SOUTH EAST EUROPE
WHOLESALE MARKET OPENING

Report on Tasks 1-4
March 2009

DRAFT
ACKNOWLEDGEMENT

The South East Europe Wholesale Market Opening technical assistance project (the Project) is co-financed by two multi-donor trust funds, ESMAP and PPIAF.

The Energy Sector Management Assistance Program (ESMAP) is a global technical assistance program which helps build consensus and provides policy advice on sustainable energy development to governments of developing countries and economies in transition. For more information on the program see the website: www.esmap.org

The Public-Private Infrastructure Advisory Facility (PPIAF) is a multi-donor technical assistance facility aimed at helping developing countries improve the quality of their infrastructure through private sector involvement. For more information on the facility see the website: www.ppiaf.org

The Word Bank is managing the Project as a part of its support to the development of the Energy Community. For information about the World Bank’s energy sector activities see the website: www.worldbank.org/energy
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EXECUTIVE SUMMARY

Focus of the report

Pöyry Energy Consulting and Nord Pool Consulting have been commissioned by the World Bank to develop a study on Wholesale Market Opening for the electricity market in South East Europe. The final key outputs of the study are to propose a regional market design and an action plan for implementation.

This report covers task 1-4 of this study, which include a review of the current state of market opening in the region, examination of the barriers to advancing market opening and liberalisation, identify risks and opportunities to non-household customers and review lessons learned from other regional markets.

The geographical focus of the report are the seven Contracting Parties to the Treaty establishing the Energy Community, i.e., Albania, Bosnia and Herzegovina, FYR of Macedonia, Montenegro and UNMIK. However, the creation of a regional wholesale electricity market will naturally span a broader geographical scope then this.

Key characteristic of the regional electricity market

The electricity sector in South East Europe is characterized by small, but in many cases fast growing, markets. The size of the markets in terms of final electricity consumption varies from the 3.2 TWh (UNMIK) to 25.6 TWh (Serbia). The region exhibits a mixed generation structure with primarily conventional thermal power plants and hydro power plants. The seven Contracting Parties are in total import dependent, and some of them are suffering from severe shortages.

The general trading pattern in the region is a flow from the north to the south. Bosnia and Herzegovina is the only country among the seven that has a surplus and the region import from Romania and Bulgaria. This highlights the fact that any regional solution would necessarily cover a broader geographical scope.

Losses (commercial and technical) are in many cases very high and the economies in the region are generally characterized by high energy intensities/low energy efficiency.

The national markets are in most cases dominated by one (state-owned) generator who supplies at regulated rates to tariff customers. The regulated tariffs, although they might cover the current costs, are generally low and not sufficient to cover the cost of new investments. The tariffs do however vary considerable within the region.

Current state of market opening

Table 1 summarizes the current state of market opening in the region. On some points the development has proceed relatively far. All countries have established independent regulators, although they may in some cases need to be strengthened. Looking at the regional perspectives the difficult challenge of regional cooperation between regulators probably has to be further developed, as is typically also the case in the rest of Europe. All countries, except Montenegro, have also advanced relatively far in terms of TSO unbundling. Market-based allocation of cross-border capacities is also the dominant method.

On other issues far less progress have been made. Lack of market price penetration to final customers is probably the most serious obstacle to reach an efficient electricity sector. There are generally no publically available and generally trusted reference prices for energy. Although the possibility for secondary trading for cross-border capacities exist in a few cases...
these are not liquid and well-functioning markets. Long-term trade in electricity may function reasonable well, but no organized market place for trade in electricity currently exists.

According to our understanding balance responsibility has only been developed in a few cases. In most of the region the dominant generators are in practice responsible for upholding the balance and provide ancillary services to the system operator.

Effective unbundling of DSOs has not progressed very far. Although in several cases the distribution and supply have, in various ways, been separated from generation, distribution and supply have not been separated from each other. This may be of less urgency in terms of creating a regional wholesale market, but is of importance to secure that customers get access to the electricity market.

<table>
<thead>
<tr>
<th>Table 1. Assessment of current situation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wholesale reference price and transparency</strong></td>
</tr>
<tr>
<td>Albania</td>
</tr>
<tr>
<td><strong>Secondary markets</strong></td>
</tr>
<tr>
<td><strong>Competition in generation</strong></td>
</tr>
<tr>
<td><strong>Price penetration</strong></td>
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<tr>
<td><strong>Effective market opening</strong></td>
</tr>
<tr>
<td><strong>Independent regulators</strong></td>
</tr>
<tr>
<td><strong>Effective TSO unbundling</strong></td>
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<tr>
<td><strong>Effective DSO unbundling</strong></td>
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<tr>
<td><strong>DSM</strong></td>
</tr>
<tr>
<td><strong>Imbalance cost/balance responsibility</strong></td>
</tr>
<tr>
<td><strong>Market based allocation of cross-border capacities</strong></td>
</tr>
</tbody>
</table>

Source: Team analysis

Experiences from other regional markets

The last years we have seen a development of power exchanges all over Europe. So far the volumes traded at the PXes’ spot markets are, with exception of Nord Pool, relatively small but the volumes are steadily increasing. In the eastern part of Europe the traded volumes at each PX are, with the exception of OPCOM in Romania, less than 3 TWh. This means that the PXes, for the time being, only play a marginal role in the Eastern European market.

So far it is in particular German EEX and Romanian OPCOM that stands out as potential regional champions in respectively the Western and Eastern part of Europe, while Nord Pool is the dominant and sole operator in the Northern part of Europe.

All in all, the trend all over Europe, from the very south to the very north, from east to west is that former national markets link themselves together. In EU there is an aim that regional markets should be established as a sliding path or stepping stone towards a single European Electricity Market. Current market coupling initiatives indicate that in the future national markets will partly or fully be replaced by regional markets.
Risks and opportunities

Market opening will create opportunities for non-household customers to get access to a larger base of suppliers. As has been the case in more developed electricity markets this has led to a broader range of services offered, providing the customers with new and better possibilities for contractual arrangement, hedging etc.

Increased security of supply will require both a more efficient use of the existing system, but also new investments. The necessary investments can in practice only be achieved if investors receive the required income. Particularly in the parts of the region where load-shedding is common practice, customers are likely to benefit from increased security of supply over time. This provides a key benefit to all consumers, but in particular those who are highly dependent on stable deliveries for their operations.

A key risk for non-household customers is that electricity prices may increase in an open market. This risk is particularly enhanced if only a few customers a faced with market prices, while most remain on (low) regulated tariffs. Securing an efficient working market and a high degree of competition is important to counter-act this.

Barriers to market opening

There are several potential barriers to advancing market opening and liberalisation. First of all, the prerequisites for regional market opening discussed above are generally only fulfilled to a limited degree. Key issues here are:

- Establishing reliable wholesale reference prices, probably through creating organized market places with sufficient liquidity;
- Increasing the level of competition (in generation). With a well-integrated market the competition may work reasonable well, but it will require close surveillance from market operators and competition authorities. Improvements in the utilization of cross-border capacities are also important;
- Establishing systems for balance responsibility and creating incentives for market participants to be in balance;
- Increasing the degree of market price penetration to final customers. Abolition of “full supply contracts” and regulated prices over time.
- Increasing the incentives for final customers to exercise their eligibility;
- Establishing secondary markets for energy and cross-border capacities (with an explicit auctioning model) and securing sufficient liquidity in these markets;
- The allocation of cross-border capacities also needs improvements in some cases. With the ongoing work on coordinated auctioning, important improvements can be expected.

On the broader level it is also important to recognize that there are several barriers that are essentially political in nature, ranging from concern over possibly higher electricity prices to the fundamental issue of trust between different political entities. Some market participants may also have a vested interest in keeping some elements of less well-functioning markets.


1. INTRODUCTION

The conflicts of the 1990s led to the disintegration of a unified energy system stretching from the Adriatic to the Black and Aegean Seas, changing it from a single system into a patchwork of systems. However, the separate entities still rely on each other for the smooth functioning of their power supplies.

In 2005, the European Community and then nine Contracting Parties signed the Treaty establishing the Energy Community of South East Europe. The Treaty aims at establishing an internal market for network energy in the energy and is based on binding legal commitments governed by a set of institutions. The Treaty extents and applies and synchronized application of the EC *aquis communautaire* and thus ensures homogeneity between the EC and the Contracting Parties.

The 11th Athens Forum Meeting requested the World Bank to develop a study on Wholesale Market Opening in South East Europe for the benefit of all Contracting Parties to the Treaty establishing the Energy Community. Pöyry Energy Consulting and Nord Pool Consulting were subsequently commissioned to develop the study.

The overall aim of the study is to develop a proposal for a Regional Market Design (RMD) and an Action Plan (AP) for its implementation. The full project covers eight tasks:

- Task 1: Review of the current state of market opening in SEE;
- Task 2: Examine barriers to advancing market opening and liberalisation;
- Task 3: Identify risks and opportunities posed by market opening in electricity supply to non-household customers;
- Task 4: Review lessons learned from other regional markets;
- Task 5: Define indicators to measure and monitor progress in opening the electricity market in SEE;
- Task 6: Developing the SEE Regional Market Design (RMD) and Action Plan for Implementation;
- Task 7: Workshops for non-household consumers and other market participants on electricity market opening; and
- Task 8: Implementation Support.

The aim of this background report is to cover tasks 1-4. A large number of reports have previously been developed covering these or closely related issues. Within this project the project team is to interact closely with the regional institutions and stakeholders in the development of a RMD and AP, rather than developing lengthy reports. This report is thus focused on establishing the current situation and identifying key issues for the future work.

As agreed with the World Bank officer at the start of the work, this report is primarily based on previous reports available from the Energy Community. In addition the project team has visited key institutions and stakeholders in all the seven Contracting Parties and information received during these meetings and interviews has also been used when developing this background report.

1.1 The focus of the study

Currently there are seven Contracting Parties to the Treaty establishing the Energy Community. These seven Contracting Parties are Albania, Bosnia and Herzegovina,
Croatia, Former Yugoslav Republic of Macedonia (FYROM), Montenegro, Serbia and UNMIK on behalf of Kosovo. These seven entities are the prime beneficiaries of this study and its prime focus.

The relevant region for the creation of a regional electricity market in South East Europe is however larger. In addition to the seven entities listed above; Austria, Bulgaria, Greece, Hungary, Italy, Romania and Slovenia are important for a regional market. The relevant area could be further extended to countries such as Turkey, Moldova, Ukraine and others. This report does however focus on the seven Contracting Parties.

1.2 Designation of the Contracting Parties

In the region there are disputes regarding the status and/or denomination of the Contracting Parties in two cases. In this report we use the official designation of the Contracting Parties according to the Treaty establishing the Energy Community. This should not be interpreted as reflecting any position taken by Pöyry Energy Consulting or Nord Pool Consulting.

1.3 Objective of a wholesale market reform

Under earlier assignments various options for regional market integration have been developed. One question is whether or not a regional power exchange should be established or whether there should be continued reliance on purely bilateral contracts. Furthermore, the market model currently under development relies on explicit auctioning of cross-border transmission capacities. An alternative option would be the use of implicit auctioning. This would require a liquid market place under a ‘market splitting’ approach, or ‘market coupling’ between several liquid markets.

According to the Terms of Reference for this study, these options should be reviewed, and based on this review a Regional Market Design should be developed, taking into account the possibility of a staged implementation. We thus foresee that the proposal developed under this study will entail such a staged approach starting with simple arrangements and later moving to more complex mechanisms. Furthermore, the Terms of Reference states that the ongoing work on coordinated auctions and regional balancing mechanism seems to represent a good base for wholesale market opening.

At this point the proposal for the long-run solution has not been finalized. Several objectives could be considered with different levels of ambitions, such as:

- coordinated interconnector allocations day-ahead;
- coordinated interconnector allocations day-ahead with well developed national energy markets
- fully coordinated day-ahead wholesale scheduling using implicit auctions:
  - Market coupling, or
  - Joint market with market splitting; and
- additional development, e.g., a completely seamless retail and wholesale market.

A common (seamless) retail market is not covered under this assignment, although the organization and opening of retail markets is likely to affect the functionality of the wholesale market.

1.4 Regulatory framework

The Contracting Parties to the Energy Community Treaty have legally binding commitments to the creation of an internal market for network energy. The regional market provided for by
the Treaty is to be connected to the EC internal market. Through the Energy Community Treaty the Contracting Parties are bound to implement the “acquis communautaire on energy”\(^1\), the “acquis communautaire on environment” and also follow the principles laid out in the acquis on competition insofar as it may affect the trade of network energy between the Parties. According to the Treaty the Parties shall also implement the renewables Directive 2001/77/EC (promotion of electricity produced from renewable sources) and Directive 2003/30/EC (promotion of the use of biofuels or other renewable fuels for transport).\(^2\)

Under the Treaty the regulators are cooperating within the Energy Community Regulatory Board (ECRB). The ECRB advises the Ministerial Council and Permanent High Level Group (PHLG) on details of statutory, technical and regulatory rules and make recommendations in the case of cross-border disputes between the regulators.

Annex A includes a description of the regulatory framework in the region.


\(^2\) The Treaty establishes that the Parties shall present a plan to implement the directives within one year of the date of entry into force of the Treaty.
2. THE REGIONAL ELECTRICITY MARKET

2.1 Introduction

The following sections set out a quantitative summary of the regional electricity sector under the following topics:

- electricity generation and demand;
- electricity imports and exports;
- market structure and market model; and
- prices and tariffs.

Pöyry makes long range electricity and gas market price projections for the region as part of its pan-European market modelling, designed for use by investors in project evaluation, and updated quarterly. Data items with a source labelled “Pöyry EurECa\(^3\) analysis” are based on this modelling work. The reported wholesale prices for 2015 are based on the central scenario adopted in our January 2009 quarterly update of the models. The intention is to show the relative wholesale price levels under a credible scenario, in order to demonstrate the importance of cross-border trade, and we have chosen not to present absolute price levels. We have elected not to discuss the detailed assumptions underpinning these values.

The statistical information in this section sets out a background which emphasises the need for:

- efficient dispatch and cross-border trading arrangements between the Parties and with the surrounding countries;
- increases in consumer tariffs to economically efficient levels, which will lead to a reduction in inefficient patterns of electricity consumption,
- improved levels of payment for electricity; and
- very high levels of investment in generation and network infrastructure.

The necessary investment, reduction in inefficient consumption and improvements in the efficiency of generation production can only realistically take place with a move to market-based (marginal) wholesale pricing and regional coordination.

2.2 Electricity generation and demand

Small, but growing, national markets

Figure 1 shows that the size of the markets, in terms of final energy consumption, varies widely, but also that most of the markets are small. The smallest market in energy terms is UNMIK with a final electricity consumption of 3.2 TWh (2005), closely followed by Albania and Montenegro. The largest is Serbia with a final electricity consumption of 25.6 TWh (2005). Network losses\(^4\) are generally quite large ranging from 14% in Croatia, up to 37% in UNMIK, with an average of 23%. The electricity consumption is expected to grow rapidly over the coming years, which implies significant requirements on new generation investments.

\(^3\) EurECa is the name given to Pöyry's pan-European electricity model.

\(^4\) Including transmission and distribution technical losses and commercial losses.
**High energy intensities – low energy efficiency**

The economies in the region generally have high energy intensities. As is displayed in Figure 2 below, energy intensities are considerably higher than the average OECD level (IEA (2008)). This is explained by the degraded state of energy infrastructure, high energy losses in transformation, transmission and distribution and inefficiency in the end-use sector. The high network losses shown in Figure 1 is an illustration of this.

Croatia has relatively high energy efficiency, but according to IEA (2008) the country still has an energy savings potential of around 25% of the total primary energy supply. The region as a whole could save 5 TWh annually by bringing losses down to the level of Croatia. At the same time high energy prices and high energy consumption put a significant pressure on household budgets, and it is estimated that 16% of the people are exposed to energy poverty. It is reasonable to believe that the current high energy intensities/low energy efficiency are likely to be affected by changes in prices that a market opening could result in for some of the countries. Given the starting point, increased energy efficiency can also mitigate the economic impact of possible increases in electricity prices.

Figure 2 does also display that the Parties have high carbon intensities compared to OECD averages. Serbia has the highest level of carbon intensity (1.2) which corresponds to its high dependency on coal and Albania the lowest (0.3) due to its high usage of hydropower resources.

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5 IEA (2008), Energy in the Western Balkan
A mixed generation structure but with import dependency

The region is dependent on imported energy, primarily oil and natural gas. Several of the countries are also heavily dependent on import of electricity. Lack of reliable electricity supply is generally a serious problem in the region. IEA (2008)\textsuperscript{6} mentions the erratic electricity consumption pattern of the poorer parts of the population as a key factor for concern. This is driven by the fact that fuel wood is used for heating needs by the poor, but during the heating season electric heaters are often used when fuel wood demand spikes. This then exacerbate seasonal and weather related peaks in electricity demand. Extreme peaks can then cause black-outs or require rationing. The utilities are forced to maintain considerable reserve requirements, which then reduce potentials for exports and revenues. Low tariffs and payment discipline also limit the revenues.

