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Study on Regional Energy Trading: Credit Support for Electricity Trading in South East Europe (SEE)

Technical Assistance Project Conducted for the European Bank of Reconstruction and Development

Funded by the Government of Norway

Date: 08. May 2006

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1 Executive Summary

This report evaluates the possibilities for increased power trading in South East Europe.

In the Terms of Reference for the project there are 3 main topics (in italics) to be addressed:

1) *to determine the interest of potential market participants in trading via a standardised platform (clearinghouse, exchange, or both) featuring Bank-provided credit support*

To be able to investigate this issue within the available funding of the project, it was agreed with EBRD that a questionnaire should be distributed to different participants and to government authorities. The answers are summarised in chapter 3 of the report. The questionnaires are presented in Appendix 1, and a summarised content of the answers is attached in Appendix 3.

The main conclusions are that authorities see the international trade of electricity as an important part of the national power market and that regional trade can be improved by the development of a regional trading platform. The majorities of the received answers also support the notion that cross border trade can be improved by introduction of a trading platform.

Allocation of cross border capacities seems to be the main obstacle for regional trade. There are ongoing tests to create a system for coordinated auctions of transmission rights. This kind of work should be supported by authorities, creating a level playing field for all the market participants in a regional setting.

2) to identify the most appropriate and effective platform with which to establish confidence in the regional marketplace and to accomplish the goal of increasing trade in the region through a uniform and transparent process.

There exist numerous trading platforms in different markets around the world. Chapter 5 in the report describes some principles and outlines the development in this part of Europe where bilateral trade and exchange trade of electricity work in parallel.

Chapter 6 focuses on the Athens process and its aim to develop a competitive electricity market in the SEE region. This development is based on a model in a CEER position paper, which is in line with the development of a successful pan European electricity market.

The report then describes some benchmarking criteria that can be used to evaluate initiatives for creating a regional power exchange, and in addition describes some principles for a clearing function. Clearing of trade will reduce the counterparty risk significantly and this has resulted in increased trade in many markets.

A normal development of such regional markets is to start with trade of bilateral contracts, standardisation of bilateral contracts, introduction of exchange trade with standardised contracts, clearing services and introduction of trade with derivatives. This can also be a natural development of events in the SEE region. Two national exchanges in the SEE region, Borzen (Slovenia) and Opcom (Romania), have potential to become exchanges for the region. An analysis of both exchanges against the benchmarking criteria is fully detailed. The consultant finds that there is room in the regional market for both candidates due to current congestion on the grid. Development of one or both of these exchanges into a regional presence would greatly support the establishment of a fully functional regional marketplace, particularly if the two exchanges cooperate closely.

The support from the TSOs has proven to be very important for development for power trade. TSOs can support power trade by ensuring equal access to the transmission network, and in particular they can support power exchanges by allocating a share (or all) interconnector capacity to the power exchange, as well as show their trust in the power exchange by buying grid losses at the power exchange to secure some intial volumes.

3) to provide a brief supplementary analysis of the EBRD's potential role, and an approximation of any credit requirement that would accompany such a role

Based on the answers to the questionnaires and estimation of trade volumes in the SEE region, the consultant has proposed some areas where the EBRD could be engaged to stimulate the development. This is described in chapter 7 of the report.

EBRD could support ongoing tests to achieve coordinated allocation of transmission capacity, establish guarantee mechanisms for trade, and also consider investing in companies that establish a regional trading platform.

2 Introduction

The main objectives of this study are:

1. to determine the interest of potential market participants in trading via a standardised platform (clearinghouse, exchange, or both) featuring Bank-provided credit support
2. to identify the most appropriate and effective platform with which to establish confidence in the regional marketplace and to accomplish the goal of increasing trade in the region through a uniform and transparent process; and
3. to provide a brief supplementary analysis of the EBRD's potential role, and an approximation of any credit requirement that would accompany such a role

The countries that are included in this study are:

- Croatia
- Bosnia and Herzegovina
- Serbia and Montenegro
- Romania
- Slovenia
- Albania
- FYR Macedonia
- Bulgaria
- Moldova
- Greece
- Turkey

3 Approach to the study

Creation of a regional power market is a stepwise development. In an interconnected electricity system bilateral trade of electricity will start, first on a national basis, followed by trade on a more regional basis. The level of regional trade will be based on existing possibilities of transmission capacities in the grid and existing rules for transmission tariffs, wheeling arrangements etc.

Existing arrangements for trade should not be cancelled if they do not destroy future development. It is experienced that standardisation of contracts available for trade will stimulate the trade, and initiative for such a development exists and should be stimulated. When trade of standardised contracts has reached a certain level of liquidity, it is possible to establish clearing solutions to remove a significant part of the counterparty risk from the trading participants. This will stimulate the trade additionally.

A coordinated calculation of transmission capacity and a neutral allocation of this is a very important tool to stimulate the market to develop, and the initiative presented by e-control as the Auction Office for Cross Border Market Operations seems to work along the lines that are necessary to level the playing field for organised exchange trade in the region.

Transparency of prices and other market information is extremely important for development of a regional market.

Establishment of a power exchange will create new possibilities for increased trade. In the Nordic market the use of the common power exchange Nord Pool has established transparent prices, an information source for the electricity business and high utilisation of the available transmission capacity between areas.

The liquidity of the Day-ahead market in Nord Pool soon made it possible to establish a liquid derivatives market for hedging purposes.

This project is concentrated within the following 3 areas:

Determination of level of interest for regional trade platform

The first objective of the study is to determine the level of interest among stakeholders in participating in regional trading platforms in SEE.

In order to get information regarding the interest for regional trading platforms from stakeholders in the region, questionnaires were developed and submitted to selected TSOs, Ministries, Regulators, and Traders in the region.

Two sets of questionnaires have been developed; one focusing on TSOs, Ministries, and Regulators, the other directed towards traders in the region.

The trader group consisted of traders based in the region as well as western European traders active in the region.

Benchmarking of trade platform initiatives

The second objective of the study is to identify the most appropriate and effective platform with which to establish confidence in the regional marketplace and to accomplish the goal of increasing trade in the region through a uniform and transparent process. In doing so the consultants have reviewed and benchmarked the current initiatives for regional trading platforms. Currently, there are proposals from Borzen in Slovenia and OPCOM in Romania to take on the task of setting up regional trading platforms. The Consultants have developed a set of benchmarking criteria that are considered critical for establishing a regional trading platform, and developed questions related to these criteria that have been submitted to and discussed with the 2 organisations.

EBRD's potential role

The third objective of the study is to provide recommendations on what role the EBRD may have in this regional trading process, and also to look at what level of capital may be required.

The recommendations from the consultants are based on the responses to the questionnaires as well as the consultants' discussions with stakeholders in the region.

4 Summary of Questionnaires

The following chapter provides summaries of the two questionnaires that were sent to stakeholders in the region.

The questionnaires dedicated to the TSOs, Ministries, and Regulators were submitted to 49 entities, and responses were received from 25 (51%). However, there is some overlap among the respondents and some of them pooled their answers, increasing the response rate.

The responses from the different countries in the region were as follows:

Country	Number of responses
Albania	2
Bosnia and Herzegovina	2
Bulgaria	3
Croatia	4
FYR Macedonia	
Greece	3
Kosovo	1
Moldova	1
Romania	5
Serbia and Montenegro	2

Slovenia	1
Turkey	1

The questionnaires dedicated to the traders in the region were submitted to 15 entities (entities within the region as well as from Western Europe), and responses were received from 8 (53%).

The questionnaire was intended to detect important obstacles for trade. The questions were based on known obstacles from other markets of legal, technical and economic type.

The summary of the TSOs, Ministries, and Regulators responses are as follows:

	Question	Response					
General							
1.	Please explain briefly your country's current electricity market status and the anticipated development over the next years. (Degree of deregulation and unbundling, number of independent participants, electricity industry structure, etc.)	Market Opening	<25%	25-50%	50-75%	75-100%	NA
			14	1	3	6	1
		Unbundling	Yes		No		NA
			16		9		
		No of Participants	<10	10-50	50-100	>100	NA
			9	10		6	
2.	Do you expect cross border trade to be an important part of your country's power market going forward?	Very Important	Somewhat important		Less important		
		22			3		
3.	How is the present cross border trade carried out?	Market Based		Bilateral arrangements			
		6		19			

	Question	Response				
4.	How could cross border trade procedures be improved?	- further dev of CBT and ITC mechanisms - coordinated single auction, coordinated flow based explicit auctions - pending secondary regulation - increasing number of traders and further deregulation of the market - coordinated explicit auctions and flow based market coupling - clear and simple legal framework - by introduction of market coupling and continuous market splitting - by regulation - creation of regional DAM - DAM with implicit auction of capacity - harmonization of rules, merging of SETSO and ETSO ITC funds				
		NA: 1				
5.	What are the approximate volumes of cross border trade in % of total generation for your country?		<5%	5-10%	10-25%	>25%
			4	3	13	5
6.	Do you want to allow for more volumes?	Yes		No		NA
		19				6
7.	Could it be improved through a trading platform?	Yes	Yes, possibly	No		NA
		17	7	1		
Regional Power Exchange in Southeast Europe						
8.	Is there interest and/or need for a regional trading platform in Southeast Europe?	Yes		No		
		25				
9.	What factors would lead traders to use such a platform for trading?	- flexibility in buy and sell - price discovery - correct prices - common interest of countries to exchange electricity and the generation mix - solve short term imbalances and improved liquidity - liquidity, transparency, and simple procedures - implicit congestion management and ease of access to market - clear and transparent rules applied on non-discriminatory basis - profit, number of participants, liquidity, transparency, simplicity - increase in exchange of electricity				
		NA: 2				

	Question	Response			
10.	What would be important factors for your country in determining your support of a regional power exchange?	- improvement in transmission capacity and internal generation capacity - interconnections with neighbouring systems - reciprocity in market opening and access to external markets - possibility to utilize seasonal variations in generation and demand - better liquidity and benefit to customers - transparency, clear and simple procedures, non-discrimination of participants - capacities on interconnectors, economies of scale, high energy demand in coming years - the PX should work under the same conditions as in EU, be voluntary, and have clear and transparent operational framework - avoid shortage during periods with scarce resources, improved flexibility, and avoid spilling of water during wet periods - financial guarantees for trades conducted at the PX - consolidated agreements between participating countries, common rules for accession			
		NA: 1			
11.	Would your country have ownership (as a shareholder) in a regional power exchange?	Yes (possibly)		No	NA
		22		1	2
12.	Would your country be prepared to harmonize regulation and the competitive environment for the establishment of a regional trading platform (a PX)?	Yes	Yes, possibly	No	NA
		21	4		
13.	How many independent generation companies from your country are assumed to participate in the regional power exchange?	<10	10-20	20-50	>50
		21	2	1	1
14.	How many independent retailers exist in your country and will participate in a regional power exchange?	<10	10-20	20-50	>50
		16	5	4	
15.	Would one common language for interaction with the regional power exchange be acceptable?	Yes		No	Unclear
		24			1
Access to <u>international /regional</u> Market					
16.	Are there any obstacles in regards to getting a <u>license</u> to trade (international trades) in your country?	Yes	No	NA	
		2	19	4	
17.	What are the costs for obtaining an international trading <u>license</u>?	<1000€	1000-5000€	>5000€	NA
		5	6		14
	Is this a major issue for potential traders?	Yes	No		NA

	Question	Response				
				14		12
18.	Who are eligible to get a license for trading (international) of electricity?	All	Suppliers and generators	Monopoly		NA
		17	4	1		3
19.	Are there at present any legal obstacles for obtaining a trading license?	Yes		No		NA
				22		3
20.	Is transmission capacity on interconnectors procured through auction or any other market based mechanism?	Yes		No		NA
		11		14		
21.	Approximately what percentage of the interconnector transmission capacity is occupied by long-term bilateral contracts? (Is a majority of the capacity occupied of long-term bilateral contracts?)	<5%	5-25%	25-50%	>50%	NA
		1	3	8	8	5
22.	Is the ETSO CBT mechanism (harmonized mechanism for handling of transit power through 3 party network in Europe) implemented in your country?	Yes		No		
		19		6		
23.	Are there plans for implementing the ETSO CBT mechanism?	Yes		No		
		25				
Access to national Market						
24.	Are there any obstacles in regards to getting a license to trade (trade in wholesale market and retail market) in your country?	Yes		No		NA
				22		3
25.	What are the costs for obtaining a trading license?	<1000€	1000-5000€	>5000€		NA
		5	6	1		13
	Is this a major issue for potential traders?	Yes		No		NA
				18		7

	Question	Response			
26.	Who are eligible to get a license for trading of electricity?	- Criteria set by the regulator - Licensing procedures under development - All, according to criteria defined in the Electricity Law - Any legal person registered in the country can get a supply license and sell to eligible customers - Everyone meeting all requirements of the Licensing Rule - Must be legal entity (joint stock or limited liability company) in accordance with national commercial code. - Must have registered company in the country and minimum capital of 500 000 EUR.			
		NA: 1			
27.	Are there any legal obstacles for obtaining a trading license?	Yes		No	NA
				22	3
28.	What percentage of the transmission cost is carried by the generators?	<50%	50%	>50%	NA
		12	6	3	4
	What percentage of the transmission costs are carried by consumers?	<50%	50%	>50%	NA
		3	6	12	4
	Are there any distance dependent elements in the transmission tariff structure?	Yes		No	NA
				24	1

Financial issues

In (international or national) trade of electricity it is common that buyers have to post financial collateral for their net purchase obligations. This collateral would typically be 10-20% of a trader's annual purchase at any given time. Depending on the credit worthiness of the trader collaterals will be required. Collaterals could be posted in the form of guarantees or cash. For bilateral trade other arrangements could be in place. However, in the case of a regional power exchange, one should be prepared for the above mentioned requirements.

