



MORE4NRG PEER REVIEW

Gabrovo (BG)

9-12 November 2009

Final report



**Gabrovo District
Administration**



Euro Perspectives Foundation



Agencia Valenciana
de la Energía



GEORAMA-ΓΕΩΡΑΜΑ

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More4nrg expert team would like to thank the members of the Gabrovo District Administration, Gabrovo Municipality, Euro Perspectives Foundation and the people of Gabrovo for the warm welcome and attentions received during our visit in November 2009.

Dear Veleslava, Ralitsa, Mihaela , Mariya and Atanas, thanks for all your support.

Section 1: Overview – objectives, content and main conclusions of the energy audit in Gabrovo

Objectives of the peer review:

The objectives of the peer review realised in Gabrovo is to provide the region with tools to stimulate the development of energy efficiency (EE) and renewable energy sources (RES).

The project involves the exchange of best practices in the involved «expert regions» related to the EE and RES for the benefit of all stakeholders, with a deep analysis of the potential application in Gabrovo. Also the best practices developed in Gabrovo will be analyse in order to study their replication potential and the best strategies to promote similar initiatives aimed at the promotion sustainable energy supply.

Economic objectives:

The economic objectives of the peer review are aligned with the analysis provide from EPF in order to improve the economic burden related to the relatively low energy efficiency in Bulgaria whereas the high energy intensity of the economy is considered even an inflation factor.

The share of the total end use of energy from the primary energy use is below 50% which means that more than half of the energy resources used is lost in the production and distribution chain with the related impact in cost and competitiveness.

About 40% of the total end energy use is in buildings from which the expected energy savings by 2015 are in the range of 70%, affecting primarily the economy of public bodies, final users and service sector enterprises.

It's critical to reduce the dependency of non-local energy resources as petrol and gas, that can compromise the economic development of the region.

Environmental objectives:

The environmental benefits expected from the promotion of EE and RES for a sustainable use of energy in the Gabrovo region can be classify as:

- Related to the minimising of local and global effects of non-renewable energy sources, climate change, pollution and health effects.
- Related to the protection of the local environment, natural life and biodiversity.
- Related to the best possible use of the available natural resources, creating resources from the sun, wind, water, biomass and waste.

Social objectives:

- To provide better opportunities for people to enjoy higher standards of living, comfort and commodities without compromising their environment.
- To provide new local employment opportunities related to the implementation of energy efficiency measures and the exploitation of regional natural resources in a sustainable way.

Context:

The Gabrovo region is placed in Central Bulgaria, and consists of four municipalities, Dryanovo, Gabrovo, Sevlievo, and Tryavna being the one around Gabrovo city the biggest of them with more than 55% of the population.



The regional strategy for EE and RES is aligned with the national one. In order to deliver the operational objective for sustainable development, part of the actions of the Bulgarian government are targeted at increasing the energy

efficiency, stimulating the generation and usage of energy coming from renewable energy sources (RES).

The utilization of the potential of the local RES was recognized as a priority in the National Strategic Reference Framework for the period 2007 – 2013. The commitments that the Republic of Bulgaria made are being delivered by applying a program approach implementing:

- National Long-term Program for the Promotion of Renewable Energy Sources (NLTPPRES) 2005 – 2015 – formulating measures and policies promoting the utilization of RES in the energy balance of the country, after assessing: the status of the utilization of the RES in the country; the necessity of accelerating the introduction of RES; the interrelation between improving the energy efficiency and widening the utilization of RES in the country with a view to achieving sustainable energy development.
- National long-term EE strategy by 2015 using the developed district and sectoral EE and RES strategies in the period 2004-2005
- First National Action Plan for Energy Efficiency 2008 – 2010.

Increasing the portion of the energy generated from renewable energy sources against the national energy balance as a result of the implementation of a policy based on preferential development of such resources integrates the efforts of institutions and organizations aiming at environmental improvement and energy efficiency in general. The utilization of renewable energy sources is possible in all planning regions. The North East, the South Central and the South East regions were assessed as the most favourable in terms of the development of RES.

- National strategy for financing insulations of buildings for raising their EE and plan *for its implementation*

There is a new programme being developed regarding Analysing the Opportunities for the Development of the RES in Bulgaria and its Socio and Economic Impact. The document is expected to be ready end 2009.

At the end the efforts should lead to the following commitments of the country:

- 11% of the internal electricity use by 2010 from RES. The documents say this is only possible through combination of EE and RES measures.
- 16% of total energy consumption by 2020 from RES as stated in the RES Directive from the package Energy-Climate
- The total energy consumption have to be reduced by 9% by 2016 according to Directive 2006/32/EC. The intermediate indicative target for the period 2001-2005 is of 3% from the average end energy consumption. The latter does not apply to the energy sector or the big industrial installations.

In Directive 2003/30/EC of 8 May 2003 on the promotion of the use of biofuels or other renewable fuels for transport an indicative target of 2% is set for 31 December 2005 and 5,75% market share for the biofuels in the Union's transport systems until 31 December 2010. The indicative target proposed by

the Commission is not compulsory. Each Member State has to set up a target according to the local conditions. Bulgaria has not defined a target so far.

At a local level the Gabrovo Municipality and District Government started working in Energy Efficiency measures in 1992, being the place of birth of the EcoEnergy Network (Municipal Energy Efficiency Network), involving 23 municipalities.

The Municipality of Gabrovo participated in a project financed by the United Nations Program for Development and the Global Environment Fund. This project, called "A strategy for reducing the greenhouse gases through energy efficiency. Demonstration area for Energy Efficiency Gabrovo, Republic of Bulgaria", encompassed the creation of three demonstration projects in the period 1998-2004.

The region has also being involved in other European projects and initiatives like the MODEL contest, demonstrating a great commitment with the promotion and adoption of energy efficiency measurements and the use of renewable energy sources.

The Municipality of Sevlievo in order to promote the modernization of enterprises through innovation has taken some decisions like the approval of a EE plan and the proposal for selling public land for PV parks, among others.

Organisation of the peer review:

The energy audit was organised in the frame of MORE4NRG project. This initiative aims at strengthening the delivery of regional strategies for renewable energy sources and energy efficiency by exchanging best practices on sustainable energy policies and developing an integrated monitoring tool for measuring the effect of regional sustainable energy strategies.

The project involves 12 partners. The members of Lazio (I), Valencia (E), Västernorrland (SE) and Western Greece (GR) took part in the peer review in Gabrovo, host by the Euro Perspectives Foundation, member in the project for Bulgaria, and the authorities of Gabrovo District.

The experts list comprises:

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The actual peer review started on November 9th and ended on November 12th 2009. Before the audit, the region completed a detailed questionnaire on energy so as to provide the expert team with some basic information regarding the condition of its energy sector.

The peer review was structured around a series of field inspections and meetings during which More4nrg experts had the opportunity to interview the local stakeholders and get a better insight into the Gabrovo's energy situation.

1st day

On the First day, November 9th, the expert team arrived, mainly from Sofia Airport and a welcome dinner took place, in order to organise and to put in common the regional experts' expectations and interest in order to perform the peer review.

2nd day

The second day, November 10th, activities were organised as an open event in the form of a round table entitled "Potential of Gabrovo Region for Energy Efficiency and Renewable Energy", with the participation of local stakeholders, authorities and the international experts. The program consisted on:

- Opening. Mr. Governor of Gabrovo
- Presentation of MORE4NRG project: Presentation of peer review objectives, methodology and expected results. Moderate by Mrs. Veleslava Abadzhieva, Euro Perspectives Foundation, it was followed by:
 - Presentations of good practices from Sweden
 - Presentations of good practices from Italy
 - Presentations of good practices from Spain
 - Presentations of good practices from Western Greece



- Presentation of the solar potential of Gabrovo region. Mrs. Mihaela Stoyanova
- Presentation of energy efficiency and renewable energy policies and practices of Municipalities in the region
- Discussion on Gabrovo potential for EE and RES and possible action plan measures

3rd day

On November 11th 2009, the expert team had the opportunity to visit the premises of public and private entities, and to discuss the main hurdles to the implementation of EE and RES initiatives.

The first Meeting at Gabrovo municipality, allowed the team to have an interview with the Gabrovo Mayor and to discuss with him and his team about the EE Information Centre and other EE and RES projects. This meeting ended with the visit to one of the more relevant projects, the solar heating installation for the swimming pool of the Mathematical High School, as well as the visit of one of the local main monument, the “House of Humour and Satire” that together with the Traditional Dancing Concert in the late evening allowed the experts to pulse the spirit of the people from Gabrovo.



The afternoon was fully dedicated to technical visits to a local furniture factory “Evrka Commerce” – Furniture Company that is using waste biomass for heat production used in drying and heating processes.



To end the day there was a very interesting meeting at the Technical University of Gabrovo, including the visit to a 10kW pilot photovoltaic installation; discussion about the models of photovoltaic system, project for installing of wind power generation and experience in training on Energy Efficiency.



4th day

During November 11th, there were two additional technical visits:

- STS Solar Company, visiting a real estate combining numerous RES technologies (mainly photovoltaics) and meeting their representatives.
- Mechatronika AD – Manufacturing company that is using geothermal heat pumps for heating.



The peer review visit ended with a final wrap-up session with the Regional Governor, companies and representatives of the local and national media. In this session the international experts sketch their recommendations and have the opportunity to discuss their impressions about Gabrovo region situation and potential development.



Conclusions and General Recommendations.

The experts received a very good impression of the preliminary work, with extensive information provided before and during the visit in November.

The general impression of the human capacities in the region were also very good, according to the high level and motivating discussion with representatives of companies, authorities and academia

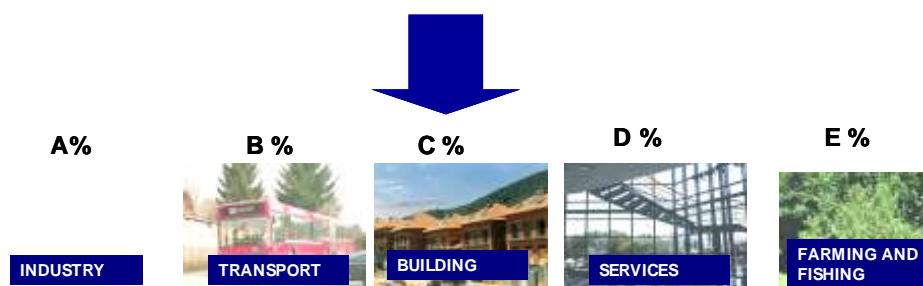
Some other general impressions about the region:

- Strengths:
 1. High entrepreneurship spirit and good private initiatives.
 2. Good potential for solar and biomass
 3. High potential in training/education
 4. Political commitment
- Weaknesses, some difficult non-technological barriers to overcome:
 1. Lack of economical resources perception by the local stakeholders.
 2. Difficult administrative burden and high associated cost (connection permits, land use, ...). The connection permits problems seem to be more related to lack of experiences from the DSO that to real technical problems but needs to be tackled carefully integrating the distribution company in the development.

To reinforce the detected strengths and to overcome the barriers detected there are a set of recommendations that can be considered the main results of this review.

- Monitor your energy consumption, inform and involve your people to foster (compete) energy efficiency.
The first step to solve any problem is to identify it. In order to identify the biggest improving potential it will be needed to quantify the biggest consumptions and monitor their evolution. It is recommended to start with the monitoring of public buildings and to communicate the results to the public employees as well as reduction strategies. In order to support these process the creation of energy controllers in buildings or institutions can be very helpful as a reference for the other people involved.

Total consumption = ?



- Creation of a local energy agency as a link among all relevant stakeholders and to support the implementation of the regional energy policy.

The creation of a Energy Agency can support the implementation of the regional policy, and at the same time support industries and the general public in the application of the best available technologies to reduce their energy consumption or to integrate renewable energy sources in their houses or premises. This is the main role of Local and regional energy agencies, to support the transition to a more sustainable energy system. They spread management practices, provide information guidance, and offer a range of services based on specific local needs, which must be adjusted to the actual circumstances of the region.

