Fairer, Cleaner, Safer

Towards a more sustainable,
people centered approach to energy development
in South East Europe

v. 1.0 For EU institutions

B | T | D The Balkan Trust for Democracy
A PROJECT OF THE GERMAN MARSHALL FUND

Compagnia di San Paolo

About Authors

The project *Synergies for Energy Awareness Change* – SEA Change[1] - has brought together CSOs representing different countries of the South East Europe region as well as different fields of expertise and disciplines to work together to tackle various aspects and interconnected challenges of sustainable energy future.

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EDEN center mission is to contribute to a sustainable development and healthy environment by informing, educating and offering services in partnership with the interested actors. www.eden-al.org

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SEE Change Net is a regional sustainable development think tank whose mission is a sea-change in policy and practice, for sustainable development in SEE region. www.seechangenetwork.org

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1 UNSCR 1244/99

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At the end of the first decade of the 21st century, South East Europe (SEE)[1] stands at a crossroads. Decisions made in the next ten years, by national authorities, European Union (EU) institutions, banks, international financial institutions (IFIs) and the private sector will determine, for better or for worse, how the energy landscape in SEE will look for the next half century and beyond.

The low road

Looking down one road, one can see increased energy prices without the balancing force of a proactive, investment-backed, approach to improving energy efficiency, coupled with a prolonged reliance on conventional energy solutions such as coal and large hydropower. Investors and governments of the region appear committed to more energy production from coal, without prioritizing a switch to natural gas, and the damming of many of our most valuable freshwater ecosystems with the risk that the generated energy would be exported out of the region, reaping large profits for the investors on the evolving energy market. Based on current investment portfolios and investment patterns of the private sector, development banks and governments of the region, the free market would largely be left to "take care of energy efficiency" with the possibility of causing much hardship to people across the region.

> "The countries of South East Europe are extremely energy inefficient. Between 1.7 and 3.9 times more energy is used to produce a unit of GDP in the SEE compared to the EU average."

The high road

However, there is another road and a viable alternative policy and investment framework that would be good for the people of the region (our pockets, our health and our precious environment) based on much greater attention to, and investment in, energy efficiency, reducing energy losses and introducing smart electricity grids - to help consumers make better choices. This strategy should be combined with a diversified use of renewable energy; including solar, wind and biomass. As a principle, investment should be focused on development of energy production for home/regional consumption first, and export only when the region's energy security and sustainability issues have been resolved. Underpinning all of the above there should be a genuine commitment to a fully transparent, people centered approach to decision making, which takes into account the full cost of all energy decisions for all those affected by them.

The crossroads

While some have called such a vision unrealistic, several highly respected reports, from the EU amongst others, are proposing exactly this route to greater energy efficiency and security. What this region and the world will look like in 2050 depends on policy choices made now, and whether we as a society will dare to think constructively and find solutions.

> "Saving a kilowatt of energy is 1000 to 10000 times more cost effective than generating a new kilowatt of energy."

1 For the purpose of this energy advocacy paper, the region of South East Europe encompasses Albania, Bosnia and Herzegovina, Croatia, Kosovo, FYR Macedonia, Montenegro, and Serbia.

Recognising the importance of the choices which need to be made we, an alliance of CSOs from across South East Europe, have come together in a project entitled Synergies for Energy Awareness Change to advocate for a practical approach to a sustainable energy future for the SEE region.

We are aware that our vision may be met with some disbelief and reluctance in a region where scepticism often prevails, due to prolonged experience of failed policies, economic hardship, the negative impacts of transition, conflicts, and mistrust of institutions and within society. Nevertheless, we believe that a change is possible in our societies and that we are capable grasping the opportunities for a better and more sustainable future and even of catching up with the current front runners in the fields of climate change and sustainable energy policies.

We furthermore believe that the solutions for successful transition towards a more sustainable energy future can be accelerated through mutual learning, cooperation and common efforts to overcome both shared and country specific problems in the SEE region.

Why are we not on the high road?

The global policy trend is obvious, so the first question must be why SEE is not moving in that direction? While there are variations in the type and seriousness of issues being faced across the region we have identified the following issues which are blocking a move towards a more sustainable energy future:

- Energy efficiency in all parts of the energy chain and through all sectors is low, with significant losses, high levels of unpaid bills and increasing concerns for energy poverty.
- Although the region has significant potentials of sustainable renewable energy sources and a high level of public support for their use, the share of the so-called new renewable energy sources is currently negligible, with an excessive reliance on dirty carbon fuels and unsustainable large hydropower plants.
- The transition fuel of choice for low carbon economies is gas, which faces many blocks to full utilization in this region.
- In spite of the adoption in many countries of Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA) regulations and other important EU Directives, the quality of implementation has been very poor.
- Corruption is one of the main problems in the region, the energy sector being no exception. The energy sector is probably even more exposed to the corrosion of corruption than other sectors due to the very large amounts of money invested, centralized planning and low levels of public participation resulting in very poor levels of transparency and accountability.
- Public awareness and education in all aspects of sustainability are much neglected in this region and networking amongst related institutions equally poor.

> “Corruption is defined by Transparency International as the abuse of entrusted power for private gain. Entrusted power is not only the power a citizen confers to a public office holder. It is the power that future generations have vested in all of us, in our stewardship role for the planet.”

How do we get there?

Since the institutional frameworks in the region control most of the resources and define most of the policies related to the energy sector we have formulated our main recommendations on how the sustainable energy vision could be implemented in the following manner:

We recommend that the governments and public/state institutions of the region:

- Provide mechanisms that would allow and encourage people centered solutions and decision making in relation to energy strategies and plans;
- Greatly improve the transparency and access to justice in energy planning and privatisation;
- Focus policy and budgetary priorities on reducing losses and increasing efficiency across the energy system from production and transmission to consumption;
- Ensure measures to help people offset the impacts of rising energy prices, especially the most vulnerable;
- A stable, reliable, independent judicial system that is capable of addressing even the most sensitive of legal disputes, conflicts of interest or cases of corruption in a competent, effective and timely manner thus boosting the confidence of potential investors in the region;
- Ensure the best possible independent evaluations of the full impact (including external costs, such as social and environmental) of energy strategies and projects, which should be available to the public in a timely manner and in an easily understandable form.

We recommend that the European Commission:

- Lays greater emphasis on implementation of laws and regulations related to environment, energy and transparency, in addition to monitoring the adoption of laws and regulations required by the acquis communautaire;
- Ensures that the enlargement policies and funding mechanisms in the region take due account of the EC 20/20/20 Communication[1] and the EC 2050 Road Map[2] ;
- Uses its considerable influence to ensure much greater transparency and less corruption in the privatisation and tendering of energy projects.

We recommend that the development banks and IFIs:

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We encourage the people of the region to:

- Demand greater transparency and participation in decision making in energy sector;
- Demand to know the full costs, e.g. in terms of health and environment, for all energy plans and projects;
- Demand a focus on more sustainable green jobs over a longer period of time.

We recommend that the Energy Community Treaty Secretariat (ECTS):

- Provides programmes and funds to allow civil society organizations to participate in sharing information and observing the work of ECTS;
- Strengthens their expert profile in terms of the level and number of staff engaged in energy efficiency, smart grids, energy poverty, calculation of externalities on a programme and project basis and energy sustainability;
- Provides a series of studies in relation to the sustainability of energy networks, implementation issues related to smart grids, the poverty impact and amelioration mechanisms of the single energy market.

We recommend the private sector to:

- Be an example by developing energy efficiency programmes with targets and budgets;
- Make a commitment to engage in a meaningful public consultation and make contracts in energy projects available to public in timely manner.

Fairer, Cleaner, Safer

In the context of these challenges and recommendations, the authors have produced the sustainable energy advocacy paper entitled *Fairer, Cleaner, Safer: Towards a more sustainable, people centered approach to energy development in South East Europe*. The paper comprises of three components:

1) An analysis of the current situation in the region in relation to legal and institutional frameworks, patterns of energy consumption, production and efficiency, also issues related to privatisation, transparency and public participation.

2) An identification of a set of alternative opportunities focused on a people centered approach to energy solutions, the sustainability of production and consumption, and greater respect for environment and health issues.

3) A set of broad policy recommendations about how to achieve a more secure, sustainable energy system in South East Europe.

The paper aims to address identified needs and problems in the South East Europe based on factual data related to specific case studies. At the same time, it recognizes the different levels of progress in the region and aims at using these gaps as an opportunity for cooperation and regional advancement.

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Abbreviations and Acronyms

AL	Albania
ACCC	Aarhus Convention Compliance Committee
AT	Austria
ATRC	Advocacy Training and Resource Center
BA	Bosnia and Herzegovina
BE	Belgium
CCS	Carbon Capture and Storage
CSO	Civil Society Organisation
CO2	Carbon Dioxide
CHP	Combined Heat and Power
CZZS	Centre for Environment
DE	Germany
DK	Denmark
DOOR	Society for Sustainable Development Design
DPSIR	Drivers – Pressures – State – Impacts – Responses
DSP	Detailed Spatial Plan
EBRD	European Bank for Reconstruction and Development
EC	European Commission
ECLO	European Commission Liaison Office to Kosovo
ECSEE	Energy Community of South East Europe
ECTS	Energy Community Treaty Secretariat
EE	Energy Efficiency
EEC	European Energy Community
EIA	Environmental Impact Assessment
EIB	European Investment Bank
ENEL	Italian National Agency for Electricity
EPCG	Montenegrin State Electricity Company
EPEEF	Environmental Protection and Energy Efficiency Fund
EPS	Serbian State Electricity Company
EREC	European Renewable Energy Council
ES	Spain
ETAP	Environmental Technologies Action Plan
EU	European Union
FI	Finland
FR	France
GDP	Gross Domestic Product
GIS	German Technical Assistance
GNI	Gross National Income
GR	Greece
GW(h)	Giga Watt (hours)
HH	Households
HPP	Hydropower Plants
HR	Croatia
HROTE	Croatian Energy Market Operator
IE	Ireland
IEA	International Energy Agency
IDA	International Development Association
IFI	International Financial Institutions
INA	Croatian National Oil Company
INSTAT	Albanian Statistical Institute
IRM	Independent Recourse Mechanism
ISE	Index of Sustainable Energy
IT	Italy
KEK	Kosovo Energy Company

KESH	Albanian State Energy Corporation
KFW	German Development Bank
KGOE	Kilograms of Oil Equivalent
KS[1]	Kosovo (UNSCR 1244/99)[2]
KT	Kilo Tonnes
LUC	Land Use Consulting
MANS	Network for the Affirmation of NGO Sector
MK	Macedonia (The former Yugoslav Republic of)
ME	Montenegro
MPPCE	Ministry of Physical Planning, Construction and Ecology
MTOE	Million Tonnes of Oil Equivalent
MW(h)	Mega Watt (hours)
NEDS	National Energy Development Strategy
NIS	Serbian National Petroleum Company
NL	Netherlands
NO	Norway
NOX	Nitrous Oxide
OECD	Organisation for Economic Co-operation and Development
PT	Portugal
PPP	Purchasing Power Parity
PV	Photo-voltaic
R&D	Research and Development
REC	Regional Environmental Center
RES	Renewable Energy Sources
RS [3]	Serbia
SE	Sweden
SEA	Strategic Environmental Assessment
SEA Change Net	Synergies for Energy Awareness Change (Project)
SEE	South East Europe
SEE Change Net	South East Europe Change Network (Regional Think Tank)
SHPP	Small Hydro-Power Plant
SO2	Sulphur Dioxide
TI	Transparency International
TPES	Total Primary Energy Supply
TPP	Thermal Power Plants
TW(h)	Terra Watt (hours)
UK	United Kingdom
UNDP	United Nations Development Programme
UNESCO	United Nations Education, Science and Culture Organisation
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Aid
WB	World Bank
WWF	World Wide Fund for Nature

1 KS is a code used for practical reasons and not an official ISO country code.
2 Hereinafter Kosovo
3 The data for Serbia exclude Kosovo (UNSC 1244/99)

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- Provides programmes and funds to allow civil society organizations to participate in sharing information and observing the work of ECTS;
- Strengthens their expert profile in terms of the level and number of staff engaged in energy efficiency, smart grids, energy poverty, calculation of externalities on a programme and project basis and energy sustainability;
- Provides a series of studies in relation to the sustainability of energy networks, implementation issues related to smart grids, the poverty impact and amelioration mechanisms of the single energy market.

We recommend the private sector to:

- Be an example by developing energy efficiency programmes with targets and budgets;
- Make a commitment to engage in a meaningful public consultation and make contracts in energy projects available to public in timely manner.

Fairer, Cleaner, Safer

In the context of these challenges and recommendations, the authors have produced the following sustainable energy advocacy paper entitled *Fairer, Cleaner, Safer: Towards a more sustainable, people centered approach to energy development in South East Europe*. The paper comprises of three components:

1) An analysis of the current situation in the region in relation to legal and institutional frameworks, patterns of energy consumption, production and efficiency, also issues related to privatisation, transparency and public participation.

2) An identification of a set of alternative opportunities focused on a people centered approach to energy solutions, the sustainability of production and consumption, and greater respect for environment and health issues.

3) A set of broad policy recommendations about how to achieve a more secure, sustainable energy system in South East Europe.

The paper aims to address identified needs and problems in the South East Europe based on factual data related to specific case studies. At the same time, it recognizes the different levels of progress in the region and aims at using these gaps as an opportunity for cooperation and regional advancement.

Fairer, Cleaner, Safer

Report

1 Vision of the region

At the end of the first decade of the 21st century, South East Europe (SEE) stands at a crossroads. Decisions made in the next ten years by national authorities, the EU institutions, banks, international financial institutions (IFI's) and the private sector will largely determine, for better or for worse, how the energy landscape in SEE will look for the next half century and beyond.

A growing number of policy papers, initiatives and analyses have been released recently from a wide variety of institutions – both government and non-government – but they have in common a proposal to introduce radical climate change and energy production and consumption targets by mid-century.

In its 2011 Communication "A roadmap for moving to a competitive low carbon economy in 2050" the European Commission (EC) sets an objective of 80 to 95% overall reduction of greenhouse gases emissions (by 2050); a secure, competitive and fully decarbonised electricity sector is to play a central role in achieving this objective. The approach is based on the view that innovative solutions are required to mobilise investments in energy, transport, industry and information and communication technologies, and that more focus is needed on energy efficiency policies.

The World Wide Fund for Nature (WWF) ''Energy report'' [1] (2011), prepared by the Eco-Fys consultancy, laid out a vision of a world that is powered by 100% renewable energy sources by the middle of this century, stating that switching to renewable energy is not just the best choice, but the only option we have. The underlying scenario includes the assumptions that the total final energy demand in 2050 will be approximately at the level of consumption in 2000, and that 95% of energy will be from sustainable sources (meaning no nuclear, coal, gas and oil, and no significant increase in hydro power). The report acknowledges that this requires an ambitious development in all the sectors and that serious challenges lie ahead, but nevertheless it maintains the scenario is feasible.

Similarly, the Greenpeace and the European Renewable Energy Council (EREC) report[2] (2010) describes a long term scenario leading towards a complete phasing out of fossil fuels in the second half of this century. The authors of the Greenpeace/ EREC report maintain that in response to climate change, this 'energy revolution' or 'a change in the way that energy is produced, distributed and consumed' has already started. The five key principles behind the entire shift will be to: a) Implement renewable solutions, especially through decentralised energy systems; b) Respect the natural limits of the environment; c) Phase out dirty, unsustainable energy sources; d) Create greater equity in the use of resources; and e) Decouple economic growth from the consumption of fossil fuels.

The span/ scope of technological and social changes experienced in the last century is almost unimaginable to any preceding generation. Provided that he/ she survived our troublesome history and lived a long life of 90 years, a person born in 1910 in the SEE region, for example, witnessed voyages into the space and a communication revolution called internet. Given the increasing life expectancy, what will a child born in 2010 in the SEE see by the end of his/her life in 2100? Exhausted resources, energy shortages and changed climate with catastrophic consequences, or a world powered by sustainable energy solutions? And what will the region and the world look like in 2050, when this new citizen of the global community, will be at the height of his/her productive life? The answer depends on policy choices made now, and whether we as a society will dare, think and find solutions.

1 http://wwf.panda.org/what_we_do/footprint/climate_carbon_energy/energy_solutions/renewable_energy/sustainable_energy_report/
2 http://www.energyblueprint.info/fileadmin/media/documents/energy_revolution.pdf

We are aware that our vision, or our contribution for the SEE sustainable energy vision, may be met with some disbelief and reluctance in a region where scepticism is widespread due to a protracted experience of failed policies, economic hardship, negative effects of transition, conflicts, and mistrust in the institutions and within society. Nevertheless, we believe that a change is possible in our societies and that we are capable of seizing the opportunities for a better and sustainable future and of catching up with the current forerunners in the climate and energy policies.

Thus we believe that in 2050, the SEE region can be:

Energy efficient:

- Current energy intensity levels will be brought down to level up with developed countries;
- Majority of buildings will be 'zero-emission';
- Continued financial support to energy efficiency measures (including R&D) will be secured, representing a large share of total energy expenditures;

Clean and powered by renewable sustainable sources:

- The use of coal will be phased out, and other fossil fuels will make a negligible share of the total energy mix;
- Water resources that have good environmental status today will maintain it, as the share of large hydropower will not grow substantially;
- Potential of sustainable renewable energy sources will be utilised to the greatest possible extent; new technologies will be widely applied and competitive, with continued financial support (including R&D) for the new ones;

With decentralised and smart electricity networks:

- The region will be a part of the EU network;
- Small and decentralised production will play an important role;
- Strategic investments in smart networks will have been made;

Free from energy poverty and equitable:

- With affordable energy prices and effective support schemes for those with low incomes;
- With a mechanism for equitable sharing of benefits from energy sector and resource use;

With a competitive and environmentally responsible energy sector:

- Energy market will be opened;
- Regulatory agencies will be independent and professional;
- Prices will fully reflect the costs, including environmental and social costs;
- Costs of environmental degradation caused by the current generations will not be deferred to future generations;

Fully functional democracies, with strong independent governance structures:

- A systemic change will have taken a place;
- Decisions in energy sector will be transparent;
- Monitoring mechanisms/ agencies will be in place and working;
- Civil society will play an important role towards fulfillment of the vision;

With changed behaviour patterns:

- Environmentally friendly;
- Producing and consuming in a wiser way;
- Quality of life and not consumerism will be the accepted measure of success.

Main benefits of these people-centered approaches to energy solutions in the region will include:

- Better living environment, cleaner air, preserved water resources;
- Durability;
- Green economy: employment and investments;
- Resource preservation, energy security;
- Financial benefits in the long-term;
- Lower corruption;
- Transparency and accountability.

