



# **SEM Committee Annual Report**

**1 November 2007 to 31 October 2008**

**SEM-09-022**

**March 2009**

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# 1 Foreword by the SEM Committee

The Single Electricity Market (SEM), which commenced as planned on 1 November 2007, created a single market for the trading of wholesale electricity on the island of Ireland. The SEM Committee was established in legislation as the decision-making body which governs the exercise of regulatory functions on SEM matters. The objectives and functions of the SEM Committee in relation to the SEM include the protection of the interests of consumers of electricity in Ireland and Northern Ireland, the need to ensure transparent pricing in the market and the promotion of the use of energy from renewable energy sources.

The SEM Committee is made up of three representatives from both the Northern Ireland Authority for Utility Regulation (NIAUR) and the Commission for Energy Regulation (CER), in addition to an Independent and Deputy Independent Member.

The SEM has combined two smaller markets with the objective of creating a single market with greater competition, more investment opportunities, an enhanced security of supply position and other efficiency benefits, all of which benefit consumers. It is seen as having European significance as it shows how European Union member states can co-operate to create effective energy trading arrangements.

The CER and NIAUR, collectively called the Regulatory Authorities (RAs), led the three-year project to deliver the SEM, working closely with the Transmission System Operators (TSOs - System Operator of Northern Ireland and EirGrid in Ireland) and the wider electricity industry. The support of the two government departments - the Department of Enterprise, Trade and Investment (DETI) in Northern Ireland and the Department of Communications, Energy and Natural Resources (DCENR) in Ireland - was also fundamental in delivering the SEM.

The SEM is a centralised or gross mandatory pool market, with electricity being bought and sold under a transparent market clearing mechanism. Generators receive the System Marginal Price (SMP) for their scheduled dispatch quantities and capacity payments for their actual availability. Suppliers purchasing energy from the pool, pay the SMP, capacity costs and system charges. The SEM rules are set out in the Trading and Settlement Code.

At the end of the first year of the market, there were 45 participants registered in the SEM, 13 of which joined since market commencement. These participants had a registered market capacity of 9,856MW. The Single Electricity Market Operator, SEMO, processes energy payments of approximately €3 billion annually, with a further €600m being paid in capacity payments.

In the first year of the market, the arrangements for the operation of the SEM Committee have been firmly bedded down. The SEM Committee, which met 11 times in this first year, made a number of key decisions which included a decision on the inquiry into complaints on the Bidding

Code of Practice<sup>1</sup> and a decision on bidding the opportunity cost of carbon into the market<sup>2</sup>. Other matters of significance for the SEM Committee during this time included the announcement that the TSO in Ireland, EirGrid, intends to purchase the TSO in Northern Ireland, SONI.

The SEM Committee is very pleased with the success of the market in its first year of operation. Generators are actively participating in the market and bidding in their short run marginal cost which leads to the dispatch of the most efficient generating units in the system. This was a key strategic objective of the new market design and will lead to increased competition and the best price for consumers.

Another key objective was to attract new and efficient generating units to the island of Ireland. The SEM Committee is encouraged by the level of interest in building new generation. In the Republic of Ireland alone, there are currently connection applications in respect of 9,000MW of renewable generators and more than 6,000MW of conventional generators. In Northern Ireland, there are connection applications in respect of 90MW of renewable generation and a further 1,200MW in planning.

In the first year of the market, the entry of a large European energy utility (Endesa) into the market is testament to the success of the SEM thus far. Increased generation will serve to promote security of supply and foster competition on the island of Ireland. The entry of new more efficient generating units should ultimately decrease prices in the wholesale market.

Reflecting on the work of the market monitor, the SEM Committee considers thus far that the market in the main has worked well and is delivering fair and cost-reflective prices. For example, intra-day peak prices have generally corresponded to peak demand and greater variability in prices is being experienced during these periods. In addition, the wholesale market prices have reacted to changes in prices in fuel.

The establishment of SEMO to manage the market, which is a contractual joint venture between the transmission system operators of Ireland and Northern Ireland, has also been very successful.

The SEM Committee has faced a number of challenges during the year such as addressing the investigation of complaints against generators' adherence to the Bidding Code of Practice and the volatility in the best new entrant price which is used to set the Annual Capacity Payment Sum, the total sum of money allocated to generators in the form of capacity payments.

The SEM Committee will continue to oversee the development of the market over the coming years. The SEM Committee will need to balance the need for the market to change and evolve over time with the provision of a high degree of regulatory certainty to the market. In the second

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<sup>1</sup> SEM-08-069 "Complaints on Bidding Practices in the Single Electricity Market", 12 June 2008

<sup>2</sup> SEM-08-032 "Bidding the Opportunity Cost of Carbon Allowances: A Decision Paper", 27 March 2008

year of the market, SEM Committee priorities will include examining the rules around the dispatch of wind in the SEM, investigating ways to stabilise the best new entrant price used to set the capacity payments as well as starting a detailed review of some aspects of the capacity payments mechanism. In addition, a programme of work will commence developing demand response measures and there will be a review of interconnector use between the SEM and the BETTA market in England, Scotland and Wales to identify barriers to market coupling.

The SEM Committee will continue to work with and consult all stakeholders on these matters in order to protect the interests of consumers in Northern Ireland and Ireland, to promote the development of an efficient and competitive market for the generation of electricity and to enhance the security of supply position on the whole island.

## 2 Objectives and Outline of this Report

### 2.1 Objective

The objective of this report is to document the main developments since SEM establishment and to discuss some of the key issues facing the market in its second year (November 2008 to October 2009).

### 2.2 Outline of the Report

The contents of the each section of the report are as follows:

Section 3 sets out the legal role of the SEM Committee and introduces the members of the Committee. This section also outlines the governance structure of the SEM which includes the Oversight Committee and the Joint Management Units.

Section 4 provides an overview of the trends in the market in terms of price and demand to date.

Section 5 details the directed and non-directed contracts process which underpins market participants' efforts to hedge risk in the market.

Section 6 discusses the role of the Market Monitoring Unit in the market and the key tasks undertaken by this team.

Section 7 describes the objectives of the Capacity Payments Mechanism and describes how the total annual capacity payments sum is calculated.

Section 8 reviews the key modifications made to the Trading and Settlement Code in the first year of the market.

Section 9 describes the key activities undertaken to regulate and incentivise SEMO in the market.

Section 10 sets out other developments that have taken place around the SEM including transmission-related areas of harmonisation, investigating the impact of high levels of renewables in the SEM on dispatch and examining other areas that may benefit from cross-regulatory cooperation such as the retail market.

## 3 Roles and Responsibilities of the SEM Committee

### 3.1 Legal role of the SEM Committee

The SEM Committee is the decision-making body which governs the exercise of regulatory functions on SEM matters. Legislation was enacted in both jurisdictions to establish and to give effect to the SEM Committee.

In Ireland, the relevant legislation is the Electricity Regulation (Amendment) (Single Electricity Market) Act 2007 which amends the Electricity Regulation Act 1999 to provide for the establishment and operation of a single competitive wholesale electricity market on the island of Ireland. Similar legislation providing a legal framework for the establishment and operation of the SEM in Northern Ireland is referred to as the Electricity (Single Wholesale Market) (Northern Ireland) Order 2007.

Under law, the primary function of the SEM Committee is the taking of decisions as to the exercise of relevant functions of the Commission for Energy Regulation (CER) or Northern Ireland Authority for Utility Regulation (NIAUR) in relation to SEM matters on behalf of the Regulatory Authorities (RAs). A matter is a SEM matter if the SEM Committee determines that the exercise of a relevant function of the CER or NIAUR in relation to that matter materially affects, or is likely materially to affect, the SEM.

The objectives of the SEM Committee in carrying out their functions in relation to the SEM are set out in Section 9 of the Electricity Regulation (Amendment) (Single Electricity Market) Act 2007 and Section 9 of the Electricity (Single Wholesale Market) (Northern Ireland) Order 2007. Section 9 includes the duty to promote efficiency and economy, to promote competition and to secure a diverse, viable and environmentally sustainable long-term energy supply.

### 3.2 Membership of the SEM Committee

The Minister for Communications, Energy and Natural Resources and the Minister of Enterprise, Trade and Industry appointed the following as members of the SEM Committee:

- Three representatives of the CER - Commissioners Tom Reeves, Michael G. Tutty and Dermot Nolan;
- Three representatives of NIAUR - Iain Osborne, CEO, Alan Rainey, Board member and Dermot MacCann, Director of Electricity; and,
- One Independent Member, Ignacio Perez Arriaga and one Deputy Independent Member, José Sierra López.

The legislative framework provides that there shall be equality of voting between the RAs. The SEM Committee therefore consists of three voting blocks: one vote for the independent voting block (representing the Independent or Deputy Independent Member, as the case may be), one vote for the CER voting block (representing the three CER SEM Committee Members) and one vote for the NIAUR voting block (representing the three NIAUR SEM Committee Members).

### 3.3 Governance Structure

Figure 1 shows a schematic of the high-level joint regulatory governance arrangements, put in place by the RAs to support the SEM Committee.

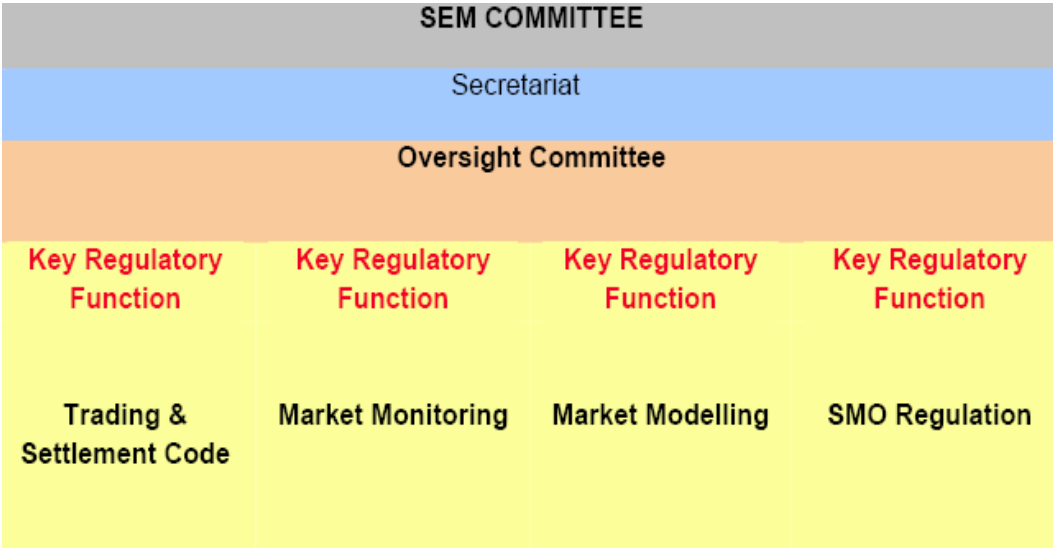


Figure 1: Schematic of the High-level Joint Regulatory Governance Arrangements

The SEM Committee is supported by an Oversight Committee, a Secretariat and a number of Joint Management Units (JMUs) which supervise and coordinate key regulatory workstreams.

