

ENERGY EFFICIENCY

*Surpassing Energy Targets through
Efficient Public Buildings*



Newsletter 02/2014



European Union
European Regional Development Fund



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Policy Recommendation

The Primary Recommendation is for member states to become more aware of the levels of certification within their own building stock. Are the requirements of the EPBD being implemented? What % of qualifying building stock has actually been certified to-date?

We Recommend to member states' Public Bodies, that have not already done so, to certify their buildings and lend support them in this action, by providing both technical advice and adequate funding.

On the basis of data collected through energy audits, draft guidelines to improve the condition and use of public building stocks, which include practical suggestions to improve energy efficiency in public buildings with maximum efficiency and investment.

Develop a communication campaign addressed to the general public and stakeholders, in order to spread the idea behind SERPENTE project's joint actions: to stimulate investments that facilitate the recovery of the building industry and enhance environmental protection, while paying for themselves thanks to the savings made.

We recommend that the EU clearly show what funding is available in the 2014-2020 budget to support awareness initiatives in public buildings and their capacity to create energy improvements.

We recommend that common rules be adopted across member states in the area of energy and ESCO Contracts.



EURONET
50/50

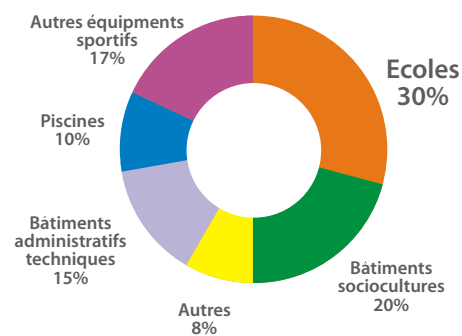
Energy efficiency

savings in Schools

As we are entering a transferability evaluation phase, regarding the Intereg IVC process, some local partners of the Local Energy Agency of Bordeaux metropolis have chosen to evaluate Euronet 50/50 project, which was previously implemented by our Serpente partner from Barcelona.

In France 30 % of a energy bill is consumed in Schools. Numerous initiatives have already been taken to arouse engagement to realize savings.

Serpente project, as it is organized in the frame of Intereg IVC program, has been the opportunity for Alec to get information about Euronet 50/50. Which has been implemented by several partners and to propose this methodology to its stakeholders as part of their implementation plan.



It is a participative and collaborative project for energy saving educational programs. It is a win-win project, enhancing awareness of consumers who don't pay the bill. This project concerns behavioural actions where the potential of saving can reach 10% without investments.

The 50/50 project offers the possibility to remove some obstacles observed through isolated initiatives implemented previously implemented by some local actors. The overall methodology has needed some adaptations to fit the French context, however the overall principle remains. The pilot phase of this project was the ideal vehicle for testing this methodology and tailoring same to fit the context. This will ensure the project is transferable and accepted at a wider territorial and national scale.

What will you find in our European Context Analysis?



It is estimated that Publicly owned or occupied buildings represent about 12% of the European building stock. There is no doubt about it, there is an urgent need to address the energy efficient renovation of these buildings, not only to save money and energy but to deliver on the EU's climate change and 2020's targets.

Despite slow progress on implementation of these targets, and the increasing lack of money dedicated to Public buildings in general, we have encountered brilliant initiatives taken by regional or local government's partners to improve energy efficiency of public buildings.

The European Context Analysis of the Serpente project gives an outlook of energy policies and includes also the best practices seen in the five subgroups of the project. Efficient technologies (monitoring of buildings, energy metering, heating and cooling systems, etc.) combined with simple measures (insulation of the roofs, energy efficient lights, behaviour change) can achieve a 50% reduction in the energy demand.

Among the recurring obstacles to good energy management that we have identified in the Serpente project are that departments involved in energy management and beneficiaries are not necessarily the same. Internalising these financial benefits and allocating them to the users would be an important step to save energy.

Implementation plan: an after project tool

The programme Interreg IV C is focused on exchange of experience on technical and policy level. In order to insure the durability and the continuity of this experience, Interreg IV C established a tool that will help local stakeholders/authorities to collect some lesson learnt during the project.