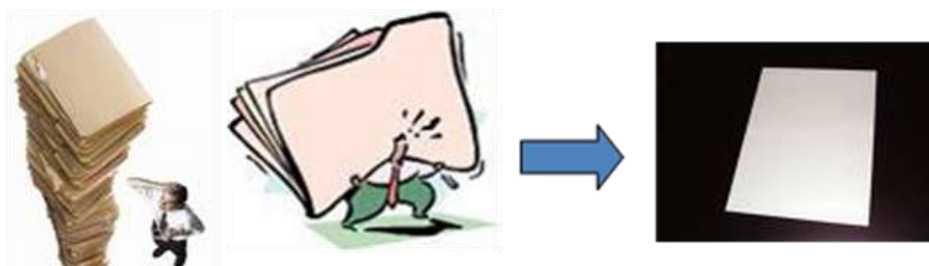
- Promote the use of high efficiency appliances and renewal of the traditional ones. E.G. Use of high efficiency biomass boilers instead of traditional chimneys for heating or fossil fuel ones.

Though this measure that can be realised by means of the energy agency, one of the more abundant energy resource in Gabrovo, the wood, can be used in a more sustainable way that in the traditional way, on the other hand due to the identified difficulties for the installation distributed electricity generation, Biomass Electricity Power Plants, are considered a secondary priority.



- Simplify administrative procedures (regional ones) and support fulfilling all the requirements (one-stop office, helping with national regulations).

It will be very desirable to accelerate the administrative process for small renewable heat or electricity generation installations, e.g. less than 20 kW, as well as to relax the need to reclassify the use of the land for these small facilities. Due that these regulations can be difficult to be approved if they are not tackled at national level, as a intermediate step it will be very useful to set up a one stop office in order to support the fulfilling of all the related regulations, local, regional and national.



- To promote the establishment of Private-Public Partnerships (PPP) in order to foster the implementation of RES (PV & ST systems) and energy services in public premises. E.G. Municipality + DSO+PV SME to exploit a PV plant in town hall's roofs easily.

The creation of PPP can assure the recovery of part of the public money for further investments, as well as supporting the creation of local companies that can supply energy services being dedicated to the installation and maintenance of the set-ups, the property of the equipments can be public, private or mixed, in different implementations of the ESCO scheme.

One possible solution can be a local company that installs and maintain a solar thermal installation on the roof of a school, invoicing a fixed price for a determined period for every kwh of hot water supplied.

Bulgaria posses one of the more attractive feed-in tariff regimes in Europe, but because of the administrative (use of land categorization), technical limitations (the DSO's are reluctant to concede grid access, mainly motivated by a weak grid and the lack of knowledge and experience in the effects of distributed generation on their distribution grid), the entrepreneur SME's that have started the development of photovoltaic generation in Gabrovo region encountered many hurdles to overcome.



Other proposed solution is to link the starting development in the region of the PV industry to the creation of private-public partnerships where:

- The regional/local administration can provide the demand and installation place on their premises, covering part of their day time energy requirements with the photovoltaic generation created in their roofs. The associated incomes (renting of the roofs and/or part in the benefits) would be used to fund new energy efficiency initiatives in public buildings.
- The DSO provide the grid access, assuring the fulfilment of the connections protocols and gaining experience and economical benefits, without the need of reinforcing the grid (using already existing nodes with a demand that can only be reduced by the PV installed).
- The PV SME's providing the installation of elements, increasing their experience and providing also maintenance services, so the public

authorities and DSO don't need to be concerned with small breakdowns or malfunction. These companies can be partial owners as well as suppliers.

In this way the region can lead the implementation of installations and export expertise to the rest of regions of Bulgaria, meanwhile benefiting the region from the established national feed-in tariff regime.

- To facilitate the use of local and external capitals jointly. It will be easier to gain trust if there is local money in the projects. Mechanism to benefit the joint use of local and foreign capital versus only local ones, obtaining a multiplication effect.

In this way the external financing agents can be sure of the selection of the best investment because of the insight of their local partners, as well as being reassured because of their common financial commitment.

By creating mechanism to favour the jointed use of the local money with foreign funds, the total available amount can be multiplied, and the number of projects and their scope clearly enlarged. For this measure to be effective there must be a clear advantage to the local investors that co-invest with other countries partners, but not any disadvantage for the local funds compared to the foreign ones when acting separately.

Section 2: Peer review methodology

An energy peer review is a mentoring visit undertaken by a group of international experts to a region interested in improving its energy situation. Its overall aim is to analyse how energy is used by the region. Peer reviews help local authorities understand how well their energy policies work and support them in making concrete improvements. During the visit, peer reviews perform a number of field inspections and hold meetings with a variety of stakeholders concerned with the issue of energy, such as energy legislators, market operators, representatives of local development agencies and business sector, and consumer associations. AER energy audits provide a good opportunity for regional representatives to exchange their experience and learn from one another.

Types of energy audits

There is a wide spectrum of energy peer reviews ranging from a quick walk through an energy facility to more comprehensive studies regarding the overall energy situation in a given region. The duration of the peer review is up to one week. AER peer reviews usually last four days. Energy audits cover a wide variety of themes. Typically, an energy peer review is conducted to make an overall performance assessment of the region's energy sector.

However, a peer review can also seek opportunities to reduce energy intensity in public buildings and public transport or to suggest regional authorities how to develop a certain type of alternative energy sources, i.e. biomass-based energy; solar or wind power.

The role of peer reviewers can also consist of recommending regional authorities how to draft effective energy strategies that would accurately depict changing trends in the energy market, such as energy demand, energy supply and energy cost.

Selection of AER peer review's topic

It is upon to the peer review team and host region to choose a topic for their energy audit. While selecting the most appropriate theme, the region should take into account its specific energy needs, previous feasibility and pilot studies that were conducted over its territory, as well as time, human and financial resources allocated to the project.

The peer review' objectives should comply with these requirements. If peer review's targets are not properly defined, it can be disastrous for the whole project's cycle. The expert team should know well in advance what is to be evaluated so to come with appropriate conclusions and recommendations.

According to AER peer review methodology, prior to the visit, the expert team receive the most relevant pieces of regional energy legislation. The host region is also requested to fill-in an energy questionnaire the aim of which is to provide experts with comprehensive background information on current and planned energy-related policies. These pre-review activities are of crucial importance,

since they reduce time required for basic descriptive information during the visit and increase time available for peer review-related issues.

Energy checklist

It is also important to stress that the peer review methodology is based around a checklist. The checklist describes what an 'ideal' regional authority would do in terms of supporting energy policies. It provides a way to measure progress towards sustainable energy goals. The checklist is derived from global best practice in the field of regional energy.

The checklist provides a set of standards by which all the review teams can make a consistent judgement about the effectiveness of energy policy, and thereby ensures a certain amount of objectivity in the reviews. The team's members make use of this checklist in undertaking the reviews. The evidence collected in the preliminary questionnaire, completed by the host regions prior to the review process, is meant to assist the reviewers in making a primary assessment of energy performance against the checklist. The peer review team also uses the checklist to structure the interviews that it undertakes with stakeholders in the host regions.

The review teams' final report should also be based upon this checklist. In the report, the review team indicates in which areas of energy the host region demonstrates strengths and in which ones certain challenges still need to be addressed. In assessing the host regions' performance against the checklist, the reviewers give clear justifications for their assessment and identify their sources of evidence.

In designing an energy checklist that can be used throughout Europe, it has to be recognised that different regions have different competences and approaches to energy. There is no 'one-size-fits-all' model. Making use of a checklist does not infer that there is a perfect approach that all regions should use to address energy issues. However, there are a number of underlying factors, which can contribute to developing successful sustainable energy policies in all European regions, no matter what their shape or size.

It should be also reminded that different regions have different political competences and financial possibilities available to them. The peer review teams must be careful to understand where the region has executive authority to act in an area, and where it shares this with other levels of government, or has no competence at all. This will obviously affect its ability to make any improvements.

Final report

After the visit the review team prepares a report with a series of recommendations on how bring the region's energy sector up to the current standards. The host region then considers the conclusions and prepares an action plan, setting out how it intends to implement experts' recommendations.

Section 3: Sustainable energy supply and production

Key Findings and Recommendations.

After receiving detailed information about the natural resources available in the region and hearing from the promoters their experiences and the barriers they must deal with, the analysis of the possible resources are:

- Biomass: There is a big potential in the region for the use of biomass in small factories and for heating in buildings. The use of biomass for electricity generation should be postponed until the grid connections protocols and permitting and the rest of administrative and technical constraint to distributed generation can be solved.
- Wind Energy. Gabrovo has only a little number of proper sites for wind energy generation (according to the presentation of the Technical University of Gabrovo, average speed is under 4 m/s), so this is not a high priority for the regional development.
- Solar Energy, PV and Solar Thermal. Both of them can be use for small business development promotion as well as clean energy generation, using on one hand the existing experience in public buildings (Technical University and Mathematical High School) and the existing knowledge and good economical incentives at national level. The detailed analysis of the solar potential provided by the Europespective/ Gabrovo District team give a very good impression of potential development (3900 Wh/yr.m²), if some basic recommendations are taken into account (avoid use of followers because of snow loads, avoid misty places, shadows, etc...).
- Geothermal. Low enthalpy geothermal energy can be used to increase significantly the efficiency of heat pumps. Having a big potential for development, it can be use for achieving very good performance for both heating in winter and air conditioning in summer. It will be very valuable to learn from the existing first experiences.
- Small hydro was not discussed in detail during the peer review.

As a extension to this short analysis some additional information about the potential use of Biomass and Solar Potential exploitation, including information about Lazio promotion and administrative support system that can be useful for replication in Gabrovo, is provided below.

Biomass use

In Gabrovo region, on one hand, biomass advanced technology is already being used in industries as a heat resource but on the other hand, traditional chimneys are still used in household.

Due to the fact that traditional chimneys and heaters are obsolete and have very low energy performances, it is being recommended to foster the implementation of highly effective in household.

Besides, domestic heaters technologies based on biomass resources have experimented an incredible development in these recently years, so their high efficiency, reliability and comfort can be compared to conventional ones based on gas or fuel.

New domestic biomass heaters are compact, controlled and regulated automatically. Usually, these low-medium power equipments have 150 – 200 W and high energy performance. So then, air conditioning supplied by new biomass technology is environmentally respectful.

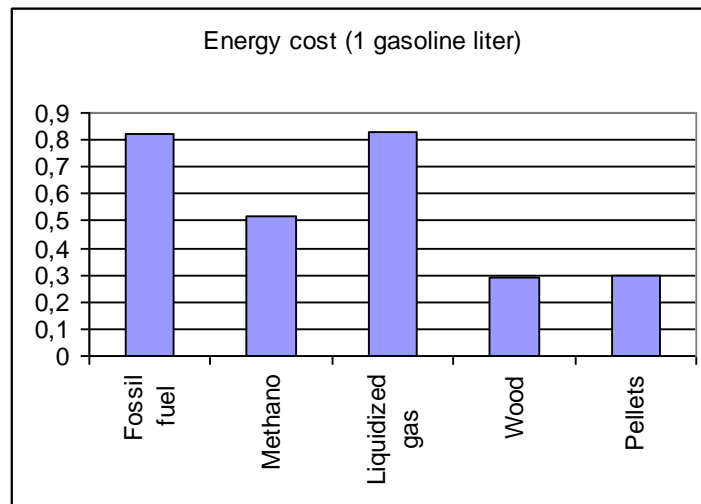
Latest developments on biomass heaters have provided the following main properties: long lifetime, silent performance due to the fact that they do not use burners and high energy performance, up to 85-92%!