29.	In general, what is the credit worthiness of participants in your country? (Is their credit rating low?)	Very Good	Good	Poor	NA
		3	5	2	15
30.	Is the banking business sufficiently developed, and can the banking system easily handle international transactions?	Yes		No	NA
		20		2	3
31.	Are State Guarantees presently available for electricity traders?	Yes		No	NA
		3		16	6

	Question	Response			
	If so, who are eligible for State Guarantees?	- Only the national utility			
32.	If an external source were to set up a guarantee mechanism for electricity trade in the region, what would the requirements from your country be (in terms of Euro)?	<10 M€	10-50M€	>50M€	NA
			1		24
33.	Are variations in your currency exchange rate towards Euro high?	Yes	No		
		2	23		
34.	Is Euro currently accepted as a trading currency?	Yes	No		
		20	5		
35.	Will you accept Euro as the only trading currency in a regional power exchange?	Yes	No	Unclear	
		23		2	
36.	Are there any taxes or duties in your country that limit regional trade of electricity (Import/export tax, border tax)?	Yes	No	NA	
		5	18	2	

The summary of the traders' responses are as follows:

	Question	Response
General		
1.	What are the main obstacles a trader faces in cross border trade in the region?	- limited value of ATC (Available Transmission Capacity) offered to the market. Old contracts are blocking NTC (Net Transfer Capacity) - Unreasonable reduction of cross border capacity, lack of synchronization of maintenance work - Non-transparent, unsynchronized, and costly cross border capacity, non-firm capacity, and late payments - Low liquidity, priorities given to certain market players - Customs and tax issues

	Question	Response			
2.	How could cross border trade from a traders point of view be improved?	- calculation of ATC must be transparent, and auctioned capacity should be firm - contracts for transfer of capacity rights should be developed - synchronization of maintenance work, improvement in legislation - standardization of contracts and capacity auctions - by increasing the NTC (Net Transfer Capacity) - market based mechanism for allocation of cross border capacity - unbundling - to implement unique ETSO ITC fund			
3.	Are there interest and/or need for a regional trading platform in Southeast Europe?	Yes	No (not yet)		
		7	1		
4.	What factors would lead traders to use such a platform for trading?	- Transparency in the market, sufficient number of participants, liquidity, and reliable price index - Real market opening - Security of concluded contracts, liquidity, easy access to cross border capacity, price reference - Possibility to balance positions - Regional binding legal documents for SEE electricity market			
5.	Would one common language for interaction with the regional power exchange be acceptable?	Yes	No		
		8			
Financial issues					
In (international or national) trade of electricity it is common that buyers have to post financial collateral for their net purchase obligations. This collateral would typically be 10-20% of a trader's annual purchase at any given time. Depending on the credit worthiness of the trader collaterals will be required. Collaterals could be posted in the form of guarantees or cash. For bilateral trade other arrangements could be in place. However, in the case of a regional power exchange, one should be prepared for the above mentioned requirements.					
6.	Do you experience major default in payment commitments in national and regional trades?	Yes, once	No	NA	
		1	7		
7.	Do you consider the banking business to be sufficiently developed, and can the banking system easily handle international transactions?	Yes	No	NA	
		6	1	1	
8.	Is it presently common that buyers within the electricity business post security cover or financial guarantees for payment before or when entering into a trade?	Yes	Occasionally	No	
		3	3	2	

	Question	Response		
9.	What types of guarantees exists?	- Bank guarantees - Insurance guarantees - Parent company guarantees - Letter of credit - Advance payment		
		NA: 1		
10.	What types of guarantees are desirable?	- Bank guarantees - Guarantees for both sides - Cash collaterals - Parent company guarantees - Letter of credit		
		NA: 1		
11.	Are State Guarantees presently available for electricity traders?	Yes	No	NA
		1	6	1
12.	Is an initiative by an external source to set up a guarantee mechanism for electricity trade in the region supported by you as trader?	Yes	No	NA
		6	1	1
13.	Is Euro currently accepted as a trading currency?	Yes	No	
		8		
14.	Will you accept Euro as the only trading currency in a regional power exchange?	Yes	No	
		7	1	
Contract issues				
15.	Are standard contracts currently being used/traded in the region?	Yes, EFET	Yes, sometimes	No
		2	2	4
16.	What contracts are most popular?	EFET contract	Bilateral contracts	
		6	2	
17.	What types of contracts are wanted by the traders (or organisation currently engaged in international trade)?	EFET contract	Short and long term contracts	
		6	2	

The major conclusions from this are:

- Authorities report that they expect regional trade of electricity to be an important part of any individual country's power market, and that regional trade can be greatly improved by a regional trading platform.
- Traders report that the main obstacles for regional trade is related to access to cross border capacities; lack of capacity and non-transparent allocation methods. The ongoing tests on methods for coordinated allocation of transmission will, if they get a successful result, solve a lot of problems. It is important that this work is supported and that results will be published.
- Based on the responses to the questionnaires it can be concluded that there is great support for the establishment of a regional trading platform. From the summary of the responses from the TSOs, Ministries, and Regulators, out of 25 response 17 state clearly yes, 7 state yes possibly, that cross border trade can be improved through a trading platform, and all 25 state that there is interest and need for a regional trading platform in Southeast Europe.
- Traders clearly state that there is great need for a regional trading platform, and factors that would lead them to use such a platform are transparency, liquidity, reliable price reference, covering of counterparty risk, avoiding direct negotiation for cross border capacities.
- There is not indicated any major obstacles that limits trade in legislation or in the grid tariff structure
- Some kind of guarantee mechanism to reduce counterparty risk is wanted.

From these responses it is detected a need for an organised trading platform to be established in the SEE region in addition to the traditional trade. As a part of the organised trading platform there can be established clearing solutions that can reduce the counterparty risk for trade both in OTC trade and in exchange trade.

In the next chapter different solutions for a regional trading platform is discussed.

5 Regional Market Concepts

There are several different market concepts now in operation. In the context of this report focus is made to concepts implemented or in a process to be implemented in the European market. The markets may be classified in two main classes:

- The US concept referred to as the PJM (Pennsylvania, New Jersey, Maryland) concept.

- The European concepts

5.1 US Market Concepts

The PJM concept calculates the electricity prices in each node in the grid. This model is used in the New Zealand market and in the east coast of USA and in Ontario.

The concept was originally a centralised dispatch model that included data for total generation, consumption and the transmission system. The model selects units for dispatch and calculates corresponding prices in real time simulation based on economic optimisation of the resources.

The core of the model is well known in the former regulated regimes where fuel prices, start/stop costs, transmission losses, transmission capacities and predicted load were included.

This market concept is from a technical point of view advanced and complex and requires substantial degree of centralisation and harmonisation of operational rules not only in trade but also in system operations.

The consultant therefore considers this market model not to be appropriate for the South East European market. Russia is the only European market where nodal pricing is practised.

5.2 European Market Concepts

The European Concepts is different compared with “PJM” concept as described above.

Most of the European market concepts are based on the following features:

- There is a competitive bilateral wholesale market where standardised and tailor made contracts are traded. Traders and brokers have established mechanisms for bilateral trade in most of Europe. When such trade is standardized, it is normally referred to as OTC trade, and some of the traders and brokers have established electronic trading platforms to handle such trade. OTC-platforms operate as intermediaries that arrange for two parties to enter into a bilateral contract. The OTC trade platform is normally not involved in financial settlement between the two parties.

- There is a day ahead spot market, DAM, operated by a power exchange for trades in short term contracts for delivery the following day. The DAM is non-mandatory. The volume in DAM, the bilateral market and direct deliveries to end-users include normally more than 95 % of total generation. Prices in DAM and the bilateral will be on the same level and is referred to as the electricity whole sale price. The price can

correlate well with prices on predominant fuel applied in generation. DAM operates in competition with the bilateral power market.

- National balancing mechanisms are established by the system operators (SOs) or by transmission system operators (TSOs). The balancing mechanisms include a balancing market for real time balancing of generation and load. The prices in the balancing market are the basis for pricing of non-predicted or non-predictable events and changes in consumptions. This power volume is referred to as imbalances.
  The prices in the balancing mechanism reflect the capability of the power system to balance load and generation. The prices and volatility are often very high, but the volumes involved are small. The balancing mechanism normally includes a volume less than 5 % of total generation.

- There are financial incentives for market participants to apply DAM to carefully balance their power resources (own generation plus purchase contracts) to their delivery commitments (sale contracts plus direct delivery to end-users).

5.3 Comparison between the European concepts

National signals and the Athens process indicate a development of the power market in South East Europe in line with the overall concept European concept described above.

Among the European systems there are some differences in choice of trade systems for the power exchange.

Continuous trade in UKPX and Elbas.:

The volumes traded in both these markets are very low.

In the Nordic market Elbas has been applied in the intra-day market between DAM and the balancing market. The system has been developed to manage congestions in the grid by applying local order books. However, the needs for an intra-day market for trade between the Nordic countries are not extensive. This is the main reason for low volumes in the market.

UKPX is the present spot market in England. It is assumed that the main reason for the low volumes in the market is more related to the overall organisation of the whole sale market than the trade system itself.

Continuous trade systems are applied in European electricity derivatives markets.

Auction trade in EEX, APX, Powernext and Nord Pool:

The above Day-ahead markets have all developed liquidity and are still increasing their trade volumes. The spot market at Nord Pool is applied in congestion management on interconnections to form the common Nordic market (market coupling).

Nord Pool achieved successful market coupling due to strong support from the national TSOs and regulatory bodies. This has to a large extent contributed to the success of the power exchange.

In South East Europe two power exchanges are established, OPCOM in Romania and BORSEN in Slovenia.

BORZEN in Slovenia operates a continuous trade system similar to the trade system in UKPX in England and the intraday market Elbas in the Nordic power market and an auction of hourly contracts for the next day. This is the model of the original EEX in Frankfurt

Block products are traded separately and not included in the calculation of hourly prices in the auction.

OPCOM in Romania operates an auction based system similar to the systems in EEX in Germany, Powernext in France, and the Nordic spot market.

OPCOM intend to integrate block bids in the hourly price calculation in the same way as practised in Nord Pool.

Trade in derivative products is established, most of them financial settled, to allow for hedging of the price for typical block periods. Standardised contract profiles are cleared by established Clearing Houses.

There are established different types of balancing mechanisms, mostly on TSO level. It is only in the Nordic area that balancing mechanism is harmonised over a regional area.

6 Regional Trading Platforms

6.1 Introduction

The introduction of a regional trading platform should cover the necessary flexibility to satisfy the need for trading products. The number of products should not be increased to a number that destroy the liquidity of the trade in the different products and make it easier to manipulate prices.

In the development of the Nordic market the interaction between the OTC trade and the exchange trade was valuable. Under the development of the derivatives market, Nord Pool looked to the products that had gained some liquidity in OTC trade, and the OTC traders standardised their portfolio to match the Nord Pool contracts. In this way the different contracts were traded both via OTC and exchange, and it became easy for Nord Pool clearing to

offer clearing for OTC traded products without extreme collateral requirements.

The Day-ahead market concentrates a large part of the physical trade in a daily auction. This gives high competition and a robust price calculation. The competitors in all 4 countries participate, and the competition will only be limited when bottlenecks occur. The agreement between the Nordic TSOs which allocated all available transmission capacity between countries to organised trade (via Nord Pool) stimulated the trade between the countries immediately.

The development of a market in SEE has started and in the following the status of this development is described.

Some commonly used terms are defined below:

Market Splitting:

Market splitting is a congestion management method used by power exchanges to split the market area into price areas to reduce contractual flow across congested interconnections.

Market Coupling:

A method whereby two or more markets operated by separate power exchanges are coupled together to form a common market.

Explicit Auction:

To get access to transmission capacities on interconnectors capacity auctions are conducted, where participants bid for capacity on daily, weekly, or monthly basis.

Implicit Auction:

Implicit auction is also used to get access to interconnector capacity, but the capacity is auctioned in a combined energy and capacity auction, such as the one used in market splitting and market coupling mechanisms.

6.2 Athens Process Framework

The Athens Forum Process was initiated by the EC DG TREN. The different governments in the South East European Region supported this process with the aim of facilitating trade of electricity in the region. The principles of the internal European market for energy are applied.

To reach the goals inherent in the Athens process, the playing field must be levelized. This implies that the region must:

- Develop regulatory authorities for the sector
- Unbundle the electricity supply according to EU directives
- Develop non-discriminatory access to the networks

- Establish non-discriminatory methods for Cross Border allocation of capacity to facilitate cross border trade.
- Focus on security of supply for end users.

The Energy Treaty has been negotiated and signed by the SEE countries, and this treaty also establishes some high level cooperation in the region.