The total electricity generation in the region\textsuperscript{7} is a mix between conventional thermal generation, hydro plants and nuclear power, as shown in Figure 3. Other renewable sources, besides hydro, have played a very limited role so far.

\textsuperscript{6} IEA (2008), Energy in the Western Balkans

\textsuperscript{7} Also including Romania and Bulgaria
The generation structure is however very different in the different countries. Albania gets almost all of its domestic generation from hydro power, but is also to a high degree import dependent. This is in particular the case in drought years. Other countries such as Bosnia and Herzegovina, Croatia and Serbia also get a third or more of their generation from hydro power. On the other extreme of the scale is UNMIK, which gets almost all of its domestic generation from thermal plants (lignite) and which is also import dependent. Most of the seven Contracting Parties are net importers of electricity or roughly in balance.
Figure 4. Country level electricity generation by fuel 2006, %

* Net exporters

Source: Final report of the regional energy demand planning project, IRG and Security of Supply Statement of the republic of Montenegro (June 2007)

Figure 5 shows the peak electricity load in 2007 and expected peak load in 2015 in comparison to the generation capacities in 2009 and 2015 (expected), respectively. This shows that in along with the growth in electricity consumption the peak demand will also grow. The graph also underlines the shortages in some of the entities. Very few of the entities are able to meet the peak demand through own generation.
Figure 5. Peak electricity load 2007 and 2015 (expected); Generation capacity 2009 and 2015

Summary comments on demand and supply balance

Table 2 provides commentary on the demand and supply balance for each of the seven Contracting Parties.
### Table 2. Comments on demand and supply balance

<table>
<thead>
<tr>
<th>Country</th>
<th>Demand and supply</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albania</td>
<td>98% hydro. Highly import dependent (24-40%) over the last years. Load shedding require since 1997.</td>
<td>One river system generates 88% of the electricity. Import dependent during droughts.</td>
</tr>
<tr>
<td>Bosnia and Herzegovina</td>
<td>Approx. 60% thermal, 40% hydro of domestic generation. In 2006 a surplus of approximately 2.5 TWh (of total generation about 14.5 TWh)</td>
<td>Consumption expected to increase considerable over the coming years and by 2014 by higher than the domestic generation.</td>
</tr>
<tr>
<td>Croatia</td>
<td>Approx. 40% conventional thermal, 10% nuclear and close to 50% hydro (total generation about 14.5 TWh). Import need of about 2 TWh.</td>
<td>Deficit is expected to grow in the future to a level of approximately 9.5 TWh by 2020. Hydro and nuclear generation reduced during droughts.</td>
</tr>
<tr>
<td>FYROM</td>
<td>Approx. 75% thermal, 25% hydro of domestic generation. About 2.5 TWh import of 8.5 TWh consumption.</td>
<td>ELEM has sufficient generation to cover the demand of EVN in terms of energy, but not sufficient capacity to meet winter peak. Of import of 2.5 TWh about 800 GWh is for tariff customers.</td>
</tr>
<tr>
<td>Montenegro</td>
<td>Approx. 60% hydro, 40% thermal (lignite). 1/3 of supply imported.</td>
<td>Considerable unused hydro potential.</td>
</tr>
<tr>
<td>Serbia</td>
<td>Approx. 75% thermal (mostly coal) and 25% hydro. Relatively well balance between supply and demand. Previous deficit turned into a small surplus.</td>
<td></td>
</tr>
<tr>
<td>UNMIK</td>
<td>97% thermal (lignite). Import dependent (number) Load shedding applied.</td>
<td>Only 52% of the delivered electricity billed and of this only 2/3 was collected. Low availability of existing plants. High demand growth.</td>
</tr>
</tbody>
</table>

Source: Pöyry Energy Consulting analysis
2.3 Regional trade in electricity

The former Yugoslavian transmission system was a 400 kV system spanning about 800 km connected to the UCTE synchronous system. In 1991 it was split in two separate parts, and Croatia and the Federation of Bosnia and Herzegovina (within Bosnia and Herzegovina) became part of the UCTE zone 1, while Republika Srpska (within Bosnia and Herzegovina), Serbia, FYRO, Bulgaria, Romania and Greece formed UCTE zone 2. In October 2004 these were again reconnected. The total interconnection capacity (net transfer capacity) in the region was in beginning of 2007 about 5800 MW, which is about 35% of total peak demand in the region.

The region in total is dependent on imported energy, primarily oil and natural gas. In general, cross-border electricity exchanges in SEE are somewhat lower compared to other regions in Europe\(^8\), main trading pattern in the region is a flow of electricity from the north to the south, as illustrated in Figure 6). Import is mainly provided from Hungary, Romania and Bulgaria and with Serbia being the main transit country.

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\(^8\) ECRB 2008 Market Development Report.
As Table 3 illustrates, Albania has increased its electricity imports in 2007 over 2006, while at the same time it has decreased its exports to all neighbouring power systems. Bosnia and Herzegovina has increased its electricity imports from Croatia and Serbia in 2007 over 2006, while its imports from Montenegro have decreased. At the same time, its volumes of power exports have recorded the reverse trend, with higher exports to Montenegro and lower exports to Croatia and Serbia.

Croatia has increased its electricity imports from Hungary and Slovenia in 2007 over 2006, while its imports from Bosnia and Herzegovina and Serbia have decreased. At the same time, its volumes of power exports have recorded the reverse trend, with higher exports to Bosnia and Herzegovina and lower exports to Slovenia, with virtually no exports to Hungary and Serbia.

Montenegro has increased its electricity imports from Bosnia and Herzegovina and Serbia in 2007 over 2006, while it has decreased its imports from Albania to virtually zero. Meanwhile, exports to Albania have increased, while exports to Bosnia and Herzegovina and Serbia have decreased.

Serbia (including UNMIK) has increased its electricity imports from Hungary in 2007 over 2006, while its imports from other regions have decreased. Conversely, Serbia (including UNMIK) has decreased its exports to Croatia and Hungary and has increased its exports to other markets, with no exports to Bulgaria as presented by UCTE in either 2007 or 2007.

There is limited information on the actual power exchange between UNMIK and Serbia and for the purposes of power exchanges, these two are treated as one region.
2.3.1 Trading licenses

Various licensing regimes can create barriers for traders to enter into the market. Requirements for trading licenses exist (or are foreseen) in all participating countries in the relevant region (except Italy). The licensing regimes of require a registered seat in the country which creates an additional burden for international traders.

The licenses are typically issued by the relevant regulatory authority, but in some case by the ministry. The trading licenses typically cover wholesale trade, retail supply of eligible customers, cross-border trade and transit, but there are differences. The licensing procedure typically has to be conducted in the national language and relevant documents are in most cases not available on the internet.

There are differences in the maximum time allowed for completing the licensing procedure ranging from 30 days in several countries up to 180 days. In the case of Bosnia and Herzegovina no limit is set. Furthermore there are variations in the licensing fees between the countries, both in terms of structure and levels.

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9 A survey on license requirements were made in 2008 and received answers from Bosnia and Herzegovina, Croatia, Serbia, Greece, Slovenia, Austria, Hungary, FYROM and Cyprus. (Energy Community Regulatory Board, Licensing requirements 2008). This section builds on that report unless otherwise stated.
<table>
<thead>
<tr>
<th>Country</th>
<th>Trading license required</th>
<th>The license covers</th>
<th>Requirement of registered company in the country</th>
<th>Reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albania</td>
<td>YES</td>
<td>Wholesale trade, cross-border trade, transit</td>
<td>YES</td>
<td>Annual report</td>
</tr>
<tr>
<td>Bosnia and Herzegovina</td>
<td>YES</td>
<td>Wholesale trade, retail supply to eligible customers, cross-border trade, transit</td>
<td>YES</td>
<td>Monthly reports on physical quantities of traded energy</td>
</tr>
<tr>
<td>Croatia</td>
<td>YES</td>
<td>Wholesale trade, cross-border trade, transit</td>
<td>YES</td>
<td>Financial reports</td>
</tr>
<tr>
<td>FYROM</td>
<td>YES</td>
<td>Wholesale trade, retail supply to eligible customers, cross-border trade, transit</td>
<td>YES</td>
<td>Monthly reports on traded quantities of electricity and a yearly general report with financial and technical information</td>
</tr>
<tr>
<td>Montenegro</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Serbia</td>
<td>YES</td>
<td>Wholesale trade, retail supply to eligible customers, cross-border trade, transit</td>
<td>YES</td>
<td>Copy of business plan for each year, annual balance sheet and profit and loss account for previous year</td>
</tr>
<tr>
<td>UNMIK</td>
<td>YES</td>
<td>Supply, trade</td>
<td>YES</td>
<td>Quarterly and annual reporting</td>
</tr>
</tbody>
</table>

Source: Energy Community Regulatory Board (2008), Albanian Energy Regulatory Entity, ERO
2.4 Market structure and market model

In most of the Parties there is one dominant, state-owned generator. There might be some fringe competitors, but the markets can typically be characterised as being very close to monopolies. As shown earlier, the national markets are also small which limits the degree of competition that can be expected on each market in isolation. Distribution and supply are typically also dominated by one company, although there might be some small distributors. However, given that the consumers in most cases either are not eligible or not interested in exercising their eligibility this currently of little importance. The limited interest in exercising eligibility seems to be explained by the fact that most consumers would face higher prices on the open market than under regulated tariffs. Given current regulated tariffs little switching can be expected unless customers are forced to switch (or the regulated tariff is removed for eligible customers).
Vertically unbundling has progressed somewhat during the last years. Albania, Croatia, FYROM, Serbia and UNMIK have legally unbundled TSO/MOs and Bosnia and Herzegovina has a legally unbundled ISO, while Montenegro has a functionally unbundled TSO. However, in Croatia the HEP group is made up of multiple companies covering production, transmission and distribution, i.e., the transmission operations is part of the same group as the main generator. However, there is a separate market operator owned by the Republic of Croatia.

The unbundling between generation and distribution (including supply) has however not reached as far. In Albania KESH Distribution is unbundled and about to be privatized.
However, KESH Generation is obliged to sell to the wholesale public supplier at regulated prices. In FYROM the distributor is now owned by Austrian EVN, but also here the dominant generator, ELEM, is required to sell at regulated prices. Among the remaining Parties generation and distribution/supply are conducted within the same company or group of companies that may be legally unbundled.

### Table 6. Degree of vertical unbundling

<table>
<thead>
<tr>
<th></th>
<th>Transmission, system and market operator</th>
<th>Generation and distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Albania</strong></td>
<td>100% state owned legally unbundled TSO</td>
<td>KESH Distribution unbundled and about to be privatized. Additional distributors selling in “non-KESH” areas. KESH Generation obliged to sell to the wholesale supplier.</td>
</tr>
<tr>
<td><strong>Bosnia and Herzegovina</strong></td>
<td>Independent ISO</td>
<td>3 vertically integrated regional monopolies.</td>
</tr>
<tr>
<td><strong>Croatia</strong></td>
<td>Legally unbundled transmission company, but part of the HEP group. Market operator 100% state owned (legally unbundled).</td>
<td>HEP a group with multiple affiliated companies in the energy value chain</td>
</tr>
<tr>
<td><strong>FYROM</strong></td>
<td>100% state owned legally unbundled transmission system and market operator</td>
<td>Distributor privatized (Austrian EVN). Main generator, ELEM, obliged to sell at regulated prices.</td>
</tr>
<tr>
<td><strong>Montenegro</strong></td>
<td>Functionally unbundled TSO</td>
<td>Functionally unbundled with four divisions (generation, transmission, distribution and supply).</td>
</tr>
<tr>
<td><strong>Serbia</strong></td>
<td>100% state owned legally unbundled TSO</td>
<td>Generation and distribution/supply integrated. Legally independent subsidiaries. DSO function legally unbundled from other operations.</td>
</tr>
<tr>
<td><strong>UNMIK</strong></td>
<td>100% state owned legally unbundled TSO</td>
<td>Generation and distribution/supply integrated.</td>
</tr>
</tbody>
</table>

Source: Pöyry Energy Consulting team analysis

Very few end-customers are active on the open market. Typically the regulated tariffs are below the prices available on the open market and the incentives for exercising its eligibility is thus often very limited. A few countries, e.g. Croatia and FYROM, have “forced” some customers out on the open market by not providing a regulated tariff alternative for the eligible customers. This is discussed in other countries as well.
### Table 7. Degree of market opening

<table>
<thead>
<tr>
<th></th>
<th>Formal opening</th>
<th>Customers exercising eligibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albania</td>
<td>Customers can apply to become eligible. It has proposed that all customers on the 35 kV level or above should automatically become eligible.</td>
<td>Currently only 1 eligible customer.</td>
</tr>
<tr>
<td>Bosnia &amp;</td>
<td>10 eligible customers. They can stay under regulated tariffs and so far no one executes his eligibility.</td>
<td></td>
</tr>
<tr>
<td>Herzegovina</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Croatia</td>
<td>2700 eligible customers</td>
<td>Eligible customers must buy on the market.</td>
</tr>
<tr>
<td>FYROM</td>
<td>As of 1 January 2008 there are 8 eligible customers (those connected to 110 kV or above), which implies a market opening of 34%.</td>
<td>The eligible customers must purchase the electricity on the open market.</td>
</tr>
<tr>
<td>Montenegro</td>
<td></td>
<td>“Everybody” is eligible, but just one supplier. Traders’ access to final customers is currently subject to consideration.</td>
</tr>
<tr>
<td>Serbia</td>
<td>All non-household customer eligible gives 47% formal market opening</td>
<td>No one executes his eligibility</td>
</tr>
<tr>
<td>UNMIK</td>
<td>Market opening applied on a voltage level (currently +10 kV with direct line)</td>
<td></td>
</tr>
</tbody>
</table>

Source: Pöyry Energy Consulting

Several countries have market models with a wholesale public supplier. The wholesale public supplier then often has “priority” access to the domestic generation which is earmarked for domestic consumption (tariff customers). This of course limits the amount of electricity that is available for trade.
**Table 8. Nature of trading model**

<table>
<thead>
<tr>
<th>Country</th>
<th>Nature of trading model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albania</td>
<td>• Market model based on bilateral contracts.</td>
</tr>
<tr>
<td></td>
<td>• Wholesale and Retail supplier responsible for supply to tariff customers.</td>
</tr>
<tr>
<td>Bosnia &amp; Herzegovina</td>
<td>• 12 traders (incl. 3 Generators). They cannot sell to final customers who are</td>
</tr>
<tr>
<td></td>
<td>supplied by “their” (3) wholesale Supplier. These Suppliers have “all in”</td>
</tr>
<tr>
<td></td>
<td>contracts with their respective Generator.</td>
</tr>
<tr>
<td>Croatia</td>
<td>• HEP supplies all tariff customers. Eligible customers can by from Suppliers/Traders</td>
</tr>
<tr>
<td></td>
<td>who have access to export/import</td>
</tr>
<tr>
<td>FYROM</td>
<td>• New market rules under development. MEPSO’s previous role as wholesale supplier has</td>
</tr>
<tr>
<td></td>
<td>been abolished.</td>
</tr>
<tr>
<td>Montenegro</td>
<td>• 56 Traders wait for access to final customers. Today only Trader/Trader and cross</td>
</tr>
<tr>
<td></td>
<td>border exchange</td>
</tr>
<tr>
<td>Serbia</td>
<td>• EPS-Trading serves tariff customers and potential eligible customers. EPS-Trading has</td>
</tr>
<tr>
<td></td>
<td>full supply contract with EPS-Generation.</td>
</tr>
<tr>
<td></td>
<td>• 37 traders have access to eligible customers and export/import</td>
</tr>
<tr>
<td>UNMIK</td>
<td>• Market model based on bilateral contracts.</td>
</tr>
<tr>
<td></td>
<td>• KEK regulated wholesale supplier.</td>
</tr>
</tbody>
</table>

Source: Pöyry Energy Consulting team analysis

2.5 **Prices and tariffs**

*Low – but varying retail tariffs*

Figure 7 below shows that Albania has the highest retail tariffs for households and some of the highest retail tariffs for Industrial and Commercial (I&C) customers in the presented markets in South East Europe (SEE).

Bosnia and Herzegovina has the second highest retail tariffs for commercial customers, while its retail tariffs for industrial users and households are around the mean of the region’s values.

Croatia has some of the highest retail tariffs for households, while its retail tariffs for Industrial and Commercial (I&C) customers are around the median of the region’s values.

