ANNEX 19

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Energy Strategy of the Energy Community

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I. Introduction

The Treaty establishing the Energy Community (the "Treaty") was signed in October 2005 and entered into force in July 2006[1]. When in 2011, the Energy Community celebrated its fifth anniversary, it was acknowledged as a "success story" by the European Commission in its Report to the European Parliament and the Council:

"The Energy Community is about investments, economic development, security of energy supply and social stability; but – more than this – the Energy Community is also about solidarity, mutual trust and peace. The very existence of the Energy Community, only ten years after the end of the Balkan conflict, is a success in itself, as it stands as the first common institutional project undertaken by the non-European Union countries of South East Europe".

However, Contracting Parties, such as the EU Member States and all other countries in the world, currently face immense challenges in the energy sector. The need to reduce our carbon footprint, and at the same time, to meet the increasing level of energy that we use, requires new technological solutions, the modernization of the energy sector and more dialogue with neighbours. New market mechanisms need to be introduced that will be appropriate to accommodate new energy sources. This complex and costly transition will have to take place in time of an economic crisis when the available public and private capital is limited and difficult to obtain. There is intensive competition among different sectors – including energy – to attract capital and countries compete with each other for the available financial resources within the energy sector.

The economic crisis has reduced the capacity of governments to finance investment and has tightened the availability of external financing. It has also highlighted the on-going need to expedite the reform agenda in the region. The growth prospects for the Western Balkans region have significantly deteriorated over the last three years, and – despite a short-lived recovery from 2010 to mid-2011 – remain gloomy in the short run. Governments will have to face high unemployment, which bears on public finances both through sluggish revenues and mounting needs for social protection. This limits the fiscal space in the budget for further expanding much needed infrastructure investments including those in the energy sector.

Despite a significant increase in public debt since 2008 in all countries (often due to budget support loans in most of the countries), most Western Balkan countries still have moderate public debt relative to their GDP. However, high levels of external debt as well as continuing vulnerability to changes in the euro zone mean that governments face difficult choices across competing sectors in determining what strategic investments should be funded from this limited fiscal space

It is with this background and the need for a strengthened regional cooperation that the Energy Community (Ministerial Council) has decided in 2011, to prepare its first Energy Strategy, in a joint effort of all its stakeholders.

[1] Nothing in this strategy shall be understood as a deviation/modification of the rights and obligations stemming from the Treaty and the legal acts adopted there under.

To this end, the supreme decision making institution of the Energy Community, namely the Ministerial Council, decided to establish a Task Force which was mandated to develop the 1st Regional Energy Strategy (Strategy). The Task Force members include a large base of stakeholders, including the Contracting Parties, the European Commission, the Donors' community, and, the Energy Community Investors' Advisory Panel; besides, experts and observers were associated with its work.

The Strategy aims at giving an overview of the current situation and the possible future of the energy sector in the Energy Community, providing the framework for facilitating investments in the energy systems, promoting energy security for the entire region (as well as for each Contracting Party). It strives both to integrate national priorities into a larger vision and also to highlight the opportunities for synergies which can benefit several Contracting Parties with minimum costs if applied on a national level, allowing investment opportunities to be better exploited.

The Energy Strategy of the Energy Community is following the same principles as that of the European Union's "Energy 2020", defining the energy priorities for the next years and setting the actions to be taken in order to tackle the challenges of achieving a market with competitive prices and secure supplies, saving energy, using less polluting energy sources and reducing the carbon footprint from the energy sector.

The present Strategy paper represents a programmatic document. It highlights the objectives of the Energy Community, the actions required to meet these, possible scenarios to meet the forecasted energy demand, targets for energy savings, as well as those for renewable energy in the final energy consumption. It does not include specific investment plans or projects.

The transition into an energy efficient and low-carbon economy will require significant investments in energy production, transport and storage in the Energy Community. It is therefore essential that the projects, which are of regional importance, are identified based on objective criteria and their planning, financing and regulatory procedures (e.g. permitting, licensing) take place in a coordinated manner. The limited availability of both private and public financing also underpins the need for a coordinated approach. The Strategy outlines the main elements of the methodology and the criteria to identify these projects. With the main cornerstones set out in the Strategy, the work on collecting and evaluating the individual projects will continue in 2012 and be finalised in 2013.

This strategy is developed against a background constrained by the financial and economic crisis, the full implications of which are not yet fully apparent. Also, the end of the Kyoto era is leading to greater uncertainty concerning future carbon costs.

II. Objectives of the Energy Community Strategy

The objectives defined in the Strategy are in line with Art.2 of the Treaty establishing the Energy Community, as follows:

Objective 1: Creating a Competitive Integrated Energy Market

The Energy Community Treaty aims at organising the relations between the Parties, in a manner that would create a common legal and regulatory framework for the energy markets and would allow trading energy across their borders. Its objective is the creation of a competitive integrated energy market

between the Contracting Parties and their EU neighbors, and ultimately, its integration with the single EU energy market.

Objective 2: Attracting investments in energy

In order to meet the increasing demand and to replace old generation plants (which will be required also due to implementation of the Energy Community environmental *acquis*), to improve security of supply, energy efficiency and the use of renewable energy sources, new investments in the entire energy sector are needed in the Contracting Parties.

Objective 3: Providing secure and sustainable energy supply to customers

Delivering uninterrupted energy, at affordable prices while taking into account environmental concerns is one of the core principles of the Energy Community Treaty.

Improving energy security implies, among others, to promote diversity, efficiency and flexibility within the energy sectors of the Contracting Parties, to be prepared to respond to energy related emergencies, and not least to promote regional co-operation with all players in the energy markets.

Energy security is closely associated with timely investments in energy supply in line with economic development and environmental needs.

III. Actions required to meet the Strategy objectives

Besides the implementation of the EU *Acquis* on energy, the Contracting Parties shall take other actions in order to achieve the first objective that shall comprise, but not be limited to, the following issues:

Objective 1: Creating a Competitive Integrated Energy Market

a. Actions related to market reforms:

i. Facilitate the creation of the Pan-European Energy Market by removing the identified barriers in the interfaces between the Contracting Parties and the EU Member States, as soon as they all fully implement the provisions of the internal energy market legislation (i.e. Third Energy Package).

ii. Introduce common capacity allocation mechanism (coordinated auctions), establish one or more power exchanges that cover all Energy Community Contracting Parties and implement price based market coupling, in line with the milestones defined in the "Regional Action Plan for Market Integration in South East Europe" with a view to join the single European Price Coupling mechanism no later than 2015, without prejudice to the ongoing discussions about the amendment of the SEE RAP for Wholesale Market Opening related to Moldova and Ukraine.

Sub-activities:

- *Setting up of the coordinated auction office project company and establishing a working coordinated auction office during 2013.*
- *Establish one or more power exchanges that cover all Contracting Parties, especially in South Eastern Europe.*

- *Develop a plan for the implementation of price based market coupling, with the aim of joining the single European Price Coupling mechanism no later than the beginning of 2015.*

iii. Adopt regulatory balancing rules and balancing responsibilities for market participants by the dates agreed in the *Action Plan for Market Integration in South Eastern Europe*[2i].

Sub-activities:

- *The responsible bodies (as determined by national regulatory authorities or legislation in each Contracting Party) shall develop adequate balancing rules and should specify the balancing responsibilities for market participants, in 2013.*
- *Contracting Parties' authorities shall improve existing or adopt new, non-discriminatory and cost-reflective methodologies for calculating price(s) for imbalances in the same timeframe.*

iv. All remaining legal/regulatory/institutional barriers to energy trade shall be removed by January 2015**.**

Sub-activities:

- *Harmonise VAT treatment for energy in Contracting Parties with that in EU Member States.*
- *Harmonise requirements for establishing a local office for energy traders by the end of 2014.*
- *National regulators shall ensure that there is consistent publication of sufficient data on cross border capacity published by TSOs and statistical information made available by national authorities.*
- *Ensure transparent and fair management of the grid connection of power producers (IPPs).*

Objective 2: Attracting investments in energy

Further actions in relation to price regulation, infrastructure and removal of regulatory barriers are needed in the Contracting Parties in order to achieve the objective for attracting investments. These shall include, but not be limited to, the following:

a. Actions related to price regulation and network tariffs

The existing price levels (non fully cost reflective) in the Contracting Parties cannot support new generation investments, either by attracting private investors or by providing domestic utilities with the means to invest on their own. The network infrastructure is largely out dated and needs upgrading in order to be able to offer increased security of supply; this will require both a more efficient use of the existing system, but also new investments in both generation and network infrastructure. When price levels are below the cost of new investments, it will not be possible to attract new commercially driven investments, which may even worsen the supply-demand balance. If the investment in the long-term remains inadequate, there is a serious risk for the security of supply, for which low regulated prices would be a key reason. Therefore, Contracting Parties to the Energy Community will need to take urgent actions to remove these barriers to investments:

i. Phase out price regulation for large customers in line with the Treaty and measures taken by the Ministerial Council.

[2] This is without prejudice to the ongoing discussions about the amendment of the SEE Regional Action Plan for Wholesale Market Opening related to Moldova and Ukraine.

- *National Regulators shall ensure that the electricity prices for large/ industrial consumers are not subject to price regulation.*

ii. Adopt cost reflective energy network tariffs in line with the Treaty and measures taken by the Ministerial Council.

- *Regulators shall ensure that network tariffs are non-discriminatory and cost-reflective.*

iii. Adopt prices that reflect fully the cost of supply for all tariff customers, in line with the Treaty and measures taken by the Ministerial Council.

Sub-activities:

- *National Regulators (and generators) shall ensure that they are able to calculate the real costs of generation (reflecting among others: the costs of full generation portfolio, necessary investments/ depreciation /and market based rate of return, the costs of imports, the costs of supply services and appropriate treatment of bad debts).*
- *All Contracting Parties shall ensure that electricity prices for all small and medium customers subject to price regulation are covering the full costs of supply.*

b. Actions related to energy infrastructure

These actions shall ensure that there is less chance of a 'supply gap' between energy demand and supply, based on forecasts of demand and supply for 2015, 2020 and 2030, both at the national and regional levels. To this end, development of new generation capacity should be a priority.

Electricity and gas interconnection capacity shall be increased, based on the recommendations derived from the ENTSO-E Ten Year Network Development Plan (TYNDP) and ENTSO-E Regional Investment Plan, and respectively, the ENTSO-G TYNDP.

The actions will include, among others:

i. A set of policy measures will be proposed to the Permanent High Level Group, by the Energy Strategy Task Force by mid 2013; these may involve accelerated and coordinated permit granting and licensing procedures, coordinated regulatory authorizations and coordinated tariff methodologies adoption, support from relevant European Union funds, degree of fulfillment of criteria for IFI's financing, and increased visibility for investors.

ii. Infrastructure projects of Energy Community interest will be defined, with the aim of stimulating those investments that contribute to enhancing security, reliability and quality of energy supply, increasing energy efficiency, and promote environmental sustainability, as well as increasing the use of renewable energy sources.

These projects may benefit from an improved permitting procedure and dedicated funding mechanisms, if necessary. Network connections between EU and non-EU countries will be duly taken into account.

c. Actions related to regulatory barriers

In order to reduce barriers of a regulatory nature, one of the actions envisaged is to:

i. Introduce harmonized licensing regimes in line with the EU licensing/registration regime by January 2015.

A harmonized Pan - European licensing/registration regime (in line with that envisaged by REMIT) should be established.

Objective 3: Providing secure and sustainable energy supplies to customers

a. Actions related to Security of Supply

The following actions shall be taken, but not limiting others, that may also contribute to achieving the objective:

i. Establish the internal framework for security of supply (nomination of Competent Authority, definition of protected customers, interruptible consumers).

ii. Enhance preparedness to secure gas supply (establishing Risk Assessments, Preventive Action Plans, and Emergency Plans).

iii. Diversify sources of gas imports where appropriate.

iv. Enhance the role for, and coordination within, the Security of Supply Coordination Group.

b. Action(s) related to energy efficiency

The most important action is to set and achieve a savings target, as follows:

i. Increase efficient use of energy by achieving a minimum 9% energy saving target by 2018.

Under their current obligations, most Contracting Parties committed to an energy saving indicative target of 9% of the final energy consumption between 2009 and 2018, through their National Energy Efficiency Action Plans. Contracting Parties shall ensure that the institutional and legal frame, as well as financial resources to implement National Energy Efficiency Action Plans is in place (e.g. Energy Efficiency Agencies and other relevant institutions, public and private funding is available) and that the implementation is monitored and correction actions are taken to reach the target.

c. Action(s) related to renewable energy

One of the key actions is to incorporate Directive 2009/28/EC in the *Acquis* of the Energy Community and to establish a target for renewable energy at the national level..

Increase renewable energy share of Gross Final Energy Consumption (“GFEC”) of the Contracting Parties in line with the methodology used for setting EU Member States' targets, and to the levels decided by the Ministerial Council in October 2012.

Sub-activities:

- Allow priority access or guaranteed access to the grid for renewable energy (RE).
- Adopt and implement National Renewable Energy Action Plans.
- Simplify and accelerate the authorization procedures for RE plants and grid connections.
- Introduce and/or revise (if necessary) existing support schemes for RE in order to assure continuity and stability for investors.

d. Actions related to environmental protection

i. Prepare national road maps for the implementation of the large Combustion Plants Directive by 31 July 2013, in a coordinated and consulted approach of all stakeholders.

ii. Prepare national road maps for GHG emissions reduction/limitation, including setting indicative targets and concrete measures, by the end of 2013.

e. Action related to protection of customers

It is important to ensure that vulnerable customers are protected. In this regard, all Contracting Parties should define clearly (and by law or regulation as appropriate) the definition of vulnerable energy customers subject to special protection and support. Moreover, targeted national programmes to support vulnerable costumers should be implemented, as well as programmes to increase energy efficiency and greater use of renewable energy in households. Create a clear and transparent regulatory framework, set standards for quality of services, handling consumer complaints, and provide clear guidelines for changing energy supplier.

IV. Current situation and national trends

1. Methodology

The Strategy covers all nine Contracting Parties of the Energy Community: Albania, Bosnia and Herzegovina, Croatia, the former Yugoslav Republic of Macedonia, Kosovo*[3], Moldova, Montenegro, Serbia, and Ukraine.

The Strategy was prepared by the Energy Strategy Task Force members and the associated experts, with the contribution of the Energy Community Secretariat. The Task Force took a “bottom up” approach using a template to collect specific energy data for each Contacting Party, preparing the basis for energy demand forecast scenarios, proposing regional objectives and the associated activities to achieve such objectives.

A public consultation was conducted in April 2012 and its results were also taken into consideration in the Strategy paper.

The significant diversity among national strategies – in terms of the date of establishment, examined timeframe, units, scenarios, methodologies – made it difficult to obtain fully compatible data for the whole region, and therefore, developing a coherent regional overview is not simple. A more harmonized approach in developing national strategies in the future would make regional analysis and comparison among Contracting Parties more feasible.

[3]* Throughout the entire document, this designation is without prejudice to positions on status, and is in line with UNSCR 1244 and ICJ Opinion on the Kosovo declaration of independence.

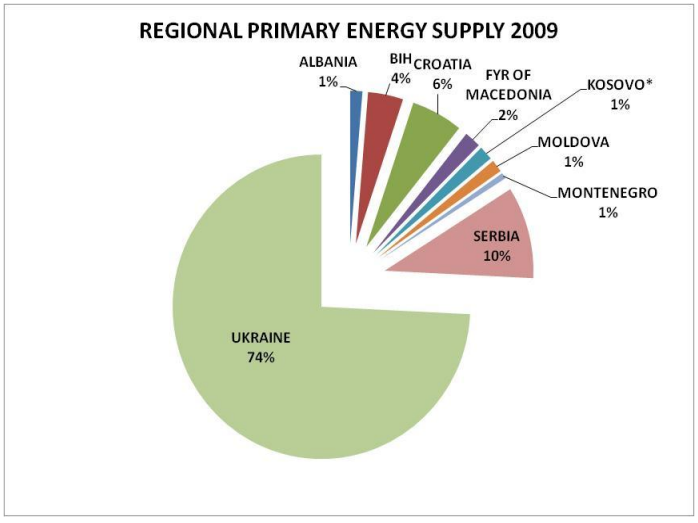
2. Brief overview of the energy sectors in the Contracting Parties of the Energy Community

The economic and energy landscapes in the Energy Community are diverse, but at the same time have many features in common. The Western Balkans and Moldova have small and fragmented energy markets, mainly dependent on fossil fuels, which are predominantly imported from the East. Apart from coal, no significant fossil fuel reserves have been explored in the Western Balkans and Moldova. On the contrary, the Ukrainian energy market alone is larger than the remainder of the Energy Community considered together.

Currently, hydropower is the most commonly used type of renewable energy, which has further growth potential across the entire region. The structure of the energy mix is, however, completely diverse with some Contracting Parties having a balanced portfolio of energy sources and others being dependent only on a few types of energy. A common feature is that the main elements of the energy infrastructure (e.g. power plants) were built in the 1960s and 1970s, using standard Eastern European technology. Their age, the type of technology, and their inadequate maintenance raise serious policy challenges at present. There is an urgent need for large scale rehabilitation and replacement of infrastructure, to avoid a situation in which considerable generation and transmission capacities are unavailable.

In 2009, the total primary energy supplied in the Energy Community Contracting Parties was 155 878, 68 ktoe, of which 74% was supplied in Ukraine and the rest in the Western Balkans and Moldova (Figure 1).

Figure 1. Regional primary energy supply 2009



Source: Calculations made by the Energy Community Secretariat based on the reports by the Contracting Parties

Domestic coal/lignite represents a significant share of the energy supply, especially in Serbia (52%), the Former Yugoslav Republic of Macedonia (50%), Kosovo* (48%), Montenegro (48%), Bosnia and Herzegovina (33%), and Ukraine (31% - source: IEA Energy Balance Ukraine).

In 2009, the total electricity supply (domestic generation plus imports minus exports) amounted to 271 TWh, of which approximately 62% was in Ukraine and 38% in the Western Balkans and Moldova.

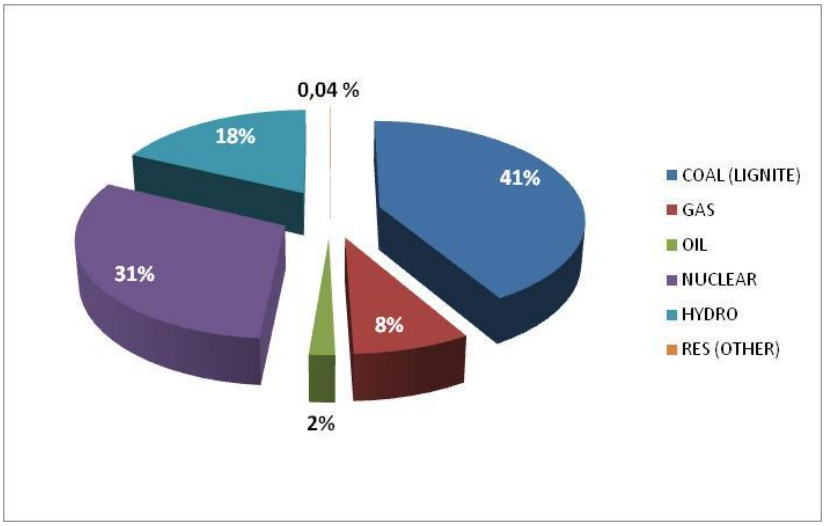
The electricity generation mix shows significant diversity in the individual Contracting Parties (See Annex 1 Table 4). At the Energy Community aggregated level, coal and lignite dominate the mix at 41%,

followed by nuclear power with 31%, hydro generation at 18%, natural gas at 7% and oil, at 2%. The prevalence of coal/lignite generation in the fuel mix was even higher (at 52%), when calculated only for the Western Balkans and Moldova (Figure 2).

Renewable energy (including large hydropower plants, as well as other forms of renewable energy, e.g. biomass) plays already a significant role in the final energy supply in some Contracting Parties (Montenegro 52%, Albania 43%, Croatia 39%, Serbia 29%, Bosnia and Herzegovina 24%, and the Former Yugoslav Republic of Macedonia 12%. It has a much smaller contribution in Kosovo*, Moldova, and Ukraine.

The Western Balkans and Moldova had a total installed generation capacity in 2009 of approximately 20.5 GW, of which Serbia accounts for approximately 35%, followed by Croatia with 19%, and Bosnia and Herzegovina with 17%. When adding Ukraine, the total capacity raises to 69.3[4] GW. The distribution by fuel sources is presented in figure 2 (for details, please see Annex 1, Figure 4, 5, 6).

Figure 2. Electricity generation in the Energy Community Contracting Parties by fuel in 2009 – overview



In 2009, the total domestic natural gas production in the Contracting Parties was 24,182 Bcm, and imports were approx.37, 4 Bcm. Ukraine transported also 95, 8 Bcm of natural gas from Russia to Europe.

The biggest natural gas producer among the Contracting Parties is Ukraine with an annual production of 21, 2 BCM per year (2009), followed by Croatia with 2, 71 BCM in the same year; the most developed gas markets are in Croatia, Serbia and Ukraine, while the markets in Bosnia and Herzegovina, the Former Yugoslav Republic of Macedonia and Moldova are small, whereas Albania, Montenegro and Kosovo* have no access to gas (see Annex 1, Table 8 and 9).

Crude oil and petroleum products production is limited and located mostly in Albania, Bosnia and Herzegovina, Croatia, Serbia and Ukraine. The total production of the Contracting Parties in 2009 was in

[4] This figure was calculated based on installed power generation in Ukraine of 48.8 GW (as reported by Ukraine)

the amount of 16 478,40 ktoe, imports of 27 109,17 ktoe and exports of 6 408,02 ktoe; transport of crude oil to Europe through Ukraine in 2009, amounted to 29,1 million tones (see Annex 1, Tables 11 and 12).

