Guideline for Energy Efficiency Commitment

WP322

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II. Introduction – General European Overview

Energy efficiency is at the heart of the Union's efforts to tackle the problems of energy security and climate change. With the recent financial crisis and downturn in the European economy, the case for energy and resource efficiency gains has become even stronger. It is crucial to find the most effective ways and methods ensuring less energy consumption. Since the public and the communal sector is a major energy consumer and the bulk of energy loss derives from the inefficient heating systems of public buildings, attention should be focussed on tackling the energetic situation of these buildings. GovernEE is intended to address this problem capitalizing on past and current initiatives in the field of energy efficiency (EE) and the use of renewable energy sources (RES). (Hódmezővásárhely, 2010)

The preconditions as well as the developed structures in the Energy sector are very different in some of the EU- member states. Hence it is not reasonable and not possible to realize concrete measures unitary in all countries. The realization of the EU-goals directed to the improvement of the energy efficiency in Great Britain by obligations of the big energy suppliers towards energy savings is worthily. As the energy suppliers normally want to sell as much as possible energy, it sounds paradox for the moment. Energy suppliers dispose of the adequate Knowhow in order to inform citizens, communities or companies about energy saving possibilities. A compulsory energy saving including parameters on quota and concrete figures is connected with a big control work and corresponding costs. Nevertheless it is advantageous, that the energy suppliers have no interest to hamper companies or communities at the realization of energy saving activities. Of course there is a danger if mainly the energy sector is responsible for energy saving and so the development and realization of new technologies will be influenced negatively. The costs for the demanded engagement but also the lower energy turnovers will be passed on to the consumer.

The regulations in Great Britain probably cannot be realized in all EU- countries. As there are results exist, the gained findings can be used from the countries.

In Central Europe many energy suppliers offer energy consulting for citizens and companies since more than 20 years as marketing activity. Of course, the consulting ends, if disadvantages for the supplier are to be expected. An independent and neutral consulting cannot be expected in this case. At the same time the danger exist, that due to the big promoting budgets the public opinion making with regard to technical developments or strategic decisions will be influenced in favor of the energy suppliers. A manifold and broad discussion and information via all media and by all energy market participants is important. Energy saving potentials can be quickly developed by the creation of useful political general frameworks, adjusted to the country specific situations connected with concrete activities in order to:

- The support of new ideas and technological developments
- Funding possibilities
- Education and Training

At community level the influencing possibilities towards energy suppliers are very limited. Regarding the GovernEE-Project, the findings from Great – Britain can be used only very limited.

Use of energy resources

Electric power supply

In Germany there are 4 big power suppliers EON, RWE, EnBW and Vattenfall, which have subdivided the market amongst them. These big suppliers have at the same time also shares in regional power suppliers, e.g. Public Utility Companies or they deliver to them electric power as well.

Also the grids belong majoritarian to these trusts or their subsidiary companies. This is the main reason that the price for electric power in Germany is considerably higher than in most countries in Europe.

Some Public Utility Companies produce parts of their power demand by themselves. More and more cogeneration plants are in use. Beside coal- and wood power plants the electric

power is locally generated by wind and photovoltaic plants, on a small scale also in small water power stations. Also the continuously increasing number of biogas plants contributes to the increase of renewable generated electric power in Germany. Nearly 40% of the spent elictric power in Saxony An halt 2011 was generated from renewable energies.

Electricity in the Czech Republic is mainly produced in thermal power plants (about 60%), in nuclear power plants (30%) and renewable energy sources (about 10%). As the fuel is used in thermal power plants primarily domestic brown coal, the state also supports the addition of biomass (but it leads to higher price and lack of local biomass for other customers), to a certain extent is also used natural gas (especially when combines production of electricity and heat).

Renewable energy sources in 2011 contribute to the total gross electricity consumption about 10.2% (in 2010, only 8.3%) in the Czech Republic. The structure of the domestic renewable mix looked like from the perspective of electricity as follows: 34% biogas and biomass, hydropower 29.7%, 29.4% photovoltaic, wind power 5.5% and 1.4% of landfill gas. The big problem caused the reckless and generous support for solar power plants that currently significantly increase the costs of electricity. The state ordered obligatorily to the distributional companies to purchase solar electricity at high prices and the costs relocate to the customers.

The price for the users consists of three main parts: the price of energy power, price of distribution and contribution to renewable energy sources. Just the contribution to renewable energy sources has grown rapidly. For that reason it becomes currently subsidizes part to mitigate the impact on the industry, which could move outside the Czech Republic. In order to have money for this subsidy, the government temporarily taxed earnings from photovoltaic plants.

There was an absurd situation when the state supports by law something, while at the same time it's taxed and limited by new laws. Wind power is also used to produce electricity in the Czech Republic but only in the limited extent because of the small wind energy potential in the Czech Republic. The main suppliers of electricity are ČEZ, E.O.N, etc.

Gas supply

Large areas in Germany carry a large area wide supply with natural gas, also in rural areas. Similar to the power supply there are some big supraregional suppliers who supply regional distributors and Public Utility Companies as well as big industrial consumers with gas. The regional gas grids, up to the house connection, belong normally to the regional suppliers. Since some years it has been possible, that also external suppliers can deliver gas to the consumers. The consumer has to pay to the grid owner a transmission fee. The amount will be defined by the Federal Grid Agency. Also with the gas supply there is no real competition.

Natural gas is also widely used in the Czech Republic. It comes mainly from the supply from Russia, thus becoming politically sensitive material. There are eight undergrounds with the second largest capacity from the Europe Union in the Czech Republic. Their capacity is sufficient for 40 to 60 days at the time of greatest need in the winter. Before 1990 the natural gas was used for cooking, for heating of small objects (because of lack of content gas heating) and for hot water heater. Later there was a vast majority of the gasification of the Czech Republic and its massive use. There are several suppliers (e.g. RWE), some supply natural gas and electricity at the same time.

The most important strategic objective of Hungarian renewable energy policy is to optimise the joint implementation of the security of supply, competitiveness and sustainability as primary national economic goals, while also taking into account long-term considerations . There can be various forms of interaction between the aforementioned threegoals –in many cases their implementation may conflict with one another, but they may also strengthen eachanother. For this reason, the measures drawn up for the achievement of these goals must place special emphasis on joint effects, the resolution of conflicts between the goals and the achievementof the greatest possible degree of consistency .The key areas of Hungarian renewable energy policy are the following:

(a) Security of supply. Hungary is highly dependent on energy source imports, and fulfils80 percent of its domestic crude oil demand, and over 83 percent of its natural gas consumption from imports, primarily from former CIS countries (due to the limited hydrocarbon reserves of the country, the shareof imports may increase further). Through theuse of renewable energy sources, the dependency on imports can be reduced, as the use of renewable energy is planned to be realised from domestic sources.

Environmental sustainability and climate protection. The use of renewable energy sources contributes to the reduction of CO2 emissions. When selecting specific applications, environmental and nature conservation considerations have special priority. An important means of ensuring that environmental and nature conservation aspects are taken into account is to include them as criteria for the measures detailed in point 4.1, having regard in particular to the establishment of aid schemes.

District heating

District heating you can find mainly in Towns. The plants are operated generally by Public Utility Companies or regional suppliers. In the past years some local gas grids were built which are supplied by biogas plants. District heating makes only sense, if the waste heat (e.g. from cogeneration plants) can be used and in a preferably small distance as much as possible heat will be spent.

Since 1999 Italy has seen a process of redefinition of its energy asset in order to allow the progressive liberalization of the energy market.

With the Decree 79/1999 the activities of production, transmission and distribution of electricity and gas were separated.

In the period 1999-2007 smaller and smaller users were made having opportunity to join the free gas and electricity market in order to decide which supplier they wanted to be provided by.

In 2007, the process of liberalization was concluded, when all domestic electricity users could finally access the free market.

Liberalization has created in Italy a variety of offers from suppliers. One main supplier is there (ENEL), who was previously responsible of the national electricity grid and main generation plants, but since ENEL has been forced to sell parts of its plants, more competitors have appeared on the market. Other competitors where in any case already present on the market, because of local municipal utilities (partly owned by Municipalities) who were responsible of electricity generation and distribution in mostly of the main cities of Italy.

Gas market was readier to liberalization since only a main transmission company was there in Italy (SNAM) and gas distribution was already mostly performed by local gas distributors, which joined the supplying market after liberalization.

Energy consortiums were also created, with the aim of offering special services to groups of customers, buying energy in the free market.

Local distribution of electricity and gas was initially assigned on a Municipal territorial scale to the same utilities who were operating before liberalization. Actually, as for gas distribution, public tenders have appeared after year 2007 in order to assign the distribution service at local level to the utility offering the best economic conditions.

Transmission of electricity and gas is still in the hand of one subject (Terna and SNAM respectively), because of the relevance of their work at national scale, even if they have been privatized.

As for energy supplying contracts, Italian Municipalities may actually approach either the energy provider who was working on the territory before liberalization (local Municipal utility, which have presently become a supplying company), either another supplier. For this reason some suppliers have decided to work mostly with public bodies (or have decided to create specific offers for them) offering specific services (typically discounts on the energy tariffs and quotas of certified green electricity).

Energy efficiency, as well as green generation, has been used by a few suppliers even in the past years as a tool to attract new consumers to join their company. However, the economic offer (with the sentences “price blocked for 2 years”, “you don’t have to worry for 2 years about variation of energy costs”) is usually the main marketing communication.

The district heating in the Czech Republic is used widely, especially in areas of construction in the period of years 1960 – 1990. At that time, the large housing estates were built. After 1990 the district heating spread to other areas for environmental reasons. In this way, air pollution by house-boiler plants for solid fuels was reduced. This type of heating system has to be preferentially considered according to the legislation in the areas where it is available as the renewable resources. The reason is that it is often the waste heat from electricity generation, which would not otherwise be used. Somewhere is the primary fuel for the heat natural gas, fuel oil or biogas. Since the type of fuel also affects the price per GJ. The waste heat from power plants is a more suitable energy, in the case of natural gas price

increases above the value of the domestic gas central heating and in the case of heating oil it goes about the most expensive thermal energy availability for direct heating by electricity. Heating companies are often co-owned by cities and their operation and development is coordinated by local councils.