FYROM is offering some of the region’s lowest retail tariffs to industrial customers and households, while its tariffs for commercial users are closer to the median level for the presented countries in South East Europe. From 1 November 2008 the all tariffs were increased with about 13%, which is valid until the end of 2008. A new tariff methodology is currently under development.10

Montenegro has the highest retail tariffs for commercial users in the presented markets in South East Europe, while its retail tariffs for industrial customers are varying to some degree closer to and above the mean of the region’s values. Its retail tariffs for households are mid-ranked from the countries listed herein.

10 Interview with ERC, December 2008
Serbia is having some of the lowest retail tariffs in the region, right across the three segments of industrial, commercial and household customers. It is thought that some of these retail tariffs may not cover even the generation costs. This may be due to a number of reasons, including the protection of so-called vulnerable customers and some level of support for energy intensive heavy industry.

UNMIK has some of the highest retail tariffs for households in the presented markets in South East Europe, while its retail tariffs for Industrial and Commercial (I&C) customers are varying to some degree close the mean of the region’s values.

Figure 7. Retail tariffs 2007, €/MWh

Source: ECRB 2008 Market Development Report
3. CURRENT REGIONAL MARKET OPERATIONS AND MECHANISMS

3.1 Current Balance Management in SEE

The level of real time automation and communication in many countries of SEE is still limited (ETSO, Current State of Balance Management in South East Europe, June 2006). Some of the obstacles are that changes to the output of individual generating units cannot be actioned without substantial manual intervention. Remote metering on some HV transmission network points are not installed and modern SCADA systems are yet to be implemented in some countries.

Some national balancing markets do exist in SEE but do not attract foreign bids.

South East Transmission System Operators (SETSO) are currently in the design stage of the Regional Balance Mechanism (BETSEE RBM or BETSEE). The aim is to achieve a system that facilitates: technical correctness, effectiveness, truthfulness, individual rationality, budget balance and social welfare.

This initiative has to be seen in view of the fact that electricity markets in the SEE region are still in the early stages of development. Market operations and their degree of openness vary greatly, traded volumes are low (especially in the short term) and exchanges struggle with low levels of liquidity.

In consideration of the challenging environment the approach was chosen to develop a concept of the RBM that assumes minimal prerequisites regarding the existing market structure.

In an Examination Paper (ETSO, Regional Balancing Mechanism BETSEE for South-East Europe, April 2008) the SETSO Task Force simulated and analysed the potential consequences for SEE countries where the RBM Design (dated Nov 2006) implemented in the Region today (April 2008).

The examination paper concluded, under the premise that the RBM development in the SEE Region was still and ongoing process and therefore subject to uncertainties that:

Depending on the availability of balancing resources there will be parties having benefits and parties facing disadvantages in case of a country deciding to join the RBM.

The absence of a transparent balance energy price is a challenge for the RBM, short term markets are underdeveloped and cross-border transfer prices for balancing can not be accurately accessed, this could cause irregularities in the function of RBM.

It is expected that the RBM will have low liquidity as a direct result for the fact that the RBM is designed by an imperfect mechanism. TSO’s and market participants will face risks that they are unable to fully manage due to lack of transparent information.

Improvement to liquidity will not bee seen until the implementation or improvement of short term trading (Day-ahead, intraday) markets and improvement in transparency in the market participant activities in the participating countries.

Monitoring processes conducted by Regulators will be required in order to prevent manipulations and to guarantee the necessary level of transparency in market participant’s activities.
3.2 Congestion management and cross-border capacity allocation

The principles for Cross Border Congestion Management are described in the Regulation (EC) 1228/2003. This regulation, through the Energy Community treaty, is also applicable in the SEE countries.

One major task of the harmonization of SEE region is the establishment of a Coordinated Auction Office (CAO). In the future, the office should provide mainly auctions on different periodical bases and should organize a “secondary” market for physical transmission rights (has still to be developed). The according action plan has been launched and the first steps are already implemented. It is foreseen that the yearly Auction 2010 will be managed by the CAO. In December 2008 a MoU was signed in Tirana by all the relevant TSOs except for Bulgaria and Serbia. Bulgaria disagreed with respect to the geographical scope and Serbia’s position was that the MoU should only be signed by TSOs in charge of capacity allocation, i.e. KOSTT should not be among the signatories. It was then also agreed that the future CAO should be located in Montenegro.

In July 2007, the SETSO TF conducted an analysis of the current situation of the applied procedures for the transmission capacity allocation. In the report it was concluded that significant improvement to the allocation procedures can be noticed. A few areas however fall still short of full compliance with the CM Guidelines. At present 50:50 capacity split is still used, the objective however is to introduce joint auctions. Not all the data relating to auction procedures and auction results, as well as commercial and physical flows are publicly available.

A Regional Congestion Management Benchmark (ECRB, 2008) analysed the level of compliance of the SEE with the Regulation in respect of Cross Border Congestion Management and found that, while the basic principles of the Regulation has already been implemented, currently all TSOs fall short of being in full compliance with Congestion Management Guidelines.

Most of the participating parties introduced a market based allocation scheme. The exceptions are Bosnia and Herzegovina were a pro rata allocation scheme is still in use.

The guidelines specify that the allocation at an interconnection line shall be coordinated and implemented using common allocation procedures by the involved TSOs. Although market based allocation schemes are common, the TSOs typically allocate their share of the interconnector capacity. None of the borders, with the exception of two in Croatia and FYROM fulfil the Congestion Management Guidelines. Coordinated capacity auctions are performed only by a few participating parties.

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11 CAO (2008), Action Plan for Establishing the SEE Coordinated Auction Office
12 Overview of transmission capacity allocation methods in SEE, Status June 2007
The quality of data and the provision of information have not yet reached satisfactory levels. Not one TSO can be identified for providing the level of information that is required by the Congestion Management Guidelines.

Despite the fact that all TSOs in the SEE region provide access to web pages in English, barriers for foreign traders and the development of an integrated electricity market do exist as not all necessary information is made available in English.
The existence of Secondary Markets is a requirement according to Congestion Management Guidelines. Secondary Markets have yet to be implemented as only few Secondary Markets do currently exist. Some market rules in the SEE region do not allow for the formation of Secondary Markets yet.
Regulation (EC) No 1228/2003 describes three options for the use of congestion management revenues:

- Guaranteeing the actual availability of the allocated capacity;
- Network investments maintaining or increasing interconnection capacities;
- As an income to be taken into account by regulatory authorities when approving the methodology for calculating network tariffs, and/or in assessing whether tariffs should be modified.

According to ECRB EWG Benchmarking Report for 2008 most of the countries in SEE already have provisions concerning the use of the revenues in their legislation, and even countries that do not have it in their legislation have implemented one of the three options.
### Table 9. Use of Congestion Management Revenues

<table>
<thead>
<tr>
<th></th>
<th>Legal provisions</th>
<th>Actual use</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Albania</strong></td>
<td>&lt;No information&gt;</td>
<td>&lt;No information&gt;</td>
</tr>
<tr>
<td><strong>Bosnia and Herzegovina</strong></td>
<td>No provisions within its legislation</td>
<td>Mainly used as an income to be taken into account by regulatory authorities</td>
</tr>
<tr>
<td><strong>Croatia</strong></td>
<td>Provisions included in legislation</td>
<td>Used according to all three options</td>
</tr>
<tr>
<td><strong>FYROM</strong></td>
<td>Provisions included in the legislation</td>
<td>Used according to all three options</td>
</tr>
<tr>
<td><strong>Montenegro</strong></td>
<td>&lt;No information&gt;</td>
<td>&lt;No information&gt;</td>
</tr>
<tr>
<td><strong>Serbia</strong></td>
<td>Provisions included in the legislation</td>
<td>Used as an income to be taken into account by regulatory authorities</td>
</tr>
<tr>
<td><strong>UNMIK</strong></td>
<td>Provisions included in the legislation</td>
<td>Income deducted by the Regulatory Authority from the Cost base. Legal framework also opens for the other two options.</td>
</tr>
</tbody>
</table>

Source: ECRB, ECRB EWG Benchmarking report 2008

### 3.3 Inter-TSO Compensation mechanism

A new voluntary agreement on Inter-TSO Compensation for transit for the years 2008 and 2009 was signed by 39 TSOs from 34 countries in October 2007 (ETSO, Report on Inter-TSO compensation mechanism, 2007). This agreement builds on the interim ITC Agreement from 2007 whereupon the SEE region was fully integrated into the ITC mechanism of the rest of Europe.

The following principles are to be followed for the ITC mechanism for the years 2008-2009:

- Allocation/compensation mechanism for infrastructure costs
- Allocation/compensation mechanism of costs arising through cross-border transit losses
- Financing of the compensation fund and the treatment of ITC perimeter countries
- Financial net results based on agreed principles for each ITC party
4. EXPERIENCES FROM OTHER REGIONAL MARKETS

4.1 Selected national and regional markets

In this chapter we will briefly review the relative success of selected national markets. The main purpose of the review is to rank the degree of market success within each and one of a number of measurable parameters listed below.

The parameters will be ranked low, medium and high. The score low signifies that the market element is weak; medium signifies that the market element clearly is present but that there still is a way to go. High signifies that the market element is fully implemented.

The given scores are based on national reports submitted by the regulators in each country. There is no unified template how to write these reports. Hence, the score given should only serve as an indication for the particular country in question. In addition the scores given are based on a qualitative and not quantitative manner and could therefore be subject for discussion.

In the end of the chapter we will go through the various finalized and ongoing initiatives on establishment of regional electricity markets.

For the national markets the parameters that will be used are as follows:

**Establishment of a reference price for electricity**

A clear reference price for the commodity electricity is necessary for transparency in the market and for market efficiency. Score high is only given to well functioning markets where a high share of produced electricity is settled with the reference price as commodity price.

**Supply quality and security**

Reliable delivery of power is of uttermost importance in any economy. That quality requirements are specified and complied with is essential in order to minimize distortions to the operation of the electricity market. Score high is given to markets where both quality and security are meeting international standards for industrialized countries.

**Wholesale market liquidity**

In order to foster a competitive electricity market energy suppliers, generators and large scale consumers need access to a competitive energy wholesale market with sufficient liquidity. Only markets where this is the case receive the score high.

**Transparency**

Market transparency is crucial to establish an efficient electricity market. All participants should have access to all relevant information regarding the electricity system’s infrastructure and operational conditions. All relevant market information should be available for all market participants simultaneously. Electricity markets where this is the case will be given the score high.

1.1. All reports can be found on the ERGEG web site. http://www.energyregulators.eu/portal/page/portal/EER_HOME/EER_PUBLICATIONS/NATIONAL_REPORTS/National%20reporting%202008
Market Surveillance

In a competitive electricity market an independent and efficient market surveillance function should be present. Market surveillance is necessary to monitor the market to unveil abuse of market power or market manipulation. Only markets where this function is taken well care of and where appropriate actions can be taken to deal with abuse of market power or manipulation of the market will score high.

Metering and main grid settlement

The settlement of imbalances requires a well organized Imbalance Management and an appropriate meter value collection and processing system. The score high is given to electricity markets where imbalance settlement is executed by the TSO and based on an AMR-system and appropriate imbalance prices.

Profiling and handling of not hourly metered consumers

In order to enable competition between supply companies not-hourly metered consumption must be handled by the usage of profiles representing normal consumption during the day, night and time of the year. Electricity markets with established profiling and change-of-supplier procedures will receive the score high.

Wholesale market settlement

While settlement of energy trading takes place bilaterally or through organized markets the imbalance settlement for a period of wholesale market participation is handled by the TSO. The shorter settlement periods are and the more frequent the settlement takes place the lower uncertainty regarding past periods’ financial obligations is. This also leads to lower collateral needs. The score high is given to markets with monthly or more frequent imbalance settlement.

Wholesale market access

The extent of competition in a liberalized market is dependent on the degree of access for various participant groups as large and small end-users and generators, suppliers and renewable energy producers. The score high will be given if all relevant participant groups have access to the wholesale market at the same conditions and terms.

Demand Side Management (DSM)

Demand side management (DSM) entails actions that influence the quantity or patterns of use of energy consumed by end users, such as actions targeting reduction of peak demand during periods when energy-supply systems are constrained. Peak demand management does not necessarily decrease total energy consumption but could be expected to reduce the need for investments in networks and/or power plants. An electricity market with strong incentives like contracts between TSO and large scale consumers and/or settlement of consumers based on hourly values using reference prices reflecting the marginal costs of generation will score high.

Imbalance costs for wholesale market participants

The TSO is responsible for balancing the electricity system in real-time. An efficient Balancing Mechanism and a cost-reflective imbalance settlement system receives a high score.
Investment climate (investments signals, investment activity, investment focus, investment incentives, investment signals)

This parameter regards to what extent incentives and procedures to encourage maintenance, upgrading or construction of new production facilities or grid are in place. A system that encourages investments all over the electricity value chain will be given the score high.

Unbundling and regulation of grids and system operation (SO)

In liberalized electricity markets there will be various forms of unbundling of vertically integrated companies which own grid, supply role and generation capacity. Only electricity markets which have minimum an economical unbundling receive the score high. In line with EU legislation, physically unbundling for distribution companies with less than 100 000 customers is not required to get this score.

Change of supplier

To foster competition, change of supplier should be result of a simple self-explaining administrative procedure and at no cost for consumers. Procedures applicable to involved suppliers and grids should be well developed and organized. Information of all available suppliers, with types of contracts and prices should be easily accessible to get the score high.

Regional integration/cooperation

The end user market is normally national, but the extent of regional integration and harmonization as price convergence, cross border capacity, exchange of balancing services and market coupling creates a more competitive wholesale market and contributes to security of supply. High cross border capacity is also important to reach the EU aim of establishment of regional markets. The score high is given to countries which are integrated or closely cooperate with neighbouring countries.
<table>
<thead>
<tr>
<th>Features:</th>
<th>Romania</th>
<th>Germany</th>
<th>Austria</th>
<th>Italy</th>
<th>France</th>
<th>Netherlands</th>
<th>Ireland</th>
<th>UK</th>
<th>Sweden</th>
<th>Norway</th>
</tr>
</thead>
<tbody>
<tr>
<td>Establishment of a reference price</td>
<td>medium</td>
<td>high</td>
<td>high</td>
<td>high</td>
<td>medium</td>
<td>high</td>
<td>medium</td>
<td>medium</td>
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<tr>
<td>Supply quality and security</td>
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<td>high</td>
<td>high</td>
<td>medium</td>
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<td>high</td>
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<tr>
<td>Wholesale market liquidity</td>
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<td>high</td>
<td>high</td>
<td>medium</td>
<td>low</td>
<td>high</td>
<td>high</td>
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<tr>
<td>Transparency</td>
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<td>medium</td>
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<td>medium</td>
<td>medium</td>
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<tr>
<td>Market surveillance</td>
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<td>medium</td>
<td>low</td>
<td>medium</td>
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<td>high</td>
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</tr>
<tr>
<td>Metering and main grid settlement</td>
<td>medium</td>
<td>medium</td>
<td>medium</td>
<td>medium</td>
<td>medium</td>
<td>medium</td>
<td>high</td>
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</tr>
<tr>
<td>Profiling and handling of not hourly metered consumers</td>
<td>low</td>
<td>high</td>
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<td>low</td>
<td>low</td>
<td>high</td>
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<td>high</td>
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<td>Wholesale market settlement</td>
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<td>medium</td>
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<tr>
<td>Wholesale market access</td>
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<td>high</td>
<td>medium</td>
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<tr>
<td>Participants exposure to</td>
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<td>medium</td>
<td>medium</td>
<td>low</td>
<td>high</td>
<td>medium</td>
<td>medium</td>
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</table>
### Features:

<table>
<thead>
<tr>
<th>Feature</th>
<th>Romania</th>
<th>Germany</th>
<th>Austria</th>
<th>Italy</th>
<th>France</th>
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<th>Ireland</th>
<th>UK</th>
<th>Sweden</th>
<th>Norway</th>
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</thead>
<tbody>
<tr>
<td>Spot market price</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Demand side management</td>
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<td>low</td>
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<tr>
<td>Imbalance cost for wholesale market participants</td>
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<td>high</td>
<td>medium</td>
<td>medium</td>
<td>high</td>
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<td>low (high prices)</td>
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<td>Investment climate</td>
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<td>high</td>
<td>high</td>
</tr>
</tbody>
</table>

*Note: All scores are based on reports to ERGEG submitted by the national regulators.*
Romania

Romania is the Eastern European country that has been most successful in establishing a market. Romania has established a power exchange, OPCOM which is the largest PX in the Eastern European area. Romania has fulfilled the EU requirements regarding unbundling, an independent TSO, regulator and market operator. However, the establishment of a fully competitive physically market requires that the content in the parameters listed above get more sophisticated. The fact that around 50% of the consumers are still part of the regulated market also hampers the development of the market.