As part of the SEM Committee’s governance arrangements, the Oversight Committee was given delegated authority to carry out certain functions on behalf of the SEM Committee. The Oversight Committee currently meets on a biweekly basis through either videoconferencing facilities or at face-to-face meetings and deals with, among other matters:

- Implementation of SEM Committee policy;
- Management of all SEM Committee operational matters;
- Management of the JMUs and other SEM work;
- Reviewing policy matters to be decided by the SEM Committee; and,
- Developing SEM work plans and budgets for the SEM Committee.



The Oversight Committee, which is authorised to make decisions with respect to all Oversight Committee matters, is a subcommittee of the SEM Committee. It consists of senior staff members from both RA offices. The current members of the Oversight Committee are Paul O'Neill (Programme Officer Manager, SEM), Dermot MacCann (Director of Electricity, NIAUR), Eugene Coughlan, Paul McGowan and Cathy Mannion (Directors, CER).

The RAs have identified four areas as key SEM regulatory functions for which a designated Manager, overseeing a JMU, is assigned. Each manager, in respect of his or her particular JMU, reports to the Oversight Committee. This manager has responsibility for the planning, management and delivery of outputs of the JMU, co-ordinated with the relevant point of contact within the counterpart RA (shadow manager). To this end, agreed internal joint working principles, called Joint Regulatory Arrangements, have been developed by the RAs for the operation of the oversight arrangements, the exercise of roles in the management of the JMU, and the exercise of any delegated functions from the SEM Committee. There is a biweekly video conferencing meeting between the managers and shadow managers of the JMUs. The following are the four JMUs:

#### **Trading and Settlement Code**

The Wholesale Electricity Markets team, based in the CER, manages the SEM Trading and Settlement Code (the Code) which sets out the rules and procedures concerning the sale and purchase of wholesale electricity in Ireland and Northern Ireland. The SEM rules, and the development of these rules, are managed by this team on behalf of the SEM Committee.

#### **Market Monitoring Unit**

The Market Monitoring Unit (MMU), which is based in NIAUR, reviews the behaviour in the market on an ex-post basis; this includes investigating the exercise of market power, monitoring the compliance of market participants with the bidding code of practice and other market rules and reviewing prices reported in the market. In addition, this unit oversees the implementation of the capacity payments mechanism.

#### **Market Modelling Group**

The Market Modelling Group (MMG), which is based in the CER, provides market forecasts of the SEM to the RAs. The majority of the MMG's work is short-term (one to two years) forecasting. This information is used to feed into work being carried out by the JMUs and other divisions within the RAs. Medium and long-term forecasting is also carried out to support the RA's policy decisions. Along with the modelling work, this unit oversees the offering of contracts in the SEM by market participants.

## Single Electricity Market Operator Regulation

This unit, which is based in NIAUR, oversees the regulation of the Single Electricity Market Operator (SEMO). SEMO, which administers the market functions of the SEM, is managed as a contractual joint venture between EirGrid and SONI and is licensed by the RAs. This unit is responsible for approving SEMO's revenue and tariffs, overseeing SEMO's licence compliance and approving projects undertaken by SEMO.

The SEM Committee is therefore assisted in carrying out its decision-making responsibilities through work carried out by the Oversight Committee and the four JMUs. This structure has worked effectively in the first year of the SEM.

## 4 Overview of the Single Electricity Market

### 4.1 Overview

The SEM high-level design was agreed in June 2005 and following this the RAs developed and implemented a suite of arrangements necessary for the SEM to commence on 1 November 2007. This involved:

- Working with DETI and the DCENR to develop the legislative framework under the aegis of which the SEM operates;
- Developing the market rules in the form of a bespoke SEM Trading and Settlement Code in conjunction with industry participants, the Market Operator and the System Operators;
- Putting in place a suite of harmonised arrangements around networks, metering, renewables and retail market interactions that form an integral part of the SEM;
- Developing a comprehensive market power mitigation strategy; and,
- Putting in place the necessary contractual and licensing arrangements in each jurisdiction.

In 2007, the government departments in Ireland and Northern Ireland, in cooperation with the RAs, finalised the drafting of several pieces of legislation required to underpin the SEM in both jurisdictions – the Electricity Regulation (Amendment) (Single Electricity Market) Act 2007 in Ireland and the Electricity (Single Wholesale Market) (Northern Ireland) Order 2007 in Northern Ireland.

As part of the development of the SEM, the RAs developed a robust market power mitigation strategy to prevent market power being abused or distorting the SEM. The major focus of this strategy comprised the imposition of directed contracts on generators with significant market power, the imposition of a licence condition on generators to adhere to a bidding code of practice and the establishment of the MMU to monitor participants' bidding behaviour.

The SEM itself consists of a gross pool market, into which all electricity generated or imported onto the island of Ireland must be sold, and from which all wholesale electricity for consumption or export from the island of Ireland must be purchased, subject to a de minimus of 10MW.

All generators were issued with a revised licence before the beginning of the SEM which includes a condition that generators must adhere to the bidding code of practice. This document, which sets out what generators should include in their bids into the market, is based on one of the key principles of the market: generators must bid their short-run marginal cost (SRMC) into the market.

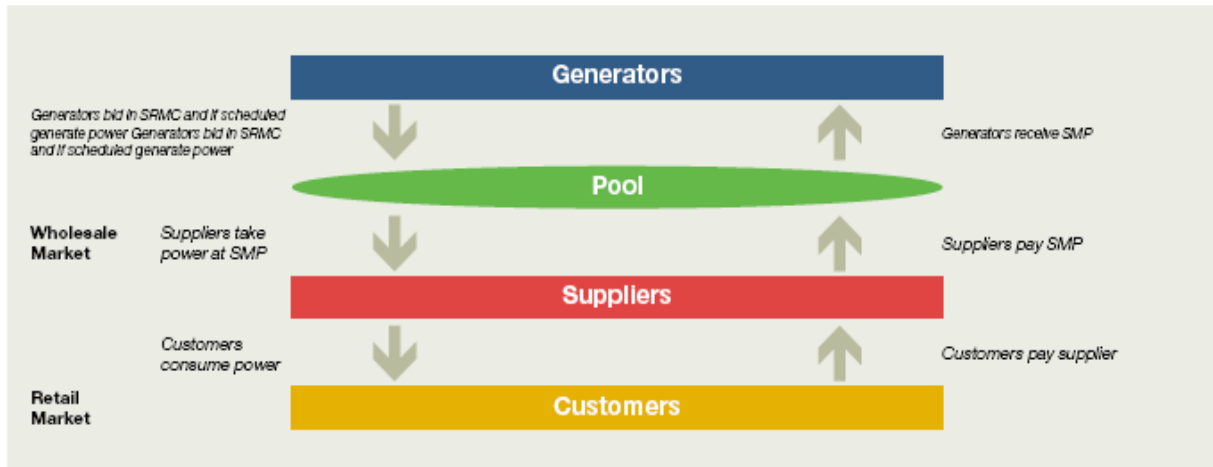


Figure 2: Diagram of how the SEM works

In the SEM, in addition to being paid the SMP when scheduled to run, generators receive a payment, called a capacity payment, for being available. This is paid regardless of whether the unit is actually scheduled to run or not. This payment, which encourages availability close to real-time, is designed to remunerate generators for part of their units' fixed costs.

#### 4.2 Prices and Demand – Trends to Date

The following observations derive from SEM Monitoring to date.

##### Load Duration Curve

Figure 3 illustrates the load duration curve for the first 12 months of the market. A load duration curve illustrates the percentage time that load or system demand measured in Megawatts is above a certain level. For example, from reading the graph below, in the first year of the market, demand was above 5,000MW approximately 20% of the time.

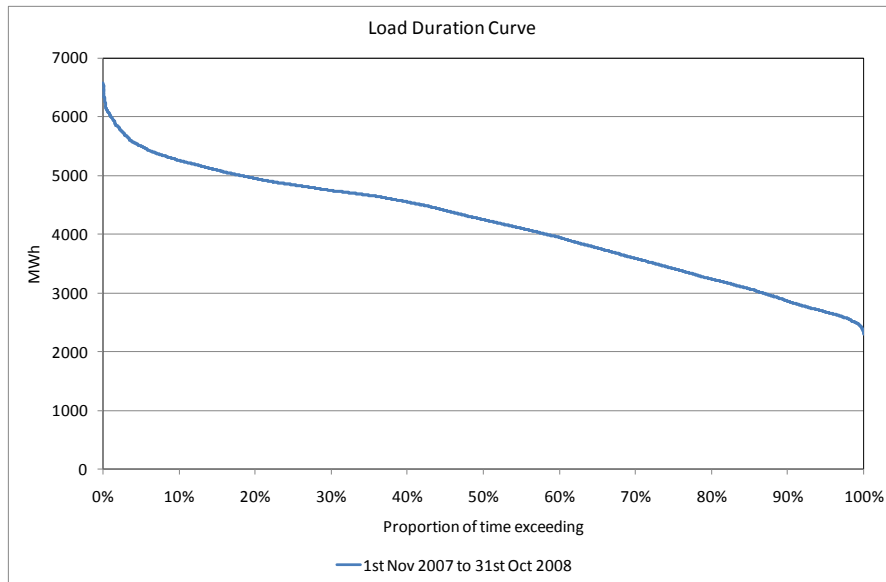


Figure 3: Load Duration Curve for the first 12 months of the SEM

This curve is similar to that experienced pre-SEM, with a small number of peak periods (which tend to occur over the winter period) occurring in the year.

### SMP, Shadow Price and Uplift

Part of the role of the MMU is to review market prices on an all-island basis ex-post. The following prices are in the market:

- SMP - the price at which each MWh of electricity is sold under the Trading and Settlement Code in any given Trading Period. The SMP is made up of the sum of the shadow price and uplift;
- Shadow Price – a component of the SMP for each Trading Period which reflects the SRMC of the marginal generating unit; and,
- Uplift – a component of the SMP for each Trading Period which is calculated to reflect the Start-Up and No Load Cost elements of Schedule Production Cost for relevant Generator Units.