3. Forecasts by 2020, and 2030

Total electricity production including net imports is forecasted to grow to 136,5 TWh by 2020 and to

170,72 TWh by 2030[5]. The aggregated electricity generation including Ukraine is estimated at 443, 5 TWh in 2020 and 590, 1 TWh in 2030.

The situation of the import/export balance of the region calculated from the values reported by the Contracting Parties forecasts that Bosnia and Herzegovina, Kosovo*, Montenegro, Serbia and Ukraine will be net exporters in the region by 2020 (Annex 1, Figure 3).

The aggregated demand for natural gas was not possible to be calculated for 2020 or beyond, due to insufficient data provided by the countries; nevertheless some individual country forecasts are available (see Table 9).

In crude oil and petroleum products, the forecast for the aggregated production is at 19 731, 49 ktoe and imports at 27 464, 64 ktoe (Annex 1, Table 11).

4. Planned new capacity by 2020

In order to cover the forecasted demand growth, and also aiming at exporting outside the region, the Contracting Parties have indicated in their strategies and investment plans, very ambitious investments in new power generation by 2020 (in some cases 2021[6]) and beyond, to 2030.[7]

The forecasted new power generation capacity between 2012 and 2020 (or 2021) represents approximately 21,3 GW (see Annex 1 Figure 7); its distribution by Contracting Party and fuel, is presented in Figure 8, and in Table 5 (Annex 1).

Only between 2012 and 2020 (or 2021), the installed generation capacity in the Western Balkans and Moldova is forecasted to grow by 13, 23 GW, which represents an increase of approx 64 % from 2009 capacity. To this, Serbia contributes with 25%, and each of the others with approximately 10%, with the exception of Moldova (4%).

In Ukraine, the additional installed capacity is forecasted at 8,100 GW[8], distributed between nuclear (2GW), and renewable 6, 1 GW, between 2009 and 2020.

The additional generation capacity mix, without Ukraine included, continues to be dominated by lignite (at 45%) followed by hydropower (39%), natural gas (9%), and other renewable energy (7%). New gas power plants are foreseen mainly in countries with a current gas market (Croatia, Bosnia and

[5] These figures are taken from the results of the 'minimal investment cost' scenario, which reflects the expected impact of energy efficiency on electricity demand and do not include Ukraine.

[6] *Some Contracting Parties provided information for 2021, not 2020.*

[7] *Much of the data for the period 2012 through 2030 was incomplete.*

[8] *The figure was calculated based on Ukraine data submitted for their energy strategy.*

Herzegovina, former Yugoslav Republic of Macedonia, Moldova and Serbia); Albania, where there is no gas supply at present, is the only notable exception for significant new gas fired capacity.

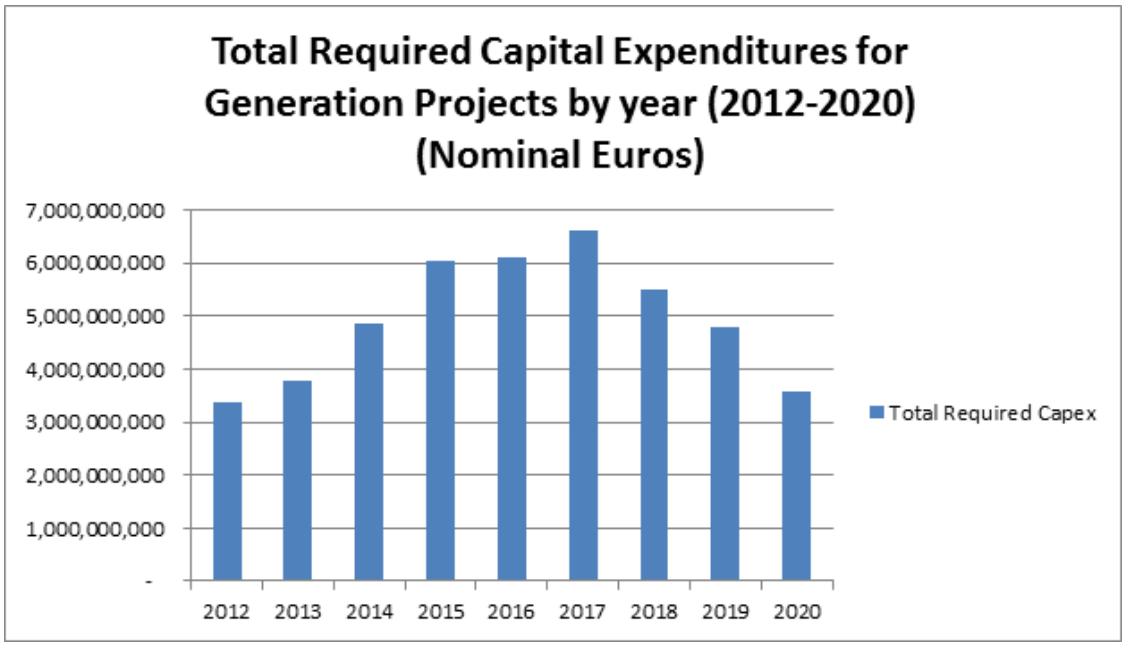
With Ukraine included, hydro generation will be predominant (42%) in the new generation, followed by coal fired plants (32%), nuclear (10%), gas (6%) and other renewable energy (10%) in the planned additional *generation* mix.

The total investment cost for this much additional capacity is 44,6 billion Euros over the period of 2012 through 2020, for those new projects targeted for development and commissioning within this time period. The figure for the Western Balkans and Moldova (not considering Ukraine) is estimated at a daunting 28,8 billion Euro and could be even higher.[9]

These figures do not include the capital expenditures required in the latter part of the decade for new planned facilities proposed after 2021. Realistically, a new large thermal plant, for instance, may take four years from the time of ground-breaking to commissioning. A plant planned for 2023 commissioning will see about 30-35% of its capital expenditure in 2019 and 2020. This capital requirement, for facilities post 2020, is not reflected in the table shown below.

More concerning is the simple fact that since 1990, this region has only seen about 0,940 GW of new utility scale plant put in place (compared to the current plans of 13, 23 GW). Thus, to ensure adequate power supply, the region will need to develop its generation plant fleet at a rate more than 10 times that seen over the past two decades.

Figure 9. Total capital investments required as reported by the CPs [10]



[9] *These figures are based on median overnight construction cost estimates by plant type. It should be noted that the figures of 44, 6 billion and 28, 8 billion come directly from those projects identified by the Contracting Parties. These are not the same investment figures as required in each of the scenarios.*

[10] Calculations made by USAID sponsored Consultant, Tetra Tech, based on the planned new installed capacity reported by the Contracting Parties.

5. New electricity interconnectors

Energy Community interconnection plans (as proposed by the Contracting Parties) are driven by the same needs as seen with the ENTSO-E members that includes connecting new generation, integrating energy markets and new renewable energy in the grid, enhancing the security of supply, and improving the reliability and quality of energy services provided.

A number of cross border interconnections in the Western Balkans have been identified already as priorities by the incumbent TSOs and have been the subject of a significant amount of grants for preparation of feasibility studies, as well as environmental and social impact assessments, through the Western Balkans Investment Framework. Moldova and Ukraine are interested to become members of the ENTSO-E and synchronize their electricity systems with the ENTSO-E synchronous zone. More detailed information in presented in Annex 1, Table 6. Interconnectors are presented in Table 7.

6. Natural gas and crude oil infrastructure

The different sizes and levels of establishment in the gas markets of the Contracting Parties make it important to have a complex approach and recognize the various needs in order to achieve the objectives as set out in Chapter III. Some Contracting Parties have no natural gas infrastructure and consequently gas market at all, some others have an established gas system in need of renovation, while others have a well-operating system with the desire to have access to multiple export markets. In addition, the level of interconnections between Contracting Parties should be increased to ensure real market integration.

Therefore the aim of developing natural gas infrastructure in Contracting Parties is threefold:

- to help currently isolated regions to have access to natural gas supplies;
- to ensure continuous and secure supplies to Contracting Parties by having their network renovated and modernized;
- to bring natural gas from a new range of export markets via new routes to Contracting Parties.

Those projects that simultaneously fulfill two or all of these aims should receive stronger attention than others with a single profile. More detailed information in presented in Annex 1, Table 10.

In crude oil, a number of projects of regional significance have been discussed for some time already. Here, the objective again is to ensure stable on diversified oil supplies to the Contracting Parties serving both market and security of supply interests. For more details, please see Annex 1, Table 13.

V. Energy Community energy demand scenarios and investment needs[11]

In an effort to evaluate the direction of the energy sector in the Energy Community and to demonstrate the importance of a regional energy strategy, three scenarios were examined. It should be noted that these scenarios used a common data set, such as for total final energy consumption that did not align exactly with the information provided by the Contracting Parties. For instance, the Contracting Parties used differing assumptions regarding economic growth as well as its impact on energy demand growth. Some of the forecast information provided by the Contracting Parties embedded assumptions on energy efficiency while others treated it separately from the demand forecasts. However, for the purpose of the scenario analysis, it is more critical that the base line be consistent and allow for a comparison of the differences between the scenarios. It is the differences between the scenarios that provide the insight for the analysis.

The following tables (14a and 14b) provide the results of the scenarios in comparison to the base case, a so-called 'current trends'; a second scenario, 'minimal investment costs' examines what is required to do the bare minimum to meet consumer demands for energy fully. Finally, a low emissions/sustainability scenario is also examined, that presumes the region progresses on a sustainable development path. These tables show the impact in the year 2020, 2025 and 2030. This is a 'snapshot' of the regional energy system in each specific year. Thus, the figures that are shown apply to that particular year. This is important to understand especially in the context of the annualized investment requirements. The amounts shown represent the annualized amount required in the specific year examined, to finance the investments assumed to have been made from 2012 up through the year shown, for new or rehabilitated power facilities, for natural gas expansion (the so-called gas ring) and for demand-side improvements (primarily energy efficiency).

Tables 14a and 14b provide summaries of the scenario results. The first table (14a) examines the results of the scenarios for the Contracting Parties, not including Ukraine. Given the relative size of the Ukrainian energy system in comparison with the remainder of the Energy Community, it is useful to consider the results for the remainder of the Energy Community Contracting Parties, without Ukraine, and then for the Energy Community Contracting Parties as a whole, including Ukraine.

Further, it is important to note that current trends scenario does not meet in full the demand for electricity. Unmet need for electricity ranges from about 10% in 2020 growing to potentially a much higher level in 2030 (perhaps as much as 30%).

[11] This chapter was prepared with the technical assistance sponsored by USAID and performed by Tetra Tech

Table 14a. Results of the Scenario Analysis for Three Selected Years – Excluding Ukraine
(All Monetary Values Shown are in Nominal Euros)

		Current Trends	Minimal Investment Cost	Low Emissions/Sustainable Growth
Total Final Energy Consumption (ktoe) (See note 1)	**2020**	37.058	34.124	33.723
	2025	41.933	38.697	38.158
	2030	47.673	43.818	43.382
Total Electricity Generation including Net Imports (TWh) (See note 2)	**2020**	128,6 (unmet demand of 15,1 TWh)	136,5	130,7
	2025	125,4 (unmet demand of 36,1 TWh)	150,7	137,6
	2030	122,2 (unmet demand of 63,5 TWh)	170,7	153,1
Total CO_2 emissions (G_t) (See note 3)	**2020**	203.948	179.427	134.028
	2025	231.875	197.689	139.352
	2030	267.477	223.567	156.810
Total Investments Required between 2012 and Year Shown	**2012 to 2020**	6,1 Bln	15,1 Bln	32,3 Bln
	2012 to 2025	10,6 Bln	23,7 Bln	44,2 Bln
	2012 to 2030	15,8 Bln	35,2 Bln	59,9 Bln
Annualized Investment Costs (See note 4)	**2020**	511 Mln	1,34 Bln	2,87 Bln
	2025	939 Mln	2,11 Bln	3,93 Bln
	2030	1,27 Bln	3,13 Bln	5,30 Bln
Total Variable Energy System Costs (Fuel + O&M) (See note 5)	**2020**	4,12 Bln	3,64 Bln	2,81 Bln
	2025	5,11 Bln	4,56 Bln	3,20 Bln
	2030	6,93 Bln	6,04 Bln	4,22 Bln
Total Annual Energy Costs (See note 6)	**2020**	4,63 Bln	4,98 Bln	5,68 Bln
	2025	6,05 Bln	6,67 Bln	7,13 Bln
	2030	8,20 Bln	9,17 Bln	9,52 Bln

Notes: *(1) The Total Final Energy Consumption for 2020 is based on the forecast used by the Renewable Energy Task Force to establish renewable targets by country. Croatia was not included in this forecast and was estimated using other sources including results of the Regional Energy Strategy Task Force's data collection efforts. The current trends has the highest amount of total final energy consumption due to the low amount of energy efficiency and that as electricity becomes increasingly unreliable, some customer switching to other fuel sources is assumed.*

(2) This analysis is based on an analysis of which plants will be available under each of the scenarios, to provide electricity in the region. This also assumes normative hydropower generation based on 2009 actual, weather adjusted for existing plant. As can be seen in the current trends scenario, the unmet demand is large and grows between 2020 and 2030. The unmet demand is calculated as the forecasted demand for electricity and what is available to be supplied. A large amount of fuel substitution is assumed, primarily to end-use consumption of oil products, thus contributing to the higher total energy use under this scenario. The other scenarios benefit from energy efficiency efforts that affect all fuels. It should also be noted that one cannot take the electricity demand from the minimal investment costs scenario and use it as the basis for calculating the unmet demand, given that it embeds energy efficiency not seen in the current trends scenario.

(3) The emission factors used have been adopted from the Study on the Potential for Climate Change Combating in Power Generation in the Energy Community (30 March 2011) and supplemented with other emission factors for end-use fuel consumption. An important assumption is that imports are, on average, provided by coal based sources.

(4) This represents the annual costs associated with the investments made in the period from 2012 to the year shown, to serve the region. It includes investments for power generation, energy efficiency/demand-side improvements, and for the third scenario, the introduction of the gas-ring. It does not reflect the capital costs required for repair and upkeep of existing plant or for expansion and maintenance of the distribution networks. However, the gas distribution network is included as it is considered to be part of the gas ring investment.

(5) Total variable energy system costs are calculated using both the primary fuel inputs for electricity generation, natural gas and oil products as well as variable operating cost assumptions applied to each general type of plant (e.g. existing lignite, existing hydro, and new hydro).

(6) This represents the sum of the annualized investment costs and the total variable energy system costs shown above.

Table 14b. Results of the Scenario Analysis for Three Selected Years – Including Ukraine (All Monetary Values Shown are in Nominal Euros)[12]

		Current Trends	Minimal Investment Cost	Low Emissions/Sustainable Growth
Total Final Energy Consumption (ktoe) (See note 1)	**2020**	123.448	113.674	109.296
	2025	139.669	128.908	119.348
	2030	159.504	145.967	130.209
Total Electricity Generation including Net Imports (TWh) (See note 2)	**2020**	372,8 (projected unmet demand of 70 TWh)	443,5	405,0
	2025	371,5 (unmet demand of 143 TWh)	514,3	420,2
	2030	370,3 (unmet demand of 220 TWh)	590,8	443,9
Total CO_2 emissions (G_t) (See note 3)	**2020**	499.152	421.045	350.449
	2025	584.211	499.433	376.188
	2030	619.813	592.452	414.093
Total Investments Required between 2012 and Year Shown	**2012 to 2020**	18,1 Bln	39,1 Bln	73,6 Bln
	2012 to 2025	23,3 Bln	48,2 Bln	101,5 Bln
	2012 to 2030	29,4 Bln	64,1 Bln	130,4 Bln
Annualized Investment Costs (See note 4)	**2020**	1,6 Bln	3,5 Bln	6,5 Bln
	2025	2,1 Bln	4,3 Bln	9.1 Bln
	2030	2,5 Bln	5,5 Bln	11.1 Bln
Total Variable Energy System Costs (Fuel + O&M) (See note 5)	**2020**	10,6 Bln	11,4 Bln	8,8 Bln
	2025	12,8 Bln	14,4 Bln	10,1 Bln
	2030	15,9 Bln	17,5 Bln	12,2 Bln
Total Annual Energy Costs (See note 6)	**2020**	12,2 Bln	14,9 Bln	15,3 Bln
	2025	14,9 Bln	18,7 Bln	21,3 Bln
	2030	18,4 Bln	23,0 Bln	23,3 Bln

[12] The investment figures shown in tables 14a and 14b are the result of Tetra Tech analysis of the costs of the facilities and projects needed to meet the criteria shown in the specific scenario.

Notes: *(1) The Total Final Energy Consumption for 2020 is based on the forecast used by the Renewable Energy Task Force to establish renewable targets by country. It should be noted that this forecast varies substantially from that included in information provided by the Ukrainian delegation and in the latest update of the Ukrainian energy strategy. The current trends has the highest amount of total final energy consumption due to the low amount of energy efficiency and that as electricity becomes increasingly unreliable, some customer switching to other fuel sources is assumed.*

(2) This analysis is based on information taken from the latest version of the Ukrainian energy strategy. Unmet demand in this case is taken as the difference between the electricity demand expected in the minimal costs investment scenario and the estimated electricity supply available – excluding imports – under the current trends scenario.

(3) The emission factors used have been adopted from the Study on the Potential for Climate Change Combating in Power Generation in the Energy Community (30 March 2011) and supplemented with other emission factors for end-use fuel consumption. An important assumption is that imports are, on average, provided by coal based sources.

(4) This represents the annual costs associated with the investments made in the period from 2012 to the year shown, to serve the region. It includes investments for power generation and energy efficiency/demand-side improvements, and for the third scenario, the introduction of the gas-ring. It does not reflect the capital costs required for repair and upkeep of existing plant or for expansion and maintenance of the distribution networks.

(5) Total variable energy system costs are calculated using both the primary fuel inputs for electricity generation, natural gas and oil products as well as variable operating cost assumptions applied to each general type of plant in service or planned.

(6) This represents the sum of the annualized investment costs and the total variable energy system costs shown above.

These scenarios demonstrate the importance of a regional energy strategy for the Energy Community. Perhaps the best example is the significant impact seen by the introduction of the gas ring (as modelled in the low emissions/sustainable scenario for the Western Balkans). This gas ring is inherently a regional project. It cannot be effectively implemented by a single Contracting Party and requires a regional approach if it is to be realised. The benefits of the gas ring to the region can only be achieved through multiple CPs working in concert, something a regional energy strategy and framework for supporting projects of regional importance would support.

VI. Development of Projects of Energy Community interest

Energy infrastructure remains the backbone of economic development while meeting the policy targets and commitments that the Contracting Parties assumed when joining the Energy Community. Developing a modern and efficient energy infrastructure will enable the Energy Community to create a properly functioning regional energy market, enhance security of supply, increase energy efficiency, and integrate more renewable energy sources.

Contracting Parties need substantial investments, in the range of €44.6 billion[13] in the energy sector to maintain the supply-demand balance in the coming decade, and even more financial resources to manage the transition into a low-carbon economy. Because of the current economic crisis, public funding is limited and attracting private investment is likely to become more and more difficult.

Furthermore, Contracting Parties – with the exception of Ukraine – represent small markets with small projects, which may be less attractive for investors than bigger projects. Due to the logic of economies of scale, it will be definitely more expensive, if each Contracting Party pursues full energy independence and strives to achieve security of supply alone rather than cooperating and planning together its infrastructure developments with its neighbours and increasing the reliance on the regional energy trade. In case of a coordinated approach, investment requirements in electricity generation would be significantly reduced – around 10% of the energy expenses between 2005 and 2020, in South East Europe, according to the Power Generation Investment Study conducted for the World Bank[14]. Certain projects can have benefic effects and lead to a simultaneous reduction of energy prices in several Contracting Parties.

In addition, each individual Contracting Party has their own strengths and competitive advantages which, if coordinated on an Energy Community level, should lead to a diverse, optimized and flexible energy supply and demand portfolio. This requires cooperation and the pursuit of regional interests instead of only national ones. Such an approach could also contribute to creating a large enough market in the Western Balkans that should prove more attractive for private investors than the small individual markets as they now currently stand.

For this reason, those projects need to identified in all concerned energy sectors, which have the highest positive impact in the most possible Contracting Parties. Selecting these projects is a process and the Strategy is the first step of it, as it contains the methodology how the Projects of Energy Community Interest (PECIs) should be identified, the project categories and the main principles along which the projects will be evaluated and scored.

1. Priority infrastructure axes

According to the ENTSO-E Regional Investment Plan, the Regional Group Continental South Europe (CSE), the predominant power flow directions are East–West and North–South and the main drivers for future development of the transmission grid in the Energy Community and its EU neighbours include:

[13] This figure represents the estimate of the costs, through 2020, of the new projects the CPs have noted.

[14] Electricity Generation Investment Study for South East Europe (including the survey of Western Balkans, Bulgaria and Romania), update 2007

- Contribution to market integration in the region;
- Connection of new conventional generation and future renewable energy production;
- Enhancement of security of supply; and,
- Extension and further reinforcement of the synchronous zone to the East.

The ENTSO E Regional Investment Plan will be one of the main sources of projects of Energy Community interest, for its electricity network development. This will be complemented by other sources, especially for Albania, Kosovo*, Moldova and Ukraine that are not included in the Continental South Europe region.