2 The analysis: where are we now?

2.1. Index of Sustainable Energy (ISE) in the region

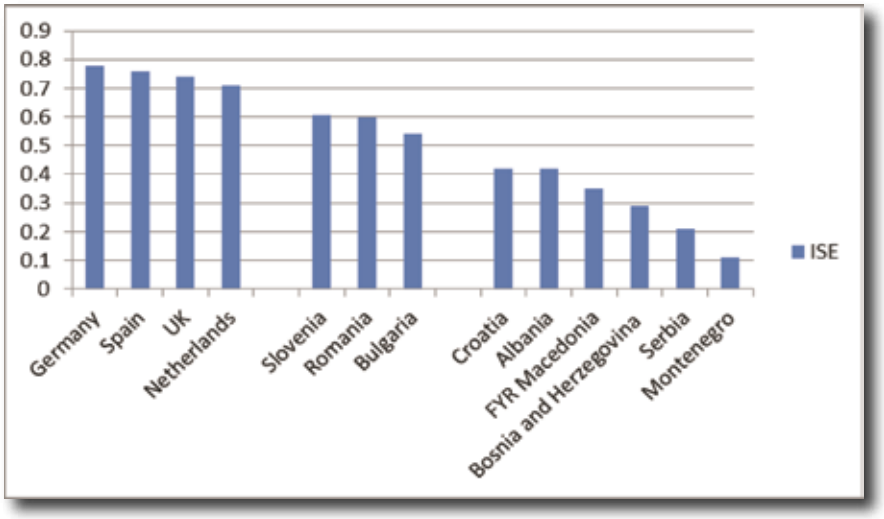
The 2008 European Bank for Reconstruction and Development (EBRD) analysis of energy sustainability in transition economies (including the SEE region) represents an interesting starting point in considering performances of the energy sector in the region and prospects for the future. The core of the EBRD[1] analysis was deriving an Index of Sustainable Energy (ISE) as a composite indicator of (i) institutions, (ii) market incentives and (iii) outcomes in three areas relevant to the use of energy and its effect on the climate: energy efficiency, renewable energy and climate change. For each of the three areas the ISE provides a snapshot of where each country stands in terms of institutions and incentives and the potential for further improvement in terms of sustainable energy outcomes. The index does not assess energy or power sector market reform, the efficiency of the regulatory structures in the electricity and gas sectors, nor does it address the efficiency of energy enterprises and the fuel mix used in electricity generation.

> "All the countries of South East Europe rank at or below 40% of the maximum possible score (1) of the Sustainable Energy Index: Croatia being the best at around 0.4 and Montenegro being the worst at 0.1."

The index scores range from 0.0 to 1.0. A value of 0.0 is the lowest in terms of sustainable energy (absence of institutions and market mechanisms coupled with the worst outcomes in terms of energy efficiency, renewable energy generation and carbon intensity), while a maximum score of 1.0 denotes an economy with strong sustainable energy institutions and market mechanisms that also rank in the top 20 per cent in terms of sustainable energy outcomes.

According to this analysis, the leading countries of the region were Croatia and Albania (with indexes slightly above 0.4), followed by FYR Macedonia (index around 0.35), Bosnia and Herzegovina (slightly below 0.3) and Serbia (slightly below 0.2), while the worst performance was derived for Montenegro (index around 0.1). Kosovo was not studied separately at the time. The best ranking EU countries included in the analysis - Spain, UK, the Netherlands and Germany – had indexes in the range from 0.7 to 0.8. ISEs for Slovenia, Romania and Bulgaria were between 0.54 and 0.6 (Bulgaria having the lowest index among the three)[2]. The ISE values for different groups of countries are graphically depicted in the figure 2.1.

Figure 2.1: Index of Sustainable Energy scores for the SEE and other groups of countries



Created based on the following data source: EBRD (2008)

1 EBRD, 2008

2 The data used for the index were the most recent available for each class of information at the time of analysis: for institutions as of mid-2007, for energy use 2006 and carbon emissions 2004.

The underlying reasons for the existing problems and inefficiencies often include past development policies and planning, but at the same time much of the current policies and actions (or lack of actions) contribute to a status quo or to widening the problems rather than to resolving them.

2.2. Legal and institutional frameworks

Legal and institutional frameworks for energy sector operation in the SEE countries are changing rapidly. A process of amending the existing and adopting new regulations is evident in almost all the countries, and new institutions have been or are being set up to implement national priorities, fulfill requirements of the EU accession process and obligations undertaken upon signature of the Energy Community Treaty.

All the SEE countries are the Contracting Parties of the Treaty that established the Energy Community (the ECT, also referred as Energy Community of South East Europe (ECSEE) and European Energy Community (EEC)) and have thus committed to an ambitious and demanding endeavour requiring substantial legislative work, administrative capacity and resources, but also significant political commitment and a shift in social perceptions.

The Energy Community has a three-fold purpose. First, it aims to create open and transparent national energy markets capable of attracting investments in power generation and networks. Secondly, the establishment of a regional energy market is foreseen to allow for cross-border trade in energy, guarantee energy supply and ensure that climate/ environmental and social considerations are integrated in the energy sector operation. Finally, in the long term, the objective of the Energy Community is to have this regional market fully integrated in the EU's internal energy market.

By joining the Energy Community, the Parties have committed themselves to implement the relevant EU rules on energy, environment and competition; the Treaty moreover provides the tools for the cross border operation of the energy markets in the region.

Timetable for implementation of the Treaty is the following:

- By 1 July 2007 implement the two EU energy market directives and the regulation on cross-border network access;
- From 1 January 2008 liberalization of the market for all non-household customers;
- By 31 December 2011 reduction in the sulphur content of certain liquid fuels;
- From 1 January 2015 liberalization of the market for all customers;
- By 31 December 2017 limitation of emissions of certain pollutants into the air from large combustion plants.

The recent EC Report[1] identified the following main challenges with the implementation of the ECT:

- Bridging the existing gap between theory (political commitments) and practice (full implementation of the Energy Community acquis and enforcement of the rules adopted);
- Private investments in the energy sectors of the ECT Parties remained on a relatively low level (despite substantial support from international financing institutions); the main reasons include the unreliable implementation of the regulatory framework and the small scale of national markets;
- Failure of governments to restructure regulated end-user prices and the associated implicit and explicit subsidies on all energy markets.

1 COM(2011) 105 final, Report from the Commission to the European Parliament and the Council under Article 7 of Decision 2006/500/EC (Energy Community Treaty)

The recommended approach to address these challenges in the coming period includes:

1. Focus on implementation (including making further EU financial support conditional on the implementation and enforcement of the rules, and inviting other IFIs and bilateral donors to follow the same policy);

2. Implementation of the Third Internal Market Package and the Directives on Renewables and Energy Efficiency, as a means to speed up integration of the region in the single European energy market; and

3. Coordinated investment strategy.

Other key messages from the Report regarding the coordinated investment strategy are presented in the Figure 2.2 below, since they outline the main courses of action that can be expected from the Commission in the forthcoming period.

> "A responsible approach to the opening of the regional energy market in 2015 would be adoption of policies and implementation of measures to help citizens make their homes and businesses more energy efficient. Energy efficiency is the best way to partly offset the impacts of rising prices and protect citizens."

Figure 2.2: Excerpts from the European Commission Report on the Energy Community Treaty implementation

The primary condition for new investments is undertaking price/subsidy reform. The current price and tariff levels, often below cost recovery, constitute a market distortion and hamper policies to promote demand management and energy efficiency. This, compounded with low levels of electricity billing and revenue collection imperil the financial viability of some of the power utilities.

The Commission intends to take the lead in this area by offering specific advice on structural reform. Emphasis will be placed on the social impacts of reform. The Contracting Parties need to develop efficient energy welfare systems and targeted subsidy schemes.

The Contracting Parties need to realise what are the costs of not-reforming, in terms of increased energy intensity, lost welfare, lost economic growth, a degraded environment and health impacts.

A secondary condition is that the Contracting Parties must look beyond their borders and realise the economies of scale offered by regional investment plans. This requires the political will to rely on neighbours, and to do that the European Union must take a direct and high level interest in the Energy Community at every opportunity.

Thirdly, the Commission will raise the level of importance attached to environmental and climate criteria in the debate on energy in the Contracting Parties. The necessity to invest in new generation capacity to replace old, inefficient and polluting power plants is all the more urgent when taking into account the environmental legislation of the EU. The ability of the Contracting Parties to implement the requirements of Directive 85/337/EEC, on environmental impact assessment, as amended, along with the provisions of Article 4(2) of Directive 79/409/EEC on the conservation of wild birds, will also deserve specific consideration from the Commission.

Source: EC, COM (2011)

The countries of the SEE are coping with the ECT implementation at differing rates, while making progress, albeit slow, towards the ultimate goals of the Treaty.

Albania has no integrated energy law and different regulations apply to various energy sub-sectors. The electricity sub-sector is regulated by the Power Sector Law, which is largely in line with the Energy Community Treaty. There is no specific legislation on renewable energy however some provisions on promoting renewables (e.g. the use of biofuels in transport) are in place, alongside the measures the country is taking to support development of electricity from renewable sources. The legal framework on energy efficiency (EE) is partly aligned with the acquis (e.g. regarding the energy performance of buildings and energy labeling). However, overall implementation of legislation is poor. A new energy strategy is being prepared.

In **Bosnia and Herzegovina**, a highly complex yet dysfunctional legislative and institutional set up is in place, failing to produce positive results and necessary dynamics in the energy sector reforms. The lack of cooperation and coordination between the Entities has a detrimental impact on the functioning of the energy market and compromises sector development. The country has not adopted a comprehensive energy strategy, while implementation of the EU requirements is in the initial phase in several key areas, including internal gas and electricity markets, promotion of EE and of renewable energy sources. Bosnia and Herzegovina lags behind in meeting its obligations under the Energy Community Treaty.

Croatian system entails elaborated policy and legislative frameworks and various institutions, with set national targets for renewables (20% of the overall consumption by 2020) and EE (10% reduction in final energy consumption by 2020). An Energy Agency is however not in place. Electricity and gas markets are open, but still dominated by single suppliers. The level of alignment of national legislation with the acquis is high. Implementation in the area of renewable energy resources (RES) is however hampered by complicated bureaucratic procedures and in the case of energy efficiency, by market (price) distortions, insufficient incentives and lack of monitoring. Further efforts are needed to secure the administrative capacity and independence of the energy sector regulators, as well as to improve transparency and public participation (in particular with implementation of the environmental legislation required under the ECT).

In **Kosovo**, legal framework has been substantially strengthened during the last couple of years. In 2010 alone, several important pieces of legislation including laws on energy, electricity, energy regulator and environmental impact assessment have been enacted. Energy Efficiency Action Plan 2010-2018 was also adopted, setting the national energy efficiency target at 9% increase by the end of 2018. Even though it currently has no gas market, Kosovo has to a large degree transposed provisions of the relevant EU legislation and the policy is to promote participation in regional gas supply projects with a view to bringing in the pipeline gas. Institutional coordination needs further improvements, alongside with implementation of laws and policies, which remains to be the key challenge.

New energy strategies were adopted in **FYR Macedonia** during last year, and the new comprehensive energy law was passed in February 2011. The strategy for the use of renewable energy sources set a target for a share of 21% of renewable energy in the total energy consumption by 2020. The country has started to address its energy efficiency (EE) objectives, but the Energy Agency still lacks the necessary resources and administrative capacity to effectively promote energy efficiency and renewable energy sources (RES). Natural gas supply has still not been unbundled from transmission, as required by the Natural Gas Directive. The electricity market is still not fully opened to all non-household customers.

The new **Montenegrin** Energy Law (adopted in 2010) is generally in line with the energy acquis. Targets for renewables have not been set, while current efforts to increase renewables are focused on the electricity sector alone. New national energy efficiency law and action plan were also passed in 2010, targeting a 9% energy saving by 2018, in compliance with the Energy Community commitments; the law however remains deficient when it comes to setting up implementation instruments (such as energy efficiency fund and agency). The electricity market has been open for all non-household consumers since 2009, but it is not active yet. Legal unbundling in the electricity distribution sector is yet to be implemented, and legal framework for the future gas market is still missing. Further adjustments of the legal and institutional framework and in particular strengthening of administrative and implementation capacities are needed.

As for **Serbia**, formal opening-up of the electricity and gas markets to non-household consumers has been completed. Further efforts are needed to achieve unbundling and real market opening. The current Energy Law needs to be aligned with the electricity and gas acquis, and the role and independence of the Energy Regulatory Agency needs to be strengthened. Legislative framework on energy efficiency (EE) is lacking, but the national energy efficiency action plan was adopted in 2010. The main elements of the acquis on renewable energy remain to be transposed whereas some regulations to stimulate renewable energy (such as feed-in tariffs for electricity produced from renewable sources) are already in place.

The main policy objectives across the countries include security of supply, restructuring of the energy sector and improved competitiveness, sustainability of energy development, integration of environmental considerations, developing and rehabilitating infrastructure, increase in EE and the use of RES, development of hydropower potential, increased use of natural gas, etc.

2.3. Energy production and consumption

Due to diverse geological, climatic and geomorphological conditions, a wide range of energy resources is found in the SEE region. The dense network of watercourses (belonging to three major watersheds of Black, Adriatic and Aegean seas) holds significant hydropower potential, and most of the countries have relatively abundant forest resources. There are significant coal reserves in the tertiary tectonic basins spreading along the Dinaric mountain range and some oil and gas deposits in the plain areas at the Albanian coast as well as in northern Bosnia and Herzegovina, in Croatia and Serbia. Solar and wind power, as well as geothermal resources, are also important. Their potential should be better researched.

The geographical position of the region makes it also an interesting area in terms of energy transmission: a network of high-power transmission lines is already in place in the region (although its overall condition is not satisfactory) and there are plans for expansion of oil and gas networks are also in place.

> "Since large hydro power schemes can have severe and irreversible social and environmental impacts any new schemes would need to meet stringent Environmental Sustainability and Human Rights Criteria."

The key features of the existing energy production capacities in the region can be attributed to the legacy of socialist era policies and prolonged lack/ low rate of investments during the past decades of armed conflicts, political and economic instability. As a result, the energy generation in the region is heavily relying on coal and as a rule operates with old and inefficient technologies. The region is large importer of oil (mainly used for transport) while gas (whether domestic or imported) is only used to a significant extent in a couple of countries (Croatia and Serbia). The predominant renewable energy sources used include hydropower[1], biomass (fire wood), and some geothermal.

1 Hydropower in this region is mainly produced by large HPPs, the construction and operation of which is often linked with significant negative impacts from the sustainability point of view. There is need for a more balanced and diversified use of renewable energy sources in the region.

Table 2.1: Key data on the energy generation/ use capacities in the SEE countries

Country	Hydro (installed cap., MW)	Number of HPPs	Fossil fuels			
			Installed cap., MW	Coal	Oil	Gas
Albania	1450 (81%)	7 large storage HPPs, 43 small	340 (19%)	no	2	no
Bosnia and Herzegovina	2000 (53%)	13 HPPs	1765 (47%)	9	no	no
Croatia	2080 (55%)	5 major HPPs, around 20 small	1675 (45%)	1	8	
Kosovo	-	1 small, currently non-operational	1355 (100%)	1	no	no
FYR Macedonia	450 (31%)	13, mainly storage HPS	1010 (69%)	4	1	no
Montenegro	630 (75%)	2 large HPPs	210 (25%)	1	no	no
Serbia	2800 (37%)	9 HPPs	4720 (63%)	4	no	3

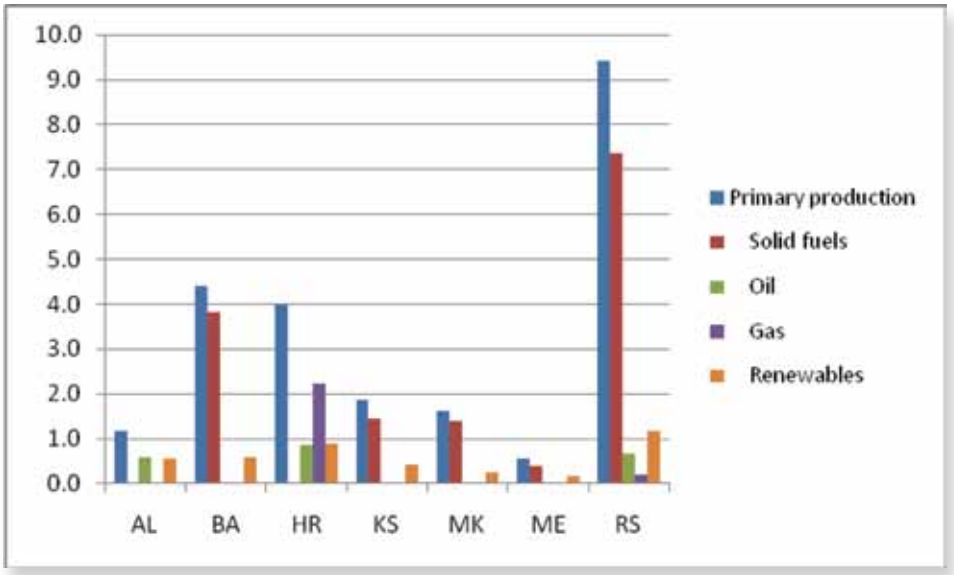
Country	No of refineries	Gas	District heating
Albania	2	No	No
Bosnia and Herzegovina	1 (used at min cap.)	Imports app 10,000 TJ/ annum (for district heating, indus. and HH)	Settlements above 25,000; gas and fuel oil used
Croatia	2	Well-developed distribution network (14000 km)	Yes
Kosovo	None	No	Yes
FYR Macedonia	1	Pipeline from Bulgaria, supplies industry and district heating	Skopje system (500 MW), fuel oil and gas
Montenegro	None	No	No
Serbia	2	Well-developed distr. network in the north, low usage for heating	5500 MW installed capacity, incl. 3 CHP plants (350 MW)

Created based on the following data sources: SEEC (2011) and Buzar (2008)

Total installed capacities for electricity and heat generation in the region (see table 2.1) are around 9,500 MW hydropower and 11,000 MW fossil fuels.

Total primary energy production and its structure by country is shown in the figure 2.3. Serbia is the biggest producer with 9.4 Mtoe, Montenegro the smallest with 0.6 Mtoe. Solid fuels are predominant in majority of the countries (Bosnia and Herzegovina, Kosovo, FYR Macedonia, Montenegro and Serbia). There is no primary production of coal in Croatia, while in Albania production is very low (0.02 Mtoe). Primary production in these two countries mainly comprises oil and renewables in Albania, i.e. gas, renewables and oil in Croatia. There is no generation of nuclear energy in the region.

Figure 2.3: Primary energy production in SEE countries in 2008 (in Mtoe)[1]



Sources[2]: 1) Country inputs, energy balances and answers to the EC Questionnaire; for Albania, data from the EC Questionnaire was used, while energy data is also available from the Albanian Institute of Statistics http://www.instat.gov.al/
2) http://ec.europa.eu/energy/publications/statistics/statistics_en.htm
3) For Bosnia and Herzegovina: Study on Energy Sector in BiH, Module 1, Book A: Energy reserves and historical energy balances, and http://www.enercee.net/bosnia-hercegovina/energy-supply.html

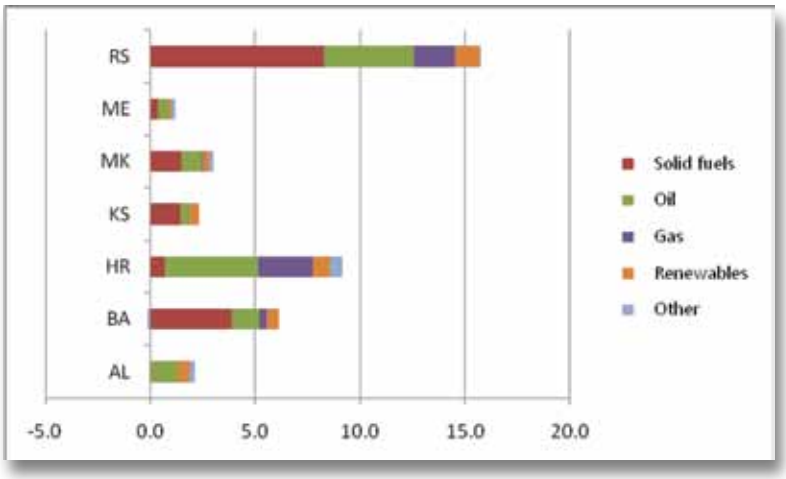
Out of the total of 23 Mtoe of primary energy produced in the region in 2008, coal accounted for 63%, renewables for 18%, gas was around 10% and the share of oil was around 9%.

