

World Bank Framework for Development of a Power Market in South East Europe

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THE WORLD BANK
GROUP



The Energy and
Mining Sector Board

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FOREWORD

The signing of a Treaty on October 25th 2005 by Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Macedonia, Romania, Serbia and Montenegro, and United Nations Interim Administration for Kosovo (UNMIK) represents a major step forward in development of a regional energy market in South East Europe. The Treaty represents a legal commitment to a process which started in 2003 following the signing of the Athens memorandum, under which countries in the South East Europe region agreed to develop a regional energy market and to undertake reforms required to support this.

This paper updates the Bank's Framework for Development of Regional Energy Trade in South East Europe published in March 2004. It focuses on the power sector, where significant reform has been undertaken in the context of the Athens process, and where previous Bank advice has been incorporated in the evolving legal and institutional framework.

Notwithstanding the progress, a number of significant challenges remain if a regional power market is to be successfully implemented. The paper identifies these challenges and proposes ways in which these can be addressed. The Bank will continue to work closely with other stakeholders to support development of a regional power market in South East Europe that will bring benefits to consumers in the region.

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ABSTRACT

This Bank framework is motivated by the Athens memorandum and the Treaty whereby countries in South East Europe have agreed to form a regional power market in South East Europe. It outlines challenges in successful market implementation, and elaborates an ongoing role for the Bank providing policy and investment support.

The paper recognizes the significant progress that has been achieved in the context of the Athens Process: regulators have been established and regulatory frameworks are being developed; there has been progress in industry restructuring through establishment of separate transmission companies in most countries of the region; the legal framework for liberalization has been widely adopted and implementing legislation is in place in several countries.

There are, however, a number of major challenges outstanding that must be addressed if the market is to function in the interest of consumers in the region. There are large investments required in power generation and transmission, and there is a need to develop a framework to support mobilization of required financing. Environmental aspects of the market rules should be clarified in order to support the investment decision making process. Tariff reform and improved payments discipline will be required to support power industry financial viability.

The paper argues that an investment support mechanism will be required to support mobilization of finance, and that this may best be in the form of an obligation upon transmission companies to maintain a target system reserve. Such a mechanism would support investment in rehabilitation of existing capacity, and addition of lignite and gas fired plants and new hydro capacity, all of which are part of the regional least cost expansion plan. The Bank will support development of power generation investment projects through technical assistance and possible investment finance, and will work with countries to support reforms required for regional power market development.

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ABBREVIATIONS AND ACRONYMS

APL	Adaptable Programmatic Loan
CEER	Council of European Energy Regulators
EC	European Commission
ECSEE	Energy Community of South East Europe
ETSO	European Transmission System Operators
EU	European Union
FGD	Flue gas de-sulfurization
GIS	Generation Investment Study
GW	Gigawatt
IFC	International Finance Corporation
IPP	Independent Power Producer
MIGA	Multinational Investment Guarantee Agency
MW	Megawatt
PRG	Partial Risk Guarantee
SEE	South East Europe
SEE REM	South East Europe Regional Energy Market
Tcm	Thousand Cubic Meters
UCTE	Union for Coordination and Transmission of Electricity

EXECUTIVE SUMMARY

Background

This Bank framework paper to support development of a regional power market in South East Europe covers Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Kosovo¹, Former Yugoslav Republic of Macedonia (hereinafter referred to as “Macedonia”), Romania, Serbia and Montenegro, and Turkey. All these countries – except Turkey - are signatory to the ECSEE Treaty² whereby the non household power market will be liberalized from 2008. Turkey nevertheless will participate in the regional market because it has signed the Athens Memorandum and is expected to sign the Treaty at a later date.

The framework updates a previous paper published by the Bank³ in light of the following:

- A Generation Investment Study co-managed by the Bank and the European Commission (EC) has been completed.
- There has been significant progress made in developing regional power market design.
- As a result of the Athens Process, there has also been significant progress made in developing a legal and institutional framework to support regional power market liberalization.

The framework outlines the Bank’s approach to continued support for regional power market development. It covers both support for investments and policy advice (further development of market design, tariff reform, social safety net strengthening, regulatory development, industry unbundling, etc.).

The main themes of the framework are:

- The need for significant investment in power generation if regional capacity balance is to be maintained.
- The potential impact of environmental legislation on investment choices (e.g. rehabilitation of existing lignite fired plants versus construction of new gas fired

or hydro plants) in power generation.

- The appropriateness of the chosen market design (trading based on bilateral contracts between generators and large consumers) for the an interim period, following which more sophisticated arrangements may be introduced.
- The need to further consider complementing the market design with an investment support mechanism (e.g. tendering for capacity by transmission companies).
- The need to develop regulatory frameworks and to functionally unbundle power companies in some SEE countries.

Investment requirements to support regional power market liberalization

Adequate generation capacity is required in order that regional power market competition ensues. A regional Generation Investment Study (GIS)⁴ co-managed by the Bank and the EC and carried out in close co-operation with SEE energy ministries and power companies was completed in 2005. The objective of the study was to identify investment requirements to maintain capacity balance and to support market liberalization.

The GIS considered least cost options – including rehabilitation of existing plant, and construction of new lignite, gas, hydro and nuclear plant - to meet power demand in SEE over the period 2005-2020. The conclusion of the GIS was that 11.5 GW of capacity should be rehabilitated, and 13.5 GW of new capacity should be added to the system. Regarding the latter, this should comprise lignite fired plants in Bulgaria, Kosovo and Serbia, gas fired plants across the region, and nuclear plants in Bulgaria and Romania. The associated investment costs are of the order €16 billion.

One notable result to come from the GIS is that large hydro projects may be economic, in the sense that if these are assumed to go ahead they do not impose a significant cost penalty on the system. On the other

¹ Kosovo is currently under the administration of the United Nations INTERIM Administration IN Kosovo (UNMIK) according to the terms of UN Security Resolution 1244 of June 1999.

² The Energy Community in South East Europe Treaty, signed in Athens on October 25th 2005. The Treaty follows the earlier Athens Memorandum under which participating countries committed themselves to developing a regional energy (power and gas) market in South East Europe.

³ World Bank Framework for Development of Regional Energy Trade in South East Europe, by David Kennedy and John Besant-Jones, Energy and Mining Sector Board Discussion Paper No. 12, March 2004.

⁴ Electricity Generation Investment Study for South East Europe, published on the Europe and Central Asia - Power pages of the Bank’s website in June 2005.

hand, system costs and investment choices are sensitive to the gas price. The GIS was carried out at a time when the gas price was significantly lower than the current price in SEE. At the current SEE gas price, some hydro projects are selected before gas fired projects.

Depending on the environmental legislative framework for the regional power market, the conclusions of the study might change. Most notably, if SEE countries are required to comply in full with the EU's Bulk Power Directive, and if carbon credits are available for gas fired and hydro plant, much of the rehabilitation of existing plant becomes uneconomic. Then plant might be decommissioned and replaced with gas fired or hydro capacity, the balance between these depending on the gas price. Environmental legislation to prevail in the regional power market context is yet to be elaborated in full.