After the end of the project, the Implementation plan will provide a structure to implement actions and best practices learnt during the project. Thanks to that tool, the project's results will continue to influence local action and politics after the project's temporality. Each partner from SERPENTE project, should develop its own plan in cooperation with one local stakeholder. Regarding their Regional Operational Programme (ROP) and territorially objectives, the partner has to choose one or two good practices from SERPENTE project and develop it to the implementation plan.

The plan provides the detailed listing of activities, costs, expected difficulties and schedules that are required to achieve the objectives of the strategic local plan. SERPENTE project gather 10 different partners, some of them are local authorities others are Energy agencies. The difficulty to develop the implementation plan is different for each partner and the long-term success of the project lies on the development of this plan.



Interview with Mr Nicos Hadjinicolaou

*Industrial Officer at Ministry of Energy,
Commerce, Industry and Tourism, CYPRUS*

What does it mean „Energy efficiency in Public Buildings” in your country? How do you implement it?

Energy efficiency in public buildings means upgrading these buildings at least at the level of the current minimum energy performance requirements.

What are/were the biggest advantages of the energy efficiency in buildings investments in Cyprus?

I would say that the biggest advantage is that investments in energy efficiency in buildings are by definition investments of low risk, and if their done “wisely” they can have a very high rate of return. Additionally, there is a solid legislative framework the supports and encourages energy efficiency in buildings something not very common in other economic activities.

What obstacles do you face in financing projects related with energy efficiency in buildings?

Projects of upgrading energy efficiency of public buildings will be launched in 2014, so at the time we cannot determine these obstacles. The plan is to use different financing approaches or combinations according to each case. These approaches are Energy Performance Contracting (EPC), EU financial instruments, EU funding and public funding.

How the approach to energy has changed during the last few years in your country?

The last few years the public became more aware in matters of energy efficiency and renewable energy, which in great extent is due to several legislations that have been implemented, the subsidy scheme of the Special Fund and last but not least the increase in energy prices. However, there is more to be done in informing all the stakeholders about the benefits of energy efficiency in buildings in order to assist them to implement financially and technically optimum solutions.

Why projects like SERPENTE are worth of realizing?

The realization of projects like SERPENTE is very important because they set the example for the rest of the stakeholders to develop similar projects in the private sector. All parties involved in upgrading the energy efficiency of buildings can learn from the experiences of SERPENTE, implement them and improve them.

Free Cooling in Cork

An AC Sollution

Headquarters of Cork County Council,
County Hall Cork, Ireland.

As one of the SERPENTE partners chosen to undertake a pilot action Cork County Council decided to initiate a free-cooling project in the main IT server room of the County Hall campus. This is one of 3 server rooms in the overall campus and the success of this pilot would determine the merits of replicating a similar project in the other rooms.

This project posed a challenge from the beginning as a number of air conditioning companies had looked at this server room and could not install an 'off the shelf' solution due to the location of the room and the layout of the servers, therefore a new system had to be designed including components of successful applications previously visited.

Average reduction in air conditioning load of >90%

The project was completed and commissioned in quarter 4 of 2013 and to-date has worked beyond expectations resulting in an average reduction in air conditioning load of >90%. The final step in the pilot project will be verification of the savings using the IPMVP methodology.

Following the success of this project Cork County Council are now at the latter stages of designing a similar system for another server room and in parallel are beginning the investigation of installing a similar system in the final server room.

The final design was informed by a similar project undertaken by Barcelona Provincial Council, and by a site visit to see a large scale free cooling installation in a large data centre in Cork. The final design is quite simplistic in theory, however needed careful planning to ensure a successful conclusion.

In essence the design involves dividing the room into hot and cold aisles in order to confine the air which needs to be cooled, and then with 2 small fans pulling in colder fresh air from the outside and pushing it through to the hot aisle and exhausting the hot air.

Malmö Pilot:

an effective way to verify energy efficiency projects.

The SERPENTE project is about follow up good examples of energy efficiency projects. When making a follow up on energy projects you do not only provide knowledge to those who partake of the data but also experience and knowledge for yourself. But it is a time consuming job to follow up energy projects.