If a comparison is done between biomass and conventional technologies, it can be appreciated the importance of biomass in the future of air conditioning systems:

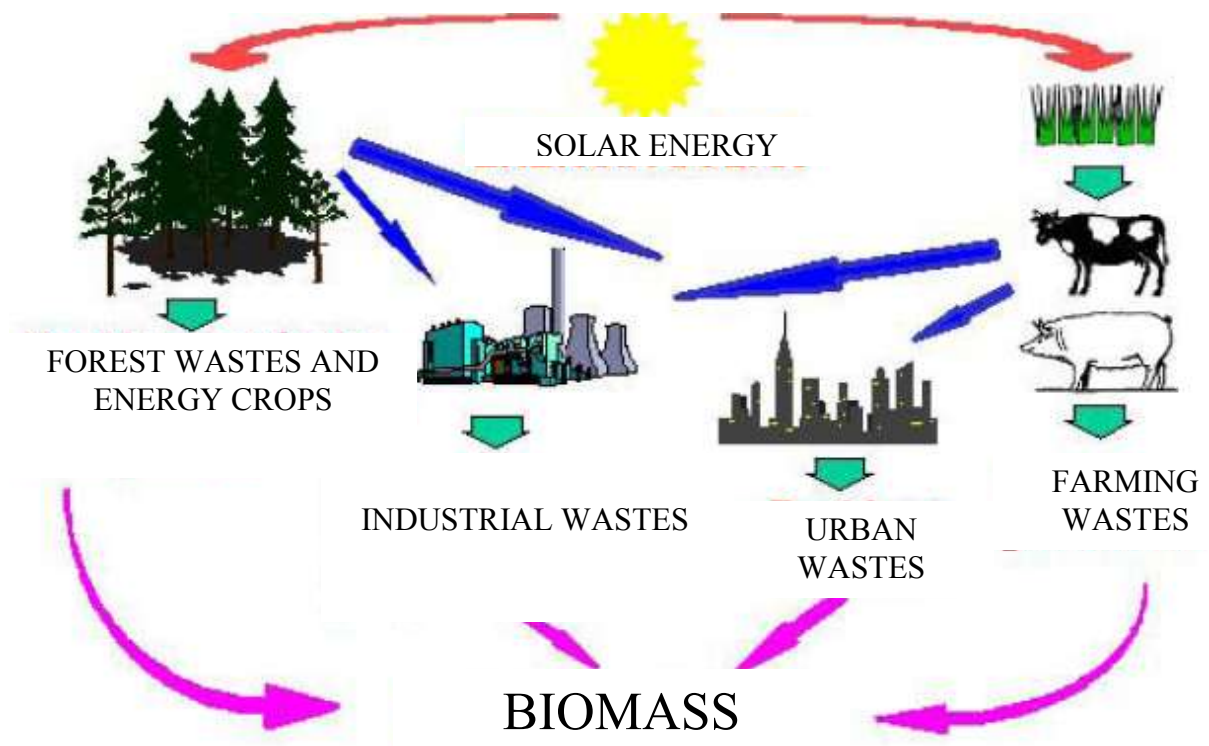
Biomass	Fossil fuels
It's an endless energy source	Society is about to exhaust this energy source
Stable and competitive prices	Prices are growing constantly
It generates local Jobs	All benefits go to foreign countries
Harmful emissions are nearly zero	High emissions of harmful gases

Biomass technology has many advantages, it has to be underlined economical and environmental issues.

Nowadays, tendency for fossil fuel price is to grow up while biomass price tendency is to be stable or to go down. So then, biomass price can be very changeable, it can cost zero (in case of having our own biomass production) or it can cost up to 0,4€/kg.



Besides, biomass helps environment due to the fact that biomass CO₂ emissions are much lower than solid fuels.



It is considered that biomass doesn't have CO₂ emissions thanks to its neutral emissions balance through its lifetime, it means, CO₂ throw to the environment when biomass is being burnt, is the same CO₂ quantity absorbed by the forest.

Besides, biomass has low dangerous emissions content (sulphur, nitrogen, chlorine) compare to conventional energy sources:

Lifetime emissions			
	Fossil fuel for heating	Natural gas	Wood and pellets
CO (kg)	35	90	20
SO ₂ (kg)	205	20	48
CO ₂ (kg)	195	160	15
Ashes (kg)	20	10	30

For a proper heater selection, it has to be taken into account the following characteristics:

- System reliability
- Combustion performance for heaters. As higher as possible, consumption will be lower and efficiency will be better.
- Low CO emissions (below 200mg/m³)
- Low ashes emissions (below 150 mg/m³)
- It has to obey gases and ashes emissions normative.
- Easy control and regulation for the user.
- Automatic cleaner system or minimum manual cleaning required.
- Easy maintenance
- Good technical services
- Wood supply guarantee.

So then, a biomass air conditioning system is mainly composed by the following equipments:

- Combustible warehouse
- Fuel supply system such as a pneumatic system.
- The heater composed by a combustion chamber, interchange zone, ashtray and combustion gases box.
- Chimney which bigger diameter that usual due to the fact that gases humidity is higher than in conventional chimneys.
- A heat distribution system
- A control and regulation system
- It can be connected to an absorption system in order to provide cooling needs.



Example of a biomass heater supplied by wood resource

Solar Potential

The solar PV energy potential is good in Gabrovo, ranging between 1200 and 1400 kWh/m²*year (Figure 1, Figure 2 (Source Italy: ENEA).

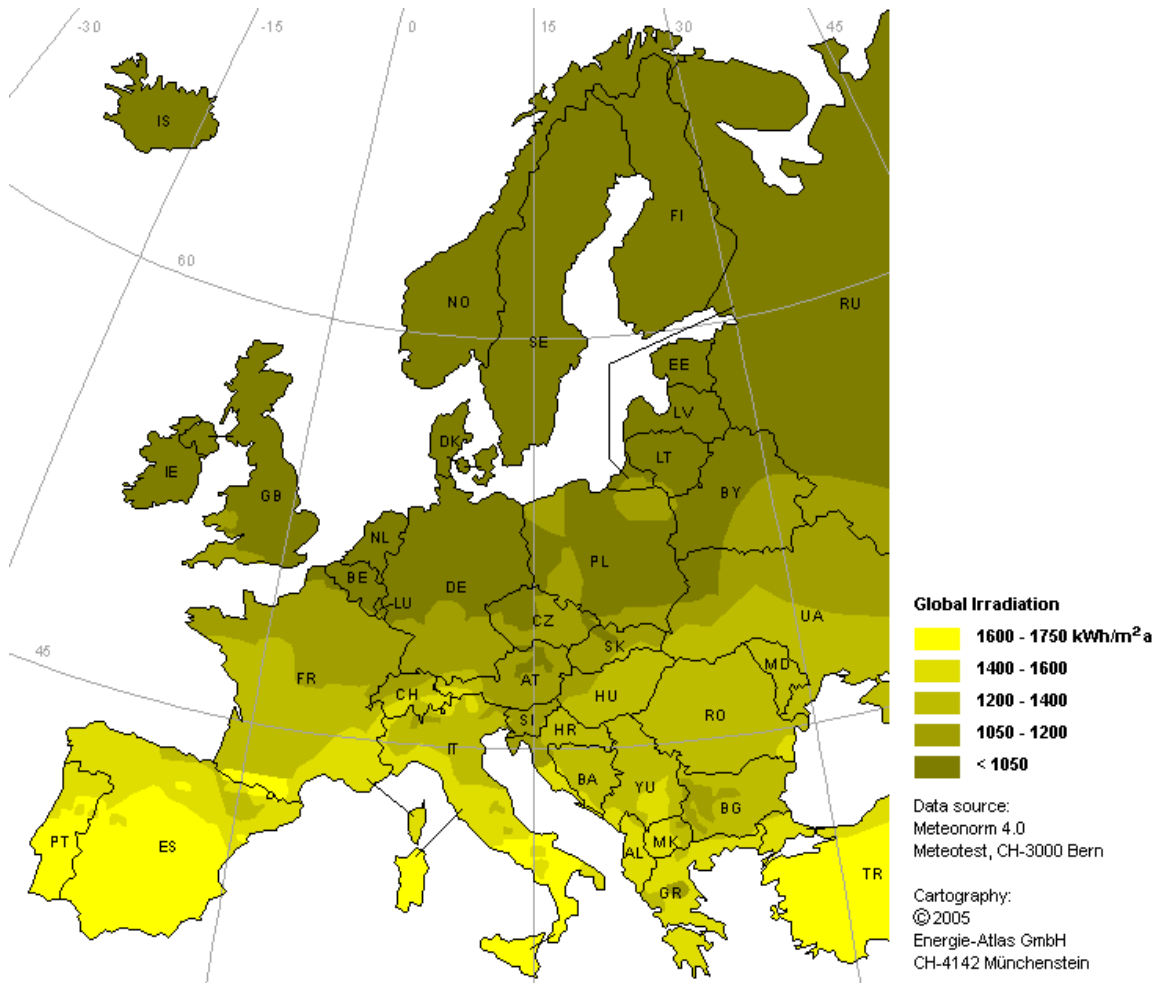


Figure 1

**EUROPEAN MAP OF GLOBAL SOLAR RADIATION
ON A HORIZONTAL SURFACE**
[KWH/M² . YEARLY]

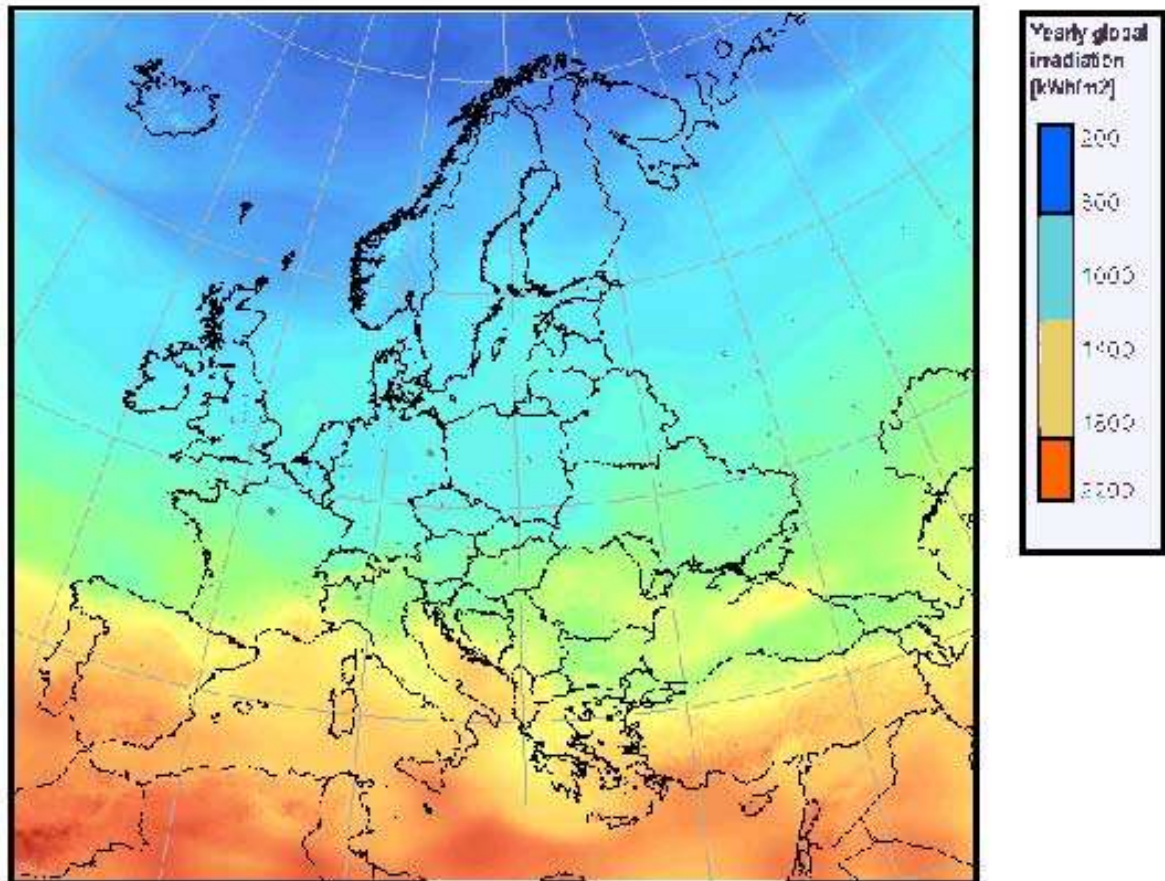


Figure 2 (Source Italy: ENEA National Agency for New Technologies, Energy and Sustainable Economic Development)

A way to promote the development of PV is through totally or partially integrated systems (residential rooftop, industrial roof) operating in net-metering system.