The figure below shows the average daily profiles for the first year of the market. It shows:

- The Load profile over the day in MW (black line);
- The Shadow Price (blue area);
- Uplift (red area). The top of the red area shows the SMP at that time; and,
- The spread which shows the volatility of the price at any time of the day. The graph illustrates a tendency for the SMP to be more volatile during peak periods.

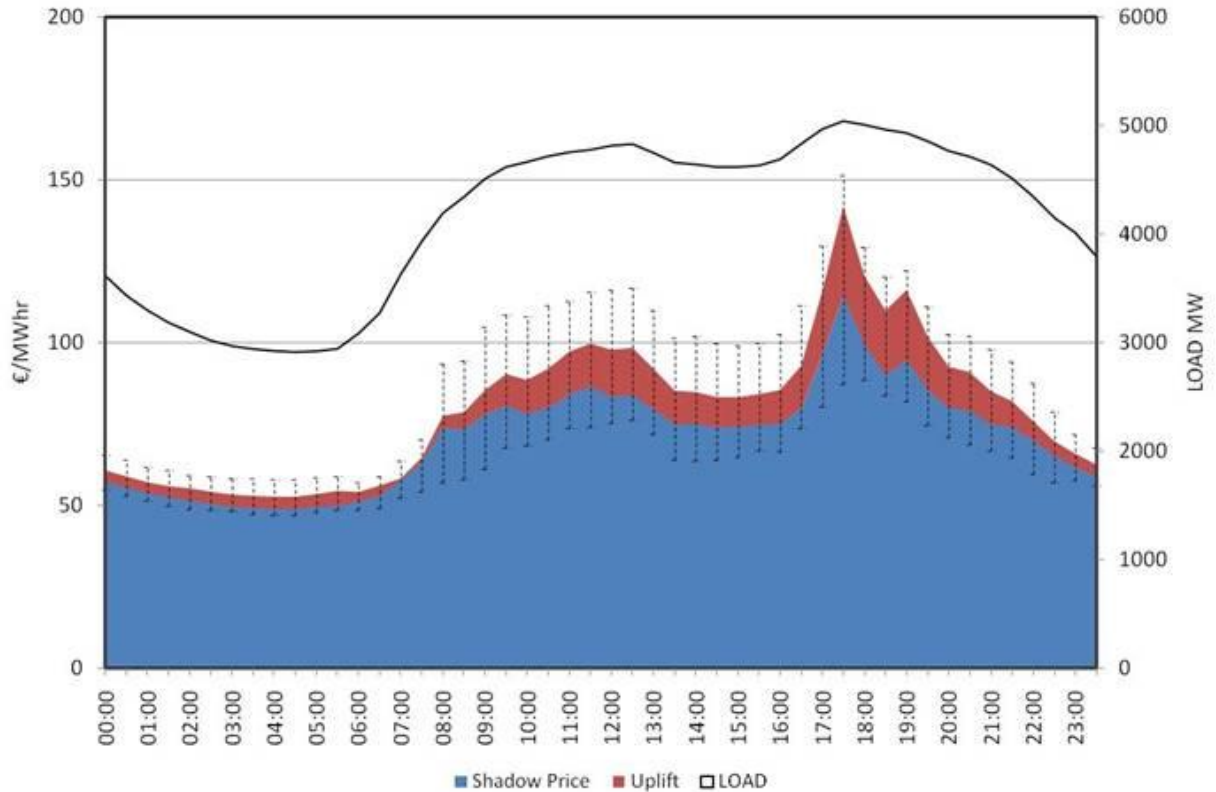


Figure 4: Average Daily Profiles for the first twelve months of the market

The profiles shown in the SEM broadly reflect what is found in other markets, for example the UK wholesale market, BETTA.

The following graph shows the SMP duration curve for the first year of the market. Similar to the load duration curve, the SMP duration curve illustrates the percentage time that the SMP is above a certain value. SMP is measured in euros per MegawattHour (€/MWh).

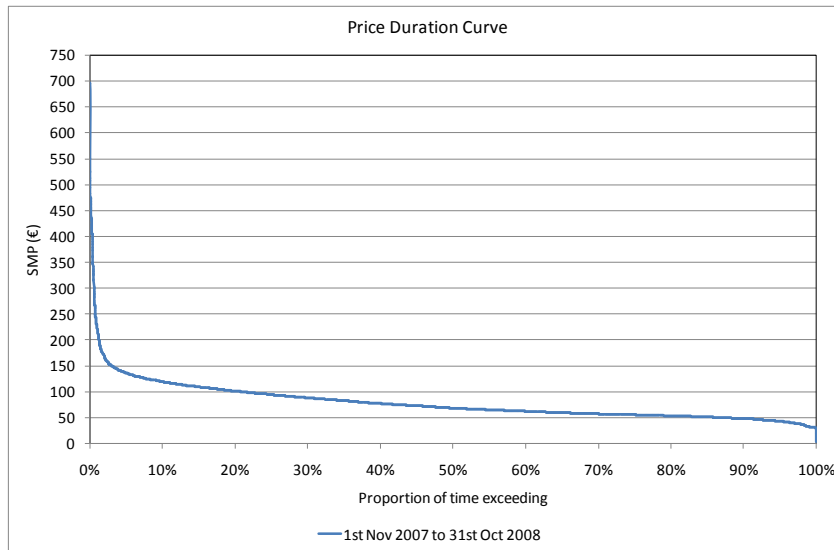


Figure 5: Price Duration Curve for first twelve months of the market

The graph illustrates the propensity for price spikes in the SMP. The graph shows a sharp descent at first that stabilises into a smooth descent from around the 4% mark. Of note is the fact that around 70% of half-hourly price outcomes fall between €50-€100/MWh, with only about 10% of half-hours yielding values below €50/MWh.

The table below shows the top ten incidences of SMP and the split between the shadow price and uplift at that time.

<b>Date</b>	<b>Period</b>	<b>SMP €/MWh</b>	<b>Shadow €/MWh</b>	<b>Uplift € MW/h</b>
<b>15/10/2008</b>	06:30:00	696.85	51.36	645.49
<b>15/10/2008</b>	06:00:00	694.72	49.22	645.50
<b>21/08/2008</b>	11:30:00	551.46	551.46	0.00
<b>13/06/2008</b>	11:00:00	525.70	517.96	7.74
<b>19/05/2008</b>	17:00:00	525.44	525.44	0.00
<b>24/11/2007</b>	17:00:00	524.65	524.65	0.00
<b>24/11/2007</b>	17:30:00	524.65	524.65	0.00
<b>03/12/2007</b>	17:30:00	513.45	513.45	0.00
<b>26/11/2007</b>	17:30:00	507.67	507.67	0.00
<b>06/05/2008</b>	21:30:00	499.68	499.68	0.00

Figure 6: Top Ten incidences of SMP in first year of the SEM

A number of the top ten incidences of SMP in the first year of the market occurred in November and December 2007 when the system margin (the level of available capacity above demand) was relatively tight and the Kilroot oil-firing facility was often being scheduled at the margin during peak periods.

The top two prices relate to a discrete event in which a significant uplift was computed for the first two periods of the trading day as a result of a single station being shut down after one hour in the MSP software run for that day, rather than running through to 12:00 as per the look-ahead calculation made on the previous day.

The table below shows the top ten incidences of Uplift, with the corresponding Shadow Price and resulting SMP.

<b>Date</b>	<b>Period</b>	<b>Periods</b>	<b>SMP €/MW/h</b>	<b>Shadow €/MW/h</b>	<b>Uplift € MW/h</b>
<b>15/10/2008</b>	06:00:00	1	694.72	49.22	645.50
<b>15/10/2008</b>	06:30:00	1	696.85	51.36	645.49
<b>07/06/2008</b>	06:30:00	2	350.28	73.52	276.76
<b>20/11/2007</b>	17:30:00	1	347.37	127.99	219.38
<b>31/03/2008</b>	02:00:00	8	261.72	55.47	206.25
<b>08/06/2008</b>	12:30:00	1	315.71	120.29	195.42
<b>14/04/2008</b>	01:00:00	14	246.05	60.23	185.82
<b>05/02/2008</b>	17:30:00	1	324.82	141.15	183.67
<b>19/02/2008</b>	18:00:00	1	327.34	148.66	178.68
<b>06/12/2007</b>	17:30:00	1	270.65	92.04	178.61

*Figure 7: Top Ten Incidences of Uplift*

This data is more diversely spread across the first year of the market, suggesting that uplift is a feature which will tend not to necessarily correlate with periods of tight margin. This is intuitively sensible, as one would expect uplift to be higher for periods in which units were called to start up and shut down over a short space of time. This can happen under a wide range of system scenarios. Indeed, units have been called for short-term (within-day) scheduling at various intervals over the first year of the market.

The first year of the SEM saw significant movements in the SMP as a result of the major fluctuations in the international fuel markets. In the early part of 2008, oil and coal prices reached record highs and gas prices reached levels not seen in a number of years. However in July, the price of oil and coal started to fall to lows that have not been witnessed for a number of years. The price of gas also fell but to a lesser extent. As the SEM is dominated by generators that run on fossil fuels, with gas making up approximately 64% of the electricity generated in



2008, the market carries through any price changes from those fuel markets into the wholesale electricity price.

Typically, electricity prices are higher over the winter months when electricity demand is high and fuel is usually more expensive. However, the fall in international fuel prices have pushed the cost of generation down and have meant lower wholesale prices going into the winter. The figure below shows the average daily SMP from 1 November 2007 to 31 December 2008.

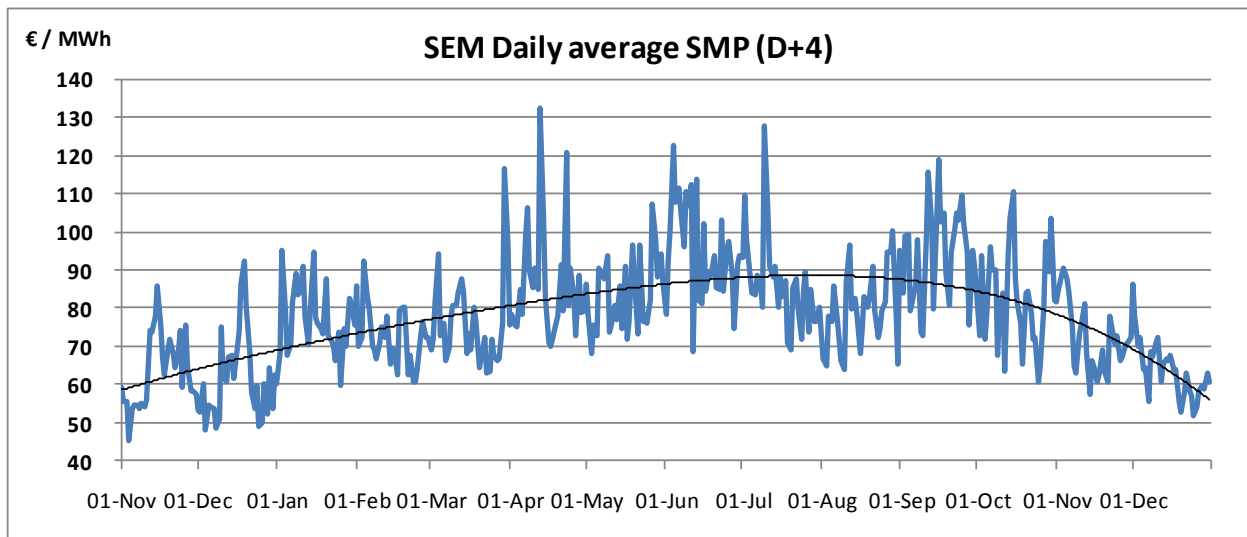


Figure 8: Daily Average SMP for first 14 months of the market.