However, only 5.2 TWh was traded at the DAM at OPCOM in 2008. Although this makes OPCOM an Eastern European champion the share is too small to make a real significance in the big picture.

Germany

The German market is characterized by a generation structure where RWE and E.ON in particular create an oligopoly that supplies large industrial customers and municipal utilities. In this market competition is limited. Market information is voluntary and is not based on regulated procedures, which again explains the medium score at the transparency parameter. In the household end-user market competition exists but procedures and grid access are complicated and costly. This fact explains that less than 4% changed supplier in 2007.

On the positive side, the trading volume at the Energy Exchange (EEX), in both the physical and financial market is steadily increasing. In 2008 the traded volume at the spot market increased to 154 TWh compared to 123.7 TWh in 2007. Supply quality and security as well as regional integration are among the best in Europe. Also investment climate and incentives for renewable Energy is at top in Europe.

Austria

In Austria most of the features that characterize a competitive market are in place, however the volumes traded at the power exchange EXAA are still marginal and the households tend to stick to their local supplier, and hence limit the competitive aspect of the market, despite an effort by the regulator the last years to pave the way for an easy and transparent way to change supplier.

Also in the case of unbundling the current requirement of legal unbundling combined with lack of monitoring of integrated companies by the provincial governments in charge of this process, only give a medium score on this parameter.

Regional integration with Germany is high, and due to the importance of this market the score high is given despite lack of efficient integration with other neighbouring markets.

Italy

In Italy the regulated and commercial electricity market exist side by side. In provided electricity volumes the regulated market is still larger than the spot market operated by GME, but the latter is caching up year by year. However, as the spot market is based on mandatory participation it can not be compared to e.g. EEX of Germany or Nord Pool of the Nordic countries when it comes to its successfulness. The regulated market and the mandatory spot market affect most of the parameters listed in the table in a negative way;
hence the medium score is often given. Only legally unbundling is required and explains the reason for the medium score on this parameter.

Regarding supply quality and security the situation today is not as good as in many other European countries. However, planned new generation capacity is 14,424 MW in the period from 2007-2010. The interregional grid capacity is still critical in some regions and some cities, but will be improved in the years to come. Number of minutes of interruptions per low voltage client has fallen from 187 in year 2000 to 64 in 2006.

Italy has in 2008 launched a comprehensive renewable sources incentive scheme which also contributes to the score on the investment parameters.

**France**

In the path towards a liberalized internal energy market in EU, France has traditionally been anything but a forerunner in the process. Only the minimum requirements of the various EU directives and regulations have been implemented in the national legislation.

Even though EDF’s monopoly in the electricity sector has been broken it still has a dominant position in all areas in the electricity value chain, including the ownership of the regulator CRE. This fact hampers the development of real competition in the French market.

Another obstacle to competition is that regulated retail tariffs are retained alongside market contracts through the “tarif transitoire d’ajustement du marché” (TaRTAM). The introduction and prolongation of TaRTAM has according to the regulator closed the large business market as alternative suppliers to EDF hardly can match the regulated prices.

For small consumers like households there are little signs of competition one year after deregulation. This can be explained by low regulated prices, which means there is not much to gain by entering the free market. In addition only 1/3 of the consumers are aware that such an opportunity exists. There is also a fee attached to the change of supplier which hampers the competition.

For new investments in generation capacity TaRTAM could be an obstacle in the future. However, a new ambitious programme to double the share of renewable sources is adopted, and the production surplus is already high, so TaRTAM will not create a big problem in the years to come.

The recent coupling of the French, Belgian and Dutch markets, and the coming extension to the German and Luxembourg markets in 2009, means that the regional integration is high.

The traded volume at the Powernext spot market was 44 TWh in 2007.

**The Netherlands**

The Netherlands has a highly developed electricity market and gets a high score on most parameters directly relevant for a competitive market. However, the volumes traded at the power exchange, APX, are still low, 21 TWh out of a total consumption on 112 TWh, but is increasing year by year.

The weakest parameters in the Dutch market are investment climate and incentives, where it seems like that the Dutch focuses on import and regional integration to cover its normal deficit on around 20% of total consumption.

Only legal unbundling are required which explains the medium score on this parameter.
Ireland

The energy market in Ireland is a centrally dispatched or single price market. Compared to the other European markets, which clearly separate the TSO and market operator function, in a single price market the transmission and system operation costs are included in the price for the energy delivered or produced. The single price market is also typically constructed with focus on the generation side. The generators place bids for the plants they wish to operate. The bid with the highest price necessary to meet demand sets the pool price.

Organizing the market this way means that the competitive element clearly is present, but lack of a reference price, weak demand side, limited wholesale market etc. means that in most of the directly market based parameters it is hard to reach a higher score than medium.

In 2007 the Single Electricity Market for Ireland and Northern Ireland was established. SEM consists of a gross pool market, into which all electricity generated or imported onto the island must be sold. This was an important step for greater competition in the electricity sector. In addition Spanish ENDESA has bought two power stations from the dominant Irish power producer and grid owner ESB, and thereby reducing the generation market share of the latter to 40%.

Ireland is in the process of launching a pilot smart meter project aiming at optimizing the Irish electricity market. This explains the high score in the metering parameter.

UK

The same characteristics regarding a single price market is also valid for UK. However, the UK market is far more mature. Hence, the competitive aspect is higher. In addition there exists a spot market run by the Dutch market operator APX. However, this spot market only takes 1-2% of the totally traded volumes and plays little significance.

In addition, Nasdaq Omx and Nord Pool Spot have been chosen to establish a spot and financial market in UK, which also includes, intra day market, a physical forward market and a clearing function. The Spot market should be operative from Q2. 2009.

Norway and Sweden

Together with Denmark and Finland, Norway and Sweden constitute the most competitive and liquid regional electricity market in the world. Maybe the single most important factor behind the success of the Nordic Market is that all aspects, from regulation to market operation in the electricity market chain in each of the four countries are fully market based. This is not the case in many other European markets that strive to combine the old regulated regime with a market regime. This fact is particularly important for Norway as Nord Pool is located in Norway, and hence a subject for Norwegian legislation and regulation.

However, looking at Norway and Sweden separately there are differences in the ways the markets are organized. In e.g. congestion management Norway uses market splitting which can result in 2-3 price areas for electricity within Norway in case of congestions. In Sweden countertrade is used to secure that all customers get the same price within Sweden. Currently work is ongoing that might result in the establishment of more price areas in Sweden.

Also when it comes to market power there are generators like Vattenfall of Sweden and Statkraft of Norway that would have been too dominant if they had been operating within a
strictly national market. However, in the integrated Nordic wholesale market these companies’ market power is limited.

4.2 Review of Regional Markets

The establishment of regional markets normally is a step-by-step process where two or more countries decide to cooperate to integrate a few or more functions in order to make more efficient use of the cross-border capacity. Over time these functions can be deepened and expanded to include new areas until, in the end, there is a true regional market that at least complies with the following criteria.

- Good conditions for power trading – this is crucial as this is the very motor and driving force behind the development of an integrated market. A well functioning regional market pre-requires that the physical and financial market work and that there is trust in the price formation. There should be reciprocity between the markets, a minimum degree of harmonization and smoothly functioning routines for joint planning and operation.

- Balance mechanism and the settlement of imbalances – The rules governing the integrated regional market must be established also regarding to regional cooperation in the balancing mechanism. Settlement procedures should be harmonized and based on market prices.

- Equal access to information – all participants in the market should have equal access to all relevant information, at the same time and at the same cost. This also includes information about transmission facilities.

- Market based solutions for congestion management – this is crucial to achieve an efficient electricity market.

- Investments in new transmission links – if socio-economically justifiable, and to ensure the dynamic development of the electricity regional market, the cross border capacity among the countries involved should be sufficient.

Until now only the Nordic electricity market Nord Pool can be said to be close to fully comply with the above mentioned requirements. However, also the Irish market, the Iberian market (Spain and Portugal) and the TLC market (France, Belgium and the Netherlands) can be said to be regional markets.

4.2.1 Present situation and initiatives

The Association of European Power exchanges (EuroPex) and European Transmission System Operators (ETSO) has recently launched a report: “Development and Implementation of a Coordinated Model for Regional and Inter-Regional Congestion Management”

In the report the status and future plans for established regional markets and market coupling projects are described. The report can be downloaded for free at: http://www.europex.org/default.asp?kaj=news&id=277

The Nordic electricity Market – Nord Pool

The Nordic electricity market Nord Pool became the first regional market in the world when Sweden, and later Finland and Denmark joined the originally Norwegian power exchange in the last half of the 1990ies. Nord Pool is Europe’s largest market place for physical and financial power contracts. The Nord Pool market consist of a physical market which offers intra day trading and various types of contracts for DAM, a financial market providing
forward and futures contracts and in-house clearing of contracts. Nord Pool also offers trade in European Emission Allowances EUAs and certified emission reductions (CER).

The success story of Nord Pool can be explained by many factors:

- As already mentioned there was a political will in all the 4 countries to create a liberalized and regional competitive energy market, even if the scepticism within the electricity sector definitively was present.
- The Energy mix used in the various Nordic countries is highly complementary. This was a driving force to integrate the markets.
- A close cooperation between the involved TSOs and their commitment to facilitate the joint regional market was and is clearly the most important reason for the Nordic success.
- A nearly common language, culture, historical background, political system etc. made integration much easier.
- The long history of Nord Pool can to a large extent explain its relative success compared to other power exchanges. It takes time to establish a viable market.

**The TLC area and the continental European Power market**

The so called TLC area consisting of France, Belgium and The Netherlands is the most recent example of an emerging multi nation regional market.

In 2006 implicit auctions replaced the previous system of explicit auctions. The result of this exercise has been convincing. The use of existing transmission capacity has been optimized by approximately 60% and the prices in these 3 countries have also been identical in around 60% of the time. ([http://www.apxgroup.com/index.php?id=185](http://www.apxgroup.com/index.php?id=185)).

Compared with the criteria above, The TLC countries have not gone into e.g. cross border intraday trading and common balancing arrangements. The main purpose of the TLC market is to harmonize the prices in the three countries involved by distributing electricity from low price to high price area and more efficient use of the daily interconnection capacity. However there are discussions regarding further development towards an integrated market. France and Belgium have since 2007 been making intraday exchanges using pro rata allocation. A similar project is in progress on the Dutch borders with Germany and Belgium.

The TLC market will to a large extent be enlarged in the near future in the flow based market coupling project with Germany which will contribute further to the EU aim of an internal European Energy market. France and Germany are also in the process of operating a common spot market (EPEX) which also includes Austria and Switzerland.

**Market coupling between TLC-area, Germany and the Nordic Power market**

Germany and Nord Pool have established European Market Coupling Company (EMCC) to run implicit auctions covering the two interconnections between Northern Germany and Denmark. The capacity is 373 MW and 379 MW at the two interconnections and can be seen as a pilot project for further integration between the Nord Pool area and Germany. The implicit auctions where launched in 2008 but closed down for further analysis due to non optimal results regarding the utilization of capacity between the market areas ([http://www.marketcoupling.eu](http://www.marketcoupling.eu)).

At the end of 2008 also the NorNed cable (700 MW) between the Netherlands and Norway was put into commercial operation. For the moment the cable capacity is sold through explicit auctioning, but the plan is to switch to implicit auctioning during 2009.
**Market coupling projects in other parts of Europe**

Also in other parts of Europe the trend is that various states are in a process to couple their electricity markets. Austria, Czech Republic, Germany, Hungary, Poland, Slovakia, Slovenia are for the time being in a process evaluating the potential for market coupling in the Central Eastern Europe region, and how to organize such a market coupling.

Hungary and Romania are in the final stage of coupling their markets together. This market can be expanded by Bulgaria which has expressed interest in linking up with these two countries as a part of the establishment of a national market.

The liberalization process in these countries is not as mature as in the western European countries something that is also mirrored in the design of the electricity market coupling projects. For the time being it appears like explicit auctions are the chosen alternative in this part of Europe.

### 4.2.2 Lessons learned

In this section we will reflect upon some important issues that should be born in mind in order to create an efficient regional market.

As a starting point the essential and most important requirement is that there is a strong political will among the countries involved to create such a market. It is equally important that the cooperative environment within and between the states involved are good and that the politicians dare to take the necessary steps to create a regional market even though the resistance from some parties can be high.

**Benefit of a regional market**

By looking at Nord Pool and other regional and national liberalized markets in Europe it is fair to state that at least the following benefits have been achieved.

The use of the energy sources in the Nordic countries with hydro power in Norway, combined hydropower and thermal power in Sweden and Finland, and thermal and wind power in Denmark has been optimized.

Even though the proven balance in relative terms has been reduced compared to the increase in consumption the security of supply has been maintained. In dry years a hydro nation like Norway can be supplied with electricity from the other Nordic countries. In other words the need for reserve capacity at national level has been reduced without jeopardizing the security of supply.

However, the free market can also make it tempting for hydro producers to sell as much electricity as possible in times where the price is high, without keeping a sufficient reservoir reserve for dry years. This potential problem is in particular important to be aware of when the market concentration is high.

In all the Nordic countries there are a major market actor that would have had too much market power in a strictly national market. In the Nordic regional market there are enough actors to secure competition.

Due to the competition among producers, distributors and retailers the electricity price to end users has been kept at a low level given the generation reserves available.

In a liberalized market the price for electricity is a very rapid signal for the state of the market. This is a clear benefit, but at the same time it is a political challenge to stick to the market price mechanism in deficit situations.
**Organization and regulation of the market**

Both in the establishment of national and regional markets a regulator with sufficient power to secure that issues as cross subsidization between monopoly functions (ownership of grid) and competitive functions (production and retailing) for vertically integrated companies are avoided. A strong regulator is also necessary to deal with the complicated issues regarding monopoly control as e.g. tariffication. At the same time the lesson learned is that the role of the regulator should be clearly defined. A regulator that inappropriate interferes in the daily tasks of the TSO or market operator is an obstacle for the optimal development of the market.

In a regional market the TSOs which, from a technically point of view, best know how to optimize the smooth functioning of the regional market should be a driving force and key actor in the integration process. If the TSOs are not sufficiently involved it is much harder to create a market.

It is a recurrent challenge in a regional market that the TSO move what is originally a national bottleneck to the border and thereby disturb the regional market. This is owing to the fact that the TSO in a pressed situation tends to put national interests in front of the common regional interest. In order to secure that the various TSOs involved are pulling in the same direction, also in pressed situation, their cooperation should be based on a written contract where issues like this are treated.

An issue that concerns the organization of the market as such is that investors should be assured that the market framework would remain stable for a long period of time. Stable market conditions are necessary for the investors to calculate rate of return for their investments under normal circumstances. A well developed financial forward market facilitates such stability. For the same reason it is important that all issues regarding the electricity market are transparent and easy accessible.

**Organization of the Power Exchange**

Experience shows that the market place itself will gain on competition from the bilateral market. This competition secures that the market operator constantly will try to improve the products offered to the market, improve the service, reduce the product prices etc.

In advanced markets the PX is counterpart in all contracts. This is a big advantage for the risk management of the actors trading at the PX as their payment are secured and their administrative burden eased. To provide this counterpart service a clearing house function must be established in-house or outsourced to a bank or a financial institution.

The establishment of a financial market has also proven to be a clear advantage for the well functioning of an electricity market and for the market participants that can The traded volumes at the financial market are normally many times higher than the trade at the DAM and hence, important for the market liquidity.

As in all issues regarding a liberalized market, transparency and well established information services are important in order to create trust in the marketplace and the price formation.

**4.3 Conclusion**

The last years we have seen a development of power exchanges all over Europe. So far the volumes traded at the PXes’ spot markets are, with exception of Nord Pool, relatively small but the volumes are steadily increasing. In the eastern part of Europe the traded volumes at each PX are, with the exception of OPCOM in Romania, less than 3 TWh. This
means that the PXes, for the time being, only play a marginal role in the Eastern European market.

So far it is in particular German EEX and Romanian OPCOM that stands out as potential regional champions in respectively the Western and Eastern part of Europe, while Nord Pool is the dominant and sole operator in the Northern part of Europe.

All in all, the trend all over Europe, from the very south to the very north, from east to west is that former national markets link themselves together. In EU there is an aim that regional markets should be established as a sliding path or stepping stone towards a single European Electricity Market. Current market coupling initiatives indicate that in the future national markets will partly or fully be replaced by regional markets.
5. RISKS AND OPPORTUNITIES FOR NON-HOUSEHOLD CUSTOMERS

5.1 Possible causes for high electricity prices

One significant reason for the high retail tariffs is the lack of generation capacity in the SEE region, as well as the particulars of cross-border electricity trading – for example, the available capacity for net transfer across border – amongst the countries concerned. This is not just due to the closure of Bulgaria’s nuclear power reactors at Kozloduy, but is symptomatic of an endemic situation of underinvestment in new generation capacity in the entire region.

