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Ensuring compatibility of the all-island electricity system with the target model: Fitting a square peg into a round hole? ☆

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HIGHLIGHTS

- The Single Electricity Market (SEM) has worked well for consumers in Ireland.
- The SEM has to conform to the Target Model (TM) by 2016.
- The SEM is mandatory pool/central dispatch; the TM is bilateral contracts/self dispatch.
- Ensuring compliance with TM is best achieved through minimal change to SEM.
- Far reaching change is more appropriate once SEM is fully integrated in the EU electricity market.

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ABSTRACT

The all-island wholesale electricity market, SEM, has to comply with the Target Model by 2016. SEM has worked well for consumers through mitigating market power, facilitating entry and ensuring adequate generation capacity, problems that will persist. But the SEM is a mandatory pool with central dispatch, the Target Model is a self dispatch with bilateral contracts. Minimal change to the SEM in complying with the Target Model is preferable to reinvention of SEM. The latter option might be appropriate when the EU internal electricity market is complete and the all-island market has sufficient interconnection to participate fully in that market.

1. Introduction

The model for trading electricity at the wholesale level on the island of Ireland – the Single Electricity Market (SEM) – has to comply with the European Union's (EU) Third Package. While a deadline of 2014 has been set for Member States' compliance, transitional arrangements, that "do not extend beyond 2016," for meeting the Capacity Allocation and Congestion Management (CACM) Network Code apply to "island systems with central dispatch" (Agency for the Cooperation of Energy Regulators, 2011, Section 1.12), of which the SEM is the only instance within the EU.[1] These transitional arrangements reflect the fact that most EU wholesale electricity markets are self dispatch bilateral exchange models, in contrast to the mandatory pool central dispatch model of the SEM.

The Network Code will apply to capacity allocation and congestion management "between the zones of the EU electricity market" (*ibid*, Section 1.1). SEM is likely to be a separate zone. The Network Code, which will be legally binding and based on the CACM Framework Guideline, which was finalised in July 2011, deals with "the integration, coordination and harmonisation of the congestion management regimes, insofar as such harmonisation is necessary to facilitate electricity trade within the EU" (*op cit*, Section 1.1) in compliance with the Third Directive. In securing such integration the Third Directive states that in setting "fair rules for cross-border

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[1] It should be noted that the Agency for the Cooperation of Energy Regulators (ACER) adopted the CACM Framework Guidelines (FG) in July 2011, while the European Network of Transmission System Operators for Electricity (ENTSO-E) presented their proposals for the CACM NC in September 2012. See Agency for the Cooperation of Energy Regulators, 2011, European Network of Transmission System Operators for Electricity (ENTSO-E) (2012a) and Single Electricity Market Committee (2012, pp. 17–18) for a discussion of the relationship between the FG and the NC.

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exchanges in electricity'' that account should be taken of ''the particular characteristics of national and regional markets.''[2]

The Framework Guideline is based on the Target Electricity Model (the Target Model) which ''is a high level description of the market mechanisms to facilitate'' the EU internal market in electricity that emerged from the Florence Forum process (Booz & Co, et al., 2011, p. 24). While some aspects of the Target Model have to be finalised, the key features of the model, such as a forward, day ahead, intraday and balancing market, have been settled. The issue thus becomes how the SEM should be restructured to ensure compliance with the Target Model and thus the CACM Network Code.

The paper is divided into six sections, including the introduction. Section 2 sets out the framework for analysis. Section 3 sets out the problems and challenges that the SEM was designed to address, together with the extent to which participation in the internal EU electricity market and other recent and expected developments address these problems. Section 4 compares the SEM and the Target Model and briefly outlines proposals that for ensuring compliance of the SEM with the Target Model. These proposals were put forward by the SEM Committee (2012).[3,4] Section 5 evaluates the proposals, based on the conclusions to Sections 2 and 3. Section 6 concludes.

2. Selecting the most appropriate approach: A framework for analysis.

One approach would be to evaluate a range of proposed models that comply with the Target Model by considering whether or not the benefits exceed the costs. The proposal with the highest benefit/cost ratio is the preferred choice. However, it could be argued a simpler methodology should be employed: estimate the fixed and ongoing costs of implementing each proposal in terms of investments in new computer and trading systems for the market operator and market participants *etc*[5] and select the least cost proposal. No attention would be paid, however, to crucial factors that are likely to differ between the proposals and that, in turn, are vital to ensuring that the SEM works well for consumers, the ultimate objective of the electricity wholesale model.

Seen in this broader light, the issue of selecting the most appropriate model to replace the current SEM that is compliant with the Target Model becomes more difficult. The current SEM model was designed to deliver electricity in an efficient and cost reflective manner.[6] However, in order to do so successfully the SEM had to address particular concerns, including the market power of the incumbent vertically integrated Electricity Supply Board (ESB),[7,8] facilitating entry[9] and ensuring adequate capacity. These concerns can also be used to evaluate proposals for complying with the Target Model.