Business volumes of DH in Hungary:

- District Heating supply: in 94 settlements
- (242 independent DH systems)
- Number of supplied flats: 640,000
- Built in thermal capacity: 10,300 MW
- Supplied heat energy: 14,300 GWh
- More than 80% of DH is generated by natural gas
- Heating demand of a standard flat (135 m3): 38 GJ
- Length of distribution network: 3,400 km

III. Role Model - British Energy Efficiency Commitment

The Energy Efficiency Commitment (EEC) is an obligation on gas and electricity suppliers that sets mandatory targets for the promotion of higher energy efficiency in the residential sector. (Fabio Forfori – eErg, 2006)

EEC is a non-tradable certificate-based framework mechanism. Encouraging the least-cost solution for obliged parties, the EEC gives the option to suppliers to trade on a bilateral basis their obligation or energy savings with other suppliers, once it has been approved by the organisation responsible for the implementation of EEC.(Fabio Forfori – eErg, 2006)

Ofgem5, the institution in charge of administering EEC, determined the energy efficiency targets for each gas or electricity supplier on whom obligations where imposed, and adjusted these targets yearly during the period of EEC application. Suppliers were accredited with energy savings for their schemes6 on ex-ante basis. The methodology for determining the energy savings attributed to measures corresponds to Defra's EEC targetsetting model.

The EEC supports the overall UK Climate Change Programme (CCP) as well as the Fuel Poverty Strategy. The UK's CCP sets out the UK's response to the worldwide call for action. Indeed, the Government has set a domestic goal to go further than the Kyoto commitment and cut the UK's emissions of carbon dioxide (CO2) by 20% below 1990 levels by 2010. (Fabio Forfori – eErg, 2006)

These were not sudden energy measures but were a series of programs that been in place since 1994 that were subsequently replaced. So there was gradual implementation in the market.

The EEC programme left freedom to suppliers about the ways to comply with obligations, giving them flexibility over the types of measure to implement and not requiring to spend a fixed amount of money.

The set of energy efficiency measures encouraged by the EEC is as follows:

- Cavity wall insulation
- Loft insulation, top up
- Loft insulation, virgin
- DIY loft insulation
- Draught stripping
- Tank insulation, new – for hot water tanks currently without any form of insulation
- Tank insulation, top-up – adding a further layer of insulation to reduce heat loss.
- Radiator panels
- Solid wall insulation
- Fridge saver-type programme
- Condensing boilers
- Heating controls upgrade
- Fuel switching
- CHP/Communal heating
- Appliance replacement
- CFL – first or extra bulbs

(Fabio Forfori – eErg, 2006)

EEC can be viewed as a continuation of Energy Efficiency Standards of Performance – EESoP – that operated between 1994 and 2002. EESoP obliged initially electricity suppliers, then electricity and gas suppliers, to encourage and assist consumers to take up energy efficiency opportunities, focusing particularly on pensioners and other low-income consumers. (Fabio Forfori – eErg, 2006)

Goals/Targets

Electricity and gas suppliers were required to achieve targets for the promotion of improvements in domestic energy efficiency. The EEC's objective is to contribute to the Climate Change Programme by cutting greenhouse gas emissions, and to help reducing 'fuel poverty' by providing help to low-income consumers. (Fabio Forfori – eErg, 2006)

Policy savings in the domestic sector are expected to reduce annual emissions by 4.8 MtC for 2010, these policy savings consist of 3.6 MtC from policies in the 2000 CCP and a further 1.2 MtC from the new measures introduced in 2006 CCP.
The EEC 2005-2008 is expected to reduce CO2 emissions by 0.6 MtC per year by 2010. (Fabio Forfori – eErg, 2006)

The target on energy savings had to be achieved in the residential sector, particularly in homes heated by gas, electricity, coal, oil or LPG. At least 50% of the total savings had to be met within the priority group.
Each supplier having more than 15000 customers was committed with an obligation. As a result, the following supplier groups were set a target under the EEC: Atlantic Electric and Gas, British Gas, Cambridge Gas, Dee Valley, EDF Energy, npower, Opus Energy, Powergen, Scottish and Southern Energy, Scottish Power, Telecom Plus and TXU Energy. Suppliers were free to target any domestic consumer in Great Britain (not only their own costumers). Energy saving measures were promoted through:

- direct offers to consumers
- partnerships with other organizations such as Social House Providers and charities
- partnerships with retailers and manufacturers
- links with other Government programmes

In the final year of the programme the suppliers managed to narrow the gap between their priority and non-priority group activity primarily by increasing the distribution of free low energy lamps to priority group households. (Fabio Forfori – eErg, 2006)

Roadmap

Ofgem is the Office of the Gas and Electricity Markets in the UK. It is an independent regulatory body that regulates energy companies in the UK. This office was responsible for the administration and implementation of the EEC. (Ofgem) Ofgem was responsible for:

- determining the energy efficiency targets for each gas or electricity supplier on whom obligations were imposed and yearly adjusting of these targets
- determining whether a proposed activity was to be considered as a qualifying action,
- determining the improvement in energy efficiency to be attributed to a qualifying action,
- providing, where appropriate, a supplier the written agreement allowing that part of or all its target can be achieved by another supplier,
- annual reporting to the Secretary of State for the Environment, Food and Rural Affairs. (Fabio Forfori – eErg, 2006)

Obliged suppliers met their targets by setting up sets of measures to promote and deliver energy efficiency measures to domestic consumers. As administrator, Ofgem put in place procedures to assess suppliers' actions and to oversee their progress and compliance against their targets. (Fabio Forfori – eErg, 2006)

Ofgem assessed whether a supplier's proposal could be a qualifying action under the Order, i.e. capable to produce improvements in energy efficiency that would not have otherwise happened. These proposals detailed the measures suppliers were planning to offer, how they would be promoted and who could benefit from them. (Fabio Forfori – eErg, 2006)

Suppliers were required to report on each set of measure once it had been completed to confirm the exact types and numbers of measures that were installed. (Fabio Forfori – eErg, 2006)

Results

The direct costs incurred by Ofgem in administering the EEC from April 2002 to March 2005 were 1,463 million € (1 million £). (Fabio Forfori – eErg, 2006)

EEC's mechanisms offered flexibility to suppliers in meeting their obligations at least cost, and in the ways of financing actions undertaken. It was anyway predicted a total expenditure of about €330 million per year including energy supplier indirect costs, of which €222 million from energy suppliers and the balance €108 million from other sources (customers' contribution, social landlords, charities, manufacturers, etc). (Fabio Forfori – eErg, 2006)

Suppliers' cost to develop and administer EEC related activities was estimated around the 21% of the cost of inducing energy savings (estimate based on the previous EESoP experience). (Fabio Forfori – eErg, 2006)

Today

There has been a market transformation as a result of the EEC. The impact of EEC and its predecessors on has been most marked for those energy efficiency products where there is an opportunity to change the purchasing decision of the consumer to a more energy efficient solution. In EEC1, this was particularly relevant for white good appliances (i.e. refrigeration, washing and dishwashing appliances) but significant developments occurred in the condensing boiler sector as well. For lighting, there was a significant increase in the number of CFLs given or supplied to households but despite the significant increase, the market for lighting products remains dominated by incandescent light bulbs. (Fabio Forfori – eErg, 2006)

There are several effects in operation, including the impact of labelling itself and Energy Efficiency Recommended. But there seems little doubt that EEC is critical. The key delivery mechanism for appliances in EEC is through arrangements under which energy suppliers incentivise A-rated sales in the major white goods retailers. (Fabio Forfori – eErg, 2006)

Under the Utilities Act 2000, the Government placed on electricity and gas suppliers an obligation to achieve energy efficiency improvements. The Government is responsible for setting the level of the overall obligation on companies and the broad criteria for the operation of the Energy Efficiency Commitment. The Utilities Act 2000 introduced new liberalised market and regulatory structures for the energy industry. The Act also made Government responsible for setting the level and form of future energy efficiency performance standards. In the preparation of the new utilities legislation, the Government (March 2000) consulted energy utilities, consumer bodies and others on the practicality of operating EESoPs in the liberalised domestic energy market, and the new regulatory structure. It was agreed to make changes to the EESoP to bring it into line with the newly liberalised market, while retaining its basic aims. The new mechanism proposed was the Energy Efficiency Commitment (EEC). The Electricity and Gas (Energy Efficiency Obligations) Order 2001 No. 4011 set the legal basis for the EEC. (Fabio Forfori – eErg, 2006)

Ofgem apportions the overall obligation for energy efficiency improvement between suppliers and is responsible for successive annual updatings to their individual obligations. The apportionment between suppliers was determined on the basis of their number of customers. Each supplier having more than 15000 customers was committed with an obligation. In order to reflect the higher costs incurred by smaller companies, targets are progressive, so that a smaller company had a lower target in proportion to its customer numbers than a larger company. (Fabio Forfori – eErg, 2006)

Once committed to their obligations, suppliers were requested to submit to Ofgem their energy efficiency schemes for meeting the target. Suppliers had freedom to develop their scheme on the basis of a least-cost approach, having their measures to achieve EEC obligations through residential consumers' savings of electricity, gas, coal, oil or liquid petroleum gas. Ofgem was responsible to determine whether measures proposed by suppliers qualify for the purpose of achieving their EE obligations (i.e. measures involve qualifying actions). Ofgem considered each measure case-by-case, however general principles and a list of allowed actions were previously provided. (Fabio Forfori – eErg, 2006)

Suppliers are requested to realize qualifying actions installing measures in accordance with particular quality standards. These are set in Ofgem's EEC Technical Guidance Manual. Suppliers also provided reports – annually and quarterly – on actions and results. In addition, there were independent audits also conducted. (Fabio Forfori – eErg, 2006)

Particularly important was the synergy and partnerships established between the EEC and other previously existing or newly implemented measures and programs. This helped especially by ensuring that all measures implemented by the government and other bodies helped to promote the general goal of energy efficiency creating efficiencies in their own right. (Fabio Forfori – eErg, 2006)

The number of EE measures installed by suppliers resulted in an energy saving of:

- 433.6 PJ including uplifts or 98% of the overall target of 442.4 PJ. The net energy saving excluding uplifts is 402 PJ. It has to be noted that energy savings deriving by the total number of measures installed (i.e. measures taken into account into EEC1+EEC2) results in 727.6 PJ or 164% of the overall target.