The development of gas networks, especially in the Western Balkans is closely linked to the opening of the Southern Gas Corridor which aims at linking directly the EU gas market to the Caspian/Middle East which will also contribute to the gasification of some countries and to the diversification of gas supply sources for others.

There is a significant diversity in the form and size of the markets and use of natural gas in the Energy Community. For instance Ukraine has significant domestic gas production, and is keen to strengthen its national gas system, in order to be able to supply reliable and larger quantities of gas to Europe. On the other hand there are countries with no gas market at all, or a small market linked with one supplier. This diverse background needs to be taken into account when prioritizing infrastructure investments and diversification of gas supply sources. Nevertheless, all nine Contracting Parties have a positive attitude towards gas playing a role in their future power mix, and therefore are ready to prepare investments to achieve this goal.

Aiming to take a coherent and coordinated regional approach to electricity and gas infrastructure development, the Strategy will focus on a limited number of Energy Community regional priorities which must be implemented to meet its objectives, by 2020.

While the present Strategy paper is not including a concrete list of priority projects, it facilities the development of such a list, through a commonly agreed methodology, and transparent criteria for identification and ranking of projects proposed by countries or companies.

These will be denominated „Project of Energy Community Interest" (PECIs), which will confer them political priority and eventually financial support.

2. Methodology and criteria for identification of projects of Energy Community interest

The energy markets and infrastructures of the Contracting Parties and the European Union are strongly interconnected. Therefore, development of both sectors in both areas should be carried out in a harmonized way to ensure compatibility with each other.

The EU, in the framework of the Energy Infrastructure Package set up ad hoc regional planning/working groups which aim to identify those projects, which are part of the main priority axes and which serve a common interest. It is highly desired that the Energy Community adopts an approach, which in the end can result in Projects of Energy Community Interest that are selected based on the same main criteria and methodology as those projects in the EU.

The proposed Multi-Attribute Decision Analysis is compatible with the one used by ENTSOE and ENTSOG when preparing their TYNDPs, and also with that used by the ad hoc Working Group for South East Europe, set up under the proposed Regulation on Guidelines for Trans-European Energy Infrastructure. In this methodology, projects are evaluated and scored against a set of pre-defined criteria, which reflect the objectives set out in this Strategy and the Energy Community as a whole. For the evaluation, each criterion is translated into indicators, whose importance is defined by different weights, which will be attributed by the Task Force. The sub-scores coming from the different indicators will add up to an overall score for each project. In this way, it will be easy to see the general and specific strengths of each proposed project and the results will serve as a clearly understandable benchmark for investors as well. It will be possible to compare competing projects with each other. When finishing the evaluation, projects can be grouped into categories of top, medium and low scores. Projects with high cross-border impact with an EU Member State would be included in the EU regional infrastructure development group discussions. The list of projects with the scores shall be proposed by the Task Force to the PHLG for endorsement.

A framework should also be established, where a high score would serve as a positive trademark (such as the TEN-E label in the European Union) and which in this way would indirectly attract more investors. In addition, tools and policy measures that would bring additional benefits to the high-ranking projects could be considered. These may involve accelerated and coordinated permit granting and licensing procedures, coordinated regulatory authorizations and coordinated tariff methodologies adoption, support from relevant European Union funds such as the Western Balkans Investment Framework[15], a certain degree of fulfilment of criteria for IFI's financing, increased visibility for investors etc. It is important that national regulatory authorities are also involved in the process.

This Strategy contains the main aspects/criteria, to set the framework of major principles that PECIs should comply with. The further elaboration of concrete indicators, the possible scores and weights attributed to them, should take place in the second half of 2012 and should be agreed by the Task Force.

The prioritization criteria proposed below are in line with the Energy Community objectives. Some indicators are defined also on the basis of selecting, where it is possible, quantifiable measures, which could be used to evaluate the extent to which a certain project met the defined criteria.

An independent evaluator should assess the projects proposed by stakeholders. These will be agreed by the Permanent High Level Group, at the proposal of Regional Energy Strategy Task Force, whose mandate will be extended for this purpose. The criteria fall into the following categories:

[15] The Western Balkans Investment Framework (WBIF) supports socio-economic development and EU accession across the Western Balkans through the provision of financial and technical assistance for strategic investments, in key sectors such as energy, environment, transport, social sector and private sector development. It is a joint initiative of the EU, International Financial Institutions, bilateral donors and the governments of the Western Balkans and seeks to blend grants with loans to achieve greater impact.

I. Contribution to the implementation of Regional Energy Strategy's objectives

- Involves, and/or is developed with, the cooperation of at least two Contracting Parties, or between a Contracting Party and an EU Member State
- Cross-border infrastructures
- Projects with significant cross-border impact.

II. Contribution to regional market integration, and enhanced competition

- Enhancement of cross-border capacity (in both directions)
- New links between markets
- Reduction of market concentration and facilitating access for new market entrants.

III. Security of supply

- Through diversification of supply sources, supplying counterparts and routes,
- By using the lowest cost of available resources, while taking into account all externalities

IV. Contribution to sustainable energy development

- Facilitation of the development of renewable energy sources
- Facilitation of replacing old and low efficient technologies
- Facilitation of reaching national carbon targets and reducing GHG emissions
- Improving efficiency in primary energy transformation and in energy use
- Contribution to economic development
- Economic, social and environmental viability
- Socio-economic benefit.

V. Maturity of the project

- Progress in realisation (feasibility study, EIA, FID, permits and licenses)
- Length of project realisation
- Support from governments / local communities
- Experience of project promoter.

VI. Commercial strength of the project

- Bankability
- Level of public funding needed.

In line with the existing practice in the EU, the proposed eligible project categories are broken down by sectors of electricity, natural gas and oil. Taking into account the Energy Community specificities, power generation is included as eligible (this category does not appear in the EU working groups).

The following categories of projects could be considered of regional significance and enter the priority project list:

Power generation:

- New generation capacities (including bundling of different projects or adding new units to existing facilities), which have an added value in enhancing cross-border supplies and trade and grid stability in at least 2 Contracting Parties
- Modernization, retrofitting of existing power plants which have an added value in enhancing cross-border supplies and trade and grid stability in at least 2 Contracting Parties, allowing for more efficient and environmentally safe production.

Electricity transmission:

- High-voltage lines (overhead lines for minimum 220 kV; and underground and submarine transmission cables, if they have been designed for a voltage of 150 kV or more)
- Electricity storage facilities, including pump storage
- Smart meters and ancillary equipment
- Equipment for the safe, secure and efficient operation of the system.

Gas transmission:

- New transmission pipelines and related equipment (metering and compressor stations) for the transport of natural gas that form part of a network which mainly contains high-pressure pipelines, excluding high pressure pipelines used for upstream or local distribution of natural gas, with emphasis on bi-directional capacity
- Equipment for the safe, secure and efficient operation of the system
- Enhancing the capacity of existing transmission pipelines
- Refurbishment of existing pipelines.

Gas storage:

- New underground storage facilities
- Expansion of existing underground gas storage facilities.
- LNG, CNG facilities
- LNG and CNG terminals (reception, storage and re gasification facilities).

Oil:

- Refinery improvements for facilitating improved fuel quality
- Storage facilities to contribute to the security stockholding obligations
- Pipelines used to transport crude oil.

It is proposed that the list of Projects of Energy Community Interest (PECI) would be updated every two years and established for the first time before the Ministerial Council meeting in 2013.

VII. Conclusions and Recommendations

Over the next eight years, energy investments in the order of €44.6 billion are needed in the region to diversify existing resources and replace ageing equipment, as well to supply the increasing energy demand. Investment decisions and choices will have a long term impact, and will lead to structural changes in energy supply, partly resulting from changes in indigenous production.

Nevertheless, the "current trends" scenario presumes that the energy system will develop slowly (and inadequately) as seen in the past several years. It presumes that large combustion units that should be retired are delayed further (beyond 2020), and that little new generating capacity is built. Investment needs focus on keeping aging plants in service.

It is critical to note that under this scenario, electricity demand is not able to be met by 2020, with 15.1 TWh (assuming the demand growth as forecasted), implying curtailments or additional imports, and these shortages extend further into 2025 and 2030. These curtailments also contribute to higher losses, given the impact on technical losses on the electricity network. The possibility of additional external imports of electricity into the region to make up such short-falls should not be relied upon as a sound and secure development strategy. Even though the investment needs are lower than with the other two scenarios, the supply costs are much higher due to reduced efficiency and substitution to other fuels.

The economic impact of such short falls must also be recognised; economic growth will be constrained if electricity demand cannot be met, or if there is a perception of an energy supply problem. Even the latter will constrain investor interest in the region by creating uncertainty as to the adequacy of electricity supplies to support business growth.

Both private and public investment in energy infrastructure needs to be mobilised, as the volumes and investment delivery times expected are extremely challenging.

Nevertheless, analysis and studies have identified a significant number of barriers of a different nature that make investments riskier, more expensive and consequently, less attractive for investors, including inter alia:

➢ *Barriers to investments*

Some of these barriers are also common to EU Member States[16], but others are particularly present in the Energy Community region, as follows:

- A key investment barrier stems from regulated and/or non-cost-reflective prices and tariffs. In the prevailing majority of cases, regulated end user prices do not reflect the real costs of electricity supply, including the costs of generation (short run marginal cost), reflecting the full generation portfolio, necessary investments/an appropriate rate of return, the costs of imports, the costs of supply services and bad debts.
- Asymmetric distribution of cost and benefits among beneficiaries; externalities (positive or negative) that are not properly reflected by existing market signals and revenue streams.

[16] Commission Staff Working Paper – Impact Assessment, SEC(2011) 1233 final

- Lack of innovative financial instruments, other than grants.
- Lengthy and ineffective permit granting procedures, along with public opposition, that impede the timely implementation of energy infrastructure projects.
- The regulatory framework, although in progress, is not fully in line with the Acquis especially with regards to wholesale market opening, transparency of capacity allocation and third party access to network.
- An important barrier to market opening is that supply and distribution have, in general, not been unbundled, which creates an unequal playing field between the incumbent supplier and a new entrant.
- The differences in allocation of cross border capacity (in particular non market based allocation) as well as the differences in pricing methodologies constitute obstacles to trading.
- The wholesale reference price, transparency and market liquidity which are prerequisites for successful power trading, are still missing in most countries.
- Longer term predictability of feed-in tariffs which is crucial for new renewable energy projects, is nevertheless not always ensured.
- (Un) availability of grid capacity to dispatch fluctuating energy from renewable sources is often used to limit the development of renewable energy.

➢ *Regional Initiatives*

In order to address some of the barriers mentioned above, the Energy Community has embarked on a few regional initiatives.

✓ *Coordinated Auction Office*

One of the major tasks of harmonization of the SEE region is the establishment of a Coordinated Auction Office (CAO). A well functioning Day Ahead Market for the whole SEE region requires among other things, that all transmission capacity should be made available for the implicit auctions. In this respect, the main function of the CAO is to provide correct transmission capacities to the market, irrespective of the market concept. In December 2008, a Memorandum of Understanding was signed in Tirana, by all the relevant TSOs, with the exception of Bulgaria and Serbia. In June 2012, the TSOs of Albania, Croatia, Bosnia and Herzegovina, Former Yugoslav Republic of Macedonia, Greece, Montenegro, Romania, Slovenia, Kosovo* and Turkey signed the company agreement necessary for the registration of CAO as Limited Liability Company under Montenegrin company law.

Despite some delays and bottlenecks, the progress made recently, as well as the concrete steps already taken towards the establishment of a South East Europe Coordinated Auction Office are a proof of the region's capability and ownership on linking local interests for regional benefit. The successful cooperation of network operators and International Financing Institutions proved that technical, administrative and legal challenges on a local (national) level can be overcome, when there is a will to reach a regional goal. Meeting the CAO's target of executing auctions for 2014 annual capacities at the end of 2013 still requires continuous involvement of all parties committed to this goal. This accomplishment will not only pose a strategic pillar of regional electricity wholesale market opening, but will also represent the achievement of the first project of a regional dimension in SEE.

✓ ***Regional day ahead market***

A SEE Regional power market should be developed as a competitive market environment where TSOs, power exchanges, traders, suppliers, generators are working together to establish efficient and liquid market prices. "The key underlining concept is a physical day-ahead trading and market organization, where market operations are carried out before day before the traded physical contracts are delivered"[17]. The trading method is called Day-Ahead Market (DAM) auction trading, and this provides a neutral reference price for the wholesale and retail markets and for power derivatives trading.

This initiative is closely linked with the operation of CAO and should be implemented in a timely coordinated manner.

✓ ***Gas infrastructure development***

1. Gas to Power Initiative in the Western Balkans

As mentioned above, the so called "gas ring" concept will need to be transposed into an implementable project or a series of projects.

In spite of the political will of the countries to gasify more their economies, that was expressed on several high level meetings, it is clear that investment decisions to build new gas-fired power plants, with a total gas demand in the range of 2-3 BCM per annum, is key to the progress of the new gas infrastructure in the Western Balkans.

While these will require large amounts of capital for investment in gas infrastructure that must come largely from private sources, public sector will also need to engage in the form of Public Private Partnerships, in order to achieve the minimal costs of energy sector development. Nevertheless, bearing in mind the tight fiscal space and the somewhat high level of public debt related to GDP of many of the Western Balkans' countries, private capital is crucial to achieve these investments.

A new approach to attracting the private sector's participation in the development of gas fired power plants in the Western Balkans is currently being developed and promoted to private investors – in form of a special Consortium, as proposed by the World Bank's experts. In this model, the Consortium would consist of a group of investors, as shareholders, that could be private energy companies, international financial institutions, state-owned companies (electricity generators, suppliers, gas suppliers, traders), big electricity consumers, municipalities etc. The Consortium would establish national companies in the interested Contracting Parties based on public – private partnership model (PPP companies). Shareholders may vary from country to country, including or not the participation of national companies (electricity consumers and utilities). The shareholders of each national PPP Company would be responsible for all the costs of the electricity produced and would buy the electricity at production cost.

The Consortium would also determine the required gas infrastructure needed to deliver gas to its national PPP companies which would build the power plants. This infrastructure would be in line with the development intentions of the "gas ring". There could be two alternatives – (a) the Consortium develops the required gas infrastructure; and (b) national gas network companies develop the main pipelines and

[17] SEE Wholesale Market Opening, Final report 2010, Pöery & Nord Pool Consultants

the Consortium develops the balance. In either option, the role of TSOs would be important. However, the Consortium would be responsible for gas supply to its PPP companies.

This is an innovative approach in the Western Balkans, but has successfully used in Finland since 1930s for the development of hydro power plants.

2. Modernisation of Ukrainian gas transport system

The modernization of the Ukrainian gas transportation system (GTS) and increasing its efficiency will contribute to increasing the energy security of the Energy Community. This is also beneficial for the well functioning of the single European gas market, and can play a key role in the implementation of the Energy Community "gas ring" concept.

Ukraine has set itself a goal to achieve the modernisation by 2020, while the Commission, as well as EBRD and World Bank, confirmed their support to it, in the context of the energy security of the EU and the Energy Community countries, whereby third party access and transparent management in line with the Energy Community Treaty should be fully ensured.

✓ ***Projects of Energy Community Interest – an integrated approach***

In order to facilitate the development and implementation of PECIs, the Energy Community will adopt a holistic approach, in which regulatory measures will be enforced in order to remove some of the barriers to cross border investment; these may involve permitting procedures, information for decision makers, cost benefit analysis, incentives for projects with a cross border impact, and others. To complement these, more innovative financial instruments will be taken into account, and special funding mechanisms for PECIs will have to be adequately designed, using the pre-acession funds or other similar instruments. The Western Balkans Investment Framework focusing on supporting strategic projects in the Energy Community is a potential channel to secure financing for priority investments and to finance relevant sectoral studies that can contribute to this Strategy.

To this end, the Energy Community, thorugh its Secretariat will work closely with DG ENER and DG ELARG to develop a more comprehensive package to remove some barriers to investments.

The way forward

Key regional themes for the Energy Community to address include the following:

- ✓ *Gasification of the Western Balkans and Moldova*. Further gasification of this region is important both for energy security and de-carbonisation; modernization of the Ukrainian gas transport system is also critical.
- ✓ *Pursue price liberalization*, as this is the *sine qua non* for investments.
- ✓ *Improve cross border interconnections* – also a fundamental requirement to support the investments required.
- ✓ *Pursue actively the regional initiatives.* These include the Coordinated Action Office, Regional Day Ahead Market, Gas to Power Initiative, and Projects of Energy Community Interest, as well as others; additional initiatives are certain to be developed. It is of significant importance that these are coming to fruition through timely implementation, and thus sending the right signals to investors.

- ✓ *Implement the Actions required to meet the Energy Community objectives in a timely and coordinated manner.* All Contracting Parties are making progress in the implementation of the Energy Community Treaty, but some are still lagging behind; the more they will do so, the more the gap between these and the more advanced ones is increasing, become another hurdle for investors to overcome.
- ✓ *When it comes to updating or developing new national energy strategies, such strategies should align with this Strategy.*
- ✓ *Take policy measures at a regional level that would bring additional benefits to the high-ranking projects.* These may involve accelerated and coordinated permit granting and licensing procedures, coordinated regulatory authorizations and coordinated tariff methodologies adoption, support from relevant European Union funds, harmonization of criteria for IFI's financing promotion to increase project visibility to investors.

Finally, it is important to stress that the Energy Strategy Task Force has made much progress in its work on a regional energy strategy, but the efforts remain at an early phase. In order to achieve the benefits of a regional strategy, the work should continue to permit the Task Force finalise the criteria and method for identifying projects of regional importance (the PECIs), and further identify and rectify the specific barriers and obstacles that have to date affected project development in the region.

As noted earlier, if past trends continue into the future, the Energy Community will face serious and growing shortfalls in supply, especially in electricity, and these shortfalls will adversely impact the ability of the Contracting Parties to achieve optimal economic growth. Further, the social and environmental impacts associated with an inadequate response to these challenges will be detrimental and undercut significantly the region’s ability to meet its development indicators in a sustainable manner.

ANNEX 1

CONTRACTING PARTIES' DATA

1. Energy supply and consumption

Some of the energy demand growth projections were made before 2008-2009 (the onset of the financial and economic crisis) and therefore may appear over optimistic as of the date of this analysis. For example, according to the countries strategies' projections, in 2012 the forecasted final consumption presents an increase of 8% compared to 2009 at the consolidated regional level. The fastest energy demand growths are projected Montenegro, Former Yugoslav Republic of Macedonia, Kosovo*, and Serbia.

All Contracting Parties, with the exception of Ukraine indicated energy savings targets of a minimum of 9% of their final energy consumption, by 2018 over a nine year period starting in 2010, (unless otherwise indicated in Table 1). Presently, Ukraine is preparing its first National Energy Efficiency Action Plan, in which the minimum energy saving of 9% by 2020 will be targeted.

Renewable energy already represents a significant share of the total gross final energy consumption in 2009, and it is planned/under discussion that the Energy Community will embark before the end of 2012, on setting binding targets for renewable energy achievable by 2020, in line with the EU Directive 2009/28/EC. National energy targets are expected to be adopted at the Ministerial Council meeting in October 2012.

A summary of these indicators is included in Table 1 (bellow). Please note that the targets for renewable energy in Table 1 are provided by the Contracting Parties, and do not represent any connection to the discussions regarding the renewable energy targets expected to be adopted in the Ministerial Council in October 2012.

More detailed figures on the overview of energy supply and consumption are presented in Table 2 and 3.