Account needs to be taken as well of the market facts in 2016 and beyond, when the SEM has to comply with the Target Model, which may not be the same as those that obtained on 1 November 2007 when the SEM model was created. If the Third Package is successful in integrating Ireland in the internal EU market for electricity issues such as market power are likely to be of lesser importance.[10,11] The significance of renewable sources of electricity, especially wind, is much greater to-day and its significance is likely to increase. The wholesale electricity model needs to provide flexible plant that is able to provide electricity at short notice, given the variability and difficulty of forecasting wind accurately.[12]

In the debate over restructuring the SEM to meet the Target Model there is often a concern to preserve the essence of the current market model.[13] However, there is no generally agreed set of 'essential' or 'critical' characteristics of the SEM. What is essential/critical are those elements of the current SEM model that deliver electricity efficiently while successfully dealing with problems such as market power and ensuring adequate generation capacity. Whether these elements are relevant in the future depends on the degree to which the problems that the current SEM was designed to resolve are still pertinent in

[2] Article 1 (a) of Regulation (EC) No 714/2009 of the European Parliament and of the Council of 13 July 2009 on conditions for access to the network for cross-border exchanges in electricity and repealing Regulation (EC) No 1228/2003.

[3] There was also an accompanying paper, EirGrid et al. (2012) by the Single Electricity Market Operator (SEMO), and the Transmission System Operators (TSOs) in Ireland (EirGrid) and Northern Ireland (System Operator of Northern Ireland or SONI). SEMO is a joint venture between EirGrid and SONI that according to its website, ''facilitates the continuous operation and administration of the Single Electricity Market.'' http://www.sem-o.com/AboutSEMO/Pages/default.aspx. Accessed 25 May 2012. EirGrid et al. (2012) address the issue of how to adapt or vary the current SEM so as to comply with the Target Model.

[4] This consultation is part of an ongoing process; it is not expected to result in a definitive answer to the question of the how compliance will be achieved, but rather mark a move towards resolving the issue. For details see: http://www.allislandproject.org/en/TS_Current_Consultations.aspx?article=41f5681a-ef37-41ca-ab7d-7a1bdd7db385. Accessed 6 March 2012. See also SEM Committee (2102, pp. 73–74).

[5] For example, when the SEM was introduced the implementation costs were estimated at €256.4 million in 2006 prices. The implementation costs were divided into four categories. For details see NERA (2006, p. ii). However, the actual outturn were much less, €110 million (Single Electricity Market Committee, 2012, p. 48).

[6] The primary objective of the SEM, developed by the energy regulators in Northern Ireland and Ireland, ''in the light of their statutory duties and functions,'' is that the ''wholesale electricity trading arrangements should deliver an efficient level of sustainable prices to all customers, for a supply that is reliable and secure in both the short and long-run on an all-island basis'' (Single Electricity Market Committee, 2012, p. 28).

[7] And the corresponding firm in Northern Ireland, Viridian.

[8] Fitz Gerald et al., (2005, Table 6.1, p. 89) found that, for example, that 2003 ESB plant had the ability to set the market price 91 per cent of the time on an Ireland basis and 67 per cent on an all-island basis. The index used to determine whether ESB has the ability to set prices is the Residual Supply Index (RSI) defined as (System capacity(including import capability)—Uncommitted capacity of investigated generator)/Demand. An RSI above 120 per cent is taken to be a competitive market. For discussion see also (Cambridge Economic Policy Associates, 2010, p.18). Some of this market power may have become dissipated in costs that are too high. This issue is discussed in Fitz Gerald et al. (2005, pp. 81–82) and Diffney et al. (2009, pp. 480–482) which finds evidence consistent with this view at least up to 2004, the most recent year used.

[9] Especially if the incumbents have been protected from competition. Bridgman et al. (2011) find that the threat of liberalisation (i.e., privatisation and market entry) caused productivity in the Brazilian state-owned oil company, Petrobas, to double in the six years after its legal monopoly was abolished, despite no entry actually occurring or its status changing.

[10] While it is true that since 2002 the Moyle Interconnector (IC) linked the SEM with Scotland, its impact was limited due to its size relative to the SEM market and the high transaction costs involved in trading across the Moyle IC. The issue of interconnection with Great Britain is addressed in Malaguzzi Valeri (2009).

[11] Of course, if the European market is dominated by a few firms, integrating Ireland into the European market may simply import market power problems. The European Commission (2007, p. 152) expressed concern over concentration and market power at the Member State level. To the extent cross-border mergers occur in response to the creation of the internal EU market in electricity then the pattern of concentration on Member State markets is likely to be replicated at the EU level.

[12] This issue would, of course, have to be addressed irrespective of whether the SEM had to comply with the Target Model.

[13] In a consultation exercise conducted by the Single Electricity Market Committee (2012, p. 31) this was one of the questions raised. The SEM Committee is responsible for regulating the SEM. Membership consists of: (1) up three representatives from CER: (2) up to three from NIAUR; and (3) one independent (and deputy independent) member. Each block has one vote. For details, see for example, Single Electricity Market Committee (2011, pp. 5–6).