Partially integrated systems consist of PV modules installed both horizontally and inclined over flat roofing or with the same tilt of an underlying sloping roof. A further step in architectural integration may foresee the implementation of PV modules not only as energy generators but as functional component of the building envelope also using new materials for glass facades (BIPV).

Since 2006 Lazio Region has financed an agreement to build a excellence centre for the research and development of organic and hybrid technologies applied to photovoltaic energy and in september 2008 it's born DYE POWER Consortium (ERG Renew S.p.A., Permasteelisa S.p.A. , Dyesol Italia CHOSE – University Tor Vergata, University Ferrara, University Torino) for the industrialization of DyeSolarCells for glass facades (BIPV).

In Italy PV distributed generation is being promoted conceding the highest incentives.

Furthermore in Lazio Region the law makes obligatory for building renovation and new construction the installation of renewable energy sources, taking care of the integration with the structures of the building in order to satisfy:

- Minimum 50% of sanitary hot water demand;
- Electricity production from renewable energy sources minimum:
 - ✓ 1 kW for each unit of property
 - ✓ 5 kW for industrial, commercial and service buildings, with surface > 100 mq

At last it's important to take measures to remove administrative barriers towards using RES so citizens and investors can easily access the permits for installing RES technology. It's possible to simplify very much the authorization procedures, for example in Lazio Region:

- Authorization for installation isn't necessary for partially or fully integrated PV installations, wind generation of power < 5 kW in buildings, solar thermal fully integrated or not exceeding 30 mq;
- It is necessary to give a "Start-work construction declaration" to the concerned Municipality in case of solar photovoltaic ground system having power < 20 kWp and solar thermal exceeding 30 mq
- Authorization procedure has been delegated by the Region to the five provinces of Lazio in the case of solar photovoltaic ground plants having power >20 kWp, it's released in the end of a Conference of the competent administrations involved of a maximum of 180 days.

Recommendations:

It is highly recommended to prepare and approve guidelines for the use of systems for the production of renewable energies both in urban and rural areas. These guidelines ought to be considered as flanking measures for the local and regional administrations in charge with approving building codes or specific procedures concerning the environmental impact assessment of projects. The systems to be considered in the guidelines are the solar thermal energy and photovoltaic plants (especially in urban areas) as well as geothermal for heat pumps and biomass in heating of industries and buildings

The actions on the promotion of highly efficient appliances, administrative simplification as well as the creation of PPP apply to support to the development of more sustainable energy generation.

Section 4: Energy efficiency and Management

- **Key findings:**

During field visits in Gabrovo Region, it was possible to find out that there wasn't yet any strategic plan which is very important in order to organize Gabrovo region energy infrastructure and requirements.

Although a big effort is being made in the municipalities to increase the energy efficiency of public buildings, detailed information about regional energy use is not available.

Other difficulties associated to the lack of investment resources, high interest rates and uncertainty about future change rate with the Euro can delay private investment in Energy Efficiency.

- **Recommendations:**

First recommendation is to identify and train an energy management team, energy controllers, capable of assessing the needs for reduction of energy consumption of administrative buildings and infrastructures.

This team could start the process of regular auditing of public buildings energy performance, municipal fleets and installations in order to create a live energy database on consumption. This team also could later spread their experience in other municipalities and create

Second recommendation is to create a Regional Energy Agency. The Creation of a local energy agency as a link among all relevant stakeholders and to support the implementation of the regional energy policy will foster the awareness and implementation of actions in public and private entities.

The creation of a Energy Agency can also support the implementation of the regional policy, and at the same time support industries and the general public in the application of the best available technologies to reduce their energy consumption or to integrate renewable energy sources in their houses or premises. This is the main role of Local and regional energy agencies, to support the transition to a more sustainable energy system. They spread management practices, provide information guidance, and offer a range of services based on specific local needs, which must be adjusted to the actual circumstances of the region. It is very important the dissemination of good practices among stakeholders. Although, as stated in the received information, all energy projects developed and implemented on the territory of the region have promotional and information activities, the knowledge and replication potential of these activities as well as the work of the existing Energy Management Centre at the Municipality of Gabrovo and Energy Information Centre in Gabrovo town, could be reinforce and extend to other municipalities through the creation of a Regional Energy Agency.

Third and main recommendation It is to create an energy strategy plan (ESP). It is possible to developed different kind of energy strategy plans

depending on region possibilities, a detailed description of this levels and the expected results, as well as the information of Valencia Region as an illustrative example is given below.

Creation of an Energy Strategy Plan (ESP)

It is possible to developed different kind of energy strategy plans depending on region possibilities:

1. A detailed energy strategy plan.
2. A medium energy strategy plan.
3. A basic energy strategy plan.

1. A detailed energy strategy plan

These are the steps followed by a detailed energy strategy.



Figure 1 - "Ideal energy strategy plan (Ideal ESP)"

The first step on a detailed energy strategy plan is to make an energy balance of region infrastructures. An energy balance gives an idea of consumptions evolution and energy production in the region. So then, it provides all statistical data in order to make possible an analysis of the energy infrastructure.

A detailed energy balance includes:

- An analysis of primary energy (coal, oil, natural gas, uranium, renewable energies and energy's exports/imports)

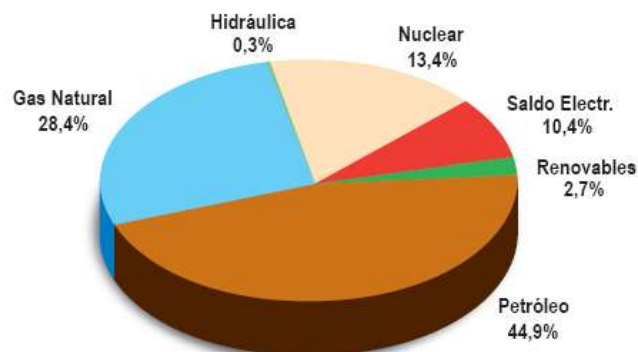


Figure 2 - Example " Analysis of Valencia region primary energy in 2007"

(*) English translation:

- | | |
|-----------------------------|---|
| - Nuclear – nuclear energy | - Petróleo – oil |
| - Gas natural – natural gas | - Renovables – renewable energies |
| - Hidráulica - Hydropower | - Saldo electric – energy's exports/imports |

- An analysis of final energy (Coal, oil products, natural gas, electricity and renewable energies)

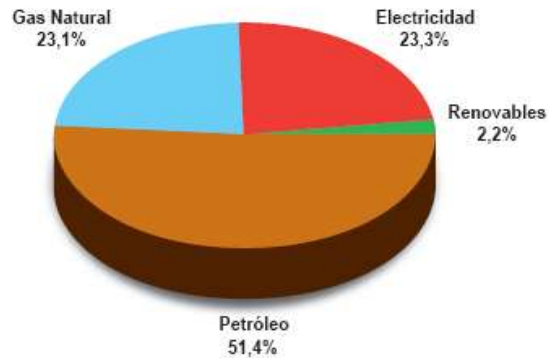


Figure 3 - " Analysis of Valencia region final energy in 2007"

(*) English translation:

- Electricidad – electricity
- Gas natural – natural gas
- Productos petrolíferos – oil products
- Renovables – renewable energies

- A sectorial analysis of final energy (industry, transport, household, services and agriculture & fishing).

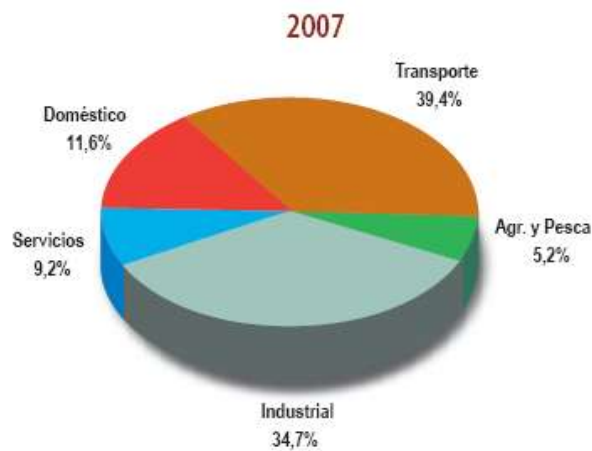


Figure 4 - " Sectorial analysis of Valencia region final energy in 2007"

(*) English translation:

- Doméstico- household
- Servicios – services
- Industrial – Industry
- Transporte – transport
- Agric & Pesca – Agriculture and fishing

After this energy balance, it is possible to analyze energy infrastructures:

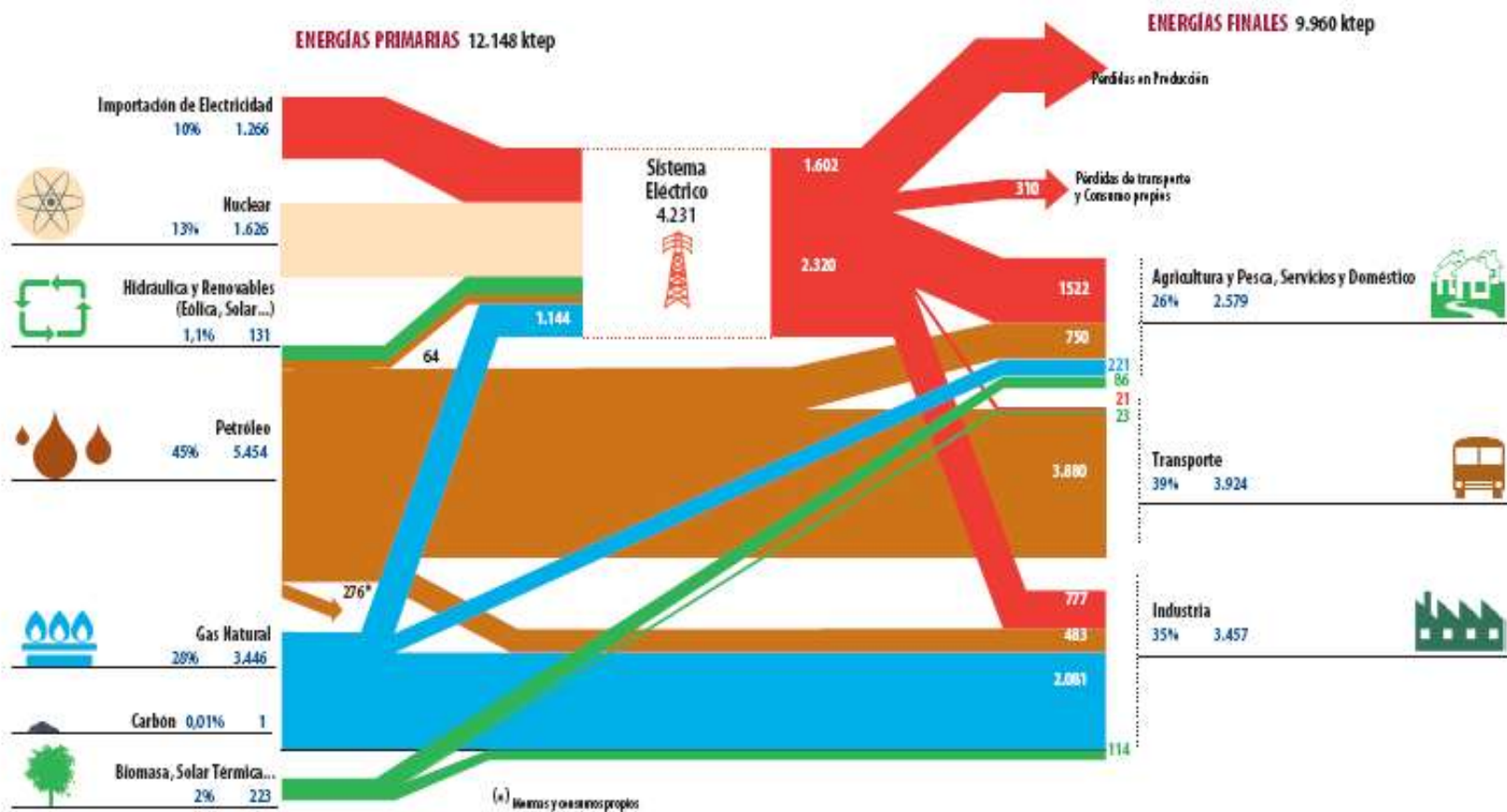


Figure 5 - "Valencia region sectorial energy balance"