Table 1

ENERGY COMMUNITY GROWTH SCENARIOS AND TARGETS

		2012			2015			2018			2021			2024			2030		
		Low	Base	High	Low	Base	High	Low	Base	High	Low	Base	High	Low	Base	High	Low	Base	High
ALBANIA	GDP growth (%)	2,0%	4,5%	7,0%	2,0%	4,5%	7,0%	2,0%	4,5%	7,0%	2,0%	4,5%	7,0%	2,0%	4,5%	7,0%	2,0%	4,5%	7,0%
	Energy demand growth (%)	2 % annualy																	
	Energy efficiency target (%)	9 % in 2018																	
	Renewable energy target (%)	38 % in 2020																	
BOSNIA AND HERZEGOVINA	GDP growth (%)	3,6%	3,6%	3,6%	4,8%	5,8%	6,8%	4,2%	5,2%	6,2%	3,8%	4,8%	5,8%	3,4%	4,4%	5,4%	2,3%	3,3%	4,3%
	Energy demand growth (%)	1,9%	2,7%	3,6%	1,9%	2,7%	3,6%	1,9%	2,7%	3,6%	2,0%	2,6%	3,2%	2,0%	2,6%	3,2%	2,0%	2,5%	3,1%
	Energy efficiency target (%)	-	-	-	3,7%			9,2%			12,1%			15,0%			-	-	-
	Renewable energy target (%)	42,1 % in 2020																	
CROATIA	GDP growth (%)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Energy demand growth (%)	NA	3,1%	2,7%	NA	3,1%	2,7%	NA	3,1%	2,7%	NA	3,1%	2,7%	NA	3,1%	2,7%	NA	3,1%	2,7%
	Energy efficiency target (%)	9% in 2016																	
	Renewable energy target (%)	20 % in 2020 (10% RES target in transport)																	
FORMER YUGOSLAV REPUBLIC OF MACEDONIA	GDP growth (%)	5,7 % annualy																	
	Energy demand growth (%)	NA	2,6%	2,2%	NA	2,6%	2,2%	NA	2,6%	2,2%	NA	2,5%	2,2%	NA	2,5%	2,2%	NA	2,5%	2,2%
	Energy efficiency target (%)	9% in 2018																	
	Renewable energy target (%)	21% in 2020																	
KOSOVO*	GDP growth (%)	3,1%	3,8%	4,5%	3,2%	5,0%	7,0%	2,4%	5,3%	8,3%	2,4%	6,0%	8,2%	-	-	-	-	-	-
	Energy demand growth (%)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Energy efficiency target (%)	9% in 2018																	
	Renewable energy target (%)	26% in 2020																	
MOLDOVA	GDP growth (%)	4,0%	5,0%	6,0%	4,0%	5,0%	6,0%	4,0%	5,0%	6,0%	4,0%	5,0%	6,0%	4,0%	5,0%	6,0%	4,0%	5,0%	6,0%
	Energy demand growth (%)	Cummulative growth: Base scenario -58%; Low Scenario -53%; High Scenario - 75%																	
	Energy efficiency target (%)	20% in 2020																	
	Renewable energy target (%)	20 % in 2020																	
MONTENEGRO	GDP growth (%)	NA	5,2%	NA	NA	5,2%	NA	NA	5,2%	NA	NA	6,8%	NA	NA	6,8%	NA	NA	6,8%	NA
	Energy demand growth (%)	NA	2,8%	NA	NA	2,8%	NA	NA	2,8%	NA	NA	1,7%	NA	NA	1,7%	NA	NA	1,7%	NA
	Energy efficiency target (%)	9% in 2018																	
	Renewable energy target (%)	29,5 % in 2020																	
SERBIA	GDP growth (%)	3,4%	NA	5,2%	3,4%	NA	5,2%	NEW SERBIAN ENERGY STRATEGY WITH THE PROJECTIONS UP TO 2030 IS UNDER THE PREPARATION.											
	Energy demand growth (%)	NA	NA	NA	NA	NA	NA												
	Energy efficiency target (%)	9% in 2018																	
	Renewable energy target (%)	NA																	
UKRAINE	GDP growth (%)	5,0%	NA	6,5%	4,5%	NA	8,5%	4,5%	NA	5,5%	6,2%	NA	6,7%	4,5%	NA	5,4%	5,0%	NA	7,0%
	Energy demand growth (%)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Energy efficiency target (%)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Renewable energy target (%)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 2 Total primary energy supply forecast

Primary energy supply (ktoe)	2009 (reference year)	2012 (forecast)			2015 (forecast)			2018 (forecast)			2020[c] (forecast)			2025[c] (forecast)	2030 (forecast)
		Base scenario	Low scenario[a]	High scenario	Base scenario	Low scenario	High scenario	Base scenario	Low scenario	High scenario	Base scenario	Low scenario	High scenario	Base scenario	Base scenario
ALBANIA	2.035	2.369	2.272	2.588	2.677	2.547	2.840	2.752	2.649	2.899	2.806	2.664	2.957	2.902	3.011
BOSNIA AND HERZEGOVINA	6.302	6.458	6.485	6.470	6.709	6.692	6.823	6.931	6.902	7.133	6.920	6.884	7.332	6.961	7.227
CROATIA[b]	8.734	NA	8.666	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FYR of MACEDONIA	2.791	3.459	NA	NA	3.719	NA	NA	3.862	NA	NA	4.212	NA	NA	4.949	5.180
KOSOVO*	2.353	2.356	2.028	2.408	2.495	2.119	2.630	2.846	2.295	3.581	2.943	2.371	3.735	NA	NA
MOLDOVA	2.071	2.192	2.095	2.219	2.314	2.202	2.347	2.486	2.395	2.541	2.693	2.594	2.782	2.919	3.281
MONTENEGRO	777	1.019	NA	NA	1.163	NA	NA	1.812	NA	NA	1.942	NA	NA	2.389	2.481
SERBIA	15.344	16.242	15.440	17.310	NA	17.240	18.070	A new Serbian Energy Strategy with projections until 2030 is under preparation							
UKRAINE [e]	115.472				24.247	25.795	30.825				27.351	29.028	23.387		
Total energy supply	155878,68														

Notes: (a) Under low, respectively high scenario is understood low, respectively high economic growth scenario

(b) In the case of Croatia, under the "low scenario" is meant the Sustainable development scenario

(c) In the case of Albania, Bosnia and Hezegovina, the forecasts are given for 2021 instead of 2020, and for 2024 instead of 2025

(d) The Total (regional) supply was not calculated beyond 2009 as the supply data were not available for all eight Contracting Parties under the same scenarios and years

(e) IEA data and data from Ukraine questionaire

** This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and ICJ Opinion on the Kosovo declaration of independence.*

Table 3 Total final energy consumption forecasts

Energy Consumption data (ktoe)	2009 (reference year)	2012 (forecast)			2015 (forecast)			2018 (forecast)			2020 (forecast)			2025 (forecast)	2030 (forecast)
		Base scenario	Low scenario[a]	High scenario[a]	Base scenario	Low scenario	High scenario	Base scenario	Low scenario	High scenario	Base scenario	Low scenario	High scenario	Base scenario	Base scenario
ALBANIA	1.868	2.127	2.087	2.130	2.524	2.238	2.560	2.950	2.692	2.992	3.313	2.858	3.360	3.501	3.893
BOSNIA AND HERZEGOVINA	4.346	4.410	4.412	4.419	4.191	4.178	4.281	3.997	3.970	4.173	3.966	3.927	4.235	3.939	4.130
CROATIA[b]	6.956	NA	6.952	NA	NA	7.964	NA	NA	NA	NA	NA	9.314	NA	10.213	11.323
FYR of MACEDONIA	1.686	2.003	1.928	NA	2.220	2.103	NA	2.454	2.316	NA	2.618	2.466	NA	3.020	3.346
KOSOVO*	1.165	1.380	1.324	1.428	1.487	1.384	1.613	1.601	1.445	1.816	1.685	1.492	1.968	NA	NA
MOLDOVA	1.973	2.078	2.011	2.079	2.171	2.118	2.189	2.257	2.224	2.297	2.359	2.350	2.421	2.471	2.617
MONTENEGRO	714	914	NA	NA	1.054	NA	NA	1.139	NA	NA	1.191	NA	NA	1.311	1.417
SERBIA	9.072	10.404	9.670	10.360	NA	10.260	11.180	A new Serbian Energy Strategy with projections until 2030 is under preparation							
UKRAINE[d]	64.545				19.518	20.739	17.635				21.006	22.596	18.211		
Total energy consumption	92324,57														

Notes: (a) Under low, respectively high scenario is understood low, respectively high economic growth scenario

(b) In the case of Croatia, under the "low scenario" is meant the Sustainable development scenario

(c) In the case of Albania, Bosnia and Hezegovina, the forecasts are given for 2021 instead of 2020, and for 2024 instead of 2025

(d) The Total (regional) supply was not calculated beyond 2009 as the supply data were not available for all eight Contracting Parties under the same scenarios and years

(e) IEA data and questionaire

** This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and ICJ Opinion on the Kosovo declaration of independence.*

2. Electricity supply

The electricity generation mix shows a significant diversity across the Contracting Parties, and their forecasts are presented in Table 4.

Table 4. Domestic electricity supply forecast

Domestic Electricity Supply (GWh) - base scenario	2009	2012	2015	2018	2020[a)]	2025[a)]	2030
Albania	**6630**	**7855**	**8659**	**9563**	**10476**	**11603**	**14161**
Domestic production	5231	5037	6386	9026	10467	11581	14176
- Coal (lignite)	0	0	0	0	0	0	0
- Dual - fired	0	294	728	1364	932	1515	556
- Gas	0	0	0	264	528	370	2153
- Oil	0	0	0	0	0	0	0
- Nuclear	0	0	0	0	0	0	0
- Hydro	5231	4743	5612	7278	8831	9453	11039
- RES (other than hydro)	0	0	46	119	176	244	428
Imports	1886	2817	2272	537	9	22	0
Exports	-486	0	0	0	0	0	-14

Bosnia and Herzegovina	**11696**	**11111**	**16402**	**20113**	**22223**	**23826**	**-**
Domestic production	13140	13817	20220	23762	25863	27490	-
- Coal (lignite)	6578	6663	8094	9864	9536	9536	-
- Gas	0	0	0	0	0	0	-
- Oil	0	0	0	0	0	0	-
- Nuclear	0	0	0	0	0	0	-
- Hydro	6563	7154	11845	13108	15026	16143	-
- RES (other than hydro)	0	0	280	791	1301	1811	-
Imports	2602	120	230	398	407	383	-
Exports	-4047	-2826	-4047	-4047	-4047	-4047	-

Croatia	**26623**	**24605**	**24613**	**26792**	**29420**	**-**	**-**
Domestic production	20939	21908	21916	24095	26723	36752	43976
- Coal (lignite)	4375	6243	5309	6300	11010	7702	9500
- Gas	6360	7002	6681	7845	4913	4662	6488
- Oil	3422	179	1800	0	0	0	0
- Nuclear	0	0	0	0	0	7988	7988
- Hydro	6719	8334	7526	8600	9200	10800	12000
- RES (other than hydro)	63	150	600	1350	1600	5600	8000
Imports	7581	2697	2697	2697	2697	NAD	NAD
Exports	-1897	NAD	NAD	NAD	NAD	NAD	NAD
FYR of Macedonia	**8266**	**9762**	**10465**	**11271**	**10152**	**13412**	**15181**
Domestic production	6828	9353	10461	11261	10150	13410	15046
- Coal (lignite)	5379	4787	4471	4526	4202	7445	7657
- Gas	0	1929	3633	3654	2799	2538	3822
- Oil	179	1050	496	573	160	0	0
- Nuclear	0	0	0	0	0	0	0
- Hydro	1270	1587	1861	2508	2989	3427	3567

- RES (other than hydro)	-	-	-	-	-	-	-
Imports	1438	409	4	10	2	2	135
Exports	0	0	0	0	0	0	0
Kosovo*	**5469**	**6143**	**6674**	**7210**	**7532**	**8357**	**9181**
Domestic production	4975	5541	5874	8896	9123	9174	9223
- Coal (lignite)	4855	5386	5568	8007	8188	8188	8188
- Gas	0	0	0	0	0	0	0
- Oil	0	0	0	0	0	0	0
- Nuclear	0	0	0	0	0	0	0
- Hydro	105	132	186	738	776	776	776
- RES (other than hydro)	15	23	120	151	159	210	259
Imports	768	602	800	0	0	0	0
Exports	-274	0	0	-1686	-1591	-817	-42
Moldova	**4230**	**4478**	**4946**	**5553**	**6225**	**6907**	**8422**
Domestic production	1346	1594	2206	2950	3752	4558	6302
- Coal (lignite)	0	0	1099	1890	2736	3582	5410
- Gas	1158	1405	967	919	875	835	750

- Oil	83	84	36	36	36	36	36
- Nuclear	0	0	0	0	0	0	0
- Hydro	105	105	105	105	105	105	105
- RES (other than hydro)	0	0	0	0	0	0	0
Imports	2884	2884	2740	2603	2473	2349	2120
Exports	0	0	0	0	0	0	0
Montenegro	**3748**	**4653**	**5231**	**5493**	**5679**	**6031**	**6406**
Domestic production	2762	2891	3426	5925	6970	8414	8505
- Coal (lignite)	689	1150	1179	3389	3389	4749	4749
- Gas	-	-	-	-	-	-	-
- Oil	-	-	-	-	-	-	-
- Nuclear	-	-	-	-	-	-	-
- Hydro	2073	1741	1957	2200	3153	3153	3153
- RES (other than hydro)	0	0	290	336	428	512	603
Imports	1158	1762	1804	0	0	0	0
Exports	-172	0	0	-433	-1291	-2383	-2099
Serbia	**36897**	**37910**	The new Serbian Energy Strategy, including projections up to 2030 is under				

			preparation				
Domestic production	38322	37863	-	-	-	-	-
- Thermal power plant (coal/lignite)	26833	26779	-	-	-	-	-
- CHP (gas)	185	213	-	-	-	-	-
- Industrial power plants (oil)	160	286	-	-	-	-	-
- Nuclear	0	-	-	-	-	-	-
- Hydro	11144	10585	-	-	-	-	-
- RES (other than hydro)	-	-	-	-	-	-	-
Imports	5184	6410	-	-	-	-	-
Exports	-6609	-6363	-	-	-	-	-
Ukraine [b)]	**167532**	-	-	-	-	-	-
Domestic production	173599	-	215000	-	237000	260000	283000
- NPS (nuclear)	83200	-	96000	-	116000	126000	133000
- HPPs + HPSPS (hydro)	11979	-	15000	-	20000	21000	21000
- TPP (coal)	63400	-	86000	-	80000	89000	99000
- TPP (gas)	-	-	2000	-	2000	2000	2000
- CHPs and local plants (gas, oil)	14977	-	15000	-	15000	15000	15000

- RES (other than hydro)	43	-	1000	-	4000	7000	13000
Imports	1894	-	-	-	-	-	-
Exports	-7961	-	6000	-	6000	6000	6000
Total domestic production	**267142**						
Total domestic supply	**271090**						

a) In the case of the former Albania, Bosnia and Herzegovina and Moldova, the forecasts are given for 2021 (instead of 2020) and for 2024 (instead of 2025)

b) Ukraine: both IEA data and the country's report to Task Force were used for 2009

* Throughout the entire document, this designation is without prejudice to positions on status, and is in line with UNSCR 1244 and ICJ Opinion on the Kosovo declaration of independence.

The forecasted electricity mix by 2020 or where feasible, 2030 is as follows:

Albania: the electricity production continues to be largely dominated by hydro, with some contribution of thermal generation; electricity imports remain a significant share of total electricity supply until 2018 (36% in 2012 and 26% in 2018). After that, electricity supply is planned to be almost completely covered from domestic generation.

Bosnia and Herzegovina (BiH): Its power generation is based on coal, hydro and other renewable energy (starting with 2012)**;** there are also plans to build new gas fired power plants in the data supplied by the entities; BiH remains a net electricity exporter (12% in 2009, 16% in 2021, 15% in 2025, of the total domestic electricity supply).The coal share in domestic electricity production is planned to decrease from 50% in 2009 to 36% in 2021 (base scenario), and to 34% in 2024; these will be compensated by the increased share of renewable energy (hydro and other sources).

Croatia: All types of fuel are used for electricity generation before 2020 (with the exception of nuclear energy): coal, gas, oil, hydro and other renewable sources in fairly balanced shares. Electricity generation from renewable energy is expected to grow significantly, both from hydro, but also other renewable sources (wind, solar, etc. Nuclear generation is forecasted starting with 2025.

Electricity imports are forecasted to remain constant in physical value from 2012 to 2020, but decreasing from 11% in 2012 to approximately 9% in 2020 of the total domestic electricity supply.

Former Yugoslav Republic of Macedonia: The domestic electricity generation is based on coal, oil and hydro and is supplemented by imports; gas is forecasted to have a significant larger share in the fuel mix of domestic generation starting in 2012 (21%), to 35 % in 2015, to 28% in 2020 and 25 % in 2030. Renewable energy shows the same trend in domestic electricity generation, from 19% in 2009 to 29 % in 202. Electricity imports are forecast to reduce significantly from 17% in 2009 to 4% in 2012 and 1% in 2030.

Kosovo*: The domestic electricity supply is based largely on lignite: 98% in 2009, decreasing to 90% in 2020 (base scenario). The rest of the supply will be covered by hydro and other renewable energy; a current net import position will become a net export position starting with 2018. Given that the information provided was based on Kosovo* Energy Strategy adopted in 2009, gas and oil are not foreseen in the electricity generation by 2030; Nevertheless, lately Kosovo* expressed its intention to introduce gas in its consumption.

Moldova: Domestic electricity production is forecasted to be dominated by coal and gas, with a small contribution of non hydro renewable energy. A significant part of the electricity consumed at present is imported, mainly from Ukraine; the share of imports is expected to decrease from 68% in 2009 to 40% in 2021 and 25% in 2030 in the total electricity supply.

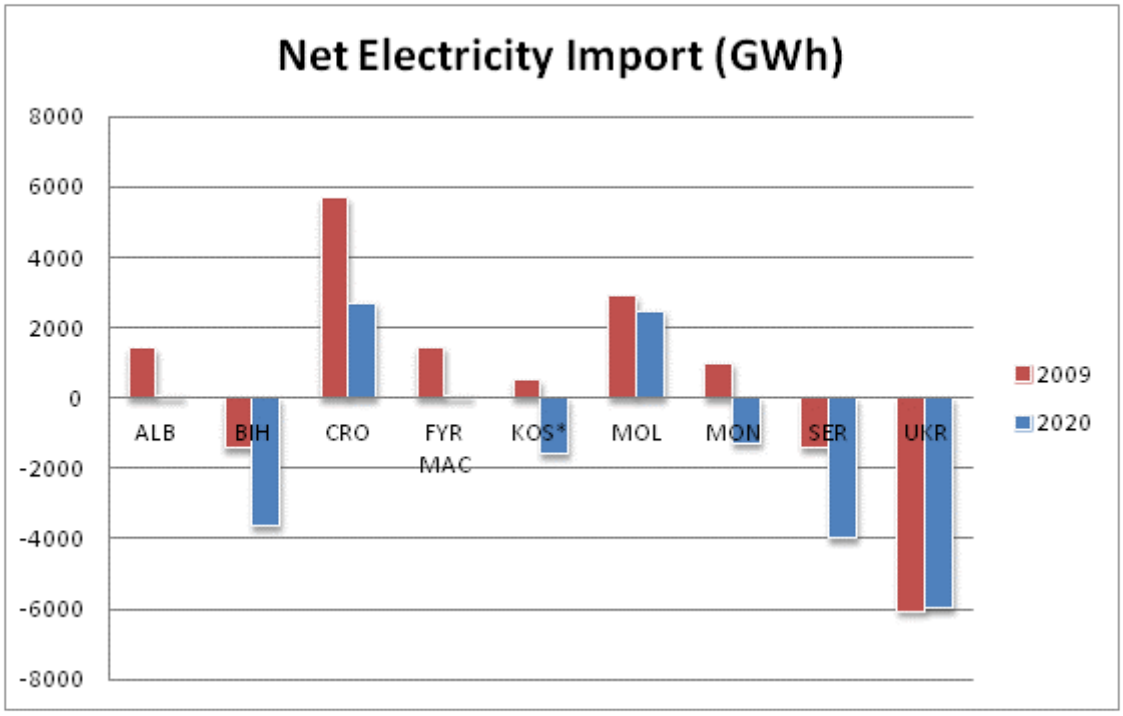
Montenegro: Domestic electricity production is based largely on coal and hydro that will continue to dominate until 2030. At least until 2018, a significant share of the electricity supplied is imported, but after that Montenegro plans to become a net exporter reaching 25% of generated electricity to be exported until 2030. In spite of lately, politically expressed intentions for its territory gasification, gas and oil appear to play no role in electricity generation by 2030, but other non-hydro renewable energy will comprise part of the generation mix.

Serbia: Has reported data on electricity supply only until 2015 (in accordance with its energy sector development strategy of the Republic of Serbia, by 2015; an update of this Strategy to 2025 is under preparation); For the same reason, it was also not able to report its electricity production in terms of fuel type, but of the user of fuel (e.g. thermal power plant, cogeneration, industrial power plants, etc.); it appears that Serbia will become a net importer of electricity starting in 2015.

Ukraine: In 2009, domestic generation is dominated by nuclear production (48%), followed by coal 36[18] %; the projections (under the base scenario) show that nuclear generation will continue to be dominant, as well as coal; a notable change is the contribution of renewable energy that raises from 6 % to 10% in 2020 electricity mix; exports appear to remain constant from 2009 to 2030.

An important feature of the Energy Community is that in most Contracting Parties were net electricity importers in 2009, with the exception of BiH, Serbia and Ukraine, as seen from Figure 3.

Figure 3. Net Electricity imports in 2009 and forecasts for 2020



Source: Calculation of ECS based on the data reported by the Contracting Parties

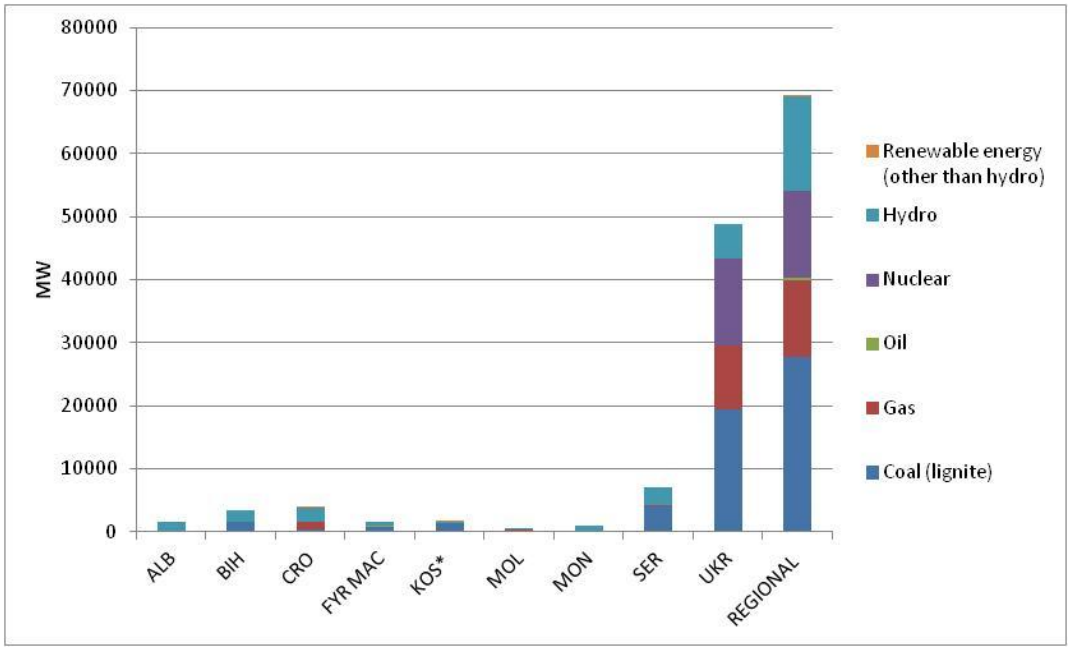
[18] Source: Ukraine data submission for the preparation of the Strategy

3. Power generation infrastructure

Installed capacity in 2009

A snapshot of installed generation capacity in 2009, by fuel, shows the significant diversity across the region. The Western Balkans and Moldova had a total capacity of approximately 20.5 GW, of which Serbia accounts for approximately 35%, followed by Croatia with 19%, and Bosnia and Herzegovina with 17%. When adding Ukraine, the total capacity raises to 69.3[19] GW. A distribution of generation capacity by fuel in MW and, respectively in percentage is presented in Figure 4, 5 and 6.

