

European Gas Markets, Trading Hubs, and Price Formation: A Network Perspective

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David Woroniuk, Arzé Karam, Tooraj Jamasb

Abstract

We apply network theory to analyse the interactions of trading hub prices, and to assess the harmonisation of the European gas market. We construct dynamic networks, where the nodes correspond to the twelve EU trading hubs, and where the edges weight the causality between the variations of the respective gas prices. Network density dynamically calculates the aggregate quantity of causal interactions recorded within the system, which provides information pertaining to the integration of the European gas network. We document a number of spikes in network density, suggesting short periods of improved connectivity of European gas markets. We argue that these results appear to be driven by exogenous factors, such as unseasonal weather patterns, seismic activity and pipeline capacity reductions or outages. The findings elucidate the time varying nature of European gas market dynamics, and the importance of continual monitoring of market evolution.

Keywords Market Integration, Information Transmissions, Natural Gas, Network Theory

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Contact david.j.woroniuk@durham.ac.uk
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