Contracts which aid market participants to hedge against movements in SMP are described in the next section.

In addition to its ongoing monitoring role, the SEM Committee made a number of key decisions in the first year of the market such as a decision on the complaints made against generators regarding bidding. This decision and others are discussed in detail in Section 6.3.

## 5 SEM Directed Contracts

### 5.1 SEM Directed Contracts

As part of the SEM Market Power Mitigation Strategy, the Market Modelling Group implements a suite of Directed Contracts (DCs) on behalf of the RAs. Market Power is defined as the ability of a market participant, acting independently, to raise (or reduce) market prices consistently and profitably above (or below) competitive levels for a sustained period of time. They are designed to reduce significantly the incentive on market participants to submit bids above competitive levels or withhold capacity, in order to influence current spot prices or future contract prices.

There were three elements to the RAs' work on the implementation of DCs for the tariff year Q4 2008 to Q3 2009:

1. The quantification of the DCs required to mitigate market power in the SEM;
2. The pricing of the DCs; and,
3. The eligibility of suppliers in the SEM to subscribe to the DCs.

#### Quantities of Directed Contracts

The quantities of DCs imposed on the incumbent generators are set to achieve a desired concentration level in the market as measured by the Herfindahl-Hirschman Index (HHI). A HHI level of 1,150 was chosen and at this HHI level, both ESB Power Generation (ESB PG) and NIE Power Procurement Business (NIE PPB) were required to sell DCs (in the first year of the market, only ESB PG was required to offer DCs). Three products were offered – baseload, mid-merit and peak.

The quantities of DCs which ESBPG and NIE PPB were required to sell to eligible suppliers are shown below:

Quarter	ESBPG Quantities			NIE PPB Quantities		
	Baseload (MW)	Mid-Merit (MW)	Peak (MW)	Baseload (MW)	Mid-Merit (MW)	Peak (MW)
<b>Q4 2008</b>	244	135	460	0	0	0
<b>Q1 2009</b>	280	36	489	0	0	0
<b>Q2 2009</b>	237	110	n/a	0	107	n/a
<b>Q3 2009</b>	132	223	n/a	0	233	n/a

The contracts were sold in two separate subscription processes by incumbents ESB PG and NIE PPB. Each consisted of a Primary Subscription Window and a Supplemental Subscription Window, in which any unsold contracts were offered to those suppliers who had bought their full share in the Primary Subscription Window.

### Pricing of Directed Contracts

The prices of the Directed Contracts were determined each day during the subscription period using forward fuel and carbon prices and regression formulas determined by the RAs through econometric analysis. These formulas were designed to mimic the results of the validated SEM PLEXOS model.

The average prices for each product are shown in Euros and Sterling below:

<b>Product</b>	<b>Euro</b>	<b>Sterling</b>
	<b>€</b>	<b>£</b>
<b>Baseload</b>	91.30	72.29
<b>Mid-Merit</b>	102.77	81.36
<b>Peak</b>	162.20	128.42

### Supplier Eligibility

Using supplier Maximum Import Capacity (MIC) data and historical energy and load shape for each customer type, the RAs calculated the MW eligibility for each type of DC for each supplier for each of the DCs being offered by ESB PG and NIE PPB. Supplier eligibility was communicated to each supplier and to the DC sellers (ESB PG and NIE PPB).

In 2009, the RAs will complete the annual process of the implementation of DC's described above. This process has already begun with the publication of a consultation paper on the implementation of DCs for the tariff year Q4 2009 to Q3 2010.

## 5.2 SEM Non-Directed Contracts

While the RA's legal remit largely extends to DCs, licensed generators can also offer non-directed contracts in the market. In terms of non-directed contracts, the RAs do not set the price or the quantity of these as they are agreed on a bilateral basis between market participants. In the first year of the market, non-directed contracts were offered for sale by ESB PG and NIE PPB.

In addition to the above contracts, ESBPG also offered Irish generation backed by the Public Service Obligation (PSO) in the first year of the market.

The RAs take an active role in the monitoring and development of the SEM contracting market by assessing the reasonableness of prices during the ESB PG and NIE PPB auction processes and publishing the auction results. The RAs have also worked with participants on the development of a multi-lateral trading facility which is due to go-live in April 2009.

The key regulatory objective is to encourage the development of a robust, transparent and cost-effective means for the trading of risk management products in the market to the ultimate benefit of consumers. In this regard, an information note on Contracts for Differences was published in February 2009, which provides an overview of the contracting process ([SEM-09-016](#)).

## 6 The Market Monitoring Unit

### 6.1 Role of the Market Monitoring Unit

Along with the requirement to offer directed contracts, the market power mitigation strategy required that the MMU be established<sup>3</sup>. The MMU's role is defined as:

- Active monitoring of the SEM;
- Conducting investigations into the exercise of market power including but not limited to the violations of bidding principles or other market rules;
- Acting as the point of contact within the RAs for well documented complaints that upon investigation appear to have a sound basis<sup>4</sup>; and,
- Making recommendations, as necessary, to modifications to the Trading and Settlement Code which the RAs wish to initiate.

Further information can be found in reports published by the MMU such as the 6-month report ([SEM/08-101](#)) and a report covering the period 1 November 2007 to 31 December 2008 which is due to be published in the coming months.

### 6.2 Key Tasks carried out by the Market Monitoring Unit

The MMU's key ongoing tasks have evolved since market commencement. The MMU's resources are focussed on the following main tasks:

#### Monitoring Commercial and Technical Offer Data

The MMU is tasked with monitoring the data that is submitted by market participants for input into the Market Scheduling and Pricing (MSP<sup>5</sup>) software. Typically this primarily translates into the examination of Commercial and Technical Offer Data (COD and TOD) submitted by price-making generators<sup>6</sup>.

Large volumes of market data are taken from the SEMO systems each day onto the MMU's secure server by way of an automated poll. The data is then automatically uploaded into the MMU central database. The MMU examines the Commercial and Technical Offer Data on a

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<sup>3</sup> Full details are contained in the Decision paper Market Monitoring in the SEM (AIP/SEM/217/06) published in December 2006 and the initial Consultation paper (AIP/SEM/143/06).

<sup>4</sup> The MMU has no enforcement authority and is not an adjudicatory body. Enforcement actions, such as directions, are wholly administered under the joint regulatory arrangements between the RAs.

<sup>5</sup> This software is used by the Market Operator to determine Market Schedule Quantities for each Price Maker Generator Unit and to determine the System Marginal Price for each Trading Period.

<sup>6</sup> In principle, all participants are subject to the same rules. The scrutiny of all data submissions from all parties fall under the MMU remit.

daily basis, reconciling movements with any known changes in what are normally expected as underlying inputs (fuel price movements being the biggest driver of change from one day to the next).

As part of this exercise, a note is taken of any potentially anomalous data submissions that cannot be immediately reconciled with information the MMU has to hand. These are then referred up to a wider level of investigation depending on the nature of the potential anomaly.

### **Analysing SEM Outputs**

Concurrent with the daily examination of COD and TOD is the analysis of the SEM outputs; most notably Shadow Price, Uplift and the Market and Dispatch Quantities for each Unit. The MMU, on a daily basis, build an explanation of what market input data (COD, TOD, Unit Availability and Demand) has acted to drive the market outcomes. This includes searching for the 'price-setting' unit where one can be identified. This work is also concerned with monitoring for instances which may arise, both within-day and across multiple days, under which one or more participants have an opportunity to benefit from the exertion of market power.

### **Hardware and Software Maintenance and Development**

The MMU systems sit on a dedicated server with several programs configured to automatically manage and query the market data that is downloaded from SEMO's systems. In addition, the MMU has developed several software tools for analysing the raw market data. Ongoing development of these tools forms a key task undertaken by the MMUs.

### **Reporting**

The MMU reports to the SEM Committee via the Oversight Committee. This reporting features regular written and oral reporting of market outcomes. The MMU also provides regular presentations and updates to the RAs, as well as circulating daily summaries of market behaviour to the same. In addition, the MMU publishes reports from time to time.

### **Enforcement of Rules**

The work performed in analysing the detailed market data feeds into the overarching MMU function of ensuring that the market inputs and outputs are commensurate with the regulatory expectation under the standing rules. Typically, this body of work includes liaison with market participants and the System and Market Operators in order to pursue issues the MMU sees as relevant.

Depending on the outcome of the MMU's queries, this work may feed into the issuance of decisions, clarifications or directions by the SEM Committee.

## Policy Development

The MMU also assist with policy development.

The following pie chart shows a breakdown of the time the unit spends on the main tasks.