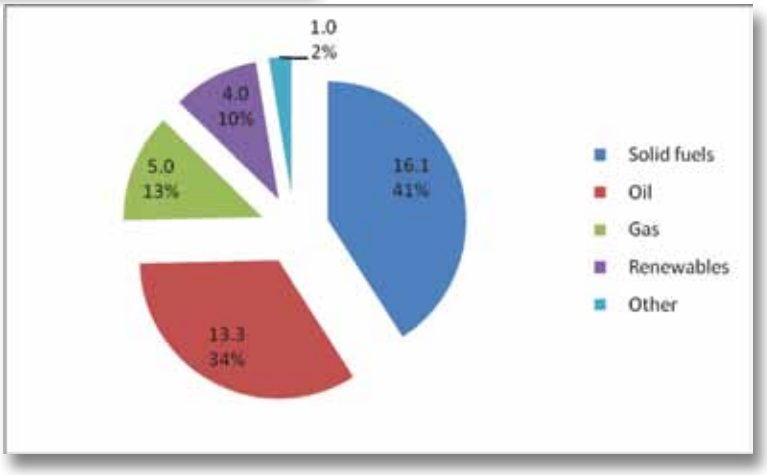
The region as a whole is a net importer of energy with energy dependency rate of 43% in 2008 (net imports were 16.9 Mtoe). The least import dependent country is Bosnia and Herzegovina (where around one quarter of gross inland consumption comes from imports), while Croatia and Montenegro are the most energy dependent countries (respectively, 60% and 52% of total primary consumption comes from imports). Energy exports are rare and mainly refer to low amounts (e.g. electricity – Bosnia and Herzegovina, renewables - Croatia, lignite – Montenegro).

1 Energy production and consumption categories used through this section are consistent with the EU energy statistics breakdown, as published on http://ec.europa.eu/energy/publications/statistics/statistics_en.htm. Definitions are available in Appendix of the paper.
2 The same sources were used for all the other graphs in this section and partly for the table 2.2; energy figures used to generate the graphs are included in the Appendix of the paper.

Figure 2.4 shows the energy mix for gross inland consumption (primary production + net imports) by country (upper graph) and for the region (lower graph).

Figure 2.4: Gross inland consumption in 2008 by country (Mtoe) and for the region (in Mtoe and as % of the total)





Note: Category 'Other' refers to Electrical Energy and Industrial Waste

Sources: 1) Country inputs, energy balances and answers to the EC Questionnaire; for Albania, data from the EC Question naire was used, while energy data is also available from the Albanian Institute of Statistics http://www.instat.gov.al/
2) http://ec.europa.eu/energy/publications/statistics/statistics_en.htm
3) For Bosnia and Herzegovina: Study on Energy Sector in BiH, Module 1, Book A: Energy reserves and historical energy balances, and http://www.enercee.net/bosnia-hercegovina/energy-supply.html

Coal and oil make up around three quarters of the total primary energy demand (coal alone is 41%), share of renewables is 10% while 13% of the total refers to gas. Comparison with the EU-27 shows that in relative terms consumption of coal in the SEE is more than double the EU consumption (18% in the EU), and the opposite applies to gas (13% in the SEE compared to 24% in the EU).[1] The EU however has somewhat lower share of renewables (8%), and a significant share (13%) comes from nuclear sources[2] . The higher share of the renewables in the total primary consumption in the SEE is due to a more widespread use of fire wood in our region[3] .

1 This data indicate that there is a large room to improve the energy mix in the SEE by increased utilisation of gas. According to WWF (2010), gas is considered as the most appropriate transition fuel towards full switch to renewables.
2 Data for the EU are for 2007.
3 The concerns over widespread use of fire wood in our region primarily refer to negative impacts of unsustainable harvesting of biomass and low efficiency of its conversion into energy.

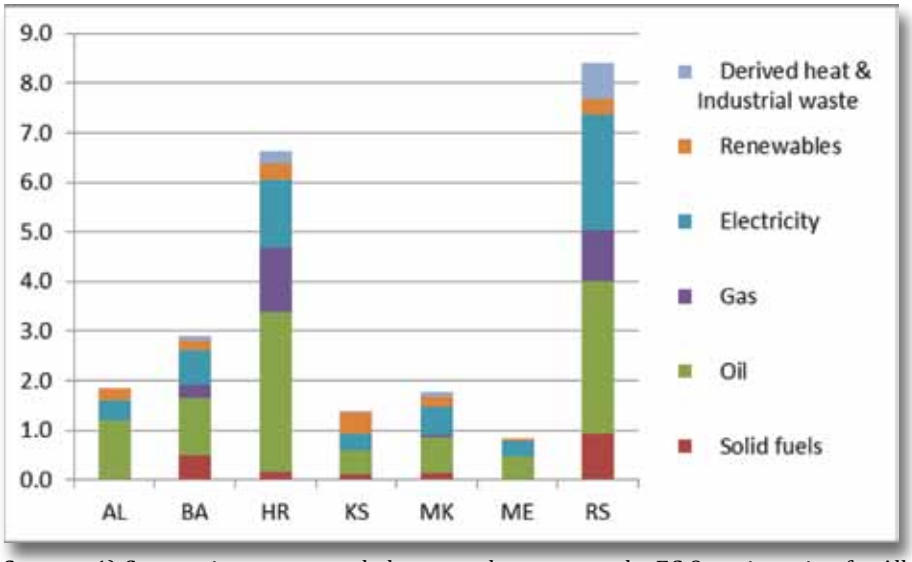
According to Greenpeace and EREC report[1] (2010), renewable energy sources accounted for 13% of the world's primary energy demand in 2007. Biomass, which is mostly used for heating, was the main renewable energy source. The share of renewable energy in electricity generation was 18%. About 80% of primary energy supply came from fossil fuels, and 6% from nuclear power.

> "While the countries of South East Europe generate more of their electrical energy from renewables (31%) than the EU average (16%), the use of gas for electricity generation – a very important transition fuel – is extremely low compared to the EU average (23%)."

Electricity generation in the SEE (79.2 TWh in 2008[2] in total) is almost entirely based on coal (61%) and renewables (31%). This is in sharp contrast with the EU where respective shares are 29% (coal) and 16% (renewables). Unlike the SEE where gas is used for electricity generation only in Croatia, it is a substantial fuel in the EU (with 23%). A large portion (28%) of the EU electricity, however, comes from nuclear sources. The SEE electricity generating capacities utilising renewable sources are almost entirely hydropower capacities, predominantly large HPPs. The region's net imports are around 18% (or 1.1 Mtoe) of the total electricity consumed. In 2007, Bosnia and Herzegovina exported electricity (its exports were at the level of around 10% of the region's total deficit of 1.2 Mtoe), and Serbia was self-sufficient. The most import dependent countries were Albania and Montenegro, where 51 and 48% of the final demand for electricity had to be met from abroad. Croatia and FYR Macedonia were not able to cover around 40% of total demand from national production, while for Kosovo import dependency rate for electricity was 18%.

In 2008, final consumption of all fuels/ products in the region was 23.8 Mtoe, and the breakdown is shown in the figure 2.5. Per capita final energy consumption in the SEE was 977 kgoe (compared to 2,333 in the EU).

Figure 2.5: Final consumption of energy by country (in Mtoe)[3]



Sources: 1) Country inputs, energy balances and answers to the EC Questionnaire; for Albania, data from the EC Questionnaire was used, while as energy data is also available from the Albanian Institute of Statistics http://www.instat.gov.al/
2) http://ec.europa.eu/energy/publications/statistics/statistics_en.htm
3) For Bosnia and Herzegovina: Study on Energy Sector in BiH, Module 1, Book A: Energy reserves and historical energy balances, and http://www.enercee.net/bosnia-hercegovina/energy-supply.html

1 Energy [r]evolution: A sustainable world energy outlook
2 Data for 2008 was used for all the countries except for Croatia and Bosnia and Herzegovina, where 2007 data was used for electricity generation.
3 Energy sources have different forms in nature, at different refinement levels from firewood to nuclear. However "Final Energy Consumption" is final only from the point of view of the energy sector and represents roughly the form in which energy is commercialized, whether as firewood (renewable) to heat a home or electricity to power a refrigeration unit (regardless of whether that electricity was produced from a renewable or non-renewable source) etc. See Appendix of the paper for more details.

Oil and electricity are the main components of the final energy consumption mix in all the countries, gas has a relatively significant share in Croatia and Serbia, and renewables in principle do not play an important role (the exception is the fire wood) (share of renewables in the total final energy consumption in the region was 7.2%).

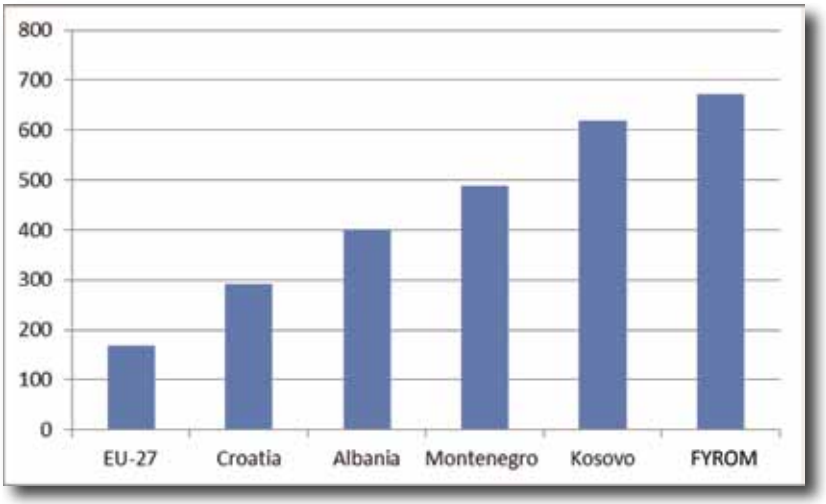
Table 2.2: Selected energy indicators

Country	Gross inland consumption per capita (kgoe)	Energy intensity (toe/GDP Meuro '00)*	TPES/ GDP PPP (toe/000 2000 USD)**	Electricity consumption per capita (kWh)
Albania	701	400	0.12	1,372
Bosnia and Herzegovina	1,296	n.a.	0.17	2,385
Croatia	2,062	293	0.12	3,497
Kosovo	1,104	619	n.a.	2,038
FYR Macedonia	1,455	673	0.21	3,161
Montenegro	1,866	488	n.a.	6,029
Serbia	2,102	n.a.	0.31	3,751
EU-27	3,641	169	(OECD) 0.16	5,731
SEE average	1,622	n.a.	n.a.	2,917

Notes: Depending on available data, figures in the table refer to the years 2006 – 2008
TPES stands for total primary energy supply (equivalent to gross inland consumption)
* Based on country inputs and http://ec.europa.eu/energy/publications/statistics/statistics_en.htm
** Source: International Energy Agency, Key World Energy Statistics (2010)

The countries in the SEE region are consuming by far less **energy per capita** than is the case within the EU. Albania's per capita consumption is five times lower than the EU-27 average, while the consumption in countries that were part of former Yugoslavia is substantially higher compared to Albania but still far below the EU energy usage (ranging from around 30% in Kosovo to about 58% of the EU consumption in Serbia). However, when efficiency with which energy is used in the region is examined, the picture changes completely. All the SEE countries[1] use much more energy to produce a unit of GDP than the EU countries. With **energy intensity** of 293 toe per million of GDP in 2000 euros, Croatia is the closest to the EU level of 169, followed by Albania (400 toe/ Meuro '00). Economies of Montenegro, Kosovo and FYR Macedonia are several-fold more energy intensive than the EU. The energy intensity indicators (for countries for which they were available) are shown in the figure 2.6.

Figure 2.6: Energy intensity in the SEE countries compared to the EU-27 (in toe/GDP Meuro '00)



Note: Based on Table 2.2
Sources: International Energy Agency, Key World Energy Statistics (2010),
http://ec.europa.eu/energy/publications/statistics/statistics_en.htm and country inputs

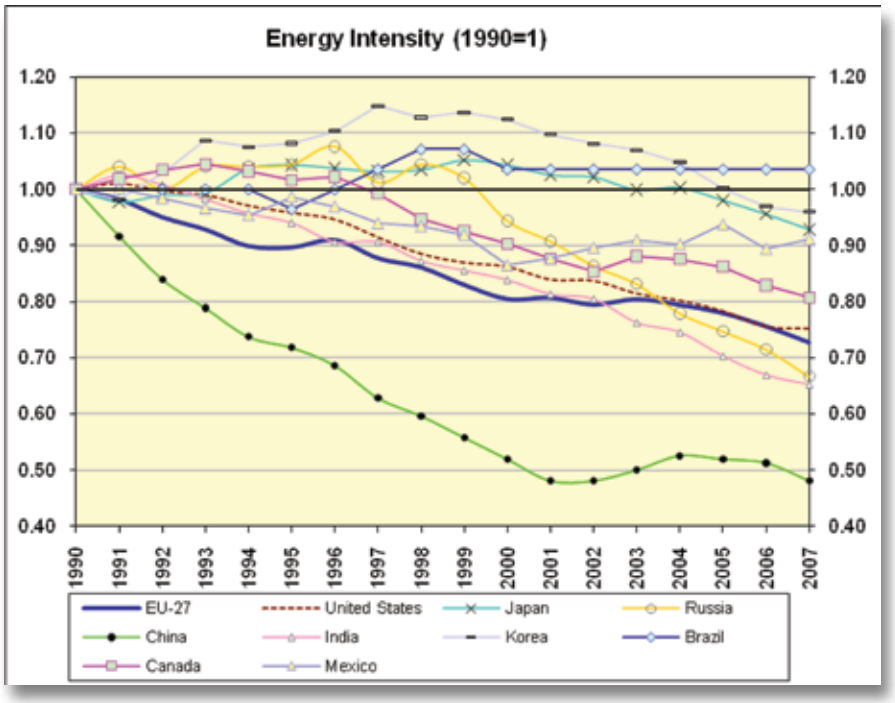
1 Data on GDP in 2000 euros (and thus the energy intensity indicator) was not available for Bosnia and Herzegovina and Serbia, but similar indicators and comparison included in the table 2.2 indicate that these two economies are also highly energy intensive.

A comparison with energy consumption in OECD countries (where GDP is expressed in purchasing power parities – PPP – 2000 USD) is also included in the table 2.2, showing that Albanian and Croatian economies are below average OECD energy intensity level, while as other economies are above – Bosnia and Herzegovina slightly, and Serbian economy almost twice as energy intensive as the OECD average. It should be noted that in terms of energy intensity, OECD averages are significantly higher than the EU ones.

The world energy intensity ratio was 392 toe per million of GDP in 2000 euros in 2007[1]. In the period 1997 – 2007, the EU decreased its energy intensity from over 200 to 169 toe per million of euros of GDP (meaning that about 17% less energy is consumed to produce one euro of GDP in 2007 than was the case a decade earlier). High GDP growth in much of the SEE region in the period from mid-2000's until the global economic crisis was not followed by significant increases in energy consumption, which substantially improved the region's energy intensity indicators compared to late 1990's and early 2000's. This improvement can be attributed to the fact that GDP growth was mainly linked to non-energy intensive sectors (services and similar) rather than to well designed and implemented energy efficiency measures[2].

An overview of how the energy intensity decreased worldwide since 1990 (as measured by energy intensity index) is shown in the figure 2.7.

Figure 2.7: Changes in energy intensity indicators 1990 – 2007



Source: Energy Statistics Pocketbook 2010 available from
http://ec.europa.eu/energy/publications/statistics/statistics_en.htm

The EU alone decreased its energy intensity by a quarter over the period of 17 years, China has halved the use of energy per GDP unit, and other developed and developing economies, including the US, Russia and India, achieved substantial drops in energy intensity. The SEE region needs to set and achieve comparable or better results to ensure its competitiveness in the global economy and to realise its European agenda.

1 In Japan it was 128, in the US 267, Russia 2,171, China 981, etc. Source: Energy Statistics Pocketbook 2010 available from http://ec.europa.eu/energy/publications/statistics/statistics_en.htm

2 Although energy efficiency has been getting increased attention during the last years in the SEE region and some measures are beginning to yield results, there is still a vast room for improvements and energy efficiency remains the single most important opportunity to contribute to sustainability of the energy sector in the region.

2.4. Energy and environment in the region

Interactions between energy and environment in the SEE countries were analysed at the Synergies for Energy Awareness project workshop (held in April 2011 in Belgrade) and through the compilation of country inputs for this paper. An overall framework that guided the analysis was the DPSIR (drivers – pressures – state – impacts – responses) model. The key findings of this analysis and an assessment of the effectiveness in applying the tools to safeguard the environment (such as environmental assessments and public participation) are presented in this section.

The two issues that have been the focus of analysis are climate change (in terms of the region's energy sector contribution to this global problem) and environmental pollution due to operation of energy facilities as the key concern on the local level.

> "Climate change is already a reality hundreds of millions of people worldwide are already affected by water shortages, crop failures, flooding and extreme weather events. The WHO estimates that climate change is already causing more than 150,000 deaths a year."

With the region's reliance on coal (inherited, but likely to be further boosted through on-going and planned developments), CO2 emissions represent an important issue. Even though total emissions of the SEE countries studied in this paper account for less than 3% of the total EU emissions coming from fuel combustion (table 2.3), the intensity of emissions signals that there is a large room for improvements. Furthermore, measures to reduce emissions frequently coincide with and are mutually reinforcing with EE and measures to promote the use of RES.

Table 2.3: Overview of CO2 emissions from combustion of fuels and carbon intensity

Country	CO_2 emissions (Mt)	CO_2 emissions per capita (kg)	CO_2 from electricity and heat generation (grams CO_2/kWh)
Albania	3.9	1,227	14
Bosnia and Herzegovina	19.5	5,181	928
Croatia	20.9	4,720	341
Kosovo	7.15	3,405	n.a.
FYR Macedonia	9.0	4,333	786
Montenegro	2.7	4,355	n.a.
Serbia	49.2	6,695	671
EU-27	3,849.5	7,719	351

Sources: SEEC (2011) based on CO2 Emissions from Fuel Combustion (2010 Edition), IEA, Paris. http://www.iea.org/ and country inputs/national energy statistics for Kosovo and Montenegro

Croatia is the only SEE country (as Annex I country under the UNFCCC) with internationally legally binding commitment (under Kyoto Protocol) to reduce emissions of greenhouse gases.