Regarding power transmission, the GIS estimated that investments in interconnection of the order 340 million Euros would be sufficient to support regional trade based on the least cost expansion plan. In addition, strengthening of networks within countries (as opposed to interconnections) would be required, particularly in Kosovo.

There is a significant amount of interconnection capacity between SEE and Russia / Ukraine that is currently not used. Import of low cost power from Russia and Ukraine would reduce the required level of investment in SEE power generation. Synchronization of the Russian and European power systems would be required in order to facilitate imports.

Market design and the framework for investment support

The Bank's earlier proposals have been reflected in the current regional power market design. In particular, this will be based on bilateral contracts between generators and eligible consumers, with progressive liberalization through a falling eligibility threshold over time. For the interim period, there will be no day ahead market (except in selected countries), and real time balancing arrangements will not be market based. Going forward, and as technical / institutional capacity permits, a day ahead market will be introduced and there will be a move towards market based trading in real time.

There is the risk that such market arrangements will not deliver the investments outlined in the GIS. In particular, it is not clear that the proposed market arrangements alone will provide adequate incentives for generators and consumers to enter into the type of contracts that would be needed to mobilize investment finance. The framework paper therefore proposes that market design is complemented by transmission companies tendering to meet target reserve margins, at least for an interim period. An alternative would be to place capacity obligations on load entities (supply companies and large consumers).

Development of regulatory arrangements and industry restructuring

The framework paper reviews progress made in development of legal and institutional frameworks to support market liberalization, and driven by the Athens process. It concludes that all countries have moved forward in these respects. In some countries, all arrangements are now in place to support liberalization. In other countries, however, regulators are newly established, and there is a need both to develop tariff methodologies (network access and end user) and grid codes. There are also some countries where the process of power industry restructuring is at an early stage, and where further reforms are required to effect the functional unbundling that is required under the Treaty.

Challenges for regional power market implementation

Investment in power generation

- Most of the projects identified as being least cost in the GIS are generic. It is important that a project pipeline is now developed, with detailed feasibility work and development of contractual frameworks / mobilizing of finance. This is a pressing issue given the long lead time for projects relative to the regional capacity imbalance that is forecast to emerge reasonably soon.
- Pre feasibility / feasibility studies of large hydro projects are required to better understand economic benefits. Large hydro projects may be particularly attractive if gas prices are sustained at or around current levels.

- Further analysis of the scope for power transfer from Russia / Ukraine is required. Imports to the SEE region could provide a low cost alternative to investment in new generation capacity.

Development of Market rules

- Most countries have not yet adopted a balancing market design. It is important that balancing prices / other balancing market arrangements are designed to give the correct incentives to eligible consumers.
- Though a cross border tariff mechanism for the SEE market is in place, this is not supported by all participating countries. In order that countries do not opt out, there is a need to ensure that the mechanism is cost reflective going forward.
- It remains unclear in some countries which customers will become eligible and over what time period. In order to support reciprocity, there is a need to agree common standards for eligibility.
- There is scope for trading of contracts on one or more regional exchanges. Further work is required to explore arrangements that would support contract trading.

Development of an investment support mechanism

- If an investment support mechanism is to be incorporated in the SEE market design, there is a need to decide whether this will be in the form of transmission companies tendering (physical or financial contracts) to maintain a target reserve, or capacity obligations on load entities.
- Other (unresolved) aspects of investment support design include: the date at which obligations should be introduced (immediately upon liberalization or at a later date); the period to be covered by obligations (one or more years ahead); design of contracts for fulfillment of obligations (whether these would be tradable capacity contracts or financial guarantees relating to day ahead markets); the target reserve margin upon which obligations would be based.

Environmental rules

- There is a need to quickly clarify the environmental framework that will apply in the context of the regional power market, given that this will impact on

the choice of investments to be undertaken. Clarification might either be given at the regional level, or at the country level (possibly in the context of bilateral negotiations between SEE participating countries and the European Union).

Industry reform

- Functional unbundling of generation and distribution remains a challenge in a number of countries. In order to comply with requirements under the Treaty, the role of centralized management at *headquarters* in some power companies of the region should be reduced. Correspondingly, new management structures are required, with new management information systems and the production of unit level accounts.
- There is still a need to develop tariff methodologies in some SEE countries. Implementation of methodologies remains a challenge in all countries of the region.

Proposals for Bank action

The World Bank Group will continue to actively support development of a SEE power market using its investment lending, technical assistance and policy support instruments. Specifically, the Bank will:

- Provide finance for investments to support regional power market development.
- Work with other SEE stakeholders to develop a power generation investment support mechanism.
- Provide support to individual countries on power sector regulatory reform, industry restructuring, market design, and strengthening of the sector social safety net.

1. INTRODUCTION

This Bank framework paper to support development of a regional power market in South East Europe covers Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Kosovo⁵, Former Yugoslav Republic of Macedonia (hereinafter referred to as “Macedonia”), Romania, Serbia and Montenegro, and Turkey. All these countries – except Turkey - are signatory to the ECSEE Treaty⁶ whereby the non household power market will be liberalized from 2008. Turkey nevertheless will participate in the regional market because it has signed the Athens Memorandum and is expected to sign the Treaty at a later date.

The framework updates a previous paper published by the Bank⁷ in light of the following:

- A Generation Investment Study co-managed by the Bank and the European Commission (EC) has been completed.
- There has been significant progress made in developing regional power market design.
- As a result of the Athens Process, there has also been significant progress made in developing a legal and institutional framework to support regional power market liberalization.

The framework outlines the Bank’s approach to continued support for regional power market development⁸. It covers both support for investments and policy support (further development of market design, tariff reform, social safety net strengthening, regulatory development, industry unbundling, etc.).

The main themes of the framework are:

- The need for significant investment in power generation if regional capacity balance is to be maintained.
- The potential impact of environmental legislation on investment choices (e.g. rehabilitation of existing lignite fired plants versus construction of new gas fired or hydro plants) in power generation.

- The appropriateness of the chosen market design (trading based on bilateral contracts between generators and large consumers) for an interim period, following which more sophisticated arrangements may be introduced.
- The need to further consider complementing the market design with an investment support mechanism (e.g. tendering for capacity by transmission companies).
- The need to develop regulatory frameworks and to functionally unbundle power companies in some SEE countries.

The intention in the framework is to provide an assessment of progress that has been made and outstanding challenges which should be met in order to support successful power market liberalization in the SEE region. In all instances, the framework proposes broad solutions to outstanding problems, whilst detailed solutions are left for follow up work. Proposed solutions are guided by the objective to mitigate risks associated with power market liberalization in SEE, both as regards power prices and security of supply.

Key proposals for Bank support are: to provide technical assistance for development of some power generation projects identified as being least cost in the GIS; to provide finance for investments in power generation and transmission; to work with other SEE stakeholders to develop a power generation investment support mechanism; to provide support to individual countries on power sector regulatory reform, industry restructuring, market design and sector social safety net strengthening.

⁵ Kosovo is currently under the administration of the United Nations INTERIM Administration IN Kosovo (UNMIK) according to the terms of UN Security Resolution 1244 of June 1999.

⁶ The Energy Community in South East Europe Treaty, signed in Athens on October 25th 2005. The Treaty follows the earlier Athens Memorandum under which participating countries committed themselves to developing a regional energy (power and gas) market in South East Europe.