Figure 4. Installed capacity in MW in 2009



In order to be able to see the smaller Contracting Parties' generation mix, this was plotted separately on figure 5, only for the Western Balkans and Moldova.

[19] This figure was calculated based on installed power generation in Ukraine of 48.8 GW (report by Ukraine)

Figure 5. Installed capacity in MW in 2009 (without Ukraine included)

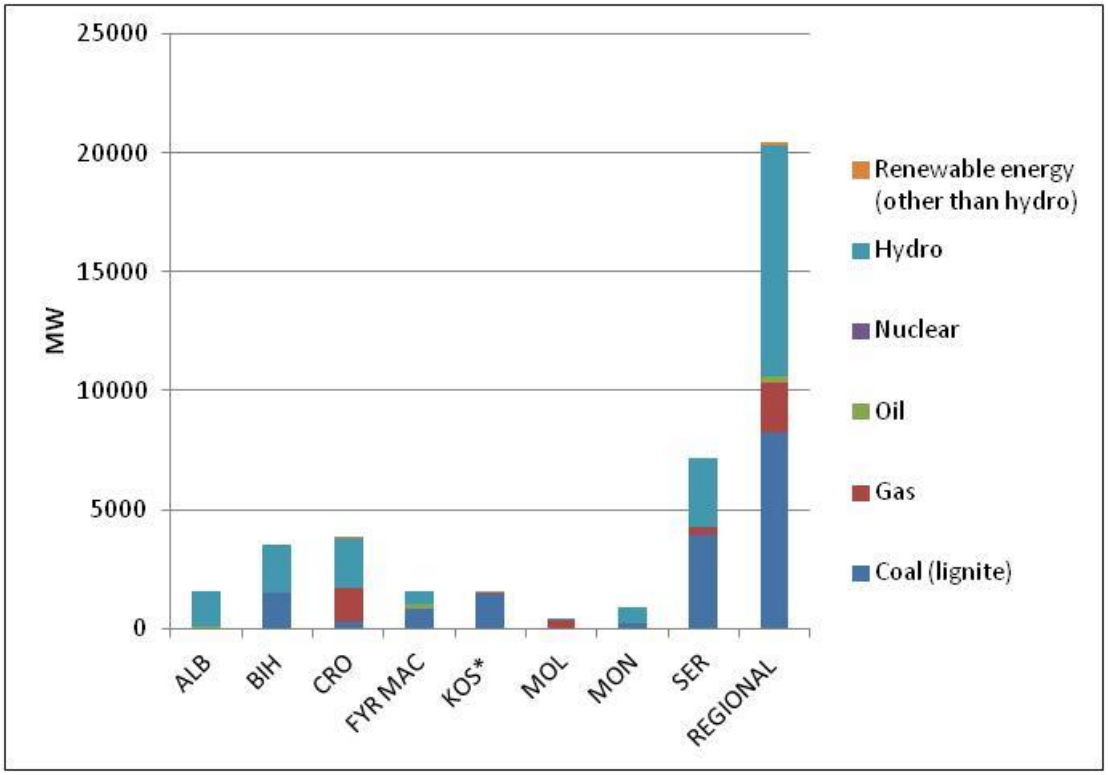
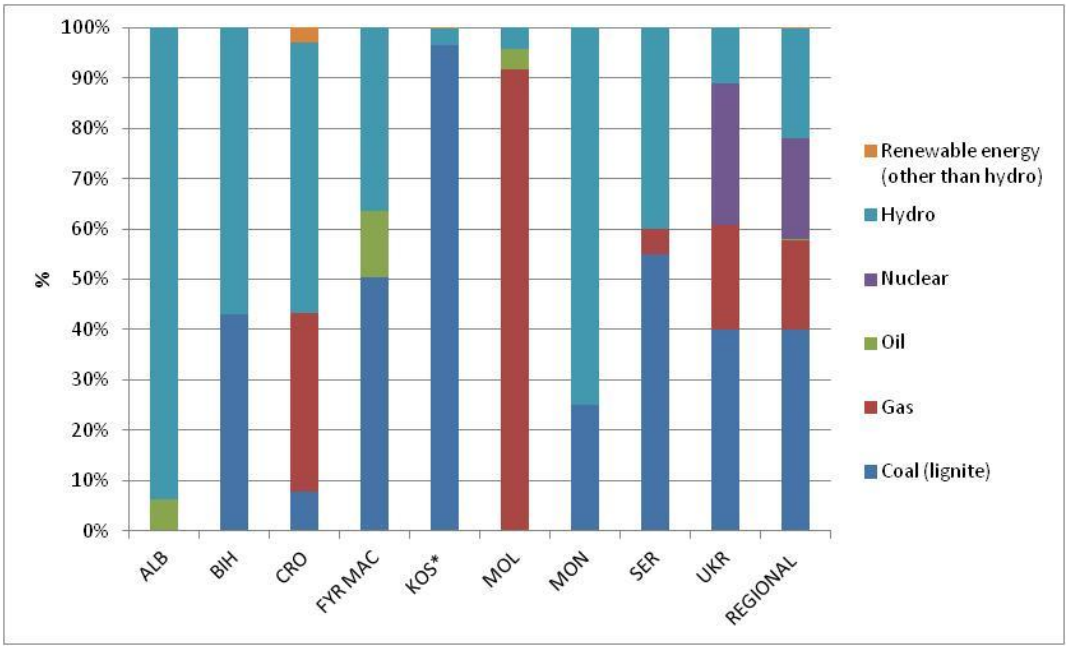


Figure 6. Installed capacity in 2009, in percentage (%)



4. Planned new capacity by 2020

The forecasted new power generation capacity between 2012 and 2020 (or 2021) represents approximately 21.33 GW. In Ukraine, the additional installed capacity is forecasted to 8.100 GW, distributed between nuclear (2.0 GW), and renewable 6.1 GW, between 2009 and 2020.

The additional generation mix without Ukraine continues to be dominated by lignite (at 45% of the new generation) followed by hydro (39%), gas (9%), BIH and other renewable energy (7%).

With Ukraine included, hydro generation will be predominant (42%), followed by coal fired plants (32%), nuclear 10%, gas 6% and other renewable energy, 10% in the planned additional generation mix.

Table 5, and Figures 7 and 8 present the distribution of new generation by type of fuel at aggregated level, as well as by each Contracting Party

Table 5 New (planned) power generation

New power generation capacity	Albania		Bosnia and Herzegovina		Croatia		Former Yugoslav Republic of Macedonia		Kosovo*		Moldova		Montenegro		Serbia		Ukraine		Total	
(MW electric)	2009 - 2012	2012- 2020	2009 - 2012	2012- 2020	2009 - 2012	2012- 2021	2009 - 2012	2012- 2021	2009 - 2012	2012- 2020	2009 - 2012	2012- 2021	2009 - 2012	2012- 2020	2009 - 2012	2012- 2020	2009 - 2015	2015- 2020	2009 - 2012	2012- 2021
Total of which	**44**	**1.328**		**1.870**		**2.438**		**1.352**		**1.416**	**54**	**479**		**1.144**		**4.686**	**2.200**	**5.900**	**2.298**	**20.613**
Coal (lignite)	-	-		1.050		950		300		1.000	-	200		356		2.540	-	-	-	**6.396**
Gas	-	120		730		340		300		-	-	61				450	-	-	-	**2.001**
Oil/dual fuel	-	-	No new capacity	-	No new capacity	-	No new capacity	-	No new capacity	-	-	-	No new capacity		No new capacity	-	-	-	-	**-**
Nuclear	-	-		-		-		-		-	-	-				-	-	2.000	-	**2.000**
Hydro	44	1.147		90		1.038		752		358	-	-		612		1.425	1.600	2.900	1.644	**8.321**
Renewable energy (other than hydro)	-	61		-		110		-		58	54	218		177		271	600	1.000	654	**1.895**

*This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and ICJ Opinion on the Kosovo declaration of independence.

Notes:

(a) Most CPs did not specify under which scenarios the new power generation investments were calculated

(b) The values put in the column 2019, 2020, 2021 represent the cummulative new installed power forecasted to be built between 2012 and the respective end period year; the same is valid for the regional calculation for 2019-2021

Figure 7. Planned new capacity (MW), by fuel

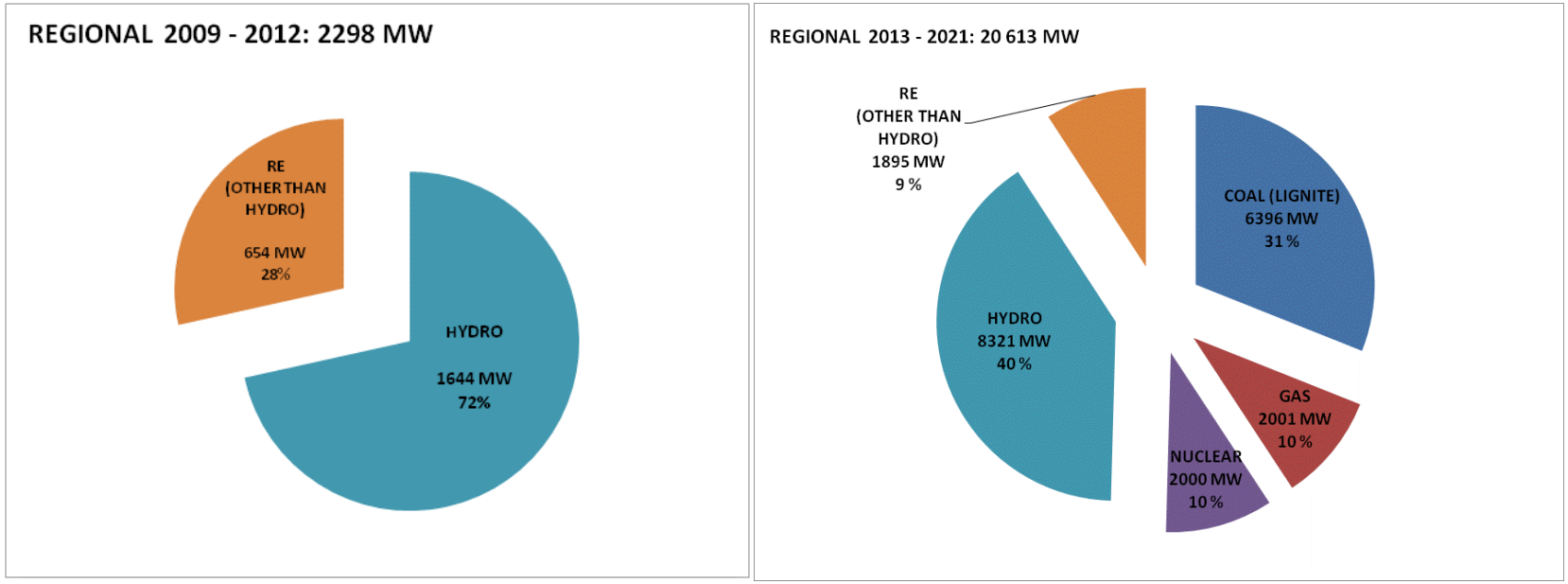
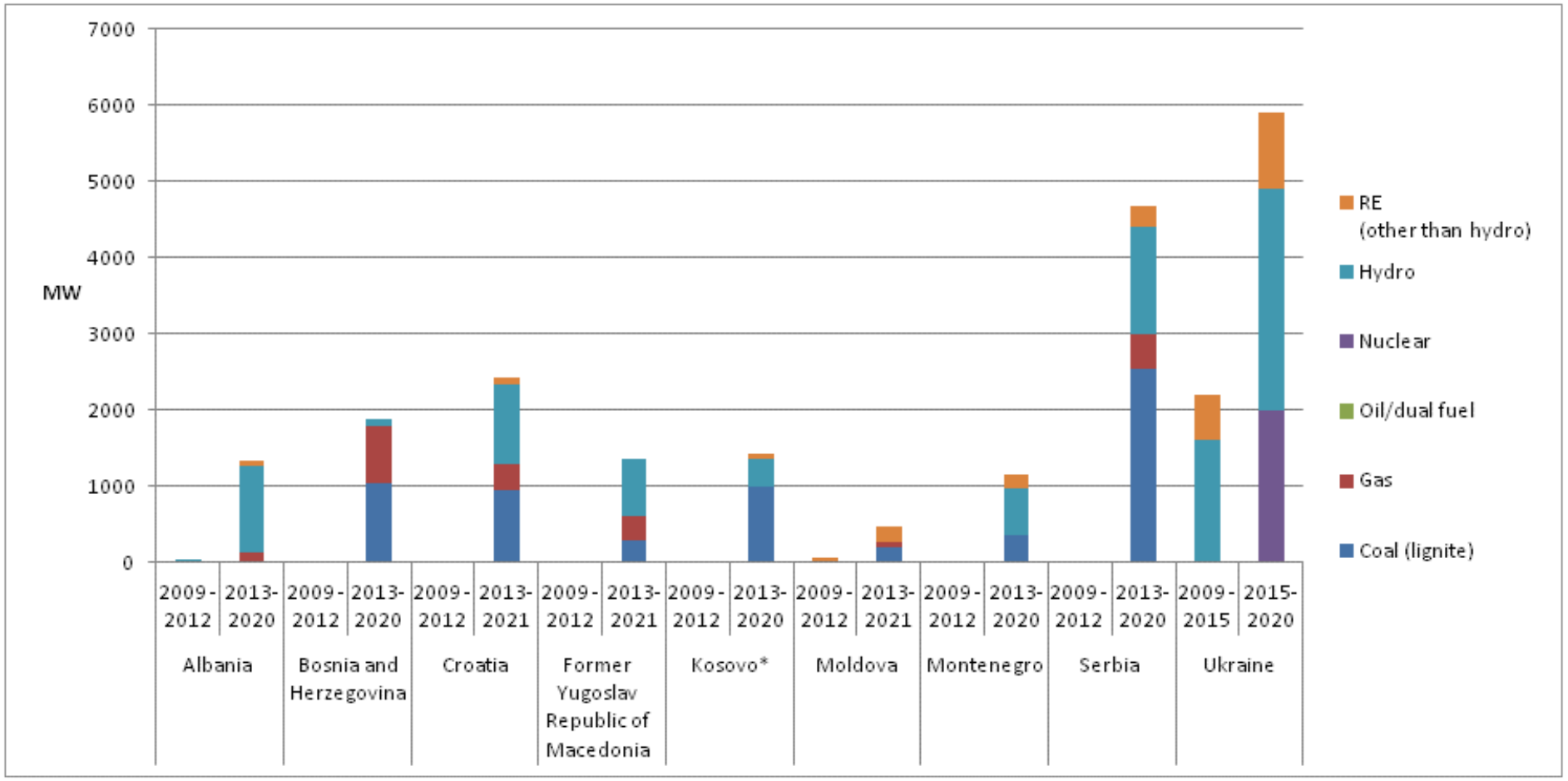


Figure 8. Planned new capacity (MW), by Contracting Party and fuel



Regarding the forecast of the regional adequacy, the foreseen installed generation capacity is sufficient to meet the anticipated demand. The challenge remains to bring this on line by 2020. Past experience shows a very long lead time for any significant new power plant to be built in the region, in the past 15 years. The additional challenge is the environmental constraints associated with the use of domestic fossil fuels (mainly lignite) for power generation, and the limitations that international financial institutions have in investing in these.

Moreover, a study commissioned[20] by the Energy Community in 2010, showed that there were 65 TPP units in the Western Balkans with a total installed capacity of 10,805 MW; their average weighted operation life by the end of 2010, was 30 years, as compared to 25 years which is the standard technical life of thermal power plant equipment. Hence, the majority of units should be close to retirement, and some have surpassed their designed technical life but remain in operation. The Energy Community is committed to implement the Large Combustion Plants Directive (LCP) by 31 December 2017 and therefore significant measures to either retrofit (where it is economically justified) or retire and replace a large amount of capacity is needed. Nevertheless, the current plans to retire lignite fired, gas or oil fired power plants only cover 2,374 MW before 2021, with the largest share coming from Serbia (874 MW), Kosovo* (610 MW), and Bosnia and Herzegovina (560 MW). In the power generation forecasted by Ukraine, a total of coal fired 3400 MW are recorded as being retired between 2009 and 2020, under the base scenario.

The large capacity gap between the needs for retrofit or retirement of old plants in order to comply with the LCP Directive, and the declared plans for decommissioning, calls for a serious analysis of measures at a national level, in the immediate term. Although, most of the Contracting Parties are not bound by the Kyoto Protocol to the UNFCC (being non Annex 1 countries), some of them have adopted greenhouse has (GHG) emission targets, as follows: Albania: 10% reduction in 2018 (the reference year is not given); Croatia: 20% reduction in 2020 as compared to 1990 emissions level; the Former Yugoslav Republic of Macedonia: 30% reduction in 2020 in the energy efficiency scenario compared to the business as usual scenario; Moldova: 25% in 2020 as compared to the reference year 1990.

5. Electricity interconnectors

The ENTSO E Regional Investment Plan highlights that “the main characteristic of the transmission network in the Continental South East region (Hungary, Slovenia, Romania, Serbia, Bulgaria, Former Yugoslav Republic of Macedonia, Montenegro, Bosnia and Herzegovina, Croatia, Italy and Greece) is inter-dependency; that is, cross border exchanges between two power systems significantly influence power flows in the rest of the network, especially neighboring ones. This should be attributed to the scarcity of the regional network. As a consequence, transit power flows in the predominant East West and North–South directions create congestion for countries close to the main exporters and importers of the area. For example, countries facing such transit include Slovenia, Serbia and the Former Yugoslav Republic of Macedonia”.

[20] Study on the Potential for Climate Change Combating in Power Generation in the Energy Community, SEEC, 2010

Energy Community interconnections plans (as proposed by the Contracting Parties) seem to be driven by the same drivers: connecting new generation, integrating new renewable energy, increasing security of supply, increasing the reliability and quality of energy services

A number of cross border interconnections in the Western Balkans have been identified already as priorities by the incumbent TSOs and have been subject of a significant amount of grants for preparation of feasibility studies and environmental and social impact assessment studies through the Western Balkans Investment Framework; these priorities include, inter alia:

Electricity 400kV interconnection between the Former Yugoslav Republic of Macedonia and Albania,

Electricity 400kV interconnection between Serbia and the Former Yugoslav Republic of Macedonia

Electricity 400kV interconnection between Croatia and Bosnia and Herzegovina

Electricity 400kV interconnection between Montenegro and Serbia, with a connection to Bosnia and Herzegovina

Electricity 400kV interconnection between Albania and Montenegro

Electricity 400kV interconnection between Albania and Kosovo*.

Electricity 400kV interconnection between Serbia - Romania that has reached the investment decision phase, and

1000 MW undersea DC cable between Montenegro and Italy.

Moldova and Ukraine, together with Romania are identifying investment needs related to the possible synchronization with the continental synchronous system, through a study funded under the Eastern Partnership, and started in 2012. Both these Contracting Parties are interested in joining the ENTSO E.

Additionally, reinforcement of national grids to accommodate new generation and reduce power losses is taking place in almost all of the Contracting Parties.

All Contracting Parties that are not presently members in the European Network of Transmission System Operators for Electricity are aiming to become in the near future, and therefore their planned investments have to be considered in the enlarged interconnection planning process.

In winter 2010/2011, the net transfer capacity in the Western Balkans is presented in Annex 1, Table 6. More details on existing and planned electricity interconnectors are in Annex 1 Table 7.

6. Natural gas supply and consumption

The biggest natural gas producer among the Contracting Parties is Ukraine with an annual production of 21,2 BCM per year (2009), followed by Croatia with 2,71 BCM in the same year.

The Energy Community consumed in 2009 approximately 73,642 BCM, of which Ukraine alone used 66,30 BCM. In 2015, the aggregated forecast amounts to 74,176 BCM, of which the Western Balkans and Moldova represent approximately 11,776 BCM.

Nevertheless, not all parties provided forecasts beyond 2015, and therefore a longer term regional analysis was not possible. (See Annex 1, Table 8 and 9).

The significant forecasted gas market growth in the Western Balkans is expected to play also a role in the overall European gas market supply, especially in the perspective of opening the South Gas Corridor.

7. Gas infrastructure

In the Contracting Parties, Ukraine has the largest gas transport infrastructure with a capacity of gas input of 290 BCM per year[21], and gas output of 178 BCM per year; the infrastructure includes 39.8 kilometres of pipelines, 13 underground storage facilities with 32,0 BCM working capacity.