- 312.5 FS PJ or 140% of the overall target of 223.2 FS PJ according to Ofgem methodology. The solvent suppliers have over-achieved against the overall target by roughly 90 FS PJ of energy savings and this will be transferred to the EEC 2005-2008. (Fabio Forfori – eErg, 2006)

The overall target of 442.4 PJ was over-achieved by 164% but during the three years of EEC one supplier went into administration and one into administrative receivership and did not comply with their targets. As a consequence, taking also into account the decision of the solvent companies to transfer their exceeding energy savings to EEC 2005-2008, the delivered total amount of energy savings is 402 PJ. The shortfall (40.4 PJ) is 9.1% of the overall target. In the Eoin Lees, 2006: Report to Defra estimates energy suppliers indirect costs in £87.9 million. Depreciating 44% of £87.9 million (installations, appliances) over 10

years and the remaining 56% (insulation measures) over 25 years, gives a depreciated indirect cost of £30.5 million, i.e. €44.7 million (Fabio Forfori – eErg, 2006)

Factors to consider

The EEC Programme can be considered a successful action, since targets were overachieved and a continuation of the programme is running; the main success factors are:

- On suppliers' and market side: supplier's skill and market preparedness due to previous experience of EESoP;
- On customers' side: the important share of financing afforded by suppliers or other financing bodies, thus softening customers' costs; this factor being stronger in relation to the priority group that received a greater financing support.
- EEC is a mandatory obligation subject to penalty in case of non-compliance (up to 10% of supplier's turnover). Complying with EEC commitment is a requirement of the Supply Licence. This means that if the requirement were not met, government had the ultimate sanction to revoke the Supply License. (Fabio Forfori – eErg, 2006)

Some possible fail factors, whose absence could have further improved the success of EEC are:

- Bundling of EE measures could lower project acquisition cost;
- Cheapest, most mature and relatively easy to implement EE measures mostly promoted
- Addressing also industrial and non residential sectors would allow to achieve higher energy savings.
- Except from lighting sector, EEC has not stimulated in the direction of technical innovation. Technical innovation should be included and promoted among the criterias that define eligible measures to reach each supplier's target. (Fabio Forfori – eErg, 2006)

What this means for GovernEE Partners cities

Although the UK was the first country worldwide to implement such measures into law, every GovernEE partner country has an energy efficiency plan in accordance with EU Directive 2006/32/EC. These plans are very detailed and provide extensive information on how to increase energy efficiency in your own countries and what are the steps the government is taking.

Conclusions

The EEC can be considered successful from the point of view of the obligations implemented by Ofgem and the effectiveness of actions taken by suppliers and the public. With the number of small measures such as changing the temperature on the thermostat, plugging droughts, and/or changing to more efficient light bulbs, this made it easy for the public to accept as well as suppliers to provide services on a more regular basis. In addition, providing incentives for energy saving services is an excellent way to promote them. (Fabio Forfori – eErg, 2006)

The GovernEE project is intended to address this problem of energy efficiency by capitalizing on past and current initiatives in the field of energy efficiency (EE) in this case, the Energy Efficiency Commitment of the UK. This is one of many energy efficiency commitments and plans in place in the European Union which is at the heart of the Union's efforts to tackle the problems of energy security and climate change. With the recent financial crisis and downturn in the European economy, the case for energy and resource efficiency gains has become even stronger. It is crucial to find the most effective ways and methods ensuring less energy consumption. (Hódmezővásárhely, 2010)

IV. Present situation – Existing techniques in Europe

a, Current national tools, guidelines, provisions, possibilities to the obligation of large energy suppliers directed to save energy with their consumers.

In Germany and Hungary there are some laws and guidelines regarding energy efficiency.

In the energy saving act **(EnEV in Germany, In the 7/2006 (V.24.) TNM Building code in Hungary)** there are some energetic minimum standards for the building shell and installation engineering defined. (Transmission heat losses and primary energy need). The EnEV applies for all heated living and other buildings. It is distinguished between new buildings, stock buildings and restoration of buildings. In the Renewable Energies Heat Law is stated, that in every new built building a certain percentage of the needed heat has to be generated by regenerative energies. In some Federal States, but not in Saxony- Anhalt, this rule applies also for buildings that will be reconstructed. Nearly all energy supplying companies in Germany belong to the free economy and want to make profit. This applies also to the Public Utility Companies. It is in the interest of the companies to sell as much as possible energy and not to save it.

There are no guidelines, provisions or laws which oblige the energy suppliers to take care about energy saving in Germany, and in Central Europe.

Nevertheless, the majority of the energy supplying companies, especially Public Utility Companies and regional energy suppliers, offer free of charge information and consulting services regarding energy saving. This is mainly done due to marketing or to the customers' retention. But also for companies and communities consulting services are offered. Before companies can't pay their energy bills it is better, to show them possibilities for more energy efficiency, e.g. load management.

Energy suppliers have original no interest regarding energy efficiency. Hence, an independent and professional energy consulting organised by the energy supplieres is not to be expected. An obligation from the German point of view is not conceivable. Advantages would be, that the energy suppliers dispose of a big knowhow as well as corresponding financial possibilities and manpower. Disadvantages would be, that an independent consulting is not guaranteed and that the more than 10.000 energy consultants would loose their jobs.

Under its National Energy Efficiency Action Plan (NEEAP), Austria plans to achieve an energy savings target of 9 percent of its average annual consumption over the period 2001-2005, ie, 22 TWh (1.9 Mtoe), by 2016. Austria aims to reduce its primary energy intensity by at least 20 percent by 2020. Since the household sector accounts for about 31 percent of energy consumption, energy saving measures are particularly focused on buildings. Austria provides about €2.4bn/year ($3.2bn/year) in funding for housing support programs, including building renovations and subsidies for energy-efficient or renewable heating systems. Efficiency standards were reinforced in 2006. By 2020 Austria also aims to have achieved the thermal renovation of all buildings constructed between 1950 and 1980. The klima:active program, launched in 2004, aims to reduce heating costs and CO2 emissions in buildings, notably through the modernization of large residential buildings, support for passive housing (active climate protection standard for 50 percent of new buildings) and information campaigns directed at households. The National Renewable Energy Action Plan 2010 aims to increase the share of renewable energy in final energy consumption to 34 percent by 2020.

Energy consumption trends: declining consumption since 2005

Austria's total energy consumption (primary consumption) per capita is 17 percent higher than the EU average, at around 3.9 toe/cap. Primary consumption increased rapidly between 1990 and 2005 (+2.1 percent/year) and has been declining since then (-1 percent/year). Oil is the most consumed energy, accounting for 39 percent of primary energy consumption (42 percent in 1990), followed by gas (23 percent in 2009) and biomass (17 percent). Hydroelectricity covers 10 percent of primary consumption, while wind power accounts for 1 percent. The share of coal has regularly decreased since 1990 and currently stands at 9 percent. The industry sector and the households and services sector, each account for 36 percent of the country's final energy consumption. The transport sector share grew significantly over the 1990-2009 period, from 24 percent to 29 percent, to the detriment of the households and services sector.

At over 7,200 kWh, electricity consumption per capita in Austria is about 30 percent higher than the EU average. Electricity consumption rose by 45 percent between 1990 and 2007, but has been declining since (-0.9 percent/year). However, electricity's share in final consumption remained stable at around 18 percent between 1990 and 2009. Industry is the largest consuming sector, with 48 percent of electricity consumption, closely followed by the households and services sector (47 percent).

Directives

Sectoral benchmarks were introduced in 2004 to assess energy efficiency and potential improvements in Austrian industry. Companies were encouraged to compare their performance with industry leaders and to identify Best Practice Examples for energy savings in each branch. Energy audits are voluntary and in certain länder (provinces) they are subsidized. Companies can obtain subsidies from the Federal Environment Fund to finance up to 30 percent of the investment cost in renewable energy, energy efficiency projects, and use of waste heat. The CHP law was enacted in 2009: new plants are entitled to subsidies according to their size (up to 10 percent of the total investment), while existing or modernized CHP plants can benefit from the partial reimbursement of their operating costs.

Energy consumption trends: rising industrial energy consumption

Industrial energy consumption grew by 2 percent/year between 1990 and 2008; in 2009, it fell by 1.3 percent, owing to the global economic crisis. Since 1990 gas and electricity have been the most consumed energy sources in industry (31 percent and 29 percent in 2009, respectively). Overall, the industrial consumption of coal and oil remained stable over the period, while their shares in total consumption declined from 30 percent and 12 percent in 1990 to 14 percent and 9 percent in 2009, respectively. The consumption of heat and biomass grew steadily: biomass now accounts for 14 percent of industrial consumption, while heat supplies 3 percent. The share of energy-intensive industries has decreased slightly since 2000, from 69 percent to 62 percent in 2009. Steel is the largest consuming branch, with 22 percent of industrial energy consumption, followed by the paper (17 percent), non-metallic minerals (12 percent) and chemical (11 percent) branches.

Legislation

Austria completed the implementation of EPBD (2002/91/EC) in 2008 after a long and difficult harminzation process among the nine provinces in the country.

Previous regulations were individualized according to the federal province and referred only to the building shell's heat demand. This was particularly relevant given the differences between the various climates in the country: alpine in the west, continental in the east, and more temperate climates in the south. The new regulation is based on building codes and includes not only heating but ventilation and air conditioning as well. The new regulation is also based on the federal energy identification law (Energieausweis-Vorlage-Gesetz EAV-G). This regulation is being revised to encompass the latest changes to the EPBD. The process of harmonization and implementation is managed by the Austrian Institute of Construction Engineering (OIB).

Below is a listing of laws the various provinces have enacted for energy efficiency in their respective provinces:

- Burgenland Energy Concept 2003
- Carinthia State Energy Directives 2007 - 2015

- Lower Austria Climate Protection Programme 2000, Lower Austria Climate Protection Programme 2004 - 2008, and Lower Austria Climate Report 2005 and Lower Austria Energy Report 2005
- Energy Concept Upper Austria 1993, Energy Efficiency Programme Upper Austria
- (Energy Star 2010), and Phase 2 of the Upper Austria Energy Concept (Energy 21)
- Energy model, Federal State of Salzburg and its implementation programme, "Energie Aktiv" (evaluation report on the) Kyoto Option Report Salzburg 2006
- Energy Plan 2005 - 2015 of the Federal State of Styria
- Energy model, Tyrol 2000 - 2020
- Energy concept, Vorarlberg 2010, transport concept Vorarlberg 2006
- Municipal energy efficiency program for the city of Vienna (data and concept 2006), Vienna transport master-plan 2003

Austrian national, regional, and local governments have played a crucial role in the development and growth of ESCOs in the country. Numerous incentives for using energy efficiently such as subsidies, tax credits for residential buildings and loans have helped this market grow. Local energy agencies have participated in a very active way both directly and indirectly in local ESCO projects.

Currently in Austria, there only five companies however, they cover approximately 70-80 percent of the market in Austria. ESCOs estimate approximately €500 for energy efficiency projects. The Austrians have followed the example of Berlin with the bundling of projects in order to help save money and reuse the knowledge and experience. This enables standardized contracts, helps to increase quality and helps with the implementation of projects. A Thermoprofit quality label has been implemented by the Graz Energy Agency to guarantee quality proposals. This is used to assess ESCO companies on a regular basis to

ensure that they meet certain standards. An eco-label is used to assure service quality and compliance with standards.

