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MARKET DESIGN OF AN ENERGY EXCHANGE: THE CASE OF GREECE

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Overview
Driven by the liberalization of the energy market launched in the 1990s, the European Union (EU) aims to unify the internal market and achieve price convergence among all European economies. Nowadays, most of the EU countries have successfully established Power Exchanges (PXs), through which cross-border transactions are conducted in a transparent and reliable manner. Yet, several national electricity market designs denote one of the major obstacles to the construction of integral electricity market. This paper provides a comprehensive overview of prior literature related to PXs market design. Additionally, the paper identifies recent developments regarding the case of Greece, by explicitly decomposing the structure of Hellenic Energy Exchange and the markets to be formed during the upcoming period.

Method
This paper is a preliminary attempt to provide an updated review, by explicitly addressing two basic objectives. Initially, its prior aim is to review previous studies on the field of PXs, their market design and integration. Secondly, the study aims to present the latest developments in the Greek energy sector, accompanied by the formation of the three new markets that are going to be formed, during the next period (Day-Ahead, Intraday and Forward Markets). The present paper describes and discusses the new market codes, that are currently through the phase of public consultation. Therefore, based on the Cournot model which is designed to capture the oligopolistic market effects of the imminent reform in the wholesale electricity market, we provide a forecast analysis based on price-quantity co-movements to illustrate the potential advantages from market liberalization.

Results
This study described the theoretical perspective of Power Exchanges, which was separated into three discrete subjects. Initially, we reviewed the literature in terms of (i) the broad concept of PXs, (ii) their market design and, (iii) PXs imminent integration towards a single European energy market. Next, driven by the formation of Hellenic Energy Exchange (HEE), the second objective of this paper was to outline its market design and structure. Hence, we examined concepts such as bidding system modelling, auction mechanisms and order types. Additionally, we provide a comprehensive overview of the recent developments in the Greek wholesale market structure, accompanied by a careful investigation in terms of Day-Ahead, Intraday and Forward markets function. Finally, based on a Cournot simulation, we argue that the main reform of moving from a monopolistic market towards and an oligopolistic one, is expected to boost energy demand accompanied by lower market prices.

Conclusions
In conclusion, the establishment of HEE is undoubtedly a reform that will introduce Greece into the map of mature energy markets. The initial stages of this process have already begun, and the benefits expected to emerge followed by its formation are multiple. HEE is anticipated to act as a central risk-taking and risk-management platform for all market participants. At the same time, HEE is expected to encourage competition, guarantee transparency, enhance liquidity and finally facilitate integration with the rest European electricity markets.

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