise ESCO models? What services do the ESCO units offer and what types of financing instruments they use? ESCOs usually offer such services as: Energy audits, feasibility studies, Engineering design, Equipment procurement, Subcontractor management, Construction, Measurement and verification, Operation and maintenance, Project financing.[32]
TA2.6 How did the construction industry and consumers receive the new regulations? What have been the incurred costs on the overall construction investment and also on the maintenance of the buildings?
TA2.7 Is an energy management and controlling system implemented which assures a continuous monitoring of energy consumption of buildings? Describe in terms of organizational and financial aspects. Are responsibilities clearly defined?

[32] SOURCE: Bogdan Atanasiu Buildings Performance Institute Europe and Paolo Bertoldi European Commission Joint Research Centre Institute for Energy (2011) Energy Services Companies (ESCO' s) – definition and best practices across the EU,

TA2.8 Is the pool of municipal buildings evaluated in terms of energy performance (Energy Performance Indicators, Saving Potential, Energy supply and energy supply contracts etc.)?

TA2.9 On the basis of the evaluated pool of buildings, does a mid- and longterm planning exist concerning refurbishments of buildings? Are RES considered? Is there a detailed description of measures in terms of timeline, responsibilites and budget?

TA2.10 Are there regular educational measures for municipal staff responsible for the operation of buildings and its equipment/installations? Describe in terms of organizational means, content, frequency and persons concerned.

TA3 Innovative financing tools for boosting local EE/RES investments / do we include other types of sustainable energy investments?

Types of financial instruments supporting the energy performance of buildings[33] and otherwise:

- Subsidies allow prices to be kept low. They may be provided, for example, to manufacturers of energy efficient equipment such as compact fluorescent light bulbs.
- Grants are targeted at households, industrial or other energy consumers to pay for part or all of the cost of introducing energy efficient processes – such as enhanced building insulation.
- Grants or subsidies may be financed directly through the state or local authority budget or hypothecated taxes (also known as ring-fenced or ear-marked tax).
- Loan schemes to encourage energy efficient practices can be introduced with subsidised interest rates or credit risk support. Subsidies provided by the local authority or state budget to banks offering low interest rates are a fiscal policy.
- Value Added Tax (VAT) normally affects the final consumer but not the producer – who passes the cost onto the consumer. [. . .] differential VAT rates can be used to influence the choice of energy efficient technology by householders.
- Levies on consumption or production may be used to create a fund (e.g. a levy on electricity sales to fund renewable energy schemes).
- Less common, and thus considered innovative, include Energy Supply Obligations (also commonly known as White Certificates) or Energy Performance Contracting. They are considered innovative although Energy Performance Contracting has been around since the 1980s and Energy Supply Obligations since the 1990s. There is another important distinction to make which is relevant for policy-makers. It refers to innovative instruments entirely relying on private financing (and not government budgets). If used properly, they can provide long-term financial support that often cannot be guaranteed due to the changing budget priorities of national governments. Energy Performance Contracting has been deployed in Europe since the 1980s while Energy Efficiency Obligations started in the early 1990s in a few Member States
- European Investment Bank through Loans, ELENA and JESSICA supports investments in sustainable

[33] ENERGY EFFICIENCY POLICIES IN BUILDINGS – THE USE OF FINANCIAL INSTRUMENTS AT MEMBER STATE LEVEL, BPIE 2012

energy and energy efficiency.

Midland & MWRA partners please fill in Table 2 in Annex 3 and the related questions below.

TA3.1 Sources of funding per amounts and funding organisations; are there private actors involved? How? If yes, what is their contribution and what are the perceived benefits (that would justify their involvement)?

TA3.2 Types of eligible funding actions: projects? Investments? Research?

TA3.3 Amounts of funding dedicated to SE EE/RES investments / projects / initiatives, and also vs total development funding amounts

TA3.4 Is the funding allocated sufficient, in your opinion?

TA3.5 How do we really know it is a good practice, a performing solution?

7. Evidence of success (evaluation of the good practice and its results)

- reduction the maintenance cost, stabilized the running
- CO2 avoided more than 95.000 kg till 11.04.2011.
- saving is more than 21.000.-EUR (6 million HUF) so far
- became best practise for other towns, settlements
- provided a promotion for the citizens and companies
- won 325.000.-EUR (91,1 million HUF) non-refundable amount to implement the project
- the energyproduction is more than 136.000 kWh

8. Transferability of the good practice: Is the good practice transferable? Are there any specific projects incldued in the good practice ? Please justify

The project is good practise for other cities, towns, settlements, who have high costs. The istalations should be designed according the needs in order to reduce the pay back energy maintenance cost.

9. Any other comments you wish to make

-

10. For more information	
Name of contact person	Dr. Kiss Edit, mayor
Organisation	Local Government of Martfű
e-Mail	drkissedit@t-online.hu; drkissedit@ph.martfu.hu
Mobile	70/371-85-77; 20/312-16-96

ANNEX 2 STEP project THEMATIC AREA 1 Local sustainable energy plans

Table 2.Local Government Policies/Activities that Can Influence Renewable Energy[34]

Policy/ Activity Category	Areas	Descriptions of Policies/Activities by Sub-Category	
1. Target setting …	Target setting …	(a) CO2 reduction targets	CO2 reduction with 20%
		(b) Future shares/amounts of renewable electricity or energy for all consumers in city	
		(c) Future shares/amounts of renewable electricity or energy for government operations and/or buildings	use more renewable energy, town of Martfű will submit one more project within KEOP-2012-5.5.0/A - „Building energy development and street lighting improvements and conversion" programme KEOP-2012-5.5.0/A. It covers 4 municipal institutions
		(d) Future shares or absolute numbers of buildings or homes with renewable energy installations	
		(e) Future shares/amounts of biofuels for the government vehicle fleet and/or for public transport	
		(f) Other types of targets, for example to become fossil-fuel free or "carbon neutral"	
2. Regulation based on legal responsibilities and jurisdiction ..	Urban	(a) Urban planning and zoning that encourages and integrates the local generation, distribution and use of renewable sources of power in the local jurisdiction--including planning and zoning for public transportation and electric vehicle infrastructure.	
	Building	(b) Building codes and/or permitting that applies to, or incorporates renewable energy in some manner. Examples: mandates for solar hot water and solar PV installations, zero-net-energy homes, shading	

[34] SOURCE: Global Status Report on Local Renewable Energy Policies, Working Draft, 12 June 2009 A Collaborative Report by: REN21 Renewable Energy Policy Network for the 21st Century Institute for Sustainable Energy Policies (ISEP) ICLEI–Local Governments for Sustainability, page 10.

Policy/ Activity Category	Areas	Descriptions of Policies/Activities by Sub-Category	
		legislation, and mandated design review/scoping of opportunities and potentials for renewable energy.	
	Taxes	(c) Tax credits and exemptions within tax systems: for example, sales, property and fuel taxes, permitting fees, and carbon taxes.	
	Other	(d) Other regulation, including municipal departments mandated to promote or plan for renewable energy, mandates for biofuels use in vehicles or biofuels blending, and mandatory carbon cap-and-trade.	
3. Operation of municipal infrastructure	Purchase	(a) Local government purchasing (and joint-purchasing with other municipalities or with private sector) to integrate renewable energy into government operations. Includes renewable electricity, biofuels, and bulk purchasing for market transformation programs.	local government of Martfű does the best in this act
..	Invest	(b) Local government investment in renewable energy for government buildings, schools, vehicle fleets, and public transport.	local government will provide the own contribution, if EU or state aid will support the project
	Utility	(c) Public utility regulation, including tariff regulation, renewable energy targets, feed-in tariffs, interconnection standards, net metering, and portfolio standards; also designates private utility policies of these types.	
4. Voluntary actions and government serving as a role model	Demo	(a) Demonstration projects, including participation in national pilot and demonstration projects. Often done with private sector.	
	Grants	(b) Grants, subsidies, and loans for investments in renewable energy by homeowners or businesses	
	Land	(c) Using local government land/property for renewable energy installations (leasing/selling/permitting). Can also include deals that require developer promises for renewables and efficiency.	if this request appears, the government will be open
...	Other	(d) Examples: joint ownership of private projects, city-financed investment funds, bond issues, and green certificates and trading.	
5.Information promotion, and raising awareness	Info/ promo	Includes public media campaigns and programs; recognition activities and awards; organization of stakeholders; forums and working groups; training programs; enabling access to finance by local stakeholders; enabling stakeholder-owned projects; removing barriers to community participation; energy audits and GIS databases; analysis of renewable energy potentials; information centers; and initiation	won a solar champion and solar city awards

Policy/ Activity Category	Areas	Descriptions of Policies/Activities by Sub-Category	
		and support for demonstration projects.	

GOOD PRACTICE 3 PILOT PLANS FOR RURAL SUSTAINABLE DEVELOPMENT, ARAGON

A.-INFORMACIÓN GENERAL

1. Nombre de la buena práctica	**PLANES DE ENERGIA SOSTENIBLE EN AREAS RURALES** (SARGA, Aragón, España)	
2. Área Temática (AT)	AT1 Mejor implantación de políticas de energía sostenible a escala local	**X**
	AT2 Desarrollo y puesta en marcha de sistemas de gestión energética sostenible	
	AT3 Herramientas de financiación innovadoras para estimular inversiones locales en EE/FER	
3. Tipo de buena práctica: Comprobar todos los criterios relevantes	3.1 Iniciativa permanente	**X**
	3.2 Proyecto	**X**
	3.3 Metodología	**X**
	3.4 Tecnología	
	3.5 Otros	
4. ¿Cuáles son los aspectos más importantes de la buena práctica? Comprobar todos los criterios relevantes	4.1 El rendimiento de la BP logra los parámetros de referencia (*benchmarks*) fijados por la CE para utilización de FER	
	4.2 El rendimiento de la BP contribuye de manera considerable al logro de los parámetros de referencia fijados por la CE (mencione en qué medida lo consigue)	**X**
	4.3 Los costes energéticos han descendido (a escala local / regional / nacional)	**X**
	4.4 La proporción de las FER en el *energy mix* de la comunidad ha aumentado (indique cuánto)	**X**
	4.5 Innovación tecnológica demostrable	
	4.6 Creación de estructuras organizativas que traten asuntos relacionados con la energía.	
5. Socio participante	SARGA	
6. Contribución del socio	Auditoría previa de los sistemas energéticos públicos locales, a nivel de edificios públicos e instalaciones públicas (alumbrados, bombeos) para optimizar la eficiencia energética de los mismos y la posibilidad de sustitución de fuentes fósiles por renovables. Licitación de proyecto y obra para la ejecución de las instalaciones	

	prioritarias resultado de las auditorías previas en 13 comarcas. Control y seguimiento técnico y administrativo de la ejecución mencionada que contempla, -300 instalaciones de eficiencia en alumbrados públicos - 100 instalaciones solares térmicas para ACS - 90 instalaciones solares fotovoltaicas ubicadas en edificios público
7. Ubicación	Aragon (España)
8. Fecha inicial y final de la buena práctica, si procede	Plan Piloto, 2010-2012 Plan de Desarrollo Rural Sostenible, 2012-2015

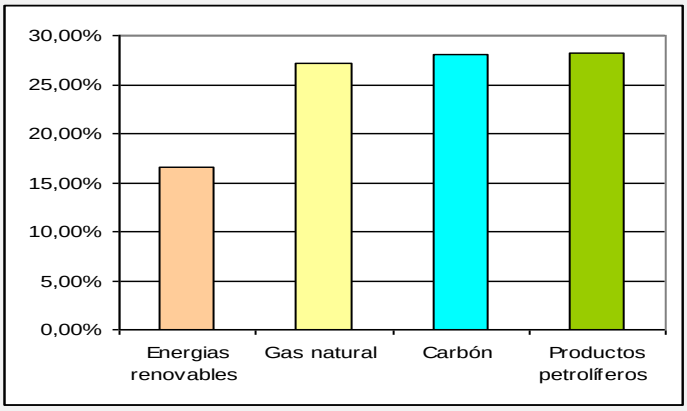
B.-CONTEXTO REGIONAL, A CUMPLIMENTAR POR TODOS LOS SOCIOS

9. Eficiencia energética de la región:

- **Todos los socios deben cumplimentar la Tabla 1 del Anexo 2**

Cifras cuantitativas: % de FER (fuentes de energía renovables) sobre la producción energética total (si procede) en la región; aplicaciones FER como % de las necesidades globales de energía en la región; aplicaciones FER en el sector público, en especial en edificios; FER en industrias; intensidad energética de la región; coste unitario de energía por consumidor en la región.

Energía Primaria en Aragón (2011).



En cuanto a la comparativa de uso de renovables por la industria y las administraciones públicas, no existen datos concretos para ellos, únicamente existen datos de la totalidad del uso de este tipo de energías.
Aragón es una región eminentemente exportadora de energía como podemos ver en los siguientes gráficos y tablas :

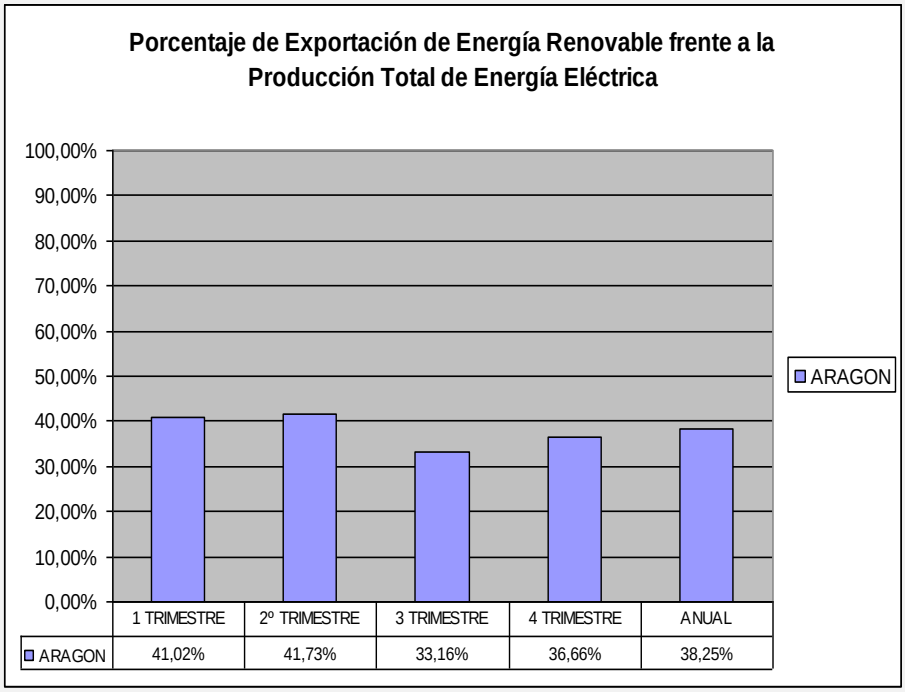
PORCENTAJES DE EXPORTACIÓN DE ENERGÍA ELÉCTRICA (AÑO 2011)

ARAGÓN (MW h)	EXPORTACIÓN	PEE TOTAL (*)
1 TRIMESTRE	1.926.116	4.823.919
2º TRIMESTRE	2.268.290	5.073.361
3 TRIMESTRE	2.074.610	4.799.827.
4 TRIMESTRE	1.442.115	4.186.757
TOTAL	7.711.130	18.883.864

PEE.- Producción de Energía Eléctrica

PORCENTAJE DE PRODUCCIÓN DE ENERGÍA ELÉCTRICA A PARTIR DE ENERGIAS RENOVABLES FRENTE A LA PRODUCCIÓN TOTAL DE ENERGÍA ELÉCTRICA

ARAGÓN (MW h)	PEE renovable	PPE total
1 TRIMESTRE	1.978.954	4.823.919
2º TRIMESTRE	2.116.871	5.073.361
3 TRIMESTRE	1.591.517	4.799.827.
4 TRIMESTRE	1.535.019	4.186.757
TOTAL	7.222.361	18.883.864

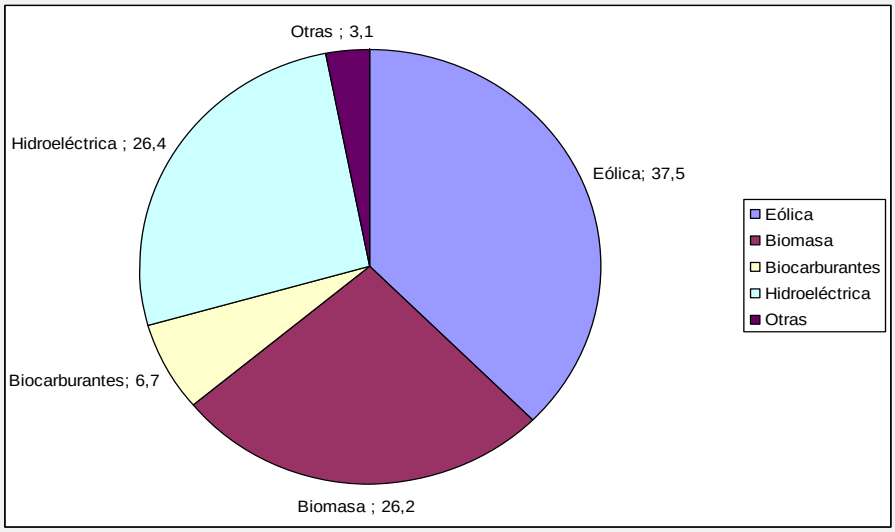


- **Herramientas de políticas energéticas sostenibles:** ¿en qué consiste la herramienta de política energética local / regional y qué tipos de cuestiones aborda entre las siguientes categorías: 1. Fijación de objetivos; 2. Reglamentación basada en responsabilidades legales y jurisdicción; 3. Funcionamiento de la infraestructura municipal; 4. Acciones voluntarias y servicios del gobierno como modelo de rol; 5. Información, promoción y concienciación.

Esta cuestión la resolveremos a lo largo de la encuesta, ya que muchas de las preguntas que plantea se repiten a lo largo del cuestionario.

- **Producción y aplicaciones FER, alcance, barreras, alguna especialización:** ¿Hasta qué punto es activo el programa local / regional de FER? ¿Qué fuentes de energía renovables hay en su región? ¿Dónde se venden las FER? ¿Generan ingresos a escala regional? ¿Existe un sector empresarial vinculado a ellas? ¿Qué organizaciones coordinan la producción de FER en la región? ¿Qué organizaciones (si las hay) se encargan de la investigación en FER? ¿Qué proporción de las necesidades energéticas regionales / municipales se cubren con FER? ¿Ha habido alguna repercusión sobre los precios de la energía? ¿Cuáles han sido los mayores problemas en la divulgación de las aplicaciones FER en el sector público, en la vivienda y en la economía productiva (servicios y fabricación)? ¿Existe alguna organización responsable de fomentar las aplicaciones de FER en la región?

Distribución de la energía renovable producida



10. Contexto	
País	España
Región	ARAGON
Población	1.347.095

C.-DESCRIPCIÓN DETALLADA DE LA BUENA PRÁCTICA

11. Descripción de la buena práctica (antecedentes, objetivos, problema abordado, aspectos clave, actividades que incluye, instituciones implicadas, costes que conlleva, financiadores (¿quién paga?, ¿cuánto tiempo?, ¿qué cantidad?).

ANTECEDENTES.-

Hasta la publicación de la ley 45/2007 de 13 de Diciembre, para el desarrollo sostenible del medio rural, las políticas para el medio rural español, venían dadas por los reglamentos comunitarios y los fondos asociados a ellos como FEADER, FEDER, FSE , así como los diferentes planes, programas y líneas de acción creadas por las diferentes administraciones españolas .

La Ley 45/2007 de desarrollo rural sostenible, que se implementa a través de Los Planes de Desarrollo Rural Sostenible, aspira a la creación de una política rural nacional, a través de 3 objetivos generales :

1. Mantener y ampliar la base económica del medio rural mediante la preservación de actividades competitivas y multifuncionales, y la diversificación de su economía con la incorporación de nuevas actividades compatibles con un desarrollo sostenible.
2. Mantener y mejorar el nivel de población del medio rural y elevar el grado de bienestar de sus ciudadanos, asegurando unos servicios públicos básicos adecuados y suficientes que garanticen la igualdad de oportunidades y la no discriminación, especialmente de las personas más vulnerables o en riesgo de exclusión.
3. Conservar y recuperar el patrimonio y los recursos naturales y culturales del medio rural a través de actuaciones públicas y privadas que permitan su utilización compatible con un desarrollo sostenible.

Al margen de los objetivos generales descritos, la Ley 45/2007 persigue objetivos más concretos, entre los que debemos destacar por su relación con nuestro proyecto los dos siguientes.-

- Dotar al medio rural, y en particular a sus núcleos de población, de las infraestructuras y los equipamientos públicos básicos necesarios, en especial en materia de transportes, energía, agua y telecomunicaciones.
- Lograr un alto nivel de calidad ambiental en el medio rural, previniendo el deterioro del patrimonio natural, del paisaje y de la biodiversidad, o facilitando su recuperación, mediante la ordenación integrada del uso del territorio para diferentes actividades, la mejora de la planificación y de la gestión de los recursos naturales y la reducción de la contaminación en las zonas rurales.

Para implementar la ley 45/2007 en el desarrollo de una política nacional de desarrollo rural, se puso en marcha el Primer Programa de Desarrollo Rural Sostenible para el período 2011-2015.
Este programa adopta la definición de una estrategia de desarrollo sostenible, a través de la articulación de unos ejes estratégicos, con sus propios objetivos y acciones, destinados al cumplimiento de la ley.
Previamente al desarrollo de acciones, se subdivide el territorio nacional según la ruralidad, calificándose la prioridad en la implementación de las acciones.
Los ejes y acciones los podemos ver en este cuadro :

CUADRO. EJES ESTRATÉGICOS Y MEDIDAS DEL PROGRAMA	
EJE 1.- ACTIVIDAD ECONÓMICA Y EMPLEO	
Art. 16	Apoyo a la agricultura territorial
Art. 17	Fomento a la actividad económica en el medio rural (incentivos regionales)

Art. 20	Diversificación económica
Art. 22	Creación y mantenimiento del empleo
EJE2.- INFRAESTRUCTURAS Y EQUIPAMIENTOS BÁSICOS	
Art. 18	Infraestructuras de interés general
Art. 23	Infraestructuras, equipamientos y servicios básicos
Art. 24	Energías Renovables
Art. 25	Agua
Art. 26	Tecnologías de la información y la comunicación
EJE 3.- SERVICIOS Y BIENESTAR SOCIAL	
Art. 27	Seguridad ciudadana
Art. 28	Educación
Art. 29	Cultura
Art. 30	Sanidad
Art. 32	Protección social
Art. 33	Urbanismo y vivienda
EJE 4.- MEDIOAMBIENTE	
Art. 19	Planificación ambiental
Art. 21	Conservación de la naturaleza y gestión de los recursos naturales
Art. 25	Agua (restauración hidrológico-forestal)
EJE 5.- EJE TEMÁTICO: ACTUACIONES NO TERRITORIALES	
	Todos Asistencia técnica
Art. 29	Cultura (actuaciones no territoriales)
Art. 8	Igualdad

CLASIFICACIÓN DE LAS ZONAS RURALES

La división del Territorio se establece dependiendo de sus necesidades y de su índice de ruralidad. Para el índice de ruralidad se tienen en cuenta parámetros como :

- Renta
- Densidad de Población
- Pirámide de población
- Afección Red Natura 2000
- Servicios existentes en la zona rural

Una vez realizado el estudio de la zona rural conforme a los parámetros que hemos visto, las zonas rurales se dividen en tres tipos:

- A revitalizar
- Intermedia
- Periurbana

Estas a su vez se subdividen en 3 niveles: Primer Nivel, Segundo Nivel y tercer nivel, dependiendo de las necesidades de la zona rural.

INSTITUCIONES IMPLICADAS

Estos Planes son la consecuencia del trabajo conjunto del Ministerio de Medio Ambiente y Medio rural y Marino actualmente Ministerio de Agricultura, Alimentación y Medio Ambiente, que ha coordinado el Plan y las acciones del resto de los Ministerios implicados en el programa (la totalidad de ellos exceptuando el Ministerio de Defensa) , junto a las Comunidades Autónomas, entidades locales y las asociaciones más relevantes relacionadas con el mundo rural.

Si algo caracteriza a este plan, es la importancia dada a la participación ciudadana en la elaboración de las actuaciones previstas en el plan, así como en la elaboración en cada una de las zonas rurales incluidas en el programa.

FINANCIACIÓN DEL PLAN

El régimen financiero de las actuaciones contempladas en los Planes de Zona concertados resulta diferente según se trate de las tres siguientes categorías de actuaciones:

1. Actuaciones competencia de la Administración General del Estado
2. Actuaciones que se declaren de interés general
3. Actuaciones competencia de la Comunidad Autónoma

En los dos primeros casos, la ejecución y la financiación de la actuación corresponde a la Administración General del Estado, con o sin cofinanciación comunitaria.

En el tercer caso, la ejecución corresponde a la Comunidad Autónoma, cofinanciada al 50% por la misma y al 50% por la Administración General del Estado, sin cofinanciación comunitaria.

INFRAESTRUCTURAS REALIZADAS A TRAVÉS DE LOS PLANES PILOTO DE DESARROLLO RURAL SOSTENIBLE

Los objetivos tan amplios que marca la Ley 45/2007, definidos a través de unas acciones generales cuyo alcance es muy extenso, y cuyo ámbito de aplicación, “todas las zonas rurales de España” es asimismo muy amplio, aconsejan su implantación previa “experimental” a través de planes o programas piloto.

En este contexto, Aragón parte con una mejora competitiva respecto al resto de Comunidades Autónomas en España, por la creación previa de la Administración Comarcal.

De inmediato, las comarcas aragonesas se asimilan a las zonas rurales que define la Ley 45/2007. Ello posibilita la firma entre el Gobierno de Aragón, a través de sus Departamentos de Medio Ambiente y Agricultura, y el Gobierno Central, a través del Ministerio de Medio Ambiente, Rural y Marino (MARM), de cinco convenios piloto para el desarrollo sostenible del medio rural suscritos en diciembre de 2008, y de un sexto convenio piloto, suscrito ésta vez en diciembre de 2009, entre el Departamento de Medio Ambiente del Gobierno de Aragón y el MARM

Para facilitar su definición, los planes piloto se estructuran en tres bloques, energías renovables, proyectos emblemáticos y otros proyectos de interés municipal, asignándose 1.000.000 € a cada uno de ellos.

OBJETIVO

El objetivo que se desarrolla mediante la buena práctica, es la auditoría, ejecución, dirección y gestión de todas las inversiones que se llevan a cabo en el marco de las energías renovables, vinculadas a los Planes Piloto de Desarrollo Rural Sostenible, con el objetivo claro de minimizar consumos energéticos (menor gasto público). Ese saldo económico positivo permitirá a los ayuntamientos gestionar más recursos en beneficio de los ciudadanos.

PROBLEMA ABORDADO

Reducir el consumo energético en la Administración Local, o sustituir el consumo de combustibles

fósiles por renovables.

ASPECTOS CLAVE

Desarrollo de Auditorías, en las que se analizan los servicios prestados por la Administración que conllevan mayor consumo energético, y ejecución de las inversiones prioritarias detectadas en dichas Auditorías, encaminadas al cumplimiento de los objetivos marcados.

ACTIVIDADES

Actualmente se está trabajando en la ejecución de una serie de actuaciones en energías renovables y eficiencia energética, cuya inversión total supera los 12 millones de euros,
Las energías renovables que se están implantando son: solar fotovoltaica, solar térmica y biomasa, ligada esta última al mantenimiento de las masas forestales. Mientras que las inversiones de eficiencia energética se centra en alumbrados públicos, edificios y bombeos municipales.
En concreto las instalaciones en ejecución en el marco de esta buena práctica son:

- 96 instalaciones fotovoltaicas de un potencia entre 5 y 20 Kw
- 63 instalaciones solares térmicas
- 156 farolas solares
- 85 medidas de eficiencia energética
- 1 planta de Biomasa en proyecto
- 1 parque de mediana eólica de 400 Kw
- Acondicionamiento de salas de calderas para sustituir combustibles fósiles por biomasa.

Actualmente muchas de las instalaciones previstas en este plan están ejecutadas o finalizando su ejecución, por lo que será a lo largo del año 2013 cuando pueda evaluarse esta parte del plan en profundidad.

INSTITUCIONES IMPLICADAS

La ejecución de esta buena práctica compromete a la Administración Central , a través del Ministerio de Medio Ambiente, Rural y Marino, como entidad que co-financia y supervisa la ejecución, la Administración Autonómica, como entidad que, además de co-financiar, ejecuta directamente las inversiones que acompañan a la buena práctica, y la Administración Local, como entidad beneficiaria de dichas inversiones en bienes de su titularidad, y que deberá posteriormente encargarse del adecuado mantenimiento y explotación de las mismas.

COSTES QUE CONLLEVA

Los costes derivados de la implantación de éste Plan Piloto de ejecución de Energías Renovables a nivel local, ascienden a 12M€, asignándose 1M€ de media a cada una de las entidades comarcales beneficiarias.

En su ejecución, se han destinado entre 30.000 y 60.000 € a la realización de Auditorías, destinándose el resto de los fondos a la ejecución de las instalaciones definidas consensuadas entre

las instituciones implicadas como prioritarias.

FINANCIADORES

La financiación de las inversiones se reparte al 50% entre el Gobierno de España y el Gobierno de Aragón, mediante un acuerdo de ejecución convenido entre las partes.

12. Cuestiones específicas de las áreas temáticas de las buenas prácticas (ATs)

AT1 Mejor implantación de políticas de energía sostenible a escala local.

Esta área temática se centra en enfoques exhaustivos para promover la adopción de políticas regionales de energía sostenible a escala local.

Las políticas y actividades locales para fomentar las energías renovables pueden agruparse en cinco categorías principales: 1. Fijación de objetivos; 2. Reglamentación basada en responsabilidades legales y jurisdicción; 3. Funcionamiento de la infraestructura municipal; 4. Acciones voluntarias y servicios del gobierno como modelo de rol; 5. Información, promoción y concienciación.

Los socios con BPs en este área temática deberán cumplimentar con especial atención la Tabla 1 del Anexo 2 y vincularla con las preguntas que figuran a continuación.

Debemos tener en cuenta el modelo autonómico para entender el modelo enérgetico local en España. En la transposición de las directivas al ordenamiento jurídico español, el Estado marca las directrices básicas de acuerdo a la directiva europea y después, cada Comunidad Autónoma desarrolla su Plan Estratégico de acuerdo a las especificaciones físicas y técnicas de la Comunidad Autónoma.

En el caso de Aragón y como explicaremos más adelante, las políticas regionales y locales impulsadas por las diferentes administraciones se articulan mediante el Plan Energético de Aragón 2005-2012.

El impulso para el desarrollo de políticas en energías renovables se desarrolla mediante ayudas convocadas con la finalidad de impulsar proyectos en materia de ahorro y diversificación energética, uso racional de la energía, aprovechamiento de los recursos autóctonos y renovables e infraestructuras energéticas.

Los beneficiarios de estas ayudas pueden ser, tanto corporaciones locales, como instituciones sin ánimo de lucro, o bien empresas y particulares que realicen sus inversiones en proyectos dentro de Aragón.

En cuanto a las actuaciones e inversiones subvencionables , las podemos resumir en :

1. Ahorro y diversificación energética, uso racional de la energía y aprovechamiento de los recursos autóctonos y renovables

1.1. Biomasa: a) Utilización de la biomasa para producción de energía térmica para uso residencial e industrial. Hasta un máximo del 40% del coste elegible de la inversión.

b) Utilización de la biomasa para producción conjunta de energía térmica y eléctrica, o eléctrica, para uso residencial e industrial, Hasta un máximo del 10% del coste elegible de la inversión

1.2. Minihidráulica: Minicentrales con potencia inferior a 5 MW correspondientes a nuevas concesiones a la rehabilitación y modernización de centrales ya existentes también con una potencia inferior a 5 MW. Hasta un máximo del 20 % del coste elegible de la inversión subvencionable

2. Optimización y desarrollo de las infraestructuras energéticas.
Líneas eléctricas de distribución y suministro en el medio rural, tanto en alta como en baja tensión.
Centros y subestaciones de transformación, en el medio rural
Subestaciones de transformación e instalaciones eléctricas de enlace a la red en centrales generadoras de energía eléctrica de menos de 5000 kVA incluidas en el régimen de pequeñas centrales hidroeléctricas o, sin ser hidroeléctricas, en el caso de que su titular ostente la condición de autogenerador.
Implantación de suministro de gas canalizado en aquellos municipios de Aragón que carezcan del mismo, y que contribuyan a los objetivos de la planificación energética regional.

Inversiones en materia de investigación y desarrollo, cuyo objeto sea el uso eficiente de la energía y el aprovechamiento de las fuentes de energías autóctonas y renovables, incluidos nuevos proyectos de producción y aprovechamiento de hidrógeno usando fuentes autóctonas y renovables. Las inversiones realizadas y honorarios de acreditación de la norma UNE 216.301 de gestión energética.

Además, se consideran subvencionables con hasta un máximo del 20% del coste elegible de la inversión, cualquier proyecto energético cuya implantación aporte valor añadido especial para Aragón con hechos diferenciales.

A los proyectos llevados a cabo a través de este plan, debemos añadir, tal y como hemos explicado antes, las inversiones realizadas en los Planes Piloto y de Desarrollo Rural Sostenible en materia de energías renovables.

Del mismo modo en los últimos años cabe destacar las actuaciones realizadas a través del ámbito privado mediante las empresas de Servicios Energéticos (ESE).

La Directiva 2006/32/CE del Parlamento Europeo y del Consejo define la Empresa de Servicios Energéticos (ESE) “como una persona física o jurídica que proporciona servicios energéticos o de mejora de la eficiencia energética en las instalaciones o locales de un usuario y afronta cierto grado de riesgo económico al hacerlo. El pago de los servicios prestados se basará (en parte o totalmente) en la obtención de mejoras de la eficiencia energética y en el cumplimiento de los demás requisitos de rendimiento convenidos”.

Las ESEs tienen el objetivo final de ahorrar energía, lo que deriva en un ahorro tanto económico como de emisiones de CO2. Su actividad se centra en el diseño y puesta en marcha de proyectos que garanticen una gestión eficiente de la energía, comprometiéndose económicamente con los resultados. Además, son especialistas en monitorizar, medir y controlar el gasto energético y verificar el nivel de ahorro generado tras la puesta en marcha de cada proyecto

En los últimos dos años se han presentado en Aragón 173 proyectos relativos a la eficiencia energética mediante la participación de una ESELa, por lo que también debemos destacar el papel de estas en cuanto al ahorro energético y el uso de energías renovables.

AT1.1 ¿Existe una política nacional que fomente enfoques exhaustivos? ¿Existe una política regional claramente orientada a las energías sostenibles? En caso afirmativo, ¿cuáles son sus objetivos y principales líneas de actuación? ¿Cuándo fue establecida? ¿Hay resultados mensurables? En caso afirmativo, ¿cuáles? ¿Existen amplios fundamentos políticos para el fomento de las FER?

La política nacional de energías renovables se desarrolla principalmente a partir de la aprobación del **RD 661/2007 de 25 de mayo,** por el que se regula la actividad de producción de energía eléctrica en régimen especial

- **Real Decreto 1565/2010,** de 19 de noviembre, **por el que se regulan y modifican determinados aspectos relativos a la actividad de producción de energía eléctrica en régimen especial.** En el cual se requiere la obligatoriedad de que la generación tenga asociado un contrato de suministro de al menos el 25 % de la potencia instalada en generación, y regula la nueva prima para la tipología de éstas instalaciones en 28 céntimos de euro.

- **Real Decreto 1699/2011**, de 18 de noviembre, **por el que se regula la conexión a red de instalaciones de producción de energía eléctrica de pequeña potencia**. En el cual se establece un procedimiento de tramitación abreviado para instalaciones fotovoltaicas de menos de 10 Kw, y elimina el trámite de autorización administrativa previa y que avanza una regulación posterior para el autoconsumo con conexión en red interior.

- Por último, la publicación del **Real Decreto-Ley 1/2012**, de 27 de enero, **por el que se procede a la suspensión de los procedimientos de preasignación de retribución y a la supresión de los incentivos económicos para nuevas instalaciones de producción de energía eléctrica a partir de cogeneración, fuentes de energía renovables y residuos,** ha supuesto una alteración sustancial de la viabilidad de las instalaciones de renovables tal y como estaban concebidas, puesto que pasan de recibir una prima (cuyo último valor conocido era de 28 c€ por Kw generado) a poder vender solamente al precio de mercado libre o pool, cuyo valor medio asciende a algo menos de 6 c€/Kw.

Legislación Autonómica.

En la Comunidad Autónoma de Aragón, la política de energías renovables se materializa en el Plan Energético de Aragón 2005-2012 Actualmente se está desarrollando el Plan Energético 2013-2020, este plan que se encuentra en fase de información pública está centrado en la energía eólica, la evacuación de energía y en la participación ciudadana.

Este nuevo Plan se estructura en cuatro ejes:

- energías renovables,
- generación eléctrica,
- ahorro y la eficiencia energética,
- infraestructuras eléctricas
- investigación, desarrollo e innovación, que en este nuevo Plan adquirirán un papel estratégico.

Actualmente se encuentra en vigor el Plan de Energético de Aragón 2005-2012, las acciones de este plan se estructuran en torno a cuatro ejes fundamentales :

- Incrementar el parque de generación eléctrica
- Desarrollar infraestructuras energéticas
- Promover las energías renovables

El ahorro y uso eficiente de la energía.

AT1.2 ¿Se han establecido en su región objetivos FER específicos para cada sector y planes de acción para 2020, tal y como se estipula en la Directiva sobre FER?

El objetivo del Plan de Fomento de las Energías Renovables en España (2000-2010), que estableció una aportación de estas fuentes de energía del 12% sobre el total de consumo de energía primaria en el horizonte 2010. Para este mismo año, la Directiva 2001/77/CE, establecía una participación del 29,4% de electricidad generada a partir de fuentes de energía renovable.