The framework for the market mechanism in the Athens process is summarized in DG TREN's *"South East Europe Electricity Market options paper, draft v43."* The main elements from this option paper that directly affect the regional market are:

1. Transparency

   This includes and stresses the importance of publication of market related information used in

   a. Trading
   b. Investments decisions
   c. Removal of price distortions and cross subsidies
   d. Preventing fraud in contracts

2. Price Distortions

   Removal of price distortion is a prerequisite for competitive electricity markets, and subsidies from big consumers to small consumers as well as other distortions must be removed at the latest by 2010.

3. Market Monitoring

   The market monitoring primarily looks at the performance and the structure of the market with the aim to improve the functioning of the market. National monitoring must be put in place to detect market misbehaviour. Regional activities to monitor cross border trade must also be put in place.

4. Wholesale Market

   The options paper states the following principles for the wholesale market:

   a. Zonal pricing model
   b. Voluntary bilateral trading
   c. Voluntary power exchanges
   d. Power exchanges are concentrating on single auction day-ahead spot market
   e. Power exchanges (Borzen and OPCOM) in the region together with Europex should work on establishing a spot

market for all zones in the region.

f. An intra-day market for the balance responsible parties will be created for each control zone following the creation of national or regional markets.

g. Real time balancing market will be created for each control zone, and TSOs will contract real time balancing power.

5. CBT Mechanism

Congestion management methods for cross border trade are de facto becoming a combination of explicit and implicit auctions. Regional congestion management is executed by an auction office commonly operated by the TSOs.

Timeline

2005 – CBT agreement

2006 – Trading at the wholesale level fully opened

– TSO auction office operational

– Energy information centre operational

2007 – TSOs unbundled

2008 – Opening of the market for non-household customers

6.3 Proposed Market Design

In line with CEER Position Paper on "Standard Market Design of the SE Europe Electricity Market – Basic Principles" the market will include:

- A bilateral market and OTC-market for long term and short term contracts.
- A day ahead spot market, DAM, for standardised short term contracts operated by power exchanges.
- A market based Balancing Mechanism for ancillary services and reserves operated by the respective national TSOs.

The wholesale electricity market thus includes bilateral contracts and DAM contracts. Theses markets are open for all generators, traders and eligible customers.

DAM is assumed to have the following main roles:

- Make it possible for market participants to balance their contractual positions or offer additional trade volumes close to time of operations.

- The DAM price is a public known neutral market price and can be the reference price for financial hedging instruments.

Import/export is handled in the bilateral market through explicit auction and in DAM through implicit auction.

Transmission rights for bilateral contracts are procured through flow based coordinated explicit auctions of transmission rights.

Remaining transmission capacities after an explicit auction and capacity not notified to be used can be allocated to DAM and applied in an implicit auction in DAM. This will ensure optimal utilisation of available transmission capacity.

European experiences in restructuring of the electricity market and forming of regional markets clearly demonstrate that restructuring is a stepwise process. National markets are integrated to form regional markets when harmonisation and reciprocity have reached an appropriate level.

At present there are two power exchanges in operation. These two power exchanges and potential new power exchanges should be developed in line with CEER Position Paper on Standard Market Design to facilitate integration / market coupling of these exchanges and thus form a fully integrated DAM for the CEER region.

6.4 Clearing Mechanisms

The expressions Settlement and Clearing are used in many market contexts. Thus it is important to differentiate between them and understand their different meanings.

Settlement refers to the process of calculating the payment and cash-flow for a transacted commodity. The value and payment terms of the traded commodity are well defined and the risks associated with settlement are related to payment risks. Settlement is used for bilateral and exchange traded physical contracts, including Day-Ahead markets.

Clearing refers to the processes of handling cash flow and associated risks for derivatives contracts. The value of the derivatives is not known, as they depend on the market price fluctuations. The price risk is therefore far more complex to validate and to hedge against. Clearing in this context refers thus only to derivatives trades.

A similar clarification needs to be done with respect to financial versus physical derivatives. Bilateral physical contracts such as the currently traded long-term and short-term bilateral contracts in Europe are per definition forwards contracts, and in principle they could be cleared through a central clearing service. Technically, clearing of a physical electricity contract would imply that the clearing house would guarantee delivery of the physical commodity, which is extremely impractical or even prohibited.

The Clearing House is established to manage the counterparty risk. As mentioned the future price is not known, but if a standardized contract is listed and traded at a market place or in an OTC market where the prices are published, the Clearing House can use the published prices for their calculation of available prices in the market in case of a default of a contract. If a contract is tailored for a customer, it could be difficult to estimate the available price for this contract in case of a default. The collateral requirement for such a contract would be significantly higher than for a standardized contract.

The efforts from the power market to make a limited number of standardized contracts are mainly done for the following reasons:

- To create liquidity in the market
- To make competition
- To make the trade efficient
- To make the trading costs low
- To make clearing possible
- To make collateral requirements low

The association of European traders, EFET, has also worked with standardisation of their products. They have developed a General Agreement Concerning the Delivery and Acceptance of Electricity. In this agreement the responsibilities of the parties in a contract are defined

The contracts are normally defined as Block contracts, i.e. with the same quantity for a defined number of hours. The price can be fixed or floating.

There are also defined standards for put and call options.

EFET is also defining the forms of credit support allowed, non performance clauses etc.

This kind of standardisation will shorten the time for negotiations between parties accepting the contracts.

It is normally a close dialogue between traders and marketplaces. Popular contracts traded in the OTC market will be listed by power exchanges and vice versa.

The most important part of the standardisation is probably the definition of how the contract can be terminated in case of default.

6.4.1 Over the Counter (OTC) Clearing

Some electricity derivatives exchange operators and/or their affiliated Clearing Houses such as Nord Pool and EEX/Germany offer the opportunity to

clear bilateral **derivative** transactions through their exchange clearing system (OTC Clearing). As central counterpart the Clearing House together with the Clearing Banks covers the counterparty risk for all OTC trades which are identical with the Financial Electricity Markets products.

Note that the mentioned services are for financial derivatives contracts only, and not for physical bilateral contracts. Normally a clearing house will offer clearing services only for OTC contracts of a type that also is available for exchange trade. To the Consultants knowledge, no Clearing Houses or exchange operators offer clearing of long term physical electricity contracts.

Information about the bilateral contracts is collected by using appropriate registration software. The process goes as follows:

- The two parties in the bilateral contract come to an agreement on product and price. The product is typically standardized products equal to the products offered on the organized exchange.

- One party (e.g. the buyer) registers the trade at the Clearing House and informs the counterpart (the seller) of the registration.

- The counterpart (seller) logs into the Clearing House interface system and confirm the transaction.

- The contract price negotiated must not exceed or fall below a predefined interval around the last settled exchange price. The trade such determined is only published with the traded volume, but no exchange price fixing (subject to public law) and therewith no publishing of the price takes place.

6.4.2 Proposal for handling of counterparty risk in physical OTC contracts

If a clearing house or settlement administrator shall take the counterparty risk of a physical delivered contract it has to perform the following two tasks:

- The counterparty risk of delivered but not paid for commodity (often referred to as payment risk) has to be covered by posted collateral. The clearing house or settlement administrator will perform the settlement between the parties.

In order to make the counterparty risk in a physical contract manageable, it is proposed (in line with the EFET contract) that the contract should include a termination clause, and collateral should also be posted for the termination period.

- The counterparty risk of a defined termination period has to be calculated. If the contract is of a standard type with high liquidity in the market, the collateral requirements will be easy to calculate. With tailored contracts it will be more difficult. The existence of a regional

day-ahead market will make it easier for the clearing house to manage contracts for physical delivery.

6.5 Current Regional Initiatives

6.5.1 Description of the Borzen Initiative

Borzen d.o.o in Ljubljana in Slovenia has taken an initiative to be a Regional Power Exchange for the South East Europe.

The initiative is launched according to the initiatives of the Athens Process to create a common market in the SEE area.

Borzen was established in March 2001 as a national power exchange for Slovenia. With some years experience in operating a PX, Borzen consider themselves to be a natural candidate to establish a regional power exchange and presented their proposal mainly during 2005. Borzen has been active in several international forums and presented their initiative.

The Regional exchange is presented as a company separated from the national exchange and with a neutral ownership spread among stakeholders in the region. The TSOs are anticipated to be part of the stakeholders.

The regional exchange will in the proposal mainly offer the existing traded products in the national exchange, but will be able to list other products when necessary.

By development of the local developed trading system, Borzen introduces its capability to adapt to congestion management solutions that will be developed in Europe.

The initiative indicates that Borzen foresee a stepwise development in the region, and that it is necessary to agree with the local TSOs to organize the trade.

Borzen has arranged a clearing solution for Slovenia and intend to offer clearing solution for the regional exchange based on the principle “trade Global Clear Local”.

The initial plan was to launch the regional exchange in the beginning of 2006 and have a final decentralised model ready in 2008.

6.5.2 Description of the OPCOM Initiative

OPCOM SA in Bucharest was established in 2000 as a market operator for Romania. Since the start OPCOM has developed their business and started in July 2005 a Day Ahead Market (DAM) for Romania.

OPCOM is also given the role as a Settlement Administrator for electricity products and performs settlement not only for own products but also for the Balancing Market and the settlement of imbalances in Romania.

OPCOM launched late 2004 themselves as a candidate to be a Regional Power Exchange.

OPCOM participates in several international forums that address the development of electricity trade, both in SEE and the rest of Europe.

OPCOM is also preparing to launch a financial derivatives market for Romania and for the region within the next two years.

First step of the regional development will be to establish a short term market for physical delivery.

OPCOM base their trading systems on procurement of established and proven software systems. The local system for Day-Ahead market is operating and has the capability to establish a regional market with Romania as a hub in the region. OPCOM will extend the software system to allow trading and congestion management according to existing proposals in Europe.

OPCOM will within 2006 establish a clearing house for the trade within Romania. The solution will be prepared for regional operation.

The Regional Power Exchange is intended to be launched as a separate company and with distributed ownership within the region.

It is planned to develop the regional solution stepwise dependent on interest from regional stakeholders.

Cooperation with the TSOs to facilitate trade is an important issue to succeed.

6.5.3 Review of the Proposed Initiatives

This section contains a review of the two Regional Power Exchange initiatives in SEE.

To be able to compare the initiatives proposed by Borzen and OPCOM, the consultant worked out a benchmarking questionnaire to be sent to the two exchanges. The questionnaire was reviewed by EBRD before it was submitted to Borzen and OPCOM.

The consultant scheduled meetings with Borzen and OPCOM to discuss, explain and get deeper information on the initiatives.

Before the scheduled meetings, the consultant received answer from OPCOM but not from Borzen. EBRD has got explanation from Borzen on the reason for this, as Borzen did not want to go into further details without separate confidentiality agreements.

In the meeting with Borzen, the consultant asked questions from the questionnaire and got verbal responses. The consultant made notes and produced the answers during the meeting. The questionnaire with the answers was submitted to Borzen for comments and corrections. The consultant has not received any response from Borzen on the meeting notes.

The answers in the attached questionnaire have to be handled with this knowledge in mind.

The consultant received answer from OPCOM ahead of the meeting and the meeting with OPCOM was used to clarify the exact meaning of the answers.

The questionnaire was worked out on the basis of the criteria described in the following:

Several of the present power exchanges in Europe have stepwise expanded their respective trade areas by integrating interconnected national markets.

The market in the SEE region is assumed to follow the same procedure. The SEE region is a large region and will in the first stages of the process operate with several national power exchanges. These will expand their trade area and include interconnected markets that are prepared to join a common market. The market itself will to a large extent decide on an appropriate density of power exchanges and it is assumed that the number of power exchanges will converge towards a number assumed to be appropriate by the market itself.

Further different models for decentralised market operations will be experienced where countries take responsibilities of execution of defined tasks to facilitate regional market operations.

Based on experiences from the creation on competitive power markets, the consultant has developed some criteria that are important to comply with if the creation of a power exchange should be successful.

A number of requirements and criteria for regional power exchanges are worked out with explanation of why they are important. This description is presented in Appendix 4. The specific criteria have served as basis for the benchmarking questions that are contained in Appendix 5.

The benchmarking criteria are connected to the answers from the power exchanges listed in the following.

6.5.3.1 Regulatory Issues

Local support to expand international

The PX that intends to expand to a Regional PX must have strong local political and regulatory support.

Borzen: The Government and Minister of Economy are very supportive. Discussions are ongoing with other ministries.

OPCOM: Ministry, TSO and Regulator are fully supporting the role of OPCOM as a Regional PX.

Adaptation to different regulatory frameworks

Regional Power Exchange must have developed strategies and procedures to manage differences in regulatory framework inside the market area.

Borzen and **OPCOM** have not developed strategies and procedures yet.

Licenses in the different countries
The Regional PX must have a strategy how to handle differences in licence practices in the market area and have procedures to analyse when differences are acceptable to establish a common market area.

Borzen: In Slovenia licence is needed for PX and market participants. Licences needed in foreign areas are not clarified yet, but the PX must register as a balance group in foreign areas or its clearing branch/partner should obtain the local licenses and arrange for the balance group responsibility.

OPCOM: In Romania licence is needed for market operator and market participants. The regional development will be stepwise and the identification of licence needs will be investigated and taken into account when agreements are developed.

Legal framework
The Regional PX must have agreements with participants and other stakeholders that are legally binding and executable in the all participating countries.

Borzen: There is no agreement between Borzen and ELES apart from their membership on the Borzen national PX with its clearing mechanism. There are participants' agreements and clearing/settlement agreement between Borzen and the participants.