More than a half of the total region's CO2 emissions come from electricity and heat generation. Serbia is the biggest emitter both in absolute and relative (per capita) terms, and all of the SEE countries have per capita emissions well below the EU average. However, CO2 emissions per kWh generated in Bosnia and Herzegovina are almost triple the emissions in the EU, while in Serbia and FYR Macedonia CO2 emissions intensity is approximately twice the value of the EU-27 average. This is due to high share of coal in electricity mix and inefficient energy transformation technologies in these countries.

Albanian energy sector is a very low emitter due to the fact that its power generation is based on hydropower and oil, and Croatia is also below the EU-27 average due to a more balanced fuel mix in energy transformation process[1].

Responses to climate change causes i.e. mitigation measures have been formulated across the region through the work on national communications to the UNFCCC, whereas the last submissions to the Convention were made in 2010 when Montenegro and Serbia submitted initial and Croatia submitted fifth communication[2] . Some countries have carried out Technology Needs Assessments (for mitigation and adaptation) and some are starting with that process.

In Croatia, goals and measures to reduce emissions of greenhouse gases are also integrated in the national energy strategy, and they inter alia include preparation for applying the Carbon Capture and Storage (CCS) technology. The strategy also sets a goal of stimulating the research and transfer of new technologies for energy generation, energy savings, renewable energy sources, hydrogen use, more efficient transport, smart grids, etc. Climate change mitigation measures are spelled out in detail in the Air Quality Protection and Improvement Plan 2008 – 2011 (includes 33 measures referring to renewables, EE, research and development on climate change, technology and know-how transfer, implementation of Kyoto Protocol flexible mechanisms etc.). Despite well elaborated goals and measures, it cannot be said that Croatia has an overarching and clear climate change policy. For example, there are plans for new coal based power plants, which is not in alignment with carbon reduction measures. The public has not been properly informed about negotiations with the UNFCCC, and there is no system of monitoring and verification of implemented measures.

Other countries are also developing their climate policies. In FYR Macedonia, for example, different scenarios were developed for mitigation in energy (electricity and heating), transport, waste, agriculture and forestry sectors. The focus is on the hydropower-potential of the country, investing in RES, increasing EE and on using the gas as a fuel for production of electricity and for heating. Similar work was done for all the SEE countries that have submitted (one or more) national communications.

> "By 2050 more than 1/3 of building heat could come from geothermal sources."

Regarding **other pressures from energy sector** in the SEE (with local impacts), the key ones are linked to emissions of air pollutants due to large consumption of coal (and other fossil fuels), poor quality of fuels used in electricity/ heat generation and old and dirty technologies used in energy and industry. An indirect factor that contributes to strong pressures on air quality is low energy efficiency. Second important group of pressures linked to the operation of energy sector are stresses placed on biodiversity and water resources due to the operation of existing and construction of new facilities, in particular large HPPs.

Coal accounts for 50% or more of gross inland consumption in 4 countries of the region – Serbia, Bosnia and Herzegovina, Kosovo and FYR Macedonia[3]. Croatia does not have primary production of coal and has a more diversified energy mix with gas accounting for close to 29% of the gross inland consumption (the share of coal is less than 8%). The principal sources of pollution in Croatia's energy sector are oil refineries and oil powered thermal plants. Around 4.5 Mtoe of oil are used within the country annually, making roughly one half of the total gross inland consumption (final energy consumption in transport sector is around 2.1 Mtoe). The use of coal in gross consumption is significant (in relative terms) in Montenegro, accounting for close of one third of gross inland consumption, and is also linked to significant air pollution problems.

1 Future polices in the region should thus strongly stimulate a fuel switch from coal to gas as a way to reduce emissions from energy generation (coupled with energy efficiency measures and a larger and more diversified uptake of renewables).
2 Kosovo is not a party to the Convention (no national communication) yet. Albania and FYR Macedonia completed two national communications and Bosnia and Herzegovina and Serbia have each completed one.
3 In Serbia, 8.2 out of total 15.6 Mtoe gross inland consumption are from coal; for Bosnia and Herzegovina, the ratio is 3.9 out of 6 Mtoe, for Kosovo 1.4 out of 2.3 and in FYR Macedonia exactly one half of the total 3 Mtoe consumed in the country in 2008 was from coal.

The lignite used in Serbian TPPs in Obrenovac, Lazarevac and Kostolac, for example, has low calorific value, high moisture content and its combustion produces high quantities of fly ash, sulphur dioxide (SO2) and nitrogen oxides (NOx). These plants are equipped with electrostatic precipitators, but desulphurisation and NOx control equipment is not installed. Oil refineries in Pancevo and Novi Sad are also significant sources of air pollution.

The largest polluters in Kosovo are the existing TPPs Kosovo A and B. Total emissions (by power plants and cars) of key air pollutants in 2009 were 17.12 kt of SO2, 33.48 kt of NOx and 19.34 kt of dust.

CASE STUDY: Thermal power plant Kosovo C in Kosovo

The on-going plans to build new thermal power plants in Kosovo will, together with the coal mining expansion, have a significant detrimental impact on the environment. An example of such plans is the Ministry of Energy project for the construction of Kosovo C plant which was initially envisaged as having an installed capacity of 2,100 MW. The Energy Strategy of Kosovo 2005-2015 on the other hand identified the following key elements of the strategic orientation of the Assembly of Kosovo on the production of electricity in the future:

- Capacities of new plants are to be up to 1,000 MW;
- Inclusion of investors from Kosovo; and
- Construction of any new capacity should be preceded by detailed studies on various relevant topics.

Based on these criteria, it can be concluded that the plan for a new power plant with the capacity of 2,100 MW was in conflict with the key elements of the Energy Strategy passed by the Assembly of Kosovo. However, contrary to the strategy approved by the Assembly, the plans for construction of the new thermal power plant Kosovo C have evolved without studies and analyses on economic, social and environmental issues. Public discussion has not been enabled, and there was no environmental impact assessment studies produced. Furthermore, analysis on population density, limited water resources and decreasing agricultural land per capita, were not done, and benefits (including their distribution across Kosovo society) have not been identified.

Due to significant political and civil sector pressure, the Government of Kosovo has changed its original plan of 2,100 MW to two times 300 MW, taking into account the opinion of experts and environmentalists and respecting documents and strategies adopted by Kosovo institutions. The tender procedure has been initiated, but is unfortunately characterized by a lack of transparency and information. The existing thermal power plants Kosovo A and B are sources of enormous air pollution. The level of dust emissions from Kosovo A stack is 40 times higher than the maximum allowable concentration under EU regulations, while the emission from Kosovo B is 10 times higher. Daily emissions of dust are around 200 t. Furthermore, excess emissions have been recorded for other pollutants such as SO2 and NOx from both plants. Since these two power plants will continue to work for a long time, about 700,000 people living in an area of their influence will continue to breathe its polluting emissions. Despite the fact that Kosovo C will utilize new technologies and have lower emissions, the overall situation with air quality will deteriorate even further with its construction. The Ministry of Energy was promoting Kosovo C project (2,100 MW) through so-called “discussions” with the civil society, however these events were not designed to engage the citizens in the process or to benefit from their inputs but merely to meet formal requirements. Adequate information to enable participation was not provided, as it only included characteristics of the investment and no data whatsoever on:

- Environmental quality, now and after the start date of the new plant;
- Health of the population and their security;
- Social issues associated with the project.

The Government started with project plan without prior consultation with the inhabitants of Obiliq/Obilić municipality who would be directly affected by the new plant (as they are by the current plant). In a meeting organized by the Ministry of Energy in Obiliq/Obilić municipality, the mayor, Mr. Ismet Hashani, said local authorities would demand a referendum to be organized so that inhabitants of Obiliq/Obilić could have a say as to whether they would accept to still live with the polluting emissions of thermal power plants or not.

Annual emission of SO2 in FYR Macedonia in 2006 and 2007 were at the level of 140 kt, followed by a drop to 110 kt in 2008 (due to shutting down of some industries). More than 2/3 of total emissions are from fuel combustion. NOx emissions were at the level of 40 – 45 kt annually in the period 2006 – 2008, half of it from fuel combustion. As regards the state of the environment in Croatia, reduced air quality was recorded at certain locations[1] including the towns of Osijek, Sisak and Rijeka where large energy facilities are located.

1 At 15 out of 143 monitoring stations in Croatia concentrations of pollutants above permitted levels were measured and the air was assessed as third category (excessively polluted).

Health impacts due to air pollution were among the key energy sector impacts identified by almost all the countries. In Kosovo, for example, many people are exposed to excess air pollution from combined sources (energy being the primary one) and the incidence of respiratory problems in the areas affected by these sources is significant. Similar is true for the area of Pljevlja, Montenegro, where lignite fired TPP operates. The air quality in the town of Sisak in Croatia is classified as 3rd category due to pollution from hydrogen sulphide (H2S) and particulate matter of 10 micrometers or less PM10. Ministry of Health and Social Care conducted an epidemiological study and found that mortality rate from respiratory diseases and rate of chronic diseases of the lower respiratory system in Sisak were significantly above the national average (with Sisak ranking as the town with respectively the highest and second highest rate in Croatia).

CASE STUDY: Air pollution in the town of Sisak in Croatia

The town of Sisak is located in central Croatia, and is a centre of Sisak Moslavina County. Urban population is around 37,000, while as a total of 52,000 people live in wider area around the town.

The Sisak Oil Refinery – a business unit of INA, the state oil company – is the main contributor to pronounced air pollution problems in the area air quality measurements for several pollutants often peak into category 3. INA is a medium-sized European oil company with a leading role in oil business in Croatia and a significant role in the region in the areas of oil and gas exploration and production, oil processing, and distribution. The Sisak Oil Refinery is a complex plant. It covers about one million square meters of warehouse space, with modern installations for product shipment, as well as a river harbour with four docks for oil supply and the shipment of processed products. The products include LPG, motor gasoline, diesel fuels, virgin naphtha, heating oil, coke – green and calcinated, bitumen and liquid sulphur.

On 15 July 2004, Croatian Government adopted decision which obligated INA to prepare modernization program for the plant. This followed an in depth assessment and related report of the Ministry of Environmental Protection and Physical Planning and Construction (MEPPPC), which tied the air pollution in the town to the existing technical and technological level of the Refinery's operation and identified the plant as the key source of air pollution.

In the period 2007 – 2010, desulphurisation plant and FCC gasoline hydro-desulphurisation plant have been completed. An isomerisation plant was planned to start operating during March 2011 (the last Ministry's report is dated February 2011). Total costs of activities completed in the 1st phase of Sisak Oil Refinery modernization were 118 million euro. Operation of desulphurisation plant (Claus) has solved the problem of sulphur dioxide (SO2) pollution, leading to an improved air quality (1st category being recorded for this specific pollutant), as confirmed by measurements carried out on air quality stations in the town. Commissioning of this facility also contributed to a significant reduction of hydrogen sulphide (H2S) pollution. FCC gasoline hydro-desulphurization plant and isomerisation plant have enabled the production of Euro V fuels. Activities related to the implementation of 2nd phase of Sisak Oil Refinery modernization are still in the preparatory phase. Revision of the Basic Design of HC/HDS plant (Mild hydro cracking/ hydro-desulphurisation) has been completed and signing of contracts for the development of Basic Design for a new coking plant is underway. Total estimated costs of planned activities for 2nd phase of Sisak Oil Refinery modernization are 340 million euro. New coking plant should permanently solve the problem of hydrogen sulphide (H2S) pollution. Despite evident improvements, measurements done in 2010 still show significant air pollution. Air quality was assessed as 3rd category due to pollution from H2S and PM10 particles and benzo[a]pyrene in PM10 particles. Until the completion of the 2nd phase of modernization, full compliance with environmental requirements on hydrogen sulphide is not possible. The occurrence of excess air pollution due to PM10 particles and benzo[a]pyrene in PM10 particles requires a detailed analysis of the causes.

Category 1 air quality was measured in relation to SO2, NO2, CO, benzene, and heavy metals (cadmium, nickel and arsenic) in PM10. It is estimated that the air quality will remain in this state in the coming years, and that the problem of air pollution in the town of Sisak in relation to these pollutants is permanently resolved.

In 2011, the Committee for Environmental Protection of the Croatian Parliament held a session on the air quality and health indicators in Sisak Moslavina County, using the Government report and the results of a health Working Group (tasked with monitoring and epidemiological research) of the relevant Ministry as a basis. Some of the key findings of the report/ Working Group were that the incidence of cancer and related mortality in Sisak did not differ from the Croatian average. The evidence on leukaemia was inconclusive, but in terms of mortality from respiratory diseases and chronic diseases of the lower respiratory system, Sisak takes first and second place and significantly differs from the Croatian average. Data linked to cancer will be routinely monitored and special epidemiological research on respiratory diseases will be conducted.

In Serbia, research on health impacts of air pollution was conducted for the town of Pancevo. According to the results, respiratory and cardiovascular diseases were more frequently occurring during the years when concentrations of benzene and ammonium in the air were higher.

Loss of biodiversity was another important impact identified by most of the countries, as construction of power plants leads to loss of habitats and species (through direct destruction or alternation of natural conditions).

Degradation of water resources – whether due to impediments and altered flow or to discharges of heat and other energy related pollution into the watercourses – is another significant impact. Since there is an evident tendency in the region to advocate large HPPs as a solution that only brings benefits (a renewable and clean source of energy), it is worth pointing out, as was done in the recent WWF (2011) report[1] , that hydropower can have severe environmental (as well as social) impacts. By changing water flow downstream, dams threaten freshwater ecosystems and the livelihoods of people who depend on fisheries, wetlands, and regular deposits of sediment. They fragment habitats and cut-off fish access to traditional spawning grounds. Creating reservoirs also means flooding large areas of land[2] .

Soil (and landscape) degradation as well as **economic losses due to operation of polluting technologies** have also been identified as some of the key impacts.

In Kosovo, for example, large areas have been degraded through open coal mining ad deposition of soot and ashes from TPPs. Economic losses (on macro and micro levels) have been demonstrated and attributed to different groups of environmental problems in Serbia, where aggregate cost of environmental degradation is estimated to range between 4 and 13% of GDP. Three major groups of environmental problems are 'responsible' for the bulk of these costs: air pollution – 53%, water pollution – 22% and inadequate waste management – 11%. According to the World Bank report (2007), an important issue related to the local air pollution problems and CO2 emissions is the unsustainable and wasteful use of the country's energy resources. The cost of net depletion of Serbia's energy resources is reported to amount to 2.4% of GNI, which corresponds to 630 million USD per year.

Environmental management instruments and mechanisms such as environmental impact assessment (EIA), strategic environmental assessment (SEA), public participation and access to information/ justice can, when adequately implemented, play a safeguards role in the complex energy – environment interaction and contribute significantly to sustainable energy sector development.

Countries of the region are in various stages of implementing these instruments/ mechanisms, whereas the EU accession process is often the key driving force. In some countries (such as Kosovo), the EIA and SEA laws have recently (2010) been enacted, while as in others (such as Croatia, FYR Macedonia, Montenegro, Serbia) transposition of the relevant EU legislation is (almost) completed. However, a lot remains to be done before these mechanisms are utilised to their full potential and before an informed and balanced consideration of environmental, social and economic aspects of energy projects, plans and programmes is ensured before decisions are made.

1 The energy report: 100% renewable energy by 2050
2 Between 40 and 80 million people worldwide have been displaced as a result of hydropower schemes (data from http://www.international-rivers.org/en/way-forward/worldcommission-dams/world-commission-dams-framework-briefintroduction)

An overview of assessments from the last set of the EC progress and/ or analytical reports (the latter accompanying EC opinions on the countries' application for membership) on the EIAs, SEAs and public participation/ access to information and justice (commonly referred to as a part of horizontal legislation) is provided in the figure 2.8.

Figure 2.8: Progress with transposition and implementation in the area of horizontal legislation

Country	EIA		SEA		PP, access to info and justice	
	Transposition	Impl & Enforc	Transposition	Impl &Enforc	Transposition	Impl & Enforc
Albania	Flaws in transposition	Improve consideration of alternatives, coordination, stakeholder involvement	Early stage	Requires considerable strengthening		Requires considerable strengthening
Bosnia and Herzegovina		Further efforts required	Transposed (Federation only)	Further efforts required		Further efforts required
Croatia	Almost complete (generic assessment for horizontal legislation)	Efforts need to be increased	Almost complete (generic assessment for horizontal legislation)	Efforts need to be increased	Almost complete (generic assessment for horizontal legislation)	Insufficient (cooperation with judiciary needs to be strengthened)
Kosovo	EIA Law adopted in 2010		SEA Law adopted in 2010		Implementing legislation for PP in EIA adopted in 2010	
FYR Macedonia		Administrative capacity improved	Implementing legislation adopted	Administrative capacity improved		Public consultations in EIAs and SEAs are inadequate
Montenegro	High level of alignment	Considerable strengthening required (alternatives, coordination)	High level of alignment	Considerable strengthening required	High level of alignment (more needed on access to info and justice)	Considerable strengthening required
Serbia		Generally good progress (no specific info)		Generally good progress (no specific info)		Generally good progress (no specific info)

Sources: EC Opinions and Analytical reports and Progress reports 2010

In some cases, the insufficient capacities in countries and lack of experience with new governance and transparency approaches can be singled out as the main causes for the still defective implementation of these tools. On a positive note (and as observed by the EC), the countries are making progress in this area (for the last year this was particularly visible for FYR Macedonia and Serbia) and building capacities for better conducting of these processes and meaningful consultations of the public. The worrying trends are however also evident, where there is a prolonged avoidance and undermining of the good environmental assessment practices in the energy sector development planning.

One example that best illustrates this is Montenegrin experience with: first, lack of consideration of SEA recommendations for the energy strategy (even though the SEA was not legally required at the moment of Strategy development, the assessment was conducted through a pilot project); and second, conducting a very weak, both from the quality of assessment and from public participation aspects of the process, SEA for the spatial plan for development of four large hydropower dams on Moraca river. The assessment was deficient in the areas of the key environmental impacts of the dam (water and biodiversity), biased regarding the economic and social benefits of the plan, and despite the high public interest and significant inputs provided to the debate more than a year ago, it is still not known which of these public recommendations have or will be taken into account and how. Notwithstanding the fact that the final versions of the plan and SEA have not been released yet, the tendering process for the selection of investor has advanced, which points out to the conclusions that vested interests are driving the process, that the administration is failing to safeguard the public interest and that unsustainable solutions are likely to prevail.

CASE STUDY: Hydropower plants on Moraca river in Montenegro

Montenegro is highly dependent on energy imports and fossil fuels have a significant share in the energy mix. According to available data, five times more energy per capita is spent in the country compared to the EU, and the losses on the distribution and transmission grids reach 22% (four times more than in the EU countries). Every second kWh which reaches the households in Montenegro is used for heating.