An additional reason for higher electricity prices in the region is the inefficient management of congestion across the borders and the lack of further investment into more interconnection amongst the regional markets. For example, building a particular interconnection line between Serbia and FYROM can alleviate the congestion of interconnectors between other countries, e.g. between Bulgaria and Greece.\(^\text{14}\) This scenario is potentially applicable across the entire SEE region, but measures to improve this have so far been relatively slow to implement. At an interview with ELEM (FYROM) it was mentioned that 30% or more of the (import) price is due to capacity payments.\(^\text{15}\)

Another reason is the lack of well-functioning wholesale markets across the region. Some of the requirements – frequently some or all of these are missing in SEE – for an efficient wholesale market are\(^\text{16}\):

- efficiently functioning and liquid spot market;
- availability of an efficient balancing mechanism market;
- support framework for market access;
- good level of transparency;
- well established roles/positions for all market players, including the TSO (as a provider of efficient balancing services), producers and suppliers (using market mechanisms to hedge risk), traders and brokers.

These criteria are generally not fulfilled, or at best partly fulfilled.

5.2 Risk and opportunities

The risks and opportunities for non-household customers are likely to differ across the region. Given that the main trading pattern currently is from the north to the south competitive prices are likely to increase to the south in the region. Some parts of the region also suffer from shortages and load shedding, while other parts have a surplus (even though this more narrowly defined region is import dependent as a whole). Furthermore, the current situation in terms of tariff differs. Montenegro for instance has substantially higher tariffs than other countries in the region.

\(^{14}\) ECRB EWG Draft on SEE Co-ordinated flow-based explicit auctions.
\(^{15}\) Interview with ELEM, December 2008
\(^{16}\) EFET: Obstacles to Electricity Trading in Central & South Eastern Europe.
It is reasonable to believe that competitive electricity prices in the region at least in the short run will be higher than the currently regulated prices. Customers in the southern part of the region, currently being the most dependent on imports, are likely to have more to benefit from improved regional trade, compared to customers in export areas.

Furthermore, if only part of the market is being opened for competition while substantial part is kept on regulated tariffs for a prolonged period of time it is likely that the prices for the customers on the open market increase even more. If a substantial part of the demand is kept on relatively low regulated tariffs these are less likely to respond and adapt their behaviour reducing the overall low level of efficiency in the region.

Furthermore, each national market is currently very concentrated and a reasonable level of competition is dependent on a successful regional integration. With a successful regional integration, coupled with effective surveillance from market operators and competition authorities a reasonable level of competition could arise. It is however not unlikely to expect that over time some consolidation in the market structure would occur. Given that the main generators are currently state owned this is however a decision that remains within the domain of the national governments.

To summarize: A key risk for non-household customers is that electricity prices may increase in an open market. This risk is particularly enhanced if only a few customers faced with market prices, while most remain on (low) regulated tariffs. Securing an efficient working market and a high degree of competition is important to counteract this.

With the current market structure the (non-household) customers are essentially dependent on the local supplier. This is further enhanced by the fact that the local (low cost) generation is in many cases reserved for the local tariff customers. Market opening will create opportunities for non-household customers to get access to a larger base of suppliers. As has been the case in more developed electricity markets this has led to a broader range of services offered, providing the customers with new and better possibilities for contractual arrangement, hedging etc.

It should also be noted that if price levels are below the cost of new investments, it will not be possible to get new commercially driven investments, which may worsen the supply-demand balance. Increased security of supply will require both a more efficient use of the existing system, but also new investments. The necessary investments can in practice only be achieved if investors receive the required income. Particularly in the parts of the region where load-shedding is common practice, customers are likely to benefit from increased security of supply over time.
6. BARRIERS TO MARKET OPENING

6.1 Current market distortions

The degree of competition in the market is generally low in the region with in most cases one dominant generator in each country. Furthermore, it is common practice that this generator is obliged to first-hand supply to the domestic tariff customers. This limits the possibilities for trade and reduces or eliminates the incentives for eligible customers to exercise their eligibility. In some countries no regulated tariff is offered to eligible customers, which in effect means that those customers are the only one facing the marginal cost of generation in the region.

On the wholesale level there is no clear wholesale reference price established. This reduces the possibility for efficient trade between parties, and is also likely to lead to less efficient use of the system.

National generators in most SEE countries are obliged by law to continue to supply tariff (captive) customers, as per the local energy legislation for Public Service Obligation (PSO). Thus, they are allowed to request capacity from the TSOs for so-called Already Allocated Capacity (AAC) for import purposes\(^\text{17}\). In effect, part of the cross-border capacity is reserved for fulfilling this PSO and is an issue that has to be investigated further.

One of the main market imperfections is the lack of clear incentives to SEE TSOs to support cross-border trade and invest more in integrating the regional markets. In this respect an operational framework of Co-ordinated Flow-Based Explicit Auctions (CA) is being mulled over for allocating interconnection capacity in the region.

This initiative has led to a dry-run simulation through 2006, with continuing work and simulations in 2007, potentially whetting the appetite of traders to participate as well. One important existing issue is the distribution and use of revenues from the CA and the ensuing effect on TSOs’ participation in this framework, the actual capacity that they provide to the market and the corresponding benefits for the regional cross-border trade and planned further market integration of the regional electricity systems\(^\text{18}\).

However, some of the incentives that may benefit TSOs in the area can cause higher customer bills and lead to a market distortion. This is due to the fact that CA-generated income for grid operators is a windfall profit\(^\text{19}\) since OPEX and CAPEX spending on the country’s network is covered by regulated tariffs and the inter-TSO compensation mechanism, unless the CA-generated income is either used for investments or for reducing the tariff according to the established guidelines.

In regions with liquid and efficient markets, the use of congestion revenues – through either investment to reduce congestion or to provide firm availability of capacity or lower tariffs – should lead to an improvement in welfare. Until the SEE markets are developed to this level, it is important to prevent scenarios where TSOs are obtaining certain incentives to “retain” congestion on their borders, especially given the fact that the framework for allocation of transmission capacity is not completely market based yet.

\(^{17}\) ECRB EWG Draft on SEE Co-ordinated flow-based explicit auctions.
\(^{18}\) ECRB EWG Draft on SEE Co-ordinated flow-based explicit auctions.
\(^{19}\) ECRB EWG Draft on SEE Co-ordinated flow-based explicit auctions.
It is generally accepted by interested parties that TSOs in SEE should receive income as per agreed MW for congested borders, which should allow them to redirect these revenues to additional investment in congested areas. Currently, the SEE grid operators use congestion revenues internally to achieve a lower transmission tariff.

6.2 Prerequisites for market opening options and current status

Independent of the market model eventually chosen some prerequisites have to fulfilled, possibly to a varying degree dependent on market model. Some important prerequisites will be:

Wholesale reference price, transparency and liquidity

Price reference is a basic prerequisite for power trade, power plant operation, consumer behaviour and investment decisions. A minimum degree of liquidity is required to establish confidence in the reference price and to reduce volatility. Most bilateral markets show sufficient liquidity in long term products. For the SEE region the challenge is to create liquidity in short term products.

Energy reference prices can be developed in different ways, but typically organized market places with sufficient liquidity is important for a reliable reference price to be established.

With market models based on implicit auction (of cross-border capacities) the cross-border flows will be determined by the prices established on organized market places. This is not the case with market models based on explicit auctions. For such market models reference prices are however required in order to secure the correct flows since the bids for cross-border allocation will be based on these prices.

Currently there are no liquid market places in the region and no generally known and accepted reference price for electricity. However, there are active traders functioning as mediators and these can be expected to have a reasonable good knowledge about the relevant reference price.

Secondary markets for energy and cross-border capacities

Related to the establishment of trustworthy reference prices is the availability of liquid secondary markets. This is also important to ensure efficient use of the system.

Currently there are no secondary markets for energy. According to the ECRB EWG Benchmarking report (version 30 April, 2008) only Serbia and UNMIK offers the possibility for secondary markets for capacities (and UNMIK does currently not control the cross-border capacities). Market rules may in some cases also have to be changed in order to implement secondary markets for energy as well as cross-border capacities.

Competition in generation

Any well-functioning market requires a sufficient degree of competition in order to avoid market power. With national energy markets this sufficient degree of competition would have to be upheld in each (small) national market. For many of the small markets in the SEE region it is unlikely that a sufficient number of generators can be established. Regional integration to some degree dilutes market power, and thus reduces the requirements on each national market.

With the exception of Bosnia and Herzegovina, all the national markets in the region are dominated by one generator. There are in several countries additional market
participants/generators, but from a competition point of view the effect of these can be expected to be very limited.

A well-integrated regional market could be expected to function reasonable well given the number of generators that would be present. This of course requires that the markets can be sufficiently integrated and that there is both sufficient interconnector capacities and that these capacities are utilized in an efficient way. There are currently many active traders that can provide some competition in the cross-border trade.

**Price penetration**

In an efficient power market final consumers and generators react to market prices. Market design aims at exposing a steadily increasing number of market participants to short and long term marginal prices. “Full supply contracts” and regulated prices are not compatible with price penetration.

Currently the price penetration to end-users is limited in the region. The countries typically have regulatory regimes in place that are supposed to be cost-reflective. The level of the regulated tariffs varies widely within the region. The tariffs are however typically not sufficient to cover the cost of new investments. The payment discipline is also in many cases low.

Most of the customers in the region are not exposed to market prices. In some countries (Croatia, FYROM and Montenegro) eligible customers are forces to be exposed to market prices.

**Effective market opening**

In order for a competitive wholesale market to emerge it is necessary that there are customers available to supply.

Currently the customers are in most cases “locked” into their current supplier, either through not being eligible to switch or not having any incentives to switch supplier. In all cases the effective market opening is low and, with the exception of Croatia, FYROM and Montenegro the *de facto* market opening is zero or close to zero with (almost) no customers exercising their eligibility.

**Independent regulators**

Independent regulators equipped with the sufficient regulatory capacities are important in any market setting. A more complex market design is however likely to put higher demand on the regulator. In particular, regional integration may require cross-border regulatory interventions.

All the countries in the region have formally independent regulators, although the capacities of the regulators vary.

**Effective TSO unbundling**

All of the foreseen market models require neutrality of the system and market operator.

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20 With full supply contracts we refer to a type of contract where the customer can off-take as much electricity as it wants and the customer has no cost for imbalances (the customer has no reference consumption). This is sometimes also referred to as “all in” contracts.
Most of the countries have established independent TSOs. The exceptions are Bosnia and Herzegovina where an independent ISO is established, Croatia where an independent market operator is established but the TSO is within the HEP Group and Montenegro where this process has only begun.

**Effective DSO unbundling**

DSO unbundling most directly affects the retail level and is thus not an absolute requirement. A well functioning retail market however supports and enhances the functionality of the wholesale market. Demand side participation in energy markets can be prevented by discriminatory behaviour from a non-unbundled DSO. Many markets around the world works reasonable well without a complete (e.g. ownership) vertical separation. It is however important to make a proper ring-fencing of the DSO activities.

In FYROM distribution and supply has already been separated from generation and privatized. Distribution and supply are however not separated. Several others are either in the process of separating the distribution and supply activities or have already legally separated these activities. In no case there is an effective separation between DSO and supply activities.

**Demand side management**

Participation in energy markets from the demand side generally improves the functionality of the wholesale market. However, many energy markets are relatively well-functioning without an active demand side. DSM is however likely to be important e.g. in order to reduce load shedding and increase energy efficiency.

In the few countries were some customers are more directly exposed to market prices, the demand side can be expected to be more responsive to market conditions.

**Imbalance cost/balance responsibility**

Competitive energy markets require that the responsibility for upholding balance is allocated to the TSOs. However, each market participant is required to trade into balance.

Currently Bosnia and Herzegovina and Croatia have established systems for balance responsibility.

**Market based allocation of cross-border capacities**

Independent of market model chosen the cross-border capacities should be allocated using market based methods (implicit or explicit auctioning). Currently the allocation is basically based on explicit auctioning in all countries except Bosnia and Herzegovina (UNMIK does not control the capacities in/out of the area). It is however common that some capacities are reserved for the supply to tariff customers. The allocation is furthermore mostly done on a long-term basis and the availability of secondary markets is limited.

**6.2.1 Summary assessment of the current situation**

Based on the discussion above Table 11 summarizes our assessment of the current situation. On some points the development has proceed relatively far. All countries have established independent regulators, although they may in some cases need to be strengthened. Looking at the regional perspectives the difficult challenge of regional cooperation between regulators probably has to be further developed, as is typically also the case in the rest of Europe. All countries, except Montenegro, have also advanced
relatively far in terms of TSO unbundling. Market-based allocation of cross-border capacities is also the dominant method.

On other issues far less progress have been made. There are generally no publically available and generally trusted reference prices for energy. Although the possibility for secondary trading for cross-border capacities exist in a few cases these are not liquid and well-functioning markets. Long-term trade in electricity may function reasonable well, but no organized market places for trade in electricity currently exist.

According to our understanding balance responsibility has only been developed in a few cases. In most of the region the dominant generators are in practice responsible for upholding the balance and provide ancillary services to the system operator.

Furthermore, customers currently face market prices only to a very limited extent. This is particularly the case regarding more short-term price signals.

Effective unbundling of DSOs has not progressed very far. Although in several cases the distribution and supply have, in various ways, been separated from generation, distribution and supply have not been separated from each other. This may be of less urgency in terms of creating a regional wholesale market, but is of importance to secure that customers get access to the electricity market.

### Table 11. Assessment of current situation

<table>
<thead>
<tr>
<th></th>
<th>Albania</th>
<th>Bosnia and Herzegovina</th>
<th>Croatia</th>
<th>FYROM</th>
<th>Montenegro</th>
<th>Serbia</th>
<th>UNMK</th>
</tr>
</thead>
</table>

Source: Team analysis

### 6.3 Barriers to market opening

There are several potential barriers to advancing market opening and liberalisation. First of all, the prerequisites for regional market opening discussed above are generally only fulfilled to a limited degree. Key issues here are:

- Establishing reliable wholesale reference prices, probably through creating organized market places with sufficient liquidity;
- Increasing the level of competition (in generation). With a well-integrated market the competition may work reasonable well, but it will require close surveillance from
market operators and competition authorities. Improvements in the utilization of cross-border capacities are also important;

- Establishing systems for balance responsibility and creating incentives for market participants to be in balance;
- Increasing the degree of market price penetration to final customers. Abolition of “full supply contracts” and regulated prices over time.
- Increasing the incentives for final customers to exercise their eligibility;
- Establishing secondary markets for energy and cross-border capacities (with an explicit auctioning model) and securing sufficient liquidity in these markets;
- The allocation of cross-border capacities also needs improvements in some cases. With the ongoing work on coordinated auctioning, important improvements can be expected.

On a more fundamental level, our understanding is that the current view is that the “bottlenecks” in practice are seen to be established on the borders. However, in a truly regional wholesale market the bottlenecks should preferably be shown were they actually occur in the physical system. This can create wholesale price differences within a country, which is likely to be a challenge for the nationally oriented regulatory regimes.

Furthermore, it is important to recognize that this is a poor region and that a relative high degree of the population suffers from energy poverty. Based on consumer protection concerns it is common to want to keep the cheap generation for the home market and offer this to the consumers at low regulated rates. Although the regulated rates may cover the cost of the existing system, those price levels are insufficient to cover the cost of new investments on a commercial basis and generally below the prices on the open market. The perceived risk of price increases can thus be considered to constitute an important barrier. Related to this is also the concern that increases in the prices will have a negative impact on the industrial development and the competitiveness of the local industries in the region.

This situation is however different in different countries. Montenegro for instance has substantially higher tariffs than other countries in the region. It is possible that the customers in Montenegro can gain from regional market integration. On the other hand, in most countries the regulated tariffs are lower than what can be expected in the open market at least in the short run.

It should be noted that if price levels are below the cost of new investments, it will not be possible to get new commercially driven investments, which will worsen the supply-demand balance.

With the current price regulation the interest of the eligible consumers the exercise their eligibility is limited or non-existing. In a few countries the eligible consumers are forced out on the open market. In order to create a well-functioning market opening it is necessary to gradually increase the number of customers on the open market. This can either be done by eliminating the option of regulated tariff for eligible customers, or by changes in the tariff regulation.

Some market participants may also have a vested interest in the current market structure. A complex, and badly functioning market, will create opportunities for some market players that may disappear, or at least change, if a more efficient market structure can be reached.