⁷ World Bank Framework for Development of Regional Energy Trade in South East Europe, by David Kennedy and John Besant-Jones, Energy and Mining Sector Board Discussion Paper No. 12, March 2004.

⁸ Gas market development in SEE will be covered in a separate Bank framework.

2. THE ATHENS PROCESS

In recognition of potential gains from increased energy trade, and as part of a wider movement to deeper regional integration within the region, and between the region and the EU, the governments of Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Macedonia, Greece, Kosovo, Romania, Turkey, and Serbia and Montenegro signed the “Athens Memorandum – 2002” whereby they agreed to develop a South East Europe Regional Electricity Market (SEE REM).

Under the Athens Memorandum, countries expressed the intention to implement the following reforms: adopt an energy strategy; maintain cost recovery tariffs; enforce payments discipline; put in place social safety nets to offset adverse affordability impacts of tariff increases; establish independent energy regulators to oversee third party network access; adopt tariff methodologies and technical codes for network access; restructure energy companies; progressively liberalize power markets.

On October 25th 2005 the same countries – excepting Turkey – signed a legally binding Treaty⁹ to support the move towards regional energy market liberalization whereby they agreed to:

- Adopt the relevant EU legislation on energy (the power and gas directives¹⁰. *Inter alia*, these directives require that energy companies are restructured, and that independent energy regulators and regulatory frameworks for energy are established.
- Adopt the relevant EU legislation on environment (e.g. the Large Combustion Plant Directive¹¹ [governing sulfur dioxide emissions from power plants]).
- Liberalize energy markets for all non household customers from 1st January 2008.

There are various institutions established under the Athens Memorandum and / or the Treaty:

- A Ministerial Council to provide strategic guidance and endorse proposals. The Ministerial Council meets annually.
- A Permanent High Level Group of Energy Ministers’ representatives, to prepare the Ministerial Council and ensure follow up of its decisions.
- A Regulatory Forum (“Athens Forum”), comprising representatives of the EC, Governments, Regulators, Transmission System Operators, the Council of European Energy Regulators, the European Transmission System Operators, UCTE, electricity companies, International Financial Institutions, donor countries, and consumers. The Athens Forum meets at least twice yearly.
- A Regulatory Board, comprising energy regulators, responsible for monitoring detailed statutory, technical and regulatory rules, including safeguard measures and investment security measures, and reporting to the Ministerial Council on these issues. In addition the Board will adopt and implement a cross border dispute resolution mechanism.
- A Regulatory Secretariat, headed by a Director to be proposed by the EC and approved by the Ministerial Council, and charged with supporting implementation of the Treaty (e.g. through benchmarking reform progress against milestones in the Athens Memorandum and other documents, and – as markets are opened – through monitoring the level of cross border trade that takes place).

⁹ The full name of the Treaty is given in note 6 above.

¹⁰ The European Community Directive 2003/54/EC of the European Parliament and of the Council of 26 June 2003 concerning common rules for the internal market in electricity, and the European Community Directive 2003/55/EC of the European Parliament and of the Council of 26 June 2003 concerning common rules for the internal market in natural gas.

¹¹ The European Community Directive 2001/80/EC of the European Parliament and of the Council of 23 October 2001 on the limitation of emissions of certain pollutants into the air from large combustion plants.

3. THE SOUTH EAST EUROPE GENERATION INVESTMENT STUDY

3.1 Background and assumptions¹²

A preliminary assessment carried out in 2004 by the Bank suggested that a significant generation capacity deficit would emerge in SEE in the medium term absent investment in rehabilitation of existing plant and adding new plant to meet incremental demand¹³.

Clearly this would be problematic given the potential macroeconomic and other disruptions associated with power outages. It would be problematic in the context of regional power market development because the benefits of competition are limited when there is a shortage of supply. In particular, incentives for good performance are reduced when generation capacity is tight, and there is scope for generators to game (for example, through withholding plant to drive up prices).

Based on the preliminary assessment (referenced above), the Bank identified the need for further study of power generation investment requirements to support SEE power market liberalization. This was implemented through 2004-05 as the South East Europe Generation Investment Study (GIS), co-managed by the Bank and the European Commission (EC), and carried out in close co-operation with power industry stakeholders in the region (e.g. representatives of ministries and power companies from participating countries, other IFIs and donors).

The starting point for the GIS was to develop a demand forecast. This reflected the region's high energy intensity and allowed for power price increases to full cost recovery. It modeled expected demand responses in the form of energy efficiency improvements—including gasification in some of the region's larger cities—and restructuring of large, energy-intensive industry (iron, steel, aluminum, and so on). In addition, it modeled the impact of GDP growth of 3–4 percent a year. The resulting demand forecast contained average annual regional demand growth of about 2.5 percent.

The next step was to forecast the least cost means to meet ongoing and incremental demand given the existing capital stock (which at the appropriate time

could potentially be rehabilitated or retired) and opportunities for investment in new (lignite, gas fired, hydro and nuclear) plant. The exercise was carried out using the WASP model, which selects from amongst candidate plants to minimize discounted system (i.e. capital plus operating) costs.

3.2 Results of the GIS

Plant rehabilitation

It is important to note that much of the capacity in the region is old and in need of either rehabilitation or retirement. The study concluded that much of the rehabilitation planned by utilities would be economically beneficial. Specifically, it suggested that 11.5 GW of plant should be rehabilitated, 60% of this in the period to 2010, and 40% in the period between 2010-2020. The cost associated with rehabilitation was estimated to be around €6 billion, with annual investment requirements of €655 million for the period 2005–11 and €232 million for the period 2012-2015.

Incremental capacity

Regarding incremental plant, the study suggested that the following should be added to the regional system:

- 2.5 GW of new capacity would be required before 2010. Of this 50% should be lignite fired (located in Bulgaria, Kosovo and Serbia), 21% gas fired (distributed across the region), 26% nuclear (in Romania)
- A further 11 GW of new capacity would be required before 2020. Of this 45% should be lignite fired (in Kosovo and Serbia), 34% gas fired (distributed across the region), 20% nuclear (in Bulgaria)

In addition to units already under construction (Bucuresti South and West in Romania, Maritsa East 1 in Bulgaria and Vlora in Albania), the results show that, for the period 2005-2010, the following new capacity should be added to the regional power system:

- Cernavoda nuclear unit #2
- Kolubara lignite unit #1; and
- One 500 MW Kosovo lignite fired plant.

¹² The study is published in full on the Bank's website (see note 4 above).

¹³ Review of Electricity Supply and Demand in South East Europe, by Varadarajan Atur and David Kennedy, World Bank Working Paper 17, 2004.

In the period 2011-2015, the following units should be added:

- Cernavoda nuclear unit #3;
- Kolubara lignite unit #2;
- One 300 MW and two 500 MW Kosovo lignite plants.
- Two 100 MW CHP plants; and
- Two 300 MW and one 500 MW combined cycle (gas fired) plant.

In the period 2016-2020, the following units should be added:

- Belene nuclear unit #1;
- Three 300 MW and three 500 MW Kosovo lignite plants;
- Two 100 MW CHP plants; and
- Three 300 MW and two 500 MW combined cycle plants.