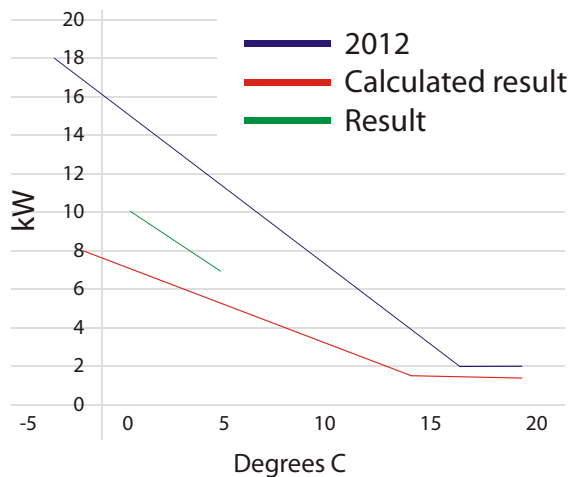
The Malmö pilot will develop an effective method for following up the results made by energy efficiency both for retrofitting's and new constructions. The goal is that the method shall in a early stage of follow up be able to:

- Determine if the retrofitting or new construction work as intended
- Find errors in installations early
- Making it easy to assimilate the experience of a renovation or new construction
- The method should be flexible, quick and easy to use



The idea of the model is to use the power signature of the property (the average power in relation to the outside temperature) to check and find errors in the property, this by comparing the power signature with theoretical calculations. The difference compared to only monitor energy usage on a monthly basis will be that the results after just a few months can be followed up and it then gives early indications of what it is that differs relative to the theoretical value. An example of this can be seen below for a preschool where the gas boiler has been replaced and heat recovery ventilation was installed in late 2013, and there are only three readings of the energy to follow up after the installation.

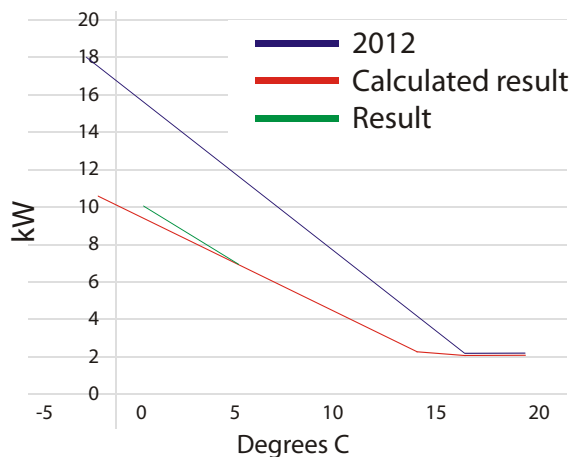
Malmö Pilot



The blue line is a power signature developed from 2012 data, the red line is a theoretical power signature for the building's heat after the actions was performed and the middle green line is the actual outcome of the energy use.

The example shows that the measures will save a lot of energy, but not as much as estimated. There is already a motive to control the gas boiler and ventilation on site. Indications from the model specify that probable inaccuracies may be due to causes that are affected by outdoor temperature (the energy use is dependent on how cold it is outside).

A benefit you get with this type of monitoring and follow up is that you can find errors that make the property consume more energy, which means that the contractor can fix the errors in an early stage. This results in higher energy savings and also a better indoor climate for the users. If it turns out that some errors cannot be fixed, or if the error is because of incorrect data for the calculations, it still means that there is experience to gain for the future so that errors are not repeated. This will both reduce operating costs and working towards a better environment. Savings that can be made with this type of monitoring is very large relative to the costs involved in implementing the follow-up. It might also lead to a greater interest for facility managers to take an interest in energy efficiency, and this make it easier to reach the EU's energy targets for 2020.



For example two things that are depending on the outdoor temperature might be if the ventilation flows before retrofitting was less than expected and the gas boiler efficiency might not be so much improved as expected in the calculations. If small changes are made on the efficiency of the boiler and the ventilation flows in the theoretical calculation then the results will look as below instead. However to know what is the cause, there has to be done an on-site inspection. The retrofitting demonstrates great savings compared to before, but the model shows that the result should have been even better. So there might be more to gain by checking the installations.