OPCOM: There are established agreements between market participants and OPCOM that allow participants to trade in the products offered by OPCOM

For the regional project it is required to have agreements with the TSOs.

6.5.3.2 Organisation

Cooperation with participants (committees etc…)
The Regional PX must have a strategy for cooperation with the market participants where it is defined how they could influence the market development.

Borzen: A market council is established that provides recommendations on development. It is estimated that there is a need for a regional market council. The structure has to be discussed.

OPCOM: Rules are published by the Regulator for discussions and comments. OPCOM arrange meetings with the market participants to present changes

and for information/discussions. There are established "Technical Groups" to work out new products, The OPCOM web-site is used for information and a Market Committee is formed from the top management of important stakeholders in the market.

This structure is in principle also needed in a regional structure. In the regional structure also work in and input from CEER, ERGEG, ETSO and EUROPEX will be important.

Ethical rules and rules for conduct for power exchange staff.
The PX must as an integrated part of the trading rules define ethical guidelines for the participants. The PX must also define ethical rules for their own employees and rules for conduct of the PX staff.

Borzen: Some guidelines are included in the market rules. Currently no specific rules for the employees exists, but this is considered as important.

OPCOM: Ethical rules are enclosure to the agreement for DAM participants. There are some ethical rules in the internal regulations, but this will be more formalised.

Local presence (flexibility in task carried out by a local organisation)
The PX must have a strategy for local presence in different areas of the Regional Market to give the participants the needed service.

Borzen: Plan local offices with all the relevant local cooperation, i.e. local Market Operator, local banks with local handling of cash and scheduling settlement. This follows the concept of "Trade Global Clear Local.

OPCOM: Consider it necessary with local offices. This could be local subsidiaries. The purpose of the local office is the need for contact with local market participants, TSO, information to the public, establish training courses etc.

6.5.3.3 Trade Concept

Localized bids (nations, zones, etc.)
The PX trade system must have the capability of receiving bids referred to geographical defined areas and produce information from the trade system with the same resolution.

Borzen: At present it is a Slovenian solution. Ongoing work for having a possibility of geographical registration. This is necessary for congestion management and consequential cross-border trading.

OPCOM : Present trading system is prepared for new zones directly connected to Romania as a hub. OPCOM plans to extend the system to allow

more flexible solutions to be able to handle a meshed network for the regional market.

Congestion management
The PX trade concept must be able to handle congestion management according to rules set by the System Operators.

Congestion management:

Borzen: It is ongoing work to prepare for congestion management. Management has developed a strategy for congestion management in a regional market effectively enabling cross-border trade.

OPCOM : In Romania the congestions are managed by counter trade according to the Commercial Code. On the borders there is possibility for implicit auction of capacity. When the regional market is introduced the strategy is in the first phase to extend the trading system to be able to handle market splitting internally in the regional market and market coupling towards other exchanges if this will be the preferred solution in Europe. Real time congestion management must be agreed between TSOs.

Market coupling / support of explicit and implicit auctions of transmission
The PX trade concept must be able to handle coupling of markets between congested areas in a way that optimize the use of available capacity. The transmission capacity between areas must be configurable and be able to handle different capacities in the different trade intervals.

Borzen : The present trading system handles market coupling. The available transmission capacity is easy to take into account in the trading system.

OPCOM: The present trading system takes into account the available capacity from border zones. The hourly values for ATC on the borders can be loaded into the trade system.

Interface to SO and others
The PX trade system must have an interface towards System Operators that allow correct and efficient information flow (transmission capacities, trading information and schedules) between the parties involved.

Borzen: Uses ETSO XML format.

OPCOM; The TSO define interfaces for information exchange with OPCOM.

Binding contracts
The Regional PX must have established agreements that secure that the contracts traded in the PX will be settled according to the traded volume and published price.

Borzen: No, not at present, in the regional market this must be secured with agreements with TSOs and accepted by the regulators.

OPCOM: This is secured in Romania in the Commercial Code. In the regional market there must be agreements with TSOs in the zones.

6.5.3.4 Market Development

Trading rules adaptable to changing market environment
The PX must have change procedures incorporated in the trading rules that defines the process for adapting the rules to changing requirements.

Borzen: Market rules can be changed without signing new agreements.

OPCOM: The process of when changes are necessary is addressed. The procedures for actual changes are not described.

6.5.3.5 Settlement

Harmonized settlement period
The PX must have prepared a strategy of deciding settlement periods for trade that are harmonised to the needs in the region.

Borzen: In Slovenia daily settlement is used. The settlement period should be as short as possible. Some problems are expected to establish common settlement period for a region.

OPCOM: The answer takes into account the whole period before the reception of money. This period should be as short as possible. In a regional perspective local possibilities for banking systems etc. has to be taken into account. In the stepwise development planned by OPCOM, the problems could be discussed from country to country.

6.5.3.6 Market Surveillance

Procedures
The PX must have established a department for Market Surveillance with defined obligations for their work and established procedures for the performance of the work.

Borzen: No special department established. It is just a function. In a regional market it will be necessary to monitor daily operations and make some analysis for ministries and regulators.

OPCOM: Has a market surveillance department since 2002. In the regional market surveillance must monitor market operation, monitor market

participants compliance with rules and report to the Authorities if inadequate operation of the centralized market is discovered.

Reporting to authorities
The Market surveillance department of the PX must present regular reports to the authorities according to the regulatory framework. In addition detection of breach of market rules have to be reported without unreasonable delay.

Borzen: Issue some reports to the regulator/ministry. No indication of expected requirements in a regional market.

OPCOM: Report weekly and monthly to the OPCOM CEO and the Regulator. The report to the Regulator has a standard pattern and limited number of pages, In the regional market it is expected also to concentrate on information distribution and insider trading in addition to what is done locally today.

Mandate
The Market Surveillance department must have the necessary mandate to collect all necessary information to perform its duties. In addition, measures to be taken in case of breach must be clearly defined and mandated.

Borzen: Can exclude participants in certain situations.

OPCOM: Limited mandate today, but OPCOM see a need for more transparency in the market. In the regional market the possibilities will more or less be defined by proposals from international organisations.

6.5.3.7 Information

Transparent routines for information dissemination
The Rulebook of the PX must contain the rights for the participants to receive information from the PX and the obligation for the participants to submit information to the PX.

Borzen: No rules yet for submitting information

OPCOM: Present rules do not describe submission of information.

Efficient information collection
The PX must have established efficient routines for electronic collection of needed information.

Borzen: Information is crucial and transparency is required, but it is expected to take time and be difficult to agree.

OPCOM: See the importance of information and transparency. The PX should have a central position to distribute information. International associations have to get an agreed solution on the content of information.

6.5.4 Financial

How will the operation be financed?
The PX must have defined a clear plan for how the costs of operation will be covered.

Borzen: In the present solution a special tariff is covering the costs of the market operator portion in the Power Exchange. In regional solution it is planned that costs of the regional exchange has to be covered by trading fees.

OPCOM: In the present solution the costs of OPCOM is covered by a part of the tariff collected by Transelectrica. In the future there will be worked out a trading fee structure that takes into account the needs of different users of the regional exchange.

Equity, level of equity. Expansion of the shareholders to allow for regional ownership.
The PX must have a strategy for deciding the level of equity necessary for the PX, seen in relation to the level of counterparty risk. The PX must also have a clear strategy for how to change/expand the ownership structure to allow for stakeholders in new areas to become shareholders.

Borzen: Currently Borzen is 100 % owned by ELES. The regional company is planned to have regional stakeholders and will offer shares to TSOs and other stakeholders in the region.

OPCOM: Currently 100 % owned by Transelectrica. The Regional spot exchange is planned to be established as a special purpose company, commonly owned by TSOs.

Credit cover and types
The PX must have defined clear requirements for credit cover from the participants and have defined the types of credit cover that is allowed and adopted to local legislation.

Borzen: Has collateral requirements in form of cash deposits and guarantees. Do not expect changes in the principles in the regional exchange, but this depends on the stakeholders.

OPCOM: Has collateral requirement in the present rules. The principles are not expected to change in the regional market.

Risk policy
The PX must have a clearly defined risk policy.

Borzen: Not a specified risk policy, but settlement risk is handled by the collateral requirements.

OPCOM: Describes the different risks OPCOM is exposed to and are developing procedures to handle the risks.

Multiple currencies
The PX must have defined clear strategy for handling of currencies (multiple or single).

Borzen: Assume that multiple currencies have to be used in a regional market.

OPCOM; Presently assuming a market with one currency.

Tax issues
The PX must have defined clear strategy for how to handle tax issues in different countries.

Borzen: Must be prepared for differences in different countries. The Treaty will contribute to harmonisation.

OPCOM: will treat these problems when addressing a new zone.

6.5.5 Evaluation of the candidates (For EBRD only)

Preparation for regional market

Trading Systems

Organisation

Clearing

6.5.6 Cooperation between Borzen, OPCOM and EBRD.

Both candidates have well developed plans for development of a regional power exchange.

OPCOM has from the beginning adopted the philosophy to first prove a well functioning market in its own country, then address the neighbouring countries and offer them to participate in a regional market and get a stepwise development into a market that cover the whole SEE region in due time. They have focused on creating liquidity in the markets instead of number of listed products that fail to create liquidity.

Both candidates indicate that in order for their regional initiative to be successful they plan to establish regional offices.

It will be most efficient if the trade concept is harmonised between the regional power exchange candidates as soon as possible, and also in line with the rest of Europe. This will make it easier to perform congestion management between the two regions at a later stage and towards the other power exchanges in Europe.

The consultant will propose that the two candidates start to discuss measures to minimise investments in trading systems. OPCOM will procure suitable systems for auction trade with congestion management. Borzen will need new development of their system and will probably get a cheaper solution if they are allowed to use the system of OPCOM for auction trade. On the other hand Borzen indicates that they have a system for handling available transmission capacity in trade of continuous contracts. If this is the case, this system could be used by both parties if the region will introduce an intra day trade.

Both exchanges will have trade systems for continuous trade that can be used for derivatives. The type of listed contracts should be harmonised.

Both exchanges will need change in ownership when they are going to establish a regional market. Market participants will not trade at a marketplace owned by a single TSO.

In the Nordic area the TSOs have shown interest of ownership in the physical exchange. This is considered as a neutral solution for ownership. To get a balanced solution for the ownership in the regional exchange in the SEE based on ownership only by TSOs, it may be necessary to have an interim investor as owner. This could be EBRD. As an example 10 TSOs are expected as owners in the final solution, but only 5 are participating in the initial phase.

If there is a real interest in Borzen and OPCOM for cooperation, the principles for ownership of the regional exchange should be discussed very soon.

An ownership structure of the TSOs will make the Power Exchange a part of the infrastructure and simplify the work for the TSOs in real time operations. Such an ownership, as we have seen example of in the Nordic market, could facilitate the development of a common market, including harmonisation of balancing mechanism and congestion management, as these two areas require strong involvement from the TSOs.

7 EBRD's Potential Role

Based on the responses to the questionnaire, discussions with stakeholders, and the consultants' observations from the region, the following roles for EBRD are recommended:

1. **Support for regional trade platforms**
   - Equity investor
   - Intermediary between trade parties and local banks
   - Facilitator/operator of a settlement bank for PXs

2. **Support for regional participants**
   - Guarantee mechanism (collateral fund) for participants based on EBRD's local knowledge

3. **Support to coordinated auctions of capacities**
   - In the responses to the questionnaires it has been clearly stated that one of the greatest obstacles impeding regional trade today is access to cross border capacity. It is assumed that if EBRD could support market based mechanisms for access to cross border capacities, this would contribute to increased regional trade.

During the meetings with stakeholders it was also mentioned that the EBRD could further increase their investment in infrastructure (transmission projects etc), but this issue will not be further addressed in this report.

The recommended roles for the EBRD can be grouped into roles that can be implemented in the short-term (within 12 months) and in the medium-term (12-24 months).

The proposed roles for EBRD are similar in that they all aim to utilize EBRD's capital and local presence and knowledge in the region. However, it is the consultants' assumption that the equity investor role and the guarantee fund role are those roles that are the closest to EBRD's typical operation.

The roles of intermediary between trade parties (participants and PXs) and local banks as well as the role of facilitator/operator of a settlement bank for PXs is assumed to be of a different character than what EBRD typically are involved with. However, this should be further discussed with the EBRD.

It should also be noted that the roles proposed are not short term roles (in the sense that EBRD should withdraw from its positions within 1-2 years) as confidence in the market and the market mechanisms takes time to develop.

7.1 Short-term roles

The short-term roles should be possible to implement within 12 months. Within this time frame it is not expected that a regional power exchange will be operational, and the mechanisms put in place should be directed towards bilateral trade. The proposed mechanisms are

- Intermediary between trade parties and local banks
- Guarantee mechanism for participants based on local knowledge
- Support to coordinated auctions of capacities

7.1.1 Intermediary towards local banks

In current trade arrangements in the region, guarantees or collaterals are being used to support trades. In international trades, bilateral trade counterparties (buyers and sellers) have to interface directly with each other and with each others' banks or financial institutions. A foreign entity's knowledge about local legislation, banking practices, and banks' standings are often limited or it requires considerable effort to acquire a sufficient level of knowledge.

It is assumed that due to this uncertainty it would be very beneficial for foreign trade counterparts to have a reputable intermediary to facilitate between local banks. With its regional reach and local knowledge it is proposed that the EBRD could take on such a role, and that the EBRD would guarantee the performance of the local banks in terms of execution of guarantees and payments.