The total investment costs associated with this new capacity are estimated to be of the order €10 billion. Annual investment costs associated with new capacity are estimated to be €730 million to 2008, and to fluctuate between €500 and €930 million over the period to 2018.

Sensitivity analysis: economics of new hydro power plants

A number of sensitivity cases were tested (e.g. high demand, low demand, low rehabilitation, high hydro investment, high gas price). In general, the capacity and generation mix remains largely unchanged in the sensitivities. In a high demand scenario, for example, a similar set of projects are selected as in the base case, although the schedule is somewhat advanced.

One notable result to come from the sensitivities is that large hydro projects may be economic, in the sense that if these are assumed to go ahead they do not impose a significant cost penalty on the system. On the other hand, and reflecting the fact that in the base case some of the incremental capacity is gas fired, system costs and investment choices are sensitive to the gas price. At a gas price of €210 / tcm (roughly the border price in SEE at the end of 2005), hydro projects are selected before gas fired projects.

The benefit of integrated system operation

The analysis also considered the benefits of operating an integrated SEE power system versus each country operating in isolation. The estimated benefit of integrated operation was a net present value of €3 billion over the period 2005-2020, or approximately 10% of discounted system (operating plus capital) costs. The benefit reflects reduced costs from integrated operation which ensue given the heterogeneous resource endowments of countries in the region (e.g. some countries have an abundance of cheap coal which could potentially form the basis of exports to the regional power market)

3.3 Environmental aspects of the GIS

Compliance with the EU's Large Combustion Plants Directive

A separate study was carried out in conjunction with the GIS to assess the impact of alternative environmental legislative frameworks on investment choices¹⁴. In the GIS it was assumed that as part of plant rehabilitation NOx control technology would be installed. The GIS did not assume, however, that SO₂ control technology (e.g. flue gas de-sulfurization [FGD]) would be introduced as part of rehabilitation, except where installation of such technology has already been agreed in the context of EU accession (in Bulgaria and Romania).

The assumption on SO₂ was consistent with the prevailing environmental legislative framework in SEE, as embodied in the regional energy market Treaty, which requires full compliance with the EU's Large Combustion Plants Directive (see section 2 above) – particularly as regards existing plant - towards the end of the planning period for the GIS.

Nevertheless, there is the possibility that individual countries will be required to comply more quickly with the Directive as part of bilateral agreements in the context of EU accession. Hence it is of interest to understand associated compliance costs, and impacts of such requirements on investment choices.

¹⁴ Development of Power Generation in South East Europe – Implications for Investments in Environmental Protection, published on the Europe and Central Asia - Power pages of the Bank's website (on the same page as the GIS).

The environmental study estimated that SO₂ related compliance costs are of the order €2.3 billion. Adding these to rehabilitation costs reduces the level of economic rehabilitation to around 9.2 GW, relative to rehabilitation of 11.5 GW in the GIS base case. The study suggested that some plant planned for rehabilitation should be retired, and replaced either with new low cost lignite fired plant or new gas / hydro capacity.

The potential impact of carbon credits

The environmental study also assessed the potential impact of greenhouse gas emission legislation on investment choices in the region. Currently Bulgaria, Macedonia and Romania have ratified the Kyoto Protocol. The intention is that other SEE countries will ratify the Protocol following signing of the regional energy market Treaty, although there is no binding legal commitment to this (under the Treaty countries agree to aim to ratify the Protocol by the end of 2006).

Notwithstanding whether more SEE countries ratify the Protocol, the fact that some countries have already ratified provides the possibility that projects in these countries may benefit from carbon credits, and that such projects may displace projects in other countries (e.g. rehabilitation projects) in the context of the regional power market.

In order to understand the possible impact of carbon credits on investment in power generation, two carbon credit price scenarios were considered: €5 / ton; €10/ton. In the first scenario, the level of economic rehabilitation fell to around 7.5 GW (7 GW if SO₂ compliance is also required) with a further reduction to around 5.1 GW (3.9 GW if SO₂ compliance is also required) in the second scenario.

Thus rather than being rehabilitated, existing plant would be retired and replaced with gas fired or hydro capacity, the balance between these two depending on the gas price. It may be inferred from the analysis that carbon credits provide a means to cover at least part of the (€2.3 billion) SO₂ compliance cost. For example, the cost of new SO₂ compliant gas fired plant net of carbon credits is in many cases less than the cost of rehabilitating existing lignite fired plant without upgrading for SO₂ compliance.

Further clarification of the environmental framework

These results suggest that the environmental legislative framework could have significant impacts on both investment costs and choices, and upstream impacts on coal industries. The fact that this framework is currently not fully developed introduces uncertainty as regards investment decision making and, specifically, the risk that costs associated with rehabilitation could become stranded as a result of changing environmental standards.

For example, a rehabilitation project could be rendered uneconomic ex-post as SO₂ compliance is required and / or as more countries ratify the Kyoto Protocol. In either case, cash flows from the power market to the rehabilitated plant might not be able to cover investment financing costs.

This suggests the need to further clarify the environmental framework as a matter of urgency, particularly given the pressing need either to rehabilitate or replace a large amount of new capacity. In any event, the possibility of a changing environmental framework should be factored into investment decision making, particularly as regards investments in rehabilitation scheduled to take place in the near term.

3.4 Transmission investments to support regional market liberalization

As part of the GIS, analysis was undertaken to assess whether the regional power transmission network would support forecast load flow under the least cost generation expansion plan.

It was assumed that the following interconnection projects – which have been identified as economically and technically desirable as part of other studies – go ahead:

- Ugljevik - S. Mitrovica (between Bosnia&Herzegovina and Serbia)
- Kashar-Podgorica (between Albania and Montenegro)
- Maritsa Istok – Filipi (between Bulgaria and Greece)
- C. Mogila – Stip (between Bulgaria and Macedonia)
- Ernestinovo – Pecs (between Hungary and Croatia)
- Bekescaba – Nadab (between Romania and Hungary)
- Florina – Bitola (between Greece and Macedonia)

- Zemlak – Bitola (between Albania and Macedonia)
- Kashar – Kosovo B (between Albania and Kosovo)
- Skopje – Vranje – Nis (between Macedonia and Serbia)

The cost associated with these projects is associated to be of the order €340 million. Under the assumption that the projects proceed, the analysis carried out in the context of the GIS suggested that there should be no congestion on connections between countries in the SEE region.

It is important to note that detailed modeling of transmission networks within countries was not carried out, and that further study is required here. The GIS identified Kosovo in particular as a case where the internal network will require strengthening, particularly if new plants identified as being part of the least cost expansion plan are actually added to the regional system.

A preliminary study carried out for the World Bank estimates that there is approximately 3.5 GW of potentially usable interconnection capacity between Russia / Ukraine and the European network (of which SEE is part)¹⁵. The study suggests that this provides scope for power transfer from Russia and Ukraine to (*inter alia*) SEE, and that this could provide a substitute to some of the required investment in power generation capacity. The fact that it would be a low cost substitute, with limited investment required, is important given that there may be a finance gap for investment in SEE power generation.