En Aragón antes de 2003 ya se habían sobrepasado esas cifras, con una participación de las energías renovables en el consumo superior al 12% y una relación de la producción de energía eléctrica respecto al consumo cercana al 80%, se siguen concentrando esfuerzos en mejorar la situación y colaborar en el desarrollo de las energías renovables dentro del panorama nacional que, lejos de alcanzar el objetivo del Plan de Fomento, se encuentra aún por debajo del 7% de participación.

El plan Energético de Aragón tiene los siguientes ejes vertebradores

- Vertebración y reequilibrio territorial
- Optimización y desarrollo de infraestructuras energéticas
- Promoción y desarrollo de las energías renovables
- Ahorro, diversificación y uso eficiente de la energía
- Garantía del suministro y cobertura de la demanda
- Mejora de la calidad del suministro
- Minimización del impacto ambiental
- I+D+i de las tecnologías energéticas

La aportación de las energías renovables en Aragón suponía en 2004 un 44,4% del total de producción de energía primaria (PEP), y se prevé que en el año 2012 su cuota de participación será del 63,6%.

Si consideramos el consumo total de energía primaria (CEP), las energías renovables contribuyen con un 16,7% (superando ya el objetivo del Plan de Fomento), y se ha previsto que durante el periodo 2005-2012 se incrementen de tal manera que su cuota de participación sobre el total de consumo alcance el 19,1% en 2012.

AT1.3 ¿Cuáles son los instrumentos de apoyo existentes para las FER en su región? ¿Se han formulado alternativas de políticas para las FER en su región?

Plan Energético de Aragón 2005-2012. El impulso para el desarrollo de políticas en energías renovables se articula mediante ayudas que se convocan con la finalidad de impulsar proyectos en materia de ahorro y diversificación energética, uso racional de la energía, aprovechamiento de los recursos autóctonos y renovables e infraestructuras energéticas.

Además de estas ayudas a la instalación y uso, en Aragón se han llevado a cabo iniciativas para la instalación de energías renovables en los municipios aragoneses dentro de los planes de Desarrollo Rural Sostenible, así como a través de fondos europeos como el FEADER para la mejora energética

de regadíos.

AT1.4 ¿Se han integrado los criterios FER en las políticas y procedimientos relevantes para contratación pública en su región?

Sí , todos las actuaciones llevadas a cabo están relacionadas entre sí y con la política energética regional y nacional

AT1.5 ¿Por qué creen que estas herramientas son en realidad buenas prácticas?

Las consideramos buenas prácticas, porque en el caso de las acciones derivadas de los planes de desarrollo sostenible, se ha incidido en las actuaciones de autoconsumo y eficiencia energética desde el punto de vista de las entidades locales (ayuntamientos y comarcas).
Hasta el momento la generación y el desarrollo de las energías renovables, venía mayoritariamente dado por la iniciativa privada, con estas actuaciones entran como productores de energía, o beneficiarios de análisis de eficiencia energética, las entidades locales.
Del mismo modo estas actuaciones cumplen con tres objetivos:

- Sirven como experiencias piloto que nos ayudan a determinar futuras necesidades y actuaciones
- Suponen un ahorro energético importante en entidades con problemas de financiación
- Se trata de acciones ejemplarizantes en el medio rural.

AT2 Desarrollo de sistemas de gestión energética sostenible

AT2 alude esencialmente a la implantación de la DIRECTIVA EPBD 2010/31/UE DEL PARLAMENTO EUROPEO Y DEL CONSEJO de 19 mayo 2010 sobre eficiencia energética en edificios, Planes de acción de la UE sobre eficiencia energética (2006 y 2011), la Directiva UE 2006/32/CE sobre la eficiencia del uso final de la energía y los servicios energéticos (ESD) y la Directiva de eficiencia energética[35] aprobada más recientemente (26.9.2012).

Respecto a la Certificación de eficiencia energética en los edificios, es una exigencia derivada de la Directiva 2002/91/CE, la cual se traspone parcialmente a través del Real Decreto 47/2007, de 19 de enero, por el que se aprueba el Procedimiento básico para la certificación de eficiencia energética de edificios de nueva construcción.
Para los edificios existentes está previsto la elaboración de otro R.D. con anterioridad a enero de 2009

AT2.1 ¿Cuándo se comenzaron a implantar los sistemas de gestión energética sostenible en su región?

[35] **Medidas obligatoria de ahorro energético**, incluyendo la rehabilitación de edificios públicos, planes de ahorro de energía para empresas de suministro público y auditorías energéticas para todas las grandes empresas: serán aplicadas de conformidad con una directiva europea sobre eficiencia energética aprobada el martes en sesión plenaria. Una reducción del 20% en el consumo de energía podría suponer a la UE un ahorro de 50.000 millones de euros al año. Prioridad de las medidas obligatorias; rehabilitación de edificios públicos; planes de ahorro para empresas de suministro público; auditorías energéticas (todas las grandes empresas); mecanismos de financiación.

El 28 de Noviembre de 2003 el Consejo de Ministros aprobó la Estrategia de Ahorro y Eficiencia Energética en España (E-4) para el período 2004-2012.
En Aragón, se aprueba también el Plan Energético de Aragón 2005-2012, el cual se estructura entre otros, en los siguientes ejes:

- Promover el uso de energías renovables
- Establecer medidas para el ahorro y uso eficiente de la energía.

Al margen de las estrategias nacional y autonómica, los sistemas de gestión energética sostenible desarrollados en esta buena práctica se implementan desde al año 2009, iniciándose con la redacción de las Auditorías Previas en 5 de las 13 entidades comarcales beneficiadas por estas inversiones.

AT2.2 ¿Se ha transpuesto la Directiva EPBD refundida (2010) en su país? ¿La Directiva EPBD refundida sobre eficiencia energética en edificios se aplica en su región? ¿Se supervisa su aplicación? ¿Cuáles son las instituciones y las herramientas utilizadas para supervisar la aplicación de la Directiva EPBD refundida? ¿El sector público de su región promueve de manera explícita la eficiencia energética en el ámbito de la construcción privada y pública??

No, está en proceso de elaboración. Existen ya borradores previos del Real Decreto que traspondrá al ordenamiento jurídico español las directivas citadas, aunque no está aprobado hasta la fecha.

AT2.3 ¿Los reglamentos de edificación requieren la concesión de un certificado de eficiencia energética (CEE) siempre que se venda, construya o arriende un edificio? ¿El CEE muestra la eficiencia energética de una propiedad inmobiliaria e incluye recomendaciones sobre cómo mejorarla? ¿Sus modelos CEE?

La implementación del requisito está ya recogido en el REAL DECRETO 47/2007, de 19 de enero, por el que se aprueba el Procedimiento básico para la certificación de eficiencia energética de edificios de nueva construcción, a pesar de que en los edificios ya construidos o con licencia de edificación otorgada en la fecha de entrada en vigor del mismo no les aplica.
En el caso de rehabilitación, modificaciones, reformas o rehabilitaciones de edificios existentes, con una superficie útil superior a 1.000 m2 donde se renueve más del 25 por cien del total de sus cerramientos, también es obligatorio el trámite de certificación energética.
Asimismo se define la etiqueta de eficiencia energética que deberá recoger los datos de la certificación.
En el caso de que un edificio tenga ya su certificado, éste deberá entregarse en el trámite de venta o alquiler de dicho edificio.

AT2.4 ¿El certificado de energía expuesto es obligatorio cada año para edificios públicos con una huella superior a 1.000 m2? ¿Muestra este certificado los costes de funcionamiento reales del edificio y está colgado en un lugar destacado y visible?

El certificado es obligatorio que esté expuesto., aunque los datos básicos que recoge son los consumos y las emisiones de CO2 anuales.

AT2.5 ¿Existen requisitos para fijar objetivos de incremento en el uso de edificios LZC (*low/zero energy consumption*: consumo energético bajo o nulo) con objetivos separados para viviendas nuevas y rehabilitadas/ edificios comerciales nuevos y rehabilitados/ edificios ocupados por entidades públicas? ¿Han adoptado ustedes un Sistema de Gestión Energética Local? ¿Utilizan

modelos ESCO? ¿Qué servicios ofrecen las unidades ESCO y qué tipos de instrumentos de financiación utilizan?
Hasta la fecha no se has desarrollado dichos requisitos, ni están en aplicación en la región de Aragón.
AT2.6 ¿Qué acogida tuvieron los nuevos reglamentos en la industria de la construcción y entre los consumidores? ¿Qué costes ha implicado la inversión total en la construcción y en el mantenimiento de los edificios?
El Código Técnico de Edificación, que se aprueba por Real Decreto 314/2006, de 17 de marzo, introdujo una serie de requisitos en la construcción de obra nueva. Se generaban costes adicionales al introducir la obligatoriedad de fuentes renovables en las instalaciones térmicas de los edificios, pero introdujo también entre los consumidores un incremento de la demanda en el uso de energía renovables y en la mejora en la eficiencia energética.
AT2.7 ¿Se aplica un sistema de gestión y control de la energía que garantice una supervisión continuada del consumo energético en los edificios? Descripción en cuanto a aspectos organizativos y financieros. ¿Las responsabilidades están claramente definidas?
No a nivel general. Actualmente se está en fase de desarrollo normativo para su posterior implantación.
AT2.8 ¿El parque de edificios municipales se evalúa en lo relativo a eficiencia energética (indicadores de eficiencia energética, potencial de ahorro, suministro energético y contratos de suministro energético, etc.)?
No a nivel general, sin embargo en la buena práctica descrita se han analizado diversos edificios públicos y se han aplicado medidas encaminadas al incremento de la eficiencia. Dichas medidas sí se analizan mediante la obtención de indicadores tales como consumos energéticos o mejora del nivel de confort térmico en determinados espacios
AT2.9 Atendiendo al parque de edificios evaluados, ¿disponen ustedes de una planificación a medio y largo plazo referente a la rehabilitación de edificios? ¿Se tienen en cuenta las FER? ¿Existe una descripción detallada de medidas en cuando a calendario, responsabilidades y presupuesto?
No, actualmente se está en fase de desarrollo normativo para su posterior implantación.
AT2.10 ¿Se aplican medidas educativas regulares para el personal municipal responsable del funcionamiento de los edificios y sus equipamientos/instalaciones? Descripción en cuanto a medios organizativos, contenido, frecuencia y personas implicadas.
Se están iniciando diversas medidas de formación y difusión, aunque no está desarrollada una normativa que demande de manera procedimentada la puesta en marcha de medidas regulares entre el personal de mantenimiento.
AT3 Herramientas de financiación innovadoras para estimular inversiones locales en EE/FER? / ¿Incluimos otros tipos de inversiones energéticas sostenibles? Tipos de instrumentos financieros que respaldan la eficiencia energética de los edificios[36] y por lo demás:

[36] ENERGY EFFICIENCY POLICIES IN BUILDINGS – THE USE OF FINANCIAL INSTRUMENTS AT MEMBER STATE LEVEL, BPIE 2012

- Las subvenciones permiten mantener los precios bajos. Se pueden conceder, por ejemplo, a fabricantes de equipos energéticamente eficientes, tales como bombillas fluorescentes compactas.
- Las ayudas se destinan a hogares, industrias u otros consumidores de energía para pagar parte o la totalidad del coste de introducción de procesos energéticamente eficientes, tales como aislamientos de edificios mejorados.
- Las ayudas o las subvenciones se pueden financiar directamente a través del presupuesto estatal o local o los impuestos hipotecados (también conocidos como impuestos específicos o con destino determinado).
- Para estimular prácticas energéticamente eficientes se pueden introducir programas de préstamos con tipos de interés subvencionados o cobertura de riesgo crediticio. Las subvenciones proporcionadas por la autoridad local o el presupuesto estatal a los bancos que ofrecen tipos de interés bajos representan una política fiscal.
- El Impuesto sobre el Valor Añadido (IVA) afecta normalmente al consumidor final pero no al productor: quién transfiere el coste al consumidor [. . .] Los tipos de IVA diferenciales pueden utilizarse para influir en la elección de tecnologías energéticamente eficientes por parte de los hogares.
- Los gravámenes sobre el consumo o la producción pueden servir para crear un fondo (p.ej. un gravamen sobre ventas de electricidad para financiar planes de energías renovables).
- Menos comunes, y por ello consideradas innovadoras, son las Obligaciones de Suministro Energético (conocidas habitualmente como Certificados blancos) o Contratos de eficiencia energética. Se consideran innovadores aunque los Contratos de eficiencia energética existen desde la década de 1980 y las Obligaciones de Suministro Energético desde la década de 1990. Cabe realizar otra distinción importante que es relevante para los responsables de las políticas. Hace referencia a instrumentos innovadores que dependen enteramente de la financiación privada (y no de presupuestos del gobierno). Si se utilizan adecuadamente, estos instrumentos pueden proporcionar un soporte financiero a largo plazo que con frecuencia no se puede asegurar debido a los cambios en las prioridades presupuestarias de los gobiernos nacionales. Los Contratos de eficiencia energética se utilizan en Europa desde la década de 1980, mientras que las Obligaciones de Suministro Energético comenzaron a aplicarse al principio de la década de 1990s en algunos Estados miembro.
- El Banco Europeo de Inversiones, a través de los préstamos ELENA y JESSICA, respalda las inversiones en energías sostenibles y eficiencia energética.

AT3.1 Fuentes de financiación por cantidades y entidades financiadoras; ¿hay agentes privados implicados? ¿Cómo? En caso afirmativo, ¿cuál es su contribución y cuáles son los beneficios percibidos (que justificarían su participación)?

AT3.2 Tipos de acciones de financiación elegibles: ¿Proyectos? Inversiones? ¿Investigación?

AT3.3 Importe de fondos destinados a inversiones / proyectos / iniciativas de ES EE/FER, y también en comparación con importes totales de financiación para el desarrollo

AT3.4 ¿Los fondos asignados son suficientes en su opinión?

AT3.5 ¿Cómo podemos saber que se trata en realidad de una buena práctica, de una solución que funciona?

13. Evidencias de éxito (evaluación de la buena práctica y de sus resultados

La implantación de las instalaciones de EERR y de eficiencia energética a nivel local, ha permitido una serie de beneficios ambientales y económicos, que pueden cuantificarse de manera teórica. Para ello se realiza una estimación de kw generados por las instalaciones fotovoltaicas y mediana eólica, y del ahorro de potencia derivado de las distintas instalaciones de eficiencia energética. Asimismo se acompaña una tabla en la que se recogen los valores de ahorro de emisiones de CO2, derivados de la implantación de la buena práctica descrita.

Total AHORRO TN CO2 CARIÑENA	60,17
Total AHORRO TN CO2 GUDAR	253,78
Total AHORRO TN CO2 BELCHITE	53,53
Total AHORRO TN CO2 MATARRAÑA	33,69
Total AHORRO TN CO2 MONEGROS	30,18
Total AHORRO TN CO2 SOBRARBE	49,62
Total AHORRO TN CO2 RIBAGORZA	78,17
Total AHORRO TN CO2 SOMONTANO	19,89
Total AHORRO TN CO2 CALATAYUD Y CUENCAS MINERAS	270,66
Total AHORRO TN CO2 ALTO GÁLLEGO	28,10
TOTAL AHORRO TN CO2/AÑO	**877,79**

14. **Transferibilidad de la buena práctica**: ¿La buena práctica es transferible? ¿La buena práctica incluye proyectos específicos? Justifiquen, por favor.

En resumen, la buena práctica aquí descrita proporciona una auditoría a las administraciones locales, de aquellas actuaciones que resultan susceptibles de mejorarse o modificarse, para obtener una mayor eficiencia energética, bien por la minoración en los consumos energéticos, bien por la generación de energía eléctrica o calorífica a través de fuentes renovables, acompañándose además de la implantación de varias de las medidas de ahorro detectadas en la auditoría.
En ese aspecto de análisis de los distintos consumos que asumen las administraciones públicas, tales como alumbrado público, bombeos para abastecimiento o depuración de aguas, prestación de distintos servicios, sanitario, lúdico o administrativo en edificios públicos, es totalmente transferible. Es más, el análisis de esos consumos, debería considerarse una práctica de auditoría obligada de asumir temporalmente, en un proceso de revisión y mejora continua.
Lo que además aporta la buena práctica, es el desarrollo de varios de los proyectos específicos derivados de esa auditoría, que permite profundizar en el análisis, y obtener datos reales de las instalaciones más rentables, analizando parámetros tan sencillos como ahorro obtenido vs inversión ejecutada.
La transferibilidad de esa inversión, en este caso financiada a través de la Ley 45/2007, está más limitada, aún cuando a través de las denominadas empresas de servicios energéticos, es posible

para promotores públicos llevar a cabo las instalaciones, con una reducida capacidad inversora, amortizando la ejecución con los ahorros obtenidos.
Los proyectos específicos desarrollados se eligieron en su momento con el necesario asesoramiento técnico, pero también con el consenso de los beneficiarios de estos proyectos (administraciones local y comarcal)

15. Otros comentarios que deseen formular

En la ejecución de la buena práctica descrita, ha jugado un importante papel la legislación.
La incertidumbre jurídica que ha regulado el sector de las energías renovables, básicamente en los aspectos relativos a la conexión en el denominado "régimen especial", ha penalizado las instalaciones ejecutadas, algunas de las cuales, en el escenario actual, se hubieran planteado de otra manera.
Asimismo la fortaleza de las empresas distribuidoras de energía, que ha retrasado, o incluso imposibilitado la conexión a red de distribución en algún caso, también ha resultado un escollo importante.
Por último, los trámites que el proceso exigía que se resolvieran mediante la gestión administrativa local, permisos, licencias…han ralentizado en ocasiones la puesta en servicio de las instalaciones.

16. Para más información

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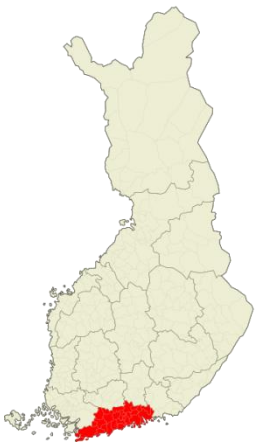
GOOD PRACTICE 4 HELEN DISTRICT HEATING AND COOLING FINLAND

General information

21. Name of the good practice	Helen District Heating and Cooling : District heating from the waste heat of the data center and district cooling from the sea water, heat pump and absorption technic.	
22. Thematic area (TA)	TA1 Better implementation of sustainable energy policies at local level	
	TA2 Development and implementation of sustainable energy management systems	**x**
	TA3 Innovative financing tools for boosting local EE/RES investments	
23. Type of good practice - check all relevant criteria	3.1 Permanent initiative	**x**
	3.2 Project	
	3.3 Methodology	
	3.4 Technology	**x**
	3.5 Others	
24. What are the most important aspects of the good practice ? check all relevant criteria	4.1 Performance of GP achieves EC set benchmarks for RES utilisation	
	4.2 Performance of GP contributes considerably to the achievement of EC set benchmarks (please mention how much)	
	4.3 Energy costs have gone down (locally / regionally/ nationally)	**X** Heat from Academica Data Center is free for Helen, so it goes for citizens benefit (no additional costs).
	4.4 RES % participation in the «energy mix » of the community has increased (please mention by how much)	**X** Producing district heating is 80% from renewable energy, heats thousands of houses.
	4.5 Provable technological innovation	**X** Existing equipments has been combinated and used in an innovative way.
	4.6 Creation of organizational structures, dealing with energy matters.	X Helen offers different kind of services (cooling, electricity transmission, electricity energy,

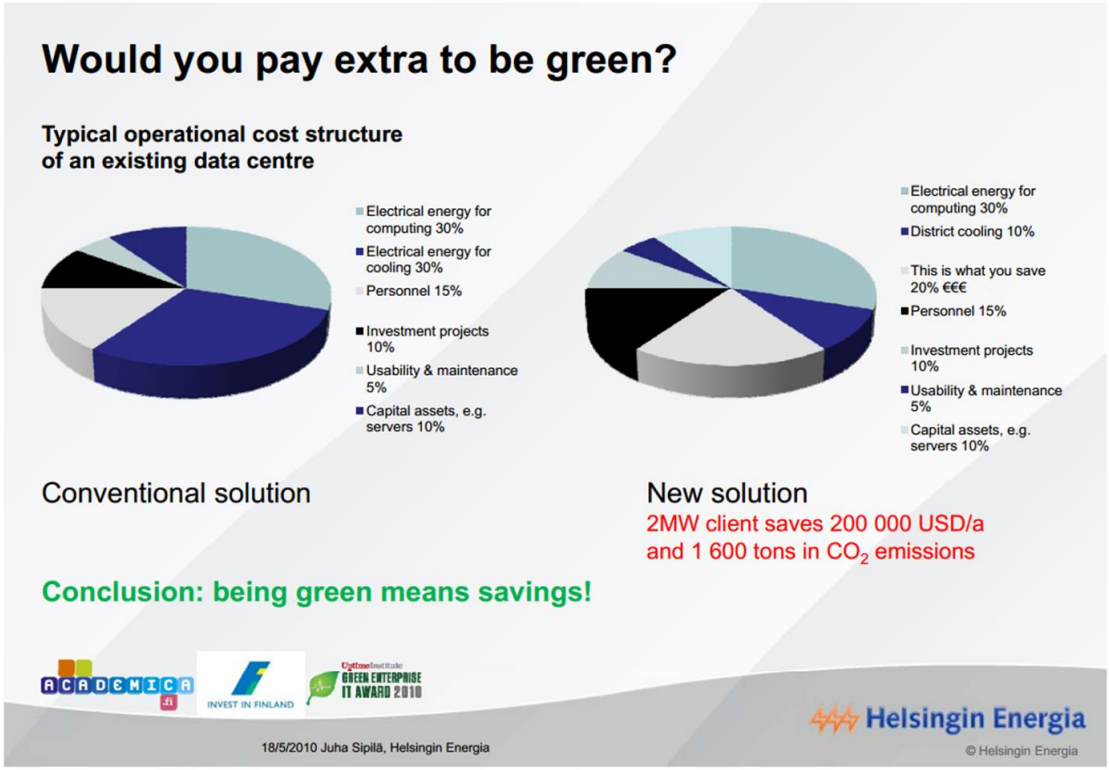
		telecommunications, renting facilities etc).
25. Contributing partner	Helsingin Energia is one of the largest energy companies in Finland. • World top class in energy efficiency • Supplies electric energy to nearly 400 000 customers in Finland • Covers over 90% of the heat demand of the capital city with district heating • Produces and sells district cooling, first commercialized in a successful business model. • Very competitive electricity and cooling prices. • Other services provided are design, projecting and maintenance of energy production and distribution systems • For-profit company owned by the city of Helsinki Year 2009 the company had net turnover of about one billion USD (€723 million) and over 1200 employees. Very high profitability of over 300 million USD (€247 million)	
26. Location	Uusimaa Region (Helsinki Region): • Inhabitants (31.1.2012) 1.550.362, biggest in Finland • 170,4 inhabitants/km^2 (31.1.2012) • Municipalities 28 • Land area 9.567,71 km2 • Total Area: 16.057,88 km2 • Unemployment rate 7,5 % (2010), Finland 10,0 % • GDP 66.584 € (2009)  City of Helsinki: • Population (31.1.2012) 596.233 • Total area 715.49 km2 • Mean annual temperature (2010) 5.9 °C	

	Helsingin Energia Ltd: • Founded 1909 • Turnover 876.000.000 € (2011) • Electricity sold, GWh 1,710 (2010) • District heat sold, GWh 1,891 (2010)
27. Start and end date of the good practice –if relevant	Investment decision and signed contracts August/2009, constructions started in the end of the year 2009, in operation in the end of the year 2010.

Detailed description

28. Objectives of the good practice

In Finland the renewable energy target level is 38 % of the total consumption of energy by 2020. In Helsinki city's Energia's Environment Management Programme one of the objectives is to exceed at least 20 % renewable milestone in heat and electricity acquisition by the year 2020. By the year 2050 Helsinki city has a target to be a carbon dioxide neutral city. New solution of cooling and reusing of waste heat of data centers' decreases CO2 emissions and saves 20 % of costs. Being green means lots of savings (picture 1.).



Picture 1. Being green means savings.

Helsingin Energia (one of the Finland's biggest energy company) and Academica (private company which offers IT infrastucture services) made a data center solution and its energy efficient and innovative district heating and district cooling solutions with co-operation of each other. The whole new solution means low starting costs for customers. There is no need for customer to buy expensive cooling equipments. Helen can rent facilities for customers scalable depending customers needs.

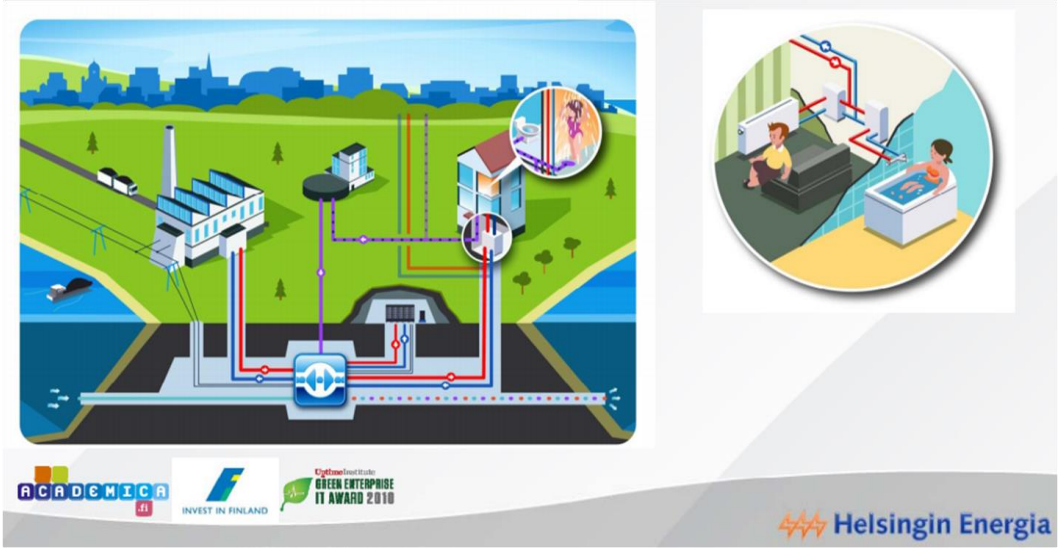
29. Description of the good practice (background, problem addressed, key aspects, actual activities, institutions involved, costs entailed, financers (who is paying? For how long? How much?).

9.1 Background

Helsingin Energia and district heating :

As early as in 1913, the director of the electricity board proposed combined heat and power generation. In 1953, the city council made a decision to build an extensive district heating network in Helsinki. Helsingin Energia started its district heating operation 1953. Currently, 93% of the city's heating needs are met with district heat, which is produced in a diverse way at four power plants, heat pump plants and peak load plants. Energy efficiency has improved further when district cooling is produced in the same processes.

Helsingin Energia is the biggest district heating company in Finland. It sells annual over 7 000 gigawatt hour of heating approximately for 14.000 customer property. Helsingin Energia uses natural gas in three of their power plants as a fuel. In their seven power plants they use fuel oil. In one of their power plants they use waste heat of cleaned waste water which is their ecological solution. District heating pipes are totally over 1.230 kilometers long and there is Europe's longest connected district heating tunnel in Helsinki.



Picture 2. District heating system in Finland.

District heating is suitable for all kind of real estates, even for most of the older single family houses (picture 2). The general rule applied in connecting a building to a district heat network is that the further the building locates from the network the larger the building should be in

order the connecting being economically justified.

Academica Data Center :

Size: 2 MW
Expanding option: to 5 MW
Area: 500 square meters
Racks: space for 150-200 racks
Location: Helsinki, inside bedrock in the old bomb shelter, 16 meters over the sea level

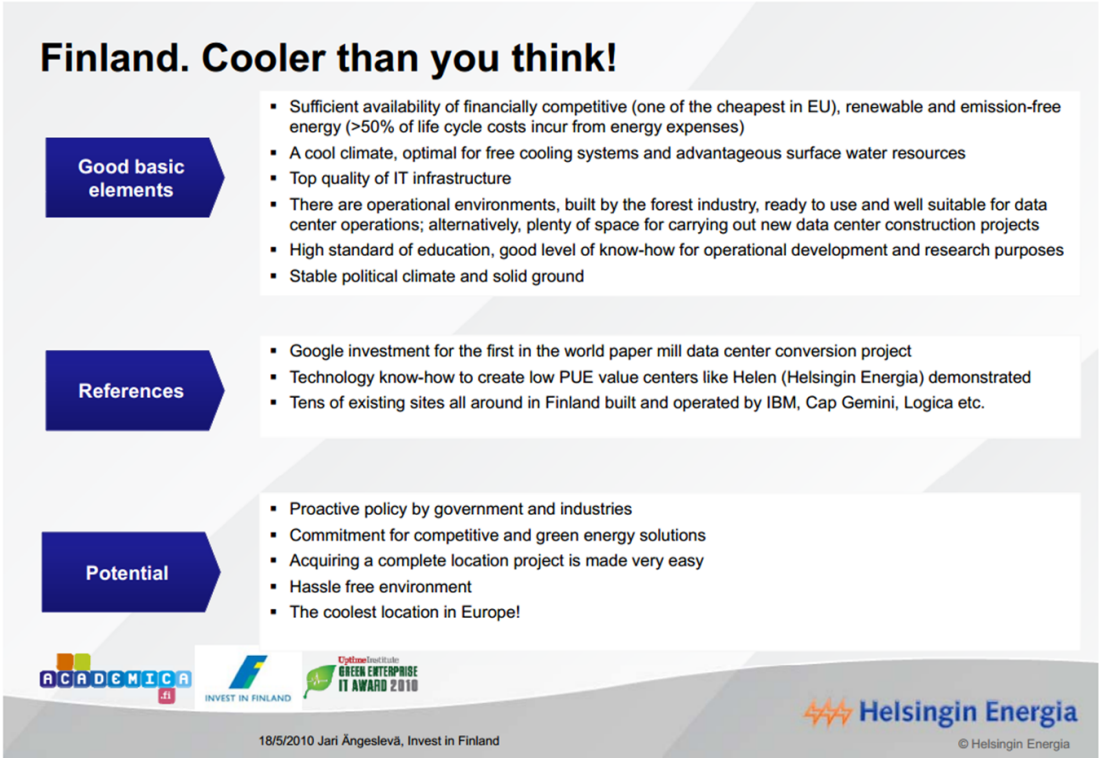
Academica Oy provides IT and telecom services for companies with decades of experience. Academica was originally found in 1932. Its operations in ICT-sector started at 1985.

Company's product offering includes ICT management and operator services such as Telecommunication-, MPLS based enterprise network-, GSM-, Internet- and Hosting services. Academica has two own data centers in Helsinki which are awarded as the world's most eco-efficient data centers.

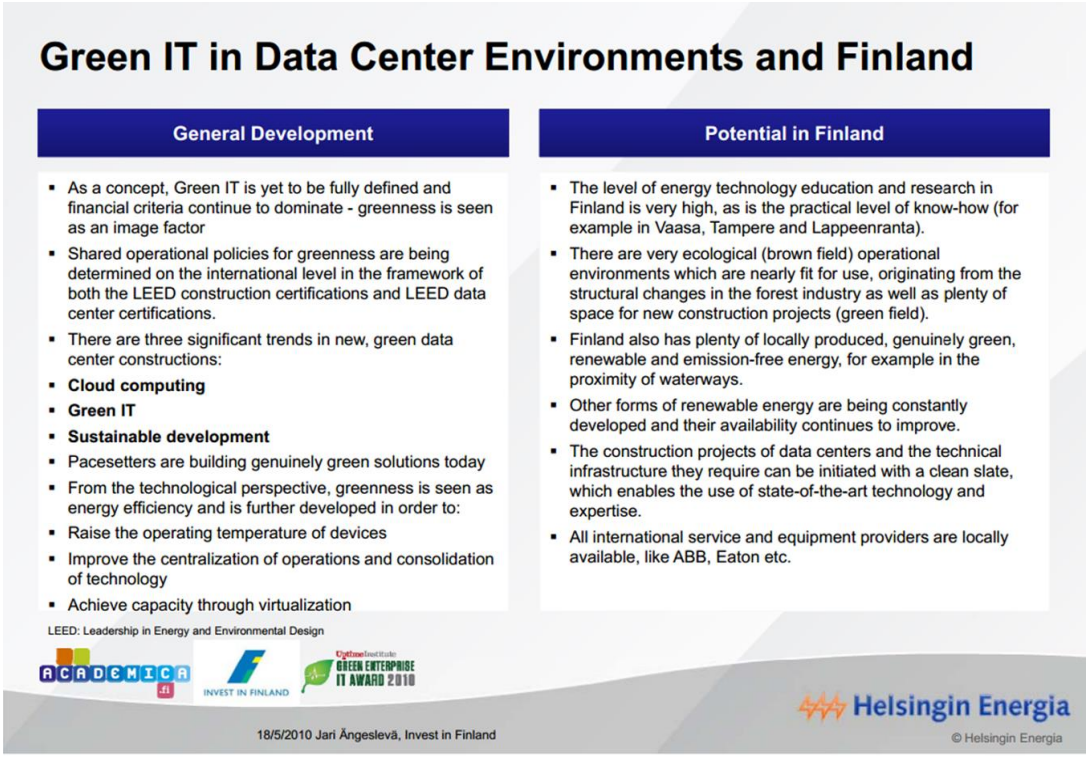
Academica currently employs 60 highly skilled technical specialists, headquartered in Helsinki, Finland. Academica's turnover is approx. 15 Meur and it is owned by Finnish institutional investors, Finnish private investors and employees.

Academica's eco-efficient colocation and hosting services provide both corporate and carrier customers with award-winning technology, mission-critical availability, eco-friendly status and and safe yet manageable locations. The eco-efficient Data Center relies on the usage of both district cooling and district heating. By using these unique production methods Academica's Data Centers are able to achieve a power usage effectiveness (PUE) never seen before.

Finland is an excellent location for data center because of its climate. We have cold sea and lakes around and in Finland. The air is quite cold almost whole year round. Finland also has high class technolocigal and academic knowledge (pictures 3 and 4).



Picture 3. Cool Finland.



Picture 4. Finland as a location of data centers.

9.2 Problem addressed

CONVENTIONAL SOLUTION (pictures 5 and 6) :

Compressor cooling :

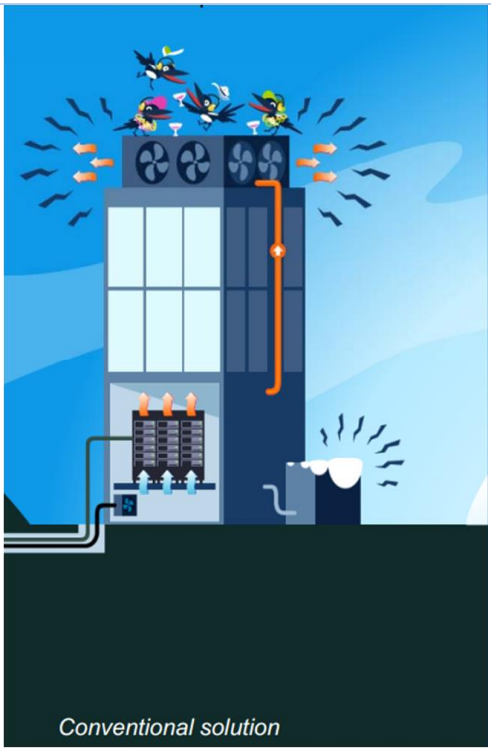
Traditional cooling solution, compressor cooling, uses very much electricity and increases energy consumption. Capacity of traditional cooling system cannot be expanded, but you have to get another compressor. Compressors are also often very heavy, so they burden roof structures. Compressor cooling system uses refrigerants which includes HCFC compounds. HCFC conpounds are proved to destroy ozone layer.

Electricity lines and communication links :

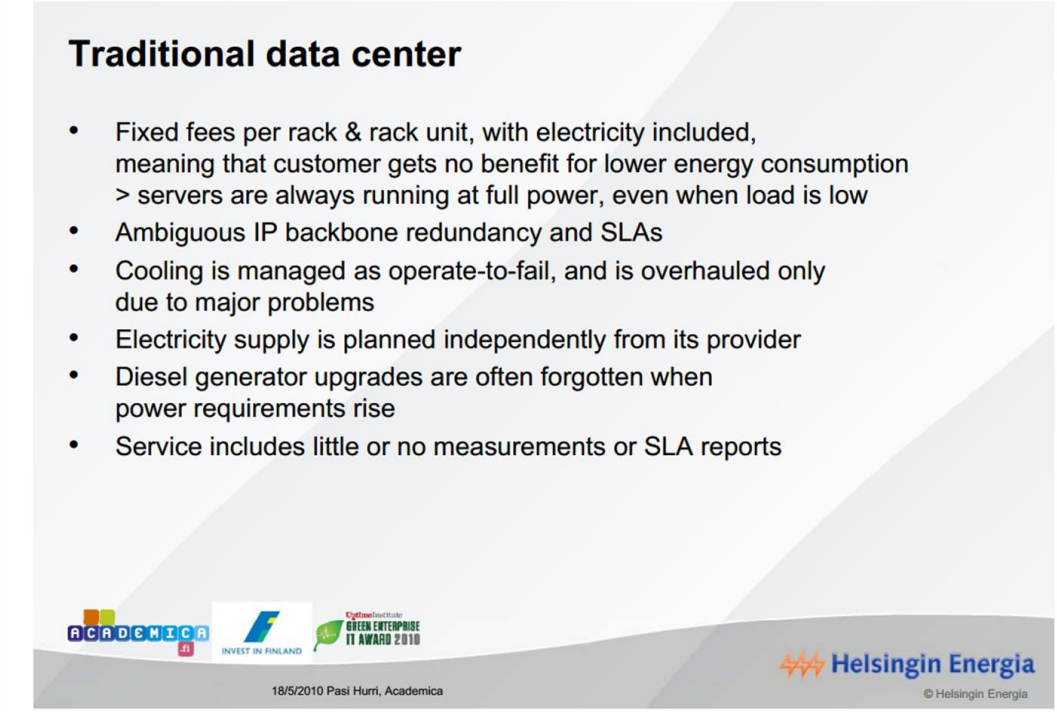
In traditional solution, electricity transmission lines and communication links are in street network, so they are vulnerable for external risk factors like excavators etc.

