

MARKET POWER AND ENERGY SECURITY IN THE GLOBAL H₂ MARKET: VALUE OF REGIONAL COOPERATION AMONG BUYERS

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Extended Abstract

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Abstract Summary

The emerging global hydrogen market is likely to be characterized by both buyer and seller concentration, raising energy-security concerns similar to those observed in liquefied natural gas markets. This paper develops a bilateral oligopoly framework to investigate, both analytically and quantitatively, the interaction between two-sided market power and security of supply. Exporters with asymmetric linear costs and importers with logit inverse demand compete in Cournot-Nash quantities under a long-term contracting perspective, yielding calibrated aggregate trade equilibria. Bilateral trade flows are then derived by solving an HHI-minimization problem subject to the market-equilibrium constraints. A cooperative-demand extension is used to examine how regional procurement affects bargaining power, prices, and concentration outcomes.

The results show that diversification opportunities are strongly asymmetric. Large importers can achieve relatively low concentration levels, while small and medium-sized countries remain exposed even under the least-concentrated feasible allocation. The resulting patterns mirror historical natural-gas trade, supporting its use as an empirical benchmark for hydrogen-related security risks. Regional cooperation, such as EU demand pooling, improves buyer bargaining power, lowers prices, and mitigates concentration vis-à-vis dominant suppliers and large competing buyers such as China. The findings imply that hydrogen strategies that raise demand targets without corresponding diversification mechanisms may worsen security risks for smaller buyers. Regional coordination, therefore, emerges as a key policy lever, strengthening market position without requiring full market integration. The results support hydrogen hubs and joint procurement as tools to balance decarbonization ambitions with supply security.

Presenting Author Biography

Svetlana Ikonnikova is a Professor of Resource Economics at the TUM School of Management, with interests in energy markets, energy transition, and technological solutions that lead to an economically affordable and environmentally sustainable future. Prof. Ikonnikova also works on a variety of questions related to global energy and other resources supply capabilities and international trade.