The major obstacle to power transfer is that this would require synchronization of the Russian and European power systems, which is unlikely to happen in the near term, but may be feasible in the medium term. An alternative would be to have asynchronous interconnection through high voltage direct current lines, although technical and economic feasibility of this option remains unclear at this stage.

4. THE SECTOR INVESTMENT CLIMATE: MARKET RULES

4.1 The importance of market rules

The SEE power market rules will be a major determinant of the sector investment climate. In other words, the market rules will influence whether finance for necessary investments is forthcoming or not.

In order to reduce risks for potential financiers (strategic investors, commercial banks, IFIs) it is important that market rules are appropriate to the SEE context and provide adequate transparency and predictability. It is important also that market rules promote competition in order that benefits of liberalization are channeled to power consumers in the region.

4.2 Interim arrangements: trading based on bilateral contracts

The Bank's previous framework paper¹⁶ proposed that SEE regional power market liberalization should be based initially on a simple model. Trading would be based on bilateral contracts between generators and eligible consumers. In addition to bilateral contracts, there would be simple real time balancing arrangements. There would be no day ahead spot market in the interim phase of liberalization.

It was argued by the Bank that this proposed market design would be suitable given the specific characteristics of the SEE region: payments discipline problems; limited technical and institutional capacity as regards implementation of a market; limited political commitment for centralized regional dispatch. Each of these characteristics favors trading based on bilateral contracts as opposed to day ahead spot markets.

Subsequently the Bank's proposed design for the interim phase was endorsed by the Council of European Regulators (CEER)¹⁷. The proposal by CEER envisages that liberalization will be based on bilateral contracts. These contracts would be potentially tradable on a

¹⁵ Study of electricity trade potential in the Black Sea region, Economic Consulting Associates (ECA), October 2005.

¹⁶ Kennedy and Besant-Jones (see note 3 above).¹⁷ Discussion paper on the options for the transition phase of the ECSEE regional energy market, CEER Working Group South East European Electricity Regulation, July 2004. This paper is posted on the energy page of the SEERECON website (www.seerecon.org).

¹⁷ Discussion paper on the options for the transition phase of the ECSEE regional energy market, CEER Working Group South East European Electricity Regulation, July 2004. This paper is posted on the energy page of the SEERECON website (www.seerecon.org).

regional exchange. Since the CEER proposal was tabled, a project has been developed to assess the feasibility of establishing such an exchange. The CEER proposal envisages that a day ahead spot market will be established after the interim phase, possibly from 2008.

The Bank's proposed market design has also been endorsed by the EC¹⁸. The EC has advocated a phased approach to market liberalization, with trading based on bilateral contracts between participants in the first phase, which should commence no later than 2008. It is envisaged by the EC that contracts may be traded at a regional exchange.

4.3 Protection of residential customers in the interim phase

Market liberalization can lead to significant price impacts for groups of customers. For example, there is the risk of significant and sustained price increases for residential customers following liberalization, both in countries where such consumers currently enjoy access to low cost power, and more generally in a context where there is a supply shortage.

Recognizing the potential adverse price impacts of liberalization, CEER proposed an interim regulated tariff mechanism to protect consumers¹⁹. Under this mechanism, certain groups of customers would be able to consume power at a regulated price rather than to purchase power in the market. In order to implement this mechanism, a part of capacity in each country commensurate with consumption of regulated customers would have to be withheld from the market.

Most countries in the region have reflected the CEER proposal in their primary legislation governing the power sector. The typical model in the SEE region is based around a market operator who will *also* act as a single buyer for regulated consumers, purchasing power from domestic generators at a regulated price and selling this on to distribution / supply companies, who in turn will sell to consumers at a regulated price.

Whilst the benefits of this model are clear, it also poses risks as regards market liberalization, particularly given uncertainties relating to the fact that secondary (implementing) legislation remains undeveloped in most countries.

In this respect, possibly the most important area for clarification is which customers will be given the option to consume at a regulated tariff. At least in some SEE countries, under current proposals all customers will have the option to consume at the regulated tariff which, if exercised, will undermine market liberalization. In order to avoid a situation where the regulated tariff mechanism works against liberalization, this should not be open to all customers, and should only be available for an interim period.

Other areas for clarification include whether customers will be *obliged* to consume at a regulated tariff. This applies most notably to distribution / supply companies, which should be given an option – rather than an obligation – to consume at a regulated tariff, certainly if the EC's objective that such companies are eligible from 2008 is to be fulfilled²⁰.

Once the broader issues above have been settled, there is need to develop an implementing framework which will include tariff methodologies for power generation and end users, and rules relating to supply obligations of power generators (what and when is a generator allowed to sell into the regional power market?).

4.4 Progress in establishing interim market arrangements

Turning back to arrangements for the part of the market that will be liberalized (as opposed to regulated), all countries in the SEE region have taken the first step in establishing a power market, through passage of enabling primary legislation (Table 1). In addition, seven countries have established market operators.

Where there has been less progress is in development of secondary legislation, defined for the purposes of the table as the network access price, terms and conditions,

¹⁸ South East Europe Electricity Market Options Paper, European Commission, June 2005. This paper is published on the South East Europe Electricity page of the Europa website (<http://europa.eu.int>) under 6th Athens Forum.

¹⁹ Discussion paper on the Standard Market Design of the SE Europe electricity market, CEER WG South East European Electricity Regulation, 2003.

²⁰ This objective is expressed in the EC's Options Paper, see note 18 above.

Table 1. Progress in establishing power markets²¹

	PRIMARY LEGISLATION ADOPTED	MARKET OPERATOR ESTABLISHED	SECONDARY LEGISLATION ADOPTED	BALANCING MARKET ESTABLISHED	MARKETING OPENING COMMENCED
Albania	Yes	Yes	No	No	No
Bosnia & Herzegovina	Yes	No	No	No	No
Bulgaria	Yes	Yes	Yes	Yes	Yes
Croatia	Yes	Yes	No	No	No
Kosovo	Yes	No	No	No	No
Macedonia	Yes	Yes	No	No	No
Montenegro	Yes	No	No	No	No
Romania	Yes	Yes	Yes	Yes	Yes
Serbia	Yes	Yes	No	No	No
Turkey	Yes	Yes	Yes	Yes	Yes

commercial code, and market monitoring procedures. Bulgaria, Romania and Turkey have made significant progress as regards the secondary legislation. These three countries have also progressed as regards establishing (real time) balancing markets and partial market liberalization (i.e. for some large customers). Of the three countries, Romania has progressed furthest, see Box 1 for more details. For all other SEE countries, development of market rules remains a pressing challenge that must be tackled before market liberalization can begin.

4.5 The cross border transmission tariff mechanism²²

A cross border transmission tariff mechanism is required for the following reasons:

- From an economic perspective, to provide signals about underlying costs, upon which consumption decisions can be made

- From a financial perspective, in order to compensate transmission companies for costs associated with regional power trade, and so to provide for their ongoing financial viability.

Much progress has been made in this respect, and a cross border tariff mechanism has been in place since the second half of 2004. The cross border tariff mechanism works as follows:

- For each country, the proportion of total (operating [including losses] and capital) transmission costs associated with regional power trade are estimated on a forward looking basis.
- This determines the revenue requirement for the *fund* from which transmission companies are compensated.
- Transmission companies contribute to the fund in accordance with costs imposed on the regional system by generators / load entities in their respective countries. (Net importing countries and net exporting countries contribute to the fund, and pure transit countries do not contribute.)