(*) English translation:

- Diagrama de flujos energéticos – Energy balance
- Energías primarias – primary energy
- Energías finales – final energy
- Importación de electricidad- imported electricity
- Hidráulica y renovables – hydro and renewables
- Petróleo – fuel
- Carbón – Coal
- Pérdidas de producción – production losses
- Pérdidas de transporte y consumo propio – transport losses and own consumption
- Transporte - transport
- Agric & Pesca – Agriculture and fishing
- Industria - Industry

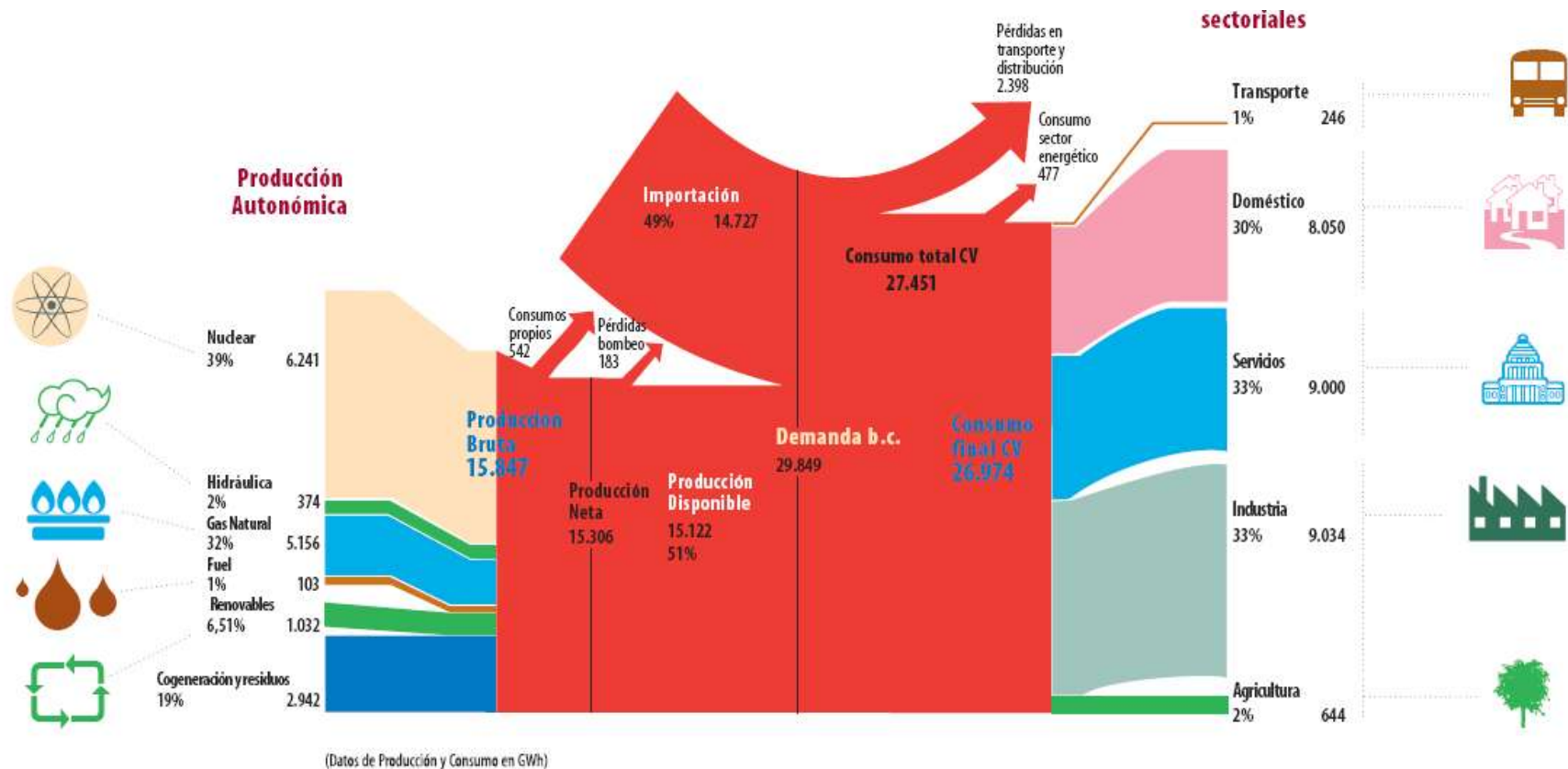


Figure 6 - "Valencia region sectorial electricity balance"

(*) English translation:

- Producción autónoma – Regional production
- Hidráulica – Hydro
- Gas Natural – Natural gas
- Renovables - renewable
- Cogeneración y residuos – cogeneration and
- Consumos sectoriales – sectorial consumption
- Transporte – transport
- Servicios - Services
- Agricultura – Agriculture
- Industria - Industry

This energy balance should be done every year in order to know exactly energy consumption evolution.

For instance, in Valencia region, it has been done this energy balance since 1980. In the next figure, it is possible to check Valencia Region energy evolution since this study started:

Miles de tep

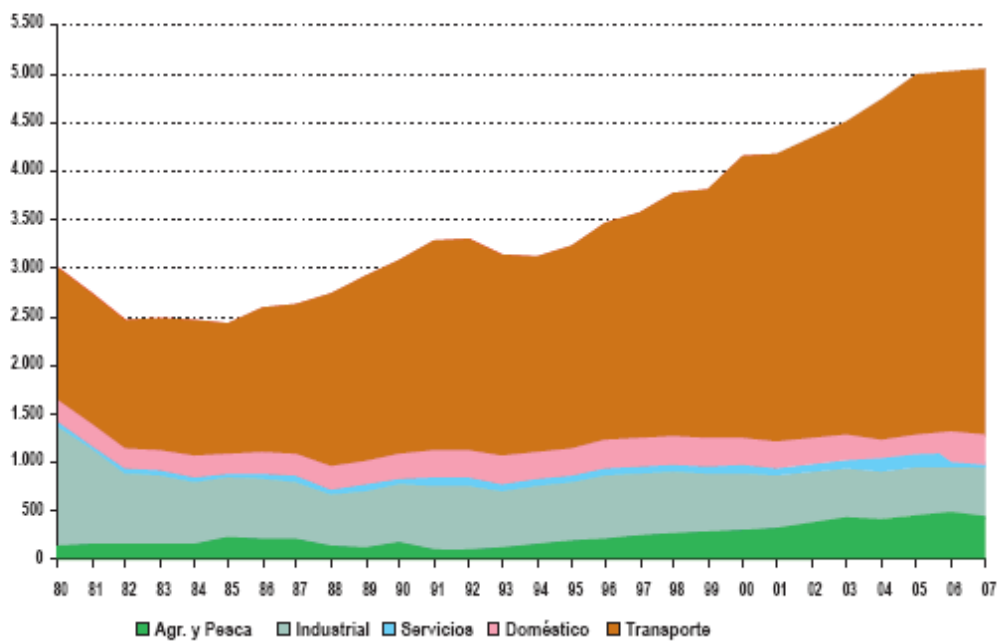


Figure 7 - “Energy consumption from 1980 till 2007”

(*) English translation:

- Doméstico- household
- Industrial – Industry
- Servicios – services
- Transporte – transport
- Agric & Pesca – Agriculture and fishing

Once energy balance is done, it is possible to determine the biggest consumer per unit, it means, the biggest amount of energy required per consumer among all sectors (industry, transport, etc.)

Thanks to the first step, it is determined the sector that consumes the most in the region.

According to this first result, the second step on a detailed energy strategy plan is to make sectorial inquiries in order to find out which branch consumes the most in this sector.

Finally, based on previous analysis, the third step on a detailed energy strategy plan is to make a deeper study so as to define the biggest consumer in this sector’s branch.

In the case of Gabrovo region, although industries represent the biggest consumers, public and private service buildings and household are considered to possess the biggest consumption reduction potential by replication of common practices.

Nevertheless, an energy balance has to be done in the region in order to get an exactly knowledge of energy infrastructure and requirements.

So then, according to Gabrovo region energy balance, an ideal energy strategy plan would probably include the following steps:

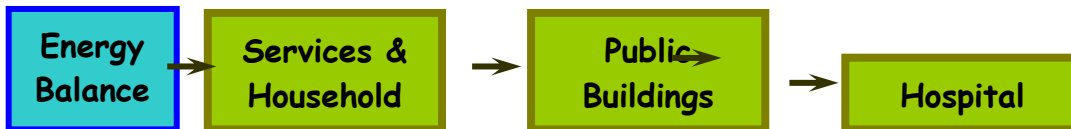


Figure 8 - "Ideal energy strategy plan in Gabrovo Region (Ideal ETP)"

2. Medium energy strategy plan

A medium energy strategy plan is done in case of not being possible to develop an energy balance in the region.

In these cases, usually it can be supposed which sector consumes the higher amount of energy.

According to this supposition, the first step on a medium energy strategy plan is to make a brief study based on sector related inquiries, so that, it can be found out which is the biggest consumer inside the supposed sector.

The most important branch in energy consumption Gabrovo region is industry, but there is a big potential for savings and replication of solutions in buildings, and more specifically public buildings.

So then, according to Gabrovo region information, a medium energy strategy plan would include the following steps:



Figure 9 - "Medium energy strategy plan in Gabrovo Region (Medium ETP)"

3. Basic energy strategy plan

If it is not possible to execute an energy balance or a sectorial enquiry, then, the first and unique step is to get an idea of the most important consumer in a sector based on the energy agency or equivalent body knowledge.

So then, according to Gabrovo region information, a basic energy strategy plan would include the following steps:

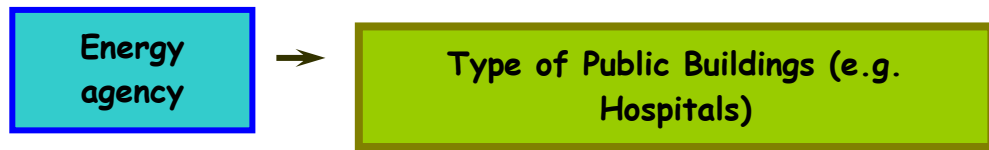


Figure 10 - "Basic energy strategy plan in Gabrovo region (Basic ETP)"

Section 5: Financial mechanisms and incentives

Key Findings and Recommendations

According to the “STUDY ON LEGISLATIVE, INSTITUTIONAL AND MARKET FRAMEWORK FOR FOSTERING ENERGY EFFICIENCY AND RENEWABLE ENERGY SOURCES DEVELOPMENT IN GABROVO REGION» prepared for the Local Initiative Group for Sustainable Tourism, by Euro Perspective Foundation and provided to the international experts previously to the peer review meeting, there is already in place a “Law on the Renewable and Alternative Sources of Energy and the Biofuels” that must be enforced by the district governors.