Energy Efficiency

In Buildings

The saying goes, the cheapest energy is the energy, you do not generate. We all know the measures to save energy in our homes, like changing appliances or incandescent light bulbs to compact fluorescent lamps, or LEDs. The main potential for energy savings in Europe is standing in our buildings all across the Europe, where most of the energy is used – and wasted.

Reducing energy use reduces energy costs for end users. Energy savings are also seen as a solution to the problem of reducing carbon dioxide emissions from energy generation. Efficient energy use is one of the main objectives of the European Energy Policy. The goal is a 20% cut in Europe's annual primary energy consumption by 2020.

The main legislative instrument to reduce the energy consumption of buildings and to achieve the “20% goal” across Europe is the Energy Performance of Buildings Directive 2010/31/EU (EPBD)¹. All member states of the EU have to adopt the measures in this directive.

There are some strong commitments, like achieving the Nearly Zero-Energy Buildings, which are to become the norm for all new buildings in the EU by the end of 2020, and two years earlier for public buildings.

However, some of the less demanding commitments have already shown positive impact on the energy efficiency roadmap. Consider for example a positive impact of the Energy Performance Certificate under the EPBD on sales and rental prices indicating that better energy efficiency is rewarded in the market. In one of the first studies² of its kind to include an analysis of residential markets in Europe, it was found that higher energy ratings result in substantially higher sales or rental values of buildings on average in most of the Member States that were analysed.

The directive obliges all EU countries to show their commitment and lead by example by renovating 3% of buildings owned and occupied by the central governments starting from 1 January 2014 and by including energy efficiency considerations in public procurement so as to purchase energy efficient buildings, products and services.

Energy Efficiency

For the building owner or manager is important to see in advance the retrofitting cost of the building and what savings it will bring in the coming years. Thus, it is mainly the financial issue, once there is a project, how to improve the energy efficiency of the building. The most important part should be the calculation of the Life Cycle Costs of the proposed measures and only then the investor can decide which of the proposed efficiency measures should be implemented.

The Life Cycle Costs include all the costs to build new technology, operation costs for the defined lifespan, and finally also the costs of the dismantling at the end of the life.

Assessment of the potential savings, preparation of the project, and especially its implementation is a demanding task, so there are specialized agencies to help with those steps. Owner of the building can commission the services of the ESCO provider and gain the guaranteed savings for a defined period of time.

Several initiatives are wanted to help planners, owners and builders to find the best practices for energy savings in operation and deep renovation of the existing buildings. One of the novel approaches is implemented by the SERPENTE project, where the best practices are developed "bottom-to-top" by the regional energy organizations from various European countries. For more general information on energy efficiency in buildings, see e.g. European Build-Up portal³, or LEED⁴ initiative by U.S. Green Building Council.

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¹ http://ec.europa.eu/energy/efficiency/buildings/buildings_en.htm

² http://ec.europa.eu/energy/efficiency/buildings/doc/20130619-energy_performance_certificates_in_buildings.pdf

³ <http://www.buildup.eu/>

⁴ <http://www.usgbc.org/leed>



INTERVIEW with Mercè Rius i Serra

Deputy president
for Environment Department
– Barcelona Provincial Council

How important is energy efficiency in Barcelona province? How is it implemented?

In the current economic and social situation energy efficiency and energy savings issues have an added value, beyond the environmental benefits, economic savings and social improvements. The employment generated thanks to energy efficiency refurbishing and to renewable energy projects is a qualified one and jobs created cannot be relocated easily; , considering an unemployment rate around 16% this is very important.

The main implementation instruments are SEAPs (Sustainable Energy Action Plan) that, fortunately, are widespread among the municipalities of our province and the ERDIBA-ELENA project.. SEAPs. identify actions that can be developed and ERDIBA-ELENA, provides technical assistance to carry out these projects.



INTERVIEW to Mercè Rius i Serra

(continuation)

Which energy efficiency measures are linked with the objectives of reducing emissions and tackling climate change?

Not all anthropogenic emissions are due to energy consumption, however we are talking about the most important part of them that not only affects to climate change but also to the health of the population, such as air pollution caused by transport in our urban areas.

Which is the level of cooperation with other levels of government?