²¹ Source: Draft Survey of ECSEE Countries National Market Design Status, prepared by Hunton & Williams in 2004. The Hunton & Williams work has been updated by World Bank staff as necessary.

²² This sub section draws on the Report on Inter TSO Compensation Mechanism Among SEE TSOs presented by the European Transmission System Operators (ETSO) to the Athens Forum held in Skopje in June 2005, and published on the Europa website (see note 18 above).

Box 1: Romania power sector liberalization

The Romanian power sector was restructured through unbundling of the vertically integrated power company to separate generation, transmission and distribution companies, a process that took place during the period 1998-2000. In addition to vertical unbundling, there was splitting of companies within generation (a number of thermal generation companies together with a hydro generation company have been established). The independent power sector regulator – “ANRE” - was established in 1998.

Market liberalization started in 2000 with the establishment of a day ahead market. New trading rules were developed in 2003 / 04 and a commercial code was adopted in 2004. Also during 2004 a new IT platform was put in place, and training for market participants was provided.

In 2005 a two sided day ahead auction operated by the Romanian market operator – “OPCOM” - was introduced (i.e. based on both demand and supply side bids). Other innovations at this time include the operation of a balancing market, the introduction of a bilateral contracts and green certificates markets.

The level of liquidity in the day ahead market is comparable with power markets in EU member states. Of 62 registered participants, 29 are active daily, with the maximum recorded number of daily participants at 38. The average hourly trade is around 400 MWh, representing around 7% of total demand.

Given the level of liquidity, the Romanian day ahead market provides a benchmark price for the South East Europe power market. OPCOM intends that market participation will be extended to neighboring countries in a phased manner.

- Total contributions to the fund are equal to the revenue requirement (above).
- Differences between ex ante and ex post costs (deriving from differences between forecast and out-turn load flows) are resolved through a *final settlement*, carried out at the end of a calendar year.

In principle, this mechanism has the potential to support financial viability of transmission companies. Whilst from an economic point of view it does not signal precisely the relevant underlying (marginal) costs, the mechanism does reflect these in an approximate manner.

In practice, however, there have been several problems as regards implementation of the mechanism which, if unresolved, may jeopardize both the willingness of countries to continue to participate in the mechanism and regional power trade more generally.

The main problems with the mechanism are:

- There has been a large difference between forecast and actual costs associated with regional power trade.
- The fee paid by countries neighboring the region and not participating in the mechanism, which does not reflect associated transmission costs.
- The mechanism does not provide for loop flows - that go in and come out of the regional network - associated with trade between two neighboring countries not participating in the mechanism.

In all three cases, transmission companies in the region have not been adequately compensated for costs borne related to regional power trade, a situation which is not sustainable, particularly given the precarious financial situation of some (newly established) companies.

Regarding the first problem, this could be resolved through the Final Settlement for 2005, which would reconcile differences between ex post and ex ante costs through additional payments to / claims from the fund by participating transmission companies.

Going forward, the difference between ex ante and ex post costs could be reduced by undertaking more accurate load flow modeling. There is scope for this given that load flows in 2006 are not expected to radically depart from those in 2005 (i.e. 2005 load flows could be used as the basis for calculations).

Regarding the second and third problems, there is a need to change the mechanism so that it becomes more cost reflective. Amongst the various options here is to merge the mechanism with that operating for the neighboring countries (which all participate in the European mechanism).

5. THE INVESTMENT CLIMATE: CAPACITY OBLIGATIONS

5.1 Why power markets may be different

Even with an appropriate set of market rules, it is not clear that necessary investments in power generation will be forthcoming without additional investment support mechanisms.

The Bank's previous framework paper explained why power markets may be different from markets more generally, and why therefore price signals cannot be relied on as the basis for investment (in a *typical commodity market*, the price increases when demand exceeds supply, thus signaling the need for investment, following implementation of which the price falls):

- Technology is often such that price cannot be used to clear demand and supply in real time
- Even if prices can be used as a clearing mechanism, the nature of power demand is such that this would require very high prices during certain periods. Such price spikes may be deemed (politically) unacceptable and not allowed by regulators.

The Bank hired National Economics Research Associates (NERA) to review the experience of power market liberalization with respect to investment in power generation²³. This review suggested that there are examples of liberalized power markets where price signals are relied upon as the basis for investment. Power markets in England and Wales, New Zealand and parts of Australia rely on price signals and appear to work well. More generally, this type of market is unlikely to be problematic where there is excess capacity, and where market participants are experienced / able to undertake sophisticated analysis (e.g. medium term price forecasts).

In other circumstances, reliance on prices as a signaling mechanism for investment has resulted in supply shortage, notably in Victoria (Australia), Ontario (Canada), and California. Anticipating shortcomings of price signals as regards ability to deliver investment, complimentary measures have been introduced in some markets with

the aim to strengthen investment incentives.

The most well known examples come from the eastern United States (New England, New York, and Pennsylvania-New Jersey – Maryland), where load entities are required to contract ahead for capacity sufficient to cover their expected demand plus a reserve margin. In other cases, there are administered price mechanisms designed to encourage investment (the best known example is the capacity adder in the [old] England and Wales power pool), and tendering of capacity contracts by transmission system operators.

5.2 Proposal for the SEE power market

The following characteristics of the SEE power market are important when considering whether an investment support mechanism would be desirable:

- Large investments in power generation will be required
- Technological limitations mean that price cannot be used to clear demand and supply in real time, at least for the foreseeable future
- There is a significant (political / regulatory) risk that prices would not be allowed to rise sufficiently to cover investment costs.
- Load entities are not experienced market participants and are unlikely to have the capability to undertake sophisticated price forecasting.

Recognizing these characteristics, NERA proposed that an investment support mechanism should be introduced, and that this should be in the form of a capacity obligation (i.e. a requirement to contract ahead for capacity to cover demand), either on transmission companies or load entities. Such a mechanism would help to mitigate the risk of supply shortage, and need not have any adverse consequences (e.g. in terms of undermining competition).

In developing this proposal, it is important to recognize that much of the power market will remain regulated in SEE for an interim period (see section 4.3 above). The likelihood is then that transmission companies will continue as they have done historically to forecast demand and to ensure that there is adequate capacity

²³ Investment incentives for the South East Europe Regional Electricity Market, prepared by NERA, June 2005, posted on the Europe and Central Asia – Power pages of the World Bank's website.

to meet this. There would seem to be scope for risk mitigation here through making what is effectively an implicit capacity obligation on transmission companies into an explicit obligation.

If this proposal is agreed in the context of the Athens Process²⁴, then there are a number of detailed design questions, including:

- The period to be covered by obligations (this should be commensurate with the long lead time for developing power generation projects in the region)
- The reserve margin to form the basis of the obligation

Going beyond the interim phase, there is the question of whether capacity obligations should continue to be placed on transmission companies, or whether these should instead be transferred to load entities. There is little to choose between these mechanisms in the SEE context. If there is a day ahead market – this is the intention – then placing obligations on transmission companies, which could offer (competitively awarded) financial guarantees based around day ahead market prices to generators could be advantageous. The alternative of placing obligations on load entities in a situation where there is retail competition – the Treaty envisages that this will be introduced from 2015 – could result in a lack of investment to the extent that supply companies are not seen as creditworthy.