This law and the associated incentives are quite high and comparable to the Italian and Spanish ones (provided for the sake of comparison), in the case of renewable origin electricity generation feed-in tariff but after the several interviews with the local stakeholders, appears that the administrative burden, like the electrical grid connections permits and time to obtain the permit to change the use of land to industrial activities (and the need to assure the investment before asking for the change of land use) can stop the potential development of the regional capacity.

Other important elements to be taken into account are the current crisis situation, jointly with very high interests and the associated risks of the evolution of the currency (BGN) in relation to the Euro, that makes very difficult to rise funding for any potential investment.

The recommendations in these aspects comprise these three general recommendations already stated:

1. Simplify administrative procedures (regional ones) and support fulfilling all the requirements (one-stop office, helping with national regulations).
It will be very desirable to accelerate the administrative process for small renewable heat or electricity generation installations, but, due that these regulations can be difficult to be approved if they are not tackled at national level, as a intermediate step it will be very useful to set up a one stop office in order to support the fulfilling of all the related regulations, local, regional and national.
2. To promote the establishment of PPP in order to foster the implementation of RES (PV & ST systems) and energy services in public premises.
3. To facilitate the use of local and external capitals jointly. It will be easier to gain trust if there is local money in the projects. Mechanism to benefit the joint use of local and foreign capital versus only local ones, obtaining a multiplication effect.
In this way the external financing agents can be sure of the selection of the best investment because of the insight of their local partners, as well as being reassured because of their common financial commitment.

Incentives in Gabrovo Region

The Law on the Renewable and Alternative Sources of Energy and the Biofuels requires the development of national and local short term and long term programs and for the national ones, the deadline was 2007. The district governors are engaged to ensure the implementation of the national policy in this field and the coordination between the municipalities.

The legislation does not differentiate between the various RES (water energy, biomass, solar energy, wind energy and thermal energy) except for the periods envisaged in the Law for Energy Efficiency for the duration of the purchase contracts – for the electric energy generated from geothermal or solar energy it is 25 years and for the electric energy generated from water power plants with installed up to 10 MW or from other renewable sources it is 15 years. It also covers the alternative energy sources such as hydrogen, waste products from technological processes and so on.

The deadlines set by the legislation seem to be far ahead in the future but they require immediate actions to be taken with a view to the large scale of the activity. According to the data of EEA, the buildings that will be liable to assessment and consequent certification are more than 4 million. At the same time, the legal entities authorized to perform the assessment and certification are less than 200 (around 130). Those authorized to assess and certify production installations are only about 40 while the action period is three years (till the end of 2011). In addition, the capacity of the consultants that are expected to perform the activities could be challenged.

The legislation envisages some promotional measures. According to the Law on Energy Efficiency that is in force, for the purpose of promoting the energy efficiency, voluntary agreements are defined between EEA and the owners of private buildings having a total of built-up area of more than 1000 m²; ESCO services and funding of the “Energy Efficiency” Fund. In the field of RES, they include the compulsory purchase of the electric energy; priority integration of the producers of electric energy; issue of a “certificate of origin” including for the thermal energy; purchase of the whole amount of electric energy, determining of preferential prices for the purchase of electric energy.

The current preferential prices for electricity from RES are:

- Producers using RES below 10 MW – 60 BGN without VAT
- Mini water power stations – 80 BGN without VAT under special conditions
- Wind power stations below 10MW – 120 BGN/MWh without VAT
- Photovoltaic systems below 5kWp – 789 BGN/MWh and for larger systems – 718 BGN/MWh without VAT

There are changes made to the Law for Local Taxes and Fees, the Law for the Corporate Income Taxation and the Law for Taxation of the Income of Natural Persons – as follows: According to Article 24 from the Law for Local Taxes and Fees, the following shall be relieved of taxation: the buildings put into utilization before 1 Jan 2005 and received a category A certificate, issued under the Law for Energy Efficiency, as listed:

- a) for a period of **7 years** after the year following the year when the certificate was issued;
- b) for a period of **10 years** after the year following the year when the certificate was issued in case there are measures implemented aiming at the utilization of the renewable energy sources for generation of energy with a view to meeting the needs of the building;

The building taxation relief is envisaged for the buildings that were put into operation before 1 Jan 2005 and received a category B certificate as follows:

- a) for a period of 3 years, starting after the year following the year when the certificate was issued;
- b) for a period of 3 years, starting after the year following the year when the certificate was issued in case there are measures implemented aiming at the utilization of the renewable energy sources for generation of energy with a view to meeting the needs of the building;

The amendments made to the Law for the Corporate Income Taxation are related to the decrease of the accounting financial result with the amount for a donation of 10 percent from the positive financial result before the tax transformation when it was done on the expense of the reserves and the non-distributed profit from previous reporting periods, if this will be beneficial for the Energy Efficiency Fund.

The amendments made to the Law for Taxation of the Income of Natural Persons state that the natural persons would receive a tax relief in case of donation in favour of the Energy Efficiency Fund.

For increasing the use of biofuels the stimuli are zero tax for biodiesel and bioethanol (not for all); obligation of the producers and importers to mix with 5% biofuels; mixing with biofuels up to the maximum levels as per the standard.

Incentives and financial mechanisms in Lazio Region

In Italy many laws (National Financial Act 2007 and 2008, DM 19/2/2007, Decree 18/12/2008, Law 23/07/2009 n.99) defined the actual RES incentives framework that is illustrated below.

Energy RES producer may require for a period of 15 years:

- Incentives by Green Certificates (CV)
- For plants with Power < 1 MW (200 kW for wind source) by feed in tariff system

Green certificates have a unit value equal to 1 MWh and are issued by the National Energy Services Manager (GSE) in number equal to the product of net production of RES energy for the coefficients, differentiated by RES, listed in table1 .

RES	COEFFICIENT
Wind power plants having power > 200 kW	1,00
Offshore wind	1,50
Geothermal	0,90
Wave and tidal	1,80
Hydro (different from that of the previous row)	1,00
Biodegradable waste, biomass (different from that of the next row)	1,30
Biomass and biogas produced from agricultural activities, farming and forestry by short chain (70 Km)	1,80
Landfill gas and biogas by wastewater plants	0,80

Table 1

Since 2008 CV are placed on the market at a price equal to the difference between 180 € / MWh (reference value) and the average annual value of the sale price of electricity established by the Authority for Electricity and Gas recorded previous year (Table 2).

Year	reference value (updatable every 3 year) €/MWh	average annual value of the sale price of electricity in the previous year €/MWh	CV price €/MWh
2008	180,00	67,12	112,88
2009	180,00	91,34	88,66

Table 2

For RES plants having power <1 MW and < 0.2 MW for wind farm, as an alternative to CV, may be applied to the GSE feed in tariff system (table 3) which includes the value of the incentive and the proceeds for the sale of electricity.

RES	FEED IN TARIFF (€centkWh)
Wind power plants having power < 200 kW	30
Geothermal	20
Wave and tidal	34
Hydro (different from that of the previous row)	22
Biogas and biomass, excluding liquid biofuels with the exception of pure vegetable oils traceable through the integrated administration and control under Regulation (CE) N. 73/2009 of the Council of 19 January 2009	28
Landfill gas and biogas by wastewater plants and liquid biofuels with the exception of pure vegetable oils traceable through the integrated administration and control under Regulation (CE) N. 73/2009 of the Council of 19 January 2009	18

Table 3

The incentive mechanism of photovoltaic, called “Energy Bill” , was introduced into Italy by the Ministerial Decree of 28 July 2005 and is currently governed by the Ministerial Decree of 19 February 2007. For a period of 20 years, the Energy Bill profits with feed in tariff system the electricity produced by photovoltaic systems having Power (P) >1 kW connected to the grid. As established by DM on 19/02/07 photovoltaic installations brought into operation, starting from 1 January 2009 are entitled to an incentive fee values given in the following table 4.

The tariffs depend on power (P) and the level of architectural integration of PV plant, considering three type of plant: not integrated, partially integrated and integrated. Tariffs are designed in order to promote the small PV plants (distributed generation) and the architectural integration.

PV plant Power (kW)	PV PLANTS tariffs (€ /kWh)		
	not integrated	partially integrated	integrated
1≤P≤3	0,392	0,431	0,480
3<P≤20	0,372	0,412	0,451
P>20	0,353	0,392	0,431

Table 4

Furthermore, Lazio Region has created a revolving fund of 5.000.000,00 €/year since 2006 to 2011, to support the investment cost for the construction of new renewable energy plants. Thus, citizens can obtain low-interest lending through banks to invest in RES. Lazio Region had also provided financial incentives through tender for public institutions and private citizens for developing energy projects and improving energy efficiency.

Incentives in Valencia Region

Spanish government drew up a renewable energy plan 2005 – 2010 (REP) in order to bolster the priority goals of the government's energy policy,

According to Plan's forecasts, 12,1% global energy consumption in 2010 will be supplied by renewable sources, and they will provide 30.3% of electricity production.

In order to promote renewable energy installations, Spanish government established incentives. These are the most important laws related to the regulation of renewable energy's production:

- RD 661 / 2007
- RD 1578/2008
- **RD 661/2007:**

In 2007, the state published the RD 661/2007 in order to fix a price for all type of special energy producers. According to the following classification:

Classification	Description
Group A.1	Cogeneration
Group A.2	Installations that take profit of waste energies from others installations or processes (only when not electrical production is possible)
Group B.1	Solar energy as primary energy source
Group B.2	Wind energy as primary energy source
Group B.3	Geothermal energy as primary energy source
Group B.4	Hydro plant (installed power under 10MW)
Group B.5	Hydro plant (installed power more than 10MW but under 50MW)
Group B.6	Biomass from forest activities
Group B.7	Biomass from biocombustibles, biogas and dung
Group B.8	Biomass from industrial installations

Table 5– “Special energy producers’ classification”

Sub –Classification A.1	Description
Group A.1.1	Cogeneration by natural gas
Group A.1.2	Cogeneration by diesel oil
Group A.1.3	Cogeneration by biomass or biogas
Group A.1.4	Cogeneration by residual gases

Table 6– “Special energy producers’ classification. Group A.1”

Sub –Classification B.1	Description
Group B.1.1	Photovoltaic energy
Group B.1.2	Thermal processes

Table 7– “Special energy producers’ classification. Group B.1”

Sub –Classification B.2	Description
Group B.2.1	Wind farms
Group B.2.2	Offshore installations

Table 8 – “Special energy producers’ classification. Group B.2”

Sub –Classification B.6	Description
Group B.6.1	Biomass mainly from energy crops
Group B.6.2	Biomass mainly from farms
Group B.6.3	Biomass mainly from forest activities

Table 9– “Special energy producers’ classification. Group B.6”

Sub –Classification B.7	Description
Group B.7.1	Biomass mainly from biogas
Group B.7.2	Biomass mainly from urban residues
Group B.7.3	Biomass mainly from dung’s’ incineration

Table 10– “Special energy producers’ classification. Group B.7”

Sub –Classification B.8	Description
Group B.8.1	Biomass from farming industry
Group B.8.2	Biomass from forest sector’s industries
Group B.8.3	Industries that use black liquor as its main combustible

Table 11– “Special energy producers’ classification. Group B.8”

According to this classification, these are the incentives established for each group:

Grupo	Subgrupo	Combustible	Potencia	Tarifa regulada c€/kWh	Prima de referencia c€/kWh	
a.1	a.1.1		P≤0,5 MW	12,0400		
			0,5<P≤1 MW	9,8800		
			1<P≤10 MW	7,7200	2,7844	
			10<P≤25 MW	7,3100	2,2122	
			25<P≤50 MW	6,9200	1,9147	
	a.1.2	Gasoleo / GLP		P≤0,5 MW	13,2900	
				0,5<P≤1 MW	11,3100	
				1<P≤10 MW	9,5900	4,6644
				10<P≤25 MW	9,3200	4,2222
		Fuel		0,5<P≤1 MW	10,4100	
				1<P≤10 MW	8,7600	3,8344
				10<P≤25 MW	8,4800	3,3822
				25<P≤50 MW	8,1500	2,9942
	a.1.4	Carbón		P≤10 MW	6,1270	3,8479
				10<P≤25 MW	4,2123	1,5410
				25<P≤50 MW	3,8294	0,9901
Otros			P≤10 MW	4,5953	1,9332	
			10<P≤25 MW	4,2123	1,1581	
			25<P≤50 MW	3,8294	0,6071	
a.2			P≤10 MW	4,6000	1,9344	
			10<P≤25 MW	4,2100	1,1622	
			25<P≤50 MW	3,8300	0,6142	

Table 12 – “Group A incentives ¹”

¹ English translation:
- Grupo – Group
- Subgrupo – Subgroup
- Potencia (P) – Power
- Tarifa regulada – Regulated rate
- Prima de referencia – incentive
- Gasóleo /GLP – Gasoil /GLP
- Carbón – coal
- Otros - Others

Grupo	Subgrupo	Potencia	Plazo	Tarifa regulada €/kWh	Prima de referencia €/kWh	Límite Superior €/kWh	Límite Inferior €/kWh
b.1	b.1.1	P ≤ 100 kW	primeros 25 años	44,0381			
			a partir de entonces	35,2305			
		100 kW < P ≤ 10 MW	primeros 25 años	41,7500			
			a partir de entonces	33,4000			
		10 < P ≤ 50 MW	primeros 25 años	22,9764			
			a partir de entonces	18,3811			
	b.1.2		primeros 25 años	26,9375	25,4000	34,3976	25,4038
			a partir de entonces	21,5498	20,3200		
b.2	b.2.1		primeros 20 años	7,3228	2,9291	8,4944	7,1275
			a partir de entonces	6,1200	0,0000		
b.3			primeros 20 años	6,8900	3,8444		
		a partir de entonces	6,5100	3,0600			
b.4			primeros 25 años	7,8000	2,5044	8,5200	6,5200
		a partir de entonces	7,0200	1,3444			
b.5			primeros 25 años	*	2,1044	8,0000	6,1200
		a partir de entonces	**	1,3444			
b.6	b.6.1	P ≤ 2 MW	primeros 15 años	15,8890	11,5294	16,6300	15,4100
			a partir de entonces	11,7931	0,0000		
		2 MW ≤ P	primeros 15 años	14,6590	10,0964	15,0900	14,2700
			a partir de entonces	12,3470	0,0000		
	b.6.2	P ≤ 2 MW	primeros 15 años	12,5710	8,2114	13,3100	12,0900
			a partir de entonces	8,4752	0,0000		
		2 MW ≤ P	primeros 15 años	10,7540	6,1914	11,1900	10,3790
			a partir de entonces	8,0660	0,0000		
b.6.3	P ≤ 2 MW	primeros 15 años	12,5710	8,2114	13,3100	12,0900	
		a partir de entonces	8,4752	0,0000			
	2 MW ≤ P	primeros 15 años	11,8294	7,2674	12,2600	11,4400	
		a partir de entonces	8,0660	0,0000			
b.7	b.7.1		primeros 15 años	7,9920	3,7784	8,9600	7,4400
			a partir de entonces	6,5100	0,0000		
	b.7.2	P ≤ 500 kW	primeros 15 años	13,0690	9,7696	15,3300	12,3500
			a partir de entonces	6,5100	0,0000		
		500 kW ≤ P	primeros 15 años	9,6800	5,7774	11,0300	9,5500
			a partir de entonces	6,5100	0,0000		
	b.7.3		primeros 15 años	5,3600	3,0844	8,3300	5,1000
			a partir de entonces	5,3600	0,0000		

Grupo	Subgrupo	Potencia	Plazo	Tarifa regulada c€/kWh	Prima de referencia c€/kWh	Límite Superior c€/kWh	Límite Inferior c€/kWh
b.8	b.8.1	P ≤ 2 MW	primeros 15 años	12,5710	8,2114	13,3100	12,0900
			a partir de entonces	8,4752	0,0000		
		2 MW ≤ P	primeros 15 años	10,7540	6,1914	11,1900	10,3790
			a partir de entonces	8,0660	0,0000		
	b.8.2	P ≤ 2 MW	primeros 15 años	9,2800	4,9214	10,0200	8,7900
			a partir de entonces	6,5100	0,0000		
		2 MW ≤ P	primeros 15 años	6,5080	1,9454	6,9400	6,1200
			a partir de entonces	6,5080	0,0000		
	b.8.3	P ≤ 2 MW	primeros 15 años	9,2800	5,1696	10,0200	8,7900
			a partir de entonces	6,5100	0,0000		
		2 MW ≤ P	primeros 15 años	8,0000	3,2199	9,0000	7,5000
			a partir de entonces	6,5080	0,0000		

Table 13– “Group B incentives ²”

- **RD 1578/2008**

Thank to the renewable energy plan (REP) and the RD 661/2007, on one hand, solar photovoltaic installations has incredibly increased but on the other hand, the number of solar thermal installations is much less than it was expected to be.

The renewable energy plan (REP) proposed the following goals for solar installations:

- Solar thermal energy:

During 2005 – 2010 period, Spain should increase up to 4.200.000m² its surface installed. According to population density and other factors, it was determined Valencia Region’s goal:

Valencia region		
Year 2004	Period 2005 -2010	Year 2010
58.199 m ²	389.260m ²	447.459m ²

Table 14– “Solar thermal energy growth predicted at the PER”

- Solar photovoltaic energy

² English translation:

- Grupo – Group
- Subgrupo – Subgroup
- Potencia – Power
- Plazo - Period
- Tarifa regulada – Regulated rate
- Prima de referencia – incentive
- Límite superior –Upper limit
- Límite inferior – Lower limit
- Primeros 25 años – the first 25 years
- Primeros 15 años – the first 15 years
- A partir de entonces – since then

During 2005 – 2010 period, Spain should increase up to 400MWp its surface installed. According to solar energy availability in each Spanish region, it was determined Valencia Region's goal:

Valencia region		
Year 2004	Period 2005 -2010	Year 2010
2,83 MWp	23,7 MWp	26,10MWp

Table 15– “Solar photovoltaic energy growth predicted at the PER”

In 2008, Spain have 2.611 MWp PV installed, it means, there was 385% annual growth compared to 2007. So, photovoltaic power installed in Spain was 10 times higher than what it was supposed to be according to the renewable energy plan 2005 – 2010.

Once these results were analysed, it was decided to draw RD1578/2008 in order to control photovoltaic installations' growth. It was established a lower and flat rate for each photovoltaic group. So then, it does not matter solar installation's size or the time that it has been producing energy for the electrical network.

Type	RD661/2007 rate	RD1578/2008 rate
B 1.1	From 18,38c€/kWh up to 44,0381c€/kWh	34 c€/kWh

Table 16– “Group B 1.1 incentives”

Nevertheless, the number of solar thermal installations is not as high as it was expected to be. According to RD1578/2008, it was decided to increase thermal processes' incentive:

Type	RD661/2007 rate	RD1578/2008 rate
B 1.2	From 21,5498c€/kWh up to 26,9375 c€/kWh	32 c€/kWh

Table 17– “Group B 1.1 incentives”

Section 6: Analysis of R&D sector

Key findings:

The region possesses among their main assets a Technical University that can play a very important role in the future development of renewable energy sources and energy efficiency measures implementation.

Some other players that can play a significant role in the development of the R&D in this subjects are the good collection of small companies that are starting to innovate in this fields, like STS Solar Company, among others, or Medium companies with a clear vocation of testing new solutions like Mechatronika or Evrika Furniture, that can act as demonstration field for the first ones. Any R&D that can impact in the future economical development of the region through a knowledge base economy focused in sustainable energy solutions must take into account the needs of these companies and help them to rely on the academia to support them in their development.

Among the strengths detected from the University, we must include solar energy applications and mainly energy efficiency solutions and auditing. As a niche that can be exploited and can help the region in their evolution to a fossil fuel (coal and petrol) free future, it is considered that biomass applications studies must be foster.

On one hand, University is the most appropriate centre to develop research projects due to the fact that university professors have been always working on research and so, there are specialists in all fields, but on the other hand, research and development project have certain delay because it is very difficult to coordinate their this research work with their main task, education.

To have your own research department would be a perfect situation but only the strongest companies can afford this type of service inside their installations because of its high cost of maintenance.

About all companies which work on research projects but are not related to university have limited capacities and so, it's not possible to offer neither a proper nor a complete service to industry.

Recommendations:

It is recommended to create research and development institutes, based in the existing technical university but with a independent function centred in the companies needs. These institutes involve these advantages:

- They are mixed centres, it means, hired researchers are strongly supported by university professors.
- It is created a good cooperation between university and industry's professional associations. Therefore, it makes possible knowledge transference from university to companies and so, the institutes behave as companies' technological support.

- Industry can make profit of all these technological infrastructures and of all experts who work at these research institutes. This is very important factor mainly for small and medium companies which cannot afford this kind of infrastructures.
- These institutes also provide recycling courses for workers, training courses for unemployed people and a better education for students in specific topics. Therefore, they improve competitiveness of all sectors
- Projects for companies are developed by these research institutes. Individual and confidential contracts are done.
- They also help to regional policy and so, this situation provides good relations with local authorities.
- Institutes can be located outside the university campus. They are at technological parks so as to have the closest relation to industry.
- Besides, direct jobs are fully dedicated to R&D.

These are the steps to follow in order to create a research and development institute:

- To identify all possible partners
- To get their commitment
- To get involved during R&D institute's starting period
- To promote the use of these institutes for technological issues
- To be located as close as possible to companies
- To be hold by energy industry and other centers such as universities.

Section 7: Political impetus

Key Findings and Recommendations

The general impression about the political impetus that the experts received at the peer review was very positive. The Governor office was very receptive to hear the conclusions of the study and the experiences of regional bodies and municipalities were very motivating and a good signal of the potential of development of this kind of initiatives in the region.

Going into a deeper detail, the main findings about the political impetus we have encountered in Gabrovo include:

- National level:
 - Bulgaria has established, as fixed by the EU, the objective to reach 16% of Energy Efficiency compared with 1990, CO2 reduction and use of RES within the 2020.
 - The regional government is not in charge with the rural management and thus a policy for biomass or rural-related energy supply is decided by the State with municipalities.
- Regional and municipalities levels:
 - Gabrovo has signed the AER RES and energy efficiency declaration.
 - There is a clear commitment in the Governor office and in the Municipalities in the fostering of implementation of EE in public buildings, as well as in the support of RES solutions.
 - Although there is no knowledge on the regional energy consumption, the public buildings are monitored and big efforts to improve their performance are taken at municipal and regional level.

Recommendations for capitalising this impetus:

- Needs to establish an Energy Strategic Plan (ESP) as soon as possible and aligned with the national objectives.
- The establishment of a regional energy agency can create the forum to integrate all the regional stakeholders in their efforts to support the use of renewable energy and energy efficiency measures, public awareness and promotion.
- Creation of energy managers in the public sector.

Section 8: Cooperation opportunities

The future energy management agency and the existing public authorities should take full advantage of the Gabrovo's membership at the Assembly of European Regions.

Bringing 270 regional and local authorities from all over Europe, AER helps regions establish effective partnerships with the European institutions and with other regions across Europe. This also applies to the issue of energy.

AER's Funding Tracker and online Partnership Pool keep members informed of the latest funding sources and partnership opportunities, while AER study visits and tailor-made Peer Reviews help members to develop sustainable regional development strategies with the support of leading experts from "best-practice" regions.

The exchange of ideas, know-how and experience between the regions encourages mutual understanding and brings people closer together. Despite the diversity of regions in Europe, shared initiatives (joint positions, cooperation projects) allow particularities to be bypassed and shared values to become a source of mobilisation.