This mechanism should bring about a better guarantee and payment procedure and practice, and as such contribute to increased regional trade.

7.1.2 Guarantee mechanism for bilateral trade

In the responses to the questionnaires it is reported that payment problems are relatively small. However, it is also reported that this is due to implementation of strict credit/guarantee procedures. Very strict credit and guarantee procedures are assumed to limit the number of trade counterparts in the region and hence also the regional trade volume. It is further assumed that a regional guarantee mechanism would allow more participants to take active part in regional trade, and that such a mechanism would bring more confidence in regional trading.

Based on EBRD's local knowledge and its local offices it is proposed that the EBRD establish a guarantee mechanism (collateral fund) available for regional participants. The participants would buy guarantees from this fund on a commercial basis, according to EBRD practices.

In the table in section 7.2.5 an estimate is given for the size of such a fund. The estimates in this table are based on an EBRD share of collaterals of up to

50%. This means that a participant would have to provide 50% of guarantees either from own sources or from other sources than the EBRD fund.

7.1.3 Support to coordinated auctions of capacities

In the questionnaires, respondents indicated that access to transmission capacities between countries is a major obstacle for trade in the region. It is further recommended in the responses that the access can be improved by providing market-based mechanisms for the allocation of capacities.

The process of coordinated auction of capacities is addressed in the Athens Forum process, and currently trials[1] are being performed. The coordinated auction should make access to transmission capacities easier and more transparent, and thus eventually lead to increased regional trade. The Commission has developed a regional approach for coordinating capacity allocation, and one centralized office for the SE European region would eventually become more integrated with the rest of Europe.

EBRD's support of a regional auction office either in the form of grants (for capacity building, software/systems, training) or investments to the auction office or the auction process should further improve the conditions for regional trade.

The auctioning of transmission rights in a meshed network such as the European one will be more complex than in Nordpool, which is relatively isolated. The load flow in an SEE regional network is dependent on the physical parameters of the network itself, generation and consumption in nodes within the network and flows coming from outside the system. Ideally the total European synchronised networks should be represented in a network model with all major injection and withdrawal buses represented. In a pan European electricity market, the prices for electricity, hour by hour, will impact the load flow and hence the available transmission capacity on congested power lines. Therefore, major withdrawal/injection information will need to be fed into the SEE auctions system to provide a signal to market participants.

Multiple auctions of capacity can be used to allocate transmission capacity on a yearly, monthly, daily and hourly basis. Thus long-term interconnector capacity needed to match long-term bilateral contracts can be arranged via auctions, while flexibility required for shorter-term operations and balancing is retained. Available cross-border capacity is estimated by the TSOs based on historical flow patterns and auctioned off accordingly. In the Nordic system, the TSOs calculate transmission limits on the basis of known load flow of the previous day and assumptions of changes in generation and load for the next day. Given these transmission limits, the physical capacity is allocated to be available for trade in the Power Exchange. The Power

[1] Dry-runs are currently being conducted by EKC in coordination with SETSO & ETSO as part of the ECSEE process.

Exchange then performs an implicit auction of transmission capacity when calculating the Day-ahead prices. All bilateral contracts crossing the borders are settled financially, mainly with the Day-ahead price as a reference. This solution was chosen by the TSOs to avoid all scheduling of physical delivery of bilateral contracts. The TSOs in the Nordic market base their planning on reported generation schedules and load forecasts worked out by the TSOs.

Research has been conducted in the Nordic area to explore the possibility of integrating the load flow model in the pricing algorithm, but the model has not been fully developed yet, partly because the market participants resist too many bid nodes in the Nordic area.

It is proposed that the EBRD's involvement could be within the following areas:

1. Development of conceptual models. A Southeast European auction office will need support to develop new conceptual models. The TSOs will be involved, but it could be difficult to get sufficient funding for this work, so EBRD could be a source for such financing. ETSO and EUROPEX have discussed different methods of congestion management for a period of time, but there is still a lot of work to be done before an agreed model can be put into operation.
2. Development/acquisition of software tools. If there is an agreed model for the auction area, software models must be developed to handle the auction. EBRD could be a source for financing of the development of such software. In addition there will be a need for financing the establishment of an auction office.
3. Guarantee mechanism. Dependent on which models are used for the security of transmission rights, the need for collateral for this trade can be defined.

As an example let us assume that a transmission right for one week (Monday to Monday) is auctioned off on Wednesday the week before the delivery week. If electronic payment is used, the buyer of this right may have to pay on Thursday (the payment must be cleared before the transmission right is used). If payment is not received, the transmission right is cancelled and in the next phase auctioned off on a daily basis. In this case no collateral is needed.

If there is no daily auction where the transmission right can be sold, there will be a need for collateral for the cost of the transmission right for one week.

If the auction office (with support from the TSOs) gives a guarantee for delivery of capacity, the TSOs also need to be prepared to perform countertrade[2] in case of unexpected congestions. The TSOs then may have to post collateral to the auction office to assure that they are able to settle the financial obligations for this countertrade. The TSOs cannot give a guarantee

[2] Countertrade is a method used to relieve congestions by additional purchases in a deficit area and additional sales in a surplus area.

that the power lines will be operating well all the time, but they can offer to use the power market for congestion management so the market participants do not bear the risk of cancellation of traded contracts due to transmission line failure on interconnectors due to congestion.

As there still are a lot of open issues when handling transmission rights and congestion management in the regional perspective within the SEE region, it is at this time very difficult to estimate the needs for collateral in this area.

7.2 Medium-term roles

The medium-term roles are assumed can be implemented within 12-24 months. It is expected that the regional power exchange initiatives can be operational within this timeframe. The indicated medium term roles are

- Equity investor
- Facilitator/operator of a settlement bank for PXs
- Guarantee mechanism for participants

7.2.1 Ownership of power exchange

The presence of a power exchange operating a day ahead spot market is closely related to a balancing mechanism and is also regarded as a tool to manage congestion and balance consumption with generation.

Day-Ahead markets therefore normally have a monopolistic nature. It is not appropriate to operate several competitive power exchanges in the same market area. However, a non-mandatory DAM will always operate in competition with the bilateral market.

In Germany two power exchanges have been in operations EEX and Lpx. Location of the first power exchange, Lpx, in Leipzig was to a large extent a political decision to provide more business activity to the eastern part of Germany. However, after a short period Lpx merged into EEX. The merger was not dictated by any authority but was mainly driven by market signals.

In contrast, the English power market featured four competitive, privately owned spot power exchanges. None of these managed to develop liquidity and present a reliable reference price for the market. Currently, the only power exchange operating in England is the UKPX.

The market in England is an example of competing power exchanges that have not managed to develop as an important and useful part of the infrastructure. The reason is said to be very high competition with traders who contract major volumes bilaterally.

The monopolistic nature of power exchanges has lead to more attention to interfaces between power exchanges and to a lesser extent competition between power exchanges. It is understood that a kind of national or regional

monopoly is required to operate power exchanges in a competitive power market. Inter-trade between national power exchanges or market coupling to increase market integration within EU-area is therefore an important issue in ETSO (European TSO Association).

At present Governments, Transmission System Operators or private companies own the European power exchanges. Examples on ownership are:

Nord Pool – owned by the state-owned transmission system operators in the Nordic countries

APX – which was established initially as an privately held corporation, but now owned by the Dutch System Operator TenneT. APX also procured UKPX, which was established and owned by OM – a Swedish public corporation.

OPCOM in Romania is owned by the TSO

Borzen in Slovenia is owned by the TSO

Powernext in France has a mixed ownership where TSOs hold 17 %.

EEX in Germany mixed ownership without any of the German TSOs.

There are two main incentives for private investors to invest in a spot power exchange.

- A financial investor's incentives are profit on invested capital.
- An industrial or a conceptual investor invests to influence on conceptual procedures, products and other issues. This could have impact on the investors' profit of the trade.

A spot power exchange is in most markets subject to control and governmental regulation. Official requirements regarding neutrality will require restriction to the ownership structure. These requirements limit private investors' participation.

7.2.1.1 Risks and equity requirements at a spot power exchange

In a spot power exchange, traded contracts are submitted to the system operator for dispatch. This is regarded as the physical delivery of the traded spot contracts.

Sale contracts to the power exchange not fulfilled by generation, or purchase contracts not received at the buyer's location, is the responsibility of the respective TSOs and not the power exchange. Volumes not delivered or not received are settled in the balancing mechanism.

Thus the risk of a spot power exchange is a settlement risk equal to the accounts receivable over the settlement period. The settlement period is from day of trade until payment is received on the power exchange's account. The risk exposure is known to the power exchange and not dependent of future prices.

The financial settlement is normally based on weekly settlement and a settlement period 2-3 week or a daily settlement with a settlement period of about one week. The power exchanges require a credit cover that minimum covers all net purchase during the settlement period.

Unlike for an exchange that trades in electricity derivatives there are normally no special requirements in regards to equity capitalisation of a spot power exchange. For the power exchanges mentioned in the previous chapter equity is about 2-12 mill.euro.

The Austrian power exchange, EXAA, was established in 2001 and has experienced losses all years. In 2004 share holders' equity was reduced to 642 000 euro and net losses 92 000 euro i.e. a RoC of about -14 %.

Also the EEX in Germany has experienced losses at least until recently.

The most profitable non-mandatory electricity spot exchange in Europe is Nord Pool. The company has operated with profit in all years since it was established as a national power exchange in 1993 with a share capital of NOK 50 mill. (approximately 6,3 mill. Euro). By the end of 1994 the total equity had increased to NOK 71 mill. (about 8,9 mill. Euro). The annual profit the first two years of operation was about NOK 14 mill. pr year i.e a RoC of about +25 %.

In this context the case is establishment of a pure spot power exchange. Therefore only the first years of operations of Nord Pool can be applied as a reference.

From 1995 and onwards the increased costs of trade in electricity derivatives and establishment of offices in the other Nordic countries influenced on the finances.

The main reasons for the successful development of Nord Pool are considered to be:

The power exchange has experienced strong support from Nordic TSOs, ministries and regulatory authorities.

In 1998 all bilateral contracts on interconnections were made financial and the total available capacity allocated to DAM trades. This has to a large extent facilitated trade across national borders and contributed to increased volumes in DAM.

Substantial distribution of relevant neutral market information to support market participant. There is high demand side participation. Appropriate market concentration and competitive environment.

Easy and low cost market access.

Low costs in the national balancing markets.

Appropriate involvement by regulatory bodies in issues where the market did not perform. Examples are information on retail prices and simplification of procedures for change of suppliers in the retrial market.

7.2.1.2 EBRD - Equity investors in PXs

Currently, there are 2 regional power exchange initiatives as discussed above, Borzen and OPCOM. It is assumed that both of these are seeking external equity investments, and an investment from the EBRD is assumed to be welcome in both initiatives.

Initial investments from the EBRD could serve as a catalyst for further investments from other external sources, and also would serve as an important signal to regional stakeholders.

The projected share capital requirements are based on the Nord Pool reference. Nord Pool was established with a share capital of approximately 6,3 mill Euro in 1993. This corresponds to approximately 12 mill. Euro in 2007. As discussed in the section above, equity for other European power exchanges varies between 2-12 million Euro. An estimate of EBRD's equity requirement would be between 3-6 million Euro per PX (provided that the EBRD would hold a minority position), with an assumption that the total equity requirement for SEE PXs would be around 6-12 million Euros.

User-owned power exchanges have been discussed in establishment of national and regional spot power exchanges and in the answers of the questionnaires there were a clear interest for ownership. However, it has been the experience in Europe that established power exchanges have not created much profit for the owners (please refer to the section above). To create an ownership profile where demand side, supply side and Regulatory Authorities have a balanced representation and influence may be difficult in the early stages. This difficulty plus initially low expected profit, neutrality and monopolistic nature of a spot power exchange may explain why several of the present power exchanges are fully or partly owned by TSOs. Probably the prevailing rationale for TSOs to acquire equity in power exchanges is the potential opportunity to influence the development of procedures, products, and organisation of the power exchange.

A strategy for the EBRD could be to enter in as part owner of the two power exchanges together with national TSOs who have joined the market area of the power exchanges. When new TSOs enter into the market areas of the power exchanges they can buy a part of EBRD's shareholding. Thus, EBRD can stepwise reduce its involvement and withdraw from the ownership when the market concept has proved to be sustainable.

Development of a regional market is experienced to be a process that will last for several years. Development of the EU-markets and the Nordic market are typical examples. EBRD as investor in one or more power exchanges or bilateral trade platforms will probably be a long-term involvement but may be efficient to speed up integration of the national market. As discussed in the section above, very few of the European power exchanges operate with sufficient profitability to provide an attractive return on equity to shareholders. The EBRD should therefore be prepared for the possibility that

the PX's operation initially may carry a loss, and that it may take some years to turn this into a profitable business.

7.2.2 Facilitator/operator of a settlement bank for PXs

Regional power exchanges would need to interface with local banks in the region, as the PX participants' most likely will use local banks for payments and collateral handling. In this respect it would be very beneficial for the PXs to have an internationally known bank as an intermediary or a central settlement bank. This is a role that the EBRD potentially could undertake.

In a facilitator/intermediary role the EBRD would perform much the same task for the PXs as is described in section 7.1.1 above.

In a central settlement bank role, the EBRD would take active part in the cash flow process, and perform transfers between the PX's and the participants' accounts.