5.3 The role of long term contracts

Whether capacity obligations are placed on transmission companies or load entities, it is unlikely that this alone will provide adequate security to mobilize investment finance. In order to fulfill obligations it is likely that long term contracts related to new power generation capacity will be required. This is borne out by the experience developing power generation projects in Bulgaria and Romania, where long term off take agreements have been required in order to secure financing packages.

This is recognized by the EC, which has stated that²⁵:

Long term contracts are sometimes needed to secure the investments in new capacity...their compatibility with the EU legislation has to be decided on a case by case basis...[in the SEE context] long term agreements are left to the national regulators and competition authorities to decide. The question has to be considered in the context of generation adequacy.

It is well known that long term Power Purchase Agreements may be undesirable from an economic point of view, both because they may – depending on design - be associated with weak incentives to reduce costs, and because they may prevent merit order dispatch. This does not mean, however, that all long term contracts are bad, rather that contract design is key in order that objectives to promote competition and to secure finance for investments required to maintain security of supply are to be reconciled.

Amongst the important aspects of contract design in this respect are:

- The duration of contracts (it may be the case, for example, that contracts can be shorter than loan tenors [so financiers are prepared to take some market risk at a later stage])
- The scope of contracts (it may be unnecessary that contracts cover all of plant capacity [strategic investors may be prepared to accept some market risk])
- Minimum off-take requirements (the higher the minimum off-take under a contract, the more prohibitive the contract becomes [i.e. a plant may be dispatched even though it is not in the merit order depending on off-take commitments])

In order to promote competition in a context of (well designed) long term contracts, a contract exchange and / or day ahead and intra day markets are required.

²⁴ An early draft of this framework paper was presented to the Mini Market Forum held in Athens in October 2005, and to the Belgrade Athens Forum in November 2005. The conclusions of these meetings, together with those from the Permanent High Level Group meeting held in Sofia in December 2005, recognize the need to develop a capacity support mechanism and to prepare a detailed proposal. The conclusions from these meetings are posted on the Europa website (see note 18 above for the web address).

²⁵ Taken from the EC's Options Paper, see note 18 above.

6. THE INVESTMENT CLIMATE: POWER SECTOR REFORM TO SUPPORT MARKET DEVELOPMENT

6.1 Summary of reform progress

The Bank's previous framework paper outlined conditions to support competition based on bilateral contracts and mobilize finance for necessary investments:

- Effective prices (reflecting tariffs and payments discipline) should be adequate to cover costs, and tariffs should reflect costs for each customer category.
- Social safety nets should be in place to mitigate adverse consequences of tariff reform.
- Regulators should be established and regulatory frameworks in place.
- Power industries should be restructured, and separate power transmission companies set up.

A summary of the current state of reform in areas is presented in Table 2.

6.2 Average tariffs and cost recovery

All countries in the region have tariffs to support near term financial viability with the possible exception of Kosovo. A number of countries – most notably Albania, Macedonia and Serbia - do not, however, have adequate tariffs to provide positive income (i.e. to cover operating costs, maintenance, depreciation, and interest payments on debt). Whilst this situation need not jeopardize operational viability, it is not sustainable in the medium term, when major investments in rehabilitation, upgrade and new capacity will be required.

The results of the GIS are indicative as regards the profile of tariffs that would ensue in a liberalized market. The GIS suggests that capacity will become tight within a five year period, by which time the price of power generation will rise to reflect the cost of new plant, which is likely to be in excess of 5 US cents / kWh.

Table 2. Reform progress in SEE power sectors

	AVERAGE TARIFFS AT COST RECOVERY	CROSS SUBSIDY	PAYMENTS PROBLEMS	SOCIAL SAFETY NET	REGULATOR IN PLACE	TRANSMISSION TARIFF METHODOLOGY	END USER TARIFF METHODOLOGY	SEPERATE TRANSMISSION COMPANY	FUNCTIONAL UNBUNDLING OF GENERATION AND DISTRIBUTION
Albania	Yes	Yes	Yes	Yes	Yes	No	No	Yes	No
Bosnia	Yes	No	Yes	No	Yes	No	No	Yes	No
Bulgaria	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Croatia	Yes	No	Yes	Yes	Yes	No	No	No	No
Kosovo	No	No	Yes	Yes	Yes	No	No	No	No
Macedonia	Yes	No	Yes	Yes	Yes	No	No	Yes	Yes
Montenegro	Yes	No	Yes	No	Yes	Yes	Yes	No	No
Romania	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Serbia	Yes	No	Yes	Yes	Yes	No	No	Yes	No
Turkey	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes

6.3 Cross subsidy between large customers and other consumers

Currently there is limited cross subsidy between large customers and other consumers in the SEE region. Going forward, changes in the relative price of power for different customer categories will depend on the extent to which the market is liberalized.

If market liberalization is restricted to large consumers, then the price of power for that customer category will rise within a five year period to reflect the cost of new power generation, whilst tariff increases for the regulated part of the market will take place more slowly.

If distribution / supply customers are made eligible (see section 4.3 above) then power tariffs will rise across the board to reflect the cost of new power generation within a five year period. In this event, residential tariff increases would be required in all SEE countries, with significant increases in a number of countries (Albania, Bulgaria, Kosovo, Macedonia, Serbia).

6.4 Problems in enforcing payments discipline

There are problems in enforcing payments discipline in most of the SEE countries, where residential collections still average around 85% of total billings, and commercial losses (through illegal connections, meter tampering, etc.) are in excess of 10%.

Payments discipline problems pose risks to functioning of the chosen power market model for the SEE region. Specifically, there is the risk that large non paying customers do not enter into contracts for their power needs but, rather, that they consume from the balancing market and do not pay for this. Secondly, there is the risk that cash flows in the regulated part of the market do not cover costs.

In both cases, the already financially precarious position of newly established market operators would be exacerbated. This would be manifested in market operators' inability to meet their financial obligations to generation companies.

There are various solutions here which require further discussion in the context of the Athens Process:

- Ensuring that the legal framework supports disconnection of non paying customers, and that there is political support for disconnection.
- Allowing for non payments in calculation of tariffs (i.e. charging a higher tariff where there is a non payments problem that threatens sector financial viability).
- Accommodating non payments through governments foregoing equity returns where power companies are state owned.

6.5 Social mitigation mechanisms

Countries in the region have power sector social safety nets in place, with the exceptions of Bosnia, Montenegro and Turkey. Macedonia recently introduced a block tariff mechanism, and is undertaking a review of options to mitigate adverse impacts of tariff increases. In Serbia, progress was made in 2004 when the existing block tariff structure was rationalized, providing extra cash flows for the power industry and strengthening incentives for energy efficiency. Sector specific social safety net are likely to be required in the region going forward to mitigate the impact of tariff increases, particularly in countries where larger increases are expected.