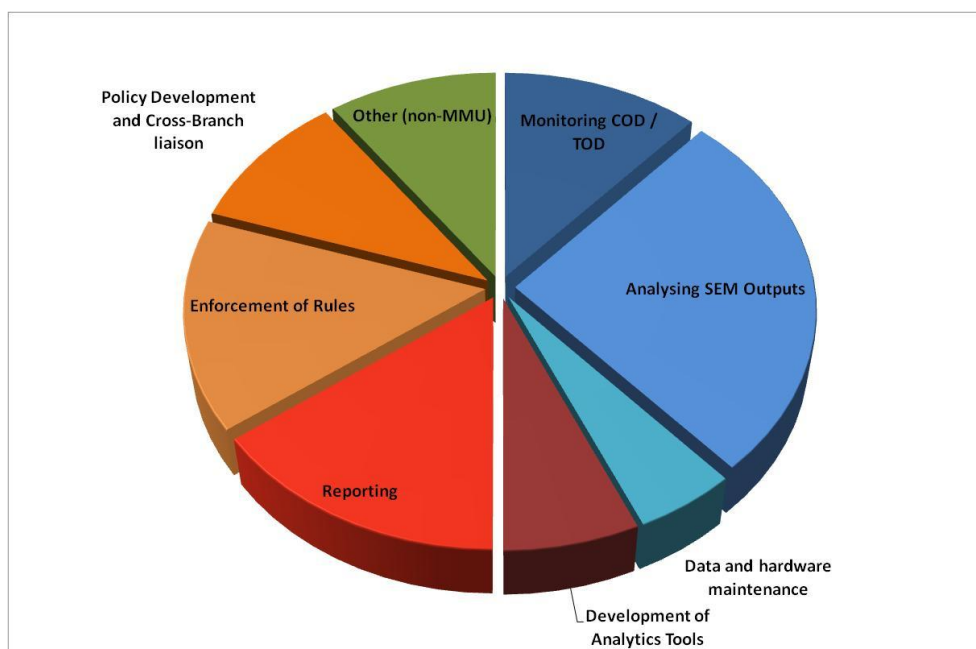


Figure 9: Pie chart of the breakdown of the time the MMU spend on the key tasks

### 6.3 Key MMU issues thus far

This section examines the key issues and developments that have occupied the MMU since the market commenced on 1 November 2007.

#### Formal Bidding Inquiry

In November 2007, several participants expressed concern to the RAs about the bidding strategies being undertaken by other participants in the SEM. These concerns were followed by the submission of official complaints from a number of participants regarding compliance with the bidding code of practice, which sets out the principles for generators bidding into the market.

Following receipt of formal complaints from Viridian Power and Energy and Premier Power, the MMU launched an inquiry into the means by which participants with Generator Units had / were interpreting the Bidding Code of Practice with regard to the construction of their COD. The SEM Committee's final report on the outcome of that inquiry was published on 12 June 2008 ([SEM-08-069](#)). This report presented the SEM Committee's consideration of each complaint and gave directions to generators on what should be included in their bid. In summary, the outcome of the

inquiry clarified how start-up costs should be bid into the market. In addition, the bidding of fuel contract prices was also made clear.

### Contest for Baseload Operation

Following the commencement of the SEM, some units that had previously operated as 'baseload' units or on a load-following profile began to receive shut-down / start-up ('two-shifting') market scheduling and/or dispatch instructions. This effect formed the core issue that led to the inquiry mentioned above. Notwithstanding the conclusions made by the SEM Committee in their paper of 12 June, this topic is one of ongoing work for the MMU. At the time of writing, a project was underway in which the technical impacts of repeated generating unit shutdowns are being investigated. This work is expected to be completed in Q2 2009.

### General Market Direction on Transmission Loss Adjustments

In December 2008, the SEM Committee published a general direction regarding the inclusion of Transmission Loss Adjustment Factors (TLAFs) in COD.

### Bidding the Opportunity Cost of Carbon Dioxide

Another decision of note was that on bidding the opportunity cost of carbon dioxide ([SEM-08-032](#)) into the market. In light of the responses received to the consultation, the SEM Committee decided against allowing greater flexibility in the bidding of carbon dioxide allowances.

## 6.4 Future Work for the MMU

In 2009, the MMU resources will be channelled mainly towards:

### Expansion of Analytic Functions

The MMU plans to develop an increased quantitative sophistication in its approach to data analysis. This is hoped to prove particularly fruitful in the context of a reasonable history of market data available.

### Continuing progression of the 'two-shifting' issue

The issue of unit dispatch and scheduling in the SEM presents an interesting challenge in light of the inquiry and the SEM Committee's subsequent decision. This topic is expected to occupy much of the research and development focus during 2009.

### Governance project

While the MMU has established an effective *Modus Operandi* following its inception during 2007, it is the case that a wealth of international experience exists regarding the monitoring of wholesale markets. The MMU plans to invest resources in the second quarter of 2009 aimed at



identify industry best-practice. The issue of policy regarding publications will fall within reviewing MMU governance structure as some monitoring undertaken by the MMU has led to confidentiality issues.

## 7 SEM Capacity Payments Mechanism

### 7.1 Overview of the Capacity Payments Mechanism

The Capacity Payments Mechanism (CPM) is managed within the electricity section of NIAUR, with shadow management responsibilities falling to the CER. The CPM falls wholly under the Joint Regulatory Arrangements and thus lies under the administration of the SEM Committee. While quantification of the Annual Capacity Payments Sum (ACPS) is undoubtedly the most onerous task carried out for the CPM by the RAs, management of the Code parameters dictating the rules for distribution and collection of the ACPS also falls with the remit.

The CPM was designed in liaison with interested parties through extensive consultation prior to market commencement. The CPM is a fixed revenue system whereby Generators are paid regulated quantities (Capacity Payments) of money for providing available generation capacity to the market. The money is sourced by concurrent Capacity Charges levied on all Suppliers that purchase energy from the pool.

The core of the CPM takes the form of a fixed annual sum of money, called the Annual Capacity Payments Sum, which is calculated by the RAs on an annual basis. The ACPS for the Trading Years 2007, 2008 and 2009 were / are:

Year	Total ACPS (€)
2007	450,517,348
2008	575,221,470
2009	640,854,720

The ACPS is very large in gross terms, typically constituting around 15% of total generator revenue. It constitutes approximately 11% of end consumers' electricity bills.

### 7.2 Objectives

Following consultation with both governments and industry, the objectives of the CPM were decided as<sup>7</sup>:

1. **Capacity Adequacy;** The CPM must encourage the construction and maintenance of available capacity. Additionally, it should encourage short-term availability when required and efficient outage scheduling;

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<sup>7</sup> Taken from AIP-SEM-95-06

2. **Efficient Long Term Price Signalling;** The CPM should provide efficient signals for long term investment and should not double pay generators;
3. **Price Stability;** The CPM should reduce market uncertainty compared to an energy only market, taking some of the volatility in price out of the energy market;
4. **Susceptibility to Gaming;** The CPM should not be susceptible to gaming and, ideally, should not rely unduly on non-compliance penalties;
5. **Fairness;** The CPM should be fair, maintaining a reasonable proportionality between the price to achieve capacity adequacy and the benefits derived from that adequacy; and
6. **Simplicity;** The CPM should be transparent, predictable and simple to administer, recognising that such a criterion will offer better incentives for longterm investment.

The following sections discuss the regulatory experience thus far, before returning to the objectives to assess the degree to which, from a regulatory perspective, these objectives have been satisfied.

### 7.3 Quantification of the ACPS

The regulatory exercise undertaken annually to quantify the ACPS involves the calculation of two key parameters which are multiplied together; a Price component and a Volume component:

$$ACPS (\text{€}) = Price (\text{€/MW}) \times Volume (MW)$$

The Price is set by reference to the annual Fixed Costs of a Best New Entrant Peaking Unit. The Volume is set by reference to the Capacity Required to exactly meet the Generation Security Standard.

The specific settings within each component are numerous and detailed. The reader is referred to the relevant consultation, information and decision papers on the AIP website to obtain further information.

### 7.4 Capacity Payments and Charges

The rules for the distribution of the ACPS amongst Generators and the rules for collection of the funds from Suppliers are dictated in Section 4 of the Trading and Settlement Code. Additional supplementary instructions for related market functions are stipulated in Appendix M.

The following fall under the RAs' remit:

1. The splitting the ACPS into 12 monthly 'pots';
2. The splitting of the ACPS into the three streams (Fixed, Ex-Ante and Ex-Post); and,

### 3. The setting of the Flattening Power Factor.

The SEM Committee thus far has retained the settings that were decided upon prior to market commencement, with the intention of more fully and quantitatively examining their efficacy in the short to medium term.

## 7.5 Performance Against Objectives

It is worth outlining the RAs' view on the degree to which the original objectives have been satisfied:

### 1. Capacity Adequacy

Ensuring there is adequate generation capacity to serve the demand for electricity is the first objective of the CPM. It is likely that the market is too new to properly judge the performance of the CPM on this, but the evidence to date is positive. The SOs and the RAs have seen significant interest in new conventional and renewable developments over the past few years (during which time the CPM design has collectively been formulated and implemented).

Under this objective, it is reasonable to discuss the outturn reliability of conventional generating units following the start of the market. Generally this has been shown as moderate, in that availability is similar to what it was pre-SEM. This may be a systemic problem with units on the island as it the RAs' view that the payment for capacity is a clear signal for generators to be available when needed. Also it is likely that a longer period of market operation will be required before a more rigorous assessment can be made regarding the outturn reliability of the existing units.

### 2. Efficient Long Term Price Signalling

#### Efficient Entry Signalling

Under the capacity adequacy objective it was stated that the RAs are encouraged by the strong interest in new generation development on the island, and that subsequently, it is deemed likely that the CPM is well addressing the capacity adequacy objective so far. However, it is unclear whether this interest in new investment is efficient. There are a myriad of contributing factors to consider in concert with the impact of CPM on the overall signal, from payments for Ancillary Services to the scope for increased interconnection with other markets. As such, it is probably too early to draw conclusions about the degree to which the CPM, which forms only a part of the SEM, has succeeded in securing efficient entry into the market. Indeed the evaluation would be better made on the SEM as a whole, as the CPM is complementary to the complete (unconstrained schedule/ SRMC bidding / marginal pricing) design.

## **Efficient Exit Signalling**

Creating an efficient exit signal is an important objective of the CPM. The RAs feel this is closely linked to the issues surrounding fairness and stability in the Intra-year payments, as the mechanism is deemed to be largely paying inflexible units on a level footing with flexible units, during periods of the Trading Year when high levels of availability are not necessarily required. Again this cannot be assessed in isolation and without detailed quantitative analysis, but is an issue the RAs are eager to pursue.

### **3. Price Stability**

Price Stability was set as an objective under the premise that the CPM would be capable of removing what would be a large degree of volatility in energy prices under an energy-only market model. For the purpose of discussion, the objective can be split in two:

#### **Inter-Year Stability**

The perceived repeatability, bankability and consistency of the regulatory process governing the annual quantification of the ACPS has been a key issue repeatedly raised by Generators and other interested parties. The issue of improving the process with regard to the perceived stability in particular of the BNE component is currently under public consultation.

#### **Intra-Year Stability**

The apparent stability, or predictability of the monies that Generators can expect to earn (and Suppliers expect to pay) within-year is generally very stable in the RAs' considered view. The current settings (described below) are such that, once the ACPS has been quantified, CPM revenues for most participants can be accurately forecast to within 1% for the year (assuming no catastrophes regarding availability).