Waste heat :

The waste heat (thermal energy) from data center goes wasted in traditional solution.



Picture 5. Conventional data center cooling solution.



Picture 6. Traditional data center solution.

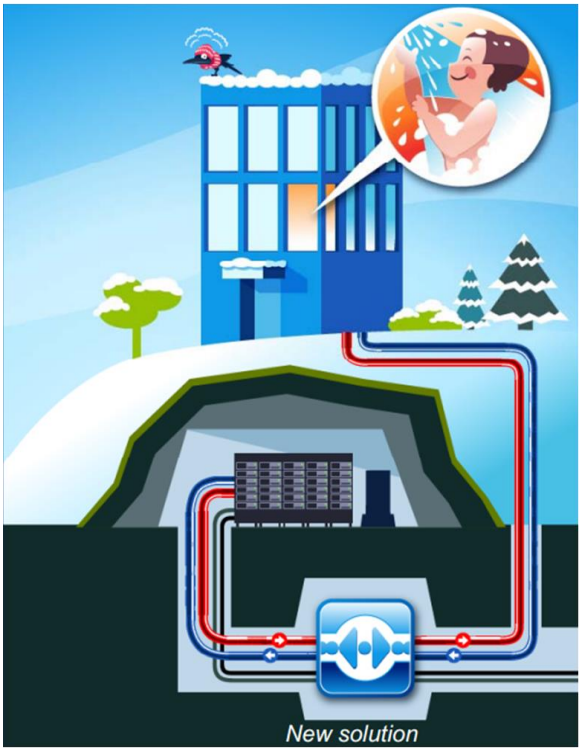
9.3 Actual activities included in the good practice

Academica Data Center using district cooling and providing district heating :

Academica Data Center is top quality ecologigal and energy-efficient Data Center, where clients can locate their servers safely, reliably and profitably. Data Center covers all the requisite technology for clients infrastructure services, fast data links and security and clients can focus on in their core business.

Green Data Center :

Server production uses lots of energy. Server cooling consumes as much energy as function itself. When the waste heat from the Data Center racks and machines is leaded to the district heating network with the help of heat pump to heat Helsinki city's buildings and use water, the energy-efficient entirety comes to exist. This system will benefit customers, climate and service providers (picture 7).



Picture 7. New cooling and waste heat solution in Academica Data Center.

As a result of its new technology innovation, Academica Data Center has been elected the most energy-efficient Data Center of 2010. Internationally know Uptime Institute has been awarded 2010 Green Enterprise IT Award and diploma for Academica Data Center.

Energy-efficiency :
Academica Ltd, as a flagship of Finland's Green IT, has been implemented its Data Center with co-operation of Helsingin Energia using extremely energy-efficient complete solution. Planned heat load, 1,5 MW will be utilized in city's district heat network. The waste heat from Data Center can be used as a heat for hundreds of Helsinki city's family houses. Soltuion is very energy-efficient and Academica Data Center is world wide known because of it.

Energy-efficiency is based of :

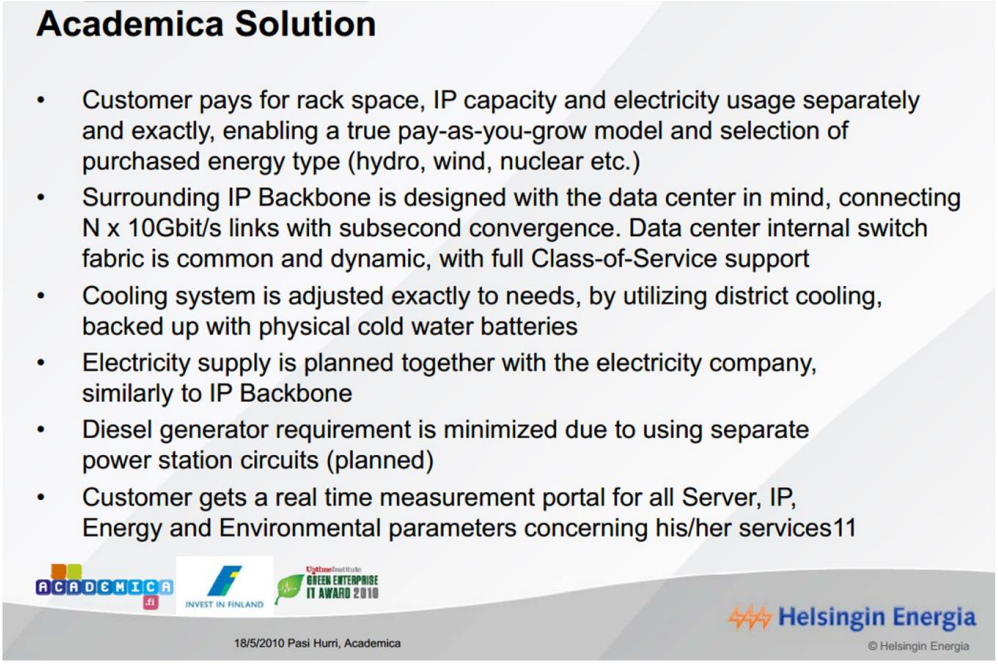
- Newest energy-efficient server technology
- Virtualisation of servers

- Cooling with district cooling technic
- Profitable storing of the heat
- The re-utilizing of energy in Helsinki energy markets.

Data Center site is located in Helsinki city by the sea in the cave of the bedrock of Katajanokka. Entering is through the three separate metal doors. There is also recording video security system.

Transformers in the site are a part of Helsinki Energia medium voltage network ring. In the network, the direction of the electricity flow can be changed which increases the reliability of the power supply.

The energy supply of the site is quaranteed with a huge back-up power system. UPS systems and generator enables the functioning if the data center even situiations when power supply from electricity company is disturbed or out off use. (Picture 8.)



Picture 8. Academica solution.

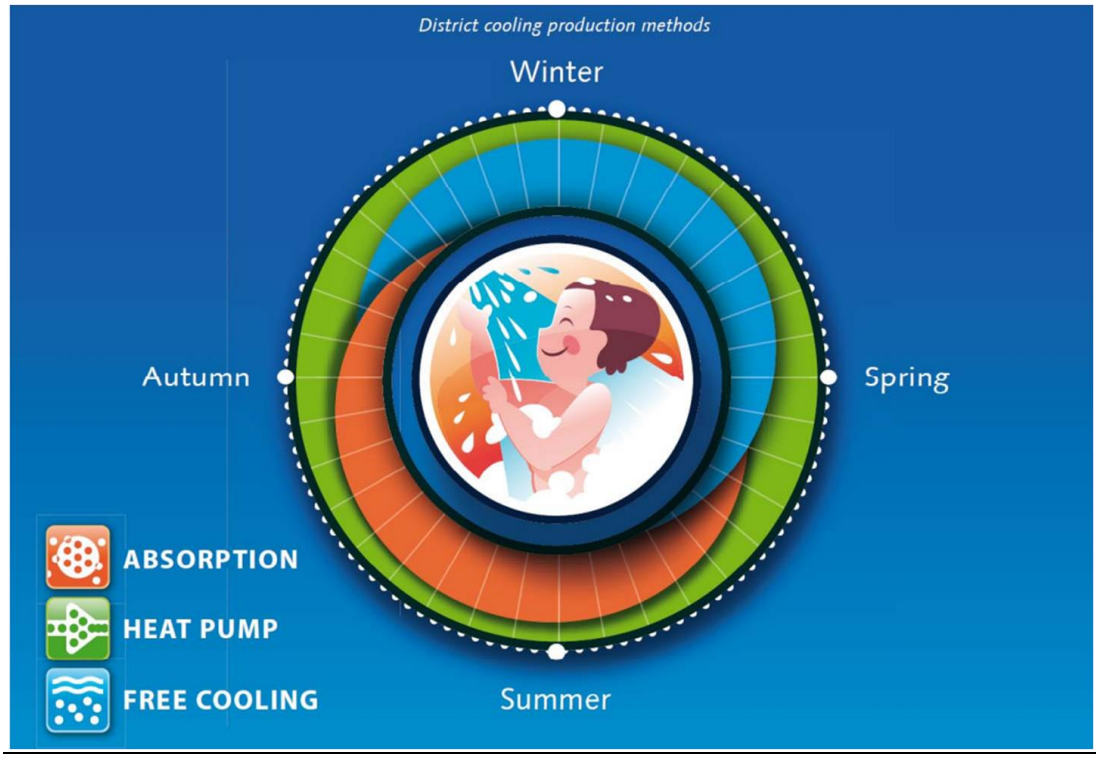
Academica solution description :

Helsingin Energia offers a solution for data centers to reuse the waste heat energy which data servers and computers produce. Solution is complete silent and inconspicuous. Carbon footprint is only a fraction of alternative conventional solution. For example the space needed in customers building for district cooling system is much lesser than in conventional systems. The need for maintenance is decreased and the risks and worries are minimized. Back-up power machines can be placed undergroud in the proximity of data center. The waste heat energy from the data center can be transferred to Helsinki Energia ditsrict heating network.

Refrigerants are not used in the data center which is cooled by district cooling solution. The power of Helsinki Energia district cooling solution is reliable and the power can be adjust infinitely when ever is needed. Production capacity is already over 100 MW and more is going to built all the time to answer for the demand. In the data server space the whole capacity of electricity connection and electricity energy can be use for calculation for 100 %. Cooling is

not using customers energy at all. Ditsrict cooling is produced in three different power plant in 15 different units which are not dependent of each other. Underground energy tunnels offer safe route and enable unbroken deliverign for important connections.

District cooling production in picture 9:



Picture 9. Production of district cooling in Academica solution.

ABSORPTION : District cooling is produced by using the waste heat of heat energy from the data center with absorption technic.

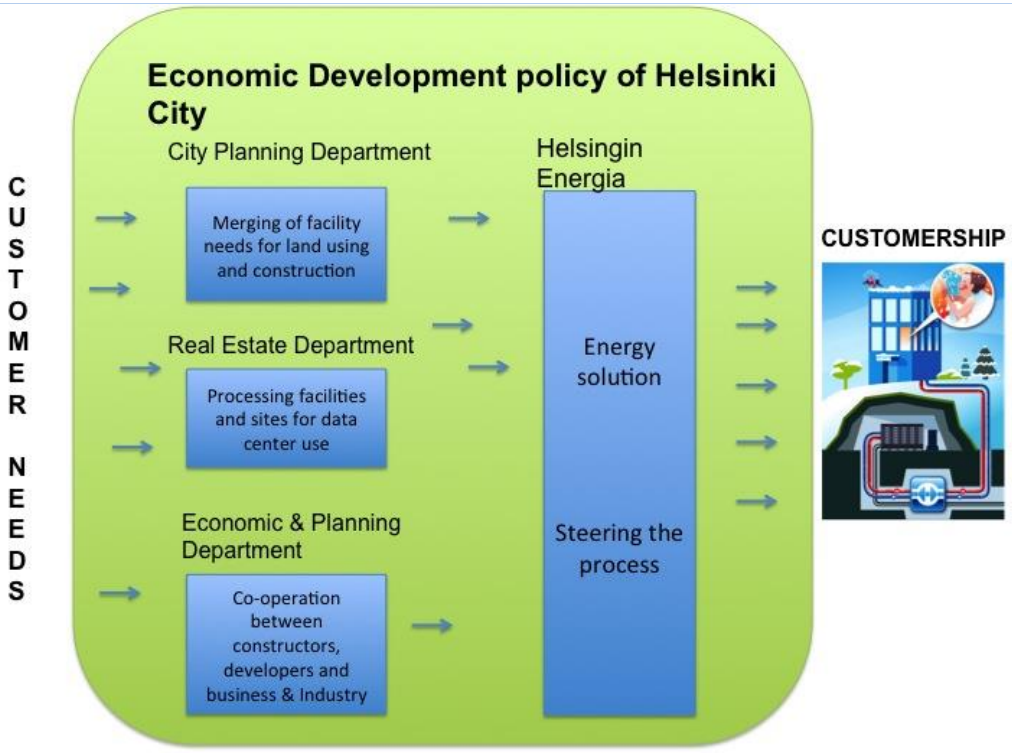
HEAT PUMP : The heat energy which is collected with district cooling is taken with heat pump. The heat is transferred to district heating system to heat Helsinki buildings and warm use water.

FREE COOLING : District cooling is produced from the cold sea water (under 8 degrees) from November to May by free cooling technic. Cooling is produced straight from the sea water every time it's possible.

9.4 Institutions involved in the planning, endorsing, implementing, and evaluating of the good practice

City of Helsinki, Invest in Finland, Helsingin Energia

Process of the Data center investments' acquisition (picture 10) starts from customer's needs. Helsinki city's economic development policy includes City Planning Department, Real Estate Department and Economic & Planning Department, which all give their expertise for helping customers to develop their own data center solutions in co-operation with Helsingin Energia.



Picture 10. Process of the data center investments' acquisition.

9.5 the key aspects of the good practice

Period covered by the budget:

Investment decision was made in August 2009.

Expenditures:

The total investment, app. over 10 million € (building Academica Data Center).

Helen offers its services for new customers with low costs. Customers only have to pay what and how much they are using.

Revenue :

Private funding: Academica's own investments and Finland's Industry Invesment (group of private funders)

COMPLETED: The Academica has been in operation since 2010.

30. Context of the implementation of the good practice

Country	Finland
Region	Uusimaa Region (Helsinki Region)
Population	1 550 362 (31.1.2012)

31. Questions spefic to the thematic areas of the good practices (TA:s) and also indicating the performance of the regions in terms of RES

RES generation: How active is the local / regional RES progamme? What are the RES sources in your region? What is your region's RE production capacity? Where is the RES sold? Does it create a regional income? Is there a business sector associated with it? Which are the organisations coordinating the RES production in the region? Which are (if any) the organisations dealing with the RES research?

Helsinki City has been signed Energy-efficiency Agreement in the year 2007. In the year 2009 Helsinki signed EU Energy and Climate Agreement. Main target is to increase carbon dioxide emission at least 20 % until the end of the year 2020. Sustainable Enenrgy Action Plan (SEAP) of Helsinki completed 2010 by The Construction Department of Helsinki. Helsinki city made this SEAP in the cooperation with city's Environment Department's work group and HKR-Rakennuttaja Ltd.

RES sources of Helsinki Region are e.g. wind power, water power, bio fuel, wood, bio gas from wood chips, burning waste, natural gas, sea water, waste heat from cleaned waste water, pellet, biomass, solar energy, heat batteries (big water tanks for storaging heat and cool water) and bio carbon.

RE prodution capacity was 54 % (2011) in electricity production.

RES is sold and coorditaned by Helsingin Energia's power plants which produces heat, electricity and district cooling.

RES research is made by Motiva ltd and Helen.

RES applications: how much of the regional / municipal energy needs are covered by RES? Has there been any effect in the energy prices? What have been the biggest problems in disseminatin RES applications in the housing, public and economic productive sectors (services and manufacturing)? Is there any organisation resposnbile for promoting applications of RES in the region?

Ninetta???

Decreasing energy usage in the public buildings the effective use of monitoring the energy consumption of the buildings is required. It means training and education of maintenance staff for using those applications and monitors and increasing thei knowledge of energy consumption of the buildings and energy saving possibilities. Helsinki city is responsible of that.

TA1 Better implementation of sustainable energy policies at local level → TA1 is essentially reviewing the implementation of the 2009/28/EC RES Directive.

TA1.1 Is there a national policy promoting comprehensive approaches? Is there a pronounced regional sustainable energy policy? If yes, what are its objectives and main action lines? When was it established? Are there any measurable results? If yes, what are they? Is there a comprehensive policy background for RES support?

TA1.2 Have sector specific RES targets and action plans for 2020 been set up –as required by the RES Directive, in your region?

TA1.3 What are the existing support instruments for RES in your region? Have policy alternatives for RES been formulated in your region?

TA1.4 Have RES criteria been integrated into the relevant public procurement policies/procedures in your region?

TA1.5 Why do you feel that these tools are actually good practices?

TA2 Development of sustainable energy management systems

TA2 is essentially about the implementation of the EPBD, DIRECTIVE 2010/31/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 19 May 2010 on the energy performance of buildings.

TA2.1 When did you start implementing sustainable management systems in your region?

District heating system has started 1953.

TA2.2 Has the recast EPBD (2010) been transposed in your country? Is the recast EPBD enforced in your region? Is its enforcement monitored? Which are the institutions and what are the tools used to monitor the recast EPBD enforcement? Does the public sector in your region explicitly promote energy efficiency in private and public construction?

EPBD is transposed in Finland. Ministry of the Environment are monitoring enforcement of EPBD. They are monitoring e.g. the preparation and use of energy certificates and the quality of energy certificates and authors of certificates.

The City of Helsinki ("Energy Efficient Helsinki") has a energy efficient targets and in their strategy and the climate strategy, and also Finland's climate and energy strategy, they promote energy efficient constructing for private and public constructors.

TA2.3 Do building regulations require that an energy performance certificate (EPC) must be produced whenever a building is sold, constructed or rented out? Does the EPC show the energy efficiency of a property and include recommendations on how it can be improved? Your EPC models?

In Finland's building regulations EPC's are required whenever a building is sold, constructed or rented out and when the building has over 6 apartments and is built after the laws of energy certificates (487/2007 and 765/2007) was published. These kind of buildings are new apartment houses, terraced houses etc. EPC is not required e.g. if the building is under 50 m2 or in temporary use (under 4 months/year) or built before the law of energy certficates and includes under 6 apartments. EPC's are coming obligatory.

EPC must show energy efficiency and also recommendations of improving it.

TA2.4 Is a display energy certificate (DEC) obligatory on an annual basis for public buildings with a footprint larger than 1,000 m2? Does the DEC show the actual running costs of the building and is it displayed in a prominent place?

DEC is obligatory in Finland for public buildings with a gross floor area over 1,000m^2. DEC has to be uder 10 years old, A4 size and shown in public spaces of the building (building where author provides public services) and where the public can see it proberly. These kind of public buildings are e.g. schools, libraries, hospitals, banks, energy companies etc. DEC has to include the information of energy usage and carbon dioxide emissions. DEC doesn't show costs, but it shows consumption in numbers.

TA2.5 Are there requirements to set targets for an increase in the use of LZC (low/zero energy consumption) buildings with separate targets for new and refurbished dwellings; new and refurbished commercial buildings; buildings occupied by public authorities? Have you adopted a Local Energy Management System? Do you utilise ESCO models?

Helsinki city has targets to be a carbon dioxide neutral city for a year 2050.

Helsinki City has published instructions (2010) for low energy construction and refurbishment in public buildings. Low energy construction means the total energy consumtion level of buildings (heat, cooling and electricity energy). Helsinki has committed to save energy for 9 % during 9 years (from the year 2005). With low energy construction it's possible to decrease the energy consumption of public buildings 1-2 % until year 2016 and 4-5 % until year 2020. Helsinki city demand that RES use has to be investigated and taken account of every low energy construction case (e.g. using solar energy in heating buildings and use water, solid rock cooling, wind power, heat pumps outside the district heating area). In central area of Helsinki city the district cooling must be used primary. Passive energy houses use 65-70 % less energy compared to the regulations and levels of the year 2009. In low energy buildings reduction is 50 %.

In new public buildings decreasing targets of heat energy consumption are 40 % compared to 2010 regulations and decreasing targets of electricity consumption are 50 % compared to present. In public refurbishment dwellings decreasing targets of heat energy consumption are 40 % compared to normal refurbishment and decreasing targets of electricity consumption are 40 % compared to normal refurbishment. Public buildings must join to energy monitoring system.

Local Energy Management System: Helen offers "Sävel Plus" -service for its customers (consumers or companies). With "Sävel Plus" –service customers can follow their electricity consumption even on an hourly basis. Customers can also rent electricity consumption meter for measuring the electricity consumption of their household devices.

In Finland Motiva Ltd offers ESCO services and has a register of ESCO projects. Motiva has ESCO models and it offers ESCO projects for data center companies.

Finland's Ministry of Employment and the Economy also support companies and makes energy reviews.

TA2.6 How did the construction industry and consumers receive the new regulations? What have been the incurred costs on the overall construction investment and also on the maintenance of the buildings?

New regulations are informed by Finland's Environmental Administration. Industry and

consumers get information also from different kind of unions and associations, like construction unions.

Building Academica Data Center cost 10 million €. Helen offers its services for new customers with low costs. Customers only have to pay what and how much they are using.

TA2.7 Is an energy management and controlling system implemented which assures a continuous monitoring of energy consumption of buildings? Describe in terms of organizational and financial aspects. Are responsibilities clearly defined?

Helsinki City monitors city's public buildings and does energy reviews ja consumption monitoring. Helsinki uses HKR-Rakennuttaja Ltd for implementing energy reviews. HKR-Rakennutaja Ltd monitors the developing the consumption and contacts the user of the building if there is any changes in the consumption.

Helen has an Energy Management System. Helen offers "Sävel Plus" -service for its customers (consumers or companies). With "Sävel Plus" –service customers can follow their electricity consumption even on an hourly basis.

Academica monitors their own energy consumption in their data center and measures e.g. PUE value etc.

TA2.8 Is the pool of municipal buildings evaluated in terms of energy performance (Energy Performance Indicators, Saving Potential, Energy supply and energy supply contracts etc.)?

Regulations obligates evaluations in municipal buildings. Helsinki City monitors city's public buildings and does energy reviews ja consumption monitoring. Helsinki uses HKR-Rakennuttaja Ltd for implementing energy reviews. HKR-Rakennutaja Ltd monitors the developing the consumption and contacts the user of the building if there is any changes in the consumption.

TA2.9 On the basis of the evaluated pool of buildings, does a mid- and longterm planning exist concerning refurbishments of buildings? Are RES considered? Is there a detailed description of measures in terms of timeline, responsibilites and budget?

Refurbishments will be implemented using low energy or zero energy solutions. Energy reviews will be implemented and improvements will be made if needed. RES will be used as much as it is possible and if they are cost effective.

TA2.10 Are there regular educational measures for municipal staff responsible for the operation of buildings and its equipment/installations? Describe in terms of organizational means, content, frequency and persons concerned.

Ninetta?

TA3 Innovative financing tools for boosting local EE/RES investments / do we include other types of sustainable energy investments?

TA3.1 Sources of funding per amounts and funding organisations; are there private actors involved? How? If yes, what is their contribution and what are the perceived benefits (that would justify their involvement)?

TA3.2 Types of eligible funding actions: projects? Investments? Research?

TA3.3 Amounts of funding dedicated to SE EE/RES investments / projects / initiatives, and also vs total development funding amounts
TA3.4 Is the funding allocated sufficient, in your opinion?
TA3.5 How do we really know it is a good practice, a performing solution?

32. Evidence of success (evaluation of the good practice and its results) : Has evaluation of the good practice been undertaken? By whom? When was the evaluation undertaken? Any evident economic benefits arising from the good practice including any improvements in Ecosystem Services; have any weaknesses of the good practice been identified? Is the good practice complete or is it continuing? If the good practice is continuing on, is there any corrective action being taken? What is it?

12.1 Evaluation of the good practice

Motiva Ltd. (Finnish research company) – Specialist in Energy and Efficiency – has made a study of 'Energy-efficient data centre' (2011). Academica Data Center and Helens district heating and cooling systems is included in the study.

As a result of its new technology innovation, Academica Data Center has been elected the most energy-efficient Data Center of 2010. Internationally know Uptime Institute has been awarded 2010 Green Enterprise IT Award and diploma for Academica Data Center.

12.2 Economic benefits

Helsinki Energia's new solution takes data center's to new eco-efficient era : computers and data servers will be cooled by district cooling and the waste heat energy from data servers could be transferred to district heating network for heating Helsinki buildings and citizens' warm use water.

In Finland, data centers use 0,5-1,5 % of all the energy costs. If every data centers in Finland would operate this way, 500 MWh of energy could be saved every day. Buildings of average town of Finland could be heated at the same time. Solution enables significant savings for Academica data center in energy costs which normally goes to the convenient cooling. Energy consumption is forecasted to double in every five years. For example cloud computing's energy demand has been forecasted to growth further more. District cooling uses only 0,0125 units of electricity for producing one unit of cooling energy.

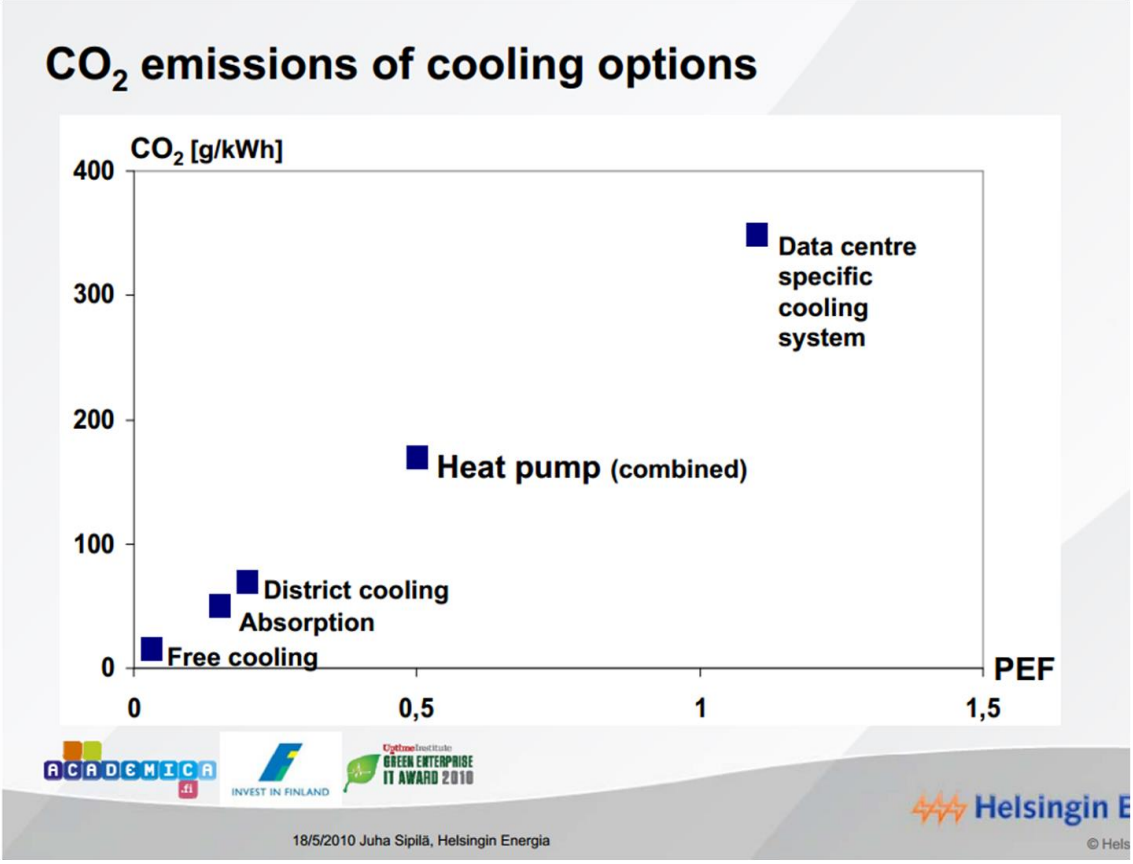
The energy-efficiency of data centers is discribed by PUE value (Power Usage Effectiviness). Value describes the ratio of the total energy consumption and server energy consumption. In the past that value was around 2 and the limit was 1. The value under 1,5 have been and still is very efficient. Nowadays, when the waste heat could be reused, new value name is NPUE. NPUE limit is 0.

In the Academica site, the PUE value can be counted as follows :

NPUE 600 kW - 1200 kW ITL = PUE 0,45 – 0,47

Carbon emissions of IT sector are approximately 2 % of the worlds carbon emissions. Data

centers' emissions are forecasted to growth over four times bigger during the years 2012-2020. With district cooling CO_2 emission can be decreased (picture 10).



Picture 11. CO_2 emissions of different cooling options.

DEMAND SIDE FOR DISTRICT HEATING:

District heat saves energy and the environment. District heat is produced in larger units when fuel is saved compared to situation when every building has its own heating system e.g. an oil combusting boiler. In Finland district heat has been in use since early 1950's. The increase use of district heating has had a very positive impact to the amair quality; the concentration of sulphur dioxide has decreased radically.

And for the customer's point of view the equipments relating to district heat technology are relative simple. The district heat (warm water) running in the district heat network is lead to a heating plant in a building, where it releases heat to the customers' heating and domestic hot water systems using heat exchangers. District heating water return pipe cools sufficiently to return back to the production plant to be re-heated. The heat exchange technology is durable and it requires very low maintenance.

12.3 Weaknesses

Existing district heating network is a platform for this new solution (application). Solution needs existing infrastructure (centralized heating system) for function (for gathering heat from data

center waste heat).

District heating network has to be near data center. Otherwise heat los sis too big and heat cannot be used in the district heating network.

12.4 Continuing

The good practise is continuing.

Some research needs have been identified. Reliability is very important in data centers. Data centers have heavy back-up systems (UPS batteries and generators) in electricity (redundancy) and there is lots of energy and power loss (10 %) because of those back-up systems (which have to be running all the time). Helen wants to find out, if data centers is located near electricity plant (reliable electricity input), is too heavy back-up systems needed at all and should data centers survive with less redundancy ? Is too heavy redundacy really worth of wasting money and energy ? This thing could be taken into consideration in the beginning of data center investment phase. Lots of savings can be reached like this and there wouldn't be so much unused back-up equipments in the end of the data center life cycle

33. Transferability of the good practice: Is the good practice transferable? Please justify

The transferability of this good practice relates to municipal governance strategies for reaching EU renewable energy targets and at the same time being more cost effective in energy production and delivery to the citizens.

Specific important factors:

- Technological: Academica has built the data center in co-operation with Helsinki City's Helsingin Energia near its district heating and district cooling networks (existing facilities).
- Legislative: Finnish climate policy dictates the target 38 % for the share of renewable energy in 2020. Helsinki City's target is 20 % in 2020 and CO2 neutrality in 2050.
- Cultural: Helen isn't paying anything of heat from Academica. Everything goes to the benefit of the citizens.

Time needed before effects of good practice are felt:

Effects of good practice are going to be seen right after operation has started.

Risks of undesirable effects during implementation of the good practice:

Risks of undesirable effects can be prevented by anticipatory maintaining. Monitoring of the operation and maintenance prevent the failure in operations of the data center.

34. Any other comments you wish to make

35. For more information	
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http://www.motiva.fi/en/publications/industry/energy-efficiency_data_centre.2022.shtml

Annex STEP thematic areas & GPs as per approved AF

1. BETTER IMPLEMENTATION OF SUSTAINABLE ENERGY POLICIES AT LOCAL LEVEL

Comprehensive approaches promoting the uptake of regional sustainable energy (SE) policies at local level

Local SE action plans in urban areas (STRIA)

Local SE plans in rural areas (SODEMASA)

2. SE MANAGEMENT SYSTEMS:GPs supporting local energy self-sufficiency, optimization & management tools for EE/RES

ESCO** models for RES in public buildings (ARGEM)

Energy performance audit (Arleg)

Local Energy Management Systems (SAENA)

RES in municipal district heating systems (Kainuu)
** ESCO= area based Energey Service Company

3. FINANCING TOOLS FOR SE INVESTMENTS

Innovative financing tools for boosting local EE/RES investments

Alternative financing options for Public Sector investments (MWRA)

Financing EE/RES initiatives in local authority functional areas (Midland)

GOOD PRACTICE 5 REPLACEMENT OF GASOIL SYSTEM WITH RENEWABLE ENERGY USING AN ESCO (MURCIA)

General information

36. Name of the good practice	**Replacement the Indoor Swimming Pool's heat gasoil system to Biomass and Solar Thermal system using a contract with an Energy Service Company (ESCO)**	
37. Thematic area (TA)	TA1 Better implementation of sustainable energy policies at local level	
	TA2 Development and implementation of sustainable energy management systems	**X**
	TA3 Innovative financing tools for boosting local EE/RES investments	
38. Type of good practice - check all relevant criteria	3.1 Permanent initiative	**X**
	3.2 Project	
	3.3 Methodology	**X**
	3.4 Technology	
	3.5 Others	
39. What are the most important aspects of the good practice ? check all relevant criteria	4.1 Performance of GP achieves EC set benchmarks for RES utilisation	
	4.2 Performance of GP contributes considerably to the achievement of EC set benchmarks (please mention how much)	
	4.3 Energy costs have gone down (locally / regionally/ nationally)	**X**
	4.4 RES % participation in the «energy mix » of the community has increased (please mention by how much)	**X**
	4.5 Provable technological innovation	
	4.6 Creation of organizational structures, dealing with energy matters.	
40. Contributing partner	Technical support along the implementation process. Also support during the procurements process	
41. Location	Carrretera de Zeneta, Municipallity of Beniel, Region of Murcia, Spain	
42. Start and end date of the good practice –if relevant	Start date: 4th octuber 2012 End date: Contract with ESCO during 10 years	

43.

Regional context, all partners please fill in

44. Energy performance of the region

All partners please fill in Table 1 in Annex 2

Quantitative figures:

The measure covers the 100 % of heating needs of the municipal swimming pool and sport center with renewable energy sources (biomass and solar thermal).
Before ESCO:
Annual Energy Consumption: 686.133,4 kWh/year (gasoil 67.934 litres).
Unit cost of energy: 0,90 €/kWh (ever growing).
Annual energy cost: 61.758,18 €/year + VAT (21%)
CO2 emissions: 196,92 Tn CO2/year
Important maintenance costs.
Alfter ESCO:
Annual Energy consumption: 686.133,4 kWh/year
Unit cost of energy: 0,056 €/kWh (during 10 years).
Annual energy cost: 38.423,47 €/year + VAT (21%)
No CO2 emissions.
No maintenance costs: the maintenance of the installations is carried our by the ESCO (included into the energy price)

Sustainable energy policy tools:

The municipal and regional energy policy is based on one hand in to achieve the commitments of reduction the CO2 emissions and on the other hand in the needs of the public administrations in saving energy costs.
Most muncipalities in the Region of Murcia are signatories of the Covenant of Mayors (over 90%), being an good tool for municipal planning, since it sets the municipal commitments and objetives through a approved Sustainable Energy Action Plan (SEAP) which defines the measures and strategy lines.

One of the most important tool, in order to achieve the policy energy objetives at municipal and regional level, is the implementation and financing of energy efficient project using contracts with ESCOs.

RES production & applications, extent, barriers, any specialisation:
How active is the local / regional RES progamme?
The regional government is promoting and supporting actively the utilisation of the RES in order to achieve the energy policy objetives in the Region of Murcia, above all in the public sector (public lighting, administrative buildings, hospitals, schools, sport centers, …). Especially the regional goverment supports municipalities to perform energy efficient projects and the use of RES (audits, technical support, ESCO, contract documents, …).

What are the RES sources in your region? Where is the RES sold?
The photovoltaic and solar thermal energies are the most important RES in the region of Murcia.
The PV energy normally is supplied to the electrical grid with the corresponding income for the owner.
The ST energy normally is consumed in places when generated (industries, building, schools, …)

Does it create a regional income? Is there a business sector associated with it?
There are a lot of PV plants in the region of Murcia which generate important incomes to owners. Also there is an important business sector associated (panels manufacturers, installation companies, maintenance companies, …)

Which are the organisations coordianting the RES production in the region?
The regional goverment is responsible for authorizing the RES instalation according the kind of tecnology and installed power. The municipal goverments are responsible of construction licences and the fulfillment the local rules.

Which are (if any) the organisations dealing with the RES research?

How much of the regional / municipal energy needs are covered by RES?
Electrycity:
Hydropower: 90846 MWh
Wind power: 298.660 MWh
Photovoltaic: 572.513 MWh
No renewable sources: 8.848.228 MWh
Electricity energy covered by RES: 11 %
We have to say that our region is an energy pole, with 3.000 MW installed of Combined Cycle with natural gas. The most part of this energy is exported to other regions.

Has there been any effect in the energy prices?
Since the introduction of RES in the Spanish electricity market the price paid for consumers has been ever growing. Now it has been stabilized due to new RES sector regulation and the reduction of prices of the material for instalations.

What have been the biggest problems in disseminating RES applications in the housing, public and ecoonmic productive sectors (services and manufacturing)?

- Expensive technologies
- No specialized companies
- Awareness of citizens and companies
- Unawareness of opportunities
- Unsufficient administrative support
- Unsufficient administrative promotion

Is there any organisation responsible for promoting applications of RES in the region?
The Regional Energy Agency of Murcia (ARGEM) is the main regional organisation for promoting the use of renewable energy sources at regional level.
The local goverment is implementing different measures to promote the applications of RES at local level, mainly this is the reduction or elimination of different taxes.

45. Context of the implementation of the good practice	
Country	Spain

Region	Municipality of Beniel (Murcia)
Population	11.068 inhabitants

Detailed description of the good practice

46. Description of the good practice

Background

The Municipal indoor swimming of Beniel had an inefficient heating gasoil system to cover the needs of heat (heating water swimming pool and hot water). That system had several problems, mainly the economic costs due to ever growing gasoil prices, maintenence problems and it was a pollutant instalation.

Objetives : Saving costs for City Council and contributing to reduce CO2 emissions..

Description

The project has consisted of the replacement the old gasoil system to a modern parallel system using 2 biomass boilers and 20 solar thermal panels in order to cover the total heating demand.

The project has been implemented through a contract during 10 years between the City Council and a Private Company (ESCO). The ESCo has funded the project and it will sell the energy to the City Council according the agreed price (initialy 0,056 €/kWh), also the ESCO will manage the instalation ensuring the performance, availability and maintenence during the contract.

Economic aspects :

- Anual energy consumption (gasoil): 686.133,1 KWh/year
- Old Gasoil System: 686.133,4 kwh*0,09€/kWh = **61.758,18 €/year+VAT (21%)**
- Modern Biomass and Solar Thermal System : 686.133,4 kwh***0,056€/kwh** = **46.492,39 €/year+VAT (21%)**

The City Council will pay mouthly the energy consumed according the price agreed in the contract during 10 years.