The National Energy Development Strategy (NEDS) with a 2025 time horizon, was adopted in 2007, just few a days before the Law on Strategic Environmental Assessment (SEA) came into force. However pilot SEA for the Strategy was carried out by Land Use Consulting (LUC) UK in coopertaion with the Government, through a UNDP supported project, but the responsible Ministry did not take into consideration the pilot SEA recommendations. The NEDS endorses the Moraca hydro power project consisting of 4 dams: Andrijevo, Raslovici, Milunovici and Zlatica with a total output of around 240 MW.

The first step in the process of developing the scheme was a tender for expression of interests for the construction of hydropower plants (HPPs). Based on the tender (signed up by 20 investors) the Ministry of Economy has initiated preparation of the Detailed Spatial Plan (DSP) for the area and an SEA for this plan. The draft DSP and the draft SEA were released in February 2010, and a public consultation followed.

The process was characterized by a massive response of the public, both general and professional. More than 500 comments from experts and civil society have been submitted to the responsible body (then Ministry of Spatial Planning and Environment). A public campaign (organised by Green Home NGO) against the Plan was conducted and a petition signed (around 15,000 signatures were collected) and sent to Government. The main objections heard during the consultation process were:

- There is no cost benefit analysis for the Plan;
- Plan for the construction of HPPs relies on technical solutions dating back to 1970s that comprise transfer of Tara river (a UNESCO Heritage Site protected by Parliamentary decree) waters into Moraca;
- Alternative options and solutions were not assessed;
- Dams threaten the canyons of Mala Rijeka and Mrtvica rivers and are likely to have negative impacts on water regime of Skadar lake and related ecosystems;
- Moraca canyon is a home to 135 species of birds (all but three of these are protected at European level);
- Property issues in the territory that will be flooded due to the construction of HPPs are not resolved and expropriation costs will be significant (expected to be covered from public sources);
- Monastery Moraca will be affected;
- The ownership over HPPs could be transferred to the state after 30 years;
- It is envisaged that in excess of 90% of the energy would be exported to Italy.

The responsible Ministries promised to address all the key concerns, questions, comments and suggestions for the final versions of the documents, however the destiny and the content of either the Plan or the SEA are not known to date, over a year after the consultation process was closed.

The process has exhibited other weaknesses as well. The call for pre-qualification tender to award the concession to construct four HPPs has been issued prematurely, before final concession act has been adopted. The premature launch of the pre-qualification process is a violation of the principles of transparency, non-discrimination and competition set under the Law on Concessions.

Due to this breach of relevant legislation, a group of citizens that included representatives of MANS, Forum 2010 and Green Home NGOs initiated a court case in front of the Administrative Court, asking for annulment of the Concession Act for the Moraca hydropower project and of the prequalification tender. In April 2011, however, the Administrative Court declared itself not competent to hear the case.

Tender for the selection of investor was launched in November 2010 with 4 applicants accepted, however shortly afterwards two of the pre-qualified bidders - the Austrian company Strabag and the Chinese company Sinohydro - officially withdrew from the tender. Thus only two Italian companies, A2A and ENEL, remained as potential bidders, and A2A is already a large shareholder in the Montenegrin Power Company. The deadline for submission of bids was recently extended until 30 September 2011, following the request of the two remaining bidders.

While the highly non-transparent process for the development of HPPs continues, not enough attention is paid to energy efficiency improvements, which could to a large extent offset current import dependency, relax the need for construction of environmentally damaging projects and contribute to economic efficiencies. Montenegro also has under-utilized resources for sustainable renewable energy.

2.5. Restructuring and privatisation

As the SEE countries began transition to market economies, **restructuring and commercialisation of state owned enterprises** became an important topic on the energy sector's agenda, followed by demonopolisation and **privatisation**. Introduction of market concepts and ways of operation was not and still is not a straightforward task due to a variety of reasons. Unbundling or separation of energy generation, transmission and distribution functions proved to be a time consuming process, sometimes running into standstills, while the governments were by large reluctant to give up the energy monopolies. Restructuring of large state owned companies that dominated the sector through the 1990s was often hindered by vested interests, over-employment, prices below cost recovery levels, low collection rates and a number of other inefficiencies in their operation (including inefficient production due to obsolete equipment). On the other hand, infrastructure maintenance backlog and shortage of funds for investments, together with more recent requirements stemming from the Energy Community Treaty, acted as forces that drove the restructuring and privatisation processes. Across the region, privatisation has mainly taken place in the oil/ oil derivatives and gas sub-sectors, and to a more limited extent in coal production, electricity and heat generation. These processes were often challenged from the transparency point of view.

In **Bosnia and Herzegovina**, for example, oil industry and some coal (lignite) mines have been privatised, and the process has been perceived as highly non-transparent in the first case.

Croatian petroleum company INA has been privatised in few consequent steps in the period 2003 -2007. Transparency was also not on the satisfactory level. There are no further immediate plans for the privatisation in Croatia's energy sector.

In **FYR Macedonia**, most of the energy sector is now privately owned. As for the electricity sector, generation and transmission companies are still state owned, while distribution has been privatised. The country strategy is to rely on private-public partnerships for building of new power plants. Furthermore, oil, heating and coal production sectors have all been privatised. Information on these processes was generally available to the public, however meaningful public debates were missing. A standing ownership dispute over gas infrastructure is slowing down gasification process in the country.

Kosovo Energy Corporation (KEK) is the only energy utility in **Kosovo** and it is a publicly owned company. The Government of Kosovo has initiated steps in the privatisation process of both the electricity generation and the electricity distribution and supply. The privatization process is perceived as overbureaucratic and not enough transparent.

National oil distribution company is privately owned in **Montenegro,** and the EPCG (electricity company comprising generation and distribution functions) is predominantly state owned, while private investors hold 45% of the shares (with a possibility to acquire majority of shares in the forthcoming period). The same ownership structure applies for the electricity transmission company. There are ongoing debates whether majority ownership over electricity generation should be private or whether the state should maintain control.

In **Serbia**, the first privatization process of a large energy system took place in 2008, when majority share of the national petroleum company NIS was sold. Part of this privatisation package was construction of the main gas pipeline through the country. Currently, there are no plans to privatise EPS (electricity company) or heat generators, but the strategic goal is to preserve and upgrade existing and build new capacities in the energy sector by boosting private investments (together with public ones). Some contracts for new investments in hydropower have already been signed in recent years. Gas and coal sectors are managed by state-owned companies. The completed privatisation process was overall characterised by poor information available to the public, confusing statements and analysis on the economic aspects and by low public participation. Another related transparency issue that is frequently debated in Serbia linked to the operation of energy sector is how the public companies use their revenues. On several occasions, accusations were made that these companies were, contrary to the legal provisions, financing political parties, however such claims never got a court epilogue.

CASE STUDY: Gasification put 'on hold' in FYR Macedonia

The resolution of the ownership of the natural gas network for FYR Macedonia has now been stalled for over a decade. It has faced legal, political and business blocks and has been referred to in the five successive European Commission (EC) Progress Reports. A functioning gas network is important for FYR Macedonia as it represents the best possible transition fuel (certainly better than coal or nuclear) in the context of moving towards the EU 20/20/20 and Road Map 2050 targets. The resolution of the problem should be seen as critical for the State and its citizens in terms of providing an important alternative source of power which is considered critical as a transition fuel source and which has the flexibility to meet peak demand and can be used directly as a fuel by consumers or also as a fuel for electricity generation.

The ownership over the existing gas transmission network is a subject to a still ongoing, decade long, legal dispute between the State and Makpetrol. This to a large degree hindered the functioning and the development of the gas market. Although the Expert Testimony Institute has stated that the State owns around 54% of the gas transmission network, up until today there is no final judgment about who is the majority owner. In the meantime, the Government and Makpetrol founded GA-MA Company for a joint managing of the transmission network. However, GA-MA has proved to be an "unhappy marriage between the Government and Makpetrol" and the unsolved dispute continued hampering the gasification process.

The Government thus decided to establish MACEDONIAGAS giving this company the new responsibilities, with Gazprom, on the South Stream project. The EC and other international institutions have urged FYR Macedonia many times to solve the issue in order for foreign investors not to be discouraged from investing in the country. The consumers have to be directly connected to the transmission gas pipeline if they are to use the gas. The experts claim that entering South Stream will not mean anything if the gas distribution network is non-existent.

On the financing aspects, the Energy Strategy of FYR Macedonia (adopted in 2010) suggests that the energy projects should be financed directly from the development programme of the state budget or indirectly through: i) issuance of state guarantees to the state owned companies; ii) issuance of concessions; iii) establishment of public-private partnerships; iv) utilization of IFIs funds: etc.

The topic of the development of the gas network in FYR Macedonia is a subject of discussion for about 20 years in which period several studies have been made. The Public Investment Programme estimated that the construction of the gasification network would cost around 283 million euro. The expected funding sources include Russia's clearing debt towards FYR Macedonia as well as EIB and the EBRD funds. In the current Public Investment Programme 2011-2013 however it is mentioned that the finances for the gasification project have not been provided yet.

The current below cost price of electricity used for heating makes the investment in the gas distribution infrastructure uncompetitive currently. The EC must continue emphasizing that the tariff models for electricity which do not cover the costs are counterproductive in the long term and must push authorities to find a solution before the full opening of the regional energy market in 2015.

In the case of heating, utilizing electricity for this purpose is both inefficient and undesirable from an environmental point of view in comparison to the usage of gas for heating. Very important point is that gas should be a substitute for coal fired electricity plants. Introducing gas could obviate the need for building new dirty thermal plants. Furthermore there are the external costs of Coal vs. Natural gas. The EU calculates that the cost of coal/lignite has a hidden extra cost of 30% per Kwh in terms of children with asthma, acid rain and other negative side effects. Thus FYR Macedonia has no choice but to speed up the gasification of the country.

The project on implementation of the Gas Ring concept on the territory of FYR Macedonia is ongoing. The Ministry of Transport and Communications implemented the procedure for selection of the team responsible for the preparation of the feasibility study for the gas system and defined the five priority intersections for the gas infrastructure. The project documentation for the five priority intersections will be prepared by the end of 2011.

The process of restructuring, privatising and liberalising energy sector opened a range of political and social issues in many of the region's countries. As already highlighted in the sections of the paper on the implementation of the Energy Community Treaty, **energy prices** are for a prolonged period of time kept below market levels and are one of the key factors that undermine efficiency of energy companies and deter private investments.

Although there are continuing efforts to bring prices to an economically sustainable level (especially for electricity) and although subsides in the energy sector have decreased significantly, energy prices remain low in most of the countries (see for example table 2.5). Nevertheless, **affordability** is a major concern as incomes are still low for a large share of SEE population. Instead of taking tough decisions and fundamentally reforming the sector, many governments in the region maintain policies of keeping low energy prices as a way of safeguarding living standards.

Another example of inefficiencies in the public energy companies are the **losses in electricity sector**. Total (transmission and distribution) losses have, for example, reached soaring 35 and 39 % in Albania and Kosovo respectively. In the case of Kosovo, out of the total of 39% of electricity lost in the system in 2009, close to 21% is attributed to so called commercial losses (i.e. unauthorised consumption and non-payments). This is in sharp contrast with Croatia where (despite public ownership) transmission losses have been kept at tolerable levels of 2.5%. In Montenegro, total electricity losses in distribution and transmission system are 22%. Total electricity losses in power distribution system of Serbian EPS in 2009 amounted to 15%. In Bosnia and Herzegovina, distribution losses ranged from 9 to 25% in the power systems in different Entities, while as the targets were set to bring them down to around 10% in 2010.

Generally speaking, the unbundling and privatisation processes seen so far **fell short of providing management improvements and necessary investments** to thoroughly address problems and inefficiencies of energy enterprises and the level of private investments remains low (as discussed earlier). Electricity sector in Croatia is more efficient compared to the rest of the region, despite the fact that the key players are state owned (but fully unbundled and commercialised) generation, transmission and distribution companies.

As for **the main investors** in the energy sector in the region, privatisation in the oil sub-sector mainly attracted EU companies and Russian Gasprom. For electricity, Italian companies are very visible either as already established partners in energy companies or as potential investors in a number of new generating capacities in Albania, Montenegro and Serbia; there are also plans to build a submerged (under the Adriatic Sea) transmission cable between Montenegro and Italy. The capital for privatisation of electricity companies in FYR Macedonia came from Austrian investors. In Bosnia and Herzegovina and Serbia, Chinese investors may become involved in the construction of some strategic projects following the discussions between the countries' top officials.

2.6. Governance, transparency and public participation

Good governance in the energy sector, based on **transparent and participatory decision making**, is a precondition for a shift towards sustainable energy production and consumption in the SEE. Closely related to this is **corruption**, which has been identified as an issue in most of the countries of the region. Other issues that stand out as relevant for majority of the countries are **lack of vision for a sustainable energy future** that would offer solutions for contemporary challenges, as well as a widespread **preference of decision makers for large and environmentally controversial energy development plans**, sometimes motivated by the desire to generate electricity for export. Civil society across the region has been involved, and in many cases successful, in questioning the basic premises of such plans and often in actively opposing their implementation.

Corruption in large energy projects and energy sector in general, enabled by weak governance structures across the region, is seen by the authors as one of the key factors hampering the progress towards a more sustainable production and consumption of energy. Long-term strategies and available options for efficiency and diversification are often not considered properly due to certain private interests in the energy market(s). Among energy providers, there are many state-owned enterprises characterized by inefficient operation and prone to political interests.

Privatisation processes themselves lack transparency and thus create possibilities for unlawful gains. Corruption and private interests can and are affecting decisions on energy projects in the direction which is not sustainable on environmental grounds and which does not provide for equitable sharing of benefits in the society. Furthermore, corruption acts as a barrier to development of green economy including a more widespread uptake of renewable energy sources and attraction of necessary private funding. As a rule, potential investors consider regulatory risks, including corruption, as a serious hindrance to investment.

The combination of massive investments required for large energy projects usually controlled by a small group of powerful elites means that the stakes for the 'winners' are extremely high. Perhaps because of this the instances of actual prosecutions in relation to this sector are rare. However there has been sufficient "smoking gun"[1] data collected to raise genuine questions about the real motivation behind many energy initiatives in the region.

CASE STUDY: Small hydropower plant on Sana river in Bosnia and Herzegovina

The case of small hydropower plant (SHPP) Medna at the source of the Sana river illustrates how a series of laws (including the Law on Environmental Protection, Law on Spatial Planning and Construction, Law on Concessions and other regulations) of the Republic of Srpska have been repeatedly violated and how the institutions failed to fulfil their mandates allowing the construction to proceed in an unlawful manner.

Ministry of Physical Planning, Construction and Ecology (MPPCE) has issued a permit to LSB Elektrane company to build SHPP Medna, despite negative opinions of Municipalities of Mrkonjic Grad and Ribnik and the Institute for Protection of Cultural, Historical and Natural Heritage of the Republic of Srpska. The Institute disapproved the plans on two occasions until it was finally, according to unofficial information, pressured by high officials into issuing a neutral opinion third time on. In addition, the Ministry permitted the SHPP construction in spite of the fact that Spatial Plan of the Republic of Srpska until 2015 envisaged designation of upper Sana River as a regional nature park due to its natural and environmental values, with the source as a strictly protected zone.

Similarly, the Ministry of Agriculture, Forestry and Water Management issued a decision approving the land use change for 12,900 m2 of forestland, thus allowing clear-cutting of trees along the riverbed and the start of the plant's construction. This despite the fact that LSB Elektrane had no valid project documentation, environmental and construction permits, and that there was an on-going court case on the issue. The construction continued while institutions, foremost the Inspectorate of the Republic of Srpska, did not react and stop further destruction of Sana River springs.

Public consultation on the environmental impact assessment study (EIA) had several major deficiencies. It was not properly announced, only one public meeting was held, and the comments (written and verbal) that were made against construction were ignored. Despite the local community's opposition, the Ministry accepted the EIA. Ribnik municipality and Eko movement Zelenkovac initiated a court case. The District Court in Banja Luka ruled in favour of the plaintiffs and rejected the EIA study in February 2010. A new EIA study was issued but without necessary changes, so in April 2010 a new court case was initiated against the MPPCE by the members of the Coalition of Civil Society Organizations for the Protection of Sana river. The second case has not completed yet.

In addition to the initiation of the court case, Coalition for the Protection of Sana River organised peaceful protests on the construction site. The concession holder (LSB Elektrane) used the opportunity to accuse protestors of destroying research samples (with an estimated damage of around 35,000 euros) and reported to the police, notwithstanding the fact that representatives of the Coalition claimed no damages whatsoever were caused during the protest.

Even though SHPPs are deemed as a renewable energy source, whether they have negative environmental impacts, and of which magnitude, very much depends on the manner in which they are positioned, built and operated. SHPP Medna is unfortunately an example of what should not be treated as a sustainable renewable source due to construction in a valuable/ protected area, destruction of surrounding biotope, landscape and the river source, diminishing drinking water supply sources and causing overall negative impacts to the river eco system.

1 www.cin.ba/Reports/1/?cid=411,1,www.balkaninsight.com/en/article/albania-top-prosecutor-rebuffs-attack-by-indicted-ex-deputy-pm
www.balkaninsight.com/en/article/hungary-s-mol-denies-accusations-of-manipulating-ina-shares
www.transparency.org.mk/en/index.php?option=com_content&task=view&id=232&Itemid=35
www.b92.net/eng/news/crimes-article.php?yyyy=2011&mm=02&dd=11&nav_id=72667

In its 2011, Global Corruption Report on Climate Change, Transparency International (TI), defined corruption as the "abuse of entrusted power for private gain". It is important to bear in mind that 'entrusted power' is not only seen as the power a citizen confers to a public office holder, but also as the power that future generations have vested in all of us and our stewardship role for the planet. An overarching message of the TI report is that a dramatic strengthening of governance mechanisms can reduce corruption risk and make climate change (and in the case of our area of interest – energy) policy more effective and more successful. The TI maintains that the quality of climate governance – the degree to which policy development and decisions are participatory, accountable, transparent, inclusive and responsive, and respect the rule of law – will help determine how well it addresses inherent corruption risks. And needless to say – the same applies to energy sector policies in our region.

CASE STUDY: MEGS Kolubara in Serbia

Burning coal currently produces 70% of Serbia's electricity. The Kolubara basin provides 75% of Serbia's lignite, and more than 50%of Serbian electricity is produced by power plants within the Kolubara complex. Kolubara coal mining and generation facilities are owned by EPS, the dominant company in the Serbian electricity sector. The EPS is a state owned vertically organised enterprise comprising 11 Economic Associations. Within the organisational structure of the EPS there is a branch called Economic Association for Coal and Energy Production. One of the six units within this branch is Mining Basin Kolubara. It is located approximately 40 km southwest of Belgrade, and is an employer for more than 10 thousand people. Every second kilowatt-hour produced in the country comes from its coal and as such, it is portrayed as a backbone of Serbia's electrical energy in the decades to come. But all these facts also make the Kolubara basin fertile ground for corruption and abuse of power. The TV B92 investigative program Insider recently revealed extensive abuse of power in the Kolubara basin.