The consultants have experienced large differences in the banks' capabilities to handle the cash flow in modern settlement systems required to operate a spot power exchange. An appropriate model may be that the regional power exchanges have EBRD as interface towards local banks. Local banks will communicate far better with EBRD than with a settlement department at the power exchange. It can here be mentioned that this model is also now adapted in the Nordic market where Nord Pool interfaces with one bank only. This bank manages all cash flows.

7.2.3 Guarantee Mechanism for Bilateral Trade

The guarantee mechanism for bilateral trade as described in 7.1.2 will still exist in the medium term.

When exchange trade has been established with confidence to the prices calculated, clearing mechanisms for OTC trade will be possible to establish. The delivery of the physical part of the contracts could be provided via the power exchange, and transparent prices will contribute to reduced collateral requirements.

It is estimated that a large part of bilateral contracts still will be settled between the participants, and the buyers will need possibilities to get bank guarantees to be able to negotiate a contract.

7.2.4 Guarantee mechanism for PX trade

Regional power exchanges will require guarantees for payment of trades from their participants. In this respect it would be beneficial both for the participants and for the power exchanges that EBRD would make available a guarantee mechanism. This is also discussed in section 7.1.2 above for bilateral trading, and the mechanism for PX trade would be very similar.

The guarantee mechanism could be designed to cover a certain share of a participant's collateral requirement. The cost of the guarantees should be based on commercial terms. An estimate of the size of the collateral fund is provided in the section below.

7.2.5 Estimate of guarantee/collateral fund

It should be underlined that this analysis is based on a number of assumptions, and that these should be further discussed with the EBRD.

The estimates below refer to a guarantee mechanism for PX and bilateral trades. The estimates below do not include any investments or costs associated with the EBRD taking on roles such as intermediary towards local banks, support of coordinated auctions of capacities, or facilitator/operator of a settlement bank for PXs. In the following two sets of collateral estimates are presented; one is based on historic data (Table 1), and the other is projecting volume and prices based on the assumption that the SEE region will move towards the level of central Europe (Table 2).

In the estimates in Table 1 below the consultants have used data primarily from the SETSO Benchmarking Report discussed at the 7th Athens Forum meeting in Belgrade. A majority of the data is for 2004. Some of the data are also found in the national regulators annual report 2005 on the ERGEG web-site (**http://www.ergeg.org**).

The bases for the estimates are the current volumes of export and imports in the region. It is assumed that the sum of export and import volumes will be traded bilaterally or through a PX, and thus is a good indicator for the volume that may draw on the collateral fund. In the figure below this volume is given in row 4.

In addition to the export/import volumes it is also assumed that there will be some contribution from the national trade. In the calculations it has been assumed that 10% of the national consumption is tradable. This resulting volume is given in row 6 in the figure.

An average wholesale electricity price of €35/MWh (0,035 €/KWh) is assumed for the region (row 7 in the figure). The value of regional trade (row 8) and national trade (row 9) is calculated as volume multiplied with the assumed electricity price and divided by 2, as we assume collateral is only posted by buyers, and not sellers. In row 8 the total value of regional trade is calculated to approx. 808 M€. In row 9 the total value of national trade is calculated to approx. 650M€. These figures are used as the basis for calculating the collateral requirements in the two scenarios.

In the figure below two scenarios are presented; scenario 1 assume that the settlement period for PX trade is daily, resulting in a payment risk period of 7 days. For bilateral trades it is assumed that the settlement period is monthly, resulting in payment risk period of 42 days. Scenario 2 is similar to scenario 1 except that the settlement period for PX trade is weekly, resulting in a payment risk period of 21 days. In the scenarios it is further assumed that

20% of the traded volumes go through the PX and the remaining 80% is bilateral trading.

In row 13 the average daily value of trade is calculated, and in row 15 adjustments are made for seasonal variations (in the calculations it is assumed 50% seasonal variations), and adjusted value is used for collateral calculations. In row 18 the total collateral requirement is calculated (adjusted for the share of the trading method). In row 19 EBRD's share of the collateral fund is assumed to be 50%, resulting in the total collateral fund requirement given in row 20.

The resulting collateral fund estimates from Table 1 for EBRD's contribution are as follows:

Scenario 1: 105 M€

Scenario 2: 113 M€

The estimates in Table 2 below are based on the same basic data as in Table 1, but indicative projections are made for future (3-5 years forward) volumes and prices.

For the volume projections it is assumed that there will be an increase in the share of the national trade as percentage of total national consumption. It is also assumed that the SEE region will move towards the western European level of prices and volumes.

The German market is used as a good reference for mainland Europe, and therefore the prices of future contracts traded at EEX is used as price projections. In the estimate for the future price, the price of the Phelix Baseload Year Future, Cal-10 (for year 2010) on May 8, 2005 is used. The Cal-10 contract was quoted with a price of €54,90/MWh, and based on this a projected price of €0,055/KWh is used.

For the volume projections, the current level of the EEX volume (physical trade) of approximately 20% of total consumption is used. It is further assumed that the share of trade transacted over a PX will be the same as that of bilateral trade (50% PX trade, 50% bilateral trade), and therefore an estimate of 40% of the total national consumption is assumed to be traded (PX and bilateral). Scenario 1 and 2 are similar to that described above.

The resulting collateral fund estimates from Table 2 for EBRD's contribution are as follows:

Scenario 1: 271 M€

Scenario 2: 348 M€

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Table 1: Estimates of collateral fund requirement for PX and Bilateral trades, based on 2004 volume and price data, and associated assumptions.

	Year 2004	Albania	B&H	Bulgaria	Croatia	FYROM	Montenegro	Romania	Serbia	Turkey	Slovenia	Greece	Moldova		Total
1	Consumption (GWh)	5.753	10.125	30.358	15.328	5.995	4.635	49.000	35.103	149.340	12.068	51.700	4.605		374.010
2	Total energy imports (GWh)	1.252	726	1.283	2.572	1.231	1.467	2.000	5.772	462	4.257	1.600	900		
3	Total energy exports (GWh)	328	1.784	6.772	1.472	55	37	1.000	5.079	1.104	5.030	0	0		
4	Regional Trade (Sum exp/imp) (GWh)	1.580	2.510	8.055	4.044	1.286	1.504	3.000	10.851	1.566	9.287	1.600	900		69.275
5	National Trade as % of consumption	10 %	10 %	10 %	10 %	10 %	10 %	10 %	10 %	10 %	10 %	10 %	10 %		10 %
6	National Trade (GWh)	575,3	1.012,5	3.035,8	1.532,8	599,5	463,5	4.900,0	3.510,3	14.934,0	1.206,8	5.170,0	460,5		37.401
7	Electricity Price (€/kWh)	0,035	0,035	0,035	0,035	0,035	0,035	0,035	0,035	0,035	0,035	0,035	0,035		0,035
8	Value of regional trade, purchase (€ '000)	€ 27.650	€ 43.925	€ 140.963	€ 70.770	€ 22.505	€ 26.320	€ 52.500	€ 189.893	€ 27.405	€ 162.523	€ 28.000	€ 15.750		€ 808.203
9	Value of national trade, purchase (€ '000)	€ 10.068	€ 17.719	€ 53.127	€ 26.824	€ 10.491	€ 8.111	€ 85.750	€ 61.430	€ 261.345	€ 21.119	€ 90.475	€ 8.059		€ 654.518

		Scenario 1 (PX Daily Settlement)					Scenario 2 (PX Weekly Settlement)				
		PX Trading		Bilateral trading		Total	PX Trading		Bilateral trading		Total
10	Share of trading method	20 %		80 %			20 %		80 %		
		Regional	National	Regional	National		Regional	National	Regional	National	
11	Total value of trade (€ 000)	€ 808.203	€ 654.518	€ 808.203	€ 654.518		€ 808.203	€ 654.518	€ 808.203	€ 654.518	
12	Trading days in a year	365	365	365	365		365	365	365	365	
13	Average daily trade value (€ 000)	€ 2.214	€ 1.793	€ 2.214	€ 1.793		€ 2.214	€ 1.793	€ 2.214	€ 1.793	
14	Seasonal variations	50 %	50 %	50 %	50 %		50 %	50 %	50 %	50 %	
15	High daily value (€ 000)	€ 3.321	€ 2.690	€ 3.321	€ 2.690		€ 3.321	€ 2.690	€ 3.321	€ 2.690	
16	Length of risk period (Days)	7	7	42	42		21	21	42	42	
17	Collateral Requirement	€ 23.250	€ 18.829	€ 139.498	€ 112.972		€ 69.749	€ 56.486	€ 139.498	€ 112.972	
18	Collateral Requirement, adjusted for share of trading method	€ 4.650	€ 3.766	€ 111.598	€ 90.377		€ 13.950	€ 11.297	€ 111.598	€ 90.377	
19	EBRD's collateral fund (% of total)	50 %	50 %	50 %	50 %		50 %	50 %	50 %	50 %	
20	**EBRD's Collateral Fund (€ 000)**	**€ 2.325**	**€ 1.883**	**€ 55.799**	**€ 45.189**	**€ 105.196**	**€ 6.975**	**€ 5.649**	**€ 55.799**	**€ 45.189**	**€ 113.611**

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Table 2: Estimates of collateral fund requirement for PX and Bilateral trades, based volume and price projections (3-5 years forward).

	Year 2004	Albania	B&H	Bulgaria	Croatia	FYROM	Montenegro	Romania	Serbia	Turkey	Slovenia	Greece	Moldova		Total
1	Consumption (GWh)	5.753	10.125	30.358	15.328	5.995	4.635	49.000	35.103	149.340	12.068	51.700	4.605		374.010
2	Total energy imports (GWh)	1.252	726	1.283	2.572	1.231	1.467	2.000	5.772	462	4.257	1.600	900		
3	Total energy exports (GWh)	328	1.784	6.772	1.472	55	37	1.000	5.079	1.104	5.030	0	0		
4	Regional Trade (Sum exp/imp) (GWh)	1.580	2.510	8.055	4.044	1.286	1.504	3.000	10.851	1.566	9.287	1.600	900		69.275
5	National Trade as % of consumption	40 %	40 %	40 %	40 %	40 %	40 %	40 %	40 %	40 %	40 %	40 %	40 %		40 %
6	National Trade (GWh)	2.301,2	4.050,0	12.143,2	6.131,2	2.398,0	1.854,0	19.600,0	14.041,2	59.736,0	4.827,2	20.680,0	1.842,0		149.604
7	Electricity Price (€/kWh)	0,055	0,055	0,055	0,055	0,055	0,055	0,055	0,055	0,055	0,055	0,055	0,055		0,055
8	Value of regional trade, purchase (€ '000)	€ 43.450	€ 69.025	€ 221.513	€ 111.210	€ 35.365	€ 41.360	€ 82.500	€ 298.403	€ 43.065	€ 255.393	€ 44.000	€ 24.750		€ 1.270.033
9	Value of national trade, purchase (€ '000)	€ 63.283	€ 111.375	€ 333.938	€ 168.608	€ 65.945	€ 50.985	€ 539.000	€ 386.133	€ 1.642.740	€ 132.748	€ 568.700	€ 50.655		€ 4.114.110

		Scenario 1 (PX Daily Settlement)					Scenario 2 (PX Weekly Settlement)				
		PX Trading		Bilateral trading		Total	PX Trading		Bilateral trading		Total
10	Share of trading method	50 %		50 %			50 %		50 %		
		Regional	National	Regional	National		Regional	National	Regional	National	
11	Total value of trade (€ 000)	€ 1.270.033	€ 4.114.110	€ 1.270.033	€ 4.114.110		€ 1.270.033	€ 4.114.110	€ 1.270.033	€ 4.114.110	
12	Trading days in a year	365	365	365	365		365	365	365	365	
13	Average daily trade value (€ 000)	€ 3.480	€ 11.272	€ 3.480	€ 11.272		€ 3.480	€ 11.272	€ 3.480	€ 11.272	
14	Seasonal variations	50 %	50 %	50 %	50 %		50 %	50 %	50 %	50 %	
15	High daily value (€ 000)	€ 5.219	€ 16.907	€ 5.219	€ 16.907		€ 5.219	€ 16.907	€ 5.219	€ 16.907	
16	Length of risk period (Days)	7	7	42	42		21	21	42	42	
17	Collateral Requirement	€ 36.535	€ 118.351	€ 219.211	€ 710.107		€ 109.606	€ 355.053	€ 219.211	€ 710.107	
18	Collateral Requirement, adjusted for share of trading method	€ 18.268	€ 59.176	€ 109.606	€ 355.053		€ 54.803	€ 177.527	€ 109.606	€ 355.053	
19	EBRD's collateral fund (% of total)	50 %	50 %	50 %	50 %		50 %	50 %	50 %	50 %	
20	**EBRD's Collateral Fund (€ 000)**	**€ 9.134**	**€ 29.588**	**€ 54.803**	**€ 177.527**	**€ 271.051**	**€ 27.401**	**€ 88.763**	**€ 54.803**	**€ 177.527**	**€ 348.494**

8 Appendices

Appendix 1. Questionnaire for TSOs, Ministries, and Regulators

Questionnaire – Regional Electricity Trading in South-eastern Europe

In the questionnaire below trade of electricity is referred to as physical trade through a power exchange or bilateral.