Saving costs: **38%** (381.964,64 € during 10 years)

CO2 Emissions saving :**196.92 Tn CO2/year**

Once finished the contract the Municipal Council will be the owner of the instalation, therefore the anual energy cost will go down.

47. Questions spefic to the thematic areas of the good practices (TA:s)

TA1 Better implementation of sustainable energy policies at local level.

The focus of this thematic area is on comprehensive approaches promoting the uptake of regional sustainable energy policies at local level.

Local policies and activities to promote renewable energy can be grouped into five main categories: 1. Target setting; 2. Regulation based on legal responsibilities and jurisdiction; 3. Operation of municipal infrastructure; 4. Voluntary actions and government serving as role model; 5. Information, promotion and raising awareness. **Partners with GPs in this Thematic area please fill in Annex 2 Table 1 with special care to please link to the questions underneath.**

TA1.1 Is there a national policy promoting comprehensive approaches? Is there a pronounced regional sustainable energy policy? If yes, what are its objectives and main action lines? When was it established? Are there any measurable results? If yes, what are they? Is there a comprehensive policy background for RES support?

TA1.2 Have sector specific RES targets and action plans for 2020 been set up –as required by the RES Directive, in your region?

TA1.3 What are the existing support instruments for RES in your region? Have policy alternatives for RES been formulated in your region?

TA1.4 Have RES criteria been integrated into the relevant public procurement policies/procedures in your region?

TA1.5 Why do you feel that these tools are actually good practices?

TA2 Development of sustainable energy management systems

TA2 is essentially about the implementation of the EPBD, DIRECTIVE 2010/31/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 19 May 2010 on the energy performance of buildings, EU Energy Efficiency Action Plans (2006 and 2011)• EU Directive 2006/32/EC on energy end-use efficiency and energy services (ESD) and the most recently endorsed (26.9.2012) Energy Efficiency Directive[37].

[37] Mandatory energy-saving measures, including renovating public buildings, energy-saving schemes for utilities, and energy audits for all large firms, will be required by an EU energy efficiency directive approved in plenary on Tuesday. Cutting energy consumption by 20% could save the EU €50 billion per year. Focus of the mandatory measures: Renovation of public buildings; Saving plans for utilities; Energy audits (all large enterprises); Financing facilities

TA2.1 When did you start implementing sustainable management systems in your region?
We started the promotion of ESCO model in 2007. In this last year we have received the aproval of an ELENA project (from the European Investment Bank) in order to help the municipalities in the procurement processes to introduce ESCOs in their installations. This project will promote more than 116 M€ in investments from the ESCOs.
TA2.2 Has the recast EPBD (2010) been transposed in your country? Is the recast EPBD enforced in your region? Is its enforcement monitored? Which are the institutions and what are the tools used to monitor the recast EPBD enforcement? Does the public sector in your region explicitly promote energy efficiency in private and public construction?
In our region we are still implementing the EPBD 2010 (not yet implemented at a national level, we wait new policies for the next year 2013). The institution in charche of the monitorization of EPBD is the General Direction of Industry, Energy and Mines, in our region.
TA2.3 Do building regulations require that an energy performance certificate (EPC) must be produced whenever a building is sold, constructed or rented out? Does the EPC show the energy efficiency of a property and include recommendations on how it can be improved? Your EPC models?
Not yet, but we wait this regulation for the next year 2013
TA2.4 Is a display energy certificate (DEC) obligatory on an annual basis for public buildings with a footprint larger than 1,000 m2? Does the DEC show the actual running costs of the building and is it displayed in a prominent place?
Not yet, but we wait this regulation for the next year 2013
TA2.5 Are there requirements to set targets for an increase in the use of LZC (low/zero energy consumption) buildings with separate targets for new and refurbished dwellings; new and refurbished commercial buildings; buildings occupied by public authorities? Have you adopted a Local Energy Management System? Do you utilise ESCO models? What services do the ESCO units offer and what types of financing instruments they use? ESCOs usually offer such services as: Energy audits, feasibility studies, Engineering design, Equipment procurement, Subcontractor management, Construction, Measurement and verification, Operation and maintenance, Project financing.[38]
As mentioned in TA 2.1, we are implementing a new policy to introduce ESCOs in the energy management of the municipalities' installations. The first thing we do with the municipalities is to develop a SEAP, which represent the main strategic policy for the municipality. During the procurement processes, an energy audit is carried out, and during the ESCO contract, a measurement and verification process is being carried out.
TA2.6 How did the construction industry and consumers receive the new regulations? What have been the incurred costs on the overall construction investment and also on the

[38] SOURCE: Bogdan Atanasiu Buildings Performance Institute Europe and Paolo Bertoldi European Commission Joint Research Centre Institute for Energy (2011) Energy Services Companies (ESCO' s) – definition and best practices across the EU,

maintenance of the buildings?
In Spain, due to the crisis, the construction sector is ralentised. That is, there are not many new building in construction. The regulation regarding old buildings still doesn't exist. In any case, people are upset with the EPBD implementation due to the cost of the required measures to fulfill it.
TA2.7 Is an energy management and controlling system implemented which assures a continuous monitoring of energy consumption of buildings? Describe in terms of organizational and financial aspects. Are responsibilities clearly defined?
No, but we are preparing a new methodology to know the energy consumption in every municipality sector by sector. They need this information to verify the fulfilment of the SEAP measures (objective 20-20-20). The responsible for this purpose is ARGEM.
TA2.8 Is the pool of municipal buildings evaluated in terms of energy performance (Energy Performance Indicators, Saving Potential, Energy supply and energy supply contracts etc.)?
Thanks to ELENA Project, every municipality will develop energy audits and will introduce ESCOs in their building installations.
TA2.9 On the basis of the evaluated pool of buildings, does a mid- and longterm planning exist concerning refurbishments of buildings? Are RES considered? Is there a detailed description of measures in terms of timeline, responsibilites and budget?
At the moment there isn't a refurbishment plan for the public buildings
TA2.10 Are there regular educational measures for municipal staff responsible for the operation of buildings and its equipment/installations? Describe in terms of organizational means, content, frequency and persons concerned.
Since 2005 until 2012, ARGEM has develop specific training plans for the technicians of the municipalities in order to know more about the energy efficiency of buildings
TA3 Innovative financing tools for boosting local EE/RES investments / do we include other types of sustainable energy investments?
Types of financial instruments supporting the energy performance of buildings[39] and otherwise: • Subsidies allow prices to be kept low. They may be provided, for example, to manufacturers of energy efficient equipment such as compact fluorescent light bulbs. • Grants are targeted at households, industrial or other energy consumers to pay for part or all of the cost of introducing energy efficient processes – such as enhanced building insulation. • Grants or subsidies may be financed directly through the state or local authority budget or hypothecated taxes (also known as ring-fenced or ear-marked tax). • Loan schemes to encourage energy efficient practices can be introduced with subsidised interest rates or credit risk support. Subsidies provided by the local authority or state budget to banks offering low interest rates are a fiscal policy. • Value Added Tax (VAT) normally affects the final consumer but not the producer – who passes the cost onto the consumer. [. . .] differential VAT rates can be used to influence the choice of energy efficient technology by householders. • Levies on consumption or production may be used to create a fund (e.g. a levy on electricity sales to

[39] ENERGY EFFICIENCY POLICIES IN BUILDINGS – THE USE OF FINANCIAL INSTRUMENTS AT MEMBER STATE LEVEL, BPIE 2012

fund renewable energy schemes).

- Less common, and thus considered innovative, include Energy Supply Obligations (also commonly known as White Certificates) or Energy Performance Contracting. They are considered innovative although Energy Performance Contracting has been around since the 1980s and Energy Supply Obligations since the 1990s. There is another important distinction to make which is relevant for policy-makers. It refers to innovative instruments entirely relying on private financing (and not government budgets). If used properly, they can provide long-term financial support that often cannot be guaranteed due to the changing budget priorities of national governments. Energy Performance Contracting has been deployed in Europe since the 1980s while Energy Efficiency Obligations started in the early 1990s in a few Member States

- European Investment Bank through Loans, ELENA and JESSICA supports investments in sustainable energy and energy efficiency.

Midland & MWRA partners please fill in Table 2 in Annex 3 and the related questions below.

TA3.1 Sources of funding per amounts and funding organisations; are there private actors involved? How? If yes, what is their contribution and what are the perceived benefits (that would justify their involvement)?
TA3.2 Types of eligible funding actions: projects? Investments? Research?
TA3.3 Amounts of funding dedicated to SE EE/RES investments / projects / initiatives, and also vs total development funding amounts
TA3.4 Is the funding allocated sufficient, in your opinion?
TA3.5 How do we really know it is a good practice, a performing solution?

48. Evidence of success (evaluation of the good practice and its results

- In this case, the City Council saves 28.235 €/year, that is 38% cheaper than the old gasoil system.
- Reduction of 196,92 Tn/CO2 per year.
- Project funded with private resources (ESCO)
- Promotion the use of RES, particularly the biomass since it is a waste generated in the regional agriculture
- Performance, availability and maintenance guaranteed.

49. Transferability of the good practice: Is the good practice transferable? Are there any

specific projects incldued in the good practice ? Please justify

This project is a good practice to transfer to other similar instalations and municipalities, mainly facilities with high heat demand. The instalation (biomass boilers, solar panels thermal, pipes, pumps, …) should be designed according the needs in order to reduce the pay back, energy and maintenance costs.

50. Any other comments you wish to make

51. For more information

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Annex 1 STEP thematic areas & GPs as per approved AF

BETTER IMPLEMENTATION OF SUSTAINABLE ENERGY POLICIES AT LOCAL LEVEL: Comprehensive approaches promoting the uptake of regional sustainable energy policies at local level

- Local SE action plans in urban areas (STRIA)
- Local SE plans in rural areas (SODEMASA)

SUSTAINABLE ENERGY MANAGEMENT SYSTEMS:GPs supporting local energy self-sufficiency, optimization & management tools for EE/RES

- ESCO (area based *Energy Service Company)* models for RES in public buildings (ARGEM)
- Energy performance audit (Arleg)
- Local Energy Management Systems (SAENA)
- RES in municipal district heating systems (Kainuu)

FINANCING TOOLS FOR SUSTAINABLE ENERGY INVESTMENTS: Innovative financing tools for boosting local EE/RES investments

- Alternative financing options for Public Sector investments (MWRA)
- Financing EE/RES initiatives in local authority functional areas (Midland)

ANNEX 2 STEP project THEMATIC AREA 1 Local sustainable energy plans

Table 3.Local Government Policies/Activities that Can Influence Renewable Energy[40]

Policy/ Activity Category	Areas	Descriptions of Policies/Activities by Sub-Category	
1. Target setting …	Target setting …	(a) CO2 reduction targets	196,92 Tn/CO2 year
		(b) Future shares/amounts of renewable electricity or energy for all consumers in city	
		(c) Future shares/amounts of renewable electricity or energy for government operations and/or buildings	100 % Renewable energy to heat the Indoor Swimming pool and the

[40] SOURCE: Global Status Report on Local Renewable Energy Policies, Working Draft, 12 June 2009 A Collaborative Report by: REN21 Renewable Energy Policy Network for the 21st Century Institute for Sustainable Energy Policies (ISEP) ICLEI–Local Governments for Sustainability, page 10.

Policy/ Activity Category	Areas	Descriptions of Policies/Activities by Sub-Category	
			hot water production
		(d) Future shares or absolute numbers of buildings or homes with renewable energy installations	
		(e) Future shares/amounts of biofuels for the government vehicle fleet and/or for public transport	
		(f) Other types of targets, for example to become fossil-fuel free or "carbon neutral"	
2. Regulation based on legal responsibilities and jurisdiction ..	Urban	(a) Urban planning and zoning that encourages and integrates the local generation, distribution and use of renewable sources of power in the local jurisdiction--including planning and zoning for public transportation and electric vehicle infrastructure.	
	Building	(b) Building codes and/or permitting that applies to, or incorporates renewable energy in some manner. Examples: mandates for solar hot water and solar PV installations, zero-net-energy homes, shading legislation, and mandated design review/scoping of opportunities and potentials for renewable energy.	
	Taxes	(c) Tax credits and exemptions within tax systems: for example, sales, property and fuel taxes, permitting fees, and carbon taxes.	
	Other	(d) Other regulation, including municipal departments mandated to promote or plan for renewable energy, mandates for biofuels use in vehicles or biofuels blending, and mandatory carbon cap-and-trade.	
3. Operation of municipal infrastructure ..	Purchase	(a) Local government purchasing (and joint-purchasing with other municipalities or with private sector) to integrate renewable energy into government operations. Includes renewable electricity, biofuels, and bulk purchasing for market transformation programs.	
	Invest	(b) Local government investment in renewable energy for government buildings, schools, vehicle fleets, and public transport.	0% Local Government 100% ESCO (74.585,75 € + VAT)
	Utility	(c) Public utility regulation, including tariff regulation, renewable energy targets, feed-in tariffs, interconnection standards, net metering, and portfolio standards; also designates private utility policies of these types.	
4. Voluntary actions and government serving as a role model ...	Demo	(a) Demonstration projects, including participation in national pilot and demonstration projects. Often done with private sector.	
	Grants	(b) Grants, subsidies, and loans for investments in renewable energy by homeowners or businesses	
	Land	(c) Using local government land/property for renewable energy installations (leasing/selling/permitting). Can also include deals that require developer promises for renewables and efficiency.	

Policy/ Activity Category	Areas	Descriptions of Policies/Activities by Sub-Category	
	Other	(d) Examples: joint ownership of private projects, city-financed investment funds, bond issues, and green certificates and trading.	
5.Information promotion, and raising awareness	Info/ promo	Includes public media campaigns and programs; recognition activities and awards; organization of stakeholders; forums and working groups; training programs; enabling access to finance by local stakeholders; enabling stakeholder-owned projects; removing barriers to community participation; energy audits and GIS databases; analysis of renewable energy potentials; information centers; and initiation and support for demonstration projects.	

ANNEX 3 STEP project THEMATIC AREA 3 Innovative financial tools for boosting local / regional sustainable energy investments

Table 4.Financing sustainable energy policies & projects		
I. Instruments supported by the member state/ region / municipality		
1.-Financial instruments supported by the municipality / region / member state. How long have the measures been in place?. . .	(a) Grants/Subsidies	
	(b) Funds (Levies)	
	(c) Preferential loans	
	(d) Rebates	
2. Fiscal instruments supported by the municipality / region / member state How long have the measures been in place?. .	(a) Tax reduction	
	(b) Tax credit	
	(c) Reduced VAT	
	(d)	
3. Measures are supported by the individual instruments How long have the measures been in place?. .	(a) Envelope (including insulation, windows & glazing, exterior wall, doors, ceiling, etc.)	
	(b) Equipment (including efficient heating, efficient lighting systems, ventilation, cooling, control systems, etc.)	
	(c) Other (including energy audits, consultancy costs, labour costs, education and training activities, etc.)	
4. The level of investment that is supported by the instruments	(a)	
	(b)	

Table 4.Financing sustainable energy policies & projects		
…	(c)	
	(d)	
5. Type of investment where the financial / fiscal measures are applies	(a) Private homes	
	(b) Private businesses	
	(c) Public sector offices	
	(d) Social infrastructure / utilities	
6. Level of ambition (what is the energy savings target of the measure), by %	(a)	
	(b)	
	(c)	
	(d)	
7. Innovative financing tools[41] Both were favoured	(a) Energy Performance Contracting (EPC) Third Party Financing (TPF), Energy Performance Contracting (EPC) and Contract Energy Management (CEM) are all terms used to cover a wide variety of contracting and financing techniques for energy efficiency and renewable energy projects[42].	
	(b) Energy Efficiency Obligation (Energy Efficiency Obligations (often called White Certificates) build on suppliers' obligation to foster energy efficiency improvements. At its simplest, an Energy Efficiency Obligation is a requirement on a group of market actors in one or more sectors of the energy industry in a given territory to achieve a specified energy saving target. These instruments are considered financial incentives as they leverage increased investment and facilitate the creation of additional cash flows)[43].	

[41] Dan Staniaszek and Eoin Lees, Determining Energy Savings for Energy Efficiency Obligation Schemes, eceee, 2012

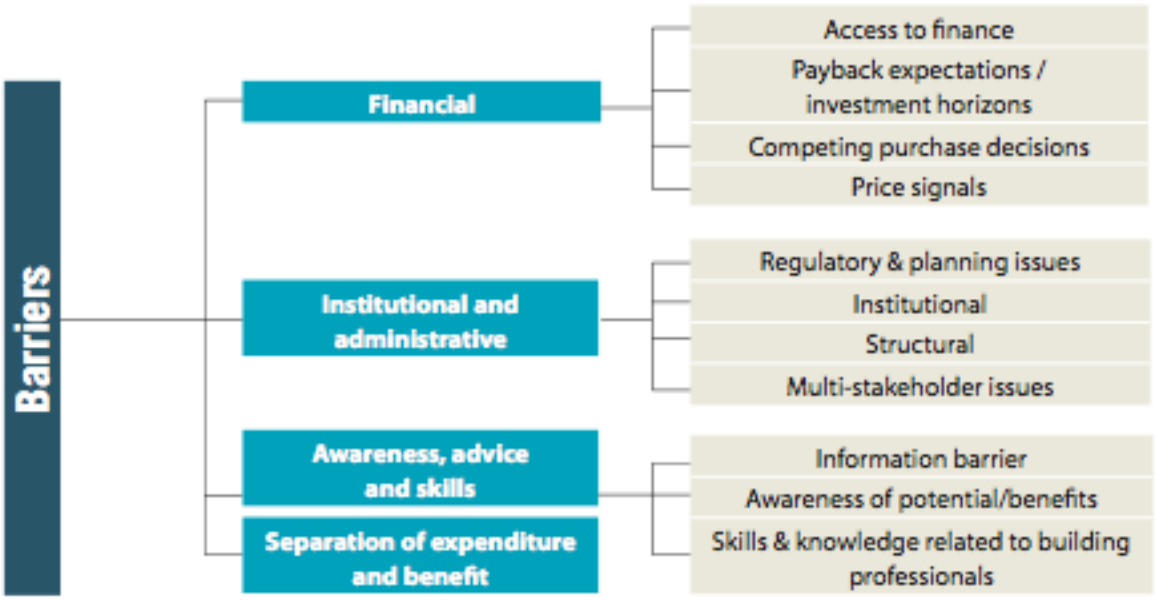
[42] Energy Charter Secretariat, Third Party Financing: Achieving its Potential, ECS, Brussels, 2003

[43] They have been used in the European Union for many years. The 2006 Energy End-use Efficiency and Energy Services Directive should have been the big breakthrough to get energy companies to play a major role in all Member States, but that did not happen. However, over the past decade there has been important awareness creation and information gathering. Europe has benefitted from the experience of several countries on the continent as well as from those in the United States. It was the US that has traditionally shown leadership in having energy companies play a significant role in promoting energy efficiency. This has been evolving since the 1970s. The most recent source of information on Energy Efficiency Obligations comes from an eceee[43] report produced by Eoin Lees for DG Energy in March

Table 4.Financing sustainable energy policies & projects		
	(c)	
	(d)	
Instruments supported by the EC &		
8. EIB (European Investment Bank)	(a) EIB lending focus themes: Renewable energy; Energy efficiency; Diversification and security of internal supply (including TEN-E); External energy security and economic development	
	(b) Energy efficiency loans (Residential, commercial and public buildings Transport (rail, road, urban transport) Electricity production & distribution Industry)	
	(c) ELENA (European Local Energy Assistance)(Project Development Services) Support to Final Beneficiaries with: Feasibility studiesBusiness Plans Technical studies (energy audits) Procurement/ tendering/ contracting Additional technical staff Financial structuring 90% of costs; investment programme supports EE investments in public and private buildings, including social housing and street and traffic lighting; DH networks; Decentralised CHP; Urban transport; Local energy infrastructure to support development in RES	X
	(d) JESSICA Alongside DG-REGIO (=Structural Funds), JESSICA instruments in Structural Funds Regulations specifically provide for EIB to act as Holding Fund (on a not-for-profit basis), offering: Technical assistance and dissemination of best practice, based on established expertise in lending to urban renewal/regenerations projects across the EU; complementary loan financing for urban development projects. Eligible loan areas: Urban infrastructure, including transport, water/waste water, energy Heritage or cultural sites, for tourism or other sustainable uses; Redevelopment of brown-field sites, including site clearance and decontamination; Office space for SM.	X
	(e) EEEF	X

Barriers

2012.



44

The major barrier to the adoption of clean energy continues to be related to cost, and local governments rely on offering financial incentives to address this barrier. Other barriers include: clean energy acceptance issues, split incentives, lack of knowledge and skilled labour, opposition from organised interests[45].

Overcoming barriers to clean energy *project development rather than just clean energy policy development* (e.g., financial incentive programs are policies designed to support project development).

[44] SOURCE: BPIE, Europe' s Buildings Under the Microscope, p. 55.

[45] S. Busche (2010) Clean Energy Policy Analyses: Analysis of the Status and Impact of Clean Energy Policies at the Local Level, Prepared under Task No. IGST.0103, http://www.osti.gov/bridge

GOOD PRACTICE 6 AND 8 ENERGY PERFORMANCE AUDIT, AND THERMO-MODERNISATION PROJECTS, POLAND

GENERAL INFORMATION

52. Name of the good practice		
53. Thematic area (TA)	TA1 Better implementation of sustainable energy policies at local level	
	TA2 Development and implementation of sustainable energy management systems	✓
	TA3 Innovative financing tools for boosting local EE/RES investments	✓
54. Type of good practice - check all relevant criteria	3.1 Permanent initiative	✓
	3.2 Project	✓
	3.3 Methodology	✓
	3.4 Technology	✓
	3.5 Others	✓
55. What are the most important aspects of the good practice ? check all relevant criteria	4.1 Performance of GP achieves EC set benchmarks for RES utilisation	✓ [46]
	4.2 Performance of GP contributes considerably to the achievement of EC set benchmarks (please mention how much) It has been assumed that gained and estimated energy savings in Poland by 2016 will come to 11%.	✓ [47]
	4.3 Energy costs have gone down (locally / regionally/ nationally)	[48]
	4.4 RES % participation in the «energy mix » of the community has increased (please mention by how much)	[49]
	4.5 Provable technological innovation The model for implementing loan and thermo-modernisation granting processes constitutes innovation.	✓
	4.6 Creation of organizational structures, dealing with energy matters. Structure on the national level.	✓
56. Contributing partner	Bank Gospodarstwa Krajowego [National Economy Bank] – loans and thermo-modernisation bonuses. Audits and certificates of energy performance– local/regional/national authorities.	
57. Location	Poland (good practises are being popularised in Poland)	
58. Start and end date of the good practice –if relevant	N/A	

[46] The assessment comprises of 1) the savings in energy and in the cost of the building maintenance achieved by the entities which use thermomodernisation bonuses as part of the support form the Thermo-modernisation and Renovation Fund and 2) the number of audits conducted (and energy certificates).
[47] The Second National Action Plan on energy efficiency for Poland 2011, Ministry of Economy, Warsaw, April 2011.
[48] There is no collective data on how the decrease in costs occurred on the local/regional/national scale.
[49] No data on the matter.

Regional context, all partners please fill in

59. Energy performance of the region

All partners please fill in Table 1 in Annex 2

Quantitative figures: % of RES in the overall energy production (if any) in the region; RES applications as % of the overall energy needs in the region; RES applications in the public sector, especially in buildings; RES in industries; energy intensity of the region; unit cost of energy per consummer in the region.

Unfortunately there is no detailed data on energy production from RES in Lower Silesia. We can assume that the share of individual energy sources is similar to that in Poland and the electric energy and heat consumption in Lower Silesia in 2010 amounted to 12,370 GWh and 24,339 TJ which constituted around 8,5% of electric energy and about 5% of heat consumed in Poland respectively. The only available data is on the overall electric energy produced from RES without indicating the source. Energy production from RES is growing little by little and in 2009 came to around 1.7% (no data about 2010). Meanwhile, electric energy production in Lower Silesia has been lower since 2008.

The share of electric energy produced from RES in Poland came to: 2.58% in 2005; 2.80% in 2006; 3.40% in 2007; 4.20% in 2008; 5.75% in 2009.
The share of generating renewable energy in generating energy on the whole in Poland came to: 6.69% in 2007; 7.57% in 2008; 8.93% in 2009; 10.16% in 2010.
The share of generating renewable energy in general energy consumption in Poland came to: 5.01% in 2007; 5.52% in 2008; 6.42% in 2009; 6.75% in 2010.

The intensity of energy in the region:

- gross electric energy production in the region in 2010 amounted to 13368.0 GWh
- electric energy consumption on the whole in the region in 2010 came to:

12,518 GWh on the whole, 2,856 GWh in the industry sector, 3,644 GWh in the energy sector, 297 GWh in the transport sector, 2,137 GWh in households, 110 GWh in agriculture, 3,465 GWh other uses.

Sustainable energy policy tools: which is the local / regional energy policy tool, and what types of issues it addresses among the following categories: 1. Target setting; 2. Regulation based on legal responsibilities and jurisdiction; 3. Operation of municipal infrastructure; 4. Voluntary actions and government serving as role model; 5. Information, promotion and raising awareness.

Main tools for implementing energy policies in the region include:

- legal regulations determining technical standards and rules for the fuel and energy sector,
- statutory actions of local governments which abide by the priorities of the national energy policy by, among others, implementing public-private partnership (PPP),
- hierarchised spatial planning ensuring the implementation of energy policy priorities, plans for the supply of electric energy heat and gas fuels to communes and plans of the development of energy enterprises,
- information actions carried out by governmental bodies and cooperating research and development institutions,
- support for the realisation of essential energy projects from public funds including European ones (e.g. investment projects, research and development works).

According to Polish energy policy, by 2025, increasing energy efficiency should by one of the key elements of energy policy and the efficiency increase shall be made possible by:

1. reducing the energy consumption of products while designing, producing, using and utilising,
2. increasing the efficiency of energy production,
3. reducing the energy consumption of industrial processes,
4. reducing energy losses in transport and distribution,
5. implementing systems of energy demand management in order to increase the efficiency of energy use.

Strategy for the development of the *energy* sector in *Lower Silesia* on the basis of the Delphi foresight method concerns the following basic targets:

- basic target 1: to ensure energy security
- basic target 2: to intensify innovation processes in regional power industry
- basic target 3: to minimise the impact on the natural environment and to promote actions aiming at more economical energy use and production.

Actions to be taken:

1. To increase the production of energy from RES to 20%.
2. To improve region's energy efficiency by 20%.
3. To recycle waste (also municipal) for energy purposes.
4. To settle the issue of brown coal deposits around Legnica.
5. To determine the role of a big consumer in the development of regional power industry.
6. To carry out energy research in general, technical, economic and law sciences.
7. To implement efficient information systems and databases on energy sources.
8. To get capital for the development of power industry and to manage finances effectively.
9. To appoint an energy unit on the voivodeship level for crisis energy management and the support of modern technologies mainly in municipal power industry (communal).
10. To develop industries producing machines and devices for innovative regional and national power industry and for export.

The most important national legal act on the development of RES is *the Act of 10 April 1997 – Energy Law (Journal of Laws of 2006 No. 89, Item 625 with later changes). Another Act undoubtedly supporting the development of RES is* Environmental Protection Law of 27 April 2001 which determines norms of conduct while estimating the environmental impact of planned undertakings.
Among problems connected with legal and jurisdictional responsibility there are:

- no coherence in legal acts, no secondary legislation,
- no clear policy for the development of power industry (renewable and dispersed) on the voivodeship level,
- no standards for cooperation of economic, organisational and technical character despite emerging local energy markets,
- the increase in investors' risk due to the high level of the control risk,
- no tools of public interventionism which would create the 'critical mass' for the development of RES,
- complicated rules of enacting easements,
- no political willingness to reforms of energy systems which would lead to increasing energy security,
- no drafts of communal plans for energy supplies or no implementation of those that have already been drafted,
- local governments do not see power industry as a matter of the utmost importance. There is no interest in choosing power industry as a priority as it is costly, long-term and politically inefficient,
- no efficient information flow between interested parties (users and local governments among other things),

– inadequate level of staff (in communes and districts) implementing energy planning.

Support from public sources including European funds, carrying out energy projects vital to the country (e.g. Investment projects, research and development works).

Information actions taken by governmental bodies and cooperating research and development institutions.
In order to reach targets fundamental to the creation of Lower Silesian Renewable Energy Cluster, it committed its actions to various environmental initiatives and those connected with promoting RES. In some undertakings, some of which were organised by the Cluster itself, both the Cluster and its members took part as partners. The greatest achievements are as follows: Lower Silesian Renewable Energy Forums, Lower Silesian Renewable Energy Fairs, Local Governments Forums, training and counselling projects.

RES production & applications, extent, barriers, any specialisation: How active is the local / regional RES progamme? What are the RES sources in your region? Where is the RES sold? Does it create a regional income? Is there a business sector associated with it? Which are the organisations coordianting the RES production in the region? Which are (if any) the organisations dealing with the RES research?how much of the regional / municipal energy needs are covered by RES? Has there been any effect in the energy prices? What have been the biggest problems in disseminating RES applications in the housing, public and ecoonmic productive sectors (services and manufacturing)? Is there any organisation responsible for promoting applications of RES in the region?

Some of the most important strategic documents connected with renewable energy sources in the region are:

Energy policy of Poland until 2030.

Voivodeship policy regarding *energy efficiency* for the years 2014 – 2020.

Strategy for the development of the *energy* sector in *Lower Silesia* on the basis of the Delphi foresight method.

The 2020 strategy for the development of the Lower Silesia Voivodeship.

Regional Operational Programme for the Lower Silesia Voivodeship for 2007 – 2013, (Priority 5: regional, environmental-friendly energy infrastructure), action: Renewable energy sources.

The Voivodeship *Fund* of *Environmental Protection* and Water Management in Wrocław – grants and loans.

Energetic potential in Lower Silesia:

- straw: 5,5 PJ
- hay: 0,3 PJ
- wood: 5,3 PJ
- biomass from breeding farms: 6,3 PJ
- energy plants: 0,004 PJ
- wastelands: 18 PJ
- communal waste: 0,6 PJ
- water energy: overall capacity of hydroelectric power stations – around 65 MW
- wind energy: by 2020 – planned power stations with overall capacity of about 127 MW
- geothermal energy: the capacity of installations using geothermal qualities of water - 1 MW
- using solar energy: several dozen or over a hundred of solar installations.

The main electricity produced in Lower Silesia is the power plant in Turów. Green resources still support it only to a little extent. Energy security of Lower Silesia is ensured by the power plant in Turów and Zespół Elektrociepłowni Wrocławskich KOGENERACJA S.A ['Co-generation']. However, the capacity of the first one is five times bigger and amounts to 1,900 MW. Kogeneracja, on the other hand, produces much more heat and supplies it to about 60% of citizens of Wrocław.
Both power plant Turów and Kogeneracja use biomass (to some extent) in energy production. Thanks to co-burning of

biomass, green energy constitutes about 20% of all energy generated by Zespół Elektrociepłowni Wrocławskich KOGENERACJA S.A. In Turów, biomass constitutes only a little over 1% of used fuels, yet still this year there are plans for co-burning biomass in next blocks and thus increasing its share to 3.6%.

The biggest amount of green energy is generated by hydroelectric power plants. They have the capacity of 50 MW in Lower Silesia. The majority of the plants in the region belongs to *Jeleniogórskie Elektrownie Wodne* Sp. z o.o. The company uses 29 hydroelectric power plants including 9 tank and 20 flow plants with the overall installed capacity of 59.779 MW. There are 23 hydroelectric power plants in Lower Silesia. On 12 December 2008, Bobrowice IV – a 29th plant belonging to the above-mentioned company, was officially opened. It is a flow power plant producing electric energy using two turbo-units with the overall installed capacity of 1.0 MW. It is located on the Bóbr River in Jelenia Góra in the District of Jelenia Góra, commune Jelenia Góra. Until 2020 Lower Silesia should have 4 more little hydroelectric power plants in: Jeżów Sudecki, Kąty Wrocławskie, Lwówek and Lubań.
The four heat and power stations located on the area belonging to KGHM are between the most significant ones in Lower Silesia. They meet the energy demand of KGHM, Lubin, Polkowice and Głogów.

5 licensed wind farms with the capacity of 58.3 MW were established in Lower Silesia by June 2012.

What is more there are over 400 solar installations different in size. They are typically small installations used for heating utility water and buildings.
The number of solar installations on public units in Lower Silesia can be estimated at around 80. Unfortunately there is no detailed data.
In case of private investors, the number can be estimated at around 360-400 installations on the area of the whole voivodeship.
The average surface area of the installations is 4.7-7.5 m2.

Apart from water, sun and wind, hay is also used to produce energy in the voivodeship. As for no we have 10 boiler houses of the kind with the capacity of 14.6 MW. Biomass is used in 24 places yet only to a little extent estimated at 6.5 MW.

The Lower Silesia Marshall Office is responsible for supervising and coordinating activities connected with legal responsibility and jurisdiction of tasks regarding energy and renewable energy sources in the region. It is done by means of the Department of Economy on the basis of the tasks determined in the Directive no. 11/2012 of 31 January 2012 issued by the Marshall of the Lower Silesia Voivodeship concerning the detailed scope of responsibilities of the Department of Regional Development by the Lower Silesia Marshall Office. The Department should, among others: *participate in programming activities aiming at ensuring energy security of the voivodeship with the use of RES.*

Research on RES in the region is mainly done by:

- The Lower Silesia Marshall Office in Wrocław,
- Associations, funds, agencies e.g. the *Lower Silesian Renewable* Energy *Cluster, Lower Silesia Energy and Environment Agency, Association for the Sustainable Development, Centre for Eco-Development and Renewable Energy Sources in Wrocław,*
- Universities e.g. Wrocław University of Technology.

The Marshall Office commissions or prepares reports on using energy and possible investments e.g.:
"The study of spacial conditions for the development of wind power industry in Lower Silesia" prepared by Wojewódzkie Biuro Urbanistyczne [Voivodeship Urban Planning Office] in 2010 which describes in detail the conditions for the development of wind power industry in the region; a potential investor has a chance to analyse the place of

the investment and choose the most optimal solution,
Report of October 2010 entitled "*Research and analysis of the potential of Lower Silesia to use renewable energy sources and research and analysis of the mutual influence of RES sector and job market under economic changes*"[50]

Institutions that deal with promoting renewable energy sources are: first and foremost the Lower Silesia Marshall Office, information centres, business support institutions, NGOs and others promoting environmentally balances energy. These include:

Non-governmental organisations:[51]

- Foundation for Sustainable Development in Wrocław,
- Polski Klub Ekologiczny [Polish Ecological Club] – Lower Silesian district in Wrocław,
- Ecological Foundation „Zielona Akcja" [Green Action] in Legnica,
- Ecological Association EKO-UNIA in Wrocław,
- Foundation for the Development of Ecological Energy „EcoEnergia" in Wrocław,

Others:

- **Wrocław Research Centre EIT+**,
- Lower Silesian Eco-energetic Cluster EEI,
- CEDRES – Centre for Eco-Development and Renewable Energy Sources,
- Wrocław Centre for Technology Transfer,
- *Lower Silesian Renewable Energy Cluster*,
- Wrocław Regional Development Agency,
- Innovative *Cluster for Generation and Energy Use* in Mega and *Nano Scale*
- *Lower Silesia Energy and Environment Agency* (conferences, seminars, trainings).

60. Context of the implementation of the good practice	
Country	Poland
Region	Lower Silesia
Population	2 916 577 mln – actual place of residence

Detailed description of the good practice

Description of the good practice (background, objectives, problem addressed, key aspects, activities it includes, institutions involved, costs entailed, financers (who is paying? For how long? How much?).

[50] N. Palkowska, "A social report on environment-friendly power engineering – Lower Silesia", Wrocław 2012.
[51] Ibidem

Executive Summary

Regional Developpent Agency ARLEG proposes the following Good Practice in 2 thematic areas:

TA 2 : SUSTAINABLE ENERGY MANAGEMENT SYSTEMS:GPs supporting local energy self-sufficiency, optimization & management tools for EE/RES

GP : ENERGY PERFORMACE AUDIT

Background

Effective energy management is one of the major tasks of modern times. Energy efficiency is the measure of rational energy management. For every €100 of generated GDP[52] in Poland, we use energy equal to 400 kg of oil which is more than twice as much as the European average [53].

Lower energy consumption in buildings (which are responsible for 40% of overall energy consumption in EU) and increased use of renewable energy are European priorities under the Kyoto protocol or commitments to maintaining the level of global temperature growth under 20°C.

Member States are obliged to implement energy certification systems and certificates of energy performance of the building under the DIRECTIVE 2002/91/EC of 16 December 2002.

The duty of implementing the Directive in all Member States was in January 2006. Apart from implementing a number of regulatory actions, the Directive obliged the Member States to perform promotional actions leading to higher public awareness on the improvement of the energy performance of buildings.

The Directive was implemented in Poland by means of an amendment to the Act – Building *Law* (of 19 September 2007, *Journal of Laws No. 191, Item 1373) and the next one (of 27 August 2009, Journal of Laws No. 161, Item 1297) which introduced necessary corrections and supplements. One of the duties was to prepare certificates of the energy performance of specific kinds of buildings (new, modernised, to be sold or rented, flats), to draft project energy performance guidelines and to consider possibilities of using renewable energy sources with associated production of electrical energy and heat in building in the designing phase (implemented by means of an amendment to the directive of the Minister of Infrastructure of 6 November 2009 on detailed scope and form of construction designs - Journal of Laws No. 201, Item 1239)*[54].

Changes in the Energy Performance of Buildings Directive 2010/31/EU passed by the European Parliament so as to promote increasing energy performance of buildings in EU, concern among others: defining a building with almost zero energy consumption, indicating rules for sanctioning in case of violating national legislation, the necessity for devising plans aiming at increasing the number of instruments of financial support.

At first it is worth pointing out that all changes in the Directive are connected with the energy performance of new buildings and the already existing ones: sold, rented or under serious renovation (the overall cost of renovation exceeds 25% of the building's worth or over 25% of the surface are of internal barriers is under modernisation). In both cases, it is essential to aim at increasing the number of buildings which would not only meet minimal demands of energy performance, but would also be more energy efficient, reduce energy consumption and emission of CO2.