Cooperation between public authorities is always desirable but often a difficulty issue. However, in recent years communication fluency between Local Authorities and the Catalan Government has increased significantly. A good example of this, in energy issues, is the cooperation between Catalanian Government, Barcelona Provincial Council and Metropolitan Area of Barcelona to organise the Sustainable Energy Week. Another good example of cooperation is the creation of the Covenant Club of Catalonia where the four Provincial Councils and Metropolitan Area of Barcelona work together to promote the Covenant of Mayors in Catalonia.

Which other actors, public or private, have a significant intervention?

Apart from the Catalan Government and the four Provincial Councils, other institutions have an important role like the Network of Cities and Towns Towards Sustainability, the Consortium of Local Environmental Initiatives (CILMA) and other agents such as the Energy Efficiency Cluster of Catalonia, which includes governments and companies.

Which are the main advantages of investing in energy efficiency in the municipalities of the province of Barcelona?

Currently, the main advantage of investments in energy efficiency over investments in other public sectors is having a short payback period; this allows the possibility of establishing public-private partnership/consortium. Therefore this advantage increases the feasibility of those projects and makes them attractive in a moment of economical difficulty.

Which barriers must be faced to carry out investments?

The main barriers are legal and financial. Legislation severely limits the borrowing capacity of municipalities and therefore there are viable projects that can not be developed by the legal threshold of capacity to incur debts. Moreover the Spanish regulation on renewable energy makes extremely difficult the application of self consumption to complement energy efficiency. Financial problems turn around the lack of credit and debt.

Which is the volume of investments accounted in the last three years, who has made them?

Is difficult to precise the volume of investments in energy efficiency in Barcelona. According to a report from the European Investment Bank, in 2008 there was an investment potential of over 1000 Million euros in buildings and municipal facilities in Barcelona. On the other hand, ERDIBA (ELENA project), about to finish, has generated investments for 130 Million euros during last 4 years. Most of the investments have been made through private investors (PPP), although there have also been some public investments. The work, developed to enhance public-private collaboration has been very useful and successful, so there is the desire to continue working on public-private partnerships when searching for investments in energy efficiency in public buildings.



In that time, in the municipalities of the province of Barcelona, has the political and civic concept of energy changed?

There is an important change in the behaviour of institutions and of citizens front energy uses. As well as with water uses, the drought represented a change in consumption patter leading to significant decrease (decreases that don't get back), the crisis is having a similar role with energy use and the consumption per inhabitant has decreased slightly.

Moreover awareness of the energy value is increasing due to as the arising of fuel poverty and the general consensus of climate change effects. On the other hand public authorities and private sector are doing an creative effort and to adapt energy management models, such as new ESCo (Energy Service Company) contracts or including energy investments in maintenance contracts, to our needs.



INTERVIEW to Mercè Rius i Serra

(continuation)

Which factors have facilitated investments?

- A greater awareness of the effects of wasting energy
- The assumption of causes and effects of climate change at local level, through the Covenant of Mayors.
- The need to optimise consumption in order to allocate resources to more urgent issues.
- The role of Barcelona Provincial Council, a second level local authority, as a main reference for technical assistance to the municipalities.
- And others that depend on local characteristics such as: associations, environmental activities, etc.)

Why and in which measure is useful the participation in European projects like SERPENTE?

Partnerships of European projects reach a unique concentration of information for both geographic and thematic scopes, and they have the ability to turn knowledge into action proposals for a very wide territory. Many actions could not be identified or implemented in one country, on the contrary they require different point of views and experiences of many organizations. SERPENTE is a good model for that. Very often, thanks to economies of scale in the acquisition of knowledge and the replication of actions, actions that would not be profitable for a single authority, become feasible, and a lot, when a good group of several authorities agree. Co-financing from the European Commission also helps. It facilitates the implementation of innovative solutions, often not provided in the annual budgets, because ordinary duties of administration leave slight space for new things. To summarize it up in three words: Knowledge, innovation and replication.

What could Barcelona Provincial Council teach to other partners? What can it learn from them?

