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## Regulatory and Energy Assistance

### MEMORANDUM

**TO:** Mubera Bicakcic  
Ministry of Foreign Trade and Economic Relations

**FROM:** Ognjen Markovic

**CC:** Ankica Gavrilovic  
Jane Wilson  
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**DATE:** 19 June 2009

**RE:** REAP Comments on Regional Draft Market Design

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

**The underlying concept of the regional market design is the following:**

- Two or more control/bidding areas in the Region;
- A market design is based on: (i) Bilateral contracts, (ii) Day Ahead Market; (iii) Intraday Market (in the latter stage); (iv) Imbalance settlement; (v) Regional Balancing Market; (vi) Implicit Auction of cross border capacity in case of constraints; (vii) Ancillary services; (viii) Balancing Responsible Company;
- Step-by-step approach regarding market opening levels;
- Existence of a market operator; and
- Harmonization of power sectors of the contracting parties.

**REAP's Comments on the Study are the following:**

1. Trust as a prerequisite: The model is based on the presumption that a satisfactory level of a trust among Energy Community contracting parties exists. The authors consider this precondition as a must. Unfortunately, there is a high level of distrust among signatory parties which is clearly one of the factor which negatively impacts implementation of the Energy Treaty in SEE. (Distrust in Bosnia and Herzegovina has significant impact on electricity reform here.)

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2. National market: The proposed model considers different options regarding the existence of national market operators. In the case of a de-centralized market, national market operators exist; however, in a centralized market, only a Regional Market operator exists. In both cases, harmonized legislation and regulation among parties is foreseen.
3. The model is not completely defined: the proposed model does not give a complete design of the market model. For example, it is not clear which role, if any, a local (national) operator has?
4. How the market works: The document does not specifically describe how the model works; therefore, readers can interpret the document differently, depending on how they read the various articles of the Study.
5. Coordinated market activities are needed or one regional market operator is needed, which is very difficult to implement under the current circumstances.
6. The Authors did not analyze the level of liquidity of the prospective regional market and market/bidding areas, as well as the congestion management issue in evaluating whether this model works and whether some other models could be proposed.
7. The Authors say this model can increase market prices in bidding areas where prices are lower where there is no the regional market. The question that comes up on the basis of such assumption is how to get a commitment for such model from all signatures parties?

Note: MOFTER sent the request to all stakeholders in BiH in order to get comment to the Draft Study. The deadline to submit comments is June 22, 2009.

Attachment 1 contains an explanation on implicit auctions from REAP's paper entitled, "Congestion Management Methods," dated June 12, 2008.

**Attachment 1**  
**Excerpt from REAP’s paper entitled “Congestion Management Methods”**  
**Dated June 12, 2008**

**The example on how the market works if it is based on the implicit auction:**

There are two countries: A and B and both have a demand of 1000MW

Country A has three generating stations with the following characteristics:

	<b>capacity</b>	<b>unit price/MWh</b>
Aa.	400	25
Ab.	400	30
Ac.	500	40

The price prevailing in country A is therefore €40/MWh since this is the price required to bring 1000MW of generation to supply to the market

Country B also has three generating plants

	<b>capacity</b>	<b>unit price/MWh</b>
Ba.	700	30
Bb.	200	45
Bc.	200	50

This leads to a price of €50/MWh in market B.

Currently Country A, has a surplus available of 300MW at a price of €40/ MWh. This could be used to reduce prices in Country B. However let us suppose that capacity of only 150MW is available in the interconnector.

Implicit auction

For an implicit auction to occur, a centralized market operator must be in existence, as the market operator takes an active part in congestion relief activities. An implicit auction occurs when interconnector capacity is included in the auctions of electricity. In implicit Auctions, the capacity between bid areas (price areas/control areas) is made available to the spot price mechanism in addition to bid/offers per area; thus, the resulting prices per area reflect both the *cost of energy* in each internal bid area (price area) and the *cost of congestion*.

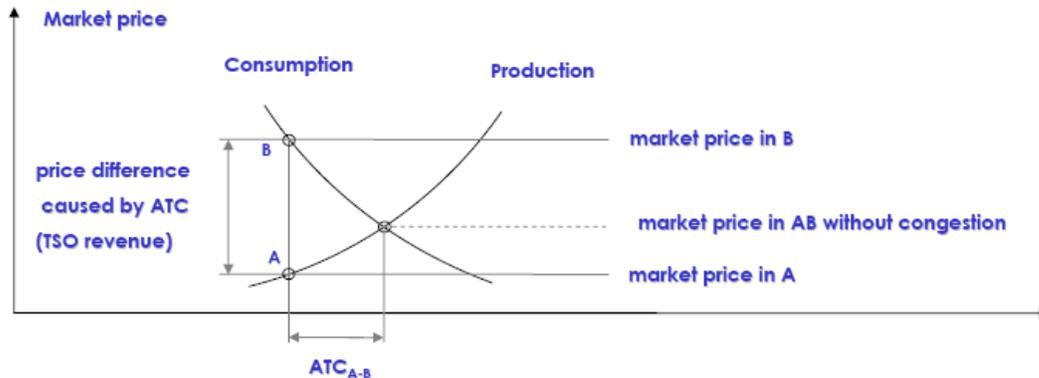
There are two types of implicit auctions: market splitting and market coupling.