Most of the contracts have been concluded in the public with federal and municipal buildings. Approximately 2000 public buildings were refurbished using energy performance contracts (EPC) which guarantee energy savings of almost 20 percent over 10 years. There have also been several improvement projects in waste water management, heating and cooling systems as well as public lighting (e.g., street lighting).

While there have been a number of projects done in the public sector, the private sector is relatively unaware of the ESCO market and its offerings and benefits. More needs to be done to raise the awareness of ESCOs and their use in the private sector. This could also require some changes to the structure of financing of the ESCOs and the types of contracts offered but could also allow for new financial products and players to enter the field.

Italy has developed a system of rules obliging to the development of energy efficiency (energy saving quotas and renewable energy quotas). Decree 79/1999 contained both indications (energy saving and renewable), even if only renewable electric energy was clearly regulated, by assigning that each electricity producer had to show that part of its production derived from renewable energy and this quota had to increase every year. This rule has started and well established the Italian market of Green Certificates for electricity, since producers who don't have renewable plants may buy renewable quotas through the virtual stock market of green certificates.

Energy saving was introduced as an obligation in the Italian energy market through two Decrees at year 2001, which actually became in force (and where updated) in year 2004 by the Decrees issued by the Ministry of Productive Activities jointly with the Ministry of the Environment and Land Protection on 20 July 2004 (Ministerial Decree of 20 Jul. 2004 on electricity, Ministerial Decree of 20 Jul. 2004 on gas), Energy saving is an obligation for electricity and gas distributors (not for suppliers). A quota of energy distributed in one year has to be saved by energy saving measures at end-users level in the next year, according to national quantitative targets (these targets have been amended by the Ministerial Decree of 21 Dec. 2007).

Electricity and natural gas distributors achieve their energy efficiency improvement targets by implementing energy efficiency projects. Also ESCOs may carry out energy efficiency projects. Distributors may also buy the savings obtained by other distributors or by ESCOs through a virtual stock exchange of Energy Efficiency Certificates (Italian acronym TEE, also called white certificates). Each energy efficiency project is evaluated by the National Authority for Electric Energy and Gas (AEEG). For each Toe of primary energy saved through an energy efficiency project one TEE is recognized.

Energy efficiency projects have to consider installation and substitution of an old technology/appliance owned by the end-user with an energy efficient one. Standardized projects are available for a certain set of technologies/appliances, including refurbishment of residential and tertiary buildings shell (insulation of walls and roofs, substitution of windows). Standardized projects only require to report the number of appliances or technology units (like square meters of insulation) installed.

Heating plant renovation is not a standardized project and needs a more complex procedure, with a monitoring of consumption before and after the installation of the new plant.

TEEs last 5 years for projects devoted to electric appliances and 8 years for projects devoted to buildings.

The TEE system introduced the role of ESCOs in Italy, even if only through the following Ministerial Decree 158/2008 and following rules issued by the Italian Body for Harmonization of Regulations (UNI) in 2010, 2011 and 2012, ESCOs acquired a clear definition.

Actually, at the starting of TEE system, many companies who were already offering energy maintenance for building-plant systems joined the TEE system. However only a part of them took advantage of TEEs to offer specific measures on energy efficiency. Other ESCOs appeared on the market, mostly offering specific projects and campaigns, related to those technologies which showed the highest payback time.

The economic value of 1 TEE has changed in the years, from the lowest (30€) reached on 2006 up to the highest (100€) reached on 2012. The changing value of TEEs has determined a strong interest in developing measures with the highest internal rate of investment, that was distribution of high efficient lamps for domestic use and water saving devices (for domestic use, sport structures and hotels). High cost measures that could not be fully covered by TEE revenues were much less supported and benefitted of TEE mechanism only as a secondary result.

In 2011 AEEG stopped the possibility of presenting EE projects related to high efficient domestic lamps and water saving devices. This situation has luckily created the need for Energy Distributors and ESCOs in offering projects related to building-plants savings (in particular on thermal end uses, but since 2011 also on electric end uses). Of course TEEs economic values are in any case insufficient to cover the full costs of new technologies, but they become part of the income of ESCOs while offering energy services. The end users (public buildings at first) may nowadays see the offer of a contract of management of thermal or electric plants including refurbishment of heating or lighting systems and installation of renewable plants (thermal solar or photovoltaic).

It is in any case very difficult making ESCOs in charge of fully refurbishment of a consistent quota of buildings envelope, since energy service contracts should last more than ten years. For a single building refurbishment no ESCOs presently offer such a service. For public buildings the situation is different, since today tenders usually requires to offer incremental services above the basic maintenance and “heat” services: working with a stock of buildings ESCOs may offer heating plants retrofit, together with a few building shell refurbishment. However it is still a task of public administration to define a clear set of EE measures in their tenders if they want to reach specific targets of energy savings or renewables quotas.

According to the previous explanation, in Italy it is not a role of energy suppliers having an EE commitment. However suppliers may behave as ESCOs or might co-operate with ESCOs as third parties in order to acquire new customers and keeping them in their portfolio for a number of years, as already explained before.

The “ESCO approach” has been adopted by suppliers especially for the domestic users and especially for those serviced by a single independent heating unit.

Obligation to EE targets introduced in Italy by the TEE system has been supported in the following years by the national EPBD regulation (as for the part addressing energy performance of buildings), issued in 2005 with Decree 192 (updated in 2006), and by the Government Decree 28/2011 which has implemented at Italian level the EU Directive 2009/28/EC regarding the promotion of RES use.

EPBD regulation has been adopted as local legislation at regional level for a few Regions in Italy, among which Emilia Romagna Region (DAL 156/2008). Decree 28/2011 has been recently incorporated in EPBD regulation by Emilia Romagna Region (DGR 1366/2011).

It must be noticed that both regulations (energy performance of buildings and increase of thermal quota to be satisfied by RES) assign EE responsibility and commitment to the end-user and do not speak of obligation of other energy actors.

In order to promote EE with end-users, since 2007 Italian Government has implemented a tax deduction of 55% for EE investments (insulation of buildings, substitution of heating systems, thermal solar plants). This solution is available only for private sector and not for public administrations. This solution has been partly effective comparing to expectations, maybe because of less awareness of people and some difficulties in its formal implementation (payments must be performed only through bank transfers; technical documents must be sent to the national Agency for EE ENEA through web electronic system and if something is missing troubles might intervene; tax deduction period has been changed in the years and is presently fixed at 10 years; tax deduction is effective only if the person/enterprise has taxes to pay, that means low income people/companies or subjects having variations of their income along the years may not fully benefit of the advantage).

55% tax deduction of an EE measure is much higher than TEEs that could be acquired by the measure: this is also a reason why TEEs are considered as a secondary income tool to pay-back and EE action. Another point to be kept in mind is that 55% tax deduction applies only to end-user and not to an ESCO, meaning that the end-user has to be in charge of the

investment and no ESCO can be involved in the management of his energy bills. Of course if money for investment is missing, end-user can benefit of bank loans; however this requires solvability of the end-user.

What said before clarifies that 55% tax deduction and ESCO have to be considered as two different possible alternatives and the end-user has to decide the approach he prefers.

As for public administration, since 55% tax deduction cannot be implemented, it is clear that ESCO approach may be used.

To complete the scenario, it must be noted that in order to help Italian administration in their buying process of goods and services, a national system of standardized tenders and suppliers (with costs under control) has been developed (Consip System). Consip System is mostly dedicated to the reduction of costs. Environment and GPP criteria are usually extra-criteria to be added to Consip System tenders.

b, Best Practice

Please find this section in the annex.

V. Future prospects, guidelines

The technological development of energy efficient electrical devices was very quick in the past years. Caused by the pressure of increasing energy prices the industry was forced to keep an eye at the energy efficiency especially in their research activities.

At the same time there is more clarification regarding the user habit needed.

All existing possibilities should be used to explain the topic to the energy consumer. Preferably many partners should be involved in this process. These are, beside institutions of the Federal and State- Governments, consumer associations, organizations, energy suppliers, interest groups and independent energy consultants.

Only a combination of informational campaigns, consulting activities, guidelines, provisions and laws can bring numerable results regarding energy efficiency.

Energy prices have a direct impact on the sub-sectoral energy efficiency of a country. An increase in energy prices will encourage more efficient use of energy or the producers may decide to substitute energy for other inputs such as labour and capital, where feasible. While appropriate energy pricing can be an effective tool to improve energy efficiency and internalize some externalities such as resource depletion and environmental degradation, it is politically more difficult to implement, especially in many Central and Eastern Europe countries.

Energy prices have a direct impact on the sub-sectoral energy efficiency of a country.

As faster the energy prices increase, as bigger is the pressure for all consumers, industry and energy suppliers to confront to the topic energy efficiency.

Many governments in Central Europe region (in Hungary in 2013) tend to subsidize the price of energy with the reasoning that lower energy prices are beneficial for economic growth and can make the products and services more affordable. There are several perverse impacts of such short-sighted policies. When the subsidy is not properly targeted, it is the affluent class of the society consuming more energy that benefits the most from subsidized

energy prices. Also, a low energy price is deterrent to the adoption of energy-efficient equipment and processes, eroding the competitiveness of manufactured products and services. Moreover, when the limited financial resources of the government are channeled to import fossil fuels at high costs and distribute them at subsidized rates, fewer resources are left to meet more critical needs of the society.

As the intensified use of renewable energies creates thousands of jobs it will be also possible, by consequently improving of the energy efficiency in all spheres of the daily life, to create much more jobs and economic growth. Europe is able and has to play a leading role in the world. The energy turnabout including more renewable energy use and more energy efficiency is so far not really noticed as a big chance for the economy and the society.

Future prospects, guidelines

Loss detection

At the beginning, it is very important to discuss how energy efficieny and energy efficiency commitment can serve as a keystone in maximizing the economic, social, and ecological quality of growth. In practice, however, one comes across several barriers and challenges to effectively promote energy efficiency. These barriers can be grouped into following categories without exhaustive [UN ESCAP]:

a. Political and structural: Structural characteristics of the political, economic, energy system which make energy efficiency investment difficult

b. Institutional: Weak institutions to support energy efficiency; institutional bias towards supply-side investments

c. Regulatory: No regulation to invest in cost-effective energy efficiency; subsidized energy supply

d. Information and awareness: Lack of information on actual energy consumption and energy saving potentials, lack of knowledge of best practices and best available technologies

e. Behavioural and organizational: Behavioural characteristics of individuals and organizations that hinder the propagation of energy-efficient technologies and practices

f. Technical: Absence of affordable energy-efficient technologies suitable to the local context; inadequate capacity of energy users to identify, develop, implement energy efficiency projects

g. Market: Market structures and constraints that prevent energy users from appraising the true value of energy efficiency

h. Financial: High up-front costs of energy efficiency solutions and the low energy supply tariffs prevailing in many developing countries; lack of awareness of financial institutions of the financial benefits of energy efficiency investments, etc.