The experience in developing SEAP's, proposing different measures to progress on reduction of municipal energy consumption and the experience acquired leading the European project Euronet 50/50, reaching reduction of energy consumption in schools through behavioural changes of its users, allows us to give the municipal point of view and the idea of working on energy savings with the involvement of consumers, users of municipal facilities. From the project and the other partners' experiences we can learn new management models and techniques, applied to many different types of buildings and facilities, such as museums, government buildings, sports and leisure, that emphasize learning regarding the involvement and participation of the managers of the buildings as well as of the users.

Which ways opens the European programming period 2014-2020 and the Europe 2020 Strategy for energy investments in the municipalities of the province of Barcelona and for Barcelona Provincial Council?

The promotion of a clean, safe and efficient energy and the fight against climate change established by Europe for 2020, also on the way of 2050, encourage all to implement measures to develop renewable energy, to increase energy efficiency, to reduce emissions and to adapt to climate change. Many of them are already in sustainable energy action plans and now it's time to implement them, even though we know we have limited resources and we have to use at maximum the money provided by the European Commission.

We have to get advantage from ERDF to promote energy efficiency and from LIFE to tackle climate change, all without losing recognition and using any other financial opportunity. European support to investments of local authorities is a key factor today, because in the next six years we don't expect to have significant increases in own incomes. The chapter of renewable energy is the one that might present more difficulties, it would be interesting that the European Union generates a legislative package ensuring a better development that helps reaching EU objectives.



Implementation of Pilot Activities in Cyprus

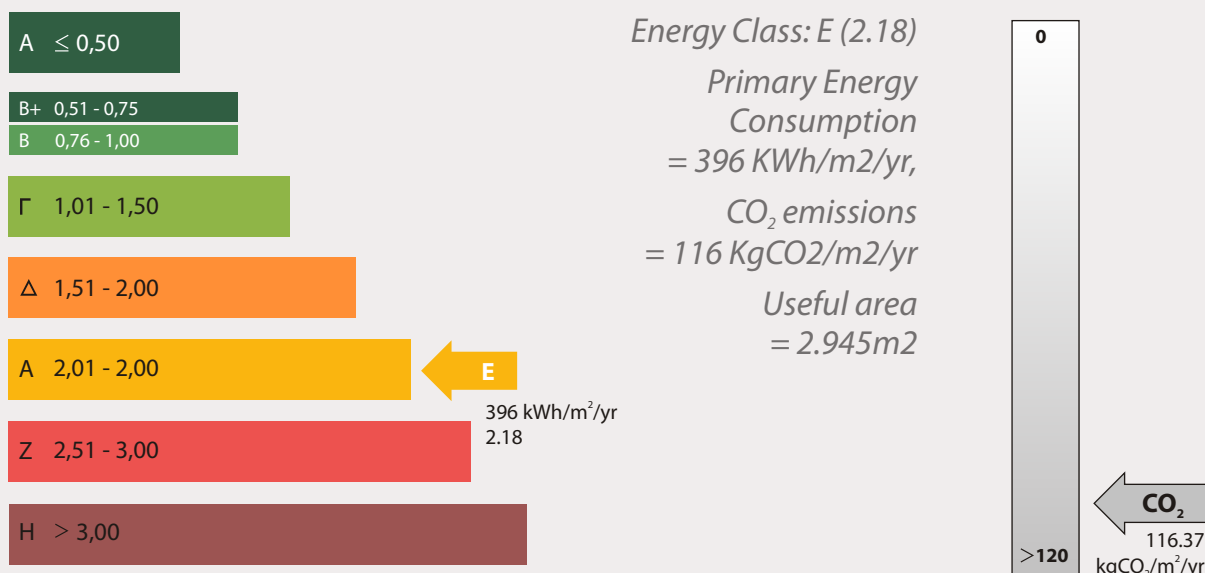
by the Cyprus Energy Agency



Modern building, luxury, externally lined with stone, was constructed around 1994 and added a small extension to the second floor in 2012. The original design had no provision for saving energy. Users of the building are energy conscious as Agios Athanasios Municipality has signed the Covenant of Mayors implements a SEAP. Only the extension to the second floor is very energy efficient as had been installed aluminum frames with thermal break and double glazing, roof insulation, LED lighting and efficient (for their time) air conditioners.

