



Issues and Options in the Economic Regulation of European Network Security

EPRG Working Paper 1405

Cambridge Working Paper in Economics 1425

Tooraj Jamasb and Rabindra Nepal

The response of the liberalised and regulated European electricity markets to supply security challenges remains a major concern. The electricity networks in Europe face the risk of significant damages and threats from high impact and low frequency (HILF) events. Increasing the number and capacity of interconnections in the European electricity markets can facilitate the transmission of HILF risks from one transmission node to other nodes through the interconnector and create a 'ripple effect' or 'cascading failures'. Hence, we review the different approaches to regulate and promote network security in the light of the changing nature of network regulation from an input-based approach to an emerging output-based incentive regulation in Europe.

We assume that addressing the network security challenges is a regulatory matter while network security can, alternatively, be viewed as an aspect of quality of service that can be achieved by incentivising the investments and innovation in the regulation of networks. A useful way to improve network security through regulation is by incorporating network security in the quality of service regulation. However, due to the nature of the network security, it is difficult to design an optimal regulatory framework or mechanism that accounts for all economic, technical, natural and malicious risks faced by the electricity networks. Nonetheless, the changing nature of network regulation from an input-oriented approach to an output-based incentive regulation can be made suitable to address the network security risks.

The nature of changing regulation, emerging regulatory trends and the need to upgrade the European networks provide an opportunity to integrate network security objectives into these

Contact tooraj.jamasb@durham.ac.uk; r.nepal@uq.edu.au
Publication March, 2014
Financial Support European Commission, FP7, SESAME Project

economic activities as well. However, this needs to take place in the coming years to maximize the ‘synergy’ effects and also make achieving the objectives more cost effective. The European Union may need to require the Member States to include network security objectives in their upgrade plans. The EU countries also need to harmonise the network security objectives and intensify coordination among each other irrespective of the network security goals being an incentive regulation matter or a policy matter. The output-based regulation of exceptional events will require defining and measuring relevant network security outputs, which can be difficult for the regulator, remains a clear challenge.

The regulation of network security should also be understood in its wider economic regulation and national policy context. This involves considering the investment requirements and innovation challenges combined with the need to protect the electricity networks from natural, accidental and malicious threats.