Evaluation

Considering the fact that each country varies from another structurally, socio-politically, and the barriers to and the drivers for energy efficiency can be very different, it will be presumptuous to propose to individual countries representing a very large region concrete solutions regarding how they should adopt and implement energy efficiency policies and programmes in order to decouple energy use from economic development. [UN ESCAP] Countries will have to identify policy measures that have scope for success within the prevailing socio-political context, and focus more on energy efficiency governance which is

described further in the next section. Learning from the experiences under comparable contexts, countries interested in achieving sustainable energy efficiency can initiate measures that have been successfully adopted elsewhere.

Development

Countries which are just beginning and have yet to establish an institutional arrangement may take into consideration the different aspects presented in the guidelines to create a goal-oriented organization that is given the mandate and allotted the resources required to operate and implement the energy efficiency policy successfully.

RELEVANCE OF ENERGY EFFICIENCY GOVERNANCE

In all countries, government plays an important role in ensuring energy supply to support socioeconomic development.

The different types of energy efficiency organizations from the energy efficiency commitment point of view:

a. Government agenciesthat deal with all aspects of energy:
   energy security, supply, pricing, legislation, efficiency and conservation, renewable energy, etc.
b. Government agencies
   specialized in energy efficiency, renewable energy, or clean energy
c. Independent statutory authorities
   with the mandate of executing government energy efficiency policies and strategies
d. “Parastatal”corporations
   in-charge of energy efficiency programme implementation
e. Public–private partnerships to promote energy efficiency
f. Nongovernmental organizations

specialized in implementing energy efficiency programmes

It is not possible to categorically say which energy efficiency commitment organization is the best because each type of organization has its own advantages and drawbacks. The government may decide to adopt whatever model of energy efficiency organization suits best the country's political, cultural, and economic priorities.

Experience of energy efficiency promotion both in industrialized countries has shown that a strong mandate from the government, consistent policy, and long-term commitment for supporting energy efficiency goals are the essential elements on which basis the energy efficiency agency can develop.

VI. Conclusions

The preconditions and the established structures in the energy sector since decades have been different among all EU- countries. Hence, it is not meaningful and also not possible to realize concrete actions in all countries in a unique manner.

The realization of the EU-targets to the improvement of energy efficiency by the obligation of big energy suppliers regarding energy efficiency in Great Britain might be worthily. As all energy suppliers normally want to sell as much as possible energy it sounds for the moment paradox.

Energy supplier have the appropriate know how to provide consultation to citizens, communities or companies about possibilities of energy saving. An obligatory energy saving with the presetting of quotas and concrete figures is connected with big control activities and corresponding costs.

But, it is of advantage, that the energy suppliers have no interest, to hamper companies or communities at the realization of energy saving activities. Of course there is a danger, if mainly the energy sector will be responsible for energy saving that this causes negatively the development and the realization of new technologies. The costs for the demanded engagement but also the lower energy consumption will be paid by the consumer through significantly higher energy prices. As there are intermediate results available, some of the findings might be used from all. In Germany the plenty energy suppliers offer since 20 years energy consulting as marketing initiative. Of course, the consulting stops there, where the company can expect disadvantages. An independent and neutral consulting in this case can't be expected. At the same time there is a danger, that big advertising budgets can influence the public opinion making regarding technological developments or strategic decisions in favor of the energy suppliers. Important is a complex and broad discussion and information via all media and by all energy market participants. Energy saving potentials can be quickly created by the setup of useful political framework conditions, adjusted to country-specific situations, connected with concrete actions to

- the support of new ideas and technological developments
- find funding instruments
- implement education and training

VI. Annex

In Germany there are countless initiatives and actions of the different energy suppliers regarding energy efficiency. Some examples from the Burgenlandkreis District and Saxony- Anhalt you'll find subsequently:

1. **Example „Energy Saving King" (Public Utility Company Weißenfels)**

Tis action is directed to every household. Everybody can take part and tap saving potentials at home. Who save most of the energy, will be supplied with electricity from the Public Utility Company Weißenfels for one year free of charge.

Mitmachaktion der Stadtwerke

Energiesparkönig gesucht

Wer möchte nicht einmal König sein? Die Stadtwerke Weißenfels bieten nun ihren Kunden die Möglichkeit dazu.

Mit der neuen Aktion „Energiesparkönig gesucht" wollen die Stadtwerke Weißenfels ihre Kunden zu mehr Energieeffizienz in den eigenen vier Wänden mobilisieren. Ab sofort können sich deshalb die Kunden des Unternehmens registrieren lassen, um Energiesparkönig zu werden. Ziel der Stadtwerke ist es dabei, dass ihre Kunden bei sich zu Hause bewusster mit Energie umgehen und Einsparpotenziale aufdecken.

Um Energiesparkönig von Weißenfels zu werden, ist zuallererst eine Registrierung notwendig. Diese kann online übers Internet stattfinden, unter www.stadtwerke-weißenfels.de, oder über den Coupon auf unserer Anzeige auf Seite 4 in dieser Zeitung. Einfach ausschneiden und ausgefüllt per Post an die Stadtwerke Weißenfels schicken.

Wer sich angemeldet hat, bekommt anschließend einen Fragebogen zugesandt. Damit soll erfasst werden, wie die Kandidaten in den eigenen vier Wänden mit Energie umgehen.

Eine Jury ermittelt aus diesen Angaben, die in weiteren Zeitabständen abgefragt werden, den Sieger, der zum Energiesparkönig gekrönt wird. Dem Gewinner winkt ein Jahr lang kostenfreier Strom von den Stadtwerken Weißenfels. Also, jetzt registrieren und Energiesparkönig werden!

Jeder Kunde der Stadtwerke hat die Chance, hier Platz zu nehmen!

2. **Example „Powercheck" (enviaM)**

Every customer can enter data about existing electric devices or other power consumer into a special interface, and receives a survey containing saving potentials.

Power checks for households

Evaluation

Congratulation, you have answered to all questions. Based on your information we could calculate your power consumption:

Total power consumption **4.709,88 kWh/a**

Total average consumption[1]	**2.900,00 kWh/a**
Absolute deviation	**1.809,88 kWh/a**
Relative deviation	**62,41 %**
Your saving potential at 21 Cent / kWh	**380,07 Euro/a**

[1] Average in Federal Germany for 3 Persons

Your power consumption is as follows:

Energycheck-field	**Your consumption [kWh/a]**	costs[2] [Euro]	Average[3] [kWh/a]	Deviation [kWh/a]
cooling	745,00	*156,45*	410,20	334,80
freezing	0,00	0,00	192,48	-192,48
cooking	23,21	*4,87*	383,12	-359,91
dishwashing	357,84	*75,15*	217,28	140,56
washing	188,03	*39,49*	193,22	-5,19
Drying	0,00	0,00	265,41	-265,41
Light	246,75	*51,82*	343,09	-96,34
TV / Audio	815,41	*171,24*	500,12	315,29
office	70,08	*14,72*	490,49	-420,41
Water	0,00	0,00	492,06	-492,06
Circulating pump	350,40	*73,58*	232,85	117,55
Diverse	1.820,80	*382,37*	281,02	1.539,78
Small devices	94,20	*19,78*	81,36	12,84

[2] at 21 Cent je kWh

[3] Own average data (Data basis: 81067 Checks for 3 Person-Households)

Your total consumption is far too much. Your saving potential is about 380, 07 Euro. Please have a look to your energycheck fields in detail. Our Energy saving tips help to tap the potentials and to lower the power costs. By the way, you can find in *www.enviaM.de* plenty of information, useful to assess and optimize your energy consumption.

3. Example „Tips to save Energy“ (Public Utility Company Zeitz)

Interactive tour through the virtual house. The user can gain energy saving tips by „click“.

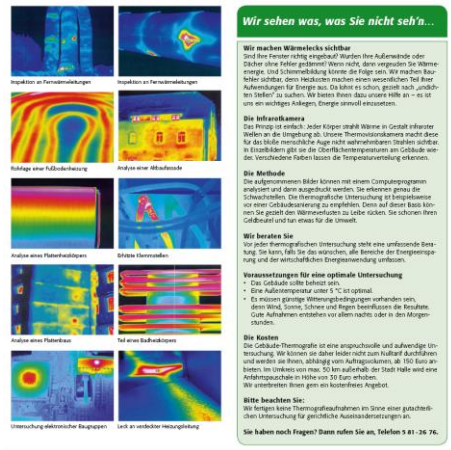
Additionally the owner of the house get interactive information about insulation possibilities and saving potentials of the building.

Energy saving tips for customers of the Public Utility Company Zeitz

Brochures containing information regarding energy saving are displayed free of charge resp. can be downloaded from the internet.

4. Example „Infrared-Thermography“ (EVH Halle)

The Public Utility Company Halle offers to her client’s subsidized checkups of their buildings using infrared thermography to detect thermal bridges.



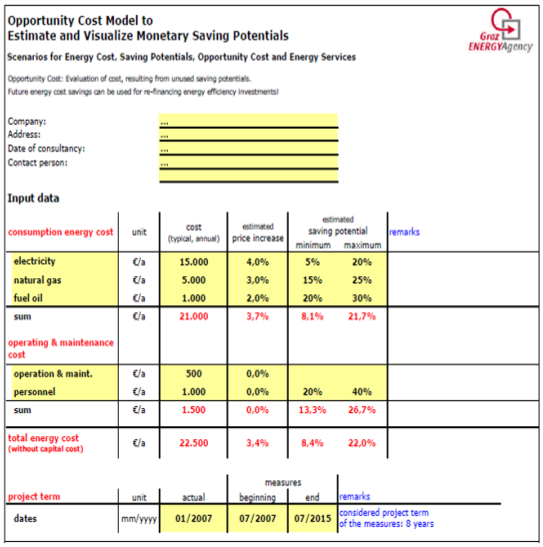
Additionally, every customer can order an energy consultant free of charge who provides individual consultation.

5. Example „Especially saving household devices“ (Public Utility Company Merseburg)

The Public Utility Company Merseburg offers to their clients, like many other energy suppliers as well, information brochures regarding to especially energy efficient household devices.