The settings are strongly geared toward price stability:

1. The twelve monthly pots are split using reference to the annual load shape, creating a smooth monthly profile with payments in summer typically dipping to around 60% of the magnitude of winter payments.
2. 30% of the Generator payments are profiled year ahead (Fixed Pot) with reference only to load shape (i.e. ignoring availability or margin).
3. A further 40% of the Generator payments are profiled month-ahead.

These effects tend to stabilise the payments that Generators receive over a year. While this can be seen as a success in terms of meeting the objective, it is the RAs' view that some of the other objectives may be being under-addressed as a result of this. This is elaborated on in the assessments of the other objectives below.

#### **4. Susceptibility to Gaming**

Generally it is thought that the present CPM settings are very difficult for any individual party to effectively game. This is largely due to a combination of:

1. Effective market power mitigation measures, including active monitoring of availability and potential investigations into discrete outage events, which generally discourages capacity withholding; and,
2. The smooth spread of CPM monies across the Calendar Year and the application of a Flattening Power Factor to reduce volatility in the payment streams. This makes short-term capacity withholding a more difficult gamble, as the expected payoff will likely be lower than what it would be under a more volatile payment setting where payments may become very high during periods of tight margin.

#### **4. Fairness**

The RAs are interested in pursuing the degree to which this objective has been satisfied thus far.

#### **5. Simplicity**

Achievement of this objective is hard to judge, but given industry knowledge presented to the RAs under consultation exercises, as well as a strong display of knowledge from potential investors and associated parties that have been in contact with the RAs over the past year and who were not part of the SEM development process, current and potential participants appear to have a sound knowledge of the CPM. This may suggest scope to increase the complexity of the mechanism, which is encouraging as the progression of issues regarding the balance of stability and potential augmentations to help encourage Quality of Capacity will certainly require, under any guise, an increase in the complexity of the CPM rules.

#### **7.6 Future Work**

The SEM Committee is currently examining the issue of stability of the Best New Entrant Fixed Costs which in turn affects the total pot of money of capacity payments. This is being progressed presently via a consultation on potential methods to improve the stability of the BNE Fixed Costs that are calculated each year by the RAs.

Towards the end of 2009, the SEM Committee also plans to examine a number of issues relating to the CPM. This review may consider the Capacity Requirement Settings, incentivising unit flexibility and start reliability and a review of the efficiency of present capacity payment parameter settings.

## 8 SEM Trading and Settlement Code

### 8.1 Role of the Trading and Settlement Code Team

The Trading and Settlement Code team, based in CER, manages the SEM rules and the development of these rules on behalf of the SEM Committee, with the central focus of this role being on the SEM Trading and Settlement Code (the Code). The Code is a multilateral contract which sets out the rules and procedures concerning the sale and purchase of wholesale electricity in Ireland and Northern Ireland. The Code was designated by the RAs on 3 July 2007 and can be modified from time to time thereafter, in accordance with procedures set out in the Code.

The role of the Code Modifications Committee, which comprises representatives from industry participants, is, among other things, to consider and report on proposed modifications to the Code.

### 8.2 Modifications Committee

There were eight meetings of the Modifications Committee held during the first year of the SEM. Over the course of the year, the Modifications Committee, guided by the Secretariat, modified its process for dealing with Modification Proposals which has resulted in notable improvements. These have been achieved through the following:

- Working groups are now being set up to develop certain Modification Proposals;
- The Modifications Committee regular meetings are more organised; and,
- The Modification Recommendation Reports are increasing in quality.

The Modifications Committee issues a Modification Recommendation Report to the RAs and the SEM Committee subsequently issues a decision on the proposed modification. The following can be found on the Single Electricity Market Operator's (SEMO) website<sup>8</sup>:

- All modification proposals submitted to date;
- All the SEM Committee decisions made on Modifications Proposals thus far; and,
- The latest version of the Code.

### 8.3 Key Code Modifications

During the course of 2007 and 2008, the SEM Committee has approved the following significant Code Modifications:

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<sup>8</sup> [www.sem-o.com/modifications\\_committee/](http://www.sem-o.com/modifications_committee/)

### **Inclusion of Aggregated Generator Units (AGU) in the SEM (Modification 05\_08)**

This Modification sought to allow the participation of a Generator Unit in the SEM that is the aggregation of several Generators in different locations covered by different Connection Agreements, where all the generators are at or below the De Minimis threshold. This type of Generator Unit is analogous to the concept of the Aggregated Generating Unit, which already exists in the Grid Codes.

In addition to the Code changes set out in the Modification, before the registration of an Aggregated Generator could take place, significant issues and obstacles concerning licensing/governance requirements in both SEM jurisdictions and metering arrangements required resolution.

On the 20 August 2008, the SEM Committee approved this Modification with immediate effect. On the licensing and compliance issue, the RAs issued a consultation in the form of a contract which Generator Aggregators are required to enter into with the appropriate RA to ensure compliance with the suite of SEM documentation, including the Bidding Code of Practice. The SEM Committee issued its decision on the AGU Agreement on 18 December 2008.

### **Correction of Excessive Credit Cover Requirement (Mod 72\_08)**

This Modification makes changes to the basis of the calculation of required Credit Cover under the Code in order to allow “netting” at participant level, and thus reducing the participants required credit cover. The proposal was originally returned to the Modifications Committee by the RAs requesting them to conduct a consultation and complete further work.

This work was subsequently carried out and a revised Modification was approved by the Modifications Committee at its meeting of 27 May. The RAs received the final recommendation report on 10 July. The RAs considered the effect this proposed Modification had on competition, noting that it would provide efficiency benefits to Participants with both Generator Units and Supplier Units, but not to any Participant with only Supplier Units. The SEM Oversight Committee took the view that given the ability of Participants with both types of Units to use Settlement Reallocation Agreements to achieve a very similar effect to that of the proposal, the competition effects must be small, whereas the operational efficiency benefits to affected Participants should be significant.

On 20 August, the Oversight Committee approved the Modification with an effective date to be proposed later by the Modifications Committee and the Market Operator. This was eventually chosen as being 16 January 2009, the day of the Day+1 Project came into operation.

### **Enduring Application of DLAFs (Mod 43\_08)**

At the time of the initial designation of the Code, it was recognised that the System Operators were not in a position to deal with Distribution Loss Adjustment Factors (DLAFs) in the way that



the Code envisaged. For this reason, interim provisions were included in Section 7 of the Code which allowed the then existing (and inaccurate) arrangements to continue for an interim period.

On 11 September 2008, SONI submitted an Urgent Modification to put in place an enduring solution to the problem of dealing with DLAFs under the Code. However this Modification was subsequently withdrawn to reflect concerns in relation to the implementation date and EirGrid implementation issues.

A revised Final Recommendation Report was sent to the RAs on 25 November 2008 and subsequently reviewed and considered by the Oversight Committee. The RAs approved this Modification on behalf of the SEM Committee and directed it be made on a Settlement Day basis with effect from 1 January 2009.

Furthermore, the Modifications Committee has numerous policy modifications in the pipeline which the RAs are inputting into through the various stages of the Modifications process. Of particular significance is the following Modification currently under consideration:

#### **Dual Rated Generator Amendment (Mod\_34\_08)**

This Modification Proposal is still under development by the Modifications Committee, which held a series of working groups to consider the topic. This Modification seeks to address the MSP software and market rules inability to handle dual-fuel generators. The rules and the software is particularly out-of-line with the arrangement of the Kilroot Generator as the unit has a higher output when fired on oil than coal and the unit requires a six-hour changeover period (which includes a significant drop in output for approximately one hour).

This arrangement is modelled in Kilroot's COD and TOD by pricing all but the last Price/Quantity pair on coal and the last pair on oil with a dwell time included in their TOD to cover the changeover. The result of this arrangement has been that the Kilroot units have been setting a high SMP in many Trading Periods.

The intention of the proposed Modification is that the arrangements at Kilroot will be modelled more accurately and therefore Kilroot-related "price spikes" should reduce.

#### **Parameters**

During 2008, the RAs consulted on several policy-related Code parameters. The Price Cap, Price Floor and the Uplift parameter values to apply in 2008/2009 remained unchanged from the 2007/8 values. The RAs also issued a consultation and decision paper on the Value of Lost Load to apply for the SEM year 2008/2009. This was updated by applying the weighted average

of the year-on-year increases in the Irish and UK Harmonised Index of Consumer Prices. Thus, VOLL for 2008/2009 has been set at €10,390/MWh.

In addition to the above, the RAs published SEM Committee decision papers, together with relevant MO or SOs' reports and responses and comments from interested parties on the following TSC parameters for 2009:

- Credit Cover parameters;
- MSP Software parameters;
- Annual Capacity Exchange Rate;
- Uninstructed Imbalances parameters;
- Flattening Power Factor; and,
- Settlement Recalculation Threshold.

Nothing in the responses received led to a change in the values proposed in the consultation papers for 2009, which were broadly in line with the parameters chosen for the first 14 months of the SEM.

## 8.4 Other Significant Issues

### MSP Software – Scheduling Mechanism & Pricing

In 2008, the RAs became aware of SEMO's use of Mixed Integer Programming (MIP) rather than Lagrangian Relaxation (LR) in the MSP Software. Under its normal operational process, SEMO uses LR to set the market schedules and Shadow Prices.<sup>9</sup> However, SEMO has an internal procedure which states that MIP is used as either a "sanity" check on the LR solution or as an alternative to the LR solution in certain instances where the LR solution delivered is questionable.

Since becoming aware of this issue, the RAs have consistently advised SEMO to make participants aware of this internal business process and to raise an appropriate modification to incorporate it into the Code. Accordingly, in August 2008, SEMO held a workshop with participants on this issue and explained that where the LR methodology produces an SMP for any Trading Period greater than €500/MWh or less than €5/MWh, SEMO will rerun the results over the relevant optimisation Time Horizon using the MIP methodology. SEMO will then choose which set of results shall represent the Market Schedule Quantity for each Price Maker Generator Unit and the SMP for each Trading Period of that Trading Day. If the MIP run of the software meets certain criteria such as lower production costs and lower consumer costs, the MO will publish the MIP prices and schedule.

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<sup>9</sup> This is outlined in the Unconstrained Unit Commitment (UUC) certification report, which is published on the All Island Project website.

Over the longer term, SEMO has agreed to conduct a study on the respective merits of using LR and MIP as the default optimisation programme in the SEM.

### **Interim Market Audit**

As part of the Code rules, an annual Market Audit is undertaken, the scope of which is consulted on and determined by the RAs. For the audit for the first year of the market, the RAs determined the scope in November 2007 and appointed Deloitte Touche Tohmatsu as Market Auditor in 2008 for a 3-year period. The scope focuses on compliance with the TSC provisions by SEMO. The Audit is undertaken in two stages – an interim report to the RAs and a full market audit report to the RAs and participants.