6.6 Development of regulatory frameworks

Separate sector regulators (i.e. not part of government ministries) have been established in all SEE countries. Most recently, a Serbian Energy Regulator was established following passage of the Energy Law in 2004. Whilst the Serbian Energy Regulator cannot be regarded as independent - tariffs must be approved by the Serbian Government – its establishment can be seen as a positive interim measure.

Regarding implementing legislation for regulation (tariff methodologies for transmission and distribution / supply and technical codes):

- Several countries (Bulgaria, Montenegro, Romania, Turkey) have adopted and implemented the relevant methodologies and codes.

- Other countries (Albania, Kosovo, Macedonia) have draft methodologies, although these remain to be implemented (i.e. there is a need to impute data from power companies and derive tariffs from the methodologies).
- A small number of countries are yet to draft methodologies. There is much progress to be made in these cases if methodologies are to be in place prior to planned market opening.

6.7 Industry restructuring to support market liberalization

Most SEE countries have made established a power transmission company that is owned separately from generation / distribution. The exception is Croatia, which has opted to establish the transmission company as a subsidiary within a holding company that leases its assets from the holding. In Kosovo and Montenegro, transmission also remains integrated with generation and distribution.

Regarding separation of generation and distribution, it is important to note here that the Treaty requires legal and functional unbundling of these businesses. There are a limited number of countries where legal and functional unbundling of generation and distribution / supply has been effected (Bulgaria, Macedonia, Romania, Turkey).

In other instances, where power generation and distribution companies remain vertically integrated, there has been little in the way of functional unbundling, with a strong headquarters making decisions that span the two businesses characterizing the region. Functional unbundling remains a major challenge, particularly if distribution / supply companies are to become eligible (without functional unbundling, the impact of this would likely be muted).

7. OUTSTANDING CHALLENGES

Investment in power generation

- Most of the projects identified as being least cost in the GIS are generic. It is important that a project pipeline is now developed, with detailed feasibility work and development of contractual frameworks / mobilizing of finance. This is a pressing issue given the long lead time for projects relative to the regional capacity imbalance that is forecast to emerge reasonably soon.
- Pre feasibility / feasibility studies of large hydro projects are required to better understand related economic benefits. Large hydro projects may be particularly attractive if gas prices are sustained at or around current levels.
- Further analysis of the scope for power transfer from Russia / Ukraine is required. Imports to the SEE region could provide a low cost alternative to investment in new generation capacity.

Development of Market rules

- Most countries have not yet adopted a balancing market design. It is important that balancing prices / other balancing market arrangements are designed to give the correct incentives to eligible consumers.
- Though a cross border tariff mechanism for the SEE market is in place, this is not supported by all participating countries. In order that countries do not opt out, there is a need to ensure that the mechanism is cost reflective going forward.
- It remains unclear in some countries which customers will become eligible and over what time period. In order to support reciprocity, there is a need to agree common standards for eligibility.
- There is scope for trading of contracts on one or more regional exchanges. Further work is required to explore arrangements that would support contract trading.

Development of an investment support mechanism

- If an investment support mechanism is to be incorporated in the SEE market design, there is a need to decide whether this will be in the form of tendering (physical or financial contracts) to maintain a target reserve, or capacity obligations placed on load entities.
- Other (unresolved) aspects of investment support design include: the date at which obligations should be introduced (immediately upon liberalization or at a later date); the period to be covered by obligations (one or more years ahead); design of contracts for fulfillment of obligations (whether these would be tradable capacity contracts or financial guarantees relating to day ahead markets); the target reserve margin upon which obligations would be based.

Environmental rules

- There is a need to quickly clarify the environmental framework that will apply in the context of the regional power market, given that this will impact on the choice of investments to be undertaken. Clarification might either be given at the regional level, or at the country level (possibly in the context of bilateral negotiations between SEE participating countries and the European Union).

Industry reform

- Functional unbundling of generation and distribution remains a challenge in a number of countries. In order to comply with requirements under the Treaty, the role of headquarters in some power companies of the region should be reduced. Correspondingly, new management structures are required, with new management information systems and the production of unit level accounts.
- There is still a need to develop tariff methodologies in some SEE countries. Implementation of methodologies remains a challenge in all countries of the region.

8. BANK SUPPORT FOR POWER MARKET DEVELOPMENT

The Bank will continue to provide *Policy Support* and *Investment Lending* in the context of SEE power market liberalization.

8.1 Policy Support

Based on its assessment of reform progress relative to commitments under the regional energy market Treaty, summarized in Table 2 above, the Bank will focus on the following:

- In Albania, on loss reduction and improvement of collections, rationalization of the tariff structure (reducing cross subsidy), and improving coverage of the social safety net.
- In Bosnia, on mitigating adverse impacts of tariff increases for residential consumers, reduction of commercial losses, an functional unbundling of power generation / distribution.
- In Croatia, on functional unbundling of power generation, transmission and distribution, upon request from the Croatian authorities.
- In Kosovo, on establishment of a separate transmission system operator, and development of a framework to support mobilization of investment finance.
- In Macedonia, on institutional strengthening of the newly established transmission company, development of a contract framework for unbundled power entities (hydro concessions, Power purchase Agreements [PPAs]), improvement of payments discipline, and reviewing / strengthening the social safety net.
- In Montenegro, on industry restructuring and commercialization (including increasing transparency and improving payments discipline), and regulatory development.
- In Romania, on power market development, providing support for implementation of the regulatory framework, and privatization of power generation and distribution companies.
- In Serbia, on functional unbundling of power generation / distribution, improving transparency, and supporting regulatory development.
- In Turkey, on power market development, and industry commercialization through privatization.

The Bank will also seek financing to develop a detailed investment support mechanism (see section 5 above) upon request from the Athens Forum.

8.2 Investment lending

In January 2005, the Bank's Board approved a \$1 billion Adaptable Programmatic Loan (APL) facility to support power market development in SEE. In order to qualify for financing under the APL, countries would have to remain current on commitments under the Athens Memorandum (so, for example, countries would have to establish a power transmission company and a power sector regulator). Envisaged financing amounts / schedules contingent upon countries fulfilling such conditions are summarized in Table 3.

Table 3. Bank financing under the ECSEE APL Program (\$ million)

	2004/05	2005/06	2006/07	2008/09	TOTAL
Albania	24		30		54
Bosnia		36		30	66
Bulgaria					
Croatia					
Kosovo		5			5
Macedonia		25			25
Romania	84		126	125	335
Serbia & Montenegro	20		50		70
Turkey	80	100		165	345
Unallocated		40	40	20	100
Total	208				1000

Investments already approved for financing under the APL include:

- In Romania, rehabilitation of the Lotru power station, which will provide ancillary services to the SEE regional power market.
- In Turkey, introduction of a market management system, upgrade of system control apparatus, and transmission grid strengthening / expansion.
- In Albania, transmission substation rehabilitation (replacement of high voltage equipment, also control and protection equipment).
- In Serbia, construction of new substations and high voltage lines.
- In Macedonia, to finance investments in construction of new high voltage lines, reconstruction of existing lines, substation rehabilitation and upgrade, upgrade of system control, and institutional strengthening of the newly established transmission company / market operator.

Going forward, the Bank will continue to consider financing of investments to support regional power market development in countries where commitments under the Athens Memorandum are fulfilled.





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