In the Western Balkans and Moldova, the gas infrastructure is under-developed (Albania, Kosovo* and Montenegro have no infrastructure). In the Western Balkans, Croatia has the most developed gas network and is interconnected with Slovenia (1,5 BCM per year) and with Hungary (6,5 BCM per year). BiH, the former Yugoslav Republic of Macedonia, and Serbia have also smaller transport capacities.

The Western Balkans are interested to gasify the regions without gas markets and expand the current ones; one of the most ambitious initiatives of the Western Balkans is the so-called “gas to power initiative” which is based on the “gas ring” concept. The Energy Community gas ring is a gas transmission pipeline concept that would link seven gas markets: Albania, Bosnia and Herzegovina, Croatia, Kosovo*, the Former Yugoslav Republic of Macedonia, Montenegro and Serbia. The ring concept emerged from consideration of the synergy between the notional regional transmission pipelines branches defined for the separate markets.The benefits of the gas ring include:

- It facilitates increased gas supply diversity by allowing supply to the ring from almost any direction and from multiple directions.
- It links Energy Community Contracting Parties into a regional SEE gas market and integrates it with the neighbouring EU gas markets.
- It allows for the development of new gas-fired generation plants in these national/regional markets and helps them to overcome tightening gap in electricity supply and comply with their environmental obligations, increasing the functioning of the regional electricity market. It should be stressed that the gas-fired power stations are assumed to be anchor loads that in and of themselves, will drive the economic attractiveness of the gas ring.
- Significantly enhances technical security of gas supply, since a disruption at any one point in the ring can be overcome by supply around the ring from other directions/supply points.
- It facilitates the future development of regional gas trading from multiple sources of gas, multiple import points into the region and also between countries in the region.
- It links all connected national gas markets to regional underground gas storage.

[21] Ukraine data submission for the Strategy

Additional benefits of national gasification include providing a cleaner source of energy and allowing fuel switching to take place. The increased use of natural gas is a promising option to secure energy supply and help the Energy Community Contracting Parties to implement their obligations under Directive 2001/80/EC on the Large Combustion Plants. The development of gas power plants in the region will also contribute to meeting the expected increased demand of electricity, supporting the development of the regional electricity market.

One of the most important pipes of the "gas ring" will be the Ionian Adriatic Pipeline (IAP), with its flexible supply from any of the main pipelines of the Southern Gas Corridor. The Ionian-Adriatic Pipeline Project (IAP) will interconnect the existing and planned gas transmission system of Croatia with Bosnia and Herzegovina, Montenegro and Albania. The project aims to establish a new supply route for natural gas from the Middle East and Caspian region, along the Adriatic coast. The feasibility study as well as environmental and social impact assessments, funded by the WBIF, will be completed by mid 2013.

Additional interconnectors are also planned between Serbia and Romania, Croatia and Bosnia and Herzegovina, Moldova and Romania. LNG terminals, storage facilities in more details on investments in gas infrastructure planned by the Contracting Parties are listed in Table 10.

Ukraine has also plans for the modernisation and reconstruction of its gas transport system and an LNG terminal.

8. Crude oil and petroleum products supply and consumption

Crude oil and petroleum products production is limited and located mostly in Albania, Bosnia and Herzegovina, Croatia, Serbia and Ukraine; the Contracting Parties' total production in 2009 amounted at 16 478,40 ktoe, imports at 27 109,17ktoe, and exports at 6 408,02 ktoe; the transport of crude oil to Europe through Ukraine in 2009, amounted to 29,1 million tones.

As Serbia could not report a forecast for 2020 (its National energy strategy is currently under preparation), a regional estimate was not possible to be calculated. Nevertheless, it appears that the domestic production of crude oil will increase significantly in Bosnia and Herzegovina, Moldova and Ukraine by 2021 (based on countries' own data).

The total consumption of crude oil and petroleum products was at 35 893, 46 ktoe, of which in Ukraine at 23 166 ktoe in 2009. As some Contracting Parties could not report a forecast for 2020, an aggregated forecast by 2020 could not be presented. Nevertheless, a significant increase of oil and oil products consumption by 2020 (between 35% and 70%) was reported by Albania, Croatia, the Former Yugoslav Republic of Macedonia and Montenegro; however, only Croatia and the Former Yugoslav Republic of Macedonia plans to significantly increase the use of oil for power generation.(Table 11 and 12).

9. Crude oil infrastructure

The most important oil pipeline is the "Adria pipeline" connecting Croatia, Bosnia and Herzegovina and Serbia with a length of 759 km; another one is connecting the Former Yugoslav Republic of Macedonia with Greece via a pipeline over a length of 240 km.

Ukraine's crude oil infrastructure includes 4 700 km pipelines, 51 pumping stations, 176 pumping units

11 reservoir parks with total capacity 1 083 000 cubic meter; the transit capacity of crude oil is 114 million tons per year, at input, and 56 million tons per year, at output.

A number of projects of regional significance have been discussed for some time already; these include the AMBO pipeline, aiming to transport crude oil from a new port and terminal in Bourgas – Bulgaria, through the Former Yugoslav Republic of Macedonia to the new export load port and terminal in Vlore – Albania with a length of 870 km; the Pan European Oil Pipeline (PEOP) from Constanta in Romania via Serbia and to Rijeka in Croatia, and finally through Slovenia to Trieste in Italy, with a total length of 1,320 km represents another significant project for the region. Despite the fact, that both projects have been discussed for some time, the investment decision is still pending for both.

Besides networks, the Western Balkans region has also a number of oil terminals located in Albania, Bosnia and Herzegovina, Croatia, Montenegro and Serbia; no plans for new terminals were reported.

In Ukraine, the most important project is the construction of the section of Prody–Plotsk pipeline, in the framework of the Euro-Asian Oil transportation Corridor (EAOTC); this is one of the strategically important projects to diversify sources and routes of oil supply to Ukraine and its transit to the consumers in the EU.

The EAOTC envisages transportation of Caspian oil by Odessa-Brody pipeline and by the southern branch of “Druzhba” pipeline to Ukrainian refineries and its transit to the Central and the Eastern Europe markets and after construction of Brody -Plock oil pipeline – to Poland.

More details on foreseen crude oil infrastructure are presented in Table 13.

Table 6

INDICATIVE VALUES FOR NET TRANSFER CAPACITIES (NTC) IN MW

Winter 2010/11, working day, peak hours (non-binding values)

FROM / TO	AL	BA	HR	ME	MK	RS	UA	SI	SK	HU	GR	RO	BG
AL				200		210					150		
BA			600	400		450							
HR		600				450		1000 SI		1200 HU			
ME	200	400				450							
MK						500					400		400
RS	210	350	350	400	400					600 HU		700	450
UA									400	650 HU		200	
SI			1000 SI										
SK							400			600 HU			
HU			800 HU			700 HU	800 HU		1300 HU			700 HU	
GR	100 150 GR				300								550
RO						500	400			700 HU			600
BG					200	300					500	600	

Source: ENTSO-E (24.02.11) NTC Values Winter 2010-2011: https://www.entsoe.eu/resources/ntc-values/ntc-matrix/

- Values in green - Value provided by only one country. The country providing no value is specified

- Values in purple - Different values are estimated between the two countries involved. The lower value is shown on top and the country providing the higher value is specified; - Values in black - Value agreed by both countries;

Table 7. Electricity interconnectors

Albania		Bosnia and Herzegovina		Croatia		Former Yugoslav Republic of Macedonia		Moldova		Montenegro		Serbia		Kosovo*		Ukraine	
Existing capacity																	
Fierze - Prizren (Albania - Kosovo)	250	Gradacac (BiH) - Đakovo (HR) - [220kV]	301	Divača (SI) - Melina -Velebit (HR) - Mostar (BiH)		400 kV Stip (MK) - Crvena Mogila (BG)	1.212	Balti-Novodnestrovsk 330 kV		400 kV Podgorica2 (MO) - Trebinje (BiH)		Summer/Winter overload settings		Kosovo-Serbia	600	Information is currently under preparation	
Bistrice 1- Myrtos (Albania-Greece)	100	Mostar 4 (BiH) - Zakucac (HR) - [220kV]	301	400/220/110 kV Melina - Tumbri - Ernestinovo (HR)		400 kV Bitola (MK) - Florina (GR)	860	MRSPS-Kotovsk 330 kV		400 kV Ribarevine(MO) - Peć 3 (KS)		Subotica (SR)-Šandorfalva (HU)		Kosovo-Montenegro	400		
Zemblak - Kardia (Albania-Greece)	300	Prijedor 2 (BiH) - Meduric (HR) - [220kV]	301	400//110 kV Ernestinovo (HR) - S. Mitrovica (SRB)		400 kV Bitola (MK)- Tessaloniki (GR)	860	MRSPS-Usatovo 330 kV		220 kV Podgorica1 (MO) - Koplik (AL)		Djerdap 1 (RS) -Portile De Fier (RO)		Kosovo-Albania	210		
Tirana-Podgorica (Albania - Montenegro)	700	Prijedor 2 (BiH) - Mraclin (HR) - [220kV]	301	400//110 kV Ernestinovo (HR) - Ugljevik (SRB)		400 kV Skopje 5 (MK) - Kosovo B (KS)	1.218	MRSPS-Nov.Odesa 330 kV		220 kV Perućica (MO) - Trebinje (BiH)		Niš 2 (SR)-Sofia West (BG)		Kosovo-FYR of Macedonia	400		
		TE Tuzla (BiH) - Đakovo (HR) - [220kV]	301	2x 400/220/110 kV Žerjavinec (HR) - Heviz (HU)		110 kV Kriva palanka (MK) - Skakavica (BG)	123	MRSPS-Artiz 330 kV		220 kV Piva (MO)- Sarajevo 20 (BiH)		Kosovo B - Skoplje 5 (MK)					
		Trebinje (BiH) - HE Dubrovnik (1) / TS Plat (HR) - [220kV]	492	2x 400/220/110 kV Ernestinovo (HR) - Pecs (HU)		110 kV Susica (MK) - Petric (BG)	123	Ribnita-Kotovsk 330 kV		220 kV Pljevlja2 (MO) - Požega (SR)		Prizren -Fierza					
		Trebinje (BiH) - HE Dubrovnik (2) / TS Plat (HR) - [220kV]	492					MRSPS-Vulcanesti-Isaccea 400 kV		220 kV Pljevlja2 (MO) - Bajina Bašta (SR)		Kosovo B -Ribarevina					
		Mostar 4 (BiH) - Konjsko (HR) - [400kV]	1.330					Cioara-Husi 110 kV		110 kV Herceg Novi (MO)- Trebinje (BiH)		Bajina Bašta (SR) - Pljevlja (MO)					
		Ugljevik (BiH) - Ernestinovo (HR) - [400kV]	1.330					Costesti-Stinca 110 kV		110 kV Pljevlja1 (MO) - Zamršljen (BiH)		Požega (SR) - Pljevlja (MO)					
		Višegrad (BiH) - Vardište (SR) - [220kV]	301					Ungheni-Tutora 110 kV		110 kV Nikšić (MO) - Bileća (BiH)		Sremska Mitrovica 2 (SR) - Ugljevik (BiH)					
		Ugljevik (BiH)- Sremska Mitrovica (SR) - [400kV]	1.330									Požega (SR) -Višegrad (BiH)					
		Buk Bijela (BiH) - HE Piva (CG) - [220kV]	366									S. Mitrovica 2 (SR) - Ernestinovo (HR)					
		HE Trebinje 1 (BiH) - (Treb.-Perucica (CG)) - [220kV]	301														
		Trebinje (BiH) - Perucica (CG) - [220kV]	301														
		Trebinje (BiH) - Podgorica (CG) - [400kV]	1.330														
Cross border capacity (MW)	**-**	**Cross border capacity (MVA)**	**9.078**	**Cross border capacity (MW)**		**Cross border capacity (MVA)**	**4.396**	**Cross border capacity (MW)**	**3.000**	**Cross border capacity (MW)**	**1.000**	**Cross border capacity (MW)**		**Cross border capacity (MW)**	**1.610**	**Cross border capacity (MW)**	
New capacity																	
Fierze - Prizren (Albania - Kosovo*)	1.000	Višegrad (BiH) - Bajina Bašta (SR) - [400kV]	1.330	400 kV Coridor across Adriatic coast		Stip (MK) - Nis (SER)/A	1.330	Balti-Suceava 400 kV (A)		400kV Podgorica2 (MO) - Tirana2 (AL)	200	Summer overload settings					
		Direction BiH - Montenegro - [400 kV]	1.330	400 kV Konjsko - Velebit		Bitola (MK) - Elbasan (AL) / P	1.330	Balti-Novodnestrovsk 330 kV (second) (P)		HVDC 400 kV Tivat 2 (MO) -Villanova (IT)	1.000	Pančevo 2 (SR)-Resita (RO) (A) (double OHL)					
		Banja Luka (BiH) - Lika (HR) - [400kV]	1.330	LONG TERM 2017+		Skopje (MK) - Kosovo C (KOS)/P	1.330	Straseni-Ungheni-Iasi 330 kV (P)		400kV Pljevlja2 (MO) - Bajina Bašta (SR)	200	Vranje (RS)- Štip (MK) (A)					
				400 kV Cirkovice (SI) - Heviz (HU) - Žerjavinec (HR)						400kV Pljevlja2 (MO) - Višegrad (BiH)	400	Obrenovac (SR)-Bajina Basta (SR)					
				400 kV Banja Luka (BA) - Lika (HR)								Bajina Basta (SR)-Pljevlja (MO) - Visegrad (BiH)					
				400 kV OHL replacing 220 kV between Brinje and Konjsko (HR)													
Cross border capacity (MW)	**1.000**	**Cross border capacity (MW)**		**Cross border capacity (MW)**		**Cross border capacity (MVA)**	**3.990**	**Cross border capacity (MW)**	**4.000**	**Cross border capacity (MW)**	**1.800**	**Cross border capacity (MW)**		**Cross border capacity (MW)**		**Cross border capacity (MW)**	
Total	**1.000**	**Total**	**13.068**	**Total**		**Total**	**8.386**	**Total**	**7.000**	**Total**	**2.800**	**Total**		**Total**	**1.610**	**Total**	

*)The designation throughout this document is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo declaration of independence.

Table 8. Natural gas supply

Gas supply	Albania			Bosnia and Herzegovina			Croatia			Former Yugoslav Republic of Macedonia			Kosovo*			Moldova			Montenegro			Serbia			Ukraine			Total		
Year	2009	2015	2020[a]	2009	2015	2020[a]	2009	2015	2020	2009	2015	2020	2009	2015	2020	2009	2015	2020[a]	2009	2015	2020	2009	2015	2020	2009	2015	2020	2009	2015	2020
Domestic production (Bcm/year)	0	0	0	-	-	-	3	2	3	-	-	-	-	-	-	-	-	-	-	-	-	0	1	No data	21	25b	26,1b	24	27,93	Incomplete data
Imports [only TOTAL] (Bcm/year)	-	-	1	0	0	0	1	1	2	0	1	1	-	-	-	1	2	2	-	-	-	2	3	No data	app. 33	No data	No data	4	Incomplete data	
Exports [only TOTAL] (Bcm/year)	-	-	-	-	-	-	- 1	- 1	- 0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No data	No data	No data	No data	- 1		
Transit (Bcm/year)	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	18	18	18	NA	NA	NA	0,237^	NA	NA	96	NA	NA			

Table 9. Natural gas consumption

Gas consumption	Albania			Bosnia and Herzegovina			Croatia			Former Yugoslav Republic of Macedonia			Kosovo*			Moldova			Montenegro			Serbia			Ukraine			Total		
bcm	2009	2015	2020[b]	2009	2015	2020[b]	2009	2015	2020	2009	2015	2020	2009	2015	2020	2009	2015	2020[b]	2009	2015	2020	2009	2015	2020	2009	2015	2020	2009	2015	2020
Total of which in	**0,01**	**0,01**	**0,427**	**0,35**	**0,34**	**0,330**	**3,870**	**5,140**	**7,7300**	**0,0791**	**0,9560**	**0,8409**	**0**	**0**	**0**	**1,290**	**1,420**	**1,540**	**0**	**0**	**0**	**1,744**	**3,910**	**No data**	**66,300**	**62,400**	**53,700**	**73,642**	**74,176**	
Power and or heat generation	0	0	0,089	0,000	0,000	0,000	0,8800		0,7200	0,0430	0,8830	0,719	0	0	0	0,023	No data	0	0	0	0	0,586	0,308	No data	7,500	13,000	11,200	9,032	Incomplete data	Incomplete data
Steam and hot water **	0	0	No data	No data	No data	No data	0,3700		0,3000	No data	no data	No data	0	0	0	No data	No data	No data	0	0	0	No data		No data				0,370		
Non energy use**	0	0	No data	No data	No data	No data	0,4140		1,0000	No data	no data	No data	0	0	0	No data	No data	No data	0	0	0	0,098	0,667	No data				0,414		
Production of oil** and gas +loses	0	0	No data	No data	No data	No data	No data		0,8700	No data	no data	No data	0	0	0	No data	no data	No data	0	0	0	0,065	0,125	No data				No data		
Industry	0,01	0,01	0,043	0,23	0,19	0,212	0,3800		0,9500	0,0348	0,0580	0,076	0	0	0	0,1599	0,17	0,18	0	0	0	0,619	2,810	No data	30,700	15,800	14,000	32,134		
Transport	0	0	0,000	0,00	0,00	0,000	0		0,1800	0,0003		0,000	0	0	0	0,0231	0,18	0,28	0	0	0	0,00		No data	no data	2,800	3,400	0,029		
Residential	0	0	0,188	0,05	0,05	0,05	0,6995		1,1300	0,0010	0,0128	0,038	0	0	0	0,3736	0,44	0,49	0	0	0	**0,249**		No data	no data	16,000	14,000	1,373		
Commercial and public services	0	0	0,107	0,01	0,01	0,01	0,1625		0,2600	0,0000	0,0022	0,008	0	0	0	0,0842	0,09	0,11	0	0	0	0,120		No data				0,375		
Other	0	0	0,000	0,06	0,06	0,06	0,0196		0,0100				0	0	0	0,6257	0,53	0,49	0	0	0	0,007		No data	no data	15,300	11,100	0,712		
Winter peak demand (Mcm/day) (detail whether it is a 1-in-2 winter or a 1-in-20 winter	NA	NA	no data	no data	No data	No data	No data	no data	no data	No data	no data	No data	NA	NA	NA	NA	NA		NA	NA	NA	16	18	No data				NA		

[a] *data for 2021*

[b] *Data from Ukraine Energy Strategy 2006-2030*

^ *data from the Regulator's Report*

NOTE: Forecast supply/demand based on Base scenario, except for Croatia - Sustainable scenario and for Serbia (combination low and high scenarios)

** This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and ICJ Opinion on the Kosovo declaration of independence.*

Table 10. Natural gas infrastructure

Albania		Bosnia and Herzegovina		Croatia		Former Yugoslav Republic of Macedonia		Kosovo*		Moldova		Montenegro		Serbia		Ukraine	
Existing interconnection capacity (bcm/y)																	
NA	NA	NA	NA	Zabok (CR) - Rogatac (SLO)	2	Bulgaria - FYR of Macedonia	1	NA	NA	Balti (MLD)-Ungheni (RO)	1	NA	NA	Kiskundoroysma (HU) - Horgos (SRB)	5		
		Loznica (SRB) - Zvornik (BH)	0,75-1	Donji Miholjac (CR) - Dravaszerdahely (HU)	7					Tocuz-Cainari-Mereni	2			Loznica (SRB) - Zvornik (BH)	1		
				Pula -currently production pipeline possible reverse flow	2												
Existing storage capacity (bcm)																	
NA	NA	NA	NA	Okoli	1	NA	NA			NA	NA	NA	NA	Banatski Dvor	0		
New interconnection capacity (bcm/y)																	
IAP (Ionian - Adriatic Pipeline)					up to 5	FYR of Macedonia-Bulgaria	0			Ungheni (MLD) -Iasi (RO) (A	1	IAP	up to 5				
		Zagvozd (CRO)-Posusje (BH) or Ploce (CRO)-Mostar (BH)a	2	Slobodnica - Bosanski Brod (BiH)	1,5 -2,5	FYR of Macedonia-Greece (Gevg)	1							(P) Interconnection SRB - RO: Mokrin - Arad	1-1,6		
		Brod (BH)-Slavonski Brod (CRO)a	3	Rakovica - Tržac (BiH)	1- 1,5	FYR of Macedonia-Greece (Bitola)	1							Reverse flow capacity RO-SRB	1-1,6		
				Imotski - Posušje (BiH) or Ploče - Mostar	1,5-2,5	FYR of Macedonia-Albania	1							(P) Interconnection SRB - BUL: Dimitrovgrad	1,8-4,5		
				Zabok - Rogatac (SLO)	5	FYR of Macedonia-Kosovo*	1							Reverse flow capacity BUL-SRB	1,8-4,5		
				Zlobin - Rupa (SLO)	15	FYR of Macedonia - Serbia	1							(P) Interconnection SRB - BIH: Mačvanski Prn	1		
				Omišalj - Casal Borsetti (ITA)	15									Reverse flow BiH-SRB	1		
				Prevlaka - Dobreč (MNE) - IAP	4									(P) Interconnection SRB - FYROM: Preševo	NA		
				Sotin - Bačko Novo Selo (SRB) - S. Stream	3									UGS Itebej	0,5-1,0		
New LNG capacity (bcm)																	
				LNG terminal stationed	4												
				LNG terminal floating	1												

**)The designation throughout this document is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo declaration of independence.*

(A) - approved; (P) - Planned

a) projects not nominated by the CPs, but granted funds by the WBIF for feasibility studies

b) Bosnia and Herzegovina - existing interconnection capacity assessed

Table 11. Crude oil and petroleum products supply

Crude oil and petroleum products supply (ktoe)	Albania		Bosnia and Herzegovina		Croatia		Former Yugoslav Republic of Macedonia		Kosovo*[1]		Moldova		Montenegro		Serbia		Ukraine		Total	
Year	2009	2020	2009	2021	2009	2020	2009	2020	2009	2020	2009	2021	2009	2020	2009	2020	2009	2020	2009	2020
Domestic production	610	702	590	1.480	833	694	-		-	37	40	219	-	-	690		13.715	16.600	16.478	data not available
Imports	1.087	1.506	2.120	1.730	5.329	5.916	1.381		489	663	612	407	348	643	3.540		12.204	16.600	27.109	
Exports	403	450	750	1.640	1.920	1.991	366		-	-	-	22	3	-	350		2.617	3.200	6.408	
Transit (mil toe)																	21	70		

This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and ICJ Opinion on the Kosovo decleration of independece.