On a broader political level there are important political barriers related to the mutual recognition of parties. This is typically issues that goes beyond the electricity market, but
have an impact on the possibilities of progress. Energy market integration is to a high
degree dependent on trust, since energy security is vital to any nation. In comparison, the
well advanced regional integration in the Nordic countries was based on a long history of
cooperation between the countries, which provided a solid foundation.

The political barriers, both related to concerns for price increases and the mutual
recognition of parties and trust between nations is probably the most difficult to overcome.

There is also relative little experience and knowledge about market operations in the
electricity sector in the region. This will require gradual capacity building, and a gradual
evolvement of the market.

On the other hand, the national markets in the region are small. Unless a regional solution
can be achieved there is a risk for a fragmented market structure with negative
consequences.

Reduced costs and increased security of supply can be expected from a regional market
both in the short- and long run. The power systems in the region differ widely between
countries in terms of the generation mix. Typically it is very beneficial to integrate hydro
and thermal systems in order to exploit the different characteristics and the storage
possibilities in the hydro system. This will reduce generation costs. The hydro dominated
systems typically need to import during droughts and are thus dependent on a regional
solution. The more thermal dominated systems can on the other hand benefit from lower
generation costs when there is excess water.

In the long run the investment incentives are likely to improve. By interconnecting a larger
system a more stable price can be expected, which reduces the risk for the investors.
Furthermore, the current locked in markets limits the possibility of commercial profitable
investments. It is difficult for other market players than the regulated utilities that can
transfer new capacity into its rate base or IPPs with a supply agreement to a regulated
utility to make profitable investments.
ANNEX A MARKET OVERVIEW

A.1 Albania

A.1.1 The Albanian power system

The Albanian power generation system is mainly based on hydro generation, predominantly located in the northern part of the country representing about 98% of the country’s total power generation. 88% of the domestic generation is generated in one single river system. As a result, the power system reliability is highly dependant on the hydro conditions (i.e. rainfall patterns). 2007 was a drought year, electricity production was reduced, the country has limited import capacities due to under-developed transmission network, and more than 900,000 household customers did not have regular power supply. The only thermal power plant (TPP Fier) in the Albanian power system is constructed with old technology and low efficiency. Since April 2007 TPP Fier is out of operation.

Due to power supply shortages, Albania has had to import 25-40% of the total electricity consumed over the last four years. In 2007 between 60% and 70% of the demand had to be imported. This situation is likely to continue in the future until new plants are constructed. Given the high share of hydro power, Albania gets particularly import dependent during drought periods.

The growing electricity demand, lack of investments for a long time period and constraints on import capacities has led to load shedding. The electricity demand has increased by an average of 6% per annum over the last 12 years, which has not been associated with increases in generation capacities. As shown by Figure 12 load shedding has been required from 1997. In the period 2007-2011 the generation capacity is planned to increase from 1,460 MW to 1,930 MW, which also include new thermal capacities.

21 The average age of the HPP is 35 years and the last was built in 1985.
22 "This paragraph is built on “Security of Supply Statement of the Republic of Albania”, Ministry of the Economy, Trade and Energy, June 2007
In recent months there has been a lot of interest shown in building new capacity in Albania, although with the exception of one unit at the Vlore power plant, none is under construction.\textsuperscript{23} The TPP Vlore and HPP Kalivac are planned to be commissioned in 2009 and 2010.\textsuperscript{24} Italian construction and electricity firm Moncada Costruzioni plans to start work

\textsuperscript{23} Platts, April 2008.

on a 500 MW power line between Italy and Albania this year. The line will include a 130 km submarine link. Moncada is also considering a 500 MW wind park in Albania. Enel and a consortium involving PPC and RWE are each considering building coal capacity, and some interest has also been shown in CCGT capacity. If any of these projects go ahead more interconnectors are likely to be built. Albania has also showed interest in building nuclear power plants, a plan supported by the new Italian government. Unless there is a very large increase in interconnection we would not expect all the planned capacity to be built, as, due to Albania’s low demand, prices could collapse.

As mentioned above, the Albanian Power System is facing serious problems due to insufficient development of the transmission system and lack of rehabilitation and upgrading of the equipment during the last 15 years. End of 2007, the Albanian power corporation (KESH) announced that it started with the renewal of transmission network with funds provided by European Investment Bank.

The transmission system consists of 400, 220 and 110 kV voltage levels, and 220 high voltage sub-stations with a total installed capacity of 5,031 MVA. A new 400 kV power line between Tirana (Albania) and Podgorica (Montenegro) is under construction and it should be operational by July 2009. A study on a new 400 kV interconnection to UNMIK has also been completed, but financing for the investment is still lacking. There has also been discussion on a new line to Macedonia.\(^{25}\)

\(^{25}\) Interview with ERE and OST, December 2008
A.1.2 Albanian market structure

The Albanian Power Company, KESH, was established in 1992, as a vertically integrated state-owned monopoly with 99% market share in the market. By the Government Decree no. 797, dated 4.12.2003 on the establishment of the company ‘Transmission System Operator’ sh.a Tirane, the legal basis for unbundling of the transmission system operator was created. A transitional market model approved by the Government Decree no.539, dated 12.8.2004 was another step forward in the restructuring process. A new market model has replaced the transitional market model and the new market rules were approved by the Board of Commissioners of ERE on the 23 June 2008.

Three private companies, Shkoder, Elbasan and Vlora, share the distribution of electricity in the parts of Albania where it is not controlled by KESH. The distribution (DSO and supply part of KESH has been unbundled and the procedure of privatization of this is in the final stages of implementation (December, 2008).²⁶

²⁶ Interviews with ERE and OST, December 2008 and Energy Community Secretariat “Report on the implementation of the acquis under the treaty establishing the energy community”, November 2008
Private sector participation in the electricity market began in 2002 and has resulted in 13 new entrants, mainly IPPs, private distribution companies, and concessionary licensee in the generation sector.

A.1.3 The Albanian market model

The new Albanian Market Model, AMM) which has replaced the previous Transitional Market Model is in broad terms characterized by bilateral contracts for electricity between market participants. The market model also outlines the responsibilities of, and relationships among, the market participants and the regulator.

A detailed description of the AMM can be downloaded from the webpage of the regulator. Here we provide a brief summary of the key market participants and their roles according to the AMM.

- OST is the transmission system and market operator and is an independent state owned company.
- A wholesale public supplier exists with the responsibility of buying electricity and to provide sufficient supply to the retail public supplier.
- The retail public supplier sells electricity only to tariff customers, under terms and conditions approved by the regulator.
- The dominant generator, KESH Gen, is obliged to sell electricity to the wholesale public supplier at regulated prices, as well as ancillary services and electricity needed to cover technical losses in the transmission system.
- Any customer is free to become eligible by applying for a license. According to interviews with the regulator (ERE) and OST) all non-household customers can become eligible. It has also been proposed that all customers on the 35 kV level or above should automatically become eligible, i.e., forced out on the open market.

A.1.4 Regulator

The energy regulatory authority, ERE, was set up in 1996 to take charge of the regulation of tariffs. Five commissioners appointed by Parliament for five years (except the first board) form the governing body of the agency. The regulator is responsible for the approval of tariffs and prices, licensing of companies in the electricity sector and monitoring their activities. The regulatory body is financially independent, with funding for its operative work mostly secured by financial revenues derived from licence charges.

ERE has to issue an annual report to the Parliament and government, outlining the state of the electric energy market and indicating the regulator’s operations, including its financial activities. This report must also be made publicly available. In addition, the regulatory body must provide information within its authority and expertise to the Energy Minister.

On the basis of the Power Sector Law amendments, the ERE is authorised to define electricity consumption threshold. By the end of 2006 the threshold was set at 100 GWh/year (one hundred million kWh; 2 eligible consumers), while at beginning of 2007 - the eligibility threshold is set at 10 GWh/year which has been fulfilled by 15 consumers.

27 http://www.ere.gov.al/doc1/AMM_As_approved_by_CoM_English_031908.DOC
28 Interview with ERE and OST, December 2008.
29 ERE website.
ERE will bring out appropriate decisions concerning the market opening. The eligibility threshold is due to be lowered to cover to all non-household customers, in 2008\textsuperscript{31}.

**A.1.5 Tariff system**

In the beginning of 2006, Albania has formulated its tariff system for transmission. It is a combination of price and revenue cap.\textsuperscript{32}

The main components of the retail tariffs are the energy part and transmission and distribution parts in addition to certain energy (and other) taxes and supplier profit margins. The energy part is largely a function of the input cost, although this can be very low in the domestically-generated volumes as the country’s power generation is largely hydro-dominated and the input energy cost is usually higher for some of the imported electricity volumes. In addition, the transmission and distribution elements of the retail tariffs are regulated and year-year on increases is somewhat more muted than the corresponding energy-related increases seen in recent years.

**A.1.6 Allocation of cross-border capacities**

On the Albanian borders the capacity is split 50/50. The Albanian share of the capacity is first allocated to KESH as public wholesale supplier. Currently KESH is allocated 25% of the capacity, but may ask for more if needed. This system is implemented in order to protect domestic customers. The remaining part of the Albanian share is allocated on a first-come-first-served basis and based on agreements between the dispatch centre and the trader. In the market rules auctioning is however foreseen.\textsuperscript{33}

**A.2 Bosnia and Herzegovina**

**A.2.1 The power system in Bosnia and Herzegovina**

Thermal generation provides approximately 59% of the total generation in BiH (coal, 1,650 MW), while the rest is generated by hydro power plants (1,960 MW). A lot of new capacity is being planned. About 130 MW of hydroelectric capacity/upgrades is already under construction, and further increases are planned. EPHZHB (one of the three main generation companies) also plans over 500 MW of wind capacity. Further coal/lignite capacity is being considered.

BiH is a fuel rich country: it has proven coal, lignite, and oil reserves and significant potential for small-scale hydropower plants. 53% of total land area is covered with forest, so there is also a high potential to produce energy from biomass.

In 2006 the electricity generation was around 13.3 TWh, while the consumption was around 10.8 TWh. The peak demand was around 2,000 MW in 2006. As shown by Figure 14 the consumption is expected to increase considerable of the coming years and by 2014 be higher then the domestic generation.\textsuperscript{34}

\textsuperscript{31} Energy Community.

\textsuperscript{32} USAID, Tariff benchmarking 2006.

\textsuperscript{33} Interview with ERE and OST, December 2008

\textsuperscript{34} "Statement on Security of Supply Bosnia and Herzegovina", May 2007
The transmission system consists of 400, 220 and 110 kV voltage levels with an overall length of 5,565 km and a total transformer capacity of about 4,744 MVA.
A.2.2 The Bosnia and Herzegovina market structure

The power sector consists of three vertically integrated monopolies: Elektroprivreda Bosne i Herzegovine (EPBiH), Elektroprivreda of the Republic of Srpska (EPRS) and Elektroprivreda Hrvatske Zajednice Herceg-Bosna (EPHZHB). The three power companies are synchronised and interconnected but there is no competition between them. Each company is a virtual monopoly within its exclusive ethnically-based service territory. The total net generation from these three companies is split between EPBiH (46.85%), EPRS (39.33%) and EPHZHB (13.82%)\(^{35}\). EPRS and EPBiH have a surplus, while EPHZHB hosting a big industrial customer has a deficit. The regulator forces EPRS and EPBiH to sell to EPHZHB.

Independent System Operator in Bosnia (ISO BIH) operates the transmission system and balancing market (established in July 2005) and is legally unbundled.

A single company for transmission of electricity in Bosnia - Elektroprenos Bosne i Hercegovine, Banja Luka - started its operations in February 2006.

EP BiH and EP HZHB are holders of a single distribution license each, while distribution subsidiaries of ERS are licensed separately (Elektro Doboj, Elektro-Bijeljina, IERN 2006 data.

35
Elektrodistribucija Pale, Elektro-Hercegovina Trebinje and Elektrokrajina Banja Luka). These DSOs are all legally unbundled.

Distribution in Brčko District of Bosnia is done by a separate entity, attached to the local government. The successful introduction of competition in the energy market and the liberalization of the sector will require major structural and regulatory reforms and preparation of an adequate regulatory framework. In November 2005, the Regulator SERC developed a draft Decision, as part of the regulatory framework and a beginning towards the realization of competition. The Draft Decision is also part of the overall obligations of Bosnia as a signatory of the Treaty on Establishment of the Energy Community.

A.2.3 The Bosnia and Herzegovina market model

As mentioned above there are 3 vertically integrated generators/suppliers with no competition between them. 10 customers are eligible (110 kV), but eligibility is optional and no one executes the eligibility which implies switching to market prices.

There are 9 independent traders and 3 entity traders. Only surplus capacity, as defined by the authorities, is allowed to be exported.36

In order to establish a power exchange law amendments are needed.

Figure 16. Market model in Bosnia and Herzegovina

TC = Tariff Customer
EC = Eligible Customer, so far just one company (Al) executes its eligibility

Source: Pöyry Energy Consulting and Nord Pool Consulting

36 Bosnia and Herzegovina has a positive supply/demand balance.
A.2.4 Regulator

The State Electricity Regulatory Commission (SERC) is an independent, non-profit statutory institution of Bosnia. SERC acts in accordance with the principles of objectivity, transparency and equality, and has jurisdiction over the transmission of electricity, transmission system operation and international trade in electricity. The regulatory body is financially independent, with funding for its operative work mostly secured by financial revenues derived from licence charges.

The regulatory authority was established by the Bosnian parliament through the passage of the Act on Transmission, Regulator and Electricity System Operator (July, 2003), and the subsequent appointment of three Commissioners. The appointing organ of the Commissioners – who serve a mandate of five years – is the Parliament of Bosnia and Herzegovina, following onto the nomination from the constituent Parliaments that is submitted to the Council of Ministers. The regulator has to submit a written annual report on its activities to the country’s Parliament and to the Ministry of Foreign Trade and Economics Relations.

The electricity market in Bosnia was partially opened to competition on January 1st, 2007, in line with the Regulators' Decision on scope, condition and time schedule of electricity market opening. The group of customers who have access to alternative suppliers ('eligible customers') is expanding according to the following time schedule:

- customers with annual consumption of electricity higher than 10 GWh as of January 1st, 2007, creating the level of market opening of 32.9%;
- all customers, except households, as of January 1st, 2008 (market opening of 58.7%);
- all customers as of January 1st, 2015.

One major customer, Aluminij JSC Mostar accounts for about 20% of total consumption and it obtained eligible status in 2007.

A.2.5 Tariff system

The country has set the transmission tariff on a cost based methodology. The ancillary services are included in this tariff as well (cost of system operation). The distribution tariffs were implemented in 2006 and based on a marginal cost methodology, which means, that the tariff includes both locational and time of use considerations.

The main components of the retail tariffs are the energy part and transmission and distribution parts in addition to certain energy (and other) taxes and supplier profit margins. The energy part is largely a function of the input cost, which itself depends on the component technologies of the generation mix. In addition, the transmission and distribution elements of the retail tariffs are regulated and year-year on increases are somewhat more muted than the corresponding energy-related increases seen in recent years.

A.2.6 Allocation of cross-border capacities

Bosnia and Herzegovina uses the pro rata allocation method on its borders to Serbia, Croatia and Montenegro, which includes a capacity split approach. The congestion management guidelines foresee the implementation of transparency requirements.

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38 USAID, Tariff benchmarking 2006.
according to Article 5.5 of the Congestion Management Guidelines. Bosnia and Herzegovina does not fulfil requirements of this regulation.\textsuperscript{39}

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<tr>
<th>From</th>
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</tr>
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</table>

Source: ECRB, ECRB EWG Benchmarking Report 2008

A.3  Croatia

A.3.1  The Croatian power system

The total installed capacity in Croatia is around 4,200 MW. Close to half is hydro power, about 40\% conventional thermal power plants (including industrial power plants) and a little less than 10\% nuclear power. The average age of the hydro power plants is over 35 years and the last started in 1989. The average age of the thermal power plants is over 30 years and the last started in 2003.

Total supply in the country is not sufficient to meet total electricity demand, so Croatia relies to some extent on imports. The existing sources in the Croatian electricity system can, given favourable hydrological conditions, generate about 14.5 TWh of electricity, while an additional 2 TWh is imported to cover total annual demand of customers in Croatia (see Figure 18). According to the “Security of Supply Statement for Croatia” (June, 2007), this deficit is also expected to grow in the future to a level of approximately 9.5 TWh by 2020.

During droughts the production in the hydro plants is reduced. Also the nuclear production is then reduced to about 80\% of its installed power (to avoid river overheating). Imports are then needed. Households also have priority during periods of limited natural gas supply. Some thermal plants can use both natural gas and heating oil.

In the security of supply statement the peak load in the years 2007-2010 was expected to be between 3,140 MW and 3,440 MW, which is less than the current available capacity.