AER intends to organise the following energy-related activities in the coming months:

- *AER study visit to GE Global Research Centre in Munich (DE)*

GE Global Research Centre is one of the world's largest and most diversified industrial research organizations, providing breakthrough technologies in areas such as energy conversion, solar systems, carbon fibre and biogas. In the past six years, this R&D facility has become an indispensable element of the broad research landscape of the Bavarian State.

The purpose of our study will be twofold:

Firstly, AER members will be offered an exclusive opportunity to explore the latest developments and current research projects in RES that GE Global is experimenting with in its labs.

Secondly, we will gain first-hand knowledge of the Bavarian state's innovation policies. Representatives from the region will set out how to put in place an effective regional framework for R&D by investing in excellent education, cutting-edge infrastructure and new energy and environmental technologies

The study will take place on 8 April 2010 and will be combined with the meeting of AER working group climate change / energy.

The full program of the event can be downloaded from AER webpage: <http://www.aer.eu/events/regionaldevelopment/2010/ge-studyvisit.html>

- *The European Regions Energy Day*

The European Regions Energy Day will bring together regional decision makers and European energy experts with the aim of presenting AER's 2009 activity in the area of climate change and energy. The purpose of the conference will be also to give an outlook on future activity and to exchange experience.

The event will start in the evening of 28 April 2010 with a panel discussion and reception at the kind invitation of the region of Baden-Württemberg, followed by a conference on 29 April.

More information: <http://www.aer.eu/events/regional-development/2010/energy-day.html>

- *AER working group on climate change an energy*

Our working group brings together regional politicians and administrators concerned with the issue of energy and interested in exchanging knowledge and experience with their counterparts from all over Europe.

The objectives of the group are as follows:

- Providing information on the last developments in the field of renewable energy sources and energy efficiency, as well as European funding opportunities
- Highlighting best practices towards RES and energy efficiency successfully implemented by AER member regions
- Setting up new European projects in the are of energy – looking for potential partners and filling in applications forms

The members of the Gabrovo region are kindly invited to join all the initiatives proposed by the Assembly of European Regions.

It should also be noted that AER personnel has capacity to assist its member regions with filling in complex applications forms when it comes to apply for European funding.

There are many European programs through which energy initiatives can be financed. Some of them are quoted below:

- **FP7**

FP7 is organised around four programmes corresponding to four basic components of European research:

- **Cooperation**

Support given to the whole range of research activities carried out in trans-national cooperation, from collaborative projects and networks to the coordination of national research programmes. International cooperation between the EU and third countries is an integral part of this action.

This action is industry-driven and organised in four sub-programmes:

- Collaborative research

- Joint Technology Initiatives
- Coordination of non-Community research programmes
- International Cooperation

- **Ideas**

This programme aims to enhance the dynamism, creativity and excellence of European research at the frontier of knowledge in all scientific and technological fields, including engineering, socio-economic sciences and the humanities. This action will be overseen by a European Research Council

- **People**

Quantitative and qualitative strengthening of human resources in research and technology in Europe by putting into place a coherent set of Marie Curie actions.

- **Capacities**

The objective of this action is to support research infrastructures, research for the benefit of SMEs and the research potential of European regions (Regions of Knowledge) as well as to stimulate the realisation of the full research potential (Convergence Regions) of the enlarged Union and build an effective and democratic European Knowledge society.

Energy is one of the ten high level themes proposed for EU action in the frame of FP7 programs. In what concerns this area, there is one open call for proposals now. Please see under:

http://cordis.europa.eu/fp7/dc/index.cfm?fuseaction=UserSite.cooperationDetailsCallPage&call_id=264

- **ELENA**

ELENA is a European Facility aiming, through technical assistance, at supporting regional or local authorities in accelerating their investment programmes in the fields of energy efficiency and renewable energy sources. It supports the local and regional authorities in contributing to the “20-20-20” initiative of the EU.

This grant support is provided within the framework of the IEE II programme (Intelligent Energy Europe; http://ec.europa.eu/energy/intelligent/index_en.html).

The ELENA facility aims at a broader utilisation of innovative techniques, processes, products or practices and facilitates their market uptake; the investment programmes supported can then be replicated in other cities or regions.

Eligible costs for ELENA support correspond to any technical support that is necessary to prepare, implement and finance the investment programme. This technical support may be of different types, for instance: feasibility and market studies, structuring of programmes, business plans, energy audits, preparation of tendering procedures and contractual arrangements and project implementation units.

However, hardware costs, such as measurement equipment, computers or office space, are excluded. The cost of newly recruited staff assigned to develop the investment programme is an eligible cost. The staff cost corresponds to actual salaries plus social security charges and other remuneration-related costs. Eligible costs can include value added tax, if it is documented that this cannot be recovered by the beneficiary.

ELENA covers up to 90% of eligible costs required for technical support related to a clearly identified investment programme. To be eligible for support, costs must be necessary to carry out the investment programme

ELENA support can be provided for the development of investment programmes or projects within the following areas:

- Public and private buildings, including social housing and street and traffic lighting, to support increased energy efficiency – e.g. refurbishment of buildings aimed at significantly decreasing energy consumption (both heat and electricity), such as thermal insulation, efficient air conditioning and ventilation, efficient lighting;
- Integration of renewable energy sources (RES) into the built environment – e.g. solar photovoltaic (PV), solar thermal collectors and biomass;
- Investments into renovating, extending or building new district heating/cooling networks, including networks based on combined heat and power (CHP); decentralised CHP systems (building or neighbourhood level);
- Urban transport to support increased energy efficiency and integration of renewable energy sources, e.g. high energy efficiency buses, including hybrid buses, electrical or low-carbon propulsion systems, investments to facilitate the introduction of electric cars, investments to introduce new, more energy - efficient concepts to improve freight logistics in urban areas;
- Local infrastructure including smart grids, information and communication technology infrastructure for energy efficiency, energy-efficient urban equipment, inter-modal transport facilities and refuelling infrastructure for alternative fuel vehicles.

Local and regional authorities, other public bodies or a grouping of such bodies from countries are eligible under the Intelligent Energy Europe Program. Currently, eligible countries are the EU member states, Norway, Iceland, Liechtenstein and Croatia. Public body means a body created by a public authority or a legal entity governed by private law with a public service mission, financed for more than 50% by public sources, whose internal procedures and accounts are subject to control by a public authority and for whose liabilities a public authority will accept responsibility in the event that the public body ceases its activities.

ELENA supports the Covenant of Mayors (www.eumayors.eu) initiative of the European Commission, but it is not restricted to entities having signed it.

Any public entity wishing to apply for ELENA must previously have identified an investment programme aiming at contributing to achieving the objectives of the European Union in the fields of energy and climate change, known as the “20-20-20” initiative. The investments do not need to be fully defined. ELENA aims at supporting and accelerating the successful implementation of such investments.

To obtain EIB financing for the investment programme it is not a prerequisite to be receiving ELENA assistance, and vice-versa. However, as one of the objectives of ELENA is to improve the bankability of the investment programme, ELENA assistance may facilitate access to financing from the EIB or other banks. The application for an EIB loan follows a different process than the request for an ELENA grant. Additional information about the procedure for requesting EIB financing can be obtained from the EIB website (www.eib.org).

There will be no calls for proposals and assistance will be granted on a first-come first-served basis within the limits of the given budget. To start the discussion to seek assistance from ELENA, the following minimum information should be presented to the EIB in a pre-application stage:

- Brief description of the planned investment programme, including type of investments and approach for implementation of the programme;
 - Expected investment cost and schedule to develop the programme;
 - Amount, scope and main needs to be addressed by the requested technical assistance
- Based on the information provided in the pre-application stage, the EIB will assess whether the proposal meets the selection criteria, and the need for technical assistance of the specific investment programme. A positive outcome of this first assessment will allow for a request for assistance to be prepared and submitted to the EIB using the application form. The Bank will then present the proposal to the European Commission for approval. The selection procedure will take around three months.

Other programs to finance energy projects:

- *JASPERS:* <http://www.jaspers-europa-info.org/>
- *South East Europe – Trans-national Cooperation Program:* <http://www.southeast-europe.net/en/>
- *Central European Initiative’s Know-How Exchange Program:* <http://www.ceinet.org/>
- *LIFE – European Union’s instrument to support environmental and nature conservation projects:* <http://ec.europa.eu/environment/life/>

Section 9: Education and training

Key findings.

Education and training are fundamental to foster the capacities of technical departments members in companies to supply reliable technical solutions for the final consumer. Other important aspect of education and training is that it will allow the implementation of energy efficiency solutions in the region, as well as to promote the awareness of the final users of the need and existence of solutions for a more rational use of energy in both, public and private sectors.

In the region there is a good initial capacity on education on energy efficiency but only oriented to university students, it will be very positive to create courses for skilled trades and working professionals to be trained in this fields.

Some relevant fields like biomass applications maybe need to be reinforce at university level, but in general the experience and technical level at the university is very high.

There are a good collection of relevant innovative installations like the ones visited on the Peer Review, which could be used to make publicity of this kind of solutions.

Recomendations.

The main recommendations on these topics include:

- Creation of an energy efficiency and renewable energy sources tour for children and adults associations to visit relevant installations in the region, as one of the most visual and impacting way to raise awareness of potential uses of these solutions and the need to reduce our carbon footprint. To create this “Sustainable Energy Tour”, some effort must be dedicated to create information aids (panels, indications, flyers, etc...) and to modify the installations to allow them to be visited, without any risk.
- It is needed to find methods to make the existing knowledge reach the technicians currently working in the companies and that can updated or acquired new capacities about energy efficiency measures and renewable energy sources application. Creation of Training Courses for workers and unemployed people.
- To create a training program with the help of Technical University of Gabrovo, oriented to the creation of public buildings and infrastructure energy managers.
- Involved members of the future energy agency and other public bodies, at regional and municipal levels in training on Energy Polocy as provided and promote by FEDERENE and AER, as explained bellow.

Training in Energy Policy

In order to keep updated with most recent legislative and technological developments in the area of renewable energy sources and energy efficiency, the proposed Gabrovo Energy Agency, once created should cooperate closely with the FEDARENE, European Federation of Regional Energy and Environment Agencies.

The main objectives of FEDARENE are as follows:

- Facilitating the development of inter-regional partnerships and thereby encouraging the exchange of experience and the transfer of know-how and technology.
- Lobbying the European institutions on behalf of regional and local communities concerning relevant energy and environmental issues.
- Promoting the regional dimension in debates concerning energy and the environment by placing particular emphasis on demand and local supply and the pursuit of sustainable development
- Helping regions develop their capacity to take action, and, amongst other things, assisting them in the creation of energy and/or environmental organisations.

It is suggested for the future regional energy agency to take direct contact with FEDARENE secretariat in Brussels in order to discuss more in details further cooperation opportunities: Dominique Bourges, fedarene@fedarene.org

The personnel of energy agency can also attend AER Training Academies.

AER trainings are related to a broad spectrum of European policies. Some of the sessions are dedicated to the issue of energy (with a particular focus on European funds for energy)

The training is specifically designed for member region officers who may be relatively new to European affairs as well as politicians willing to refresh their knowledge and understanding of the European Union. They are also open to new staff and interns in the Brussels offices of the AER member regions. In order to allow for interactive work, participation in each workshop is limited to 25 people.

In delivering the training, the AER works in partnership with a small number of its member regions that already have a good track record in delivering training in European affairs. Partner regions include: Brussels Capital (B), South West UK (UK), Friuli Venezia Giulia (I), Baden-Württemberg (D), Salzburg (A) and Île-de-France (F) and Poitou-Charentes (F). These regions each provide trainers who take responsibility for delivering a specific part of the training module.

Format:

- Two day training session
- Small group of around 25 participants in order to ensure direct involvement of all participants
- Application of peer learning method - facilitators of the sessions are working themselves in the area they are teaching and are employed by a regional authority
- Active engagement of participants - exchange of experience
- Free of charge for AER members