Proposed Energy Interventions:

- External insulation of the roof and walls
- Thermal insulation of the ground floor (basement ceiling)
- Replacement air conditioning units with energy efficient
- Installing LED lighting Installing PV for Self consumption



Sustainable Energy Week

the annual meeting in Brussels

The annually organized Sustainable Energy Week in Brussels attracts specialists from all over European Union to discuss and learn new developments in the field of energy. The energy efficiency is one of the key aspects that were addressed this year.

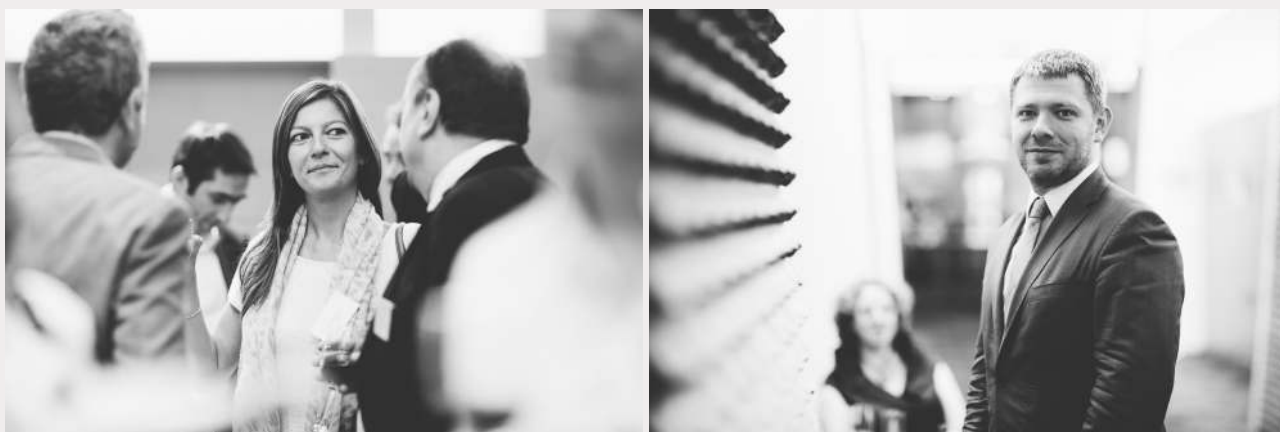


The key event was **High Level Conference**, which gathered the speakers from European institutions and guests from all over Europe to present their experience and approach towards more efficient energy use.

The keynote speech was held by **Dominique Ristori**, Director General of DG Energy.

The winners of Sustainable Energy Awards have been also presented during the special ceremony – where 6 categories have been chosen:

- communicating,
- consuming,
- learning,
- living,
- travelling,
- ManagEnergy Local Energy Action Award.



Partners of the SERPENTE project actively involved in the Sustainable Energy Week and hosted the seminar together with F.R.E.E. initiative on 26th June in Brussels. During the seminar **Dagmara Koska** – Member of the Cabinet of Energy Commissioner Günther Oettinger presented the challenges for upcoming years in terms of energy and efficient use of resources.

Next **Filip Helbig** – representing the SERPENTE Project showed the best practices in 5 related fields of the project – social housing, offices, sports facilities, schools and historical buildings. During the seminar the partners from Centre Urbain in Brussels and Cyprus Energy Agency were present to give participants of the meeting further details and technical data about the project developments.



The guests of the seminar were invited to join the final conference of SERPENTE project. The final conference will take place on 21st of November 2014 in Florence (Italy). Conference will be dedicated to present project's achievements and discuss the issues of energy efficiency in public buildings.

*Surpassing Energy Targets
through Efficient Public Buildings*



Final Conference

of Serpente Project

21st of November 2014
Florence, Italy

Details available soon

For more information visit our website:
www.serpente-project.eu/finalconference
www.serpente-project.eu



European Union
European Regional Development Fund





www.serpente-project.eu

All information and articles has been prepared by the partners of the SERPENTE project and are available on www.serpente-project.eu. For more information please contact Metropolitan Association of Upper Silesia (communication coordinator) serpente@gzm.org.pl or + 48 603 501 298.



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