Up to 2010 there are planned constructions of new power plants with a total capacity of 732 MWe (and 130 MW heat). A hydro power plant is under construction with start up in 2009 (42 MWe), a thermal plant (cogeneration – natural gas) with 100 MWe and 80 MWt is with start up in the end of 2008, a thermal plant (natural gas) with 230 MWe and 50 MWt

\textsuperscript{39}  ECRB, ECRB EWG Benchmarking Report 2008
with planned start up end 2010 and wind power plants with a total capacity of 360 MWe (level expected up to the end of 2010).  

Figure 17. Available power plant capacities in Croatia, MW


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40 Security of Supply Statement of the Republic of Croatia, June 2007
The Croatian transmission system consists of 400 kV, 220 kV and 110 kV networks. The transmission lengths at each transmission voltage level are: 157.4 km (400 kV), 1,245.1 km (220 kV) and 4,762.6 km (110 kV).
A.3.2 The Croatian market structure

Hrvatska Elektroprivreda (HEP Group) is the incumbent national electricity company engaged in electricity production, transmission and distribution. The group is made up of multiple affiliate companies in the energy value chain performing core electricity and auxiliary activities. In its current form, the group was established in July 2002.


HEP Group power plants produce about 80 percent of the electricity needed to meet the demand. It has 4,000 MW of installed capacity for electricity production. Within HEP Proizvodnja d.o.o. (HEP Generation ltd.) there are 25 hydro power plants and 8 thermal power plants fired by oil, natural gas or coal. Other players in the generation sector are TPP Plomin, co-owned by HEP Generation and RWE Power which operates a 210 MW thermal power plant, and industrial power plants and private owners of small renewable energy sources; and Krsko NPP in Slovenia, 50% co-owned by HEP.
HEP Transmission Ltd. is the legally unbundled entity with a public service obligation as transmission system operator (TSO), according to the Regulated TPA model. The national grid is organized in four transmission areas with network centres in Zagreb, Osijek, Opatija and Spit. HEP Distribution Ltd. has a public service obligation as the distribution system operator (DSO) in Croatia and is also legally unbundled.

The market operator (HROTE) founded in April 2005 has responsibility for the adoption of market rules, organising the market and settlement of balancing energy. At the end of 2006 HROTE has been separated from HEP Group and its ownership assigned to the Republic of Croatia.

**A.3.3 The Croatian market model**

The market model is based on bilateral contracts and there is no power exchange. HEP – Generation serves the tariff customers.

There are about 2,700 eligible customers who must buy on the market. An eligible customer may enter into contract with only one supplier at a single metering point.

The suppliers are allowed to export and import electricity, but traders are not allowed to sell energy to final consumers.

**Figure 20. Market model in Croatia**

![Market model diagram](source: Lahorko Wagmann, HERA)
A.3.4 Regulator

The Croatian Energy Regulatory Agency (HERA) was established in 2004. As an independent regulatory authority, HERA is responsible for monitoring the market to ensure non-discrimination, effective competition and the efficient functioning of the market. It is also a member of the regional regulators association (ERRA), which is aimed at improving regional dialogue on common issues. The regulator’s five Commissioners serve a five-year mandate, which can be renewed once. Croatia’s Parliament is responsible for the appointment of the Commissioners, following onto a proposal from the government.

HERA should submit an annual report on its regulatory activities to the country’s Parliament. Upon request, the authority should also submit a report on its professional and financial operative status to Parliament or government, as well as provide an account on specific areas from its operation for time periods shorter than one year.

Croatia intends to fully comply with the electricity market acquis even before EU accession. With an eligibility threshold of 9 GWh, the proportion of the market officially open to competition stands at 25%, but in reality there have been no new market entrants due to a lack of effective incentives. All prices remain regulated, except for prices for supplies to eligible customers.41

The regulatory body is financially independent, with funding for its operative work mostly secured by financial revenues derived from licence charges.

A.3.5 Tariff system

There are four adopted tariff methodologies.42

- Tariff system for electricity production with the exception of eligible customers without tariff rates (Official Gazette 143/2006)
- Tariff system for the electricity transmission without tariff rates (Official Gazette 143/2006)
- Tariff system for the electricity distribution without tariff rates (Official Gazette 143/2006)
- Tariff system for electricity supply with the exception of eligible customers without tariff rates (Official Gazette 143/2006)

The main components of the retail tariffs are the energy part and transmission and distribution parts in addition to certain energy (and other) taxes and supplier profit margins. The energy part is largely a function of the input cost, which itself depends on the component technologies of the generation mix. In addition, the transmission and distribution elements of the retail tariffs are regulated and year-year on increases are somewhat more muted than the corresponding energy-related increases seen in recent years.

A.3.6 Allocation of cross-border capacities

On its borders to Slovenia and Bosnia and Herzegovina, Croatia makes use of explicit auctions (for base load) on a monthly basis with using the “use it or lose it” principle. At these borders there is a periodical (annually, semi-annually, quarterly) allocation. If applications exceed offered capacities, public service obligations and imports for domestic

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41 European Commission.
42 Security of supply statement of the Republic of Croatia, June 2007
customers or exports from domestic producers are favoured (without intensified cogeneration and RES). The explicit auctions are managed by the Croatian TSO HEP-OPS. The available capacities are published 5 working days before the start of the auction and the auction’s results immediately after the auction itself. Deadlines for confirming auctioned capacity are predefined in the auction schedule table. The necessary information is published on HEP-OPS’s website.43

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Source: ECRB, ECRB EWG Benchmarking Report 2008

## A.4 FYROM

### A.4.1 The power system in FYROM

FYROM has no oil or gas resources. About 80% of primary energy demand is provided through domestic production of electricity in thermal and hydro power plants. Of the installed capacity 66% (1,010 MW) are thermal power plants, and 34% (518 MW) hydro power plants.

Almost 80% of the annual energy generation is provided by three thermal power plants of which two are lignite-fired plants. These plants were commissioned in the 1980’s. The third plant (TPP Negotino) was designed to burn heavy fuel oil but it can also use natural gas. In recent years, the plant has not been used due to high fuel costs and lack of demand. In May 2007, TPP Negotino became operational again. Six large hydropower plants have been constructed and a new one was commissioned in September 2004. The tender for two new hydro power plants in the Crna Reka (total 500 MW) was cancelled in December 2008 following the submission of bids by two different companies with the motivation that the bidders were not compliant with the tender conditions.44

In December 2008 there were 65 sites for construction of small hydro power plants (<10 MW) that were near closing of contracts, and it is estimated that there are an additional 300 other possible locations for small hydro power plants.45

Furthermore there are private investments in industrial CHP expecting to provide 200 MW electricity and 160 MW heat. This is expected to be completed in 2010 and the electricity will be sold in the open market.46

Feed-in tariffs have been prepared for small hydro power plants, wind, biomass, photo voltaic and in 2009 it will also be prepared for solar thermal.47

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43 ECRB, ECRB EWG Benchmarking Report 2008
44 Interview with ERC and the Ministry of Economy
45 Interview with the Ministry of Economy
46 Interview with ERC
The peak load (2005) was 1,491 MW, i.e., only slightly below the total capacity in the country. The total electricity demand in the same year was 8.3 TWh of which about 1.6 TWh was imported. In all years since 2000 has FYROM been dependent on net import to cover the consumption and the import requirements have increased every year. The energy consumption has increased with 3.2% on average in the period 1992-2006 and with 4.5% in the period 2001-2006. The peak load has increased by approximately the same magnitude. The yearly consumption is expected to continue growing to reach a level of about 12 TWh in the year 2020. The year peak demand is also expected to continue growing to reach a level of close to 2,400 MW in the year 2020.

In an interview with ELEM (December, 2008) it was mentioned that ELEM has sufficient generation to cover the demand of EVN in terms of energy, but not sufficient capacity to meet the winter peak. The total import to the country is now approximately 2.5 TWh, of which about 800 GWh is for tariff customers (part of the import was said to cover commercial losses).

However, the power balance in the near future is dependent on the industrial development. Presently (December, 2008) industrial facilities have been closed down due to the global economic recession, which has a significant impact on the country’s power balance.

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Figure 21. Generation, import and consumption (1991-2006), consumption forecast (2007-2020), GWh


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47 Interview with ERC
48 Interview with ELEM, December 2008
The main transmission network in FYROM consists of overhead transmission lines rated at 400 kV, 220 kV and 110 kV. There is one 150 kV line used as a connection with Greece. In 2006, overall electricity losses in the transmission and distribution network reached 1.68 TWh, equal to 85% of annual electricity imports to FYROM. In January 2008 a 400 kV interconnector to Bulgaria was put in operation and the construction of a new interconnector to Serbia is planned to start in the spring 2009. There have also been discussions about a new line to Albania, but no decision has been taken.

**Figure 22. FYROM’s electricity grid system**

Source: REBIS GIS

### A.4.2 The FYROM market structure

Elektrostopanstvo na Makedonija (ESM) is historically the dominant firm in the FYROM electricity sector. There have been several efforts, dating back to 2001, to liberalize the market and to privatize the company. The effort was cancelled in 2002, renewed in 2004, and resulted in the formation of four new companies in 2005: two generation companies (AD TEC Negotino and AD Elektrani na Makedonija – ELEM), a legally unbundled transmission company (AD MEPSO) and a legally unbundled distribution company (AD ESM). AD ELEM took over the coal-fired thermal generation, while AD TPP Negotino took control of the fuel oil powered-plant. AD ESM is also a Distributed Electricity Generator and owns 11 small hydro power plants. Seven of the small HPP are operated by a private entity Makhydro Proekt AD, under a ROT concession agreement entered into on 7 November 2001. After the concession expires in 2012, AD ESM will resume operation of the seven leased small HPPs.

Following a recent successful privatization process, the FYROM distribution company is now in private hands. On the 16th March, 2006, Austrian utility EVN AG won the bidding process to buy the national electricity distribution company, AD ESM. At the moment EVN AG owns 90% of the distribution company's shares, with the state of FYROM retaining...
ownership of the remaining 10% of the shares. TPP Negotino is currently on-going a process of privatisation\textsuperscript{49}.

**A.4.3 The FYROM market model**

The last change in the Energy Law came into force in November 2008, when the previous single-buyer model, with MEPSO as the single buyer, was abolished. New market rules have been developed, but are yet not available in English.

Under the new Energy Act the role of wholesale supplier for tariff customers do no longer exists, i.e. there is no possibility for wholesale customers (eligible customers) to buy at regulated tariff. Previously this was a function of MEPSO.

JSC MEPSO is the transmission system operator and market operator. As the TSO it owns the transmission grid and is responsible for its operation. As the market operator MEPSO is responsible for the efficient functioning of the market and manage the system for electricity sale and purchase.

The main producer JSC ELEM is the regulated electricity producer and is obliged to provide public service. This includes the responsibility to supply to the distributor JSC EVN (supplier of electricity for the retail tariff customers) at regulated prices and the system operator with ancillary services. If ELEM is not able to generate sufficiently it has to procure (through public tendering). If there are surpluses ELEM can sell on the open market. EVN can buy from traders if the price is lower than the price offered from ELEM.

Traders purchase electricity for sale to eligible consumers, the regulated electricity generator (ELEM) and the tariff customer supplier (EVN). They also function as trade mediators for sale and purchase of electricity in or out of the country.

**A.4.4 Regulator**

The Energy Regulatory Commission (ERC) was set up 2002\textsuperscript{50}. It regulates the country’s electricity market and is financed by fee payments levied on the total income of the companies involved in the energy sector, as well as by payments from licences issued. The commission is not financed from the national budget.

The regulatory body has five Commissioners – serving a mandate of five years, renewable once – who are appointed by Parliament as per a proposal of the government. ERC should submit a comprehensive annual report on its activities, including financial matters, to the country’s Parliament and government. In addition, the annual report should be made publicly available in one of the national newspapers.

**A.4.5 Tariff system**

A change in the Energy Act was adopted in September, 2008. For the last two month of 2008 the tariffs were adjusted (raised approximately 13%) and a new tariff methodology

\textsuperscript{49} The Government of FYROM launched an international tender for the privatization of TPP Negotino. The prerequisites that the FYROM government imposed are that only companies that have assets of over 300 million euros, an income exceeding 200 million euros in the last two fiscal years, and profits of over 20 million euros can enter the tender. The deadline for entry is April 27th.

\textsuperscript{50} ECRB 2008 Market Development Report.
was issued on 31 December 2008. The new tariff regulation is supposed to increase transparency and the cost reflectivity of the tariffs.

Under the previous tariff regime, the transmission tariffs\(^{51}\) have been implemented by the end of 2005. It is an incentive type of tariff. Ancillary services tariffs are included in the revenue of the TSO. It is part of the company’s organization’s revenues. Distribution tariffs are calculated on 3 different voltage levels and are a mixture of revenue cap and cost cap.

The main components of the retail tariffs are the energy part and transmission and distribution parts in addition to certain energy (and other) taxes and supplier profit margins. The energy part is largely a function of the input cost, which itself depends on the component technologies of the generation mix. In addition, the transmission and distribution elements of the retail tariffs are regulated and year-year on increases are somewhat more muted than the corresponding energy-related increases seen in recent years.

Under the new regulation the prices are regulated through a maximum regulated revenue (revenue cap) based on the average prices. The revenue cap shall be set so that it enables the company to recover sufficient revenue to cover operating costs and the depreciation of assets. Even though the tariff regulation is based on a revenue cap approach the cap may be changed if costs increase or decrease by more than 5% in relation to the approved operational costs and if this is a consequence of circumstances which did not exist at the time of approval of the revenue cap. If it is a cost increase the company may submit a request for an increase; if it is a cost decrease the company is obliged to submit a request for a decrease.

Technical losses for MEPSO and EVN are approved by the ERC. The approved losses are supplied at regulated tariffs from ELEM. Losses above the approved levels (11% in distribution, 2% in transmission) have to be bought at the open market.

### A.4.6 Allocation of cross-border capacities

On its borders to Serbia, FYROM makes use of explicit auctions (for base load) and on its borders with Greece, it makes use of joint auctions, managed with Greek TSO HTSO. For both kinds, the "use it or lose it" principle is applied.\(^{52}\) The congestion management guidelines foresee the implementation of transparency requirements according to Article 5.5 of the Congestion Management Guidelines. FYROM does not fulfil all requirements of this regulation.\(^{53}\)

#### Table 14. Capacity Allocation Schemes at the borders of FYROM

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Source: ECRB, ECRB EWG Benchmarking Report 2008

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\(^{51}\) USAID, Tariff benchmarking 2006.

\(^{52}\) ECRB, ECRB EWG Benchmarking Report 2008

\(^{53}\) ECRB, ECRB EWG Benchmarking Report 2008
A.5 Montenegro

A.5.1 The power system in Montenegro

Generation in Montenegro is dominated by hydropower, with 59% of total production coming from two major hydro power plants (Perucica and Piva) and a few small hydro power plants. The other 41% of the production comes from one lignite-fired power plant (Pljevlja).

The total installed capacity is 868 MW (net capacity 849 MW). The hydro power plans has 31% of the installed capacity, but produce about 60% of the energy. The total generation is about 2.5-3 TWh, while the energy consumption (including losses) around 4.8 TWh. The deficit is thus around 2 TWh or about 40% of the total demand.

Montenegro has considerable unused hydroelectric potential; about 1GW of new hydroelectric capacity is currently being planned, although it may not all be built.

Despite the high level of electricity imports, Montenegro still faces supply shortages. Recently, these shortages have been exacerbated by a drought that reduced hydropower production. With rising demand, Montenegro’s supply problems will only be solved by the construction of new power stations.

The transmission system consists of 400 kV lines, 220 kV lines, and 110 kV lines. Substantial investment is required in the system, as well as in generation capacity. A new 400kV power line between Podgorica, Montenegro and Tirana, Albania is currently planned and is scheduled for completion June 2009.

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54 This section is partly based on “Security of Supply Statement of the Republic of Montenegro”, Prepared by the Ministry for Economic Development, June 2007
A.5.2 The Montenegro market structure

The energy sector in Montenegro is in urgent need of restructuring following a decade of neglect. The state-owned power company Electro Distribution Company (EPCG) has faced mounting losses. The government aims to privatize EPCG, but steps must first be taken to restructure the enterprise. Given the poor financial standing of the EPCG, most of the new developments will have to be funded by the private sector.

EPCG is the functionally unbundled entity with four divisions responsible for generation, transmission, distribution and supply. However, the TSO and DSO operations are not fully legally unbundled.

Competitive electricity market (based on bilateral contracts) is in the early stage of development. Until sufficient competition has been established, generation and supply will be regulated by the Energy Regulatory Agency of Montenegro (ERA).