The following principles are assumed for a Regional Power Exchange:

1. One single, voluntary, day-ahead Power Exchange (PX) for the entire region
2. The PX is the counterpart to all trades at the PX.
3. National and international trades are conducted at the PX. No differentiation between the two types of trade.
4. One common set of rules for trading at the PX.
5. The PX is not involved in any activities related to system operations.
6. Local system operation and control in each country.
7. The PX co-exists with the bilateral market (both national and regional).

In this context a trader is assumed to be a participant in the electricity business engaged in buying or selling electrical energy. This would include generators, consumers, retailers, single buyers, etc.

	Question	Response
General		
1.	Please explain briefly your country's current electricity market status and the anticipated development over the next years. (Degree of deregulation and unbundling, number of independent participants, electricity industry structure, etc.)	
2.	Do you expect cross border trade to be an important part of your country's power market going forward?	
3.	How is the present cross border trade carried out?	
4.	How could cross border trade procedures be improved?	

	Question	Response
5.	What are the approximate volumes of cross border trade in % of total generation for your country?	
6.	Do you want to allow for more volumes?	
7.	Could it be improved through a trading platform?	
Regional Power Exchange in Southeast Europe		
8.	Is there interest and/or need for a regional trading platform in Southeast Europe?	
9.	What factors would lead traders to use such a platform for trading?	
10.	What would be important factors for your country in determining your support of a regional power exchange?	
11.	Would your country have ownership (as a shareholder) in a regional power exchange?	
12.	Would your country be prepared to harmonize regulation and the competitive environment for the establishment of a regional trading platform (a PX)?	
13.	How many independent generation companies from your country are assumed to participate in the regional power exchange?	
14.	How many independent retailers exist in your country and will participate in a regional power exchange?	
15.	Would one common language for interaction with the regional power exchange be acceptable?	
Access to international / regional Market		
16.	Are there any obstacles in regards to getting a license to trade (international trades) in your country?	
17.	What are the costs for obtaining an international trading license? Is this a major issue for potential traders?	
18.	Who are eligible to get a license for trading (international) of electricity?	
19.	Are there at present any legal obstacles for obtaining a trading license?	
20.	Is transmission capacity on interconnectors procured through auction or any other market based mechanism?	
21.	Approximately what percentage of the interconnector transmission capacity is occupied by long-term bilateral contracts? (Is a majority of the capacity occupied of long-term bilateral contracts?)	

	Question	Response
22.	Is the ETSO CBT mechanism (harmonized mechanism for handling of transit power through 3 party network in Europe) implemented in your country?	
23.	Are there plans for implementing the ETSO CBT mechanism?	
Access to national Market		
24.	Are there any obstacles in regards to getting a license to trade (trade in wholesale market and retail market) in your country?	
25.	What are the costs for obtaining a trading license? Is this a major issue for potential traders?	
26.	Who are eligible to get a license for trading of electricity?	
27.	Are there any legal obstacles for obtaining a trading license?	
28.	What percentage of the transmission cost is carried by the generators? What percentage of the transmission costs are carried by consumers? Are there any distance dependent elements in the transmission tariff structure?	
Financial issues		
In (international or national) trade of electricity it is common that buyers have to post financial collateral for their net purchase obligations. This collateral would typically be 10-20% of a trader's annual purchase at any given time. Depending on the credit worthiness of the trader collaterals will be required. Collaterals could be posted in the form of guarantees or cash. For bilateral trade other arrangements could be in place. However, in the case of a regional power exchange, one should be prepared for the above mentioned requirements.		
29.	In general, what is the credit worthiness of participants in your country? (Is their credit rating low?)	
30.	Is the banking business sufficiently developed, and can the banking system easily handle international transactions?	
31.	Are State Guarantees presently available for electricity traders? If so, who are eligible for State Guarantees?	
32.	If an external source were to set up a guarantee mechanism for electricity trade in the region, what would the requirements from your country be (in terms of Euro)?	
33.	Are variations in your currency exchange rate towards Euro high?	

	Question	Response
34.	Is Euro currently accepted as a trading currency?	
35.	Will you accept Euro as the only trading currency in a regional power exchange?	
36.	Are there any taxes or duties in your country that limit regional trade of electricity (Import/export tax, border tax)?	

Appendix 2. Questionnaire for Traders

Questionnaire – Regional Electricity Trading in South-eastern Europe

In the questionnaire below trade of electricity is referred to as physical trade through a power exchange or bilateral.

The following principles are assumed for a Regional Power Exchange:

1. One single, voluntary, day-ahead Power Exchange (PX) for the entire region
2. The PX is the counterpart to all trades at the PX.
3. National and international trades are conducted at the PX. No differentiation between the two types of trade.
4. One common set of rules for trading at the PX.
5. The PX is not involved in any activities related to system operations.
6. Local system operation and control in each country.
7. The PX co-exists with the bilateral market (both national and regional).

In this context a trader is assumed to be a participant in the electricity business engaged in buying or selling electrical energy. This would include generators, consumers, retailers, single buyers, etc.

	Question	Response
General		
1.	What are the main obstacles a trader faces in cross border trade in the region?	
2.	How could cross border trade from a traders point of view be improved?	
3.	Are there interest and/or need for a regional trading platform in Southeast Europe?	
4.	What factors would lead traders to use such a platform for trading?	
5.	Would one common language for interaction with the regional power exchange be acceptable?	
Financial issues		

	Question	Response
In (international or national) trade of electricity it is common that buyers have to post financial collateral for their net purchase obligations. This collateral would typically be 10-20% of a trader's annual purchase at any given time. Depending on the credit worthiness of the trader collaterals will be required. Collaterals could be posted in the form of guarantees or cash. For bilateral trade other arrangements could be in place. However, in the case of a regional power exchange, one should be prepared for the above mentioned requirements.		
6.	Do you experience major default in payment commitments in national and regional trades?	
7.	Do you consider the banking business to be sufficiently developed, and can the banking system easily handle international transactions?	
8.	Is it presently common that buyers within the electricity business post security cover or financial guarantees for payment before or when entering into a trade?	
9.	What types of guarantees exists?	
10.	What types of guarantees are desirable?	
11.	Are State Guarantees presently available for electricity traders?	
12.	Is an initiative by an external source to set up a guarantee mechanism for electricity trade in the region supported by you as trader?	
13.	Is Euro currently accepted as a trading currency?	
14.	Will you accept Euro as the only trading currency in a regional power exchange?	
Contract issues		
15.	Are standard contracts currently being used/traded in the region?	
16.	What contracts are most popular?	
17.	What types of contracts are wanted by the traders (or organisation currently engaged in international trade)?	

Appendix 3. Interest in Regional Trading Platform

The responses to the questionnaires in Appendix 1 and Appendix 2 serve as the main source for discussion of this issue. In the following we discuss responses regarding interest for regional trading platforms, what factors would lead participants to use such platforms, and also what obstacles are currently hindering growth of regional trade.

The discussion below is primarily based on the following questions from the questionnaires:

From the TSO, Ministry, and Regulators:

2.	Do you expect cross border trade to be an important part of your country's power market going forward?
5.	What are the approximate volumes of cross border trade in % of total generation for your country?
6.	Do you want to allow for more volumes?
7.	Could it be improved through a trading platform?
8.	Is there interest and/or need for a regional trading platform in Southeast Europe?
9.	What factors would lead traders to use such a platform for trading?
10.	What would be important factors for your country in determining your support of a regional power exchange?

From the traders:

1.	What are the main obstacles a trader faces in cross border trade in the region?
2.	How could cross border trade from a traders point of view be improved?
3.	Are there interest and/or need for a regional trading platform in Southeast Europe?
4.	What factors would lead traders to use such a platform for trading?

TSO Responses:

2.	Do you expect cross border trade to be an important part of your country's power market going forward?	Out of 9 responses from TSOs, 7 clearly state yes to this question. Only 1 states that due to regulated, low prices in the country cross border trade is not expected to be significant. **A majority state that cross border trade is expected to be an important part of the regions power market.**

5.	What are the approximate volumes of cross border trade in % of total generation for your country?	Out of 9 responses, 8 responded within the range of 7,5% - 25%. 1 stated that the question was unclear. **Current cross border trade volumes are for a majority of the responses between 10-25% of total national generation. This is a very good basis for a regional power market.**
6.	Do you want to allow for more volumes?	Of 9 responses, 5 stated clearly yes, 1 said that the market should decide. 2 said that this is depending on the ATC/NTC, and 1 did not respond. **A majority indicates that they like to see an increase in the cross border trade volumes. This further strengthen the conclusion in item 5 above that there should be a very good basis for a regional market.**
7.	Could it be improved through a trading platform?	Here 8 stated clearly yes. 1 stated possibly yes. **A majority believe that a trading platform would improve the cross border trade volumes.**
8.	Is there interest and/or need for a regional trading platform in Southeast Europe?	All 9 responded yes to this. **There is very strong support for a regional trade platform.**
9.	What factors would lead traders to use such a platform for trading?	Responses indicate factors such as: **Transparency**, **simple procedures**, **liquidity**, **short-term adjustment of long term positions**, **price discovery**, **implicit congestion management**
10.	What would be important factors for your country in determining your support of a regional power exchange?	Responses indicate factors such as: Full **reciprocity** in market opening and **access to other regional markets**. **Clear and transparent legal framework**. **Voluntary** participation. A **consolidated agreement** between the countries in the region. The **Common Rules** for accession and trade on the PX. The expectation for **reduce of the electricity price.**

Ministry responses:

2.	Do you expect cross border trade to be an important part of your country's power market going forward?	**All 9 ministry responses indicated that cross border trade would be an important part of their country's power market**.

5.	What are the approximate volumes of cross border trade in % of total generation for your country?	**A majority indicated cross border trade volumes of 10-25% of national generation, and this is a very good basis for a regional market.**
6.	Do you want to allow for more volumes?	**A majority indicated yes, and this further supports the statement in item 5 above that this is a very good basis for a regional market.**
7.	Could it be improved through a trading platform?	A majority indicated yes. 1 indicated that required infrastructure is needed before a trading platform can influence trade. **A majority indicated that the cross border trade volumes could be increased through a trading platform, which is strong support for a regional market.**
8.	Is there interest and/or need for a regional trading platform in Southeast Europe?	**All responses indicated yes to this question.**
9.	What factors would lead traders to use such a platform for trading?	Factors mentioned are: Daily different opportunities to **adjust their portfolio**. Solve **short term imbalances**. Establish the **correct price for the energy**. A regional DAM should have a **better liquidity than our national DAM**. **Flexibility**. **Utilize different types of generation** in the region.
10.	What would be important factors for your country in determining your support of a regional power exchange?	**Transparent** operation. **Guaranteed** transactions. **Access to other markets** to **utilize seasonal/daily differences**. **Liquidity**. A **consolidated agreement** between the countries in the region. The **Common Rules** for accession and trade on the PX. The **expectation for reduce of the electricity price**.

Regulators responses:

2.	Do you expect cross border trade to be an important part of your country's power market going forward?	Out of 7 responses,5 indicated yes, and 2 indicated no (due to low regulated prices in the country) **A majority expect cross border trade to be an important part of the power market.**

5.	What are the approximate volumes of cross border trade in % of total generation for your country?	Response range from 1% to 28%. **A majority indicates between 10-25%, which indicates a good basis for a regional market.**
6.	Do you want to allow for more volumes?	A majority indicated yes. 1 indicated that this is not up to the regulator. **A majority indicated yes.**
7.	Could it be improved through a trading platform?	1 said no, but the other indicated yes. However, it was also indicated that infrastructure problems must be solved first. **A majority believe that cross border trade volumes can be improved through a trading platform.**
8.	Is there interest and/or need for a regional trading platform in Southeast Europe?	All indicate yes to this. **Strong support for a regional trading platform.**
9.	What factors would lead traders to use such a platform for trading?	Factors that were mentioned: To solve **short term imbalances. Liquidity**. **Clear and transparent rules. Transparent and simple procedures.**
10.	What would be important factors for your country in determining your support of a regional power exchange?	**Clear and simple rules**. **Transparent** procedures. **Non-discrimination of participants. Guaranteed** transactions. **Liquidity.**

Traders responses:

1.	What are the main obstacles a trader faces in cross border trade in the region?	Obstacles mentioned were: Handling of access to cross border capacities and lack of firmness of contracts. Non-transparent cross-border auction rules. High price on capacities. Lack of cross-border capacity. ETSO and SETSO ITC not merged. No synchronization of maintenance work on interconnectors. **The major obstacle is access to cross border capacities.**
2.	How could cross border trade from a traders point of view be improved?	Improvements mentioned: To implement unique ETSO ITC fund in EU and SEE countries to abolish perimeter fees. Synchronization of maintenance. Allowing internal trade. Improvement of national legislation. Coordination of allocation of capacity in non-discriminatory manner. Increase available transmission capacities – transparent calculation procedures for available capacities. No "Single Buyers".
3.	Are there interest and/or need for a regional trading platform in Southeast Europe?	All (except 1) responded yes. Yes, voluntary power exchanges are needed. Yes, would increase transparency. Not yet, due to small number of participants. **Out of 8 responses 7 clearly stated yes, so there is strong support for a regional trading platform.**
4.	What factors would lead traders to use such a platform for trading?	**Transparency**, **liquidity**, reliable **price reference**. Covering **counterparty risk.** **Avoiding direct negotiation for cross border capacities**. Opportunity to **balance positions**. **Real market opening.** **Regional binding documents** for regional SEE electricity market. Safe and rapid trading procedure with **guaranteed payments.**

Appendix 4. Regional Power Exchanges Requirements

Several of the present power exchanges in Europe have stepwise expanded their respective trade areas by integrating interconnected national markets.

