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## **A liquid Power Exchange, lynchpin of the European internal energy market**

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### **Abstract**

This paper, discusses the rationale for power market liberalization, the essential role of an organized “spot market” and in particular the case of power exchanges, and the mechanics of regional cooperation between power exchanges. The paper aims to create a clear and holistic overview on why and how liquid power exchanges are the lynchpin of the European internal energy market. The paper then concludes by presenting the work currently undertaken on development of Europe’s newest power exchange under establishment, the Albanian Power Exchange (APEX).

In the paper, the authors start by introducing why a liberalized and organized power market is worth pursuing and what it can mean for a region to integrate its power market to allow for greater cooperation and connectivity.

*Electricity generation takes place in different installations and power plants, the cost of generation is dependent on two main costs; (1) the fixed costs of the plants – mainly depreciation and (2) variable ones – essentially the fuel. There are as well a lot of other factors influencing costs of electrical energy such as technology, efficiency of the unit, topology, weather, timing, etc. For any power system to be economically driven, it is essential to recognize the most effective and cheapest units and let them work while the more expensive ones are utilized only when necessary to cover the demand. This principle of “economic merit order” may be utilized in the best form via an organized market, when electricity is recognized as a commodity and price is freely established based on fundamentals and with the simultaneous participation of Supply and Demand.*

A simplified way to organize a “Spot Market” but also account for the special physical attributes of electricity, is to have a “Day – Ahead” hourly market for delivery of energy for the 24 hours of the next day. There are several types of organized markets, with the two basic classifications being the “Continuous” and the “Central Auction”. Furthermore, a market can be “obligatory” or “voluntary”.

A power exchange belongs to the “Central Auction” category with a once per day “Gate Closure” and a central auction of energy for all 24 hours of the next day. Additional details, and the central role of a liquid and transparent power exchange as an orchestrator for the European internal energy market is explained. Further, this article explains the fundamental prerequisites and key milestones on the process of creating the power exchange and discusses the multidimensional approach within the power sector, that this process requires.

*An organized market shall provide the necessary infrastructure for developing a common market place where the buyers and sellers can meet on a neutral platform. Theory and global*

*experiences strongly suggests that the Power Exchange institution (PX) is an important part of a competitive electricity market for many reasons, the most important being:*

- *The PX promotes competition in generation, which is expected to lead to improved efficiencies and thus increased supply capacity and/or reduced prices.*
- *The PX is an important mechanism to utilize transmission capacities between countries, thus promoting a better inter-regional utilization of the sparse generation resources.*
- *The PX promotes demand side responses to price signals. Demand side response is essential in any competitive market, and contributes in effect as a substantial alternative to generation capacity.*
- *The PX provides short-term and long-term price indices and a liquid market, which are important constituents for risk management and financial security for long-term investments in generation and transmission.*

The paper highlights the benefits and importance of regional cooperation in the power markets, i.e. between the power exchanges, fostering the European internal energy market through market coupling with implicit auctions and shared order books. Finally, the paper presents the current work and real “Use Cases” from the development of the Albanian Power Exchange which is currently under establishment