A.5.3 The Montenegro market model

All customers are formally eligible, but there is only one supplier. One large consumer (250 MW) meets the market price on 35% of its consumption.

Import, which covers 40% of consumption, is all done through traders including the state owned electricity distribution company EPCG.
A.5.4 Regulator

The Energy Regulatory Agency of Montenegro (REGAGEN) was established in January 2004 based on the legal framework of Energy Law 2003. Its activities are led by four Commissioners, who can serve a mandate of up to five years. The Commissioners are appointed by the country’s Parliament, following the proposal of a commission. The authority also has to submit an annual report to Parliament.

Competitive electricity market (based on bilateral contracts) is in the early stage of development. Until sufficient competition has been established, generation and supply will be regulated by ERA. The regulatory body is financially independent, with funding for its operative work mostly secured by financial revenues derived from licence charges.

A.5.5 Tariff system

The main components of the retail tariffs are the energy part and transmission and distribution parts in addition to certain energy (and other) taxes and supplier profit margins. The energy part is largely a function of the input cost, which itself depends on the component technologies of the generation mix. In addition, the transmission and distribution elements of the retail tariffs are regulated and year-year on increases are somewhat more muted than the corresponding energy-related increases seen in recent years.

A.5.6 Allocation of cross-border capacities

Most of the interconnector capacity is allocated in monthly auctions.
A.6 Serbia

A.6.1 The Serbian power system

Serbia’s energy infrastructure has suffered from years of under-investment, sanctions and the oil embargo during the 1990s, and NATO bombing in 1999. During the 1990s, domestic lignite became the country’s main primary energy source. The lignite used is of low quality due to a high percentage of moisture and ash content, and therefore has adverse environmental impact.

Serbia’s generation capacity is dominated by thermal power plants, which together account for roughly 73% of total output; of this oil and gas turbine units form only 2%. Hydroelectric plants generate an additional 27%.

Of the thermal generation, more than 90% of total supply comes from coal powered plants that use locally mined coal (mostly indigenous lignite). 75% of the total coal consumption in Serbia is used for electricity production.

Several new thermal projects are currently in the planning stage, although many of the projects are still in the early stages of planning. There is considerable uncertainty about what mix of Gas and Lignite capacity should be built due to uncertainty about when Serbia will join the EU.

Supply and demand are relatively well balanced. A previous deficit has been gradually decreased and turned into a small surplus. The growth in electricity consumption in the period 2005-2015 is expected to be between 1.7%-2.2% annually (depending on scenario).\textsuperscript{55}

\textsuperscript{55} This section is based on “Security of Supply – Serbia”, Ministry of Energy and Mining, 2007
Figure 25. Generation, demand and exchange, Serbia 2001-2006, GWh

Total transmission system includes 1,562 km of 400 kV, 2,196 km of 220 kV and 6,465 km of 110 kV.
Figure 26. The transmission system in Serbia

Source: EMS

### A.6.2 The Serbian market structure

The first important steps towards the liberalization of electricity market in Serbia were the approval of Serbian Energy Development Strategy and the new Energy Law (in 2004). The Energy Law fully complies with EU directives and the guiding principles for liberalization in the energy sector in countries aiming at accessing to the EU and it respects the commitments made by Serbia when signing the Athens Memorandum of Understanding for the establishment of regional electricity market in South Eastern Europe. In October 2005, Serbia signed The Treaty on Establishment of Energy Community of Southeast Europe and it was ratified by the Serbian Parliament in July 2006. The Treaty, which came into force on July 1st 2006, sets clear legal obligations for the implementation of the acquis communautaire on energy, environment, competition and renewables.

PE Electric Power Industry of Serbia (EPS), a public enterprise body established in 1991, was for several years the dominant vertically integrated incumbent. In 1999, EPS’s electric

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56 The Law was published in the ‘Official Gazette of the RS,’ No.84/2004 of July 24th, 2004
power facilities suffered heavy damage. In 2005, the unbundling of PE EPS commenced and EPS is now the dominant vertically integrated utility dealing with electricity production, distribution and supply. The parent company performs wholesale trade for captive customers (at regulated prices), wholesale trade for the open market and common corporate functions.

EPS legally independent subsidiaries deal with power generation (HPP Đerdap ltd, HPP Drinsko- Limske ltd, TPP Nikola Tesla ltd, TPP Kostolac ltd, CHP Panonske ltd.) and distribution/ supply (Elektrovojvodina ltd, Elektrodistribucija Beograd ltd, Elektrosrbija ltd, ED Jugoistok ltd., ED Centar ltd). The functions of the DSOs are legally unbundled from other operations.

The 100% state owned JP Elektromreža Srbije (EMS) is the independent transmission system and market operator in Serbia, dealing with grid O&M, system operation and market operation (including managing cross-border trades of electricity and capacity allocation on the interconnection lines). It has already been legally unbundled from other businesses.

In December 2007 the Government passed the proposal of EMS for access to and use of charges for electricity transmission. For the first time, the charges for transmission activity have been separated from other regulated energy activities. The coming into force of the Tariff System for electricity transmission on January 1st 2008 enabled market opening, since major buyers who meet the eligibility threshold, will be able to buy electricity from suppliers and pay transmission charges separately.57

A.6.3 The Serbian market model

The Serbian market has a high formal market opening (47%), but no customer executes its eligibility. EPS – Trading serves the tariff customers and has a 100% market share. It competes with 37 traders on export/import and transit.
Figure 27. Market model in Serbia

TC = Tariff Customer
EC = Eligible Customer, none so far (may, must). 47% formal opening

Source: Pöyry Energy Consulting and Nord Pool Consulting

A.6.4 Regulator

The Energy Agency of the Republic of Serbia (AERS) is the regulatory body established by the Energy Law of July 24th, 2004. AERS has jurisdiction in the electricity, gas, oil and district heating sub-sectors. After legal establishment in June 2005, AERS became fully operational in January 2006.

The regulator’s activities are led by five Commissioners, who serve a mandate of five years (renewable once). AERS’s Commissioners are appointed by Parliament, following a proposal by the country’s government. The regulatory body is financially independent, with funding for its operative work mostly secured by financial revenues derived from licence charges.

AERS should provide an annual report to the Serbia’s Parliament at least once a year. In addition, its Financial Plan should be sanctioned by Parliament. Non-confidential information should be made publicly available.

The initial eligibility threshold is set by the Energy Law at 25 GWh/year, this corresponds with approximately 12% of market opening.

A.6.5 Tariff system

The main components of the retail tariffs are the energy part and transmission and distribution parts in addition to certain energy (and other) taxes and supplier profit margins. The energy part is largely a function of the input cost, which itself depends on the component technologies of the generation mix. In addition, the transmission and distribution elements of the retail tariffs are regulated and year-year on increases are
somewhat more muted than the corresponding energy-related increases seen in recent years.

### A.6.6 Allocation of cross-border capacities

Serbia is using explicit auctions (for base load) based on the “use it or lose it” principle, on its borders to Romania, Hungary, Bosnia and Herzegovina, Montenegro and FYROM. Actually the auctions are not common co-ordinated.\(^{58}\) Serbia also controls and allocates the capacity on the borders between the UNMIK area and other areas.

The congestion management guidelines foresee the implementation of transparency requirements according to Article 5.5 of the Congestion Management Guidelines. Serbia does not fulfil actually all requirements of this regulation.\(^{59}\)

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*Source: ECRB, ECRB EWG Benchmarking Report 2008*

### A.7 UNMIK

#### A.7.1 The UNMIK power system\(^{60}\)

UNMIK has substantial potential for electricity generation using lignite. It also has a small additional hydro-electric potential. The power is generated by two lignite fired power plants with a total capacity of 1,478 MW and a hydro power plant (2 units of 17.5 MW each).

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\(^{58}\) ECRB, ECRB EWG Benchmarking Report 2008  
\(^{59}\) ECRB, ECRB EWG Benchmarking Report 2008  
\(^{60}\) This section is partly based on “Statement of Security of Supply for Kosovo, Provisional institutions of self-government, Government of Kosovo, Ministry of Energy and Mining"
However, due to age and lack of maintenance the availability of the lignite plants (in particular Kosovo A) is low.

Following civil conflict, the power supply situation was about to improve in 2002, when two accidents occurred at the power plant Kosovo B and the Bardh mine. These accidents seriously crippled the system’s ability to meet the rapidly growing demand. The priority at present is to stabilize the supply, and then to provide for security in the medium term. In 2007, UNMIK was a net importer of electricity (263 GWh).  

At the moment only 3.2% of the total production comes from hydro, the remaining part of 96.8% consists of lignite. Approximately 85% of the indigenous lignite deposits mined in UNMIK are used to generate electricity in the two thermal plants – Kosovo A and Kosovo B. The total installed generation capacity of the two plants is 1,498 MW. Rehabilitation work in the power plants has been carried out in some units but is not yet completed in others.

Total generation in the 2005 was around 4.5 TWh. Electricity demand as grown considerable, in the period 2000-2005 around 8% annually and in 2005 the total demand was approximately 4.9 TWh, but distribution losses accounted for almost 1.9 TWh. Only 52% of the delivered energy was billed and of this only 2/3 was collected.

The winter peak in 2005 was just below 900 MW. During the whole year of 2005 load shedding was applied.

There are plans in place for a new power plant of up to 2.1 GW and the development of a new lignite mine. However, the change of government and UNMIK’s bid for independence are said to have delayed the project. The new mine is particularly urgent, because the state of the existing mines is such that UNMIK may run out of Lignite between 2010 and 2012. Companies bidding for the project include CEZ/AES (joint bid), ENEL/Sencap (joint bid), RWE and EnBW/WGI (joint bid).

UNMIK’s transmission network consists of 400, 220 and 110 kV transmission lines. During the conflict the transmission network was severely damaged. Most of the transmission lines are back in operation, but a number of substations are still in poor condition. KOSTT is the TSO for the area, although it is not recognized by the Serbian TSO as an operator. There is a temporary agreement with the Serbian TSO (EMS) where KOSTT buys secondary control from Serbia. Furthermore Kosovo is not recognized as a control area under UCTE and KOSTT is not managing the interconnections from the area. A contract from 2001 exists with Serbia, which gives Serbia the right the coordinate the use of interconnectors, although not allocate the capacities.

With the exception of Albania, the transmission network is interconnected with neighbouring systems at the 400 kV level. The interconnection with Albania is at 220 kV. A new 400 kV line to Albania is considered vital for the realization of substantial power exchanges between the thermal power based UNMIK system and the hydropower based Albanian system and is a concern in the medium to long-term.

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61 IERN
62 Reuters
63 Interview with KOSTT and ERO, December 2008
A.7.2 The UNMIK market structure

Korporata Energetike e Kosoves (KEK) is the publicly-owned vertically integrated utility responsible for lignite mines, generation, distribution and supply of electricity. The company has recently been as a joint stock company and some of the service units were unbundled from the parent company.

The only significant power plant independent of KEK at present is a hydro power plant Gazivode/Ujman (2x17.5 MW) that is operated by an irrigation company (Hidrosistem Ibar-Lepenc). In addition, a few small hydro power plants also provide independent generation.

Transmission and dispatch functions were part of KEK but were legally unbundled in June 2006 when KOSTT was appointed by the Ministry of Energy and Mining in the function of Transmission, System and Market Operator. Since October 2006 the new company, KOSTT, has been operating independently. However, DSO activities are not legally unbundled yet.

UNMIK is committed to becoming a power exporter after 2012.

A.7.3 The UNMIK market model

The market model is based on bilateral contracts. KEK Supply has a function as a regulated wholesale supplier, who also provides balancing services. KEK Supply buys from producers and traders and the prices between the public supplier and public generator (within KEK) are regulated.
**Figure 29 – UNMIK market model**

*Electricity Market – “Bilateral Model”*

![Diagram showing the UNMIK market model with producers, traders, Bilateral Contracts (Regulated for PS/PG), KEK Supply (EC & TC), TSO & MO, and metered data.]

Source: KOSTT

### A.7.4 Regulator

The Energy Regulatory Office (ERO), established under Law 2004/9, is a strong, fully autonomous agency independent from other government departments. The ERO’s remit is to exercise economic regulation in the energy sector. It regulates electricity tariffs until such time as sufficient competition has developed to keep prices at reasonable levels. ERO’s Chairman should provide an annual report to UNMIK’s Assembly and to the Special Representative of the UN Secretary-General in UNMIK.

Its activities are led by five Commissioners, who can serve a mandate of five years (renewable once). The Commissioners are appointed by UNMIK’s Assembly, with the exception of the first board. The regulatory body is financially independent, with funding for its operative work mostly secured by financial revenues derived from licence charges, although donations from certain persons and organisations are also acceptable.

### A.7.5 Tariff system

The main components of the retail tariffs are the energy part and transmission and distribution parts in addition to certain energy (and other) taxes and supplier profit margins. The energy part is largely a function of the input cost, which itself depends on the component technologies of the generation mix. In addition, the transmission and distribution elements of the retail tariffs are regulated and year-year on increases are somewhat more muted than the corresponding energy-related increases seen in recent years.
A.7.6 Allocation of cross-border capacities

The UNMIK does not perform any cross border auctions to date. This can be explained by the fact that its cross-border capacities are controlled by the Serbian TSO. This is a case for a dispute that has not yet been resolved.
### ANNEX B LIST OF INTERVIEWS AND MEETINGS

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<td>Mubera Bicakcic, Head of Energy Department</td>
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<td>Djulizara Hadzimustafic, President</td>
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<td>Faruk Serdarevic, Project Coordinator, Technical Assistance to the</td>
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<td>Alija Mujcinagic, Tariff and Market Department Analyst, Sasa Lukic, Tariff and Market Department Analyst</td>
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<td>Croatia</td>
<td>HEP Transmission System Operator of Croatia</td>
<td>Tomislav Plavsic, Director, System Control Department, Ljubica Cvenic, International Cooperation and Restructuring, Silvio Brkic, Assistant Director, Development &amp; Institutional Affairs Department</td>
<td>26 January, 2009</td>
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<td>Croatia</td>
<td>Croatian Energy Regulatory Agency</td>
<td>Zeljko Rajic, Director, Electricity Division, Lahorko Wagmann, Head, Department for the Electric Power System and Quality of Service</td>
<td>26 January, 2009</td>
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<td>Leo Prelec, General Manager, Snezjana Blagajc, Head of Department, Market Organization Department</td>
<td>26 January, 2009</td>
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<td>Croatia</td>
<td>Ministry of Economy, Labour and Entrepreneurship</td>
<td>Boris Maksijan, 1 name missing</td>
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<td>FYROM</td>
<td>Energy Regulatory Commission</td>
<td>Vlado Gavrilov, Commissioner</td>
<td>9 December, 2008</td>
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| FYROM   | MEPSO        | Borko Aleksoski – Head of Operational Planning Office/System Operator-Dispatching Centre  
Ljubin Popovski – Head of Market Operational Office/Market Operator | 10 December, 2008 |
| FYROM   | Ministry of Economy | Elena Kolevska, Head of Unit/Energy Dept.  
Razmena Čikić-Durović, Head of Unit/Energy Dept. | 9 December, 2008 |
| FYROM   | ELEM         | Jasna Ivanova Davidovic – Member of Board of Directors, Manager for Development and Investment | 10 December, 2008 |
| Montenegro | Ministry for Economic Development | Vuko Dabovic, Adviser | 4 February, 2009 |
| Montenegro | Elektroprivreda Crne Gore | Alexandar Mijuskovic, Head of Analysis, Settlement and Planning Dept, National Dispatching Centre | 4 February, 2009 |
| Montenegro | Energy Regulatory Agency | Miodrag Djekic, Chairman of the Board  
Novak Mednica, Head of Economic Dept. | 4 February, 2009 |
<p>| Serbia  | EPS Electric Power Industry of Serbia | Dragan Vlaisajevic | 28 January, 2009 |
| Serbia  | EMS (Transmission System and Market | Milos Mladenovic, Assistant General | 28 January, 2009 |</p>
<table>
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<tr>
<th>Operator) Manager for System and Market Operation</th>
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<tr>
<td>Vladimir Jankovic, Division Manager, Market Division</td>
<td>Predrag Grujicic, Head of European Integration</td>
<td>29 January, 2009</td>
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<td>Serbia Ministry of Mining and Energy</td>
<td>Nikola Rajakovic, State Secretary</td>
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<td>Serbia AERS</td>
<td>Nenad Stefanovic, Senior Expert for Electricity</td>
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<td>Jasmina Trhulj, Senior Expert for Electricity</td>
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<td>UNMIK ERO</td>
<td>Nysret Avidu, Member of the Board</td>
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<td>Afrim Ajvazi, Acting Head of Legal and Licensing Dept.</td>
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<td>Naim Bujupi, Power System Analyst</td>
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