Problems to be solved

- residential buildings and public utility buildings sector is the recipient of over 40% of end energy. Even though this sector has potential for energy savings and the awareness about the necessity of saving energy continues to grow, buildings of high energy consumption are still accepted,
- undertakings connected with energy efficiency require investments and financial outlays,
- there is no knowledge and specialised institutions which could carry out plans connected with energy efficiency,
- there are no companies which would provided services connected with saving energy,
- there is little interest in issues connected with energy efficiency on the part of local authorities.

[52] Gross Domestic Product

[53] *J. Skibiński, T. Jaremkiewicz, Polish Power Engineers' Association Warsaw, Energy certificate of a building as an expression of energy efficiency.*

[54] http://www.kape.gov.pl/zb/certyfikacja.html

Real actions

In Poland there are two kinds of documents on energy efficiency of buildings:

- certificates of energy performance of buildings,
- energy audits prepared mainly to get finds for thermo-modernisation investments from public funds in forms of subsidies or loans.

Certificates of energy performance provides clients with meeting legal requirements and protects against buying energy-intensive building or flat which would demand big financial means. Certificates of energy performance, commonly known as energy certificates, are documents pointing how much energy a building needs and how it influences the environment.
The rate of annual demand for non-renewable primary energy (Ep) is the synthesis of information on the energy quality of a building and its influence on the environment.
The rate of annual demand for end energy (Ek) is the yardstick for the economical efficiency of a building and its installation technology[55].

The number of buildings put into use in Poland in the Lower Silesia Voivodeship in years 2009 - 1st quarter of 2012.

The number of buildings put into use	Overall	Single-family houses	Multi-family houses (including communal housing)	Non-residential buildings (of public utility, industrial and warehouses)	Other buildings
Poland					
2009	221 279	96 032	3 570	83 920	37 757
2010	146 028	73 255	3 569	56 924	12 280
2011	149 731	75 075	3 811	58 024	12 821
I semseter 2012	73 256	36 714	1 910	29 127	5 505
Lover Silesia					
2009	12 689	6 641	290	4 204	1 554
2010	9 958	5 262	305	3 631	760
2011	10 159	5 083	325	3 821	930
I semester 2012	5 177	2 623	128	2 049	377

Source: The General Office of Building Control.

In case of buildings of high energy demand, it is appropriate to conduct an energy audit.

Energy audits are conducted to determine the scope and both technical and economical parameters of a thermo-modernisation undertaking. Such document points out optimal solutions, especially from the financial point of view, taking into consideration costs of modernisation and thus energy savings and at the same time constituting guidelines to the construction project. The benefits of audits are practically invaluable. Thanks to the information included in the post-audit recommendation (which is a short description of post-investment tasks), the approximate level of undertakings, the timeline for individual tasks and the rate of return on modernisation costs, it is easier to determine changes necessary to save money.
Energy audits are not only reliable information packs on where to look for savings but also a necessary condition to have investments financed by means of thermo-modernisation bonuses. Funds for thermo-modernisation of a building can also be acquired by means of subsidies and loans from National, Fund of Environmental Protection and Water Management, taking part in EcoFund contests or using finance mechanisms available within Regional Operational Programmes in the whole country[56].

According to data from II *National Energy Efficiency Action Plan* 2011 commissioned by the Ministry of Economy, the following number of audits was carried out:

55 *J. Skibiński, T. Jaremkiewicz, Polish Power Engineers' Association Warsaw, Energy certificate of a building as an expression of energy efficiency.*

56 http://www.builddesk.pl/edukacja/doradca/audytor-ee

The name of tool for the increase of energy efficiency:	Target	The number of thermo-modernised buildings with conducted audits	Savings in 2010	Expected savings in 2016
Green investments scheme (Part 1) – energy management in public utility buildings	To lower energy consumption in public utility buildings	Around 3,000	Program under implementation and its effects are spread over the years	1 950 GWh
Effective energy use (Part 1) – subsidising energy and electricity audits in enterprises	The aim of the project is to start investments for the increasing energy efficiency of economy which would include support mechanisms and lead to notable energy savings	-	-	Carrying out 200 energy and electricity audits in enterprises
Bank Gospodarstwa Krajowego [National Economy Bank]	Thermo-modernisation bonus	Around 1,400 by 30th September 2010	Average annual energy savings per one thermo-modernisation bonus amounting: 702.7 GJ/year which is 16.77 TOE/year.	-

Source: II *National Energy Efficiency Action Plan* 2011, commissioned by the Ministry of Economy, Warsaw, April 2012.

Involved institutions

- local authorities,
- regional authorities,
- national authorities,
- private investors, private and public entities,
- natural persons (building owners).

Related costs

Costs connected with creating certificates of energy performance and energy audits are covered by building owners. The costs vary depending on the auditor preparing the document.

Due to the fact that the duty of providing certificates of energy performance belongs to an investor, owner or administrator, it is them who are obliged to bear all the costs connected with preparing the document. These costs are not regulated by law and depend on market prices, the size of a given building, its age and the amount of work and equipment required to prepare the certificate.

Financing institutions (Who pays? For how long? How much?)

Individual building owners are the financing institutions.

TA 3: FINANCING TOOLS FOR SE INVESTMENTS: INNOVATIVE FINANCING TOOLS FOR BOOSTING LOCAL EE/RES INVESTMENTS

LOANS AND THERMO-MODERNISATION BONUSES AS INNOVATIVE FINANCIAL TOOLS FOR THERMO-MODERNISATION UNDERTAKINGS

Thermo-modernisation loans are the main source of financing thermo-modernisation undertakings. Such loan is designed for entities that do not have any means for thermo-modernisation. A thermo-modernisation bonus is financial support which constitutes a part of the loan and is a source to pay off 20% of a loan taken for a given undertaking.

1. It is granted up to 80% of the total worth of the thermo-modernisation investment (the borrower must possess at least 20% of financial means or prove getting them from other financial sources).
2. It can be granted for modernisation undertakings which will bring specified, minimum effects of lowering energy demand by:
   - 25% in case of extensive thermo-modernisation,
   - 15% in case of insulating external barriers and windows replacement,
   - 10% in case of the modernisation of a heat network alone provided that it was previously modernised no more than 10 years before.
3. The loan and private capital can finance modernisation to the extent when it is possible to pay it off from energy savings (paying off instalments and interest should not cause any additional financial burden to the borrower and should basically pay off itself).

Loans can be granted on commercial conditions only by the banks which signed appropriate agreements with Bank Gospodarstwa Krajowego [National Economy Bank]. Such loan is accompanied by a thermo-modernisation bonus of 25% which is then returned to the borrower after the thermo-modernisation works are finalised. In practice, instalments and interest on 75% worth of the loan are paid off which means that they are much lower than paying off entire commercial loan and are similar to loans with interest rates lower by 6-7%.

Those who can apply for thermo-modernisation bonuses include owners or administrators of:

- residential buildings,
- buildings of communal residence,
- buildings belonging to local governments which serve their public functions,

- local heat networks,
- local heat sources.

The bonus cannot be granted to budgetary units and entities.

Thermo-modernisation bonus can be exercised when carrying out thermo-modernisation undertakings whose aims are to:

- reduce energy used for heating and warming utility water in residential buildings, buildings of communal residence and buildings belonging to local governments which serve their public functions,
- reduce costs of the generation of heat delivered to the above-mentioned buildings – as a result of connecting buildings to centralised heat source because of closing down local heat sources,
- reduce primary energy losses in local heat networks which are fed by local heat sources
- totally or partially change energy sources to RES or use highly-efficient co-generation – together with reaching legally defined savings in energy consumption.

Positive verification from Bank Gospodarstwa Krajowego [National Economy Bank] of an energy audit is an essential condition for the qualification of the undertaking[57].

To get a thermo-modernisation bonus in an energy audit, one should prove energy savings at levels of:

1. minimum 10% if only the heating system of the building is modernised
2. minimum of 15% is the heating system modernisation was done after 1984,
3. minimum 25% in the remaining buildings.

Background

According to *Energy* Efficiency *Act* of *15 April 2011(*Journal of Laws No. 94, Item 551), 'energy efficiency' is defined as the ratio of achieved level of functionality of a given building, technical device or installation (in typical conditions of operation or use), to the amount of energy used by the building, technical device or installation which is necessary to reach such effect.
The issue of energy efficiency is treated in energy policy as a priority and progress in this field will be essential to reaching all its targets. Owing to this fact, all possible actions aiming at increasing energy efficiency will be taken. Energy efficiency is central no only to ensuring balanced development and security of energy supplies, but also to the increase of competitiveness of Polish businesses and wealth of the society. The government shall thus aim at reaching aims connected with saving energy so that it happens in an economical and cost-effective way. Energy efficiency is an economically attractive tool which contributes to the reduction of CO2 emissions[58].

Problems to be solved

Enormous potential of energy savings in the construction sector and the fact that it uses up to 40% of the end use of energy in EU makes investments in improving energy efficiency particularly interesting. Since enacting laws on supporting thermo-modernisation ventures in 1999, Poland has been implementing a thermo-modernisation programme. The programme aims at ensuring technical and financial support for projects on energy saving in buildings and those on reducing heat losses in heat distribution networks or replacing traditional energy sources with the unconventional ones (including RES). Investors may get up to 20% of the loan's worth to carry out projects. Nearly 1 billion 80 million Polish Zloty was expended from the government budget for such purposes between 1999 and 2010[59].

W ciągu ostatnich 10 lat w Polsce dokonał się ogromny postęp w zakresie efektywności energetycznej.

[57] www.bgk.com.pl
[58] *Drugi Krajowy Plan Działań dotyczący efektywności energetycznej dla Polski 2011,* Ministerstwo Gospodarki, Warszaw kwiecień 2011. The Second National Action Plan on energy efficiency for Poland 2011, Ministry of Economy, Warsaw, April 2011
[59] http://www.mg.gov.pl/Bezpieczenstwo+gospodarcze/Energetyka/Efektywnosc+energetyczna

Energochłonność Produktu Krajowego Brutto spadła bowiem blisko o 1/3. Dokonania to przede wszystkim: przedsięwzięcia termomodernizacyjne wykonywane w ramach ustawy o wspieraniu przedsięwzięć termomodernizacyjnych, modernizacja oświetlenia ulicznego czy też optymalizacja procesów przemysłowych.

In the last 10 years Poland has experienced huge progress in energy efficiency. The energy consumption of GDP has fallen by nearly one third. Among accomplishments there are: thermo-modernisation undertakings as part of legal regulations on supporting thermo-modernisation, modernisation of street lighting or optimisation of industrial processes.

Yet still, energy efficiency of Polish economy is about 3 times lower than in the most developed European countries and two times smaller than an average in EU countries. Additionally, the use of primary energy in Poland in ratio to the population rate is almost 40% lower than in the countries of the 'old 15.' It shows the huge potential in energy saving in Poland which is characteristic to fast developing economies[60].

Real actions

The following chart shows data on thermo-modernisation bonuses granted by Bank Gospodarstwa Krajowego [National Economy Bank] within the *Thermo-modernisation* and Renovation *Fund*

Numerical data of the *Thermo-modernisation* and Renovation *Fund for the years 1999-2008.*

Years	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Number of filed applications	144	303	191	325	890	1 413	1 871	3 214	3 314	2 859
Number of granted bonuses	71	235	157	286	668	1 152	1 947	1 812	4 201	2 759
Worth of granted bonuses (in thousands Polish Zloty)	1061	3 859	4 014	13 042	30 304	58 554	115 737	110 033	247 860	170 062
Number of paid bonuses	3	38	107	244	499	968	1 536	1 781	2 021	3 213
Worth of paid bonuses (in thousands Polish Zloty)	19	482	2 578	8 230	19 597	43 084	77 863	106 479	116 669	187 396

Source: Numerical data of the Thermo-modernisation and Renovation Fund, Bank Gospodarstwa Krajowego [National Economy Bank], study of 17 October 2012.

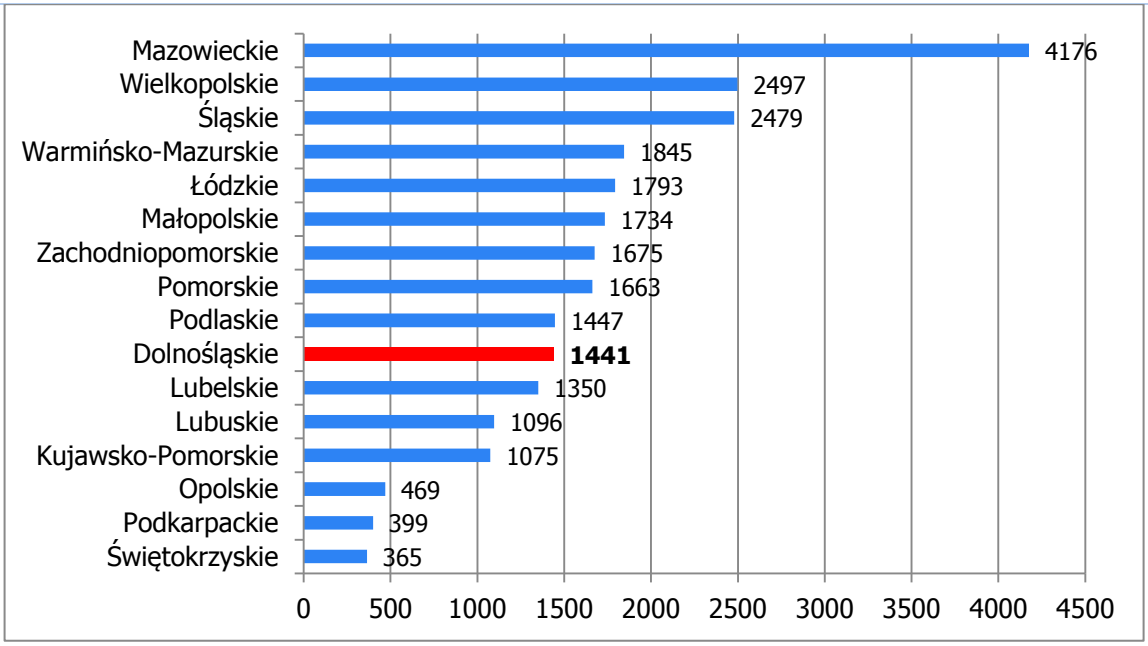
Numerical data for the years 2009 - 3rd quarter of 2011.

Years	2009	2010	2011	I-II kw. 2012
Number of filed applications	3 463	3813	3 804	3 078
Number of granted bonuses	3 332	3 369	4 135	2 596
Worth of granted bonuses (in thousands Polish Zloty)	196 717	161 691	204 909	134 236
Number of paid bonuses	3 095	3 450	3 442	2 306
Worth of paid bonuses (in thousands Polish Zloty)	178 954	170 402	160 773	109 652

Source: Numerical data of the Thermo-modernisation and Renovation Fund, Bank Gospodarstwa Krajowego [National Economy Bank], study of 17 October 2012.

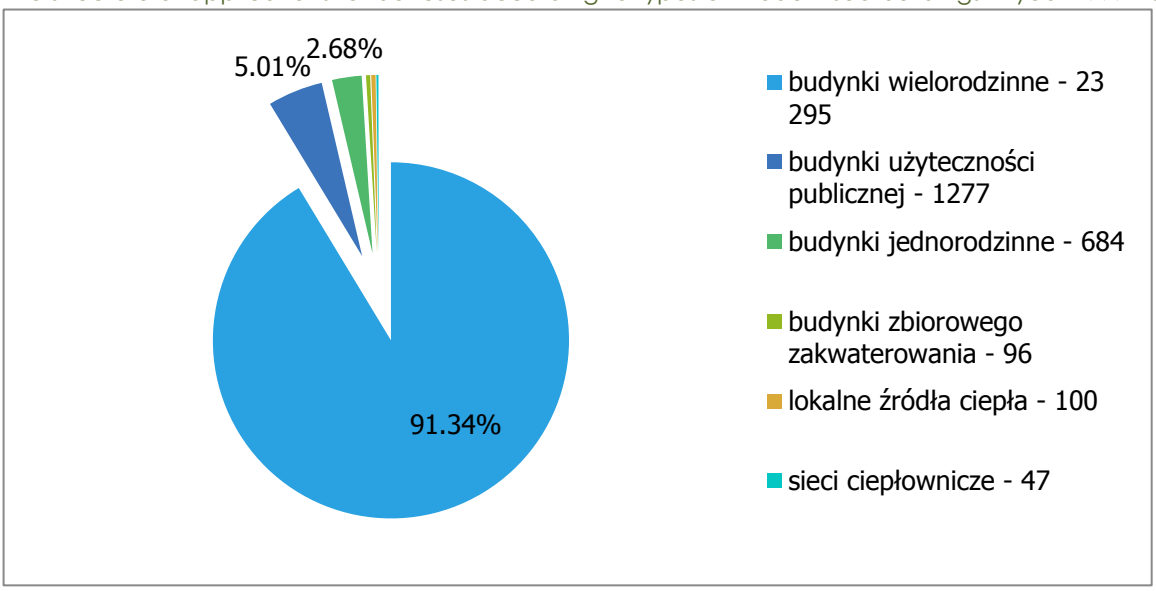
The number of applications for bonuses (all kinds) divided between voivodeships in years 1999-2011.

[60] Ibidem



Source: Numerical data of the Thermo-modernisation and Renovation Fund, Bank Gospodarstwa Krajowego [National Economy Bank], study of 17 October 2012.

The structure of applications for bonuses according to types of modernised buildings in year 1999-2011.



Source: Numerical data of the Thermo-modernisation and Renovation Fund, Bank Gospodarstwa Krajowego [National Economy Bank], study of 17 October 2012.

Savings of energy costs resulting from carried out thermo-modernisation undertakings with the support form the Fund – in millions of Polish Zloty (savings in the growing order).

Source: Numerical data of the Thermo-modernisation and Renovation Fund, Bank Gospodarstwa Krajowego [National Economy Bank], study of 17 October 2012.

What is more, the II National Energy Efficiency Action Plan 2011 estimated energy savings achieved by entities using thermo-modernisation bonuses as part of support from the Thermo-modernisation and Renovation Fund. The calculation was made on the basis of data acquired from Bank Gospodarstwa Krajowego [National Economy Bank] on the worth of thermo-modernisation

Questions spefic to the thematic areas of the good practices (TA:s)
TA1 Better implementation of sustainable energy policies at local level. The focus of this thematic area is on comprehensive approaches promoting the uptake of regional sustainable energy policies at local level. Local policies and activities to promote renewable energy can be grouped into five main categories: 1. Target setting; 2. Regulation based on legal responsibilities and jurisdiction; 3. Operation of municipal infrastructure; 4. Voluntary actions and government serving as role model; 5. Information, promotion and raising awareness. **Partners with GPs in this Thematic area please fill in Annex 2 Table 1 with special care to please link to the questions underneath.**
TA1.1 Is there a national policy promoting comprehensive approaches? Is there a pronounced regional sustainable energy policy? If yes, what are its objectives and main action lines? When was it established? Are there any measurable results? If yes, what are they? Is there a comprehensive policy background for RES support?
TA1.2 Have sector specific RES targets and action plans for 2020 been set up –as required by the RES Directive, in your region?
TA1.3 What are the existing support instruments for RES in your region? Have policy alternatives for RES been formulated in your region?
TA1.4 Have RES criteria been integrated into the relevant public procurement policies/procedures in your region?
TA1.5 Why do you feel that these tools are actually good practices?
TA2 Development of sustainable energy management systems TA2 is essentially about the implementation of the EPBD, DIRECTIVE 2010/31/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 19 May 2010 on the energy performance of buildings, EU Energy Efficiency Action Plans (2006 and 2011) • EU Directive 2006/32/EC on energy end-use efficiency and energy services (ESD) and the most recently endorsed (26.9.2012) Energy Efficiency Directive63.
TA2.1 When did you start implementing sustainable management systems in your region?
The system of energy assessment of buildings has been in force in Poland since 1 January 2009 and it was enforced by the 2002/91/EC Directive of the European Parliament and Council on energy performance of buildings. As far as ways of development of energy management are concerned, the document from 2011 entitled "Strategy for the development of the energy sector in Lower Silesia on the basis of the Delphi foresight method" is the key document in the region.
TA2.2 Has the recast EPBD (2010) been transposed in your country? Is the recast EPBD enforced in your region? Is its enforcement monitored? Which are the institutions and what are the tools used to monitor the recast EPBD enforcement? Does the public sector in your region explicitly promote energy efficiency in private and public construction?
Until 9 July 2012 all the Member States of the EU are to adjust their country's regulations concerning energy performance of buildings to match the 2010/31/EU Directive, the primary aim of which is to reduce energy consumption in the construction sector by 20%.

[61] The Second National Action Plan on energy efficiency for Poland 2011, Ministry of Economy, Warsaw, April 2011

[62] *Thermo-modernisation in Poland – rules for obtaining a loan and thermo-modernisation bonus,* Study by The Polish National Energy Conservation Agency, ul. Nowogrodzka 35/41, 00-691 Warszawa (Warsaw), www.kape.gov.pl.Printing and distribution was partially funded by Bank Gospodarstwa Krajowego [National Economy Bank].

[63] Mandatory energy-saving measures. including renovating public buildings, energy-saving schemes for utilities, and energy audits for all large firms, will be required by an EU energy efficiency directive approved in plenary on Tuesday. Cutting energy consumption by 20% could save the EU €50 billion per year. Focus of the mandatory measures: Renovation of public buildings; Saving plans for utilities; Energy audits (all large enterprises); Financing facilities

The EPBD directive (2010) has not been implemented neither in the region nor in the country.
Currently, legislation work is being conducted in order to implement the directive into the Polish law. At present Poland has got a bill on energy performance of buildings. It is planned to be passed by the Council of Ministers in the 1st quarter of 2013.
The Minister of Transport and Maritime Economy will be responsible for reporting the 201/31/EC Directive on energy performance of buildings.
As yet we have not got any tools for monitoring the adjusted directive.

One of the most frequently voiced objections to energy performance of buildings in our country is the lack of punishments needed to enforce the law.

- system of control and verification,
- publishing reports of the progress made by the Member States in the required areas,
- implementation of regular inspections of the heating and air-conditioning systems in the buildings, as an element of the assessment and monitoring system of particular installations,
- giving reports to the Committee every three years.

In Poland there are programmes which co-finance investments in public and private buildings (loans, grants, partial refunding of expenses made).

According to the Directive, it is required to make the energy performance of a given building public by putting a certificate in a visible place in the building.
Public utility buildings are often visited by citizens and that is precisely why they should set a good example for the society.

TA2.3 Do building regulations require that an energy performance certificate (EPC) must be produced whenever a building is sold, constructed or rented out? Does the EPC show the energy efficiency of a property and include recommendations on how it can be improved? Your EPC models?

Since 1 January 2009 energy performance certificates (EPC) are mandatory for all the buildings and flats rented or sold – according to the 2002 EU Directive. According to article 57 paragraph 1 point 7 of Building Law (Journal of Laws from 2006 No. 156, position 1118 with later changes) the investor is required to obtain an energy performance certificate of the building and enclose it to the notification about the construction completion or an application for permission to use the building together with all the other required documents.

EPC shows energy efficiency and contains recommendations on how to improve it.
It also contains information about:

- calculative demand for primary non renewable energy,
- technical and utilitarian profile of the building,
- calculative demand for energy,
- comments on the possibility to decrease the demand for end energy.

The only model available at the moment is EPC.

TA2.4 Is a display energy certificate (DEC) obligatory on an annual basis for public buildings with a footprint larger than 1,000 m2? Does the DEC show the actual running costs of the building and is it displayed in a prominent place?

Since 1 January 2009 according to Building Law, energy certificates are obligatory for buildings with over 1,000 m2 of usable area which hold public administration offices and institutions, or those in which services for a substantial number of people are provided. The certificates should be placed where they are visible.
By the new Directive they will have to be located in a visible place in a building with over 500 m2 of usable area (and not 1,000 m2 as before). On 9 July 2015 the number is to be 250 m2.

TA2.5 Are there requirements to set targets for an increase in the use of LZC (low/zero energy consumption) buildings with separate targets for new and refurbished dwellings; new and refurbished commercial buildings; buildings occupied by public authorities? Have you adopted a Local Energy Management System? Do you utilise ESCO models? What services do the ESCO units offer and what types of financing instruments they use?
ESCOs usually offer such services as: Energy audits, feasibility studies, Engineering design, Equipment procurement, Subcontractor management, Construction, Measurement and verification, Operation and maintenance, Project financing.64

The requirements on using Local Energy Managers will be described in a law on energy performance of buildings.
There is no Local System of Energy Management (Lokalny System Zarządzania Energią).
Although companies which act on the ESCO formula seem like one of the most effective tools for improving energy efficiency (as their income is directly proportional to the effect they achieve), their development in Poland is highly limited. The reason for that can be the many legislative and regulative barriers, which, even though they are relatively easy to remove, substantially hinder the development of the ESCO firms and discourage other companies from undertakings on the ESCO formula. In order to alter the situation it is necessary to implement changes in tax and accounting laws, changes that would take into account the specificity of contracts on energy effect, especially in recognition of liabilities and rights to depreciation deductions, as well as incentives for financial institutions, which would mobilise them to offer products suitable for the needs of companies which offer ESCO services (factoring, guaranty system). What is more, it is important to implement changes to public finance law, which at present treats liabilities for

64 SOURCE: Bogdan Atanasiu Buildings Performance Institute Europe and Paolo Bertoldi European Commission Joint Research Centre Institute for Energy (2011) Energy Services Companies (ESCO's) – definition and best practices across the EU,

ESCO services as a burden when calculating the debt of local governments, budgetary law (it needs to be clearly stated who owns the energy effect) and public procurement law and law on financial help form EU funds.
There are also certain barriers in the companies themselves, which may even be harder to remove[65].

The main areas where the ESCO model is used are:

- industry – electricity savings, passive power compensation, electric drives, construction of small CHPs, heat savings, management of compressed air, lighting of assembly rooms and production sites, ventilation, heat recovery,
- public services management – lighting of streets and squares, savings in heat production and distribution, thermo-modernisation, ventilation and air-conditioning of buildings.

ESCO I model:

- an owner makes an energy-saving investment (e.g. thermo-modernisation + RES);
- an ESCO company designs, oversees the investment (in order to ensure a required level of profit) and, if need be, oversees the exploitation, for which it receives payment;
- the owner finances an investment using his own financial resources and, if need be, external resources (grant, loan);
- after completing the investment, the owner benefits from it, gaining savings in energy costs (theoretically they are enough to pay off the liabilities – thanks to the expert knowledge of ESCO).

ESCO II model:

- an owner makes an energy-saving investment (e.g. thermo-modernisation + RES);
- and ESCO company designs, executes (oversees) and finances the investment with its own resources and loan;
- after completing the investment the ESCO company gains sufficient profit in the form of savings in energy costs (loan repayment, anticipated profit);
- the owner benefits from the investment, gaining savings in energy costs after the cooperation is completed. ESCO is still a novelty in Poland[66].

TA2.6 How did the construction industry and consumers receive the new regulations? What have been the incurred costs on the overall construction investment and also on the maintenance of the buildings?

The new regulations will require the producers and developers to use the new ecological and energy-saving technologies and building solutions. Moreover, the materials and devices that make the energy standard of buildings higher will become more and more popular.
The promised changes will revolutionise the building industry in the country, being a huge opportunity for companies that specialise in production, delivery, installation and service of modern building materials and devices that increase the energy efficiency of buildings. In the long run we can expect a decrease in modern technological solutions prices with respect to energy prices, which in turn will justify the construction of as energy-saving buildings as possible[67].

TA2.7 Is an energy management and controlling system implemented which assures a continuous monitoring of energy consumption of buildings? Describe in terms of organizational and financial aspects. Are responsibilities clearly defined?

Energy management and control systems for maintaining constant monitoring of energy consumption in buildings have not been implemented yet.

TA2.8 Is the pool of municipal buildings evaluated in terms of energy performance (Energy Performance Indicators, Saving Potential, Energy supply and energy supply contracts etc.)?

In the energy audits that have been conducted and energy performance of buildings, the buildings are assessed in terms of savings in exploitation costs and energy costs.

TA2.9 On the basis of the evaluated pool of buildings, does a mid- and longterm planning exist concerning

[65] http://aesco.com.pl/3095pl_esco,narzedzie,do,poprawy,efektywnosci,energetycznej.html
[66] http://www.businessandbeauty.pl/jak-finansowac-inwestycje-w-zakresie-energetyki-odnawialnej/?quick_view=1
[67] Opinion of The Polish National Energy Conservation Agency

refurbishments of buildings? Are RES considered? Is there a detailed description of measures in terms of timeline, responsibilites and budget?

There is no information on medium and long term plans for building renovations.
The plans for both public and private buildings concern the future resources from the EU funds and the national funds for energy-saving investments.

TA2.10 Are there regular educational measures for municipal staff responsible for the operation of buildings and its equipment/installations? Describe in terms of organizational means, content, frequency and persons concerned.

There is no information available on these activities.

TA3 Innovative financing tools for boosting local EE/RES investments / do we include other types of sustainable energy investments?

Types of financial instruments supporting the energy performance of buildings[68] and otherwise:

- Subsidies allow prices to be kept low. They may be provided, for example, to manufacturers of energy efficient equipment such as compact fluorescent light bulbs.
- Grants are targeted at households, industrial or other energy consumers to pay for part or all of the cost of introducing energy efficient processes – such as enhanced building insulation
- Grants or subsidies may be financed directly through the state or local authority budget or hypothecated taxes (also known as ring-fenced or ear-marked tax).
- Loan schemes to encourage energy efficient practices can be introduced with subsidised interest rates or credit risk support. Subsidies provided by the local authority or state budget to banks offering low interest rates are a fiscal policy.
- Value Added Tax (VAT) normally affects the final consumer but not the producer – who passes the cost onto the consumer. [. . .] differential VAT rates can be used to influence the choice of energy efficient technology by householders.
- Levies on consumption or production may be used to create a fund (e.g. a levy on electricity sales to fund renewable energy schemes).
- Less common, and thus considered innovative, include Energy Supply Obligations (also commonly known as White Certificates) or Energy Performance Contracting. They are considered innovative although Energy Performance Contracting has been around since the 1980s and Energy Supply Obligations since the 1990s. There is another important distinction to make which is relevant for policy-makers. It refers to innovative instruments entirely relying on private financing (and not government budgets). If used properly, they can provide long-term financial support that often cannot be guaranteed due to the changing budget priorities of national governments. Energy Performance Contracting has been deployed in Europe since the 1980s while Energy Efficiency Obligations started in the early 1990s in a few Member States
- European Investment Bank through Loans, ELENA and JESSICA supports investments in sustainable energy and energy efficiency.

Midland & MWRA partners please fill in Table 2 in Annex 3 and the related questions below.

TA3.1 Sources of funding per amounts and funding organisations; are there private actors involved? How? If yes, what is their contribution and what are the perceived benefits (that would justify their involvement)?

National funds and programmes:

. The National Fund of Environmental Protection and Water Management.
. The Voivodeship Fund of Environmental Protection and Water Management .
. Bank Gospodarstwa Krajowego [National Economy Bank].
. Bank for Environmental Protection.

Public sector can choose between the following programmes:

. Green investments scheme(Part 1) – energy management in public utility buildings financed from The National Fund

[68] ENERGY EFFICIENCY POLICIES IN BUILDINGS – THE USE OF FINANCIAL INSTRUMENTS AT MEMBER STATE LEVEL, BPIE 2012

of Environmental Protection and Water Management.

5. Green investments scheme(Part 5) – energy management in chosen buildings of public finance sector, financed from The National Fund of Environmental Protection and Water Management.
6. Operational Programme „Saving energy and promoting renewable energy sources " to use funds within Finance Mechanism EOG and Norwegian Finance Mechanism in years 2012-2017.
7. PolSEFF - Polish Sustainable Energy Financing Facility.
8. Other financing from The Voivodeship Fund of Environmental Protection and Water Management[69].

Funds and programmes in the European Union:

1. Structural Funds and Cohesion Fund.

European Regional Developmental Fund (ERDF) and Cohesion Fund are implemented in Poland via 16 regional programmes or national programmes, including:

- Regional Operational Programme for Lower Silesia Voivodeship for 2007-2013;
- Infrastructure and Environment Operational Programme;
- Innovative Economy Operational Programme

2. European Fund for Energy Efficiency
3. Intelligent Energy Europe (IEE)
4. JESSICA Initiative (Joint European Support for Sustainable Investment in City Areas) – an instrument to use the repayable resources, loans, guaranties and capital deposits, used voluntarily in a given region, in a few regions of Poland. In Poland JESSICA is financed by Urban Development Funds (UDF) of Regional Operational Programmes (ROP) of a given voivodeship. The function of UDF is fulfilled by banks which manage the funds. There is no JESSICA initiative in Lower Silesia.
5. ELENA Instrument (European Local Energy Assistance)

Two new instruments operate within the financial instrument called ELENA:
- ELENA-KfW – which supports investments of medium proportions, the budget of which does not exceed 50 million Euros and which concern the units of CO2 emission reduction;
- ELENA-CEB – which ensures technical service in the development of investment projects in social buildings.

6. JASPERS Initiative (Joint Assistance to Support Projects in European Regions)
7. INTERREG Cooperation Programme
8. URBACT Programme
9. SMART CITIES Programme
10. Life+ Programme
11. CONCRETO
12. Civitas plus.

Swiss and Polish Cooperation Programme

Additional financing options:

1. public and private partnership

[69] The document was ordered by the Polish Green Network and Climate Coalition, with the professional support form CEE Bankwatch Network, EFFICIENT FUNDS – EFFICIENT ENERGY. The proposal to use the funds available in the cohesion policy of EU for 2014-2020 for supporting energy efficiency in Poland, Warsaw, July 2012.

2. mobilisation of local partners' resources through commune and regional grants

ESCO – Contract of guaranteed savings – the so-called financing *by the third party*. This kind of financing is handled by Energy Service Companies – ESCO, which provide service in decreasing energy consumption and energy demand for their customers – energy users. The payment for the service most often comes from the savings the customer makes on their energy bills.

TA3.2 Types of eligible funding actions: projects? Investments? Research?

Kinds of activities that qualify to gain funds from different national and European funds[70]:

The National Fund of Environmental Protection and Water Management:

- subsidies for partial repayments of the capital of bank loans taken to purchase and install solar collectors,
- co-financing investments leading to energy savings in companies – loans,
- subsidies to loans for the construction of energy-saving houses – grants for partial repayment of the capital of the bank loan,
- energy management in the buildings of selected entities within the public finance sector,
- smart grids – grants.

Financial Mechanism of the European Economic Area (Mechanizm Finansowy Europejskiego Obszaru Gospodarczego) – efficiency and renewable energy sources. Energy saving and promoting RES.

The Voivodeship Fund of Environmental Protection and Water Management for Lower Silesia Voivodeship

- preferential interest of loans with the possibility of partial redemption,
- subsidies to interests of credits and loans,
- grants.

Bank Gospodarstwa Krajowego [National Economy Bank] – Thermo-modernisation and Renovation Fund – a credit for 100% of investment expenditure with the possibility to obtain a non-repayable bonus: a thermo-modernisation or repair bonus.

Bank for Environmental Protection (Bank Ochrony Środowiska) for Lower Silesia Voivodeship – credits with a grant for investments to eliminate asbestos waste form buildings, construction, extension and modernisation of heating systems, thermo-modernisation of buildings, construction and modernisation of sewage treatment plants and connections of the sewage system and water supply system, RES industry, waste management, etc.

Regional Operational Programme for Lower Silesia Voivodeship for 2007-2013 – Priority Axis 5. Environment-friendly regional energy infrastructure – directed at fulfilling undertakings concerning: RES, electricity and gas distribution; heat engineering and CHP; increasing energy efficiency, etc.

Infrastructure and Environment Operational Programme: Priority Axis VII Environment-friendly infrastructure and energy efficiency, Priority Axis X Energy safety, including the diversification of energy sources;

- highly efficient energy production,
- efficient energy distribution,
- thermo-modernisation of public utility buildings.

I**nnovative Economy Operational Programme** – projects that are connected with research and development, modern technologies, investments of high economic importance or implementation and using information and communication technologies.

European Fund for Energy Efficiency – non-investment activities, the aims of which are: improvement of energy efficiency and rational exploitation of energy resources, promoting new and renewable energy sources and supporting diversification of energy sources, promotion of energy efficiency and using new and renewable energy sources in

[70] http://zielona-energia.ews21.pl/index.php?page=szkolenie_wyklad&id=11&idLecture=109

transportation.

Intelligent Energy Europe (IEE)

JESSICA Initiative (Joint European Support for Sustainable Investment in City Areas) – the assumption of this instrument is to use repayable resources, loans, guaranties and capital deposits, and to implement the initiative in a given region voluntarily, in a few regions in Poland. In Poland JESSICA is financed by Urban Development Funds (UDF) of Regional Operational Programmes (ROP) of a given voivodeship. The function of UDF is fulfilled by banks which manage the funds. There is no JESSICA initiative in Lower Silesia.

ELENA Instrument (European Local Energy Assistance) – it ensures donations for help with energy projects. A broad range of means that qualify for this kind of support includes: practicability studies, market studies, construction of investment programmes, business plans, energy audits, preparation of tender procedures and contract agreements, as well as assigning the management of an investment plan to the newly-employed members of staff.

INTERREG Cooperation Programme

INTERREG IV A – a programme that supports the trans-boarder cooperation along all the internal boarders of EU; its aim is to promote experience exchange between European regions and seeking new solutions to the encountered problems;

INTERREG IV B – a programme that supports the implementation of pilot projects, preparation of small and large investments; all within the cooperation of projects;

INTERREG IV C – a programme of interregional cooperation, intended to implement non-investment projects connected mainly with the exchange of experience and minor pilot initiatives focused on testing methods and tools.

URBACT Programme – a European programme of knowledge and experience exchange being a part of cooperation, directed at cites which promote balanced urban development.