6. Graz Energy Agency' calculation tool in Austria

As part of a project financed by the Austrian Ministry of Transportation, Innovation and Technology, the Graz Energy Agency developed the following calculation tool to be be used by energy consultants to help estimate approximate savings. The calculator is based on a Microsoft Excel spreadsheet and is used to help show potential customers the possible savings in both energy and money that could be achieved. This tool is used in the initial stages of consulting.



Opportunity Cost Model to Estimate and Visualize Monetary Saving Potentials

Graz ENERGYAgency

Scenarios for Energy Cost, Saving Potentials, Opportunity Cost and Energy Services

Opportunity Cost: Evaluation of cost, resulting from unused saving potentials.
Future energy cost savings can be used for re-financing energy efficiency investments!

Company: ...
Address: ...
Date of consultancy: ...
Contact person: ...

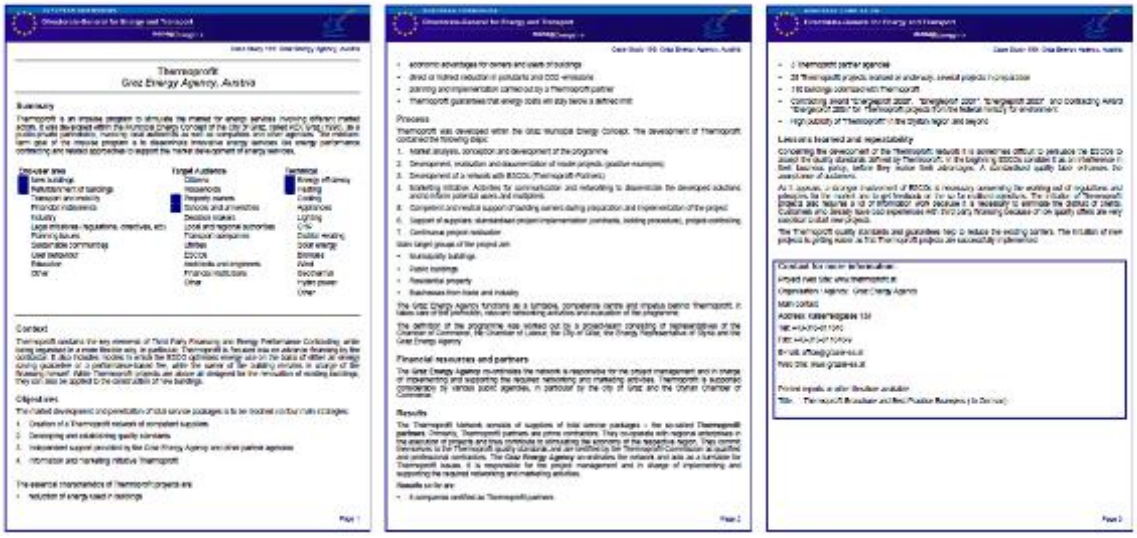
Input data

consumption energy cost	unit	cost (typical, annual)	estimated price increase	estimated saving potential minimum	estimated saving potential maximum	remarks
electricity	€/a	15.000	4,0%	5%	20%	
natural gas	€/a	5.000	3,0%	15%	25%	
fuel oil	€/a	1.000	2,0%	20%	30%	
sum	€/a	21.000	3,7%	8,1%	21,7%	
operating & maintenance cost						
operation & maint.	€/a	500	0,0%			
personnel	€/a	1.000	0,0%	20%	40%	
sum	€/a	1.500	0,0%	13,3%	26,7%	
total energy cost (without capital cost)	€/a	22.500	3,4%	8,4%	22,0%	

project term	unit	actual	measures beginning	measures end	remarks
dates	mm/yyyy	01/2007	07/2007	07/2015	considered project term of the measures: 8 years

7. Thermoprofit in Graz

Thermoprofit is an impulse program to stimulate the market for energy services involving different market actors. It was developed within the Municipal Energy Concept of the City of Graz, called KEK Graz (1996), as a public-private partnership, involving local authorities as well as companies and other agencies. The medium term goal of the impulse program is to disseminate innovative energy services like energy performance contracting and related approaches to support the market development of energy services.



Concerning the development of the Thermoprofit network it is sometimes difficult to persuade the ESCOs to accept the quality standards defined by Thermoprofit. In the beginning ESCOs consider it as an interference in their business policy, before they realise their advantages. A standardised quality label enhances the acceptance of customers. As it appears, a stronger involvement of ESCOs is necessary concerning the working out of regulations and principles for the market and to get feedback on the so far realised objectives. The initiation of Thermoprofit projects also requires a lot of information work because it is necessary to eliminate the distrust of clients. Customers who already have bad experiences with third party financing because of low quality offers are very sceptical to start new projects. The Thermoprofit quality standards and guarantees help to reduce the existing barriers. The initiation of new projects is getting easier as first Thermoprofit projects are successfully implemented.

8. BioSolESCO from Austria

Listed ESCO providers which clearly provide providing biomass and/or solar solutions

There is a short list of companies that provide services for ESCOs in solar (including solar thermal) and/or biomass consulting and services. This list does include energy agencies as well as banks and consultants.

List of Actors – Austria

	Address	Telephone	Fax	Web	Activities
ESCos (Only those clearly providing biomass and/or solar solutions)					
S.O.L.I.D. Gesellschaft fuer Solarinstallation und Design GmbH	Puchstrasse 85, 8020 Graz	+43(0)316/29284 0	+43(0)316/2928402 8	http://www.solid.at	Broad range of solar thermal energy services; ESCO activities of solar thermal energy
nahwaerme.at - Energiecontracting GmbH	Puchstrasse 85, 8020 Graz	+43(0)316/24425 9-0	+43(0)316/24425977	http://www.nahwaerme.net	Large experience with biomass heat delivery contracting for diverse customers
HOLZ die SONNE ins Haus Energieconsulting GmbH	Mail 12, 9300 St.Veit/Glan	+43(0)4212/3044 0	+43 (0)4212/3044011	http://www.holzdiesonne.net	Plumper and contracting activities focused on reneable energy technologies
AEE Energiedienstleistungen GmbH	Unterer Heideweg 7, 9500 Villach	+43(0)4242/2322 4-24	+43(0)4242/23224-1	www.aee.or.at	Broad range of facility related services, ESCO activities for Solar and Biomass plants
Aigner Energie-Contracting GmbH	Kreuzstraße 18, 4501 Neuhofen/Krems	+43(0)72276081-0	+43(0)72276081-13	http://www.aigner.at/	Broad range of facility related services, ESCO activities for Biomass plants
Bioenergie Niederösterreich	Brühlhausgasse 3, 3100 St. Pölten	+43 (0)2742 352234-0	+43 (0)2742 352234-4	http://www.agrarplus.at/projekte.energie.bene.php	Large experience with biomass heat delivery contracting for diverse customers
Energiecomfort Energie- und Gebäudemanagement	Obere Donaustraße 63, 1020 Vienna	+43 (0)1 31317-0	+43 (0)1 31317-36656	http://www.energiecomfort.at/	Broad range of facility related services, ESCO activities for Biomass, refrigeration and solar plants

9. Energy Saving in public transport from Bologna - Substitution of conventional traffic lights with LED – Municipality of Bologna and Hera Luce

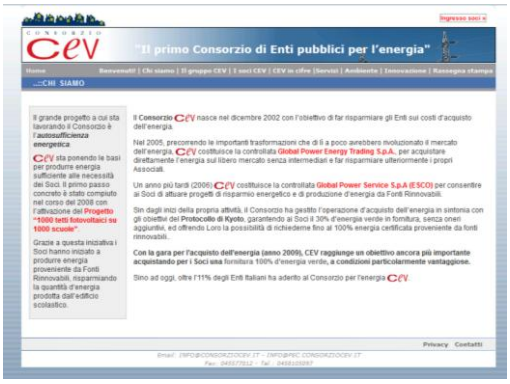
Within the street lighting maintenance contract of the Municipality of Bologna with Hera Luce, a specific agreement was signed in order to execute the full substitution of traffic lights from incandescent lamps to LED. The cost of about 2 million euros was half in charge of the Municipality and half in charge of Hera Luce. Hera Luce also obtained TEEs for the measure (equivalent to almost 200'000 euros).

10. Maintenance contract for municipal buildings – Municipality of Bologna

In 2008 the heat and maintenance service for the municipal buildings of Bologna has been gained by BGP (a joint venture company). BGP's offer included the refurbishment to energy efficiency Class A of kindergarten "FAVA", together with the substitution of more than 20 boilers with condensing ones.

11. Suppliers for public users – CEV

Consorzio Energia Veneta (CEV) has been the first consortium for electricity focused only on public customers.



The consortium is organized with

- a trading company operating in the free market and looking for the best available prices of electricity
- an ESCO, aimed at offering energy services to the customers (presently the services are: energy audit of the building; how to get TEEs from EE projects; installation of PV plants in order to cover a quota of electricity consumption with green generation).

12. Intercent-ER and GPP in Emilia Romagna Region

Intercent-ER is a Regional Agency of Emilia Romagna devoted to support Regional Health Care System and all other public administrations in their buying procedures for goods and services (it is the Consip System for Emilia Romagna Region).

Intercent-ER has developed a set of agreements with suppliers and an electronic platform through which public subjects may manage their tenders for goods and services. Particular relevance towards GPP criteria has been given in standardized tenders (for example, electricity suppliers must allow 100% green electricity requests from local public administrations).

13. Energy Service for electric end uses in public buildings and Local Solar Community - Municipality of Casalecchio di Reno

In 2011, the Municipality of Casalecchio di Reno, next to the City of Bologna, defined a tender for the management and maintenance of electric end uses of its public buildings by an ESCO.

The contract has been signed with a local ESCO, for 20 years. The contract requires that the Municipality pay less for its electricity bills and the ESCO installs a set of PV plants on the buildings, including the energy efficient refurbishment of the roofs. Moreover, the ESCO is forced to show a detailed economic plan of its investments and revenues (revenues derive from the incentives of PV plants), in order to revolve possible extra-income for the substitution of electric devices with efficient ones.