Table 12. Crude oil and petroleum products consumption

Crude oil and petroleum products consumption (ktoe)	Albania		Bosnia and Herzegovina		Croatia		ugoslav Republic of Mace		Kosovo*[1]		Moldova		Montenegro		Serbia		Ukraine		Total	
Year	2009	2020	2009	2021	2009	2020	2009	2020	2009	2020	2009	2021	2009	2020	2009	2020	2009	2020	2009	2020
Total of which in	1.131	1.673	1.650	1.640	3.845	6.579	905	1.229	526	699	569	567	398	643	3.704		23.166	28.900	35.893	data not available
Power generation	-	-	30	30	510	1.059	61	95	-	-	31	19	-	-	520				1.151	
Industry	150	166	110	80	386	319	149	214	100	133			69	211	780				1.744	
Transport	754	1.137	1.320	1.420	2.111	3.622	429	659	342	455			277	385	2.210				7.444	
Residential	73	57	70	10	249	132	149	115	26	35			5	13	-				572	
Commercial and public services	48	137	40	10	101	70	74	123	47	63			26	34	110				447	
Other	105	176	80	80	489	1.377	43	23	11	14			21	1	80				829	

This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and ICJ Opinion on the Kosovo decleration of independece.

Table 13. Crude oil and petroleum products infrastructure

Albania		Bosnia and Herzegovina		Croatia		Former Yugoslav Republic of Macedonia		Kosovo*		Moldova		Montenegro		Serbia		Ukraine	
Existing oil interconnectors (Mt/y)																	
NA	NA	Adriatic Pipeline (Adria)	20	Adriatic Pipeline (Adria)	20	VARDAX (Thessaloniki -Skopje)	3	NA	NA	NA		NA	NA	Adriatic Pipeline (Adria); Serbian part of pipeline is called JP Transnafta pipeline	20	NA	NA
		Total length 759 km		Total length 759 km		Total length 240 km								Total Serbian pipe length 154,4 Kmm out of total 759 km			
		Construction Cost 1,2 Billion EUR		Construction Cost 1,2 Billion EUR		Construction Cost 85 Million EUR								Construction Cost 1,2 Billion EUR			
		Designed and built (1974 - 1979)		Designed and built (1974 - 1979)		Built in 2002								Designed and built (1974 - 1979)			
Planned oil interconnectors (Mt/y)																	
AMBO Project	30	NA	NA	Pan European Oil Pipeline (PEOP)	40	AMBO Project	30	NA	NA	NA		NA	NA	Pan European Oil Pipeline (PEOP)	40	NA	NA
Total length 870 km				Total length 1,320 km		Total length 870 km								Total length 1,320 km			
Construction Cost ca. 1,8- 2 Billion EUR				Construction Cost ca. 2.5 Billion EUR		Construction Cost ca. 1,8- 2 Billion EUR								Construction Cost ca. 2.5 Billion EUR			
Earliest complition date - uncertain				Earliest complition date - uncertain		Earliest complition date - uncertain								Earliest complition date - uncertain			
Existing oil terminals																	
1. ARMO - BRANCH -VLORE		PLOCE		1. OMISALJ		NA	NA			NA	NA	LUKA BAR		1. NOVI SAD			
WATER DEPTH (draught) - m	20	WATER DEPTH (draught) - m	12	WATER DEPTH (draught) - m	30							WATER DEPTH (draught) - m	13	WATER DEPTH (draught) - m			
(UN)LOADING CAPACITY - m3/h	NA	(UN)LOADING CAPACITY - m3/h	up to 1.0	(UN)LOADING CAPACITY - m3/h	5.000							(UN)LOADING CAPACITY - m3/h	NA	(UN)LOADING CAPACITY - m3/h			
STORAGE CAPACITY - m3	30.000	STORAGE CAPACITY - m3	84.000	STORAGE CAPACITY - m3	820.000							STORAGE CAPACITY - m3	120.000	STORAGE CAPACITY - m3	155.000		
2. PETROLIFERA - VLORE				2. SISAK										2. PANCEVO			
WATER DEPTH (draught) - m	9			WATER DEPTH (draught) - m	NA									WATER DEPTH (draught) - m			
(UN)LOADING CAPACITY - m3/h	800			(UN)LOADING CAPACITY - m3/h	NA									(UN)LOADING CAPACITY - m3/h			
STORAGE CAPACITY - m3	65.800			STORAGE CAPACITY - m3	100.000									STORAGE CAPACITY - m3	166.565		
3. ROMANO PORT - DURRES				3. ZADAR										3. NAFTAGAS			
WATER DEPTH (draught) - m	12			WATER DEPTH (draught) - m	10 - 12 m									WATER DEPTH (draught) - m			
(UN)LOADING CAPACITY - m3/h	450			(UN)LOADING CAPACITY - m3/h	NA									(UN)LOADING CAPACITY - m3/h			
STORAGE CAPACITY - m3	NA			STORAGE CAPACITY - m3	60.000									STORAGE CAPACITY - m3	118.060		
				4. VIRNJE													
				WATER DEPTH (draught) - m	NA												
				(UN)LOADING CAPACITY - m3/h	NA												
				STORAGE CAPACITY - m3	40.000												
				5. SPLIT													
				WATER DEPTH (draught) - m	12												
				(UN)LOADING CAPACITY - m3/h	NA												
				STORAGE CAPACITY - m3	77.000												
New petroleum pipeline																	
														SINGLE PETROLEUM PRODUCTS PIPELINE			
														Total length in km	402		
														Transport capacity:			
														Diesel Mt/y	3		
														Gasoline Mt/y	2		
														6 main segments in km:			
														Novi Sad – Sombor	92		
														Novi Sad – Pancevo	91		
														Pancevo – Beograd	10		
														Pancevo – Smederevo	35		
														Smederevo – Jagodina	87		
														Jagodina – Nis	88		
														6 Terminals in:			
														Sombor, Novi Sad, Pancevo, Smederevo, Jagodina and Nis			
New Storage Capacity to comply with Directive 2009/119/EC - Oil Stocks																	
New construction - thousand m3	97	New construction - thousand m3	374	New construction - thousand m3	750	New construction - thousand m3	244	New construction - thousand m3	223	New construction - thousand m3	327	New construction - thousand m3	39	New construction - thousand m3	837	New construction - thousand m3	9.225
Modernisation - thousand m3	140	Modernisation - thousand m3	182	Modernisation - thousand m3	-	Modernisation - thousand m3	-	Modernisation - m3	34	Modernisation - thousand m3	-	Modernisation - m3	67	Modernisation - thousand m3	138,3	Modernisation - thousand m3	-
Investment for new storage - Mil Eur	21	Investment for new storage - Mil Eur	86	Investment for new storage - Mil Eur	200	Investment for new storage - Mil Eur	50	Investment for new storage - Mil Eur	54	Investment for new storage - Mil Eur	78	Investment for new storage - Mil Eur	9	Investment for new storage - Mil Eur	172	Investment for new storage - Mil Eur	2.200
Inv. for storage modernisation - Mil Eur	13	Inv. for storage modernisation - Mil Eur	17	Inv. for storage modernisation - Mil Eur	-	Inv. for storage modernisation - Mil Eur	-	Inv. for storage modernisation - Mil Eur	3	Inv. for storage modernisation - Mil Eur	-	Inv. for storage modernisation - Mil Eur	7	Inv. for storage modernisation - Mil Eur	4	Inv. for storage modernisation - Mil Eur	-

ANNEX 2

SWOT ANALYSIS OF THE CONTRACTING PARTIES

SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis of the Energy Community Contracting Parties, as a region

A short analysis of the strong and weak points, as well as the opportunities and threats of the region, as a whole, leads to some interesting common features, as presented bellow.

Strengths

The region's greatest strength is the large and diverse renewable energy potential, as well as other natural resources, even if on smaller scale (gas, oil, and lignite).

The current, relatively low energy consumption per capita, gives an indication that the region has a good growth potential. Similarly, although markets are small, in the Western Balkans and Moldova, they are rapidly growing. When considering the region's labour costs, the price of land or raw materials, the region has a comparative advantage in energy production.

A strong political will to become members of the European Union unites most of the Contracting Parties. Under the Energy Community Treaty, the nine Contracting Parties committed to binding reform obligations and deadlines, as well as, regional integration. The region can also build on the experience gained from the past forms of regional cooperation.

Weaknesses

With the exception of Ukraine, the region consists of small and fragmented markets. It is largely dependent on energy imports. Natural gas, in particular, is mainly imported from a single source (Russia), via a main transit route (Ukraine). The prevailing gas networks are positioned at the end of import routes and lack interconnectors with the neighbouring countries.

The fact that power generation is dominated by a few incumbent companies limits competition. The region's market reforms are incomplete, for now, and at different levels among the Contracting Parties. As a result, the markets are not fully functioning and are not liquid enough to be attractive. Also, the capacity allocation for cross border interconnections tends to lack transparency. Prices and tariffs are not reflecting the real costs of generation, network operation and supply. High energy intensity is also characteristic for the whole region. As regards generation and transmission, in a large number of cases, the use of available capacity is insufficient, leading to inefficient operation and higher costs. At the same time, a large share of the coal and lignite fired power plants are either close to, or have already passed their expected life spans. In general, the power station equipment, high voltage power lines and distribution networks are subject to a rather advanced level of degradation. And finally, there is a large gap between the need for and the actual investments inflow in the energy sector, at approximately 44.6 billion Euros. Despite the region's potential, the use of renewable energy sources remains insufficient.

Opportunities

Being at the cross roads between Central Europe, Southern Europe and the Middle East, the region's position also grants it an important geopolitical significance. With Ukraine joining the Energy Community, the most significant route for transport of Russian natural gas to Europe has been integrated into the internal market.

A recent World Bank study listed the numerous opportunities to be gained from the wholesale market opening in the region.[22] Above all, higher electricity and gas prices are expected to attract new investments, thus boosting the overall security of supply. The wholesale market opening would help pave the way for competition, enabling an easier market entry for new suppliers. A common, well interconnected market could better attract new gas suppliers to the region. Thanks to competition, consumers would benefit from broader product and service assortment.

New investments should be directed predominantly towards new renewable energy generation and natural gas fired power plants, whose potential both in term of enhanced security of supply and contribution to reduced emission remains untapped as of today in the region. The latter is particular important also in light of the role of natural gas can play as back up fuel in a market with high penetration of interruptible energy source as the ambitions on renewables seem to imply. In general investment should be directed towards any project that would help meeting the requirements of the LCP Directive.

Investments in renewable energy could balance the excess demand, resulting in a more sustainable energy mix and helping to meet the renewable energy targets. All in all, the region should apply modern, efficient technologies that reduce the impact on the environment. Also, there is a large potential for energy efficiency in the region. This can enhance the security of supply, increase competitiveness and reduce energy dependence and energy costs, as well as, the harmful impact of energy systems on the environment.

Threats

The sheer size of the investment required to refurbish, or replace the aging coal and lignite fired plants poses a serious challenge for the region. Should the region not succeed in attracting sufficient inflows of investments, a shortage of energy supply and load shedding could result. This would also constrain economic growth. Besides, there is also a danger that the process of uneven market liberalization widens the gap between the nine Contracting Parties. The reverse side of the market reforms, such as increased energy prices combined with the lack of accompanying measures to protect vulnerable consumers, can also be perceived as a potential threat. This could be further escalated by unjust market conditions where some consumers pay the high market prices, while others still benefit from the low regulated tariffs.

[22] South East Europe Wholesale Market Opening, study April 2010

ANNEX 3

CURRENT TRENDS AND SCENARIO RESULTS

Overview of the Scenario Analysis

After discussion within the Task Force, three scenarios were selected. These three scenarios, and their key features, are shown in Table Scenarios Overview.

To evaluate the scenarios, it is useful to have a software based energy planning model; for this analysis, such a model was not readily available and so the Task Force built a model in spreadsheet form, to allow for an analysis of energy demand by type, current and planned new capacities, retirements, fuel prices, investment needs, energy costs, environmental factors and capacity adequacy on a regional basis to be analysed across the three scenarios. Additionally, the analyses relied extensively on other work undertaken within the Energy Community (e.g., Study on the Potential for Climate Change Combating in Power Generation in the Energy Community, March 30, 2011, the South East Europe: Regional Gasification Study, January 2009, or the ENTSO-E Scenario Outlook and System Adequacy Forecast for 2011-2025). As with any analysis, the results should be viewed with some caution; however, the Task Force believes the analysis undertaken is sufficiently rigorous to demonstrate the importance of considering new regional development paths for the Energy Community's energy sector.

The current trends scenario presumes that the energy system will develop slowly (and inadequately) as seen in the past several years. It presumes that large combustion units that should be retired are delayed further (beyond 2020) in an effort to try to retain as much of the current generation stock as possible, and that little new generating capacity is built. Investment needs focus on keeping aging plant in service. It is critical to note that under this scenario, electricity demand is not able to be met by 2020, implying curtailments or massive imports, and these shortages extend further into 2025 and 2030. These curtailments also contribute to higher losses, given the impact on technical losses that results from a rationing or curtailment regime for electricity. Of course, there is always the possibility of additional external imports of electricity into the region to make up such short-falls, but this should not be relied upon as a sound and secure development strategy. At the same time, there is an assumed substitution from electricity to other fuels as consumers adjust to a lack of adequate electricity supply by taking up other measures and alternative fuel supplies to meet their energy needs that electricity cannot provide (e.g., kerosene, wood, diesel for generators). Even though the investment needs are lower than with the other two scenarios, the supply costs are much higher due to reduced efficiency and substitution to other fuels.

The minimal investment cost scenario examines the impact of a modest amount of activity in an attempt to move towards partial compliance with the energy efficiency and renewable energy targets. It provides an overall reduction in total energy usage of about five percent, roughly half of the target, and a level of renewable energy supply consistent with the targets reported by the various CPs, which are at a level below the renewable energy targets. Importantly, it presumes that the electricity system will be able to meet demand fully. This scenario is more expensive than current trends in terms of total energy system costs, but importantly, even though the investment needs are much higher, on an annualized basis, the costs are not vastly different between the two scenarios. Although the investment needs are higher, the

savings in primary fuel costs offset much of this, to lead to a result in which meeting basic energy demands costs 20% more than the current trends scenario. When one considers the damage caused to an economy by an unreliable electricity system, which could easily constrain economic growth and investment attraction, it is easy to see the importance of moving from the current trends to a scenario that ensure demand requirements are met.

The third scenario is a low emissions/sustainable scenario that assumes the energy efficiency targets are met (9% reduction in total final energy consumption by 2018), that renewable energy resource targets are also achieved, and importantly, that the 'gas ring' is introduced into the Western Balkans, allowing for both gas supply at the distribution level and for gas supply to be used in power generation. Not surprisingly, this scenario shows the highest amount of investment required (at almost 130 billion Euros from 2012 through 2030[23] for the Contracting Parties), but at the same time, the total energy system costs (fuel, operations and maintenance and annual investment needs) are almost identical between the minimal investment cost scenario which just meets demand, and the low emissions/sustainable scenario that offers added benefits (in addition to a modernized energy system, the emissions of carbon are reduced by close to 17% by 2020 when comparing minimal investment costs and the low emissions/sustainable scenario, and approximate 30% when comparing the low emissions development path with current trends).

The scenario analysis was crafted using various assessments relying on information provided by the Contracting Parties as well as other primary and secondary information sources. The specific processes used for the scenarios included the following five main elements:

- Energy demand analysis;
- Supply resource assessment for both generation and capacity;
- Investment cost analysis;
- Fuel price and O&M analysis; and,
- Environmental analysis.

The detailed process flow associated with each of the above elements is shown in the following figures.

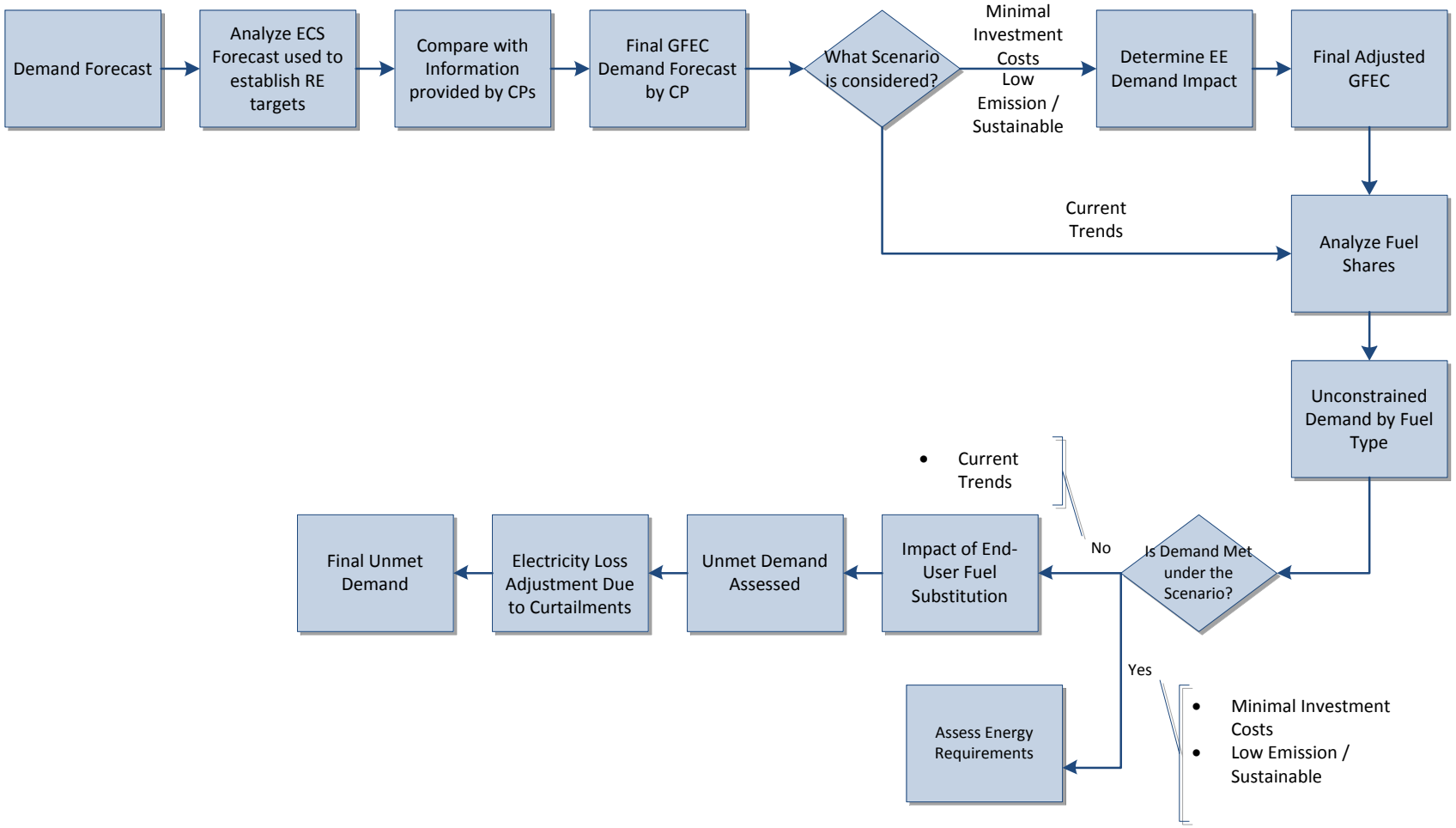
The information that was used in the scenario analyses also came from a variety of sources including the Contracting Parties (e.g., information on new projects planned, 2009 reference year data and in some cases, scenarios for energy development), from the Energy Community Secretariat (e.g., energy demand forecasts, information on fossil plants), from other donor reports (e.g., *Lights Out? South East Europe: Regional Gasification Study Final Report),* from other institutions (e.g., ENTSO-E, IEA) and from data collected by the consultant (e.g., additional plant specific information such as possible project development and retirements).

[23] Without Ukraine, this figure is closer to 60 billion Euros.