The Interim Audit Report was received from the Market Auditor on 27 November 2008 and presented to the Oversight Committee on 2 December 2008. The report identified a number of issues, none of which were material. The full Audit Report is due to be presented to the SEM Committee in March 2009 and to the Modifications Committee in April 2009.

## **8.5 Future Work**

In addition to continuing its work overseeing changes to the Code and operation of the market during 2009, the Trading and Settlement Code Team shall engage in market development work. During the first half of the year the team shall examine issues facing Interconnector trading between the SEM and BETTA in the future and wider issues associated with market coupling with BETTA in the medium term will also be examined. In addition issues that may face market operators as a result of changing generation mix and increasing wind capacity will also be explored.

## 9 Single Electricity Market Operator Regulation

### 9.1 Role & Establishment of SEMO

The development of the SEM led to a requirement for a Single Electricity Market Operator (SEMO) to administer the market. With this in mind the RAs approved the intention of EirGrid and SONI, the transmission system operators for Ireland and Northern Ireland respectively, to establish SEMO on a contractual Joint Venture basis.

SEMO's role in the market is explicitly defined in the Trading and Settlement Code (the Code), which sets out the rules, procedures and terms and conditions which all parties, including SEMO, must adhere to in order to participate in the SEM. In addition, both EirGrid and SONI must comply with the conditions imposed by their respective MO licence.

As defined in section 1.3 of the Code, SEMO's role can be summarised as being "to facilitate the efficient, economic and coordinated operation, administration and development of the Single Electricity Market in a financially secure manner".

SEMO's performance thus far is detailed in the monthly Market Operator reports which are available from SEMO's website ([www.allislandmarket.com](http://www.allislandmarket.com)). In summary, SEMO has performed well and continues to show improvement.

### 9.2 SEMO Regulation

The SEMO Regulation team, based in NIAUR, is responsible for all regulatory activities regarding SEMO. The key activities carried out by this team since market the SEM commenced are detailed below:

#### Market Operator Licence Compliance

The SEMO Regulation team monitor the status of both MO licences (SONI and Eirgrid) on an ongoing basis to ensure that the requirements of the licence are being met and managed. SEMO are required to produce deliverables on an annual basis and the regular checks and communication with SEMO have, in the main, ensured the timely delivery of these licence requirements.

#### Communication with SEMO

The SEMO Regulation team has built up a good working relationship with all sections of the SEMO organisation. The relationships have developed through participation in industry

meetings such as the Modifications Committee Meetings, Market Operator User Group Meetings and Market Operator Special Topic Meetings. There is also a regular monthly meeting between SEMO and RAs which covers all aspects of SEMO Regulation activities such as licence compliance and the status of any ongoing projects being managed by SEMO. In addition to the above, quarterly meetings, between SEMO management and the relevant RA Directors, cover strategic areas and major projects, along with an overview of the financial status of SEMO. The regular meetings have resulted in an open and cooperative relationship being developed between SEMO and SEMO Regulation team

## **Projects run by SEMO**

A key area of work for the SEMO Regulation team has been to work closely with SEMO in relation to the major projects requiring regulatory approval for cost recovery. The main projects that have occurred since the beginning of the SEM are detailed below.

### **MO's Revenues and Tariffs 2008 – 2009**

The SEMO Regulation team was the key point of contact for the development of SEMO's revenues and tariffs for the period November 2008 to October 2009. Key activities and deliverables included:

- Analysis of SEMO's revenue submission;
- Analysis of constraints and other high value costs; and,
- Approval of the SEMO costs for the tariff year.

### **Market System Development Plan (Day 1+)**

The Market System Development Plan (MSDP) for 2008 was primarily driven by the delivery of the requirements detailed in section 7 of the Code. SEMO produced a business case for this project and submitted it to the RAs for approval. The SEMO Regulation team carried out a detailed analysis of the proposed scope and costs and directed SEMO to carry out a consultation with market participants. Although this delayed the delivery of the Section 7 requirements, the final scope and costs was more efficient and beneficial than the original business case. The Day 1+ project was delivered by SEMO (on target) in January 2009.

### **TSC Modifications Panel**

In addition to the above activities, the SEMO Regulation team has a 'shadow' role in relation to work carried out on the Code, which is led from the CER. This work entails attending Code Modifications meetings, reviewing Final Recommendation Report on Modifications, with a particular focus on Modifications that may incur a financial cost.

### **9.3 Key work items for second year of the market**

The SEMO Regulation team will continue to carry out the activities mentioned above for the coming year. In addition, the team will focus on the following areas of work.

- SEMO Ex post Review and determination of K factor for first tariff year
- SEMO 2-Year Market System Development Plan
- SEMO Price Control for October 2009 Onwards
- SEMO Website Cost Approval
- SEMO Business Case and Cost approval as a result of MSDP on a case by case basis
- Monthly and Quarterly Regulation Meetings with SEMO
- Attendance at Code Modification Meetings & associated working groups.

## 10 SEM Related Developments

### 10.1 Introduction

There are a number of areas related to the SEM where work has been undertaken by the RAs on an all-island basis. Some developments which have already taken place include a harmonised shallow connection charging regime for transmission-connected generators on the island. Work is also underway on the detailed design of harmonising certain all-island Ancillary Services arrangements. The RAs are carrying out a consultation regarding the principles underlying dispatch of all types of generation, including renewables, in 2009.

In addition to this, while retail is not strictly an SEM matter, it is an area where there is a cross-regulatory cooperation.

### 10.2 The all-island Transmission Network

#### Constraints

The dispatch balancing costs are funded via the imperfections charge levied by SEMO. The budget is estimated and managed annually by the system operators. It is currently approximately €120 million per annum on an all-island basis. This budget is monitored by the RAs. There are two aspects to constraint costs:

1. Network constraints – the need for generation in specific locations; and,
2. Generation constraints – reserve holding, ramp rates, perfect foresight issues etc.

The system operators held a scheduling and dispatch workshop for generators and other interested parties in May 2008, with the aim of providing further transparency in this area. Subsequent to this, the SOs published details of their current transmission constraint groups and reserve holding policy.

#### Ancillary Services

Currently Ancillary Services (AS), which include services such as operating reserve and reactive power that are not part of the SEM, are procured and paid for by the TSOs - EirGrid and SONI, on a jurisdictional basis. Following consultation, the SEM Committee published a High Level Decision paper providing a policy framework for the harmonisation of AS across the island. This decision included information on the all-island AS arrangements for generator payments/charges, as well as a commitment to incentivise compliance by generators with the Grid Codes.

Industry workshops were held in April and May 2008 when the TSOs discussed the detailed potential harmonised arrangements with industry participants. Subsequently, in September, the RAs approved the publication of a consultation paper containing the TSOs' detailed proposals for implementing harmonised arrangements for AS. This paper was the subject of an industry briefing session in October which was chaired by the TSOs and involved the RAs explaining the proposals.

The RAs considered the TSOs' proposals and, having reviewed comments received to the September consultation, the SEM Committee found that they were generally in agreement with the principles of the High Level Decision. Accordingly on 30<sup>th</sup> January 2009, the SEM Committee published a decision ([SEM-09-003](#)) on the detailed harmonised all-island AS arrangements, covering:

- Ancillary Services:
  - Reserve;
  - Reactive Power; and,
  - Black Start.
- Generator Trip, Short Notice Declaration and Testing Charges; and,
- Generator performance incentives to encourage generator units to meet a number of selected Grid Code parameters in each jurisdiction.

The actual rates for the harmonised payments/charges and generator performance incentives (under these arrangements) will be the subject of a separate consultation by the TSOs in Q2 2009. The rates, charges and incentives will then be decided by the RAs in Q3 2009. This is with a view to commencing the harmonised all-island AS arrangements at the start of the next tariff period, i.e. 1st October 2009.

### **Transmission Use of System Charges/Transmission Loss Adjustment Factors**

In June 2008 the RAs issued a consultation paper on the proposed methodology for deriving all-island generator Transmission Use of System (TUoS) charges. Following this, the RAs decided not to proceed with harmonised all-island TUoS charges for the tariff year October 2008 to September 2009 due to the volume and nature of the concerns raised by market participants in response to this consultation and due to the residual uncertainties over the impact, year-on-year of tariff volatility and robustness of certain aspects of the proposed methodology.

Following earlier consultation, in November 2008 the SEM Committee published the all-island Transmission Loss Adjustment Factors (TLAFs) Decision Paper together with the TLAFs to apply to generators for 2009.

In January 2009 the RAs published a paper which outlined the way forward on all-island TUoS and the related issue of TLAFs, the latter which are already harmonised on an all-island basis. As stated in the paper, the TSOs, EirGrid and SONI, have now commenced a joint review of the



options and methodologies for deriving harmonised all-island generator charges - TUoS and TLAFs - in order to put in place an enduring framework appropriate to the all island transmission networks. This review will also include a consideration of demand TUoS charges. It will take into account, amongst other things, the issues of appropriate costing of the networks and the mitigation of year-on-year tariff volatility and/or unpredictability. The TSOs will engage with industry as part of this review, and will develop a paper for the RAs covering the proposed pros and cons of each overall option for TUoS/TLAFs, an indication of the impact on generator tariff levels, and a preferred approach with the possible associated go-live date. This will then be publically consulted on, with a policy decision by the RAs issued thereafter. The detailed charges themselves would also be consulted and decided on by the RAs following the policy decision.

### Connection Charging Statement

In December 2007 the SEM Committee published a consultation paper requesting views on draft transmission connection charging statements. These statements were proposed by EirGrid and SONI and reflect a harmonised shallow connection charging regime for transmission-connected generators on the island. In February 2008, the comments received were reviewed and presented in a decision paper in respect of the issues raised, along with approval of the finalised transmission connection charging statements for the SEM.

### 10.3 All-island Wind Policy

To promote discussions and identify potential solutions to issues arising from increased levels of wind generation on the island of Ireland in the context of the SEM, the RAs, under the auspices of the SEM Committee, published a discussion paper regarding the policy for large-scale, intermittent non-diverse generation early in 2008 ([SEM/08/002](#)). This was published in the context of the publication of the EU Climate Change Package in January 2008 which set out obligatory renewable energy targets for Member States and in the context of the publication of the All-Island Grid Study. In publishing this discussion paper, the RAs noted the legal framework governing the SEM and the role for governments in relation to renewable support schemes which rest outside the SEM.

The discussion paper recognised that increasing wind penetration brings benefits but also poses challenges, notably in the context of system operation. From a Code perspective, the paper discussed the compensation of wind generation when constrained down, the setting of the SMP with increasing wind on the system and the remuneration of wind under the capacity payment mechanism. Following review of comments received, the RAs published an initial response paper which set out the next steps to be undertaken in this regard ([SEM-08-127](#)).