SPECIALE IL PUNTO: ENERGIE RINNOVABILI

IL SOLE IN COMUNE:
LA COMUNITÀ SOLARE DI CASALECCHIO

In principio il piano energetico comunale, poi l'individuazione dei tetti di proprietà pubblica dove installare i pannelli fotovoltaici e infine i progetti per la realizzazione degli interventi in collaborazione con il settore privato. Questi in sintesi i passaggi che porteranno a realizzare a Casalecchio di Reno la prima **comunità solare** che consentirà di dare vita a una **gestione integrata dell'energia, che trasformerà il cittadino da consumatore a soggetto responsabile degli usi energetici e della cultura del risparmio, al fine di creare un contesto in cui l'energia possa diventare un bene comune e uno strumento per rafforzare la rete socio-culturale di una comunità.** Il progetto, avviato in collaborazione con l'Università di Bologna (dipartimento di Chimica industriale e dei Materiali) con la consulenza scientifica e il coordinamento del professor Leonardo Setti, ha ottenuto, insieme ai Comuni di Casalecchio di Reno, San Lazzaro di Savena, Sasso Marconi, Monzuno, Ozzano dell'Emilia e Medicina, un finanziamento da parte della Regione di 618.000 euro.

Casalecchio di Reno sarà il primo Comune dove partirà il progetto di Comunità solare: sono già in corso i lavori che porteranno all'installazione di impianti fotovoltaici su una quindicina di edifici pubblici producendo anche un intervento di manutenzione straordinaria dei tetti (che altrimenti non avremmo potuto realizzare) del valore di circa 400.000 euro.
L'Assessorato all'Ambiente, già nel 2008, ha incaricato l'Università degli Studi di Bologna di elaborare il Piano Energetico Comunale (PEC) con l'obiettivo di definire i principi e le azioni da realizzare entro il 2020 nell'ambito di una riconversione energetica che tenda all'indipendenza dal petrolio, secondo quanto previsto dalla Direttiva Europea 28/2009, che prevede una riduzione del 20% di emissioni di CO_2, un aumento del 20% di produzione di energia rinnovabile e un incremento del 20% di efficienza energetica. Attraverso il PEC l'Amministrazione Comunale ha preso consapevolezza che questi obiettivi si possono raggiungere solo con la forte partecipazione di cittadini e imprese, pertanto è necessario sviluppare un nuovo strumento integrato.

La creazione della comunità solare è un progetto totalmente innovativo che rafforza il valore del senso della partecipazione alla vita pubblica: la partecipazione diventa uno strumento per rafforzare il legame con il territorio e la comunità, per contribuire a determinare le scelte strategiche e per accrescere la consapevolezza del cittadino nei confronti del ruolo attivo che può giocare per cambiare il futuro energetico del suo territorio.

Attraverso la comunità solare alla quale ognuno potrà aderire – versando volontariamente una quota di adesione commisurata ai propri consumi energetici ed entrando così a far parte di un articolato sistema di incentivi economici per migliorare le proprie performance energetiche – il cittadino diventa un attivo co-autore delle politiche locali. La comunità solare è quindi lo strumento per condividere la pianificazione, per raggiungere gli obiettivi previsti dalla direttiva europea, per ottenere l'autosufficienza energetica del cittadino e soprattutto per creare un nuovo modello di Conto Energia a livello locale.

L'energia in questo modo, da costo diventa risorsa per il cittadino e per la sua comunità, un modo per creare nuove e concrete opportunità economiche e professionali e una possibile via d'uscita dalla crisi, che consenta a Casalecchio di Reno di diventare un importante distretto delle energie rinnovabili con la partecipazione, ciascuna per le proprie competenze, delle diverse categorie socio-economiche.

Quella che vogliamo attuare è una politica innovativa per il nostro territorio che proprio nella gestione locale dell'energia vuole fondare il proprio futuro di transizione e di indipendenza dai combustibili fossili, in una sintesi che sappia coniugare l'economia e la concreta tutela dell'ambiente e del territorio, salvaguardandone, con la logica del recupero, della durevolezza e del rinnovabile, quelle risorse fondamentali alla sopravvivenza della vita.

Simone Gamberini
Sindaco

Beatrice Grasselli
Assessore all'Ambiente

From ESCO's revenues, a quota must be given to citizens as a reduction of their domestic electricity bill. Citizens join a Co-operative devoted to implement EE measures for its members. The ESCO is in charge also of their bills. The budget available for EE measures is given by a subscription quota given by the members of the Co-operative.

14. Electricity and Gas Suppliers for private users

As shown by the example reported below (including some of the main operators in Italy), the marketing of suppliers for domestic users (but also service and industry users) are presently based on the following elements:

- Discount on tariffs or a fixed tariff for at least a couple of years
- Certificated green electricity
- Additional services for EE that are claimed to be at a lower price or guaranteed in terms of quality and professional skills of the operators.

All suppliers nowadays offer both electricity and gas.

Excluding Edison, all the other suppliers offer as EE additional service the energy audit or energy certification of the house/building/activity. This is usually free of cost just at a first level of the audit (which is based on a simple questionnaire to be filled in). Detailed energy audit, requiring a visit of technical personnel, must be paid (even if the cost is not indicated).

ENEL Energia and ENI offer annual maintenance of the boilers or even their substitution, with an extra fee to be paid on the gas bills. Both also offer an insurance included in the energy contract that covers the costs of repairs for small damages at home (like windows or water pipes): however this kind of insurance is not a way to cover major measures in insulation of the house.

Sorgenia offers (with extra payments) specific products to save energy, actually a few appliances to check and/or save electricity (devices monitoring electric consumption of appliances and devices reducing stand-by mode consumption of electronic appliances).

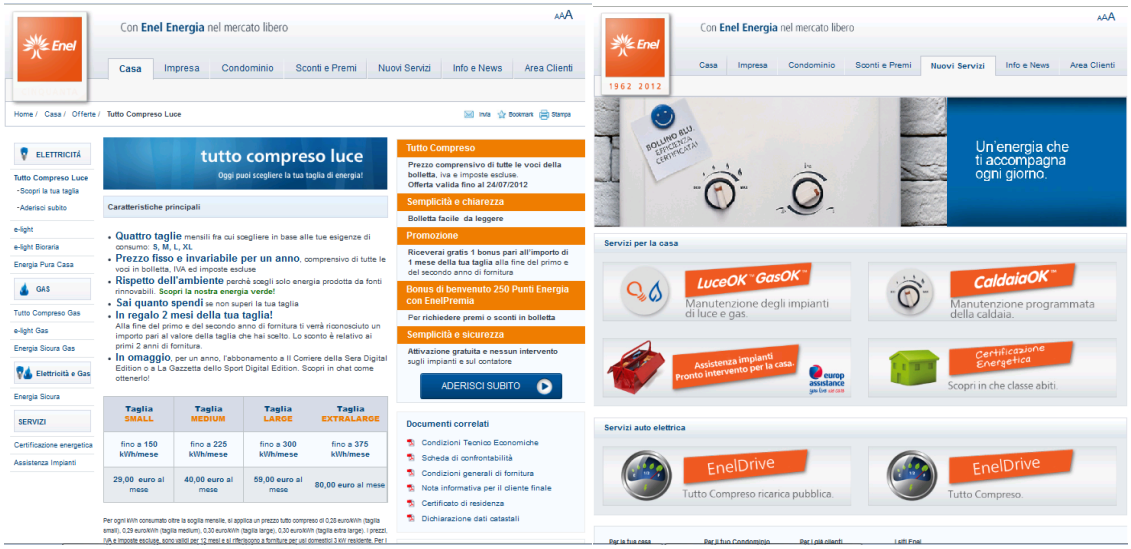
E.ON and Sorgenia offers the installation of PV systems free of costs, since they are paid back by the incentive tariffs given by the Government.

Excluding PV systems, no supplier offers other energy services in the ESCO mode: all EE services require additional payment on the bill.

E.ON offers technical support to get Energy Efficiency Certificates from EE projects for enterprises.

ENEL Energia have also a special offer of a recharging service for electric vehicles (at home and at public places).