Over the last eight years, Kolubara has paid more than 130 million euro to private companies for renting machinery the Basin did not have. Calculations show that Kolubara could have purchased new machines instead of pouring the public money into private pockets. The private companies in question, Insider revealed, were mainly owned by privileged individuals, usually in clear conflict of interests, who used political ties to win contracts. Privately owned machines deployed in Kolubara basin had been hired from companies often registered to perform completely different activities i.e. tourism etc.. The same companies were also purchasing the extracted coal for discounted, while selling it on the open market for higher prices. In other words, the profits generated in the coal production disappeared into the pockets of the owners of the private companies, often closely linked with those pulling the strings within EPS. Furthermore, Kolubara has been granting considerable amounts of money for different donations, even though it was operating with loss in respective years. In some cases, donations were politically driven. This all demonstrates the lack of supervision and control by relevant institutions over financial operations of the Kolubara basin.

In its series, Insider uncovered this massive embezzlement in Kolubara. After the program was aired in the evening of 15 February 2011, the town of Lazarevac, where the headquarters of Kolubara basin is based, was plastered with obituaries for TV B92, containing the names of the editor-in-chief and Insider journalists, as well as of the names of mourners and organizers of the funeral. The local police told the media they did not know who was behind the posters, despite the fact that a large number of obituaries and posters containing messages against B92 were located close to the police station. The obituaries undoubtedly represented an overt threat against journalists, but also a warning to potential witnesses to refrain from testifying publicly about the fraud in Kolubara. Internal control followed after reopening of the Kolubara basin case, and revealed numerous abuses and irregularities. Meantime Belgrade daily Blic is reporting that more than 100 people are "being checked" in connection to allegations of misuse at Kolubara, among them managers. Also under scrutiny, according to this source, are owners of private companies that rented out machinery and bought coal from Kolubara in order to sell it with profit. Unfortunately, even though Insider showed hard-copy evidences and named all responsible individuals, investigations and checks have not led yet to any visible result.

A coalition of civil society organisations from the region and CEE Bank Watch have recently sent an appeal to the EBRD Board of Directors to reject the loan for the proposed Kolubara environmental improvement project entailing procurement of new equipment for the EPS company and Kolubara coal mine. The civil society believes this loan would send the wrong message of support for a company whose integrity and corporate social responsibility are questionable at best. The project would support the dominant position and possibly the expansion of coal power in the power generation mix of Serbia, and indirectly limit investment opportunities in more sustainable and climate-friendly energy developments. The civil society plea was supported by the facts that EPS had been under investigation for corruption and failed to receive consent and demonstrate responsible corporate behaviour in resettling communities affected by the expansion of Kolubara mine. In spite of the concerns voiced by many, the loan was recently approved by EBRD.

Lack of capacities in another complex set of obstacles for sustainable energy encompassing: 1) lack of administrative capacities and abilities to effectively regulate and to enforce the rules; 2) lack of capacities in the areas such as technologies, knowledge and information; and 3) financial capacities (or lack of them). Even though there is a significant (yet uneven) progress across the region with capacity development, there are some aspects of energy sector operation where phrase 'stuck in the past' best reflects the state of the art. On the other hand, as pointed out by the EBRD (2008) – the key to sustainable energy is systemic change. A case that can be used to question and reflect on how different barriers are hampering positive and sustainable outcomes in the region is the case of natural gas use. Despite the fact that gas is one of the most obvious choices for improving the energy mixes in the SEE countries, its uptake across the region has been rather slow. In Albania, this is attributed to the fact that existing gas fields are approaching the end of their production life cycle, whereas there were no successful research and preparations for exploitation of new resources. In Bosnia and Herzegovina, the gas transmission and distribution network has long remained limited to the capital Sarajevo. FYR Macedonia has an interconnection with major gas pipeline but the expansion of gas infrastructure across the country has not taken place, despite long standing plans. A combination of ownership disputes and other circumstances (see the case study Gasification put 'on hold') has hampered the inclusion of residential sector in FYR Macedonia's capital in the gas distribution system. Share of gas in the final energy consumption is only significant in Croatia and Serbia, mainly due to infrastructure constructed quite a long time ago. Croatia is however building up on this baseline and is linking its climate policy objectives to increased utilisation of gas. In Kosovo and Montenegro, there is no gas market whatsoever save for a tiny bottle gas market.

The way energy sector decisions are made is **not transparent and the public is not adequately involved in the process** in any of the SEE countries. Even though significant provisions on public participation and access to information are integrated into the national legislations, implementation is still weak.

In Albania, for example, participation of the public is often ignored in planning of the major projects. Even when the public is consulted, their opinion is rarely taken into account. In most cases where the public consultations are organized, they are just a formality. Public participation is deemed insufficient both for general and expert public in Croatia. Lack of transparency and participation has been evident in several key processes that have shaped (and will continue to do so) the energy sector in Montenegro, including the adoption of energy strategy, privatisation of the power company (EPCG) and its segments (transmission included), and planning and tendering procedures for the construction of Moraca hydropower system. The lack of transparency, combined with the very lucrative contracts and weak institutional enforcement, leaves the door wide open to corruption, which has been widely discussed and/or substantiated in several plans and projects across the region. Examples of questionable tendering processes with single bidders (Kosovo, Montenegro) as well as uncovered corruption cases (Serbia) are, apart from jeopardising public interest, also acting as a deterrent for reputable and well funded private sector investments into much needed infrastructure upgrades.

Some examples across the countries where the plans have been halted (at least for the time being) or significantly downsized include construction of coal fired TPPs Porto Romano (1600 MW) in Albania and Kosovo C (2000 MW planned originally, the tendering process was eventually opened for 600 MW) in Kosovo. In both cases, export of electricity (in Albanian case to Italy) was used as one of the key arguments by the project proponents. In other countries, final destiny of such plans has not been determined yet.

Even though the debates on energy efficiency and renewables are gaining momentum and some tangible results have been achieved, when it comes to **visions for the future**, the focus is still heavily on the conventional approaches. Political, technical and financial support for bold new approaches is hardly visible anywhere in the region.

CASE STUDY: Vlora thermal power plant in Albania

Albania generates almost all its electricity (97%) from hydropower. During periods of drought, the reservoirs cannot supply the current energy needs of the country. Due to this fact, the Albanian Government decided to diversify the sources of electricity generation and to ensure the demand is met. In February 2003, the Albanian Council of Territorial Adjustment approved the construction of the Energy and Industrial Park 6 km north of the coastal touristic city of Vlora and only 100 km from the protected Natra lagoon, in the south of Albania. The Energy and Industrial Park was to host, among other structures, a combined cycle oil and gas fuelled Thermal Power Plant (TPP) with the capacity of 97 MW. However, this TPP could only provide for 20% of the gap in electricity demand.

The low-sulphur distillate oil fuelled power plant was promoted by the Albanian Energy Corporation (KESH) that provided $12.6 million for its financing. Other funding sources included a 25 million euro credit from the International Development Association (IDA), EBRD with $37.5 million and EIB with the same amount ($37.5 million). The community and the environmental groups organized themselves as the Civic Alliance for the Protection of Vlora Bay and opposed the project because of the lack of a proper public participation. They also perceived the project as a threat to the economy of the Vlora city and argued that it might harm the ecosystem of Narta lagoon due to the location of this oil and gas combined cycle TPP. Furthermore, strategic environmental assessment (SEA) had not been conducted to consider significant environmental effects of the whole complex. The Alliance filed a complaint to the Aarhus Convention Compliance Committee (ACCC) on grounds of limited opportunities for public participation in the project planning and its environmental aspects. Another complaint was also sent to the EBRD's Independent Recourse Mechanism (IRM) and the Inspection Panel of the World Bank.

The Council of Territorial Adjustment of Vlora region approved the construction permit for the power plant on August 1, 2007, and the plant was expected to start its operation by the end of 2009. Despite the delays in construction, the recent World Bank documents estimated it would start working by the end of 2011. But due to the increases in the price of oil the price of elcetricity generated by the plant has now become uncompetitive and, based on the statements of Albanian Ministry of Economy, Energy and Trade, the plant will now be maintained for reserve purposes only. In November 2009, for example, Mr. Dritan Prifti, former Minister of Economy, Trade and Energy announced to the public that the price of energy generated in the plant would be 2.5 times higher than the imported electricity. Today, with two years of delayed construction and 100 million euros of debt for the Albanian population, the plant is still not operational. With constant increases of oil and gas prices coupled with sporadic changes of plans for the development of the industrial zone in Vlora gulf, it is questionable whether the plant will ever start operating.

There is a widespread **preference of decision makers for large and environmentally controversial energy development plans**.

Several power companies in Bosnia and Herzegovina, for example, have plans for new large HPPs and TPPs. Montenegrin government strategy includes plans for large HPPs on Moraca and Komarnica rivers as well as second block of TPP Pljevlja. In Croatia, there are stronger calls for construction of new power plants as electricity imports are rising, while public resistance to large facilities is on the rise too. According to Croatian energy strategy, new coal and large hydropower plants with a total installed capacity of 1500 MW are planned (1200 MW coal and 300 MW hydro) by 2020, among other sources. Decision about nuclear power in Croatia will be reached in 2012.Several countries (Bosnia and Herzegovina, Montenegro, Albania) are pursuing large hydropower developments without carrying out appropriate assessments of environmental impacts (whether on plan/ programme or project level) and without due consideration to the impacts of climate change[1] for these investment-heavy projects, thus failing to fully consider both environmental and economic viability.

The civil society in the SEE would like not only to have to battle the unsustainable plans and projects but also to contribute to a wide debate on all the aspects of our common energy future and to formulation of solutions that will stand the test of time on economic, environmental and social grounds, thus contributing to a shift in the overall perceptions and performance of the region: from a crisis ridden to a stable and prosperous part of the world offering fair opportunities to its citizens, current and future. As there is growing evidence that 'energy [r]evolution' (to quote the joint work of the Greenpeace and European Renewable Energy Council) is under way and as clean energy targets are being set by both the establishments and civil society across the globe, we believe this is necessary and possible for the SEE too.

1 Depending on the models used, river flows in the SEE are projected to decrease by 25% - 30% in the second half of 21st century.

2.7. Key opportunities

It is of no surprise that energy efficiency, renewable energy and a shift towards people-centred solutions are identified as the main opportunities for making the energy systems in the SEE more sustainable. The first two are global and EU trends, and due to the past energy production/ use patterns and development potentials, they are very much 'at home' at the SEE. The following table 2.4 provides an overview of the existing targets on EE and RES, as set under the relevant national policies, while the following sections contain a more detailed discussion on the situation across the countries.

Table 2.4: EE and RES targets in the SEE

Country	EE targets	RES targets
Albania	9% by 2016	36% by 2020
Bosnia and Herzegovina	No target	No target
Croatia	10% reduction in final energy consumption by 2020	Increase share of RES in final energy consumption to 20% by 2020 (35% of electricity generation from RES, incl. large hydro)
Kosovo	9% savings by 2018	Increase energy production from RES to 7% by 2016
FYR Macedonia	Savings of 147 ktoe by 2018	21% by 2020
Montenegro	9% savings by 2018	No target
Serbia	6% savings on final consumption by 2016 (compared to 2008)	Increase share of electricity produced from RES to reach 2.2% by 2012 (compared to 2007)

Source: Country inputs

In order to fully utilise potentials of EE and RES in the region, development, in due time, of **Smart Grids**[1] is very important. These systems represent an upgraded electricity network to which two-way digital communication between supplier and consumer, intelligent metering and monitoring systems have been added. The benefits of Smart Grids are widely acknowledged, as these networks: 1) can manage direct interaction and communication among consumers, other grid users and energy suppliers; 2) create possibilities for consumers to directly control and manage their individual consumption patterns, providing at the same time strong incentives for efficient energy use; 3) are more secure and cheaper to operate; 4) enable integration of renewable energy while maintaining availability for conventional power generation and power system adequacy; and 5) provide an opportunity to boost future competitiveness. The EC sees Smart Grids as the backbone of the future EU decarbonised power system and intends to promote their faster and wider deployment. Among the countries of the SEE regions, efforts to create an enabling environment for development of Smart Grids are the most advanced in Croatia.

2.7.1. Energy efficiency

The past development and energy pricing policies have led to exceptionally high and inefficient energy use in almost all the countries of the region (as illustrated by energy intensity indicators discussed in the section 2.3 and presented in the table 2.2). Even though some recent improvements are evident, especially in the second half of 2000's, the low efficiency of energy production, transmission and use remains one of the key characteristics of the region and at the same time major opportunity for future sustainable development in the energy sector.

The EC (2011) is also pointing out to the significance of effective application of EU energy efficiency legislation by all the Parties to the ECT to ensure that these countries '…contribute as soon as possible to reaching the energy saving and efficiency targets and to de-carbonising the energy sector'. Furthermore, the EC emphasises significant benefits of such an approach which include lower energy bills for the citizens and creation of new jobs.

1 Smart Grids are defined as electricity networks that can efficiently integrate the behaviour and actions of all users connected to it — generators, consumers and those that do both — in order to ensure an economically efficient, sustainable power system with low losses and high quality and security of supply and safety.

The possibility of increasing EE in the region has been recently analysed by the World Bank (2010)[1]. The key finding and a starting premise of the study is that the SEE countries have relatively high levels of energy intensity and a high energy savings potential among end-users.

Since most energy infrastructure was built during the 1960s and 1970s, was inadequately maintained since the 1990s, and reaching the end of its useful lifespan, the WB assessed that now was a crucial time to consider the way forward in the energy sector. The beginning of systematic energy sector liberalisation under the auspices of the ECT also meant making the initial steps to address lack of incentives for energy users to invest in energy efficiency measures (due to low energy prices, low collection etc.).

Total energy savings potential according to the World Bank study 2010 by sector is estimated at:

- Transport sector – 10%
- Residential – 10-35%
- Public – 35-40%
- Service – 10-30%
- Industrial – 5-25%.

Residential and public sector stand out as areas with the most significant savings potential, which highlights the importance of improving EE in the current building stock as well as steering future construction towards low energy buildings.

The WB study also identified that there were multiple barriers to energy efficiency, including relatively low energy prices, cross-subsidies, lack of individual meters or heat cost allocators for heat consumption, and high levels of non-payment. Other significant barriers include gaps in the institutional, legal and regulatory frameworks; lack of energy efficiency training programs for professionals such as architects, building contractors, and energy auditors; high initial investment costs for energy efficiency technologies; a lack of financial, technical, and administrative incentives to introduce EE measures; and a lack of consumer information and awareness in most sectors.

Even though they are not comprehensive and by no means sufficient, a range of specific measures, programmes and projects is being implemented across the countries to improve EE.

Bosnia and Herzegovina is however an exception to this rule, as there are currently no major energy efficiency programmes in the country. Some measures contributing to energy efficiency have been planned and their implementation is underway (for example plans to reduce losses in electricity distribution).

Unlike Bosnia and Herzegovina, **Croatia** is a country that has defined targets and comprehensive plans[2] on energy efficiency. Financing sources are also made available and a number of programmes/ projects are on-going. The four priority sectors for national energy efficiency programmes are residential, services, industry and transport. Energy efficiency measures for residential sector include building codes, information campaigns and network of energy efficiency info centres, appliance and equipment labeling and energy performance standards, metering and informative billing, financial support for individual investments in energy efficiency and similar. For services sector, measures include energy management and auditing, certification of buildings, projects such as “Energy management in cities and counties” and “Bring your house in order”, etc.

1 Status of Energy Efficiency in the Western Balkans: A Stocktaking Report
2 Including National Energy Efficiency Programme 2008-2016 and 1st National Energy Efficiency Action Plan 2008-2010.

CASE STUDY: Low energy village Poljana – Ivanić-Grad in Croatia

The town of Ivanić-Grad has implemented many environmental projects in recent years, and lately, special attention has been paid to energy efficiency projects. In 2008, Ivanić-Grad became a member of the International Association "Energy Cities" which promotes implementation of sustainable policies in energy and energy efficiency. Membership in the association has allowed the town to participate in the Display Campaign and to share best practice examples with cities across Europe, and has enabled support in applying for projects funded by EU.

Ivanić-Grad has also participated in the project Energy Management in Cities and Counties in the Republic of Croatia of the Ministry of Economy, Labour and Entrepreneurship and the UN Development Programme.

Mayor Boris Kovačić has signed, on behalf of the town, the Energy Charter, which obliged Ivanić-Grad to implement a proactive energy policy aimed at energy efficiency improvement, reduction of harmful environmental emissions and spreading awareness among citizens about the necessity of efficient use of energy in homes. The town has also implemented other projects such as wind potential measuring, energy audit of public lighting, Mobility Week, noise map, picture book Tell me about renewable energy, and others.

A 'model' low energy building, which is also an Energy Efficiency Info Centre in Ivanić-Grad, was unveiled to the public in 2010. It was built as a part of the project Promotion of energy efficiency through construction of low energy houses in low energy village Poljana in Ivanić-Grad.

The purpose of the Energy Efficiency Info Centre is to provide information about energy efficiency and renewable energy sources in order to raise public awareness and to encourage the rational use of energy and renewable energy sources. The Info Centre will hold series of workshops, lectures and interviews with experts from various fields related to construction of low energy buildings and energy savings, renewable energy and energy efficiency in general. Centre is a model for low energy houses that will be built on 50 available building sites owned by the town. In this demonstration house, potential investors can easily see the exceptional technical and environmental characteristics of materials, quality, performance, and comfortable living environment created with high energy savings.

The town will encourage construction of low-energy houses in the village Poljana by offering 20% reduction for payment of municipal fees. Approximate price of land is 15 euro per m2, and approximate cost of construction is 750 euro per m2.

The total investment was about 105,000 euro. Most of the project costs were financed by Ivanić-Grad. Part of the costs was covered by GTZ (Deutsche Gesellschaft für Technische Zusammenarbeit) and other donors. The project has been implemented in cooperation with the company DOMUSplus, Energy Institute Hrvoje Požar and Northwest Croatia Regional Energy Agency.

As for **Kosovo**, there are on-going and planned projects to improve energy efficiency for households, services, industry, transport and agriculture. Some of the most prominent interventions include programme such as "Promotion of EE on municipal level 2006-2010" (co-financed by municipalities and GiZ, 2.5 Meuro) and "Energy efficient measures in public buildings in Kosovo 2008-2009" (financed by ECLO, 1.16 Meuro). International funders are the principal sources of support for EE for the time being.

In **FYR Macedonia**, the main documents dealing with energy efficiency are the Energy Efficiency Strategy 2010-1018 and the First National Energy Efficiency Action. Capacities to effectively promote energy efficiency are, however, still lacking. Some of the priority areas identified in these documents include full implementation of EU regulations on energy performance of buildings and capacity building. Systematic data on energy efficiency expenditures from different sources is not available. EBRD has supported electricity distribution network efficiency improvements and since 2009 is supporting energy efficiency credit lines. Energy efficiency in schools, public buildings and ambulances is a municipal competence. Some of their projects are financed through municipal budgets, some from outside sources such as the IPA funds, UNDP, USAID etc. In 2011, for example, one of the urban municipalities (Kisela voda) in the capital of Skopje plans to spend around 420,000 euros on energy efficiency measures (about a quarter of this amount from own budget, the rest from external sources).

CASE STUDY: Energy efficiency in the Municipality of Strumica in FYR Macedonia

This case study describes an Energy Efficiency Initiative conducted on the local level with the objective to reduce the energy costs of Strumica municipality. The goal of the initiative is to show that investments in energy efficiency projects and human resources dealing with these issues will bring manifold benefits for the Municipality – from cleaner environment to extensive savings in the budget.