Since the publication of the initial response paper, the RAs have published preliminary analysis of the remuneration of generators under the capacity payments mechanism for the first eight months of the market ([SEM/08/177](#)). Further analysis is being undertaken in this regard to

ensure appropriate remuneration of all generators under that mechanism. In addition, the RAs committed in the initial response paper to carry out market modelling to assess the impact of various generation portfolios on future SMPs and associated revenues to various generation technologies. This work has been published in January 2009.

Finally, the RAs are carrying out a consultation regarding the principles underlying dispatch of all generation and associated Code issues in early 2009.

## **10.4 Retail Market in the SEM**

### **Current Tariffs**

The retail markets North and South currently operate on a jurisdictional basis. However, as described below, work is expected to commence this year on areas of potential harmonisation for the retail markets.

In July 2008, both Public Electricity Suppliers (PES), North and South, announced a within-year tariff increase in domestic tariffs. In Northern Ireland, NIE Energy Supply (NIEES) announced an increase of 14%, while in Ireland ESB Customer Supply (ESB CS) announced an increase of 17.5%. Following on from this, in October 2008 another increase in domestic tariffs of 33.3% was announced by NIEES which cumulatively is an increase of approximately 53%. ESB CS also had a second review which resulted in an increase of 2.1% increase in tariffs from 1 January 2009; however this was offset by a PSO-related rebate from the sale of ESB assets. The net result was an average decrease of under 1% in the final customer bill.

The key driver for both increases has overwhelmingly been the increase in generation costs caused by the exceptional increases in international fuel prices over the past year. The main reason behind the increase in generation costs is the increase in international fuel prices with gas prices doubling. These price pressures have been reflected in the hedging contracts which both NIEES and ESBCS struck in April-June 2008 period. After energy costs, the next largest component of generation costs is capacity payments, which reflect the fixed costs of generation units. This size of the capacity pot has increased (in sterling) by 29% this year, a reflection of a significant increase worldwide in the cost of generating equipment.

During the autumn of 2008, wholesale costs of gas and coal were falling (at a time when they are usually high). This prompted a further in year tariff review by NIAUR, and although some costs are locked in by forward contracts, the remaining flexibility allow the falls in the wholesale costs of gas and coal to be passed onto the consumer (with a 10.8% decrease in domestic tariffs announced in mid-December). Similarly, the ESBCS average decrease of under 1% was passed on to customers from the 1 January 2009.

## Development of an all-island retail market

Policy and regulation in relation to energy retail markets are jurisdictional issues. That said, there is recognition of the interrelationship between wholesale and retail ends of the value chain (e.g. in relation to the need for wholesale liquidity to help deliver an effective and flexible competitive retail market). This has led to an understanding of the need for harmonised goals, where appropriate and cost effective, in relation to energy retail markets.

Energy retail competition has been slow to emerge on the island; in particular in certain sectors such as the domestic sectors and in parts of the electricity and gas industrial and commercial markets also. Recent work in Northern Ireland for example confirmed low levels of switching in most gas and electricity sectors, and none at all at the domestic level. However, in the early part of 2009, the domestic sector in Ireland has seen greater competition in the domestic sector.

NIAUR and the CER have already highlighted these goals in their Memorandum of Understanding in 2006, which stated that:

“CER and NIAUR will apply a transparent, consistent and harmonised approach to the regulation of the wholesale and retail markets in a manner which supports effective competition and equal treatment of participants and customers regardless of their location. Such approach will encompass application of the same principles of regulation to:

- PES in both markets, including:
  - Ring fencing arrangements
  - Tariff/revenue regulation
  - Economic Purchasing Obligations
  - Operation of PSO arrangements
- For all suppliers:
  - Supplier switching arrangements/requirements
  - Codes of practice”

It is worth noting also that these goals are in line with the overall policy remit set at EU level. The UK and Ireland have joined with other EU partners to agree as a matter of law that all consumers should be able to switch to a new supplier (directive 2003/54/EC, Art. 3.5). Recital 20 of the Directive stresses the need to “ensure that adequate measures and systems are in place to protect the interests of customers and ensure they have a real and effective right to choose their supplier”.

This goal has been embraced by both RAs and substantial investments have been made in automated systems to enable energy consumers to switch suppliers smoothly. This is particularly the case in the Ireland where full switching systems are already in place for both gas and electricity sectors.

Furthermore, it is clear that there is strong consumer and stakeholder support for further development of competition, although individual actions to this end will need to be considered and consulted upon on their own merits.

Retail competition in energy can deliver benefits for consumers, so long as it is developed efficiently and according to a model that suits the conditions in both jurisdictions. These benefits might include:

- Price benefits – from creating competitive pressure to reduce costs in supply, and to procure better;
- Innovation – new suppliers, with experience in other markets, are likely to bring to market different products that extend consumer choice. This will likely include dual fuel options;
- Service standards – Competitive pressures, combined with effective industry systems, should enable high service standards to be delivered flexibly and cost effectively. Regulation can only effectively set a single standard which might be the average of consumers' wishes, while competition can allow different supplier and product offerings to differentiate service levels, with prices varying accordingly.

The benefits of competition are potentially obtainable within each jurisdiction separately. However there may be enhanced opportunities (due to market scale, supplier business opportunities, efficiencies in operation, dual fuel potential) if energy retail developments are harmonised.

Given the above, the RAs are in the formative stages of discussing and agreeing areas of joint action in relation to creating a framework for enhanced energy retail competition on the island. We are in the process of discussing and agreeing potential areas for future joint work, across both electricity and gas sectors where appropriate.

In electricity, work has already commenced on joint studies in relation to over/under-recovery correction factors, supply margin implications for retail competition development and also the potential for harmonising supply tariff structures.

### **Demand-Side Management**

Demand-Side Management (Demand Response) refers to the ability of consumers to make decisions regarding the volume and timing of their energy consumption. Historically system operators have maintained the balance between electricity generation and demand, within voltage and frequency operational ranges, mainly by controlling generation to meet demand. However, there are alternative approaches by which demand can contribute to maintaining this balance. These include responses from voluntarily reducing or shifting demand e.g. in response to price or environmental signals through the system operator, to full participation in the market of demand changes. At present demand response is limited to a number of SO administered

schemes in Ireland such as WPDRS and Powersave and in Northern Ireland to demand reduction/shifting in response to high use of system charging at peak periods.

Additionally, demand side or embedded generation, installed to provide site services to customers including load reduction e.g. at peak tariff times, can also provide dispatchable generation. This can be aggregated and contributes to the market like other localised generation. Finally, new technology is paving the way for 'Smart Grids' which when provided can respond to local changes on the system and provide a natural context for demand response.

Demand Response has the potential to decrease volatility in wholesale energy prices, encourage an efficient use of energy infrastructure, provide a reduction in the emissions of generation units during peak periods and improve the capability to cope with large volumes of intermittent generation.

The RAs understand that Demand Response has the potential to be an important element of the all-island market, delivering economic and environmental benefits. To this end the first year of the SEM saw the initiation of a programme to develop a coordinated and sustainable demand response on the island of Ireland. The RAs will be working closely with DETI and DCENR and other stakeholders to ensure that the various workstreams involved are coordinated to deliver this. These include:

- Overall demand reduction/energy efficiency;
- Time of Use reduction/load shifting;
- Demand Side Bidding;
- Generation Aggregation; and,
- Smart Grids.

This programme will commence in earnest during 2009.

## 11 Workplan for the Second Year of the SEM (November 2008 to October 2009)

The SEM Committee has agreed a significant workplan for 2009, which involves further development of the market. Some of the main items included on this workplan are as follows:

1. In 2009, as discussed in section 10.3, a consultation paper will be released on the impact of high levels of intermittent generation on the SEM as wind is expected to provide a higher proportion of generation mix going forward. This paper will seek views on the principles underlying scheduling and dispatch of all generation (including wind) and associated Code issues in early 2009.
2. As discussed in section 7.6, there will be consultation paper published in early 2009 on the stability of the cost of the Best New Entrant Peaking Unit. This information is then used to feed into the Annual Capacity Payments Sum. This sum of money is used to pay generators for their availability.
3. The SEM Committee will continue to monitor the offering of Directed Contracts and Non-Directed Contracts in the year 2009. The RAs regularly engage with market participants on their views on this process with the ultimate aim of facilitating them and customers to manage risks in the market.
4. In addition to the use of the interconnector within SEM being examined, the potential barriers to market coupling of the SEM and BETTA (UK wholesale) markets in the medium term are being reviewed in 2009.
5. In 2009, the revenues earning by generators in the SEM will be examined and compared to the revenues earned pre-SEM.
6. Work will be undertaken during the year to develop a coordinated and sustainable demand response programme on the island of Ireland. Demand Response has the potential to be an important element of the all-island market, delivering economic and environmental benefits.
7. To date there have been three iterations of the value of the Best New Entrant Peaking Plant and although the Capacity Payment Mechanism is seen as an integral part of the SEM design it is considered that some elements merit review. The first phase will focus on reducing volatility in the capacity payment pot and is to be completed during 2009. This will be followed by a review of a wider range of issues such as the manner in which the monies in the pot are calculated and distributed.



## *Appendix: Acronyms*

ACPS	Annual Capacity Payments Sum
AGU	Aggregated Generating Unit
AS	Ancillary Services
BETTA	British Energy Trading and Transmission Arrangements (UK wholesale electricity market)
CER	Commission for Energy Regulation
COD	Commercial Offer Data
CPM	Capacity Payments Mechanism
DC	Directed Contracts
DCENR	Department of Communications, Energy and Natural Resources
DETI	Department of Enterprise, Trade and Investment
DLAF	Distribution Loss Adjustment Factors
LR	Lagrangian Relaxation
MIC	Maximum Import Capacity
MIP	Mixed Integer Programming
MMG	Market Modelling Group
MMU	Market Monitoring Unit
MO	Market Operator
MSDP	Market System Development Plan
MSP software	Market Scheduling and Pricing software
MW	MegaWatt
NIAUR	Northern Ireland Authority for Utility Regulation
NDC	Non-Directed Contracts
PES	Public Electricity Supplier
PSO	Public Service Obligation
RAs	Regulatory Authorities
SEM	Single Electricity Market
SEMO	Single Electricity Market Operator
SMP	Single Marginal Price
SO	System Operator
SONI	System Operator of Northern Ireland
TLAF	Transmission Loss Adjustment Factors
TOD	Technical offer Data
TSO	Transmission System Operator
TUoS	Transmission Use of System