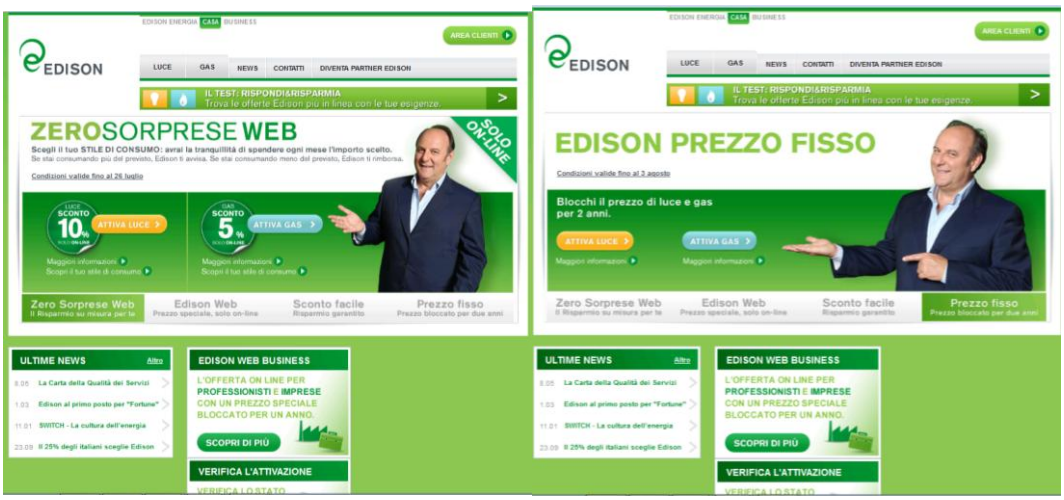
ENEL ENERGIA -Italy



E-ON – Italy, Hungary, …

ENI – Italy, Hungary, …

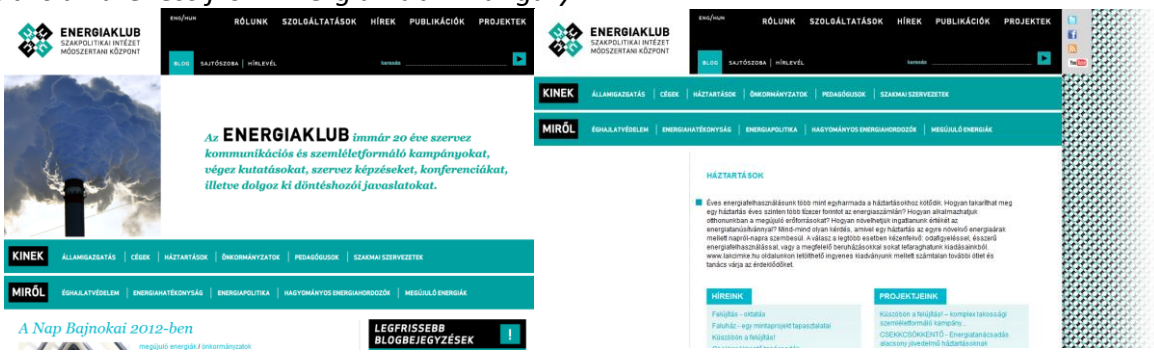
EDISON - Italy



SORGENIA- Italy

Public awareness from MVM Energia 2.0 – Hungary

Public awareness from EnergiaKlub – Hungary



Energy Efficiency Programme from Főtáv, District heating company – Hungary

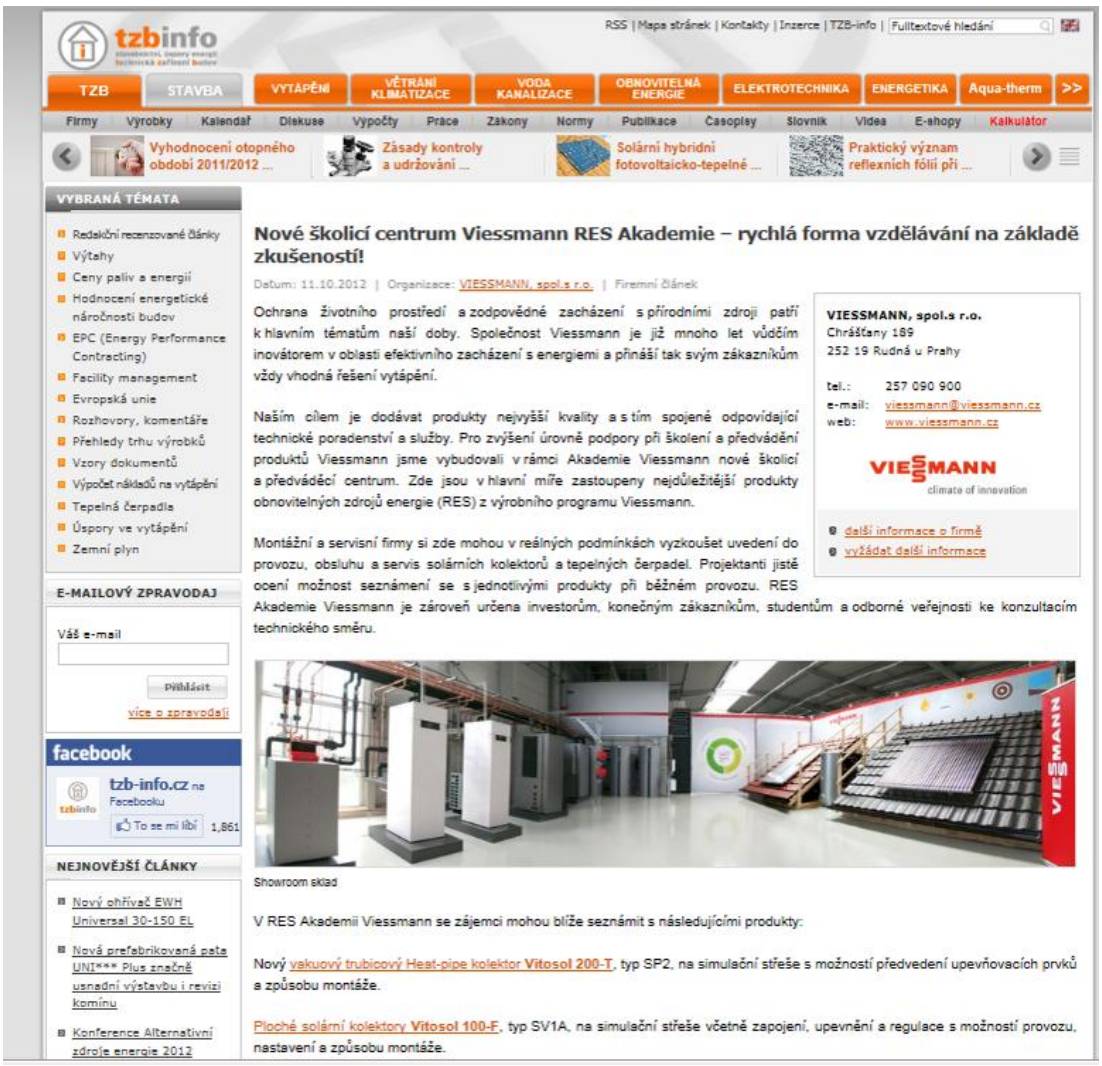
In the Czech Republic is the area of energy savings presented widely in the press, through education of companies supplying energy and energy appliances. For example, there

are associations focused on energy from the sun, various counseling centers (passive houses) and specialized portals covering issues of both structures and systems.

1. **Example. Professional internet portal "tzb-info.cz"**

In the Czech Republic has worked the independent professional web-portal "tzb-info.cz" for more than 10 years. It is specialized source of information about energy saving, construction and related fields comprehensive called "technical building equipment". It deals primarily with construction fields related with buildings and energy management in buildings. It provides current information about the development in these fields. TZB-info includes long-established base of static information to the individual selected topics. This information is provided for the general public as well as for professional designers, professional installers and dealers.

The portal publishes specifically professional and corporate-sponsored articles, information on trade fairs and other events in the field, provides broad information and comments on legislation, its amendments and debate on it. It works also like a feedback because it brings articles about the functioning of energy-saving devices in practice.



2. Example. Web-sites „Úsporné spotřebiče“ of the company SEVEn, Středisko pro efektivní využívání energie, o.p.s

This site contains a wealth of information on energy savings in the purchase and use of domestic appliances.

There are specific instructions on how to orient by purchase of new appliances with the energy label. There is also the specific and regularly updated database of energy-efficient

appliances which are sold in the Czech Republic. It can be searched there by energy performance of individual product types and other parameters.

3. Example. “Centrum pasivního domu”

Centrum pasivního domu (Passive House Center) is a non-profit association of legal entities and natural persons which was established to support and promote the passive house standard and ensure the quality of passive houses.

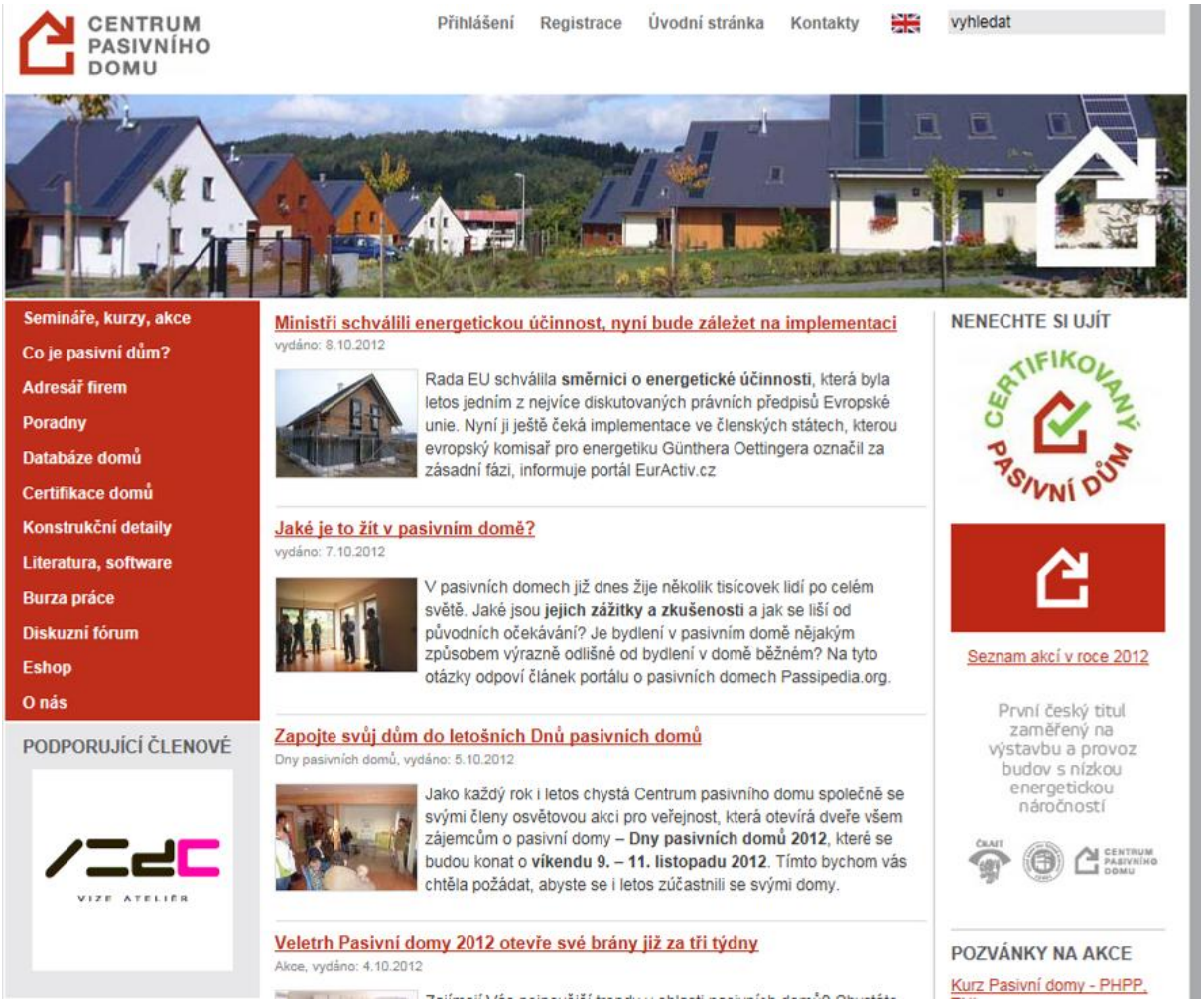
Its members are supporting members as architects, designers, construction companies, manufacturers of building materials and components, and all other professionals with an interest in passive houses. Supporting members are involved in the implementation of activities of the association, especially by their expertise, experiences, and active collaborations with other members.

Mission of the association:

- protection of the environment, the climate, nature and landscapes
- promoting sustainable development in the construction industry
- improving the quality of housing
- support of building in passive standard

Aims:

- promoting the passive house standard in the new buildings and by reconstruction
- implementation of quality assurance and quality passive house construction components and materials for the construction of passive houses
- introduction of the certification system for passive houses and related products and services
- media coverage of the results
- influencing of legislative environment



4. Example. Portal EnergyGlobe.com powered by E.ON

Useful guides and tools for determining the energy consumption in households and energy consultancy are in this portal. There is also the competition E.ON Energy Globe Award.

E.ON Energy Globe Award of the Czech Republic is one of the most respected awards for the environmental field. It honors energy-saving projects e.g. projects that conserve energy, nature and contribute to environmental protection.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