The market in the SEE region is assumed to follow the same procedure. The SEE region is a large region and will in the first stages of the process operate with several national power exchanges. These will expand their trade area and include interconnected markets that are prepared to join a common market. The market itself will to a large extent decide on an appropriate density of power exchanges and it is assumed that the number of power exchanges will converge towards a number assumed to be appropriate by the market itself.

Further different models for decentralised market operations will be experienced where countries take responsibilities of execution of defined tasks to facilitate regional market operations.

Based on experiences from the creation on competitive power markets, the consultant has developed some criteria that are important to comply with if the creation of an power exchange should be successful.

In the sections below a number of requirements and criteria for regional power exchanges are listed. These have served as basis for the benchmarking questions that are contained in Appendix 5.

8.1.1 Regulatory Issues

Local support to expand international

The PX that intends to expand to a Regional PX must have strong local political and regulatory support.

Adaptation to different regulatory frameworks

A Regional Market will include several countries with local legislation including local regulatory frameworks. The Athens process will contribute to harmonisation of the regulatory framework, but differences will remain. It is important for the PX to have a strategy for handling of reciprocity issues.

Regional Power Exchange must have developed strategies and procedures to manage differences in regulatory framework inside the market area.

Licenses in the different countries

The issue of licences to market participants and to market places/operators will probably differ in different countries, based on history, local practices etc. The Athens process will contribute to harmonisation of the licences, but differences will remain.

The Regional PX must have a strategy how to handle differences in licence practices in the market area and have procedures to analyse when differences are acceptable to establish a common market area.

Legal framework
The Regional PX must have agreements with participants and other stakeholders that are legally binding and executable in the all participating countries.

8.1.2 Organisation

Cooperation with participants (committees etc…)
Feedback from users of the markets is extremely important to succeed in the development of a regional market. This feedback can be achieved in many ways, but normally there must be a transparent way for the participants to have influence on the operation of markets and the products traded in them. Often this is achieved through Market Committees / Councils with strong stakeholder participation. It is important to determine what the mandate of such a committee should be.

The participants will have different needs, and it is important to focus on trading products of common interest to create liquidity in the trade. A Market committee will be able to create a certain degree of consensus of what the Power Exchange should offer and in this way stimulate the trade.

The Regional PX must have a strategy for cooperation with the market participants where it is defined how they could influence the market development.

Ethical rules and rules for conduct for power exchange staff.
The integrity and neutrality of a PX is considered to be crucial to obtain the necessary confidence from the market participants. Confidence will contribute to increased trade.

The PX must as an integrated part of the trading rules define ethical guidelines for the participants. The PX must also define ethical rules for their own employees and rules for conduct of the PX staff.

Local presence (flexibility in task carried out by a local organisation)

In a Regional market, the local presence will often have a large impact of the acceptance of the PX among the participants. It is costly to distribute all functions locally, but a local branch office for customer relations and marketing will often be considered as a minimum for the participants to feel an "ownership" to the PX.

The local office will be able to answer questions from participants and explain rules in the local language. The local office is meant to act as a catalyst in the market.

The PX must have a strategy for local presence in different areas of the Regional Market to give the participants the needed service.

8.1.3 Trade Concept

Localized bids (nations, zones, etc.)

In a regional market there may be different taxes and rules for settlement. In addition the nations will need local information from the PX for statistical reasons. This will make it necessary to separate information of trade in local areas. Localization of bids is also important for congestion management purposes.

The PX trade system must have the capability of receiving bids referred to geographical defined areas and produce information from the trade system with the same resolution.

Congestion management

The transmission network has been developed from a country's own need. When regional markets are developed, the load flow will normally change, and congestions will occur in the transmission grid. A market solution has to be developed under the restrictions that System Operators will introduce to obtain the security of supply. The Athens process and ETSO has a central role in the development of procedures for calculation of transmission capacities and principles for congestion management. Before gate closure for trading the PX will get information of available transmission capacity in defined cuts in the grid.

An efficient congestion management system will allow the available transmission system to be utilised for trade hour by hour. This allows the market participants to optimise their resources by increased trade.

The PX trade concept must be able to handle congestion management according to rules set by the System Operators.

Market coupling / support of explicit and implicit auctions of transmission

The transmission capacity within Europe will in an increasing degree be allocated by competitive bidding. This may be done by explicit auction or implicit auction.

The PX trade concept must be able to handle coupling of markets between congested areas in a way that optimize the use of available capacity. The transmission capacity between areas must be configurable and be able to handle different capacities in the different trade intervals.

Interface to SO and others

The PX trade system must have an interface towards System Operators that allow correct and efficient information flow (transmission capacities, trading information and schedules) between the parties involved.

Binding contracts

The trade in a PX will normally have the PX as a counterpart for all trade. This will secure the participants correct financial settlement. The PX will not have a position in the trade and will for each trading day have a balance in power purchased and power sold. The debit and credit amounts from the trade must also balance. This is achieved by agreements with the System Operators that protect traded contracts in the PX from being curtailed by the SOs in the scheduling process. The contracts will be settled according to traded volume and published price.

This is important for market participants. They will trade in the market to remove some price risk. If they cannot trust that their traded contracts are settled according to volume and price, they will reduce their activity in the market.

The Regional PX must have established agreements that secure that the contracts traded in the PX will be settled according to the traded volume and published price.

8.1.4 Market Development

Trading rules adaptable to changing market environment

The PX must have change procedures incorporated in the trading rules that defines the process for adapting the rules to changing requirements.

8.1.5 Settlement

Harmonized settlement period
The different areas that will join a regional market will often be used to different invoicing and settlement periods. The PX will normally want to shorten the settlement period as much as possible to reduce the collateral requirements.

The PX must have prepared a strategy of deciding settlement periods for trade that are harmonised to the needs in the region.

8.1.6 Market Surveillance

Procedures
The PX must have established a department for Market Surveillance with defined obligations for their work and established procedures for the performance of the work.

R**eporting to authorities**
The Market surveillance department of the PX must present regular reports to the authorities according to the regulatory framework. In addition detection of breach of market rules have to be reported without unreasonable delay.

Mandate
The Market Surveillance department must have the necessary mandate to collect all necessary information to perform its duties. In addition, measures to be taken in case of breach must be clearly defined and mandated.

8.1.7 Information

Transparent routines for information dissemination
Information is extremely important to make a competitive market work. It is not only the information from the trade itself that is important, but information of fundamental type such as accumulated generation, accumulated load, hydro reservoir fillings, maintenance schedules etc. The information should be available to all participants at the same time to avoid unfair advantages and insider trading.

In all markets it has been the experience that increased information stimulates the trade in the market. Limitation of information is used to limit

the open trade and make market participants more dependent of making contracts for full profile delivery from large power companies.

The Rulebook of the PX must contain the rights for the participants to receive information from the PX and the obligation for the participants to submit information to the PX.

Efficient information collection
The degree of information needed make it necessary to have efficient collection procedures and distribution procedures.

The PX must have established efficient routines for electronic collection of needed information.

8.1.8 Financial

How will the operation be financed?
The PX must have defined a clear plan for how the costs of operation will be covered.

Equity, level of equity. Expansion of the shareholders to allow for regional ownership.
The PX must have a strategy for deciding the level of equity necessary for the PX, seen in relation to the level of counterparty risk. The PX must also have a clear strategy for how to change/expand the ownership structure to allow for stakeholders in new areas to become shareholders.

Credit cover and types

Complex and costly arrangements for credit cover will limit the trade.

The PX must have defined clear requirements for credit cover from the participants and have defined the types of credit cover that is allowed and adopted to local legislation.

Risk policy
The PX must have a clearly defined risk policy.

Multiple currencies

In a regional market the different nations will prefer trade in own currency. A system for efficient management of trade in different currencies will stimulate regional trade.

The PX must have defined clear strategy for handling of currencies (multiple or single).

Tax issues

The PX must have defined clear strategy for how to handle tax issues in different countries.

Appendix 5. Benchmarking Regional Trade Initiatives.

In the following table, please provide responses to the questions related to the establishment of a regional power exchange.

Criteria	*Questions*
The PX that intends to expand to a regional PX must have strong local political and regulatory support.	1. How have the authorities in your country given support to your regional PX plans?
A regional PX must have developed strategies and procedures to manage differences in the regulatory framework inside the market area.	2. Have you developed a strategy to manage differences in the Regulatory framework within the region where you intend to operate as a Power Exchange?
A regional PX must have a strategy for how to handle differences in licence practices (licences for PX and participants) in the market area, and evaluate if differences in licensing practices between countries are acceptable to establish a common market.	3. Please describe the structure of licenses you have in your present market area. 4. Please describe your strategy to handle differences in license requirements you may meet in other countries when you expand your trading area.
A regional PX must have agreements with participants and other stakeholders. The agreements must be legally binding and executable in all participating countries.	5. What type of legal agreements do you have today? 6. What type of agreements do you expect to sign in a regional context?
A regional PX must have a strategy for cooperation with the market participants where it is defined how the participants could influence the development of the market.	7. Please describe how you currently ensure that your market is attractive to participants and how participants can influence market related decisions. 8. How do you envision handling this in a regional context?
The PX must as an integrated part of the trading rules define ethical guidelines for the participants. The PX must also define ethical rules for their own employees and rules for conduct of the PX staff.	9. Do you have ethical guidelines as a part of your participation rules today? 10. Do you have ethical guidelines for your employees?
The PX must have a strategy for local presence in different areas of the Regional Market to give the participants the needed service.	11. Which type of local presence do you consider to be necessary in a Regional PX? What are your plans in this regard?
The regional PX trade system must have the capability of receiving bids referred to geographically defined areas and produce information from the trade system with the same geographical resolution.	12. What possibilities does your existing trade system have to manage participants and bids in different geographical areas?

The regional PX trade concept must be able to handle congestion management according to rules set by the System Operators.	13. Does your present trade concept have the capability of congestion management? 14. Have you a strategy developed for congestion management in a Regional PX?
The regional PX trade concept must be able to handle coupling of markets between areas in a way that optimize the use of available capacity. The transmission capacity between areas must be configurable and be able to handle different capacities in the different trade intervals.	15. Does your present trade system have the capability to couple markets to optimize the use of available transmission capacity? 16. Can the available transmission capacity be easily configured in your trade system?
The PX trade system must have an interface towards the System Operators that allow correct and efficient information flow (transmission capacities, trading information and schedules) between the parties involved.	17. Please describe the structure of the interfaces for data exchange you have with the TSO. Will the interface with several TSOs change your present system significantly?
The Regional PX must have established agreements that secure that the contracts traded in the PX will be settled according to the traded volume and published price.	18. Do you have agreements with the TSO that secure that traded contracts will be settled according to the contracted volume and price (guaranteed contracts)? 19. Do you have a plan for how this can be handled in a regional market?
The PX must have change procedures incorporated in the trading rules that defines the process for adapting the rules to changing requirements.	20. Do you have a strategy for how changes in rules should be managed in a regional market?
The PX must have a strategy for deciding settlement periods that are harmonised to the needs in the region.	21. What settlement period do you consider should be used in a regional market? 22. Do you expect problems to establish a common settlement period for a region?
The PX must have established a department for Market Surveillance with defined obligations for their work and established procedures for the performance of the work.	23. Do you have a department for market surveillance today? 24. If so, please describe their role today and in future regional market.
The Market surveillance department of the PX must present regular reports to the authorities according to the regulatory framework. In addition detection of breach of market rules have to be reported without unreasonable delay.	25. What market surveillance reports do you produce today? 26. What additional tasks will the market surveillance face in a regional market?

The Market Surveillance department must have the necessary mandate to collect all necessary information to perform its duties. In addition, measures to be taken in case of breach must be clearly defined and mandated.	27. What mandate do your market surveillance department have today, and what mandate do you expect would be present in a regional context?
The participation rules of the PX must contain the rights of the participants to receive information from the PX and the obligation of the participants to submit information to the PX.	28. Do your present participation rules contain description of participants' rights to obtain information and responsibilities for participants to submit information?
The PX must have established efficient routines for electronic collection of needed information.	29. How are your plans for collection of information on a regional basis?
The PX must have defined a clear plan for how the costs of operation will be covered.	30. Please explain your model for cost recovery in a regional market.
The PX must have a strategy for deciding the level of equity necessary for the PX, seen in relation to the level of counterparty risk. The PX must also have a clear strategy for how to change/expand the ownership structure to allow for stakeholders in new areas to become shareholders.	31. Please describe the present ownership structure and equity for the PX. 32. What changes in ownership structure and equity do you expect for a regional PX?
The PX must have defined clear requirements for credit cover for the participants and have defined the types of credit cover that is allowed and adopted to local legislation.	33. Do your participation rules include requirements for credit cover? 34. Do you expect change in the rules for credit cover in a regional market?
The PX should have a clearly defined risk policy.	35. Have you defined a risk policy that addresses risk management risks such as operational, currency exchange, counter party, etc. for the PX?
The PX must have defined a clear strategy for handling of currencies (multiple or single).	36. Have you considered this issue when planning for a regional PX?

The PX must have defined a clear strategy for how to handle tax issues in different countries.	37. Have you considered this issue when planning for a regional PX?