The Municipality of Strumica is located in the southeast region of FYR Macedonia, close to the Bulgarian border, and has around 55,000 inhabitants. Strumica's efforts to improve energy efficiency are based on the Programme for Energy Efficiency 2009-2013. The implementation of the Programme is expected to contribute to a lower loss of energy and a decrease of expenses for electricity and heating in the municipality, as well as to achieve an improvement in the comfort in schools, modernization of street lighting, etc. Apart from these, the goals set by the Programme are:

- renewed energy systems and facilities;
- improved sanitary conditions and increased productivity in the municipality; and
- increased awareness on energy savings among responsible civil servants, the executives and the end consumers.

As a part of the Energy Efficiency Programme, Strumica municipality formed a team for energy efficiency with the following responsibilities:

- coordination and implementation of energy efficiency projects in the Municipality and reporting on the results at the end of the projects;
- participation in the creation of the municipal budget concerning the electricity costs and the maintenance of municipal buildings and street lighting;
- administering the database for the municipal buildings and monitoring of all energy related issues in the municipality;
- initiating and coordinating activities with governmental and non-governmental organizations for the implementation of energy efficiency projects as well as with donor organizations offering funds for supporting local development.

Members of the team had an opportunity to work closely with external consultants in order to fulfil their responsibilities. The Municipality of Strumica is also part of a regional network, established through an IPA project for development of the local infrastructure. In the past several years the Municipality of Strumica has implemented several energy efficiency projects and has 15 projects in the pipeline to be implemented in the period 2009-2013, all of them part of their Programme for Energy Efficiency. The implemented projects are:

1. Municipal building – replacement of the roof, external doors and windows and renovation of facade;
2. Primary School Vidoe Podgorec – replacement of the windows and doors;
3. Primary School Sando Masev – renovation of the facade, replacement of the external windows and doors;
4. Primary School Kiril and Metodij village Dabile – replacement of the external windows and doors;
5. Primary School Geras Cunev village Prosenikovo – replacement of the internal and external doors and windows.

Funding for the projects was provided by the Municipality as well as by international donors (such as the USAID), through IPA funds, loans, etc.

The main challenges faced in the implementation of these projects that will also continue to affect future plans of the Municipality include:

- The civil servants do not have enough time/funds to engage thoroughly in dealing with energy efficiency and implementing energy efficiency measures in their work place;
- There is insufficient knowledge regarding the development and implementation of energy efficiency projects;
- The focus is more on short-term, daily activities rather than on long-term municipal planning for energy efficiency;
- Difficulties in locating external funds for energy efficiency projects;
- High interest rates (10% - 15%) are an obstacle for investments for reconstruction and the implementation of energy efficiency measures in case the municipality applies for credits.

The Municipality intends to continue with the ambitious programme of energy/ energy efficiency measures including local gasification project, further energy efficiency improvements in several schools and other public buildings, replacement of street lighting bulbs with energy efficiency ones, etc.

Specific energy efficiency objectives in **Montenegro** refer to energy efficiency in the building stock, energy management in industry, rationalisation and increased efficiency in transport, establishing energy efficiency units throughout the country, regulatory and legislative changes, etc. A national energy efficiency action plan has been adopted recently but there are no dedicated funds at the national level to support implementation. There is a number of on-going EE projects including, the GiZ-ASE project "Improving energy efficiency in Montenegro" (strengthening legislative and institutional framework, educational activities for primary schools, awareness raising campaign, training and certification for energy auditors). An IPA project is also under way, providing technical assistance for the implementation of the Energy Community Treaty (activities include development and implementation of energy sector policies). As for the investment projects, KfW is supporting energy efficiency improvements in small and medium sized enterprises (SMEs) through the banking system, with a total budget of 12.5 Meuro available loans. The World Bank is implementing project "Programme of energy efficiency in public buildings" (total budget 6.5 Meuro). Data on total financial support provided is not available; as for the sources, international funding prevails.

In **Serbia**, legal framework for energy efficiency is being developed, while national energy efficiency action plan was adopted last year, setting the country's energy efficiency targets. Establishment of an energy efficiency fund is envisaged. The most significant intervention (implemented since 2005 by the Serbian Energy Efficiency Agency and funded by the World Bank, total budget 25 +30 million USD) is the project "Increasing energy efficiency in Serbia" with the following main objectives: i) improving energy efficiency in public buildings (schools, hospitals, homes for elderly) through insulation, heating and interior lighting measures; and ii) raising awareness of end users on energy efficiency.

2.7.2. Sustainable renewable energy sources

> "If 0.3% of the Sahara desert was a concentrated solar plant it would produce enough power for all of Europe."
>
> Note: *While this fact shows the enormous untapped potential of solar energy the authors believe that - just as in SEE - large export orientated energy projects should be planned after local energy security and sustainability issues have been tackled.*

Due to significant electricity generation from hydropower and widespread use of biomass (fire wood) for heating, the SEE region already has considerable (given the current state of play) participation of RES in total primary (10%, as compared to 8% in the EU) and final (7.2%) energy consumptions. Energy development plans in all the countries in the region include further utilisation of renewables, whereas large hydropower schemes have prevalence over all the other RES . While higher reliance on renewable energy is a must for global community and the region alike, it is worth pointing out that not every RES is sustainable. The concerns over utilisation of renewable sources in the region primarily refer to negative impacts of construction and operation of large HPPs (as already discussed in the section on energy and environment), as well as to unsustainable harvesting of biomass and low efficiency of its conversion into energy. Furthermore, a more diversified and balanced use of the existing potential for renewables (including wind and solar) is needed to achieve climate change, energy and sustainable development objectives. In the situation where implementation of environmental assessments is still weak and public participation insufficient, this calls for a careful consideration and formulation of sustainability criteria for the RES development.

The potential SEE countries have in the field of RES[1] is recognised in the EC (2011) report on Energy Community. In this report, the Commission states it will promote adoption of the Renewables Directive[2] by the Energy Community, and that the Parties to the ECT have an unexploited renewable energy potential which would allow them to contribute to the fight against climate change, increase Europe's energy security and to address local environmental and health concerns.

1 An exception is Croatia where development plans by 2020 include 1385 MW installed capacity in RES (wind, biomass, small hydropower) and 300 MW in large hydropower.
2 Renewables Directive 2009/28/EC sets an overall EU target of 20% of renewable energy in total final energy consumption by 2020.

According to Greenpeace and EREC report (2010), renewable energy technologies vary widely in their technical and economic maturity, but there is a range of sources which offer increasingly attractive options. These include wind, biomass, photovoltaics, solar thermal, geothermal, ocean and hydropower. Some of these technologies are already competitive. The wind power industry, for example, continued its explosive growth in the face of a global recession and a financial crisis in 2008 and 2009 and is a testament to the inherent attractiveness of renewable technology.

CASE STUDY: Solar energy in two kindergartens in Tirana in Albania

The aim of the project of installing passive water heating solar panels in selected Tirana kindergartens was to promote renewable energy. Specific objectives were to avoid as much as possible the use of fuels for heating (as their use has negative environmental impacts and they are expansive) by using solar power for heating of sanitary water and the heating system, and to reduce electricity consumption by 10%, and to reduce the use of fuels by 35%.

The project was supported by Regional Environmental Center (REC) and financed by the Embassy of the Kingdom of the Netherlands in Tirana and the Municipality of Tirana. EDEN center was the organization that implemented and monitored the project in the two kindergartens (with energy consumption of approximately 3200 kWh).

Operation of the solar panels provides energy to substitute the use of fuels for water heating by 100% in the period April – October, and by 70% in November – March period. The opening of the first kindergarten with 33 solar panels was on 6 July 2010. The project was presented in different newspapers and on websites. Approximately after a year of monitoring (among other things, energy bills were monitored) the results and cost savings compared to the same months of the previous year were visible.

The project is still ongoing and it is believed that the results will not be limited only to cost savings but will also yield air quality improvements at kindergartens locations. This project will also hopefully encourage more similar initiatives.

In **Bosnia and Herzegovina,** more than 150 contracts for new small HPPs have been signed, but there is progress with just a few of these projects. There are unresolved issues with small HPPs and their potential impacts on sensitive and protected areas. Pioneering steps are being made with wind power too. As of May 2011, feed- in tariffs are in place for renewables and co-generation.

Croatia has created a favourable legal framework and a system of incentives to encourage investments in renewable energy. Preferential prices are in place and suppliers are obliged to purchase minimum share of electricity produced from renewable sources. The fee for RES production promotion has however been decreased, as the production of renewable energy turned out to be less than expected. Procedures for starting RES production are too bureaucratic. Environmental Protection and Energy Efficiency Fund (EPEEF) co-finances primarily off grid RES projects and programmes.

In the period 2007-2010, Croatian Energy Market Operator (HROTE) distributed 18.2 Meuro in feed-in tariffs to eligible producers (amounts increased significantly from one year to another to reach 9.5 Meuro in 2010). EPEEF supported use of renewable resources with around 1.2 Meuro.

As a part of plans to develop new power generation capacities in **Kosovo** and achieve set targets, Zhur hydropower project is being prepared, and efforts to review the existing policies and adopt incentives to support renewable energy are underway. In 2009-2010, the work was done on identification and preassessment of potential for small hydropower. Rules for obtaining the origin of electricity certificate set out criteria as to what is considered a RES. A limited number of projects to stimulate and promote the use of renewables have been implemented, including:

- "Stimulating the use of solar panel systems for heating of sanitary water" (350,000 euro, funded by government); and
- "Public campaign for promotion of energy efficiency and use of renewable energy sources" (300,000 euro, funded by ECLO).

In **FYR Macedonia**, feed-in tariffs for electricity produced from biomass and biogas have been regulated, concession agreements for the construction of 19 small HPPs were signed, and feasibility study for a pilot wind farm was finalised. The country's strategy until 2020 on RES includes electricity generation of 2000 - 2350 GWh from large HPPs (Sveta Petka, Boshkov Most, Lukovo Pole, Crn Kamen and Galishte and Chebren), 350 – 360 GWh from small hydropower, wind energy up to 270 GWh and smaller amounts from solar and biomass. The use of biomass for heating is projected at 2740 GWh, and there are also plans/ projections for geothermal and production of bio-fuels. Specific sustainability criteria (pertaining for example to the development plans for large HPPs) have not been set.

Montenegro's Energy Development Strategy and related Action Plan advocate promotion and spread of renewable energy sources. The focus is however on utilisation of abundant hydropower potential through large (priorities are Komarnica and Moraca rivers) and small HPPs. Potential for small HPPs is estimated at approximately 400 GWh. Wind energy potential is relatively low in Montenegro, but solar energy is a significant source in terms of potential, which is assessed as one of the highest in the SEE (with recorded average energies of 4.45 kWh/m2 in the coastal towns). Potential for geothermal energy is poorly researched. So far, incentives for the use of RES have been rather modest - an example refers to Montesol project through which interest-free loans for solar collectors for household are provided.

In **Serbia,** the targets are to increase the share of electricity produced from RES to 2.2% by the end of 2012. To secure the implementation of the objective, development of at least 45 MWe small hydropower, 45 MWe wind, 5 MWe solar photovoltaic, 2 MWe biomass fueled and 5 MWe biogas fueled plants was foreseen, with total investments of around 200 Meuro. Financial incentives and support to RES development were introduced, and renewable energy sources were defined in the pertinent legislation.

The EPS counts on financial support of the EBRD, KfW, WB, and other relevant institutions, as well as to new investors, to realise these plans. Several contracts with companies in Italy and Germany have been signed on large HPP's construction, as well as contracts for 40 small HPPs and windmills. For solar capacities on the Zlatibor mountain the EPS signed a contract with Dunav Insurance Company, while contracts on energy generation from communal waste were signed with cities of Kragujevac and Uzice.

2.7.3. People- centred approach to energy solutions

Energy concerns—and the steps taken to alleviate them – always translate into household level, transportation and subsistence, and these impacts are felt differently by different segments of society. In the end it is always people - families, pensioners and businesses - which feel the real effects of government policy, bank lending practice and investors' decisions. As such, any proposed policy or investment solution should first and foremost pass the "people centered'' test. Thus this paper does not suggest that hard decisions should be avoided, but when they have to be made every effort and all the resources of institutions involved in the energy sector should be focused on the negative impacts on people and how to ameliorate them. Furthermore, strategies to improve energy policy and energy decisions must also provide mechanisms to address existing as much as to prevent possible future social conflicts and social disparities. People and communities should be therefore empowered and positioned as central agents of change and valued contributors to energy solutions.

Affordability issues and behaviour/ consumption patterns are examples of the kind of issues which need to be carefully considered, and that have an important role to play in the scenario for sustainable energy in SEE.

In the region where, generally speaking, incomes are still low and where poverty affects a significant share of population, taking actions to increase energy prices is a politically and socially sensitive. This may explain why many of the SEE governments have been reluctant to address what is often referred to as 'prices distortion' (i.e. prices below market levels and subsidies, which are one of the main underlying reasons for inefficient operation of energy companies and wasteful use of energy)[1].

While it is not clear whether motivation for such an approach by many governments in the region has been the preservation of their own political power or preservation of the living standards of the population (the latter being, of course, quoted as prime motivation by administrations), what is beyond any doubt is that the situation is not sustainable in the long run, both for the public budget/ tax payers and for the development of sustainable energy.

As the Energy Community Treaty will create a single regional energy market in 2015, energy prices will and have to grow in the region, and the question a sustainable energy policy needs to answer is how to protect those who are most vulnerable and prevent a spread of 'energy poverty'.

Electricity prices (expressed in euros using nominal exchange rates) in most of the SEE countries (see table 2.5) are several times lower than in the EU. In Kosovo and FYR Macedonia, the prices paid by the end users are more than three times less than the average EU price, while in Albania, Bosnia and Herzegovina, Montenegro and Serbia, the difference ranges from around 2 – 2.5 times less than the average EU price. If the prices were adjusted by using the Purchasing Power Parities (PPP) instead of conventional exchange rates, these differences would certainly be lower but still significant.

However it would be a mistake to believe that such 'social pricing' is in the end anything more than an illusion. Whether they pay it through their energy bills or not, SEE citizens are in the end paying the full costs of what is currently a completely unsustainable energy strategy.

Table 2.5: Overview of electricity prices across the region

Country	Electricity prices for HHs (euro per 100 kWh)
Albania	6.8
Bosnia and Herzegovina	7.4
Croatia	12.0
Kosovo	5.2
FYR Macedonia	5.0
Montenegro	7.2
Serbia	6.6
EU-27	16.7

Note: Electricity prices are from 2008 for the EU and from 2010 for the SEE countries
Sources: Country inputs and http://ec.europa.eu/energy/publications/statistics/statistics_en.htm

The SEE citizens are already 'paying' full costs of unsustainable energy outside their energy bills, through for example subsides allocated from the taxpayers' money, loss of income and opportunities due to corruption, health and economic costs due to pollution from the energy sector, losses due to unsecure and unstable energy supply and inefficient energy use, to name just a few. This makes price increases well justified and an objective and transparent pricing policy a necessity. Costs of environmental degradation will be an add-on to the above list once environmental legislation is enforced properly (for the time being, they are simply deferred to the future).

1 Non-payment of bills acts in the same way as price distortions.

According to the EXTERNE project, which was undertaken by researchers from all EU Member States and the United States of America, and designed to quantify socio-environmental costs of electricity production, it is proven that the cost of producing electricity from coal or oil would double and the cost of electricity production from gas would increase by 30% if external costs such as damage to the environment and to health were taken into account. It is estimated that these costs amount up to 1-2 % of the EU's Gross Domestic Product (GDP), not including the cost of global warming. They have to be covered by society at large, since they are not included in the bills which electricity consumers pay.

Table 2.6: External costs for electricity production in the EU (in cent/kWh, PV = photovoltaics)**

Country	Coal & lignite	Peat	Oil	Gas	Nuclear	Biomass	Hydro	PV	Wind
AT				1-3		2-3	0.1		
BE	4-15			1-2	0.5				
DE	3-6		5-8	1-2	0.2	3		0.6	0.05
DK	4-7			2-3		1			0.1
ES	5-8			1-2		3-5*			0.2
FI	2-4	2-5				1			
FR	7-10		8-11	2-4	0.3	1	1		
GR	5-8		3-5	1		0-0.8	1		0.25
IE	6-8	3-4							
IT			3-6	2-3			0.3		
NL	3-4			1-2	0.7	0.5			
NO				1-2		0.2	0.2		0-0.25
PT	4-7			1-2		1-2	0.03		
SE	2-4					0.3	0-0.7		
UK	4-7		3-5	1-2	0.25	1			0.15

* : biomass co-fired with lignite
** : sub-total of quantifiable externalities
(such as global warming, public health, occupational health, material damage)

Source: Externe (2005) Externalities of Energy: Extension of accounting framework and policy applications

Even though it may sound contradictory, paying higher energy bills now is cheaper than bearing in continuation all the costs of unsustainable energy production and consumption. But this is only if efforts and the resources of institutions involved in the energy sector are focused on the impact on people and how to ameliorate those impacts which are negative. Higher energy prices will also act as incentives for decreased energy use, which is for individual consumers a way to offset part of the burden that would be imposed through increased prices. Of course, as previously mentioned, there is a need to design effective policies and take timely measures to protect those who cannot afford market prices and make sure they are able to meet basic energy needs.

To conclude on the pricing and social aspects of the energy sector reform: a reliable supply of clean and affordable energy will not be possible without market prices, and market prices should not be seen only as a burden for the population but also as a tool that can yield substantial benefits. The challenge is to ensure an open and informed debate on how to ensure equitable distribution of costs and benefits across all stratums in the society, and to fully integrate environmental costs. Social tariffs could still be applied to the most vulnerable/poorest, and/or special measures to help them reduce consumption or to produce renewable energy. What needs to be avoided is social tariffs across the board.

As already mentioned, the EBRD (2008) analysis concluded that a systemic change was needed for sustainable energy in transition economies. This systemic change also entails a change in the way every single one of us will behave in relation to energy use, as well as the way in which society directs and/or shapes behavioural patterns. A wasteful society/ economy cannot achieve sustainable energy goals, and a tremendous amount of work is necessary to generate information and knowledge within the society and to disseminate them in order to achieve behaviour changes. At the same time, many experts have suggested that a more comprehensive understanding of the social and behavioural dimensions of energy consumption is likely to result in more effective policies and programmes that can accelerate and deepen potential energy savings[1].

1 Ehrhardt-Martinez, K. & Laitner, J. A. (2010)

The human dimensions of energy consumption and climate change are comprised of the many social, cultural and psychological factors that shape patterns of human behaviour associated with lifestyle choices, habits, technology choices, and everyday practices. Critically then addressing the human dimensions of energy consumption requires a people-centred approach; one that attempts to understand energy consumption in the context of individual and organizational needs, abilities, resources and motivations as well as the social and cultural constraints and opportunities that impede behaviour change and result in specific energy service demands.