SMART CITES Programme – a technological component of the European energy policy, as well as an initiative supporting a limited number of large cities and regions which undertake pioneering actions in order to make progress in reaching ambitious climate aims through balanced energy production and utilisation, as well as mobility. The main components of the initiative are the actions in the building industry, local power grids and transportation

Life+ Programme – the only financial instrument of European Community which was designed in order to support undertakings in environmental protection. Its main aims are: facilitating environmental protection law implementation in the Community, fulfilment of environmental protection policies as well as identification and promotion of new solutions for environmental protection problems.

CONCERTO – an all-European initiative of the European Commission, in which actions are taken in order to build more balanced future as far as the energy needs in Europe are concerned. 58 communes from 23 countries take part in the programme. Each of them strives for the ultimate level of energy self-efficiency. The CONCERTO Initiative is implemented as part of the seventh framework programme under the supervision of Directorate – General for Energy and Transport of the European Commission

Civitas plus – an initiative of the European Commission, belonging to the seventh framework programme, aims at promotion and implementation of balanced, clean and efficient public city transport.

Swiss and Polish Cooperation Programme – actions in the broad area of power engineering and reduction of greenhouse gases emissions, which can be co-financed by Environment and Infrastructure Priority Axis Fund, Aim 2. Increase in energy efficiency and reduction in the emission of greenhouse gases and dangerous substances in particular:

- I. Improvement of energy efficiency through RES systems implementation;
- II. Renovation, repair and/or modernisation of heat distribution networks in parts of cities (which have dense multi-family housing) heated by small local boiler houses and tiled stoves, in the areas of permissible and target levels of air pollution;

III. Renovation/repair and/or modernisation of central heat sources and heating installations in public health centres

which provide hospitalisation services and public schools.

TA3.3 Amounts of funding dedicated to SE EE/RES investments / projects / initiatives, and also vs total development funding amounts

. The Thermo-modernisation and Renovation Fund for 2008-2016 – this fund is financed mainly by the state budget, the amount is defined in budgetary law. The financial resources are a bonus of 20% of the credit amount. The budget for this purpose is about 200 million Polish Zloty a year.

. The resources from Green Investments Systems are available from 2010 – 2014. 1,055 million Polish Zloty is reserved for grants and 1,010 million for loans.

. PolSEFF (Polish Sustainable Energy Financing Facility) – the budget of this programme is 150 million Euros. The program is meant for small and medium companies which are interested in investments in new devices and technologies which produce energy from RES or help decrease energy consumption. The resources can be obtained as a loan or a leasing amounting to 1 million Euros maximally.

. After 2014 means for thermo-modernisation in the pubic sector will be available in EOG Financial Mechanism and Norwegian Financial Mechanism. Their budgets will amount to 75 million Euros[71].

. The National Fund of Environmental Protection and Water Management has a broad spectrum of possibilities for financing RES investments at its disposal. Until 2012 the Fund is going to allot over 2.5 billion Polish Zloty for this purpose.

. The voivodeship funds were given 560 million Polish Zloty by the National Fund of Environmental Protection and Water Management for 15-year-long loans with the stable rate of interests of 2%, which covers up to 75% of RES investments, the cost of which will be 0.5 to 10 million Polish Zloty.

Infrastructure and Environment Operating Programme – about 2,600 million Euros

TA3.4 Is the funding allocated sufficient, in your opinion?

In our opinion, there isn't enough money for RES and energy efficiency. The demand for producing pure energy and ensuring energy efficiency, i.e. building wind farms, bio-gasworks, waste incinerators, conducting research by research units, has exceeded the supply multiple times, the supply being the amount of money available for Poland in EU in 2007-13. The most money – over 780 million Euros – was allotted in the Infrastructure and Environment Programme. Two main priorities were responsible for RES grants: IX "Environment-friendly infrastructure and energy efficiency" and X "Energy safety, including diversification of energy sources". For the last few years the production from RES in Poland has been rising – the average rate of power growth since 2004 is 17%. Poland declared ensuring at least 15% of RES in gross energy consumption in 2020. At present, there is only slightly over 3 GW of installed power in RES which constitutes 8% of all the power production. It is then clearly visible that there is a long way ahead of Poland. Energy production from RES is relatively expensive. It is cheaper to produce it from coal (this is the dominant system in Poland), and power plants are almost exhausted and depreciated[72].

TA3.5 How do we really know it is a good practice, a performing solution?

An important element that should be improved to achieve construction industry efficiency when it comes to houses and public utility buildings is poor credit standing of the target users as well as lack of means for any investments. It is observed in minimal potential to carry out thermo-modernisation at market prices. That is why the thermo-modernisation works conducted do not reach the potential of energy savings in these kinds of buildings. Consequently, these works are conducted as part of general modernisation works and the solutions used are not the best possible ones – usually just wall insulation of average thickness, rarely roof insulation. Comprehensive thermo-modernisation can lead to reaching the full potential of heat and power use reduction in building industry. It is also important that energy audits and project works could be financed with EU grants and that audits could be carried out in a simplified form. The estimated investment expenditures for the improvement of energy efficiency in the Polish building industry amount to 426 billion Polish Zloty. This amount is allotted to thermo-insulation of buildings and their autonomous heating systems in houses, public utility buildings and small and medium companies.

[71] Ibidem.
[72] Rafał Makowski – a co-worker of the „European Funds", a European funds specialist, a journalist, 13.07.2012. http://www.twoja-firma.pl/wiadomosc/16831991,ostatnia-szansa-na-sfinansowanie-oze.html

At the moment the actions taken as part of the Thermo-modernisation Fund are diminishing the need for energy in a building on average by 30%, but the potential for savings is usually higher. This kind of action "freezes" the energy efficiency potential for long years; and even when the potential is reached the two-phase action is more expensive. In that case it is purposeful to subsidise comprehensive thermo-modernisation in public utility buildings. Apart for the energy effect, a synergic information and promotion effect is reached, thanks to which new and tested solutions will be able to be copied also by individual consumers. However, it is crucial to monitor the actual savings and give full information on them to the communities that visit these buildings.
Boosting energy efficiency is the most beneficial method of reducing CO2 emission in Poland, and, at the same time, it generates a number of profits such as creating new workplaces and improvement of energy safety[73].
Using tools of financing actions which improve energy efficiency of buildings both public and private is a good practice.

Evidence of success (evaluation of the good practice and its results

Energy-saving buildings are attainable as far as both the design and the execution are concerned. However, it is crucial to perceive the construction as an investment that ends when the assumed exploitation time has passed and not when the building is put to use. Additional expenditures on improving the energy efficiency of the building pay off during the time of its utilisation and are acceptable in the investment. Bearing that in mind is most important for reaching energy efficiency in building industry.

Advantages of the mechanism to finance thermo-modernisation investments:

1. The Thermo-modernisation and Renovation Fund has been in operation since 1999 to the present day.
2. Between 1999 and 2011 the savings in energy costs, gained as a consequence of implementation of thermo-modernisation investments financed by the Fund, rose up to 600 million Polish Zloty.
3. The number of applications for a thermo-modernisation bonus between 1999 and 1012 grew about 20 times.
4. According to calculations of the Polish National Energy Conservation Agency, the mean annual energy savings for the projects which were given a thermo-modernisation bonus amounted to 3,765 GWh.

Transferability of the good practice: Is the good practice transferable? Are there any specific projects incldued in the good practice ? Please justify

The improvement of energy efficiency should be a continuous and well-planned process. Making a decision to implement a pro-efficiency undertaking has to be preceded by a reliable assessment of the current state of affairs and determining what the saving potential in a given company is. A consequence of efficiency-oriented actions is confirmation of their effects and their monitoring which will allow for a further efficiency boost or at least keeping it at the same level. At each of the stages of this process an energy audit can be used. In many cases conducting an audit is one of the duties enforced by the law, e.g. in the process of applying for energy efficiency certificates (white certificates) or other forms of financing (subsidies, loans, etc.). There is only one conclusion – the common denominator for such a broad term as "improvement of energy efficiency" is an energy audit[74].

In Poland a thermo-modernisation programme for buildings is implemented, a programme which was introduced in 1999 on the basis of a law on the support for thermo-modernisation undertakings.
Every year the number of the bonuses granted is increasing, which can be a proof that the procedure of granting credits and thermo-modernisation bonuses turns out to be effective; the procedure is as follows:

1. An investor makes a decision to make a thermo-modernisation investment.
2. The investor chooses an auditor.
3. An energy audit is carried out.
4. A crediting bank is chosen and a preliminary agreement for a credit is signed.

[73] Ibidem.
[74] http://www.bialecertyfikaty.com.pl/artykuly/audyt-energetyczny-uniwersalne-narzedzie-poprawy-efektywnosci-energetycznej-w-przedsiebiorstwie

5. An application for a thermo-modernisation bonus and all the relevant documents are sent to BGK [National Economy Bank] (this is done by the crediting bank).
6. BGK [National Economy Bank] verifies the audit.
7. The investor and the crediting bank are informed that the bonus is granted.
8. The thermo-modernisation investment is implemented.
9. BGK [National Economy Bank] transfers the thermo-modernisation bonus to the crediting bank.

Any other comments you wish to make

61. For more information

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Annex 1 STEP thematic areas & GPs as per approved AF

BETTER IMPLEMENTATION OF SUSTAINABLE ENERGY POLICIES AT LOCAL LEVEL: Comprehensive approaches promoting the uptake of regional sustainable energy policies at local level

- Local SE action plans in urban areas (STRIA)
- Local SE plans in rural areas (SODEMASA)

SUSTAINABLE ENERGY MANAGEMENT SYSTEMS:GPs supporting local energy self-sufficiency, optimization & management tools for EE/RES

- ESCO (area based *Energy Service Company)* models for RES in public buildings (ARGEM)
- Energy performance audit (Arleg)
- Local Energy Management Systems (SAENA)
- RES in municipal district heating systems (Kainuu)

FINANCING TOOLS FOR SUSTAINABLE ENERGY INVESTMENTS: Innovative financing tools for boosting local EE/RES investments

- Alternative financing options for Public Sector investments (MWRA)
- Financing EE/RES initiatives in local authority functional areas (Midland)

ANNEX 2 STEP project THEMATIC AREA 1 Local sustainable energy plans

Table 5.Local Government Policies/Activities that Can Influence Renewable Energy75

Policy/ Activity Category	Areas	Descriptions of Policies/Activities by Sub-Category	
1. Target setting	Target setting	(a) CO2 reduction targets	Basic aim no. 3. The minimisation of the influence on the natural environment, and actions aiming at a more economic energy production and consumption. This aim is comprehended in two ways: firstly, as caring for the natural environment through the use of technologies that would enable, for instance, CO2 reduction (on the part of the producer) in the process of energy production, and secondly, as the use of solutions that facilitate protection of the ecosystem on the part of the consumer. Partial aim 6: Taking pro-ecological actions in the power industry Partial aim 7: Efficient regional power industry based on demand-supply correlation[76].
		(b) Future shares/amounts of renewable electricity or energy for all consumers in city	1. Replacement of devices of low power efficiency with ones of higher power efficiency. 2. Actions in favour of changes in the logic of energy distribution in flats taken in order to boost the energy use efficiency, and, finally, reach energetic self-

[75] SOURCE: Global Status Report on Local Renewable Energy Policies, Working Draft, 12 June 2009 A Collaborative Report by: REN21 Renewable Energy Policy Network for the 21st Century Institute for Sustainable Energy Policies (ISEP) ICLEI–Local Governments for Sustainability, page 10.

[76] Joint publication edited by Edyta Ropuszyńska-Surma and Zdzisław Szalbierz, "*Strategy* for the development of the *energy* sector in *Lower Silesia* on the basis of the Delphi foresight method," Publishing House of the Wrocław University of Technology, Wrocław 2011.

Policy/ Activity Category	Areas	Descriptions of Policies/Activities by Sub-Category	
			sufficiency. 3. Initiation of shared actions intended at implementation of new technologies, gaining financial resources for investments of the local community (e.g. cooperatives). 4. Implementation of "smart" technologies in houses and public utility buildings. 5. Creation of local cooperatives interested in realisation of the concept of balanced development, which in turn ensures long-term benefits to the environment and an increase in life quality standards. 6. Active participation of various entities in social consultations on programming of budgetary means for the fiscal periods to come (e.g. 2014-2020) allocated for power engineering (investments in: energy efficiency, innovations, upgrading energy efficiency; education and creation of pro-social changes)[77].
		(c) Future shares/amounts of renewable electricity or energy for government operations and/or buildings	There is no information available.
		(d) Future shares or absolute numbers of buildings or homes with renewable energy installations	There is no information available.
		(e) Future shares/amounts of biofuels for the government vehicle fleet and/or for public transport	There is no information available.

[77] *Ibidem*

Policy/ Activity Category	Areas	Descriptions of Policies/Activities by Sub-Category	
		(f) Other types of targets, for example to become fossil-fuel free or "carbon neutral"	Innovative actions aiming at implementation of the technologies of energy production and utilisation that are known in other countries should provide: clean carbon technologies, effective technologies of producing energy from biomass, development of technologies for biogas and natural gas utilisation, gaining heat from processes other than burning (solar collectors, geothermal energy), implementation of photovoltaic cells as a source of electricity free form of converting energy into mechanical work, using other renewable energy sources (windmills , water-power engineering), using sedimentation energy sources, storing electricity and heat, fuel cell technology, production of liquid biofuels, and other[78].
2. Regulation based on legal responsibilities and jurisdiction	Urban	(a) Urban planning and zoning that encourages and integrates the local generation, distribution and use of renewable sources of power in the local jurisdiction-- including planning and zoning for public transportation and electric vehicle infrastructure.	At the country level The concept of spatial development of the country 2030, a law of the Council of Ministers passed on 13 December 2011, published in the Official Journal of the Council of Ministers on 27 April 2012 position 252 "The basic renewable energy sources (RES) in Poland are wind and biomass. The remaining sources including surface waters are marginal." At the region level The spatial development plans of voivodeships have to be compatible with the strategy of functional areas development and their development plans. It is assumed that the development plans of overlapping functional areas will be prepared simultaneously by 2015, and then verified through the monitoring of the spatial development plans of voivodeships. „*The study of spatial conditions for the development of wind power industry in the Lower Silesia*" conducted by Voivodeship Urban Planning Office (Wojewódzkie Biuro Urbanistyczne) in 2010 is a source of detailed conditions for the development of wind power engineering in the region; a potential investor can analyse the possible investment sites and choose the most optimal solution. At the local level Studies of conditions and directions of spatial development of communes have to be compatible with the strategic tasks assumed in the spatial development plans of voivodeships. A study of conditions and directions of spatial development and a local plan are where RES problems are handled in the spatial development

[78] *Ibidem.*

Policy/ Activity Category	Areas	Descriptions of Policies/Activities by Sub-Category	
			system. It means that a wind power plant or a bio-gasworks has to be accepted by the commune authorities and included into the study of conditions and directions of spatial development of the commune (or city) and then a plan of spatial development can be prepared for that commune or city. The steps in fulfilling a given investment of a public target can be realised on the basis of an official decision on the localisation of a public target investment (all the elements of transmission such as water supply systems, sewage systems, gas supply system, power lines, unfortunately, wind farms were not included in this group of investments, even though the transmission of energy begins in the wind power plant generator). Public target investments include also roads, cycle paths and other elements of public roads, as well as tram routes. In most of the studies of conditions and directions of spatial development there are provisions that dictate making local plans for wind farms. Such local plans for hydroelectric power stations are also required in most communes[79].
	Building	(b) Building codes and/or permitting that applies to, or incorporates renewable energy in some manner. Examples: mandates for solar hot water and solar PV installations, zero-net-energy homes, shading legislation, and mandated design review/scoping of opportunities and potentials for renewable energy.	Basic documents that regulate legal proceedings and design and executive actions in the building industry include: 1. Building Law – an act passed on 7 July 1994 / i.e. Journal of Laws No. 207, Item 2016 from 2002 with all later changes./. 2. Regulation of the Minister of Infrastructure, 12 April 2001 on technical conditions for buildings and their locations /i.e. Journal of Laws No. 75, Item 690 from 2002 with all later changes/ are basic legal documents that set the rules for the process of designing, building, maintenance and demolition of buildings, and states what the tasks of the public administration bodies are in these areas. Additionally: 1. ACT passed on 18 December 1998 on supporting thermo-modernisation undertakings (Journal of Laws No. 162, Item 1121). 2. Act passed on 17 July 1009 on the system of management of the emission of greenhouse gases and other substances. 3. Regulation of the Council of Ministers passed on 20 October 2009 on kinds of projects and programmes to

79 T. Szymankiewicz-Szarejko, Sz. Zabikrzecki, Presentation: *"Spacial planning for renewable energy sources versus the urbanised and environmentally valuable areas."*

Policy/ Activity Category	Areas	Descriptions of Policies/Activities by Sub-Category	
			be fulfilled as part of the National Green Investments System. Among the activities in energy efficiency supported by selling of AAU units there are thermo-modernisation and construction, remodelling and purchase of electrical equipment for the buildings. There are no separate regulations concerning solar installations, zero energy houses, etc.
	Taxes	(c) Tax credits and exemptions within tax systems: for example, sales, property and fuel taxes, permitting fees, and carbon taxes.	The system of tax incentives in Poland is rather poorly developed. In practice, there are 3 groups of tax relieves which promote publicly responsible entities: 1. Electric energy produced from RES is exempt from the excise tax on the basis of a document proving the remission of the energy source certificate. Such exemption is applicable no sooner than a document proving the remission of the energy source certificate is issued and it lowers the excise tax due on electric energy in the upcoming billing months. 2. Those paying farm tax are entitled to an investment relief by virtue of expenses connected with purchasing and installing devices to be used while producing with RES (wind, biogas, sun, falling water). The relief can be used after the investment has been finalised by deducting 25% of investment outlays (proved by bills) from the due farm tax on land located in the commune where a given investment was carried out. 3. A thermo-modernisation bonus which, according to the Thermo-modernisation Law, is granted to taxpayers to partially pay off a thermo-modernisation loan. It is applicable if an energy audit proves that the investment will contribute to smaller energy consumption.
	Other	(d) Other regulation, including municipal departments mandated to promote or plan for renewable energy, mandates for biofuels use in vehicles or biofuels blending, and mandatory carbon cap-and-trade.	There is no information available.
3. Operation of municipal infrastructure	Purchase	(a) Local government purchasing (and joint-purchasing with other municipalities or with private sector) to integrate	There is no information available..

Policy/ Activity Category	Areas	Descriptions of Policies/Activities by Sub-Category	
		renewable energy into government operations. Includes renewable electricity, biofuels, and bulk purchasing for market transformation programs.	
	Invest	(b) Local government investment in renewable energy for government buildings, schools, vehicle fleets, and public transport.	There is no information available.
	Utility	(c) Public utility regulation, including tariff regulation, renewable energy targets, feed-in tariffs, interconnection standards, net metering, and portfolio standards; also designates private utility policies of these types.	There is no information available.
4. Voluntary actions and government serving as a role model	Demo	(a) Demonstration projects, including participation in national pilot and demonstration projects. Often done with private sector.	There is no information available.
	Grants	(b) Grants, subsidies, and loans for investments in renewable energy by homeowners or businesses	There is no information available..
	Land	(c) Using local government land/property for renewable energy installations (leasing/selling/permitting). Can also include deals that require developer promises for renewables and efficiency.	There is no information available.
	Other	(d) Examples: joint ownership of private projects, city-financed investment funds, bond issues, and	There is no information available.

Policy/ Activity Category	Areas	Descriptions of Policies/Activities by Sub-Category	
		green certificates and trading.	
5.Information promotion, and raising awareness	Info/ promo	Includes public media campaigns and programs; recognition activities and awards; organization of stakeholders; forums and working groups; training programs; enabling access to finance by local stakeholders; enabling stakeholder-owned projects; removing barriers to community participation; energy audits and GIS databases; analysis of renewable energy potentials; information centers; and initiation and support for demonstration projects.	1. Initiatives organised by the Lower Silesian Renewable Energy Cluster (DKEO [Dolnośląski Klaster Energii Odnawialnej]): - Lower Silesian Renewable Energy Fairs – an annual initiative – focused on educational activities showing possibilities, opportunities and threats connected with using RES in Lower Silesia, -Lower Silesian Renewable Energy Forum – this event coincides with the Renewable Energy Forum and gives opportunity to present the Forum to companies and institutions from the renewable energy sector. During the fairs, there are various presentations of the newest solutions that can be used in companies, administration buildings and residential housing, - EkoGmina [EcoC0mmune], a training and counselling project – strategies for the development of renewable energy in communes of Lower Silesia The project was prepared and is being realised by the Coordinator of the Lower Silesian Renewable Energy Cluster. Its aim is to promote balanced development by skilfully used RES on three different levels: local, district and regional. The project is the answer to real needs connected with the need for diversification of energy sources and problems with too intensive energy consumption of many investments. 2. Realised project: EnergyRegion – its aim is to create new possibilities for cooperation in the are of the development of RES in Lower Silesia and to check the regional potential for renewable sources by, among others, creating a regional system for measuring windiness. It is realised by 10 entities in Poland, Germany, the Czech Republic and Slovakia. In Lower Silesia it is supervised by the Marshall Office in Wrocław. 3. Lower Silesian Local Government Forums – it is a unique annual meeting of Local Governments from Lower Silesia in Poland (mainly commune leaders, mayors, presidents and starostes) which facilitates experiences exchange, joint agreements and the consolidation and integration of the region. During the Forum sessions there are discussion on, among others, the development of the region, its economy and promotion.

ANNEX 3 STEP project THEMATIC AREA 3 Innovative financial tools for boosting local / regional sustainable energy investments

Table 6.Financing sustainable energy policies & projects

I. Instruments supported by the member state/ region / municipality		
1.-Financial instruments supported by the municipality / region / member state. How long have the measures been in place?...	(a) Grants/Subsidies	Since 200480
	(b) Funds (Levies)	. Excise tax since 2008[81]
	(c) Preferential loans	since 199982
	(d) Rebates	
2. Fiscal instruments supported by the municipality / region / member state How long have the measures been in place?.	(a) Tax reduction	
	(b) Tax credit	since 1984 83
	(c) Reduced VAT	
	(d)	
3. Measures are supported by the individual instruments How long have the measures been in place?..	(a) Envelope (including insulation, windows & glazing, exterior wall, doors, ceiling, etc.)	✓ Since 1999 84
	(b) Equipment (including efficient heating, efficient lighting systems, ventilation, cooling, control systems, etc.)	✓ since 1999 85
	(c) Other (including energy audits, consultancy costs, labour costs, education and training activities, etc.)	since 1999r. 86
4. The level of investment that is supported by the instruments ...	(a)	
	(b)	
	(c)	
	(d)	
5. Type of investment where the financial / fiscal measures are applies	(a) Private homes	✓
	(b) Private businesses	✓
	(c) Public sector offices	✓
	(d) Social infrastructure / utilities	✓
6. Level of ambition (what is	(a)	There is no information

80 Subventions from, among others, The National Fund of Environmental Protection and Water Management, European support programmes and others.

81 Excise tax - electric energy produced from RES is exempt from the excise tax on the basis of a document proving the remission of the energy source certificate. Such exemption is applicable no sooner than a document proving the remission of the energy source certificate is issued and it lowers the excise tax due on electric energy in the upcoming billing months. The basic act on the matter of excise tax in Poland is the *Excise Tax* Act of *6 December 2008* (Journal of Laws 2011, No. 108, Item 626) (later: the Excise Tax Act) – Article 30.1, the Directive of 23 August 2010 on exemptions form excise tax (Journal of Laws No. 159,Item 1070 with later changes) (later: the Directive on exemptions).

82 The *Thermo-modernisation and Renovation Fund* - Bank Gospodarstwa Krajowego [National Economy Bank].

83 1. Act on Farm Tax of 15 November 1984 (Journals of Law No. 52, Item 268 with later changes).Those paying farm tax are entitled to an investment relief by virtue of expenses connected with purchasing and installing devices to be used while producing with RES (wind, biogas, sun, falling water). The relief can be used after the investment has been finalised by deducting 25% of investment outlays (proved by bills) from the due farm tax on land located in the commune where a given investment was carried out.

2. A thermo-modernisation bonus is granted to taxpayers exempts them prom paying the personal income tax. It may be used to to partially pay off a thermo-modernisation loan. It is applicable if an energy audit proves that the investment will contribute to smaller energy consumption.

84 Credits, loans.

85 Ibidem

86 ibidem

Table 6.Financing sustainable energy policies & projects

the energy savings target of the measure), by %		available.
	(b)	There is no information available.
	(c)	There is no information available.
	(d)	There is no information available.
7. Innovative financing tools87 Both were favoured	(a) Energy Performance Contracting (EPC) Third Party Financing (TPF), Energy Performance Contracting (EPC) and Contract Energy Management (CEM) are all terms used to cover a wide variety of contracting and financing techniques for energy efficiency and renewable energy projects88.	There is no information available.
	(b) Energy Efficiency Obligation (Energy Efficiency Obligations (often called White Certificates) build on suppliers' obligation to foster energy efficiency improvements. At its simplest, an Energy Efficiency Obligation is a requirement on a group of market actors in one or more sectors of the energy industry in a given territory to achieve a specified energy saving target. These instruments are considered financial incentives as they leverage increased investment and facilitate the creation of additional cash flows)89.	✓ 90
	(c)	
	(d)	
Instruments supported by the EC &		
8. EIB (European Investment Bank)	(a) EIB lending focus themes: Renewable energy; Energy efficiency; Diversification and security of internal supply (including TEN-E); External energy security and economic development	✓ 91
	(b) Energy efficiency loans (Residential, commercial and public buildings Transport (rail, road, urban transport) Electricity production & distribution Industry)	✓ 92
	(c) ELENA (European Local Energy	✓ 93

87 Dan Staniaszek and Eoin Lees, Determining Energy Savings for Energy Efficiency Obligation Schemes, eceee, 2012.

88 Energy Charter Secretariat, Third Party Financing: Achieving its Potential, ECS, Brussels, 2003

89 They have been used in the European Union for many years. The 2006 Energy End-use Efficiency and Energy Services Directive should have been the big breakthrough to get energy companies to play a major role in all Member States, but that did not happen. However, over the past decade there has been important awareness creation and information gathering. Europe has benefitted from the experience of several countries on the continent as well as from those in the United States. It was the US that has traditionally shown leadership in having energy companies play a significant role in promoting energy efficiency. This has been evolving since the 1970s. The most recent source of information on Energy Efficiency Obligations comes from an eceee[89] report produced by Eoin Lees for DG Energy in March 2012.

90. Energy Efficiency Act of 15 April 2011 introduces the system of white certificates. The system is to operate in Poland starting on 1 January 2013. It is now being implemented.

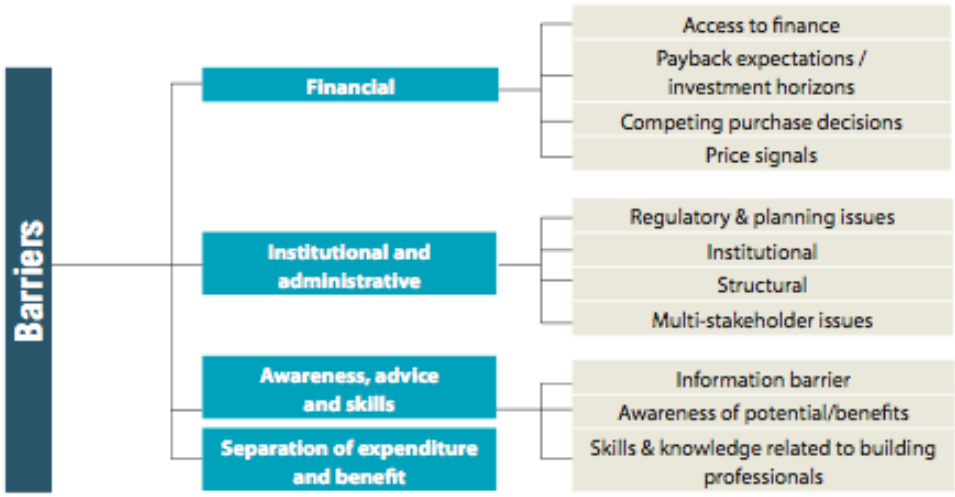
91 EIB (European Investment Bank) supports six priority targets in EU which are: supporting economic coherence, supporting small and middle enterprises, balanced development and environmental protection, innovations and economy based on knowledge, the development of trans-European transport and energy networks (TEN), balanced, competitive and safe energy supplies, "Operations of EIB (*European Investment Bank)* in Poland in 2011," February 2012.

92 In the last five years (2007-2011) the bank has granted an overall sum of 20.6 billion Euros to projects supporting European aim in Poland, "Operations of EIB (*European Investment Bank)* in Poland in 2011," February 2012.

Table 6.Financing sustainable energy policies & projects

	Assistance) (Project Development Services) Support to Final Beneficiaries with: Feasibility studies Business Plans Technical studies (energy audits) Procurement/ tendering/ contracting Additional technical staff Financial structuring 90% of costs; investment programme supports EE investments in public and private buildings, including social housing and street and traffic lighting; DH networks; Decentralised CHP; Urban transport; Local energy infrastructure to support development in RES	
	(d) JESSICA Alongside DG-REGIO (=Structural Funds), JESSICA instruments in Structural Funds Regulations specifically provide for EIB to act as Holding Fund (on a not-for-profit basis), offering: Technical assistance and dissemination of best practice, based on established expertise in lending to urban renewal/regenerations projects across the EU; complementary loan financing for urban development projects. Eligible loan areas: Urban infrastructure, including transport, water/waste water, energy Heritage or cultural sites, for tourism or other sustainable uses; Redevelopment of brown-field sites, including site clearance and decontamination; Office space for SM.	In Poland JESSICA is implemented regionally as part of Regional Operational Programmes (ROP). The JESSICA initiative in Poland is in the following Voivodeships: Wielkopolskie, West Pomerania (Zachodniopomorskie), Pomorskie, Silesia (Śląskie). There is no initiative in Lower Silesia. The initiative provides help to projects in: revitalising village infrastructure, heritage, developing post-industrial areas, improving energy efficiency (investments should generate profit). The return on the investment shall finance next urban projects. The fund for the JESSICA initiative in Poland come to 256 million Euros[94].

Barriers



95

The major barrier to the adoption of clean energy continues to be related to cost, and local governments rely on offering financial incentives to

[94] http://www.uniaeuropejska.org/inicjatywy-jaspers-jeremie-i-jessica
[95] SOURCE: BPIE, Europe's Buildings Under the Microscope, p. 55.

address this barrier. Other barriers include: clean energy acceptance issues, split incentives, lack of knowledge and skilled labour, opposition from organised interests96.

Overcoming barriers to clean energy *project development rather than just clean energy policy development* (e.g., financial incentive programs are policies designed to support project development).

[96] S. Busche (2010) Clean Energy Policy Analyses: Analysis of the Status and Impact of Clean Energy Policies at the Local Level, Prepared under Task No. IGST.0103, http://www.osti.gov/bridge

GOOD PRACTICE 7 MUNICIPAL ENERGY MANAGEMENT APPROACH

General information

62. Name of the good practice	Implementation of a Municipal energy management approach On the way to an energy self-sufficient region - Westlausitz	
63. Thematic area (TA)	TA1 Better implementation of sustainable energy policies at local level	
	TA2 Development and implementation of sustainable energy management systems	X
	TA3 Innovative financing tools for boosting local EE/RES investments	
64. Type of good practice - check all relevant criteria	3.1 Permanent initiative	
	3.2 Project	X
	3.3 Methodology	X
	3.4 Technology	
	3.5 Others	
65. What are the most important aspects of the good practice ? check all relevant criteria	4.1 Performance of GP achieves EC set benchmarks for RES utilisation	
	4.2 Performance of GP contributes considerably to the achievement of EC set benchmarks (please mention how much)	
	4.3 Energy costs have gone down (locally / regionally/ nationally)	X
	4.4 RES % participation in the «energy mix » of the community has increased (please mention by how much)	
	4.5 Provable technological innovation	
	4.6 Creation of organizational structures, dealing with energy matters.	X
66. Contributing partner	SAENA	
67. Location	Saxony; Germany	
68. Start and end date of the good practice –if relevant		

Regional context, all partners please fill in

69. Energy performance of the region

All partners please fill in Table 1 in Annex 2

Quantitative figures: % of RES in the overall energy production (if any) in the region; RES applications as % of the overall energy needs in the region; RES applications in the public sector, especially in buildings; RES in industries; energy intensity of the region; unit cost of energy per consummer in the region.

Region: Micro-Region Westlausitz
% of RES in overall energy production: n/a

% of RES overall energy needs:
Electricity: 224.132 MWh
Heating: 628.080 MWh
Overall: 852.212 MWh

Electricity:
PV: 2.077,97 MWh (0,24%)
Wind: 52.235,86 MWh (6,13%)
Bio: 7.812.918 MWh (0,92%)

Heating:
Bio: 5.698 MWh (0,67%)
Solar: 1.454 MWh (0,17%)

Overall: 69.278,748 MWh (8,13%)

RES in the public sector:
Wood pellet boiler and integrated district heating in a different school buildings.
Geothermal plants in schools.
Enlargement of a historical building that includes a wood pellet boiler.
Innovation project of a fish friendly passage facility (to enforce a EU-directive) which includes a turbine that produces 30MWh electricity per year.

RES in industries: n/a

Energy Intensity of the Region:

- 80% Agriculture and Forestry

Unit of cost per consumer:
Heating: 100€/MWh
Electricity: 200€/MWh

Sustainable energy policy tools: which is the local / regional energy policy tool, and what types of issues it addresses among the following categories: 1. Target setting; 2. Regulation based on legal responsibilities and jurisdiction; 3. Operation of municipal infrastructure; 4. Voluntary actions and government serving as role model; 5. Information, promotion and raising awareness.

1. Target setting
- self sufficiency in energy
- RES for energy production
- Implementation of an energy compentency centre
- Reducing CO2 emissions

2. Regulationen
EU, Germany and Federal State of Saxony
Voluntarily: Energy Concept for the Region Westlausitz

3. Operation of municipal infrastructure

- Electricity grid -> regional energy supplier -> owned by several municipalities
- Water grid -> owned by the municipality
- Streets -> owned by municipality, streets with higher priority -> federal state

4. Voluntary actions
- the Energy Concept is based on voluntary actions
- the Region participates in the municipal energy management
- on municipality participates in the European Energy Award

-> all actions are done voluntarily and therefore the whole region serves as a role model for the federal state of Saxony and its people

5. Information
- Within the Westlausitz a Project Management was established. One purpose is to coordinate information to the public, organize regional information events and raise awareness about energy relevant topics. Furthermore the commitment of the municipalites to energy relevant topics is promoted regularily by webpages and newsletters.

RES production & applications, extent, barriers, any specialisation: How active is the local / regional RES progamme? What are the RES sources in your region? Where is the RES sold? Does it create a regional income? Is there a business sector associated with it? Which are the organisations coordianting the RES production in the region? Which are (if any) the organisations dealing with the RES research?how much of the regional / municipal energy needs are covered by RES? Has there been any effect in the energy prices? What have been the biggest problems in disseminating RES applications in the housing, public and ecoonmic productive sectors (services and manufacturing)? Is there any organisation responsible for promoting applications of RES in the region?

How active is the local RES programme?
One local programm that rents out public roof areas for photovoltaic systems.

What are RES sources in your Region?

- Wind
- Solar
- Biomass
- Geothermal

Where is the RES sold?
Germany guarnatees the price for RES. This is specified by the Renewable Energy Sources Act (Erneuerbare Energien Gesetz - EEG).

Does it create a regional income?
RES create a regional income.
Before 2012 Saxony had a strong solar industry and research cluster.
Biomasse improves income in the agricultural sector.

Is there a business sector associated with it?
Before 2012 the solar industry.

Which are the organisations coordinating RES production in the Region?
Wind and Biomass -> Regional Planning Authority

Which are the organisations dealing with RES research?
Different research institutes.
E.g. Fraunhofer-Gesellschaft, Max-Planck-Gesellschaft, Helmholtz-Gemeinschaft

How much of the energy needs are covered?

8,13% if energy is defined as electricity and heating

Has there been an effect on energy prices?
Since the introduction of the Renewable Energy Sources Act prices dropped at the energy exchange. But for consumers prices continued to rise because of taxes and the reallocation cost for the extension of RES.

What have been the biggest problems?

- Investment costs
- Priority areas

Is there an organisation promoting RES?
SAENA is the local competency centre regarding energy efficiency, RES and innovation.
Also the Federal State of Saxony, German law, regional energy agencies…

70. Context of the implementation of the good practice	
Country	Germany
Region	Saxony -> Westlausitz
Population	54.000 inhabitants

Detailed description of the good practice

71. Description of the good practice (background, objectives, problem addressed, key aspects, activities it includes, institutions involved, costs entailed, financers (who is paying? For how long? How much?).

See GP summary

72. Questions spefic to the thematic areas of the good practices (TA:s)

TA1 Better implementation of sustainable energy policies at local level.

The focus of this thematic area is on comprehensive approaches promoting the uptake of regional sustainable energy policies at local level.

Local policies and activities to promote renewable energy can be grouped into five main categories: 1. Target setting; 2. Regulation based on legal responsibilities and jurisdiction; 3. Operation of municipal infrastructure; 4. Voluntary actions and government serving as role model; 5. Information, promotion and raising awareness. **Partners with GPs in this Thematic area please fill in Annex 2 Table 1 with special care and please link to the questions underneath.**

TA1.1 Is there a national policy promoting comprehensive approaches? Is there a pronounced regional sustainable energy policy? If yes, what are its objectives and main action lines? When was it established? Are there any measurable results? If yes, what are they? Is there a comprehensive policy background for RES support?
TA1.2 Have sector specific RES targets and action plans for 2020 been set up –as required by the RES Directive, in your region?
TA1.3 What are the existing support instruments for RES in your region? Have policy alternatives for RES been formulated in your region?
TA1.4 Have RES criteria been integrated into the relevant public procurement policies/procedures in your region?
TA1.5 Why do you feel that these tools are actually good practices?
TA2 Development of sustainable energy management systems TA2 is essentially about the implementation of the EPBD, DIRECTIVE 2010/31/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 19 May 2010 on the energy performance of buildings, EU Energy Efficiency Action Plans (2006 and 2011)• EU Directive 2006/32/EC on energy end-use efficiency and energy services (ESD) and the most recently endorsed (26.9.2012) Energy Efficiency Directive[97].
TA2.1 When did you start implementing sustainable management systems in your region?
2009 the Region developed a regional energy conept and one municipality joined the European Energy Award.
TA2.2 Has the recast EPBD (2010) been transposed in your country? Is the recast EPBD enforced in your region? Is its enforcement monitored? Which are the institutions and what are

[97] **Mandatory energy-saving measures**, including renovating public buildings, energy-saving schemes for utilities, and energy audits for all large firms, will be required by an EU energy efficiency directive approved in plenary on Tuesday. Cutting energy consumption by 20% could save the EU €50 billion per year. Focus of the mandatory measures: Renovation of public buildings; Saving plans for utilities; Energy audits (all large enterprises); Financing facilities

the tools used to monitor the recast EPBD enforcement? Does the public sector in your region explicitly promote energy efficiency in private and public construction?