(a) Market splitting

**In a centralized market structure with a pool or power exchange, one system**

*operator* ensures the right cross-border power flow by determining production surpluses in the power exchange's low-price areas, and production deficits in the power exchange's high-price areas. The system operator may either enter into trades or add surcharges to cross-border flows to encourage power flow to the high price area. Market splitting exists only in the Nordic region and between Germany and eastern Denmark. See the following graphic illustration of how two markets are actually combined to create one market

**Implicit auction: Market splitting (simplified explanation)**



As can be seen in the diagram above, under the market splitting auction method, the TSO fixes the price for using the interconnector on the basis of a comparison of electricity prices offered by the generators on both sides of an interconnector. Each generator in both countries nominates an amount it wishes to supply into the combined A&B market and the lowest price it is willing to offer electricity into the market. The bids would be as follows:

	<b>capacity</b>	<b>unit price/MWh</b>
Aa.	400	25
Ab.	400	30
Ba.	700	30
Ac.	500	40
Bb.	200	45
Bc.	200	50

The TSO then calculates the system price that would prevail under unlimited interconnector capacity. This would be €40/MWh since at that price the required 2000MW is available.

However this implies export of 300MW from Country A and there is insufficient capacity. The TSO then recalculates the price in each market taking into account the connectors and its constraints.

In Country A, with exports, demand is now 1150MW, however given the generation set

	<b>capacity</b>	<b>unit price/MWh</b>
Aa.	400	25
Ab.	400	30
Ac.	500	40

this has no effect on the price, which stays at €40/MWh

For Country B, demand is still calculated at 1000MW but the imported generation amount is added to the generation set as follows:

	<b>capacity</b>	<b>unit price/MWh</b>
Ba.	700	30
Ac.	150	40
Bb.	200	45
Bc.	200	50

The price in Country B would then fall to €45/MWh as Bb becomes the marginal producer. Generator Bc would no longer be required.

The TSO would receive a rent equal to €5 on each unit of electricity transmitted through the connector. This is because whatever the price in Country B, generators only receive the system price of €40/MWh. This means the TSO buys electricity in Country A at €40 and sells into Country B for €45.

### **Features of market splitting**

- i. Market splitting is much less prone to gaming, since the generators are not bidding for economic rents from higher prices in one market, but simply to sell at a common system price.
- ii. The economic rents will be shared between customers in the high cost country and TSOs under market splitting. Final electricity prices will be closer together than under explicit auctions. No economic rents are available to generators.
- iii. These mechanisms do not require two separate transactions by exporters, but they do require a common balancing mechanism in both countries.
- iv. TSO rents can be used for expansion but, as with explicit auctions, the amounts collected are unlikely to give a clear signal of the optimal amount of capacity increase.

### Market coupling

Market coupling is a process where co-operation between *two or more system operators* ensures that during every hour of operation all the available capacity is utilized with sufficient power flowing towards a high price area to relieve congestion. When the operators realize there is a price difference on the border during the calculation of the day-ahead prices, the operator in the low-price area buys extra power and the operator in

the high-price area sells extra power. This method of congestion management is called market coupling.

The following market coupling projects exist in Europe:

Denmark and Germany: This project aims to improve the utilization of the daily cross-border capacity between Denmark and Germany by implementing an implicit auction. Participants of the project are Nord Pool Spot, EEX, E.On Netz and Vattenfall Europe Transmission.

TriLateral Coupling (TLC) of Netherlands, Belgium and France: TLC refers to the market coupling between, Netherlands, Belgium and France. The participants in this project involve the power exchanges APX, Belpex and Powernext and the TSOs Tennet, Elia and RTE. The TLC was launched the 21st of November 2006.

Coupling TLC with NPS through NorNed: The license for the NorNed cable, currently being laid across the North Sea between Norway and Netherlands, is given on the condition that the flow should be decided based on the market prices in the two markets Norway and Netherlands. A project including Statnett, TenneT and the power exchanges Nord Pool Spot and APX is working to find a common solution for the start of operation of the cable.

Multi Market Coupling (MMC): Multi Market Coupling is a term derived from the project of coupling the TLC region with the NPS region. As the term implies it involves integration of many markets with a diverse set of local situations and requirements.