

PAST AND POTENTIAL ROLES OF ELECTRICITY SYSTEM OPERATORS: FROM LIBERALISATION TO CLIMATE CHANGE MANAGEMENT

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System operators have been crucial for the development of liberalized, unbundled wholesale electricity markets both in the United States and in the European Union – and in many other countries around the world. However, over the last 5-10 years, system operators have been increasingly reconstituted to provide for the development and management of climate change policies. In the UK, that has involved them heavily in the procurement and operational arrangements for renewable generation and, to a lesser extent, of nuclear generation. Managing the intermittency of wind power has also had major implications for system operator rules and operations involving transmission systems and the operation of wholesale markets.

During the 1980s and 1990s, and on to around 2008, OECD countries' electricity markets had been progressively liberalized with greatly increased competition in wholesale generation markets. In the US, the main model for this was the development of multi-State ISOs (independent system operators) of which the PJM system (Pennsylvania, New Jersey and Maryland) was the archetype. In England and Wales, Australia, and some other countries, ITSOs (independent transmission and system operators) dominated. These models were crucial in the spread of power sector liberalization within those countries and also in some middle-income countries. Within the European Union, ITSOs with fully ownership-unbundled transmission networks were central to the EU Third Electricity Package of 2009 and currently a clear majority of West European EU member states now have electricity ITSOs.

However, in recent years, the policy emphasis has changed from liberalization per se to combining competition with decarbonization to tackle climate change. The difference in emphasis is most obvious in the European Union. In 2007-08, the EU set out and agreed the “20-20-20” policy. This comprised a 20% reduction in EU greenhouse gas emissions from 1990 levels, an increase to 20% of EU energy produced from renewable resources and a 20% increase in EU energy efficiency - all to be achieved by 2020. Similar changes in emphasis have been introduced in the US (viz. California) and elsewhere but, in general, within looser policy frameworks than for the EU.

For Britain and other EU countries without large-scale hydro generation resources, the EU renewables obligation implies a very large expansion in wind power with major implications for the viability of competitive generation markets. Large shares of non-carbon nuclear generation can also be difficult to reconcile with openly competitive generation markets. This creates major dilemmas and problems for competition in generation markets – and for system operators.

These developments mean that in several countries, competition for the generation market remains in place, but competition in the generation market is increasingly restricted. More importantly, to meet the EU “20-20-20” obligations, investment in generation in England and Wales and some other EU economies has become much more subject to directive planning than to light-touch indicative planning. This has led to electricity system operators becoming much more like delivery agencies for climate change and renewables policy targets rather than the pre-2010 coordinating entities for companies competing over a physical network in vertically unbundled markets as previously.

A key factor on that is that the UK, like Germany and Spain, has developed proposals that emphasize the role of intermittent renewable generation (for the UK, offshore wind) in tackling climate change. That and UK nuclear generation appear to require long-term contracts with subsidy support (via Contracts for Differences) and capacity payments. Hence, there is also the need for new coal and gas generation also to be purchased via long-term contracts under a single buyer approach.

System operator arrangements play an important part in this battle. The paper discusses how and why the British system operator has been transformed in under five years from a market-coordinating agency to a state planning and delivery entity. There are major questions as to how efficient the new system and the delivery SO will be, but – provided the government allocates sufficient funding under the levy framework – it should deliver the government’s required policies, albeit at significant cost.

The European Commission’s current approach appears to depend heavily on greater interconnection to encourage multi-country regional markets and to link up those markets into a Single European Electricity Market. Experience from the US Regional Transmission Authorities with independent system operators and a Federal energy regulator indicates problems and the proposed EU co-ordination and regulatory arrangements are much weaker. There is also the question of aligning Member State system operator arrangements with EU and national regulatory arrangements – an issue that has not been much discussed publicly. SO arrangements for electricity are determined by how generation markets develop within defined policy frameworks. For the UK, from 1990-2008, we had liberalized and unbundled generation and wholesale supply markets. That required a coordinating system operator, which was a part of National Grid, the relevant IESO. However, the EU ‘20-20-20’ climate change policies with their weight on intermittent, high cost renewable generation effectively destroyed the viability of the England and Wales wholesale generation markets – as the UK government was warned that it would. In consequence, the UK has now had to invent a single buyer-like planning system operator to deliver the renewable and nuclear generation. System operators and their objectives are very good indicators of the focus of electricity policy and its requirement on market design. System operators in the EU seem to be taking on many functions – arguably, too many, including quasi-regulatory functions of the kind that US Regional Transmission Operators have done. We shall see in coming years how the EU debate unfolds and whether other EU Member States travel down the same road that the UK has done.

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