Has the EPBD transposed in your country?
Yes

Is the recast EPBD enforced in your region?
Yes

Is its enforcement monitored?
No, there are no legal requirements.

Which are the institutions and what are the tools used to monitor the recast EPBD enforcement?
No institutions, but the DIN 18599 (German standards institute)

Does the public sector in your region promote energy efficiency in privat and public construcion?
Yes, there are several financing possibilites.

TA2.3 Do building regulations require that an energy performance certificate (EPC) must be produced whenever a building is sold, constructed or rented out? Does the EPC show the energy efficiency of a property and include recommendations on how it can be improved? Your EPC models?

Do building regulations require that an EPC must be produced…?
Yes

Does the EPC show the energy efficiency and recommendations for improvement?
Yes

TA2.4 Is a display energy certificate (DEC) obligatory on an annual basis for public buildings with a footprint larger than 1,000 m2? Does the DEC show the actual running costs of the building and is it displayed in a prominent place?

Is a DEC obligatory on an annual basis?
No. The DEC is valid for 10 years. In the future the requirements will be increased to buildings larger 500m².

Does the DEC show the actual running costs of the building and is it displayed in a prominent place?
Running costs are not shown on a financial basis. Only performance and consumption. The DEC has to be shown in a prominent place.

TA2.5 Are there requirements to set targets for an increase in the use of LZC (low/zero energy consumption) buildings with separate targets for new and refurbished dwellings; new and refurbished commercial buildings; buildings occupied by public authorities? Have you adopted a Local Energy Management System? Do you utilise ESCO models? What services do the ESCO units offer and what types of financing instruments they use?

ESCOs usually offer such services as: Energy audits, feasibility studies, Engineering design, Equipment

procurement, Subcontractor management, Construction, Measurement and verification, Operation and maintenance, Project financing.[98]

Are there requirements to set targets for an increase in the use of LZC buildings
Yes. The energy saving ordinance ensures the implementation of the EPBD.
Differentiation between New and refurbished bulidings as well as residential buildings and non-residential buildings

Have you adopted a Local Energy Management System?
A few cities have adopted an EMS. But they differ as there is no uniform regulation. It basically depends on ambitius people that push ahead.
SAENA is implementing an EMS within the micro region Westlausitz on the basis of a Good Practice.

Do you utilise ESCO models?
Yes. EPC and ESC
All specific details for Saxony will be provided in the new brochure developed within the project EnercitEE SP8 FIPREC in the beginning of 2013.

TA2.6 How did the construction industry and consumers receive the new regulations? What have been the incurred costs on the overall construction investment and also on the maintenance of the buildings?
Costs are between 1500-2000€/m². The regulations and the compliance with the energy saving ordinance have more or less been accepted since an investment has to be economically. If refurbishments are not economically exeptions are possible.

TA2.7 Is an energy management and controlling system implemented which assures a continuous monitoring of energy consumption of buildings? Describe in terms of organizational and financial aspects. Are responsibilities clearly defined?
Is an energy management and controlling system implemented?
Within the EMS wich serves as the GP, a countinous monitoring is ensured by facility managers on a weekly basis. In the near future if there are enough financial resources an automatic monitoring system can be installed which will monitore the consumption of electricity, gas, water every 15 minutes.
An employee within the administration of every participating municipality is responsible for the organization. The EMS starts with non investive measures wich can reduce energy consumption by 10%-20%.

TA2.8 Is the pool of municipal buildings evaluated in terms of energy performance (Energy Performance Indicators, Saving Potential, Energy supply and energy supply contracts etc.)?
Is the pool of municipal buildings evaluated?
Partly

[98] SOURCE: Bogdan Atanasiu Buildings Performance Institute Europe and Paolo Bertoldi European Commission Joint Research Centre Institute for Energy (2011) Energy Services Companies (ESCO' s) – definition and best practices across the EU,

TA2.9 On the basis of the evaluated pool of buildings, does a mid- and longterm planning exist concerning refurbishments of buildings? Are RES considered? Is there a detailed description of measures in terms of timeline, responsibilites and budget?

Mid- and Longterm planning?

Municipalties partly do mid- and longterm planning and RES are considered, as they are part of the energy concept.

Detailed description of measures?

No. There is no detailed describtion of measures as budget is defined on an annual basis and mayors and responsibilites within the administration shift with every election.

TA2.10 Are there regular educational measures for municipal staff responsible for the operation of buildings and its equipment/installations? Describe in terms of organizational means, content, frequency and persons concerned.

Educational measures?

Employees in the administration will have an annual education regarding knowledge of system installations, basic energy efficiency measures and partly the handling of the energy management software.

TA3 Innovative financing tools for boosting local EE/RES investments / do we include other types of sustainable energy investments?

Types of financial instruments supporting the energy performance of buildings[99] and otherwise:

- Subsidies allow prices to be kept low. They may be provided, for example, to manufacturers of energy efficient equipment such as compact fluorescent light bulbs.
- Grants are targeted at households, industrial or other energy consumers to pay for part or all of the cost of introducing energy efficient processes – such as enhanced building insulation.
- Grants or subsidies may be financed directly through the state or local authority budget or hypothecated taxes (also known as ring-fenced or ear-marked tax).
- Loan schemes to encourage energy efficient practices can be introduced with subsidised interest rates or credit risk support. Subsidies provided by the local authority or state budget to banks offering low interest rates are a fiscal policy.
- Value Added Tax (VAT) normally affects the final consumer but not the producer – who passes the cost onto the consumer. [. . .] differential VAT rates can be used to influence the choice of energy efficient technology by householders.
- Levies on consumption or production may be used to create a fund (e.g. a levy on electricity sales to fund renewable energy schemes).
- Less common, and thus considered innovative, include Energy Supply Obligations (also commonly

[99] ENERGY EFFICIENCY POLICIES IN BUILDINGS – THE USE OF FINANCIAL INSTRUMENTS AT MEMBER STATE LEVEL, BPIE 2012

known as White Certificates) or Energy Performance Contracting. They are considered innovative although Energy Performance Contracting has been around since the 1980s and Energy Supply Obligations since the 1990s. There is another important distinction to make which is relevant for policy-makers. It refers to innovative instruments entirely relying on private financing (and not government budgets). If used properly, they can provide long-term financial support that often cannot be guaranteed due to the changing budget priorities of national governments. Energy Performance Contracting has been deployed in Europe since the 1980s while Energy Efficiency Obligations started in the early 1990s in a few Member States

- European Investment Bank through Loans, ELENA and JESSICA supports investments in sustainable energy and energy efficiency.

Midland & MWRA partners please fill in Table 2 in Annex 3 and the related questions below.

TA3.1 Sources of funding per amounts and funding organisations; are there private actors involved? How? If yes, what is their contribution and what are the perceived benefits (that would justify their involvement)?

TA3.2 Types of eligible funding actions: projects? Investments? Research?

TA3.3 Amounts of funding dedicated to SE EE/RES investments / projects / initiatives, and also vs total development funding amounts

TA3.4 Is the funding allocated sufficient, in your opinion?

TA3.5 How do we really know it is a good practice, a performing solution?

73. Evidence of success (evaluation of the good practice and its results)

In every municipalty which implemented the EMS energy consumption could be reduced by 10-20% with non investive measures. This savings where partly reinvestet to finance investive measures.

74. Transferability of the good practice: Is the good practice transferable? Are there any specific projects incldued in the good practice ? Please justify

The good practice can be transferred by several seminars for municipal employees to cover the basics of establishing an EMS.

75. Any other comments you wish to make

76. For more information	
Name of contact person	
Organisation	
e-Mail	
Mobile	

Annex 1 STEP thematic areas & GPs as per approved AF

BETTER IMPLEMENTATION OF SUSTAINABLE ENERGY POLICIES AT LOCAL LEVEL: Comprehensive approaches promoting the uptake of regional sustainable energy policies at local level

- Local SE action plans in urban areas (STRIA)
- Local SE plans in rural areas (SODEMASA)

SUSTAINABLE ENERGY MANAGEMENT SYSTEMS:GPs supporting local energy self-sufficiency, optimization & management tools for EE/RES

- ESCO (area based *Energy Service Company)* models for RES in public buildings (ARGEM)
- Energy performance audit (Arleg)
- Local Energy Management Systems (SAENA)
- RES in municipal district heating systems (Kainuu)

FINANCING TOOLS FOR SUSTAINABLE ENERGY INVESTMENTS: Innovative financing tools for boosting local EE/RES investments

- Alternative financing options for Public Sector investments (MWRA)
- Financing EE/RES initiatives in local authority functional areas (Midland)

ANNEX 2 STEP project THEMATIC AREA 1 Local sustainable energy plans

Table 7.Local Government Policies/Activities that Can Influence Renewable Energy[100]

The Energy and Climate concept in Saxony is still in a draft version. It failed to be approved two times within the district administration. In the first quarter of 2013 the energy and climate concept is

[100] SOURCE: Global Status Report on Local Renewable Energy Policies, Working Draft, 12 June 2009 A Collaborative Report by: REN21 Renewable Energy Policy Network for the 21st Century Institute for Sustainable Energy Policies (ISEP) ICLEI–Local Governments for Sustainability, page 10.

supposed to be confirmed. Until then, no statements can be made to the activities mentioned below.

Policy/ Activity Category	Areas	Descriptions of Policies/Activities by Sub-Category	
1. Target setting …	Target setting …	(a) CO2 reduction targets	
		(b) Future shares/amounts of renewable electricity or energy for all consumers in city	
		(c) Future shares/amounts of renewable electricity or energy for government operations and/or buildings	
		(d) Future shares or absolute numbers of buildings or homes with renewable energy installations	
		(e) Future shares/amounts of biofuels for the government vehicle fleet and/or for public transport	
		(f) Other types of targets, for example to become fossil-fuel free or "carbon neutral"	
2. Regulation based on legal responsibilities and jurisdiction ..	Urban	(a) Urban planning and zoning that encourages and integrates the local generation, distribution and use of renewable sources of power in the local jurisdiction--including planning and zoning for public transportation and electric vehicle infrastructure.	
	Building	(b) Building codes and/or permitting that applies to, or incorporates renewable energy in some manner. Examples: mandates for solar hot water and solar PV installations, zero-net-energy homes, shading legislation, and mandated design review/scoping of opportunities and potentials for renewable energy.	
	Taxes	(c) Tax credits and exemptions within tax systems: for example, sales, property and fuel taxes, permitting fees, and carbon taxes.	
	Other	(d) Other regulation, including municipal departments mandated to promote or plan for renewable energy, mandates for biofuels use in vehicles or biofuels blending, and mandatory carbon cap-and-trade.	
3. Operation of municipal infrastructure ..	Purchase	(a) Local government purchasing (and joint-purchasing with other municipalities or with private sector) to integrate renewable energy into government operations. Includes renewable electricity, biofuels, and bulk purchasing for market transformation programs.	
	Invest	(b) Local government investment in renewable energy for government buildings, schools, vehicle fleets, and public transport.	
	Utility	(c) Public utility regulation, including tariff regulation, renewable energy targets, feed-in tariffs, interconnection standards, net metering, and portfolio standards; also designates private utility policies of these types.	
4. Voluntary actions and government serving as a role model	Demo	(a) Demonstration projects, including participation in national pilot and demonstration projects. Often done with private sector.	
	Grants	(b) Grants, subsidies, and loans for investments in renewable energy by homeowners or businesses	

Policy/ Activity Category	Areas	Descriptions of Policies/Activities by Sub-Category	
...	Land	(c) Using local government land/property for renewable energy installations (leasing/selling/permitting). Can also include deals that require developer promises for renewables and efficiency.	
	Other	(d) Examples: joint ownership of private projects, city-financed investment funds, bond issues, and green certificates and trading.	
5.Information promotion, and raising awareness	Info/ promo	Includes public media campaigns and programs; recognition activities and awards; organization of stakeholders; forums and working groups; training programs; enabling access to finance by local stakeholders; enabling stakeholder-owned projects; removing barriers to community participation; energy audits and GIS databases; analysis of renewable energy potentials; information centers; and initiation and support for demonstration projects.	

ANNEX 3 STEP project THEMATIC AREA 3 Innovative financial tools for boosting local / regional sustainable energy investments

Table 8.Financing sustainable energy policies & projects		
I. Instruments supported by the member state/ region / municipality		
1.-Financial instruments supported by the municipality / region / member state. How long have the measures been in place?...	(a) Grants/Subsidies	
	(b) Funds (Levies)	
	(c) Preferential loans	
	(d) Rebates	
2. Fiscal instruments supported by the municipality / region / member state How long have the measures been in place?..	(a) Tax reduction	
	(b) Tax credit	
	(c) Reduced VAT	
	(d)	
3. Measures are supported by the individual instruments How long have the measures been in place?..	(a) Envelope (including insulation, windows & glazing, exterior wall, doors, ceiling, etc.)	
	(b) Equipment (including efficient heating, efficient lighting systems, ventilation, cooling, control systems, etc.)	
	(c) Other (including energy audits, consultancy costs, labour costs, education and training activities, etc.)	
4. The level of investment that is supported by the instruments	(a)	
	(b)	

Table 8.Financing sustainable energy policies & projects		
…	(c)	
	(d)	
5. Type of investment where the financial / fiscal measures are applies	(a) Private homes	
	(b) Private businesses	
	(c) Public sector offices	
	(d) Social infrastructure / utilities	
6. Level of ambition (what is the energy savings target of the measure), by %	(a)	
	(b)	
	(c)	
	(d)	
7. Innovative financing tools[101] Both were favoured	(a) Energy Performance Contracting (EPC) Third Party Financing (TPF), Energy Performance Contracting (EPC) and Contract Energy Management (CEM) are all terms used to cover a wide variety of contracting and financing techniques for energy efficiency and renewable energy projects[102].	
	(b) Energy Efficiency Obligation (Energy Efficiency Obligations (often called White Certificates) build on suppliers' obligation to foster energy efficiency improvements. At its simplest, an Energy Efficiency Obligation is a requirement on a group of market actors in one or more sectors of the energy industry in a given territory to achieve a specified energy saving target. These instruments are considered financial incentives as they leverage increased investment and facilitate the creation of additional cash flows)[103].	

[101] Dan Staniaszek and Eoin Lees, Determining Energy Savings for Energy Efficiency Obligation Schemes, eceee, 2012

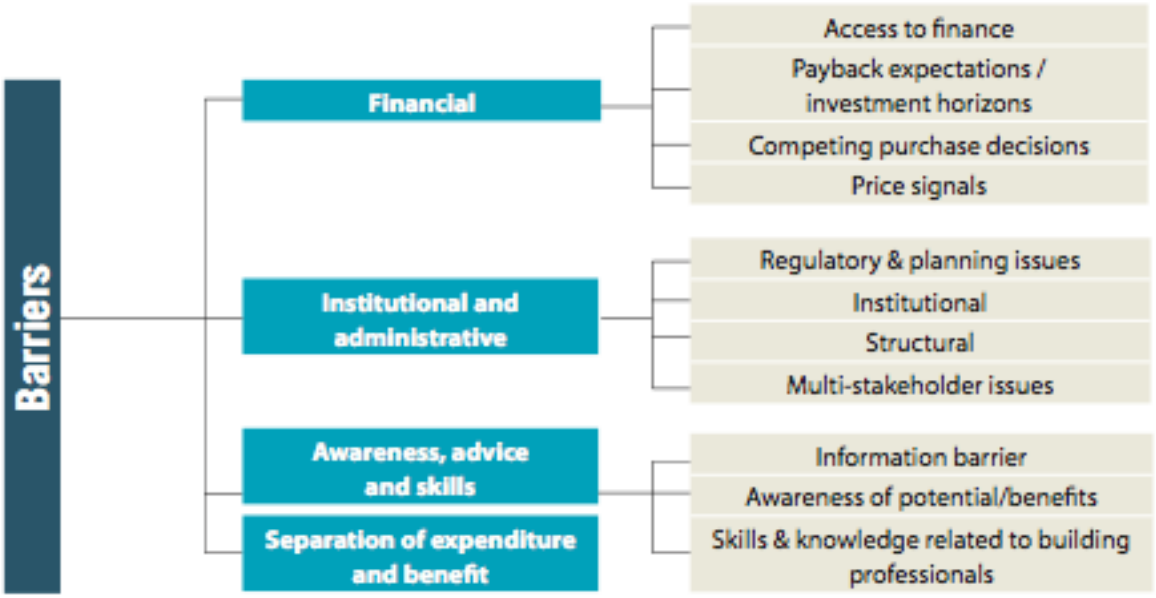
[102] Energy Charter Secretariat, Third Party Financing: Achieving its Potential, ECS, Brussels, 2003

[103] They have been used in the European Union for many years. The 2006 Energy End-use Efficiency and Energy Services Directive should have been the big breakthrough to get energy companies to play a major role in all Member States, but that did not happen. However, over the past decade there has been important awareness creation and information gathering. Europe has benefitted from the experience of several countries on the continent as well as from those in the United States. It was the US that has traditionally shown leadership in having energy companies play a significant role in promoting energy efficiency. This has been evolving since the 1970s. The most recent source of information on Energy Efficiency Obligations comes from an eceee[103] report produced by Eoin Lees for DG Energy in March

Table 8.Financing sustainable energy policies & projects		
	(c)	
	(d)	
Instruments supported by the EC &		
8. EIB (European Investment Bank)	(a) EIB lending focus themes: Renewable energy; Energy efficiency; Diversification and security of internal supply (including TEN-E); External energy security and economic development	
	(b) Energy efficiency loans (Residential, commercial and public buildings Transport (rail, road, urban transport) Electricity production & distribution Industry)	
	(c) ELENA (European Local Energy Assistance)(Project Development Services) Support to Final Beneficiaries with: Feasibility studiesBusiness Plans Technical studies (energy audits) Procurement/ tendering/ contracting Additional technical staff Financial structuring 90% of costs; investment programme supports EE investments in public and private buildings, including social housing and street and traffic lighting; DH networks; Decentralised CHP; Urban transport; Local energy infrastructure to support development in RES	
	(d) JESSICA Alongside DG-REGIO (=Structural Funds), JESSICA instruments in Structural Funds Regulations specifically provide for EIB to act as Holding Fund (on a not-for-profit basis), offering: Technical assistance and dissemination of best practice, based on established expertise in lending to urban renewal/regenerations projects across the EU; complementary loan financing for urban development projects. Eligible loan areas: Urban infrastructure, including transport, water/waste water, energy Heritage or cultural sites, for tourism or other sustainable uses; Redevelopment of brown-field sites, including site clearance and decontamination; Office space for SM.	

2012.

Barriers



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The major barrier to the adoption of clean energy continues to be related to cost, and local governments rely on offering financial incentives to address this barrier. Other barriers include: clean energy acceptance issues, split incentives, lack of knowledge and skilled labour, opposition from organised interests[105].

Overcoming barriers to clean energy *project development rather than just clean energy policy development* (e.g., financial incentive programs are policies designed to support project development).

104 SOURCE: BPIE, Europe' s Buildings Under the Microscope, p. 55.

105 S. Busche (2010) Clean Energy Policy Analyses: Analysis of the Status and Impact of Clean Energy Policies at the Local Level, Prepared under Task No. IGST.0103, http://www.osti.gov/bridge

GOOD PRACTICE 10 SMALL SCALE BIOMASS ENERGY SUPPLY AND ENERGY EFFICIENCY UPGRADES IN PUBLIC FACILITIES

General information

1. Name of the good practice	Innovative financing and operation of small scale biomass energy supply and energy efficiency upgrades in public facilities	
2. Thematic area (TA)	TA1 Better implementation of sustainable energy policies at local level	
	TA2 Development and implementation of sustainable energy management systems	
	TA3 Innovative financing tools for boosting local EE/RES investments	√
3. Type of good practice - check all relevant criteria	**3.1 Permanent initiative**	√
	3.2 Project	√
	3.3 Methodology	√
	3.4 Technology	
	3.5 Others	
4. What are the most important aspects of the good practice ? check all relevant criteria	**4.1 Performance of GP achieves EC set benchmarks for RES utilisation**	√
	4.2 Performance of GP contributes considerably to the achievement of EC set benchmarks (please mention how much) 95 % of heat for the site will be supplied by RES. EU target is 12% by 2020 for Ireland	√
	4.3 Energy costs have gone down (locally / regionally/ nationally)	√
	4.4 RES % participation in the «energy mix » of the community has increased (please mention by how much)	√ **>2%**
	4.5 Provable technological innovation The real innovation is in the delivery model	√
	4.6 Creation of organizational structures, dealing with energy matters. Contracting of the operation of the RES is a novel organisational structure for local authorities.	√
5. Contributing partner	North Tipperary County Council	

6. Location	Nenagh and Thurles Leisure Centres - Implemented Coolbawn Water Treatment Facility - Implemented
7. Start and end date of the good practice –if relevant	N/A

Regional context, all partners please fill in

8. Energy performance of the region

All partners please fill in Table 1 in Annex 2

Quantitative figures: % of RES in the overall energy production (if any) in the region; RES applications as % of the overall energy needs in the region; RES applications in the public sector, especially in buildings; RES in industries; energy intensity of the region; unit cost of energy per consummer in the region.

In 2011 renewable energy provided 57.82GWh of North Tipperary's total use of 1,996GWh. This means only 2.9% of the regions energy comes from renewable sources. The majority of the energy supply is produced from petroleum and natural gas sources, accounting for 56% and 14.5% respectively, which are imported into the region. Electricity accounts for 20.4% of the energy consumption.

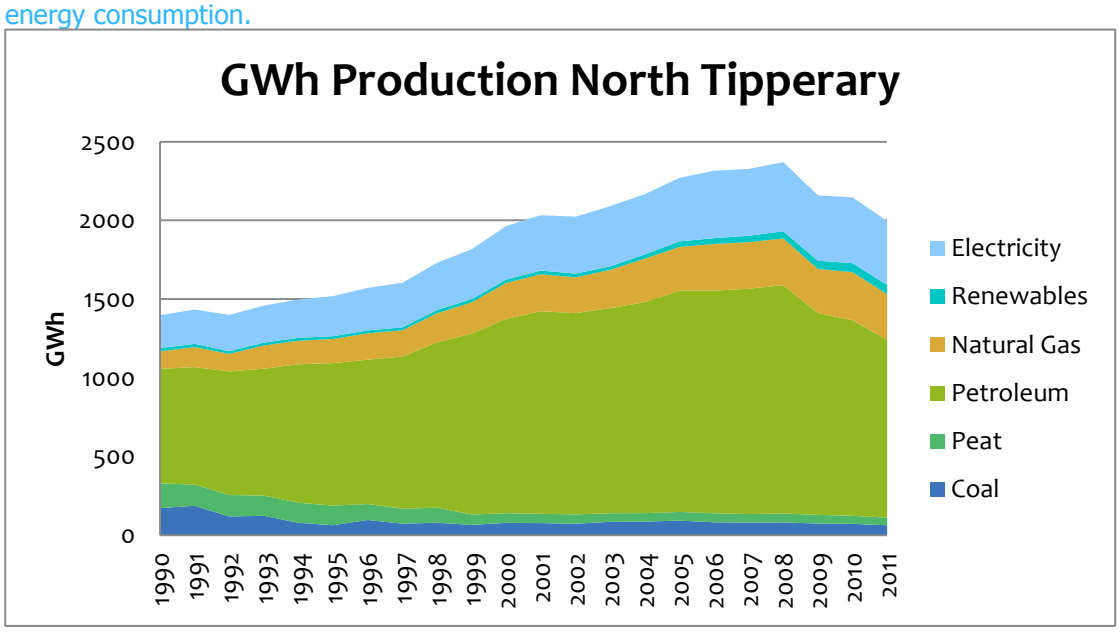


Figure 0-1: Energy production in North Tipperary Region

North Tipperary County Council has made significant inroads into adapting renewable energy supply within its public facilities. Three local authories leisure centres and one water treatment plant facility are powered by renewable energy supplies. The net result can be seen in the following graph:

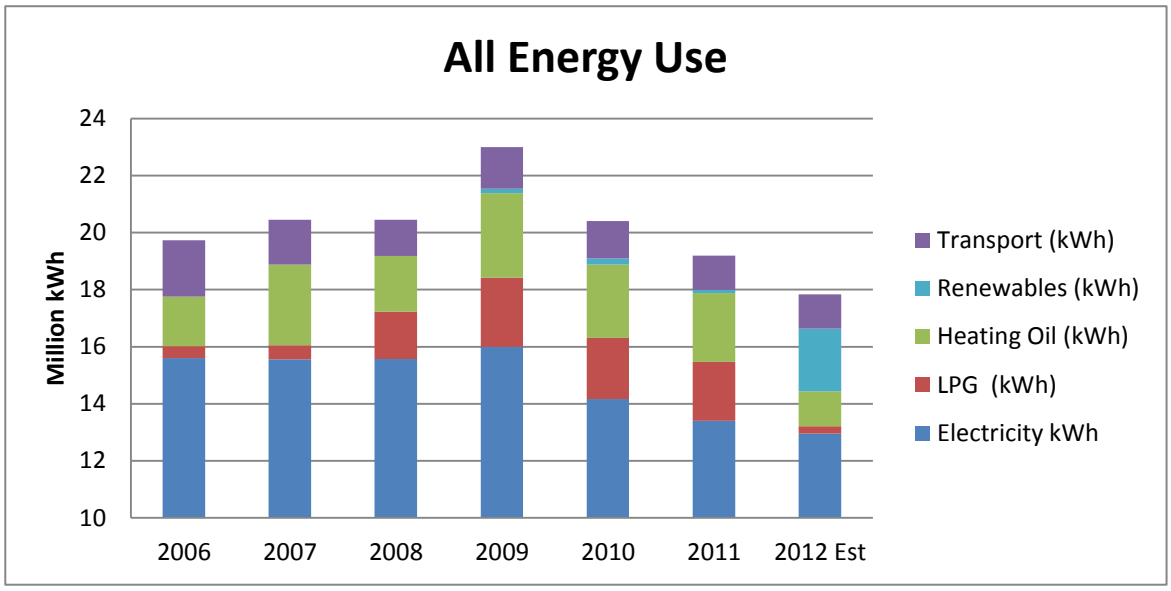
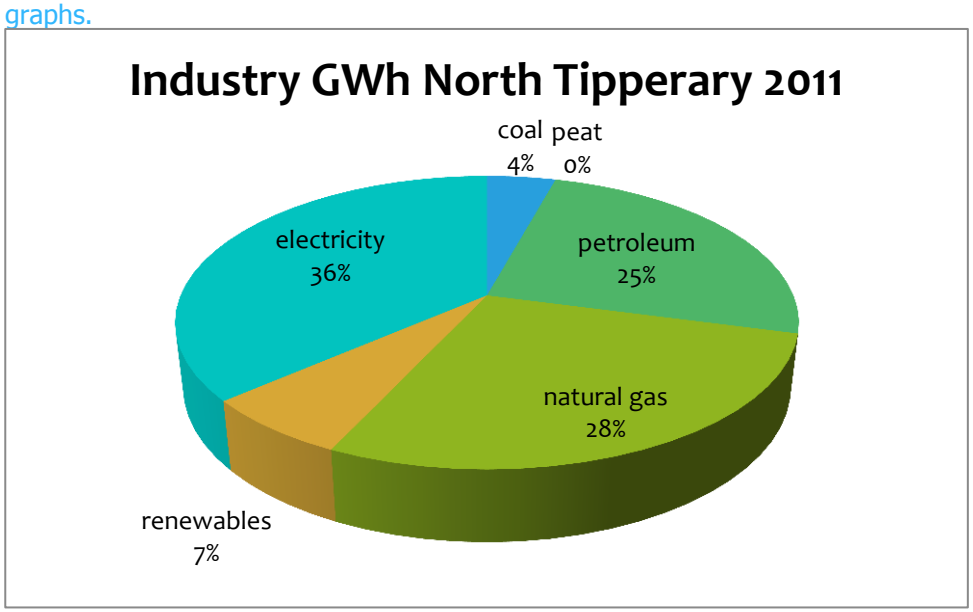
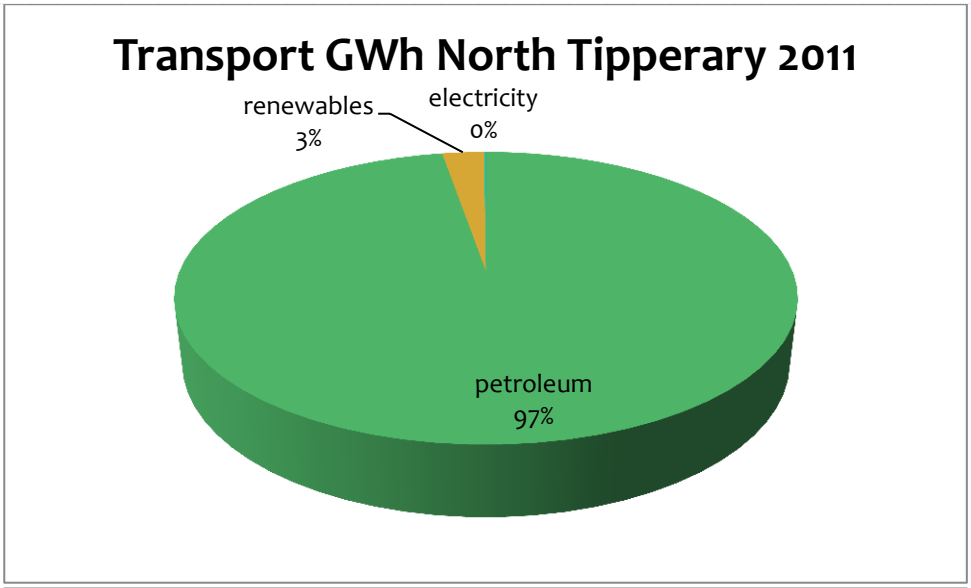
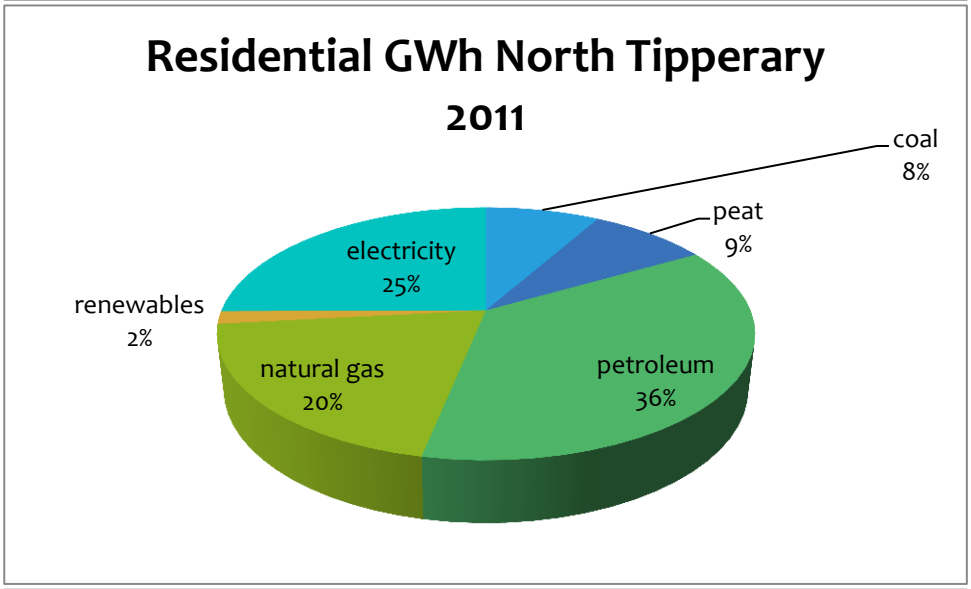


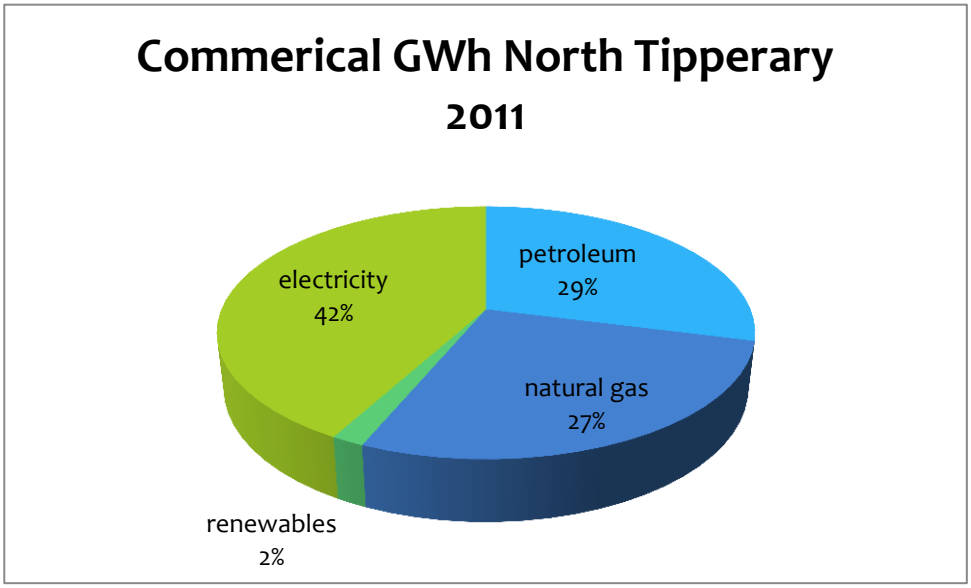
Figure 0-2: Energy use in North Tipperary County Council

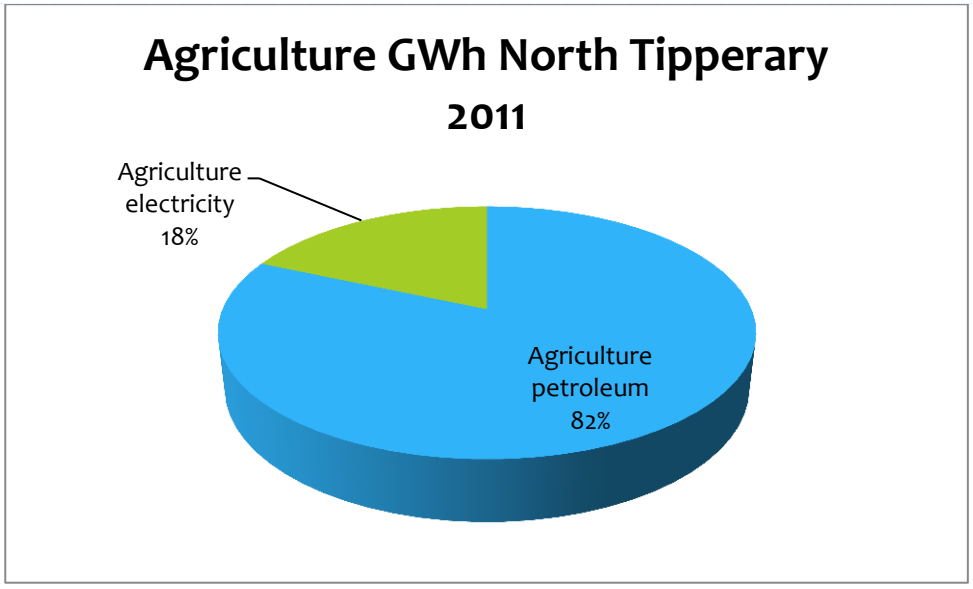
The council's renewable energy suppply accounts for 12% of its total demand. This directly mets the national bioenergy target of 12% by 2020.
The energy balance of each sector within North Tipperary for 2011 is presented in the following graphs.




Transport GWh North Tipperary 2011
renewables
3%
electricity
0%
petroleum
97%


Residential GWh North Tipperary
2011
coal
8%
peat
9%
electricity
25%
renewables
2%
natural gas
20%
petroleum
36%


Commerical GWh North Tipperary
2011
petroleum
29%
electricity
42%
natural gas
27%
renewables
2%



The most signifciant RES utilisation is seen within the industrial sector, with 6.7% of total energy production arising from renewable sources. RES utilisation of 2.6%, 1.6%, 1.67% and 0% is evident in the transport, residential, commerical and agricultural sectors respectively.

Current energy unit costs are attached for the domestic and commerical/indsutrial sector for each fuel type.

Sustainable energy policy tools: which is the local / regional energy policy tool, and what types of issues it addresses among the following categories: 1. Target setting; 2. Regulation based on legal responsibilities and jurisdiction; 3. Operation of municipal infrastructure; 4. Voluntary actions and government serving as role model; 5. Information, promotion and raising awareness.

Sustainable Energy Policies are primarily driven by national policy in Ireland. The Department of Communications, Energy and Natural resources have a Strategy for Renewable Energy 2012:2020. The strategy says that "*The development of renewable energy is central to overall energy policy in Ireland. Renewable energy reduces dependence on fossil fuels, improves security of supply, and reduces greenhouse gas emissions creating environmental benefits while delivering green jobs to the economy, thus contributing to national competitiveness and the jobs and growth agenda.*" The strategy sets out five strategic goals – increasing on and offshore wind, building a sustainable bioenergy sector, fostering R&D in renewables such as wave & tidal, growing sustainable transport and building out robust and efficient networks.