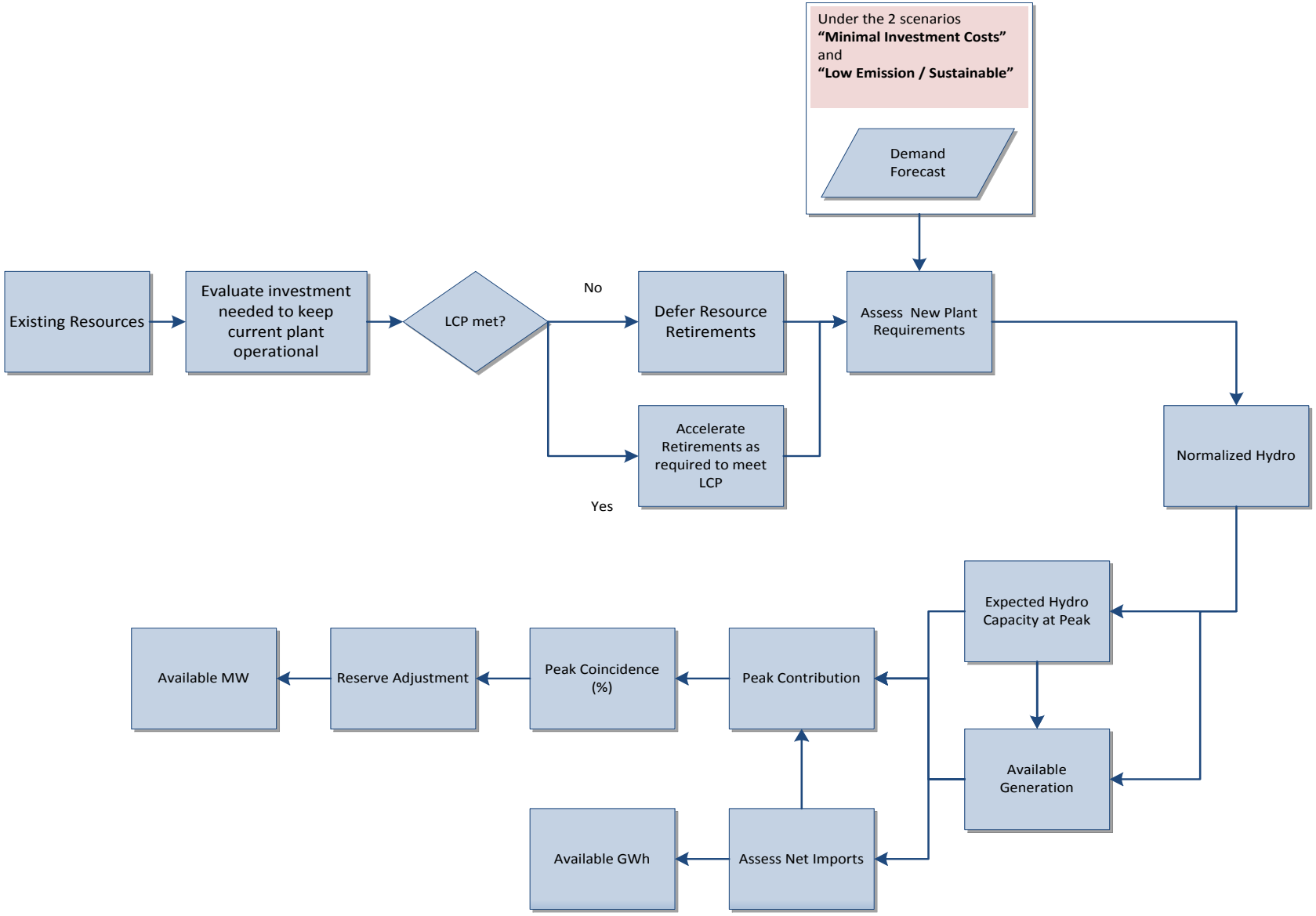
Scenario Overviews

Scenario:	*Current Trends*	*Minimal Investment Cost*	*Low Emissions/Sustainable Growth*
Objective:	This scenario presumes that current trends seen in the region over the past decade continue into the future. The expectation is that there will be insufficient growth in energy system supply to meet demand and that as a result, economic growth will be constrained. This scenario is designed to show the possible impact should present trends continue unabated.	This scenario focuses primarily on assessing the cost implications (investment and energy system costs) associated with meeting energy demand and minimum cost, without necessarily achieving compliance with the EE and RE targets, as well as the Large Combustion Plant Directive.	This scenario examines what may be achievable through the aggressive promotion of energy efficiency and renewable energy resources, to put the region on a low carbon development path. The present EE and RE targets are achieved due to strong promotion efforts, and the Large Combustion Plant Directive is achieved. Energy demand is met.
Assumptions:			
Economic growth	Supply demand mismatch causes economic growth to be constrained, to put the region on a slow growth development path. This will be reflected as a reduced rate of economic growth from the base forecast used by the Renewable Energy Task Force.	Economic growth assumptions will be taken from the forecast used by the Renewable Energy Task Force, to establish the RE targets (IMF basis for assumptions).	Economic growth assumptions will be taken from the forecast used by the Renewable Energy Task Force, to establish the RE targets (IMF basis for assumptions).
Demand forecast	Base demand uses the recent demand forecast prepared for the Renewable Energy Task Force, adjusted to account for losses. However, based on the supply demand balance and lack of sufficient new resources, this demand will not be met.	Base demand uses the recent demand forecast prepared for the Renewable Energy Task Force, adjusted to account for losses.	Base demand uses the recent demand forecast prepared for the Renewable Energy Task Force, adjusted to account for losses.
Fuel prices	IEA forecast	IEA forecast	IEA forecast
Established targets:			
EE targets	Not achieved	Possible compliance with EE targets	Achieved
RE targets	Not achieved	RE targets likely not achieved	Achieved
Large combustion plant directive	Not achieved	Full compliance of all current thermal power plants with the Large Combustion Plant directive is not achieved	Achieved
Energy system infrastructure:			
New electricity plant	Only new projects included are those already committed	This scenario will use the new projects as already committed, along with additional plant options to meet demand	This scenario will use the new projects as already committed, along with additional plant options to meet demand, with a priority given to low carbon (RE and EE) options
Natural gas access	No change from present	This scenario will be examined using two sensitivity assumptions, one with expanded gas access (the Gas Ring) and the other without.	Natural gas ring is developed by 2017
Lignite/coal plants	Current stock remains in service, with increasing O&M costs based on industry cost curves	Plant by plant analysis for retirement, or refurbishment	Plant by plant analysis for retirement, limited refurbishment
Electricity transmission interconnection capacity	Same at present, only new projects included are those already committed	Same at present, only new projects included are those already committed	Expanded interconnections are assumed to capture efficient trading options
Evaluation criteria:			
Each of the scenarios will be assessed according to the following:	1. Energy system costs (2020, 2025, 2030) 2. Investment requirements to achieve scenario by type of resource (e.g., transmission interconnection, new generating plant, refurbished plant to meet directive) 3. External socials cost and benefits (quantitative and qualitative) 4. 4. Emissions CO2 (Gt)		

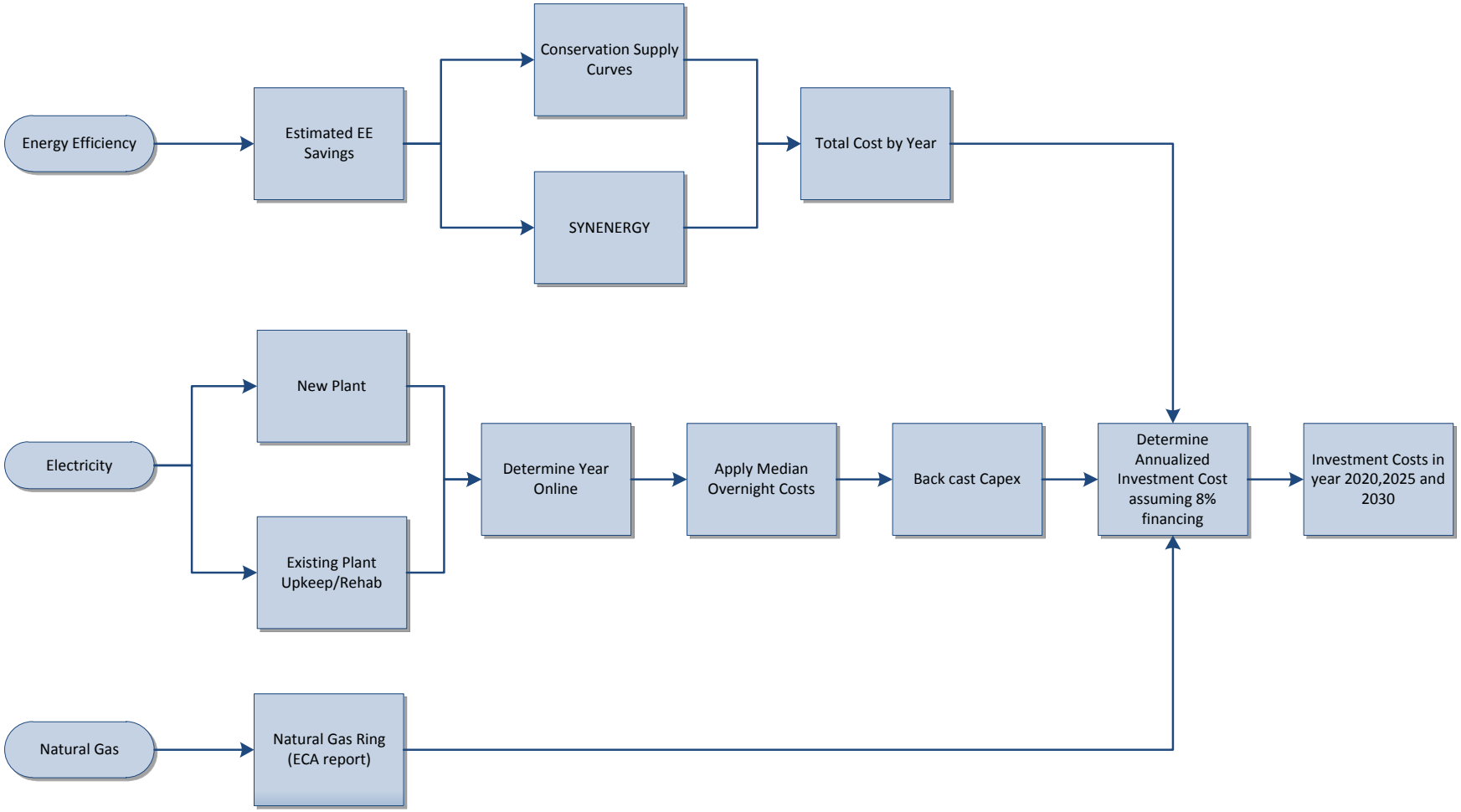
Approach – Energy Demand Analysis



Approach – Supply Resource Analysis



Approach – Investment Cost Analysis



Approach – Fuel, O&M and CO2 assessment

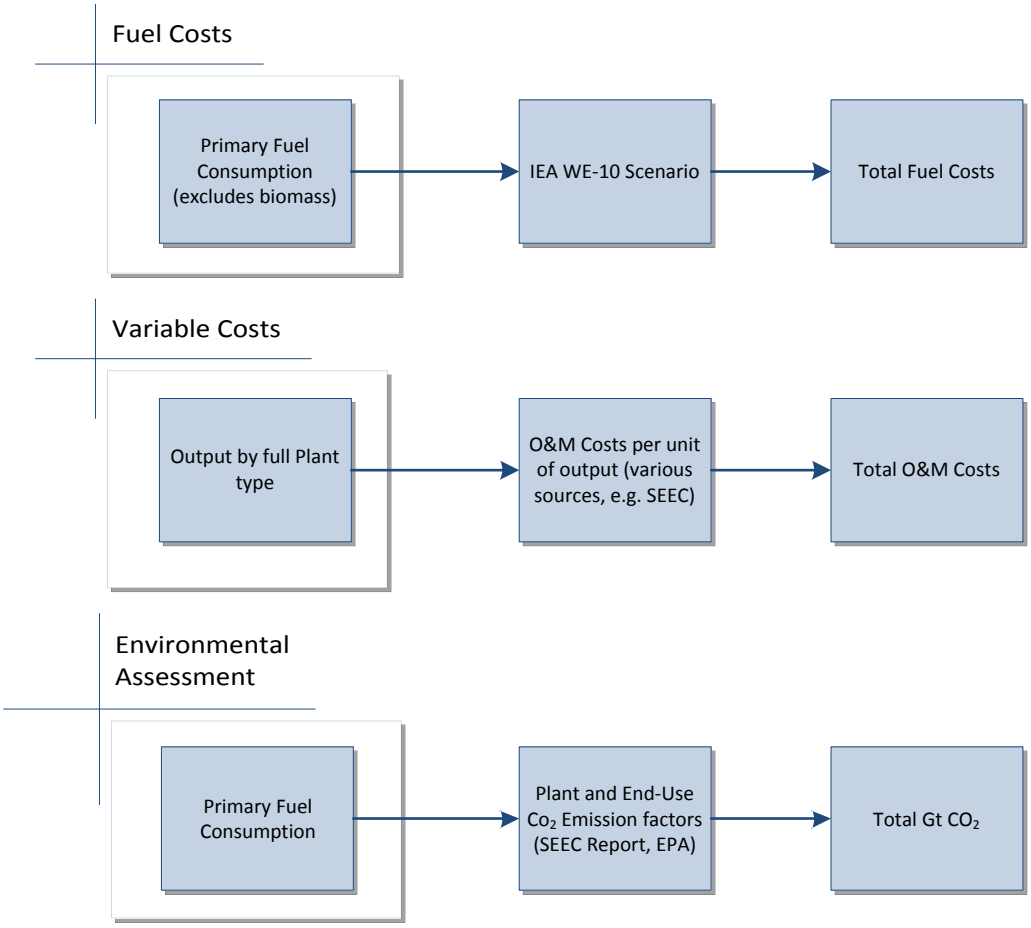


Table Annex 3 –1 shows key assumptions and sources of information used in the study.

Table Annex 3-1: Assumptions and Sources

Key Assumptions and Sources		
Inflation rate		
Country	**Rate (as of 2012)**	**Source**
Albania	3%	International Monetary Fund, World Economic Outlook Database, April 2012
Bosnia & Herzegovina	2.40%	
Croatia	3%	
Kosovo	1.30%	
Macedonia	2%	
Moldova	5%	
Montenegro	1.30%	
Serbia	4%	
Ukraine	5%	
Financing rate for new capital expenditures		
8%		
Period for annualizing new investments		
30 years		
Energy demand forecast		
Updated Calculation of the 2020 RES Targets for the Contracting Parties of the Energy Community, March 6, 2012, Energy Community Secretariat (this does not include Croatia, which was estimated separately).		
Fuel Price Forecast		
IEA WEO 10 and DECC Fossil Fuel Price Projections 2011		
Overnight Construction Cost		
Fuel Type Plant	**$/kW**	**Source**
Non-hydro renewables	2349	IEA - Projected Costs of Generating Electricity 2010 (adjusted for inflation and spread over several years depending on
Gas-fired power plants	1069	

Coal-fired power plants (CC)	3838	the type of plant being constructed)
Nuclear power plants	4102	
Hydro	1500	
Construction Period		
Fuel Type Plant	**No of Years**	**Source**
Non-hydro renewables	1	IEA - Projected Costs of Generating Electricity 2010
Gas-fired power plants	2	
Coal-fired power plants	4	
Nuclear power plants	7	
Hydro	2	

Capex Allocation Scheme		
Fuel Type Plant	**Start & End Ratio**	**Middle Year Ratio (If Any)**
Non-hydro renewables	(50%x2)	-
Gas-fired power plants	(50%x2)	-
Coal-fired power plants	(20%x2)	(30%x2)
Nuclear power plants	(5%x2)	(18%x5)
Hydro	(50%x2)	-
Energy efficiency target		
9% savings by 2020 relative to 2009 reference year assumed for all Contracting Parties; same trending assumed to determine savings for 2025 and 2030.		
RES targets		
Variable, country dependent, based on demand assumptions and proposed RES targets		
Costs of energy efficiency		
Annual and recurring cost estimate, based on both conservation supply curves and the efforts of the SYNENERGY project. Generally, the average EE measure to achieve the targets was assumed to cost approximately 75% of the cost of the primary fuel being displaced.		
Generation plant information (e.g. heat rates, retirements, possible new plants)		
Variety of sources but for all Contracting Parties other than Ukraine and Moldova, t*he Study on the Potential for Climate Change Combating in Power Generation in the Energy Community*, March 30, 2011, prepared by South East Europe Consultants Ltd. was used. Additionally, generation plant information and capacity expansion/retirement plans was collected directly by the consultant to supplement the information used in this analysis.		
Variable O&M costs for plant		
Source: *Study on the Potential for Climate Change Combating in Power Generation in the Energy Community*, March 30, 2011, prepared by South East Europe Consultants Ltd.		
Costs and energy impact of gas ring		
South East Europe: Regional Gasification Study, Final Report, January 2009, prepared by Economic Consulting Associates Ltd.		
Transmission capital costs		

Project specific estimates for the projects reported by the Contracting Parties in response to the data questionnaire of the Energy Community's Regional Energy Strategy Task Force.
Transmission supply adequacy to support imports and exports
Various sources including *ENTSO-E Scenario Outlook and System Adequacy Forecast 2011-2025*, as well as other USAID program efforts in the region
Electricity system reserve requirement
15% assumed as required to ensure reliable electricity supply at system peak period.
Peak demand regional coincidence factor
80%. This figure is believed to be slightly lower than the actual coincidence seen at present; should this factor be too low, then the actual capacity requirements would increase further.
Hydropower contribution to meet peak demands
The consultant collected and analyzed actual hydro contribution for historic winter peak in several of the Contracting Parties.

ANNEX 4

PUBLIC CONSULTATION RESULTS

Public consultation on the development of the Energy Strategy of the Energy Community

The general objective of the Energy Community is to create a stable regulatory and market framework in order to ensure that energy is accessible in a sustainable, secure and competitive way, and as a consequence, to facilitate social and economic development in all Contracting Parties. It aims in particular to:

- Attract investment in power generation and networks in order to ensure stable, continuous and affordable energy supply that is essential for economic development and social stability;
- Create an integrated energy market allowing for cross-border energy trade and linked to the EU market ;
- Enhance security of supply;
- Improve the environmental situation in relation with energy supply in the region and make better use of existing resources via higher level of energy efficiency on the demand side and higher use of renewable energy sources.

Although considerable steps have been taken, the region's attractiveness for investments must be further improved. The 2011 report of the European Commission on the Energy Community[24] pointed out that "*The Energy Community faces investment challenges that are well known, such as those resulting from the modernisation of the electricity transmission and distribution networks and interconnectors, from the EU requirements and measures related to energy efficiency or from implementation of the Large Combustion Plants Directive, the Sulphur in Fuels Directive and emissions standards of the European Union, requiring rehabilitation of existing generation plants or decommissioning and possible replacement of a number of them by December 2017. … Despite the high level of funding from international financial institutions in the region, the level of private investments remains relatively low. Reasons for that include the unreliable implementation of the regulatory framework (rules are not implemented and/or not correctly applied) and the small scale of national markets (the very same reasons that gave birth to the concept of the Energy Community back in 2005)*". It should be clearly visible for investors that a stable regulatory framework is in place, the political commitments are underpinned by concrete actions, and that there is a clear vision on the region's energy path for the coming decades.

The opportunities in public funding in the current economic crisis are becoming more and more limited and private investments are channelled to projects, which are well-planned, utilize the synergies between two or more countries and/or sectors, have a sound financial framework for the implementation and show commercial viability. The available support sources must be used to their maximum efficiency and for the highest benefit of as many countries as possible. The modernization of energy infrastructure (including power generation facilities) will require enormous investments to adopt the current energy production and consumption patterns to the fundamental changes required by climate change[25].

[24] http://ec.europa.eu/energy/gas_electricity/community/doc/20110310_report_en.pdf

[25] A study commissioned by the Energy Community in 2010, showed that there are 65 TPP units in the Energy Community excluding Moldova and Ukraine, with total installed capacity of 10,805 MW; their average weighted operation life by the end of 2010 was 30 years, as compared to 25 years which is the standard technical life of

However, infrastructure development is also one of the basic pillars to achieve the goals of the Energy Community.

The size of the challenge and the scarcity of resources make it necessary that the individual Contracting Parties form their strategies and policies in way that strengthens the region as a whole. National energy markets are too small to be attractive for investments such as in large power generation units. Creating a regional market requires strategic development planning, based on the most economic and environmental friendly options for the region, taking advantage of the natural resources available, but also taking into consideration the interconnections available or planned. Thus, having a coordinated regional approach is of primary importance to achieve the common goals.

Realizing this need, the 9th Ministerial Council approved in its conclusions the establishment of a Task Force, whose objective is to develop a Regional Energy Strategy, which will take stock of where the region currently stands and where it is heading in the next decade. The Strategy will draw up a list of regional objectives and the main actions that are required to reach them.

The aim of the public consultation is to collect the views of concerned stakeholders[26] about the main issues to be included in the Strategy.

Questions:

1. What are the most important challenges, which the region as a whole is facing in terms of moving towards secure, sustainable and competitive energy?
2. What are the strengths and opportunities that make the region attractive to investors?
3. What concrete and measurable objectives would you include in the Strategy (max. 5 objectives with a description of not more than 200 words per objective)?
4. What concrete actions would you see to achieve the drafted objectives (not more than 10 actions, with a description of not more than 100 words per action)?
5. In order to achieve a sufficient level of market integration, security of supply and to improve the environmental situation in the Energy Community related to renewable energy and energy efficiency, significant investments are needed. In your view, what are the main barriers to necessary investments and how could they be removed in order to reach these goals?
6. In terms of investments, how should energy projects (infrastructure, renewables, energy efficiency, power generation etc.) be financed?

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thermal power plant equipment. Hence, the majority of units are close to retirement, and some have surpassed the designed technical life and still operate, as there are no alternative solutions for power generation at present.

[26] National, regional and local authorities, academics, NGOs, other stakeholders as well as individual citizens with an interest.

- What should be the balance of public and private involvement and who should be involved (governments, municipalities, energy companies, financial investors, other private investors, donors, international organizations etc.)?
- What should be the forms of financing (grants, loans, project bonds, tariffs etc.)?