The SEE region as a whole is not very advanced in addressing these issues. In about half the SEE countries that are covered by this paper, research and development (R&D) programmes for RES and energy efficiency have been to some extent incorporated in different action plans, but their implementation is seldom supported by adequate (if any) funds, and transfer of technologies from developed countries is rarely seen. Energy efficiency and RES are not adequately integrated into educational programmes either at primary or secondary level, and this is particularly worrying from the perspective of striving to and planning for sustainable energy future. Materials conservation and waste minimisation polices are in place in several countries, but their implementation is hardly ever at a satisfactory level.

CASE STUDY: Enterprise Strawberry Energy in Serbia

Strawberry Energy is a team of student entrepreneurs and young engineers who have created an innovative product - Strawberry Tree - a free solar powered charger for mobile phones, cameras and MP3 players. This static unit includes built-in benches to sit and chat while waiting the short time to recharge your batteries. It also stores energy from the sun to work at night.

The first Strawberry Tree was first installed in a park in the Municipality Obrenovac in 2010. Soon after, Strawberry Energy excelled at Europe's Intel Challenge 2010, a contest to encourage creativity, innovation and an entrepreneurial spirit in students. Strawberry Tree was ranked top in Serbia and fourth overall. Further recognition has come with the Strawberry Tree device being nominated for the European Commission's prestigious Sustainable Energy Europe Award 2011, as the only business invited from Serbia, alongside major companies from Germany, Spain, Italy, the Netherlands and the UK. Strawberry Energy took part in a major ceremony in Brussels on 21 April 2011 as the only team from beyond the EU and their Strawberry Tree was awarded first place in the category for decrease of consumption in public places.

The creators of the Strawberry Tree came in contact for the first time with renewables at Petnica Science Center, which is the biggest and probably the oldest independent nonprofit organization for extracurricular, informal science education in South Eastern Europe. For many years the open spaces like PSC have played (and continue to do so) a significant role, providing optimum incubator for engagement and empowerment of young people to become innovators. In terms of support and funding, Strawberry Energy was lucky to enjoy recognition from the early stages of their enterprise development. They took the advantage of the support offered to young student entrepreneurs by the Business Technology Incubator of the Technical Faculties Belgrade L.L.C. in the form of subsidized overhead (office and research space and technological and telecommunication infrastructure), administrative assistance (legal, accounting, etc.), as well as business counseling (planning, management, marketing, etc.). In addition to that, the project was supported by the Municipality of Obrenovac, company ENEL and Agency for Energy Efficiency.

The project could be of great value for the European perspective of Serbia and the SEE region. As a part of the EU 2020 agenda, an Environmental Technologies Action Plan (ETAP) has been set up. It singles out 9 priorities to stimulate environmental technologies. The plan is limited to the EU, but has a bearing for the SEE as well. As candidate and prospective candidate countries, there is a need to leapfrog the gap with the EU member states. The SEE is lagging behind and can profit from new technologies that have already been developed and are newly developed. Another area where the Strawberry Energy serves EU defined priorities is awareness raising and education about new technologies. The ETAP as well as the European Energy Strategy underline that …"promoting the take-up of environmental technologies is not only about technology and markets - it is also necessary to raise awareness about opportunities, as well as to develop the know-how to implement new solutions." The implementation of the Strawberry Tree in Obrenovac shows how this could work. The Tree is visible and people are in direct contact with green energy. This is very different from signing up for green energy for your house.

Finally, the Strawberry Energy example shows how institutions are able to foster technological innovation. European strategies enhance national initiative with additional funding. Part of the European perspective for Serbia and the SEE is to access to European Technology Platforms and Funds.

Furthermore, a strong and vibrant civil society is crucial for sustainable energy solutions and future. Civil society organisations play an important role as countervailing power and can represent the interests of citizens in general or specific sections of society. In this sense, civil society organisations (CSOs) are the organised expression of societal pluralism, while at the same time all these organisations empower individual citizens to engage in meaningful participation.

While as you can see from other chapters that civil society has played an important role in curbing some of the worst excesses in terms of energy policy there is also extensive evidence that in spite of CSOs expression of pluralism in societies their rights are often infringed in the course of their work and many institutional blocks prevent or deflect the full and meaningful participation of people in policy formulation.

Possibilities for developing societies based on knowledge and utilisation of clean technologies – societies that will conserve their resources and produce and consume energy smartly, do exist in the SEE region. Realising these possibilities will require dedicated and inventive policy makers who will integrate the EU policies into the local/ regional contexts and augment the region's potential rather than depreciate it. At the same time, a strong support from the EU, other multilateral and bilateral funders and agencies will be needed to highlight and promote genuinely new and different ways of development.

3 Recommendations: how do we get there?

The main recommendations on how the sustainable energy vision should be implemented and the main points the CSOs gathered by the Synergies for Energy Awareness Change project are advocating are the following:

1. The key opportunities for the region are energy efficiency and renewables – bold policies are needed to promote them, stimulate research and innovation, facilitate transfer of technologies, leverage investments, build capacities and do the region's share in combating climate change.

2. Measures and investments for EE are a clear priority, and further decoupling between GDP and energy consumption needs to be achieved. Expected increase in energy consumption due to economic growth, as the key assumption to current energy development planning, can and must be to a significant extent offset by improved EE (room for improvements in the SEE is now much larger than in the EU) and different approach towards energy use. Moreover, needs for additional energy supply must be thoroughly assessed.

3. Furthermore, investments in Smart Grids need to be secured as soon as possible, to fully harness potential of RES and EE.

4. EE in buildings and home appliances is also very important – strict efficiency standards for all energy consuming appliances and buildings should be set.

5. We want to see continued, stronger and much more comprehensive (compared to what has already been initiated in some countries) policies on renewables in terms of targets and with appropriate backing (enabling environments, technology and know-how, finances).

6. Small scale decentralised solutions should be promoted rather than large unsustainable plans, and stringent environmental and social sustainability criteria defined to minimise negative impacts.

7. We need to phase out coal: it is bad for climate and is causing health and environmental problems for a significant share of our population. The technologies we have in the coal sector are inefficient and dirty (plus they undermine our efforts to comply with the environmental acquis).

8. The current plans for development of new coal fired power plants should be reconsidered, also in light of the EU targets to decarbonise the economy by 2050. If these plans are given a green light now, they will shape the energy future for the next 40-50 year and diminish our opportunities to shift to cleaner energy sources. The existing plants should be phased out gradually.

9. Gas is an acceptable solution as a transition fuel, and its use should be stimulated whenever the economics of constructing gas supply and distribution networks are viable over a relatively short period of time. Environmental impacts of needed infrastructure development (gas pipelines) should also be thoroughly assessed.

10. The region is now nuclear free, while there are on-going debates as to what the future of this energy source will be in the region. The points we would like to add to these considerations is that development and utilisation of nuclear resources is time consuming, extremely expensive and will in all likelihood meet with very strong public resistance.

11. Energy prices have to reflect the real costs, including environmental. What the region truly cannot afford is 'business as usual' and unsustainable development, as this would only mean more poverty for the low income groups and more profits for those who are on the opposite side of the income spectrum. Energy savings (due to price incentives) can offset part of the costs people will have to bear due to increased energy prices.

12. Change in behaviour is another necessity: different way of consuming the energy does matter. Efficiency represents a big chunk in all the plans to go renewable as of mid-century, and more education to this end is needed for new generations.

13. There is a need for systemic change and a need for continued and strong development of capacities at all levels. We must build a governance system that will ensure energy sector reforms and policies that are people centred, or to paraphrase one of the findings of the TI report – that are serving many rather than few.

14. Minimising the room for corruption is important as it will yield manifold benefits. The role of civil society is of paramount importance here.

15. Transposition and especially implementation of the EU environmental legislation, in particular on environmental assessments, must be significantly strengthened in the near future.

16. Transparency in energy planning has to be improved and public participation, access to information and justice need to be ensured.

17. Implementation of ECT needs to be expedited and fulfillment of Energy Community objectives ensured. The EC has an important role to play here as it holds the means to stimulate governments of the region to make a leap in reforming the energy polices to ensure security of supply, upgrade of energy infrastructure, environmental and economic benefits while addressing social issues (through e.g. efficient energy welfare systems and targeted subsidy schemes).

18. When it comes to stimulating the large uptake of renewable energy in the region, the EC needs to make sure that appropriate environmental safeguards are applied to those forms of renewable energy that have significant environmental implications, including cumulative impacts.

19. Regional solutions should be sought whenever possible (to capitalise on the economies of scale) and exchange of information and networking between all the stakeholders in different countries should be strengthened.

20. Foreign investments in energy sector need to be environmentally and socially responsible. The EU based companies in particular should not apply less stringent environmental criteria when investing in the region compared to investments in their home countries.

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Appendix

	AL			BA			HR				KS			
(in Mtoe)	2006	2007	2008	2005	2007	2008	2006	2007	2008	2009	2006	2007	2008	2009
Primary production	**1.235**		**1.154**			**4.396**	**4.130**	**4.035**	**3.974**	**4.057**	**1.420**	**1.428**	**1.876**	**1.778**
Solid fuels	0.015		0.020			3.817							1.450	1.584
Oil	0.500		0.578				0.985	0.935	0.875	0.821				
Gas	0.010		0.008				2.217	2.362	2.217	2.197				
Nuclear														
Renewables	0.710		0.548			0.579	0.929	0.737	0.883	1.039			0.426	0.193
Industrial waste														
Net Imports	**0.727**		**0.941**			**1.578**	**4.878**	**5.336**	**5.512**	**4.472**	**0.619**	**0.619**	**0.560**	**1.656**
Solid fuels	0.003		0.003			0.032	0.691	0.703	0.796	0.455			0.028	0.029
Oil	0.671		0.729			1.341	3.560	3.882	3.797	3.416			0.470	0.520
Gas						0.334	0.189	0.248	0.431	0.194				
Electricity	0.053		0.209			-0.129	0.483	0.547	0.566	0.489			0.061	0.066
Renewables							-0.045	-0.044	-0.078	-0.083			0.001	1.041
Derived heat														
Gross Inland Consumption	**1.962**		**2.095**			**5.990**	**8.962**	**9.351**	**9.133**	**8.721**	**2.073**	**2.045**	**2.318**	**2.295**
Solid fuels	0.018		0.023			3.865	0.634	0.691	0.709	0.507			1.421	1.581
Oil	1.171		1.307			1.341	4.610	4.719	4.450	4.365			0.470	0.520
Gas	0.010		0.008			0.334	2.351	2.701	2.603	2.403				
Nuclear														
Renewables	0.710		0.548			0.579	0.884	0.693	0.805	0.957			0.427	0.194
Other (****)	0.053		0.209			-0.129	0.483	0.547	0.566	0.489				
Elec. Generation (TWh)	**5.600**		**3.800**	**12.706**	**12.161**		**12.430**	**12.245**			**3.997**	**4.300**	**4.500**	**4.798**
Coal (TWh)				6.603	7.972		2.257	2.423			3.871	4.220	4.400	4.676
Oil (TWh)	0.090						1.961	2.315						
Gas (TWh)							2.058	3.064						
Nuclear (TWh)														
Renewables (TWh) (*)	5.500		3.800	6.103	4.017		6.030	4.278			0.126	0.093	0.100	0.122
Other (TWh) (***)					0.178		0.124	0.165						
Final Energy Consumption	**1.716**		**1.841**	**3.729**		**2.901**	**6.437**	**6.455**	**6.623**	**6.354**	**1.113**	**1.056**	**1.369**	**1.427**
by fuel/product														
Solid fuels	0.018		0.023	0.399		0.488	0.133	0.153	0.158	0.131			0.119	0.117
Oil	1.162		1.168	1.001		1.155	3.215	3.240	3.233	3.075			0.486	0.504
Gas				0.251		0.272	1.204	1.204	1.278	1.228				
Electricity	0.295		0.408	0.831		0.697	1.292	1.318	1.389	1.335			0.337	0.368
Renewables	0.241		0.242	1.129		0.184	0.364	0.324	0.338	0.359			0.419	0.429
Derived heat & Industrial waste				0.118		0.106	0.229	0.218	0.227	0.228			0.009	0.009
by sector														
Industry	0.320		0.349	0.823		0.606	1.636	1.654	1.704	1.428			0.236	0.244
Transport	0.653		0.811	0.699		0.929	2.028	2.173	2.157	2.142			0.354	0.366
Households	0.442		0.456	1.900			1.857	1.717	1.791	1.810			0.620	0.655
Agriculture				0.075		1.365	0.243	0.244	0.253	0.250			0.028	0.028
Services, etc.	0.301		0.225	0.232			0.672	0.667	0.718	0.725			0.133	0.135
Non-Energy Uses	0.052		0.061	0.091		0.108	0.693	0.756	0.714	0.602				

	MK			ME			RS		
(in Mtoe)	2006	2007	2008	2006	2007	2008	2006	2007 (est)	2008
Primary production	**1.617**	**1.504**	**1.624**	**0.539**		**0.558**	**8.847**	**8.796**	**9.411**
Solid fuels		1.254	1.378	0.336		0.386	7.044	7.120	7.369
Oil							0.655	0.640	0.660
Gas							0.210	0.200	0.201
Nuclear									
Renewables		0.250	0.246	0.203		0.172	0.938	0.836	1.181
Industrial waste									
Net Imports	**1.323**	**1.469**	**1.404**	**0.515**		**0.613**	**5.820**	**6.139**	**6.307**
Solid fuels		0.163	0.152	-0.017		-0.009	0.955	0.899	0.887
Oil		1.008	0.920	0.372		0.469	3.228	3.526	3.662
Gas		0.085	0.096				1.660	1.702	1.752
Electricity		0.214	0.235	0.160		0.153	-0.023	0.013	0.006
Renewables		-0.001							
Derived heat									
Gross Inland Consumption	**2.925**	**3.039**	**3.022**	**1.048**		**1.167**	**14.548**	**14.824**	**15.718**
Solid fuels		1.461	1.492	0.319		0.379	7.999	8.019	8.256
Oil		1.042	0.945	0.366		0.463	3.764	4.054	4.322
Gas		0.085	0.096				1.870	1.902	1.953
Nuclear									
Renewables		0.237	0.254	0.203		0.172	0.938	0.836	1.181
Other (****)		0.214	0.235	0.160		0.153	-0.023	0.013	0.006
Elec. Generation (TWh)	**7.000**	**6.498**	**6.311**	**3.000**		**2.800**	**36.719**	**36.102**	**37.375**
Coal (TWh)		5.488	5.471	1.200		1.300	25.610	26.130	26.614
Oil (TWh)									
Gas (TWh)									
Nuclear (TWh)									
Renewables (TWh) (*)		1.010	0.840	1.800		1.500	10.902	9.380	10.109
Other (TWh) (***)							0.207	0.592	0.652
Final Energy Consumption	**1.702**	**1.799**	**1.771**	**0.754**		**0.836**	**7.360**	**7.622**	**8.412**
by fuel/product									
Solid fuels		0.182	0.147	0.012		0.016	1.097	1.139	0.943
Oil		0.749	0.720	0.357		0.459	2.328	2.626	3.056
Gas		0.034	0.031				0.806	0.750	1.032
Electricity		0.580	0.593	0.332		0.321	2.162	2.176	2.344
Renewables		0.147	0.178	0.053		0.039			0.310
Derived heat & Industrial waste		0.107	0.103				0.967	0.931	0.726
by sector									
Industry		0.667	0.613	0.389		0.404	2.586	2.675	2.832
Transport		0.401	0.413	0.147		0.199	1.774	1.923	2.361
Households		0.479	0.507	0.160		0.159			
Agriculture		0.023	0.023				3.000	3.024	3.219
Services, etc.		0.228	0.215	0.058		0.075			
Non-Energy Uses	0.027	0.027	0.031	0.011		0.007	1.027	1.134	0.860

(*) not including pumping
(****) Electrical Energy and Industrial Waste
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For Bosnia and Herzegovina: Study on Energy Sector in BiH, Module 1, Book A: Energy reserves and historical energy balances, and
http://www.enercee.net/bosnia-hercegovina/energy-supply.html
(***) Pumped Storage Plants and Other Power Stations

Glossary

Energy Dependency:

Energy dependency shows the extent to which a country relies upon imports in order to meet its energy needs. It is calculated using the following formula: net imports / (gross inland consumption + bunkers).

Energy Intensity:

Energy intensity gives an indication of the effectiveness with which energy is being used to produce added value. It is defined as the ratio of Gross Inland Consumption of energy to Gross Domestic Product.

Final Energy Consumption (FEC):

Final energy consumption is the energy finally consumed in the transport, industrial, commercial, agricultural, public and household sectors. It excludes deliveries to the energy transformation sector and to the energy industries themselves.

Gross Inland Consumption (GIC):

Gross inland consumption is the quantity of energy consumed within the borders of a country. It is calculated using the following formula: primary production + recovered products + imports + stock changes - exports - bunkers (i.e. quantities supplied to sea-going ships).

Primary Energy Production:

Primary energy production is the extraction of energy from a natural source. The precise definition depends on the fuel involved:

Solid fuels: Hard coal, lignite

Quantities of fuels extracted or produced, calculated after any operation for removal of inert matter. In general, production includes the quantities consumed by the producer during the production process (e.g. for heating or operation of equipment and auxiliaries) as well as any quantities supplied to other on-site producers of energy for transformation or other uses.

Crude oil:

Quantities of fuels extracted or produced within national boundaries, including off-shore production. Production includes only marketable production, and excludes any quantities returned to formation. Production includes all crude oil, natural gas liquids (NGL), condensates and oil from shale and tar sands, etc.

Natural gas:

Quantities of dry gas, measured after purification and extraction of natural gas liquids and sulphur. The production includes only marketable production, and excludes any quantities re-injected, vented and flared, and any extraction losses. The production includes all quantities used within the natural gas industry, in gas extraction, pipeline systems and processing plants.

Nuclear heat:

Quantities of heat produced in a reactor. Production is the actual heat produced or the heat calculated on the basis of the gross electricity generated and the thermal efficiency of the nuclear plant.

Hydropower, Wind energy, Solar photovoltaic energy:

Quantities of electricity generated. Production is calculated on the basis of the gross electricity generated and a conversion factor of 3600 kJ/kWh.

Geothermal energy:

Quantities of heat extracted from geothermal fluids. Production is calculated on the basis of the difference between the enthalpy of the fluid produced in the production borehole and that of the fluid disposed of via the re-injection borehole.

Biomass / Wastes:

In the case of municipal solid wastes (MSW), wood, wood wastes and other solid wastes, production is the heat produced after combustion and corresponds to the heat content (NCV) of the fuel. In the case of anaerobic digestion of wet wastes, production is the heat content (NCV) of the biogases produced. The production includes all quantities of gas consumed in the installation for the fermentation processes, and excludes all quantities of flared gases. In the case of biofuels, the production is the heat content (NCV) of the fuel. In the case of biofuels, the production is the heat content (NCV) of the fuel.

Pumping, pumped storage:

Method for storing electrical energy at hydroelectric installations by pumping water between reservoirs at different altitudes.

Renewable Energy Sources (RES):

Renewable energy includes hydroelectricity, biomass, wind, solar, tidal and geothermal energy.

Tonne of oil equivalent (toe)

The tonne of oil equivalent is a conventional standardised unit for measuring energy, defined on the basis of a tonne of oilwith a net calorific value of 41 868 kilojoules/kg.

1ktoe = 1000 toe

1 Mtoe =1000 000 toe