Improving Ireland's energy efficiency is an essential part of Ireland's sustainable energy policy, and will play a vital role in reducing our dependence of fossil fuels. The Government set out an energy policy framework in its White Paper: Delivering a Sustainable Energy Future for Ireland - the Energy Policy Framework for 2007-2020. The Government has committed to achieving, in 2020, a 20% reduction in energy demand across the whole of the economy through energy efficiency measures. Recognising that Government must lead by example, we are committed to achieving a 33% reduction in public sector energy use.

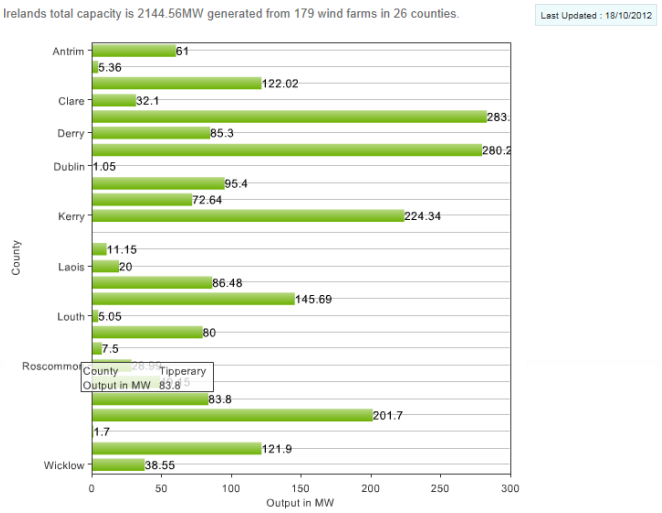
Within the region the Development Plan 2013-2019, Objective ST17 states that 'it is an objective of the Councils' to work with developers / operators of in-dustrial / commercial buildings in the use and installation of renewable technologies in order to achieve energy savings' (NTCC, 2011) . Furthermore, Policy ST11 states 'it is the policy of the Councils' to promote … the use of renewable energy resources in accordance with national policy and guidelines'.

RES production & applications, extent, barriers, any specialisation: How active is the local / regional RES progamme? What are the RES sources in your region? Where is the RES sold? Does it create a regional income? Is there a business sector associated with it? Which are the organisations coordianting the RES production in the region? Which are (if any) the organisations dealing with the RES research?how much of the regional / municipal energy needs are covered by RES? Has there been any effect in the energy prices? What have been the biggest problems in disseminating RES applications in the housing, public and ecoonmic productive sectors (services

and manufacturing)? Is there any organisation responsible for promoting applications of RES in the region?

The Mid West Region has considerable potential for renewable energy production with significant wind and biomass resources available.

Wind energy has been the primary renewable energy resource which has been developed in Ireland since 1995. Tipperary has a total of 8 wind farms, with a capacity of 83.8MW.



The Wind Energy Association of Ireland (WEAI) and Meitheal na Gaoithe (the wind farmers energy association of Ireland) are the primary regional coordinators of wind energy supply. The majority of this development has been completed by larger wind energy development companies. The Alternative Energy Requirement (AER) process, the Irish Government's support mechanism for electricity production from renewable energy has not to date stimulated specific community based projects, although it has specific bands for projects <3MW. In many cases the involvement of the community in the project is to object to the proposed development. The Tipperary Energy Agency are actively working on wind energy development at community level within the region. They recently implemented the Templederry community wind farm, consisting of 2 x 2.3MW turbines generating 11,759MWh per annum for 28 local farmers. Pursing maximum fincanical gains for the community is now being targeted by TEA through supplier-lite contracts.

Biomass presents strong potential to significantly reduce the heating bill for public body facilities as a whole and to bring the heating and hot water portion of each site's energy consumption to zero carbon emissions. To date, financial restrictions on public bodies in the MWRA has significantly deterred uptake of Renewable Energy Systems (RES), including Biomass. The innovative financial model developed by the Tipperary Energy Agency offers public bodies the opportunity to reduce their annual energy costs along with their carbon footprint, without the need for significant capital investment. The benefits of this risk removal model for the authority have been successfully demonstrated in four case studies within the region to date (Nenagh Leisure Centre, Thurles Leisure Centre, LIT Tipperary and Coolbawn Water Treatment Facility).

9. Context of the implementation of the good practice

Country	Ireland
Region	Mid-West Regional Authority Area

Population	371,900

Detailed description of the good practice

10. Description of the good practice (background, objectives, problem addressed, key aspects, activities it includes, institutions involved, costs entailed, financers (who is paying? For how long? How much?).

Please see attached report : MRA RES Good Practice Summary.doc

11. Questions spefic to the thematic areas of the good practices (TA:s)

TA1 Better implementation of sustainable energy policies at local level.

The focus of this thematic area is on comprehensive approaches promoting the uptake of regional sustainable energy policies at local level.

Local policies and activities to promote renewable energy can be grouped into five main categories: 1. Target setting; 2. Regulation based on legal responsibilities and jurisdiction; 3. Operation of municipal infrastructure; 4. Voluntary actions and government serving as role model; 5. Information, promotion and raising awareness. **Partners with GPs in this Thematic area please fill in Annex 2 Table 1 with special care and please link to the questions underneath.**

TA1.1 Is there a national policy promoting comprehensive approaches? Is there a pronounced regional sustainable energy policy? If yes, what are its objectives and main action lines? When was it established? Are there any measurable results? If yes, what are they? Is there a comprehensive policy background for RES support?

TA1.2 Have sector specific RES targets and action plans for 2020 been set up –as required by the RES Directive, in your region?

TA1.3 What are the existing support instruments for RES in your region? Have policy alternatives for RES been formulated in your region?

TA1.4 Have RES criteria been integrated into the relevant public procurement policies/procedures in your region?

TA1.5 Why do you feel that these tools are actually good practices?

TA2 Development of sustainable energy management systems

TA2 is essentially about the implementation of the EPBD, DIRECTIVE 2010/31/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 19 May 2010 on the energy performance of buildings, EU Energy Efficiency Action Plans (2006 and 2011)• EU Directive 2006/32/EC on energy end-use efficiency and

energy services (ESD) and the most recently endorsed (26.9.2012) Energy Efficiency Directive[106].
TA2.1 When did you start implementing sustainable management systems in your region?
TA2.2 Has the recast EPBD (2010) been transposed in your country? Is the recast EPBD enforced in your region? Is its enforcement monitored? Which are the institutions and what are the tools used to monitor the recast EPBD enforcement? Does the public sector in your region explicitly promote energy efficiency in private and public construction?
TA2.3 Do building regulations require that an energy performance certificate (EPC) must be produced whenever a building is sold, constructed or rented out? Does the EPC show the energy efficiency of a property and include recommendations on how it can be improved? Your EPC models?
TA2.4 Is a display energy certificate (DEC) obligatory on an annual basis for public buildings with a footprint larger than 1,000 m2? Does the DEC show the actual running costs of the building and is it displayed in a prominent place?
TA2.5 Are there requirements to set targets for an increase in the use of LZC (low/zero energy consumption) buildings with separate targets for new and refurbished dwellings; new and refurbished commercial buildings; buildings occupied by public authorities? Have you adopted a Local Energy Management System? Do you utilise ESCO models? What services do the ESCO units offer and what types of financing instruments they use? ESCOs usually offer such services as: Energy audits, feasibility studies, Engineering design, Equipment procurement, Subcontractor management, Construction, Measurement and verification, Operation and maintenance, Project financing.[107]

[106] **Mandatory energy-saving measures**, including renovating public buildings, energy-saving schemes for utilities, and energy audits for all large firms, will be required by an EU energy efficiency directive approved in plenary on Tuesday. Cutting energy consumption by 20% could save the EU €50 billion per year. Focus of the mandatory measures: Renovation of public buildings; Saving plans for utilities; Energy audits (all large enterprises); Financing facilities

[107] SOURCE: Bogdan Atanasiu Buildings Performance Institute Europe and Paolo Bertoldi European Commission Joint Research Centre Institute for Energy (2011) Energy Services Companies (ESCO' s) – definition and best practices across the EU,

TA2.6 How did the construction industry and consumers receive the new regulations? What have been the incurred costs on the overall construction investment and also on the maintenance of the buildings?

TA2.7 Is an energy management and controlling system implemented which assures a continuous monitoring of energy consumption of buildings? Describe in terms of organizational and financial aspects. Are responsibilities clearly defined?

TA2.8 Is the pool of municipal buildings evaluated in terms of energy performance (Energy Performance Indicators, Saving Potential, Energy supply and energy supply contracts etc.)?

TA2.9 On the basis of the evaluated pool of buildings, does a mid- and longterm planning exist concerning refurbishments of buildings? Are RES considered? Is there a detailed description of measures in terms of timeline, responsibilites and budget?

TA2.10 Are there regular educational measures for municipal staff responsible for the operation of buildings and its equipment/installations? Describe in terms of organizational means, content, frequency and persons concerned.

TA3 Innovative financing tools for boosting local EE/RES investments / do we include other types of sustainable energy investments?

Types of financial instruments supporting the energy performance of buildings[108] and otherwise:

- Subsidies allow prices to be kept low. They may be provided, for example, to manufacturers of energy efficient equipment such as compact fluorescent light bulbs.
- Grants are targeted at households, industrial or other energy consumers to pay for part or all of the cost of introducing energy efficient processes – such as enhanced building insulation.
- Grants or subsidies may be financed directly through the state or local authority budget or hypothecated taxes (also known as ring-fenced or ear-marked tax).
- Loan schemes to encourage energy efficient practices can be introduced with subsidised interest rates or credit risk support. Subsidies provided by the local authority or state budget to banks offering low interest rates are a fiscal policy.
- Value Added Tax (VAT) normally affects the final consumer but not the producer – who passes the cost onto the consumer. [. . .] differential VAT rates can be used to influence the choice of energy efficient technology by householders.
- Levies on consumption or production may be used to create a fund (e.g. a levy on electricity sales to fund renewable energy schemes).
- Less common, and thus considered innovative, include Energy Supply Obligations (also commonly

[108] ENERGY EFFICIENCY POLICIES IN BUILDINGS – THE USE OF FINANCIAL INSTRUMENTS AT MEMBER STATE LEVEL, BPIE 2012

known as White Certificates) or Energy Performance Contracting. They are considered innovative although Energy Performance Contracting has been around since the 1980s and Energy Supply Obligations since the 1990s. There is another important distinction to make which is relevant for policy-makers. It refers to innovative instruments entirely relying on private financing (and not government budgets). If used properly, they can provide long-term financial support that often cannot be guaranteed due to the changing budget priorities of national governments. Energy Performance Contracting has been deployed in Europe since the 1980s while Energy Efficiency Obligations started in the early 1990s in a few Member States

- European Investment Bank through Loans, ELENA and JESSICA supports investments in sustainable energy and energy efficiency.

Midland & MWRA partners please fill in Table 2 in Annex 3 and the related questions below.

TA3.1 Sources of funding per amounts and funding organisations; are there private actors involved? How? If yes, what is their contribution and what are the perceived benefits (that would justify their involvement)?

Private funding for the capital aspects of the project is provided upfront by the ESCO party. The benefits to the ESCO arise from the effieincy gains and cost reductions they will benefit from through retrofitting of the energy saving measures.

TA3.2 Types of eligible funding actions: projects? Investments? Research?

The funding covers the capital costs of the RES technology/solution.

TA3.3 Amounts of funding dedicated to SE EE/RES investments / projects / initiatives, and also vs total development funding amounts

0%

TA3.4 Is the funding allocated sufficient, in your opinion?

No requirement under this innovative financial practice.

TA3.5 How do we really know it is a good practice, a performing solution?

The case studies presented have been subjected to performance reviews post-installation, and on an annual basiss thereafter. They have clearly demonstrated significant savings to the local authority.

12. Evidence of success (evaluation of the good practice and its results

Please see attached report : MRA RES Good Practice Summary.doc

13. Transferability of the good practice: Is the good practice transferable? Are there any specific projects incldued in the good practice ? Please justify

Yes, the practice is directly replicable for other public body applications. To date it has been proven in leisure centres within the region. The feasibility to extend to other lesiure centres outside of the region is currently under review. It is also very applicable for public buildings and has been proven within the water treatment plant building.

14. Any other comments you wish to make

The solution pressented has been very well received with public bodies within the region. It has signficiantly reduced the energy cost baseline for Tipperary County Council and is actively being pursued for further buildings in the region.

15. For more information	
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Organisation	Tipperary Energy Agency
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Annex 1 STEP thematic areas & GPs as per approved AF

BETTER IMPLEMENTATION OF SUSTAINABLE ENERGY POLICIES AT LOCAL LEVEL: Comprehensive approaches promoting the uptake of regional sustainable energy policies at local level

- Local SE action plans in urban areas (STRIA)
- Local SE plans in rural areas (SODEMASA)

SUSTAINABLE ENERGY MANAGEMENT SYSTEMS:GPs supporting local energy self-sufficiency, optimization & management tools for EE/RES

- ESCO (area based *Energy Service Company)* models for RES in public buildings (ARGEM)
- Energy performance audit (Arleg)
- Local Energy Management Systems (SAENA)
- RES in municipal district heating systems (Kainuu)

FINANCING TOOLS FOR SUSTAINABLE ENERGY INVESTMENTS: Innovative financing tools for boosting local EE/RES investments

- Alternative financing options for Public Sector investments (MWRA)
- Financing EE/RES initiatives in local authority functional areas (Midland)

ANNEX 2 STEP project THEMATIC AREA 1 Local sustainable energy plans

Table 1.Local Government Policies/Activities that Can Influence Renewable Energy[109]

Policy/ Activity Category	Areas	Descriptions of Policies/Activities by Sub-Category	
1. Target setting …	Target setting …	(a) CO2 reduction targets	20% below 2005 levels by 2020 (National Target)
		(b) Future shares/amounts of renewable electricity or energy for all consumers in city	N/A
		(c) Future shares/amounts of renewable electricity or energy for government operations and/or buildings	N/A
		(d) Future shares or absolute numbers of buildings or homes with	10kwh/m2

[109] SOURCE: Global Status Report on Local Renewable Energy Policies, Working Draft, 12 June 2009 A Collaborative Report by: REN21 Renewable Energy Policy Network for the 21st Century Institute for Sustainable Energy Policies (ISEP) ICLEI–Local Governments for Sustainability, page 10.

Policy/ Activity Category	Areas	Descriptions of Policies/Activities by Sub-Category	
		renewable energy installations	per annum of heat from renewables
		(e) Future shares/amounts of biofuels for the government vehicle fleet and/or for public transport	10% biofuels in transport by 2020
		(f) Other types of targets, for example to become fossil-fuel free or "carbon neutral"	N/A
2. Regulation based on legal responsibilities and jurisdiction	Urban	(a) Urban planning and zoning that encourages and integrates the local generation, distribution and use of renewable sources of power in the local jurisdiction--including planning and zoning for public transportation and electric vehicle infrastructure.	
	Building	(b) Building codes and/or permitting that applies to, or incorporates renewable energy in some manner. Examples: mandates for solar hot water and solar PV installations, zero-net-energy homes, shading legislation, and mandated design review/scoping of opportunities and potentials for renewable energy.	2008 Building Regs. Eg 10kwh/m2 of domestic heat from renewable energy
	Taxes	(c) Tax credits and exemptions within tax systems: for example, sales, property and fuel taxes, permitting fees, and carbon taxes.	Carbon Tax of €15 per tone CO2
	Other	(d) Other regulation, including municipal departments mandated to promote or plan for renewable energy, mandates for biofuels use in vehicles or biofuels blending, and mandatory carbon cap-and-trade.	
3. Operation of municipal infrastructure	Purchase	(a) Local government purchasing (and joint-purchasing with other municipalities or with private sector) to integrate renewable energy into government operations. Includes renewable electricity, biofuels, and bulk purchasing for market transformation programs.	REFIT 3 (Renewable Energy Feed in Tariff)
	Invest	(b) Local government investment in renewable energy for government buildings, schools, vehicle fleets, and public transport.	SEAI BEC Grants shemes
	Utility	(c) Public utility regulation, including tariff regulation, renewable energy targets, feed-in tariffs, interconnection standards, net metering, and portfolio standards; also designates private utility policies of these types.	Commission for Energy Regulation (CER) REFIT 3
4. Voluntary actions and	Demo	(a) Demonstration projects, including participation in national pilot	

Policy/ Activity Category	Areas	Descriptions of Policies/Activities by Sub-Category	
government serving as a role model . . .		and demonstration projects. Often done with private sector.	
	Grants	(b) Grants, subsidies, and loans for investments in renewable energy by homeowners or businesses	SEAI BEC & SEAI BEH grants
	Land	(c) Using local government land/property for renewable energy installations (leasing/selling/permitting). Can also include deals that require developer promises for renewables and efficiency.	
	Other	(d) Examples: joint ownership of private projects, city-financed investment funds, bond issues, and green certificates and trading.	
5.Information promotion, and raising awareness	Info/ promo	Includes public media campaigns and programs; recognition activities and awards; organization of stakeholders; forums and working groups; training programs; enabling access to finance by local stakeholders; enabling stakeholder-owned projects; removing barriers to community participation; energy audits and GIS databases; analysis of renewable energy potentials; information centers; and initiation and support for demonstration projects.	Public Sector Energy Partnership program

ANNEX 3 STEP project THEMATIC AREA 3 Innovative financial tools for boosting local / regional sustainable energy investments

Table 2.Financing sustainable energy policies & projects

I. Instruments supported by the member state/ region / municipality

1.-Financial instruments supported by the municipality / region / member state. How long have the measures been in place?. . .	(a) Grants/Subsidies	SEAI Better Energy Communities Social Housing Retrofit funding
	(b) Funds (Levies)	None
	(c) Preferential loans	SEAI, ESCO/EPC supports available in 2013 -2014
	(d) Rebates	None
2. Fiscal instruments supported by the municipality / region /	(a) Tax reduction	None
	(b) Tax credit	None

Table 2.Financing sustainable energy policies & projects

member state How long have the measures been in place?. .	(c) Reduced VAT	None
	(d) Accelerated Capital Allowances introduced in 2008 The ACA is a tax incentive for companies paying corporation tax and aims to encourage investment in energy efficient equipment. The ACA offers an attractive incentive whereby it allows companies to write off 100% of the purchase value of qualifying energy efficient equipment against their profit in the year of purchase. http://www.seai.ie/Your_Business/Accelerated_Capital_Allowance	
3. Measures are supported by the individual instruments How long have the measures been in place?. .	(a) Envelope (including insulation, windows & glazing, exterior wall, doors, ceiling, etc.)	None
	(b) Equipment (including efficient heating, efficient lighting systems, ventilation, cooling, control systems, etc.)	None
	(c) Other (including energy audits, consultancy costs, labour costs, education and training activities, etc.)	SEAI Partnership Programme offers some support
4. The level of investment that is supported by the instruments . . .	(a) SEAI ESCO/EPC supports –10 Exemplar projects will be supported nationally in 2013, for projects >€500K, €35million	
	(b) SEAI Public Sector Programe – offers training, workshops, tailored supports to committed public bodies	
	(c) SEAI BEH €115m up to 2012	
	(d)	
5. Type of investment where the financial / fiscal measures are applies	(a) Private homes – from the national government funding proposals, SEAI BEH	20m
	(b) Private businesses	7m
	(c) Public sector offices	7m
	(d) Social infrastructure / utilities	30m
6. Level of ambition (what is the energy savings target of the measure), by %	(a) National Energy Efficiency Action plan targets	20% efficiency across the economy by 2020
	(b)	33% efficiency across the public sector

Table 2.Financing sustainable energy policies & projects

		by 2020
	(c)	
	(d)	
7. Innovative financing tools[110] Both were favoured	(a) Energy Performance Contracting (EPC) Third Party Financing (TPF), Energy Performance Contracting (EPC) and Contract Energy Management (CEM) are all terms used to cover a wide variety of contracting and financing techniques for energy efficiency and renewable energy projects[111].	Yes
	(b) Energy Efficiency Obligation (Energy Efficiency Obligations (often called White Certificates) build on suppliers' obligation to foster energy efficiency improvements. At its simplest, an Energy Efficiency Obligation is a requirement on a group of market actors in one or more sectors of the energy industry in a given territory to achieve a specified energy saving target. These instruments are considered financial incentives as they leverage increased investment and facilitate the creation of additional cash flows)[112].	
	(c)	
	(d)	
Instruments supported by the EC &		
8. EIB (European Investment Bank)	(a) EIB lending focus themes: Renewable energy; Energy efficiency; Diversification and security of internal supply (including TEN-E); External energy security and economic development	n/a
	(b) Energy efficiency loans (Residential, commercial and public buildings Transport (rail, road, urban transport) Electricity production	n/a

[110] Dan Staniaszek and Eoin Lees, Determining Energy Savings for Energy Efficiency Obligation Schemes, eceee, 2012

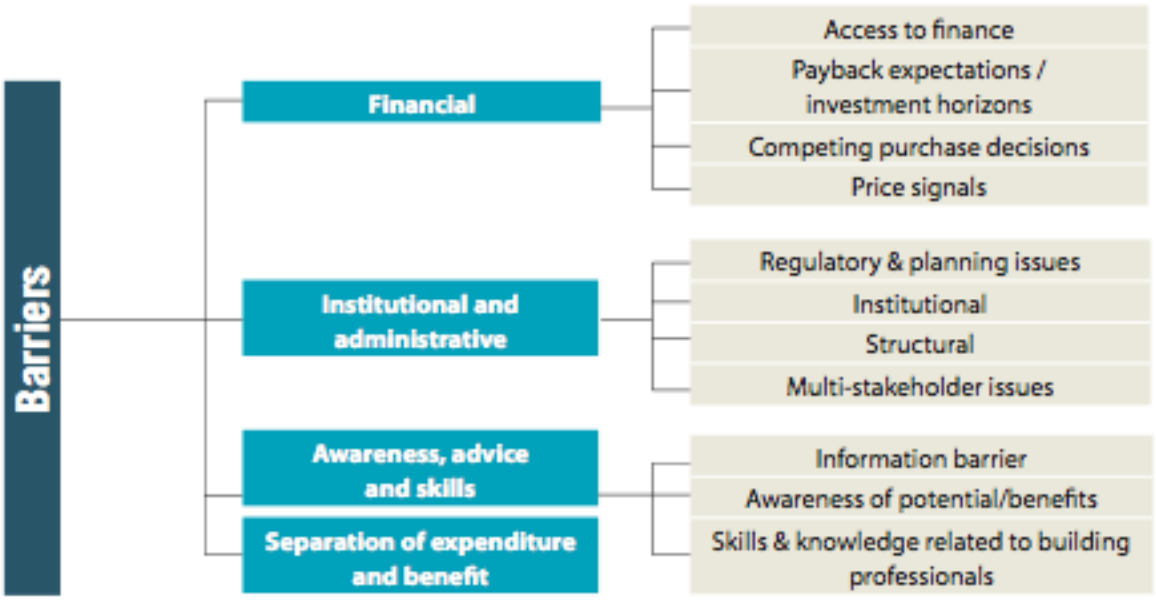
[111] Energy Charter Secretariat, Third Party Financing: Achieving its Potential, ECS, Brussels, 2003

[112] They have been used in the European Union for many years. The 2006 Energy End-use Efficiency and Energy Services Directive should have been the big breakthrough to get energy companies to play a major role in all Member States, but that did not happen. However, over the past decade there has been important awareness creation and information gathering. Europe has benefitted from the experience of several countries on the continent as well as from those in the United States. It was the US that has traditionally shown leadership in having energy companies play a significant role in promoting energy efficiency. This has been evolving since the 1970s. The most recent source of information on Energy Efficiency Obligations comes from an eceee[112] report produced by Eoin Lees for DG Energy in March 2012.

Table 2.Financing sustainable energy policies & projects

	& distributionIndustry)	
	(c) ELENA (European Local Energy Assistance)(Project Development Services) Support to Final Beneficiaries with: Feasibility studiesBusiness PlansTechnical studies (energy audits) Procurement/ tendering/ contracting Additional technical staff Financial structuring 90% of costs; investment programme supports EE investments in public and private buildings, including social housing and street and traffic lighting; DH networks; Decentralised CHP; Urban transport; Local energy infrastructure to support development in RES	n/a
	(d) JESSICA Alongside DG-REGIO (=Structural Funds), JESSICA instruments in Structural Funds Regulations specifically provide for EIB to act as Holding Fund (on a not-for-profit basis), offering: Technical assistance and dissemination of best practice, based on established expertise in lending to urban renewal/regenerations projects across the EU; complementary loan financing for urban development projects. Eligible loan areas: Urban infrastructure, including transport, water/waste water, energy Heritage or cultural sites, for tourism or other sustainable uses; Redevelopment of brown-field sites, including site clearance and decontamination; Office space for SM.	n/a

Barriers



113

The major barrier to the adoption of clean energy continues to be related to cost, and local governments rely on offering financial incentives to address this barrier. Other barriers include: clean energy acceptance issues, split incentives, lack of knowledge and skilled labour, opposition from organised interests[114].

Overcoming barriers to clean energy *project development rather than just clean energy policy development* (e.g., financial incentive programs are policies designed to support project development).

[113] SOURCE: BPIE, Europe' s Buildings Under the Microscope, p. 55.

[114] S. Busche (2010) Clean Energy Policy Analyses: Analysis of the Status and Impact of Clean Energy Policies at the Local Level, Prepared under Task No. IGST.0103, http://www.osti.gov/bridge

GOOD PRACTICE 11 FINANCING EE/RES INITIATIVES IN LOCAL AUTHORITY AREAS, IRELAND

- ANNEX 2 FINANCING MECHANISMS

ELENA – EUROPEAN LOCAL ENERGY ASSISTANCE

ELENA[115] is joint initiative of the European Commission and the European Investment Bank (EIB) helping local and regional authorities in preparing energy efficiency and renewable energy projects. ELENA technical assistance is available to authorities in EU Member States, Norway, Liechtenstein, Iceland and Former Yugoslavian Republic of Macedonia.

ELENA provides technical assistance for structuring programmes, business plans, market and feasibility studies, energy audits, preparing tendering procedures and contracts, and for paying for project implementation units. The EU contribution can be up to 90% of eligible costs.

Investments programmes requiring technical assistance can involve the improvement of energy efficiency in buildings or street lighting, the integration of renewable energy sources in buildings or the renovation or installation of district heating systems using CHP or renewable energy sources. Also urban transport programmes enhancing energy efficiency such as the introduction of energy-efficient buses or increasing renewable energy use in transport are eligible for the ELENA funding.

The ELENA funding aims to generate bankable investment projects attracting outside finance, e.g. local banks and other financial institutions, including the EIB. The projects can also be implemented as ESCOs.

EEEF – EUROPEAN ENERGY EFFICIENCY FUND

EEEF[116] is an innovative public-private partnership focusing on financing energy efficiency, small-scale renewable energy and clean urban transport projects targeting municipal, local and regional authorities as well as public and private entities acting on behalf of those authorities. The EEEF aims to support the 20/20/20 goals of the European Union through contributing to the mitigation of climate change, achieving economic sustainability of the Fund, and attracting private and public capital into climate financing.

EEEF Technical Assistance Facility aims to accelerate investments in the fields of energy efficiency, small-scale renewable energy and clean urban transport. The Technical Assistance Facility supports its beneficiaries in developing their projects by providing European Commission grants for up to 90 % of the total costs and subject to a later financing by EEEF. The TA grants aim to facilitate the implementation of projects by supporting the preparation of feasibility studies, business plans, tendering processes, etc.

Technical Assistance minimum leverage factor is 20, meaning that the investment size is at least 20 times higher than the estimated Technical Assistance.

EEEF targets investments in the EU Member States. The investment funding (eligible) beneficiaries are the same as the TA beneficiaries. Investments are granted as two types:

Direct investments to projects from project developers, ESCOs, small-scale renewable energy and energy efficiency service and supply companies serving the respective markets in the target countries.

[115] http://www.eib.org/products/elena/
[116] http://www.eeef.eu

Investments to Financial Institutions including those in local commercial banks, leasing companies and other selected financial institutions that finance or are committed to financing projects of the eligible final beneficiaries.

The European Energy Efficiency Fund (EEEF) is an initiative of the European Commission and the European Investment Bank. The capitalization is provided by the European Commission, the European Investment Bank, Cassa Depositi e Prestiti and Deutsche Bank. Deutsche Bank acts as Investment Manager managing also the Technical Assistance Facility.

EUROPEAN STRUCTURAL AND INVESTMENT FUNDS[117]

Five main funds work together to support economic development across all EU countries, in line with the Europe 2020 strategy objectives. The European Regional Development Fund ERDF aims to strengthen economic and social cohesion in the European Union by correcting imbalances between its regions.

The ERDF focuses its investments on four key priority areas:

Innovation and research;
The digital agenda;
Support for small and medium-sized enterprises (SMEs);
The low-carbon economy.

The ERDF resources allocated to these priorities will depend on the category of region. In more developed regions, at least 80% of funds must focus on at least two of these priorities; in transition regions, this focus is for 60% of the funds; and 50% in less developed regions.

Furthermore, some ERDF resources must be channeled specifically towards low-carbon economy projects:

More developed regions: 20%;
Transition regions: 15%; and
Less developed regions: 12%.

Under the European Territorial Cooperation programmes, at least 80% of funds will be concentrated on the four priority areas mentioned above.

The ERDF also gives particular attention to specific territorial characteristics. ERDF action is designed to reduce economic, environmental and social problems in urban areas, with a special focus on sustainable urban development. At least 5% of the ERDF resources are set aside for this field, through 'integrated actions' managed by cities.

Areas which are naturally disadvantaged from a geographical viewpoint (remote, mountainous or sparsely populated areas) benefit from special treatment. Lastly, the outermost areas also benefit from specific assistance from the ERDF to address possible disadvantages due to their remoteness.

[117] http://ec.europa.eu/regional_policy/thefunds/regional/index_en.cfm

THE COHESION FUND

The Cohesion Fund[118] is aimed at Member States who's gross national income per inhabitant is less than 90% of the EU average. The fund aims to reduce economic and social disparities and to promote sustainable development. It is subject to the same rules of programming, management and monitoring as the ERDF and ESF.

For the 2014-2020 period the countries eligible for Cohesion Fund are Bulgaria, Croatia, Cyprus, the Czech Republic, Estonia, Greece, Hungary, Latvia, Lithuania, Malta, Poland, Portugal, Romania, Slovakia and Slovenia.

Targeting projects with potential economic viability, financial instruments provide support for investments, e.g., as loans, guarantees, equity and other risk-bearing mechanisms (possibly combined with technical support), and interest rate subsidies or guarantee fee subsidies. The Cohesion Fund allocates funds to activities under two categories:

Trans-European transport networks[119]: The Cohesion Fund will support infrastructure projects under the Connecting Europe Facility; and

Environment: the Cohesion Fund can also support projects related to energy or transport, as long as they clearly benefit the environment in terms of energy efficiency, use of renewable energy, developing rail transport, supporting intermodality, strengthening public transport, etc.

SPECIAL SUPPORT INSTRUMENTS

Four joint initiatives have been developed by the European Commission (Directorate General for Regional Policy) in co-operation with the European Investment Bank group and other financial institutions in order to make cohesion policy more efficient and sustainable. JEREMIE and JESSICA[120] refer to the promotion of financial engineering instruments and JASPERS[121] and JASMINE operate as technical assistance facilities. JASPERS and JESSICA funding is targeted especially to regional and local public entities as beneficiaries and therefore introduced a bit further.

JASPERS -Joint Assistance to Support Projects in European Regions, is a technical assistance providing advice to the 13 countries that joined the European Union in 2004, 2007 and 2013 (Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovak and Slovenia) as well as to Greece, the former Yugoslav Republic of Macedonia, Montenegro and Serbia during project preparation, to help improve the quality of the major projects to be submitted for grant financing under the Structural and Cohesion Funds. The assistance is provided free of charge and is geared towards accelerating the absorption of the available funds.

JASPERS focuses on large projects with total costs exceeding EUR 25 million for environmental projects and EUR 50 million for transport or other sectors. However, there is flexibility about the thresholds in the case of small countries or where projects serve as pilot actions to establish best practice.

[118] http://ec.europa.eu/regional_policy/thefunds/cohesion/index_en.cfm
[119] http://ec.europa.eu/transport/themes/infrastructure/index_en.htm
[120] http:// www.jessica.europa.eu/
[121] http://www.jaspers-europa-info.org/

JASPERS is managed by the European Investment Bank EIB and co-sponsored by the European Commission (DG Regio), the European Bank for Reconstruction and Development EBRD and the German KfW. Obtaining of JASPERS technical assistance does not oblige the beneficiaries to use the investment funding of the EIB, EBRD or KfW.

JESSICA – Joint European Support for Sustainable Investment in City Areas, is an initiative of the European Commission developed in co-operation with the European Investment Bank (EIB) and the Council of Europe Development Bank (CEB). It supports sustainable urban development and regeneration through financial engineering mechanisms.

JESSICA enables structural fund managing authorities, cities and towns to engage with the private and banking sectors. This helps to leverage further investment, as well as technical and financial capacity in project implementation and management. It can also act as a powerful catalyst for the establishment of partnerships between countries, regions, cities, EIB, CEB, other banks, investors, etc. to address the problems faced by urban areas.

THE EUROPEAN TERRITORIAL COOPERATION OBJECTIVE

The European Territorial Co-operation Objective is financed by the European Regional Development Fund (ERDF) and supports cross-border, transnational and interregional co-operation programmes. Cohesion policy encourages regions and cities from different EU Member States to work together and learn from each other through joint programmes, projects and networks. In the period 2007-13 the European Territorial Co-operation Objective (formerly the INTERREG Community Initiative) covered three types of programmes:

cross-border co-operation programmes along internal EU borders
transnational co-operation programmes cover larger areas of co-operation such as the Baltic Sea, Alpine and Mediterranean regions.
The interregional co-operation programme (INTERREG IVC) and networking programmes (Urbact II, Interact II and ESPON) cover all 27 Member States of the EU. The programmes provide a framework for exchanging experience between regional and local bodies in different countries.

EUROPEAN GROUPINGS FOR TERRITORIAL COOPERATION

The European Grouping for Territorial Cooperation (EGTC) is a European legal instrument designed to facilitate and promote cross-border, transnational and interregional cooperation. EGTC enables regional and local authorities and other public bodies from different member states to set up cooperation groupings with a legal personality. The EGTC members can be e.g.:

Member States
Regional or local authorities
Associations
Any other public body

The EGTC enables public authorities of various Member States to team up and deliver joint services, without requiring a prior international agreement to be signed and ratified by national parliaments. Member States must however agree to the participation of potential members in their respective countries.

For example the Baltic Sea Region Programme is a co-operation programme under the European Territorial Co-operation Objective co-funded by the European Regional Development Fund (ERDF), and the European Neighbourhood and Partnership Instrument (ENPI). The MS joined in the co-operation programme are Denmark, Estonia, Germany, Latvia, Lithuania, Poland, Finland and Sweden, with the participation of Belarus, Norway and the Russian Federation.

The Programme is supported by the European Regional Development Fund (ERDF) for EU Member States, and by the European Neighbourhood and Partnership Instrument (ENPI) for Belarus and the Russian Federation. Norway provides its own funding.

The strategic objective of the Baltic Sea Region Programme is to strengthen the development towards a sustainable, competitive and territorially integrated Baltic Sea Region (BSR) by connecting potentials across borders.

THE NORDIC COUNCIL OF MINISTERS

The Nordic Council of Ministers is the forum for Nordic governmental co-operation. The NCM operations are involved directly or indirectly to several funding schemes to support operations to improved sustainability, competitiveness and cooperation between countries and regions. These funding institutions and programmes include the Nordica Development Fund NDF, Nordic Investment Bank NIB, Nordic Environment Finance Corporation NEFCO, Northern Periphery Programme.

The Nordic Development Fund (NDF) is a multilateral development finance institution of the five Nordic countries (Finland, Denmark, Iceland, Norway and Sweden). The NDF is to facilitate climate change investments in low-income countries in Africa, Asia and Latin America. The NDF operations reflect the Nordic countries' priorities in the areas of climate change and development. The operations are financed from the development cooperation budgets of the five Nordic countries.

The Nordic Investment Bank (NIB) finances projects that improve competitiveness and the environment of the Nordic and Baltic countries. The Bank offers long-term loans and guarantees on competitive market terms to its clients in the private and public sectors.

NIB is owned by Denmark, Estonia, Finland, Iceland, Latvia, Lithuania, Norway and Sweden. The Bank has lending operations in its member countries, but also in emerging markets: Africa and the Middle East, Asia, Europe and Eurasia, and Latin America.

NIB has an explicit environmental mandate and aspiration to promote environmentally friendly projects. In addition to financing investments improving the environment, the Bank also analyses the environmental impacts of each project considered for financing. Each loan project under consideration for financing undergoes an individual assessment of its potential environmental impact, including ecological and social aspects. A good part of the NIB total loan portfolio is classified as environmental loans. NIB has two specific environmental lending facilities: the Baltic Sea Environment (BASE) and The Climate Change, Energy Efficiency and Renewable Energy (CLEERE) frameworks.

Nordic Environment Finance Corporation (NEFCO) is an international financial institution established by the five Nordic countries. NEFCO finances investments and projects primarily in Russia, Ukraine, Estonia, Latvia, Lithuania, Moldova and Belarus but also climate projects across the world. NEFCO's main focus is to generate positive environmental effects of interest to the Nordic region.

NEFCO works with a series of different funding bodies to provide capital to support projects. The most important funding bodies are the Investment Fund, the Nordic Environmental Development Fund, the Testing Ground Facility carbon fund and the Barents Hot Spots Facility. NEFCO also

administers funds on behalf of other parties (e. g European Commission and the governments of the Nordic countries) providing resources to environmental projects.

NEFCO projects are typically run in partnership with the enterprise that 'owns' the project. Priority is on direct investments from, for example, public-private partnerships and corporate public services. NEFCO also co-operates with bilateral environmental assistance programmes.

THE NORTHERN PERIPHERY PROGRAMME

The Northern Periphery programme focuses on meeting the special challenges facing the northern, periphery regions, such as scattered populations in rural areas. Projects and initiatives in innovation, the environment, accessibility and contacts between town and country are given priority.