Electricity Security of Supply Report 2012

Submitted to the European Commission

Pursuant to

July 2012
Executive Summary

The Commission for Energy Regulation (the CER) is required to produce and submit a report to the European Commission every two years on the details of its monitoring arrangements with respect to security of supply of electricity. This is the fourth such report and is produced to meet the legal obligations set out in European legislation (Directive 2003/54/EC and Directive 2005/89/EC). These directives have been transposed into Irish Law by Statutory Instrument 60 of 2005 (SI 60). From 31 March 2011, Directive 2003/54/EC has been repealed and replaced by Directive 2009/72/EC. However, Article 4 of Directive 2009/72/EC contains the same security of supply reporting requirements above that required in Article 4 of Directive 2003/54/EC.

The monitoring of security of electricity supplies is a key legal obligation and priority for the CER. The CER has formal monitoring and reporting arrangements in place with EirGrid as Transmission System Operator to examine the security of supply position in the short term, medium term and long term. The main components of this monitoring are fuel and other power sources, the balance between supply and demand and the electricity network. In addition to EirGrid, there are a number of other stakeholders involved in the security of supply framework including the European Commission and the Department of Communications, Energy and Natural Resources and of course market participants and customers.

A noticeable feature of the generation portfolio in Ireland is the significant reliance on imported fossil fuels. In 2011, 70.3% of electricity generation came from imported fuels of which 55% was natural gas, 15% was coal and 0.3% was oil distillate. However in contrast to previous years the reliance on imported fossil fuels in Ireland has been steadily falling. For example electricity generation from gas has fallen significantly from 63% in 2010 to 55% in 2011. Similarly the use of oil as a generation fuel has been steadily falling from 3% of requirements in 2008 to 0.3% in 2011. The fall in importance of these fuels highlights significant portfolio changes that have occurred as a result of ongoing wind connections since the last report submission.

However it is important to note the importance of imported fuels to supply security are further compounded by the fact that Ireland imports more that 90% of gas requirements and 100% of oil and coal requirements. While in terms of security of supply these fuels have consistently proved reliable, it highlights Ireland’s exposure to world fuel prices and vulnerabilities that may arise in stocks and flows of fuels used for generation. A Gas Emergency Plan is being developed in accordance with Article 4 & 10 of Regulation 994/2010/EC. This Emergency Plan aims to ensure a consistent and coordinated response to an unplanned gas supply interruption in order to ensure that a gas supply emergency is prevented or minimised. Of particular importance are the mechanisms of cooperation with other Member States i.e. the United Kingdom for
each detailed crisis level. A Gas Emergency Response Team (GERT) will be responsible for managing the operational response to the gas supply emergency.

The CER has a specific management role in declaring a gas emergency and in directing crisis management. Regional cooperation between the UK and Ireland is through the UK & Ireland Gas Emergency Group. This group meets every 6 months and has developed a regional approach to emergency planning. In principle this means that where the UK experiences gas shortages then supplies to Ireland would be maintained in proportion to those available to equivalent market sectors in the UK.

Based on EirGrid’s assessment of supply and demand of electricity there is expected to be an increase in surplus capacity in the coming years peaking in 2016. This surplus capacity is expected mainly because of a drop of around 2.5% in demand over the last two years and a cumulative drop in demand of 8% in demand over the last 3 years, the connection of over 870MW of Combined Cycle Gas Turbine (CCGT) generation capacity in 2010 and another 459 MW CCGT expected to connected by 2014, a new 500MW interconnector this year and over 400MW of renewable generators connected to the system over the last two years (with ongoing new connections) that more than offsets the closure of 820MW of generators. However, the availability of generators when they are needed is of critical importance. The CER also monitors EirGrid’s and ESBN network investments to deliver sufficient network capacity to ensure that generators can service demand. Also, it is expected that the flexibility of new plant will become more important as more intermittent generation connects to the system.

One of the key targets of current Government energy policy is to generate 40% of Ireland’s electricity consumption from renewable sources by 2020. Assisted by clear market rules and regulation, since it started in November 2007, the Single Electricity Market (SEM) has encouraged more renewable generation and modern efficient gas plants on the island. This has helped to keep prices competitive, ensure continued security of electricity supply and provide environmental benefits. The SEM is a bi-jurisdictional gross mandatory pool market with an explicit capacity payment. The stable investment environment created by SEM has resulted in favourable market signals being given to modern CCGT and renewables sources.

In addition the CER has developed a gate connection process for new generation capacity. The latest gate decision allows for the connection of 3900MW of renewables and over 1300MW of conventional plant.

The successful rollout of an upgraded electricity network is a key requirement in achieving the ambitious targets for renewable generation and maintaining a
secure system. To this end, EirGrid completed and launched a study into the future needs of the high voltage electricity grid. This in-depth study named Grid 25 suggests that the biggest challenge facing EirGrid is the development of the high voltage transmission grid to meet the country’s demand for more economical, reliable and environmentally friendly electric power. EirGrid suggests that the cost of implementing Grid 25 will be in the region of €3.2 billion. A number of projects have already been completed under this programme and project status updates are periodically communicated to the CER. The details of these projects are outlined in this report. The continuing rollout of these projects is of critical importance to the successful facilitation of renewables onto the system.

To promote the security of electricity supplies there is a framework in place under which the system is operated. For example, the rules governing the physical operation of the electricity system are set out in the Grid Code. EirGrid as TSO, run and monitor a number of performance incentives particularly related to reducing peak demand and Powersave events. The Winter Peak Demand Reduction Scheme is due to be phased out in 2012-13. This is due to the sufficient capacity levels on the system during the period that renders the incentive unnecessary. The transmission and distribution system operators are also required to report annually on their performance against agreed targets. A number of performance incentives regarding network delivery and revenue incentives also run. The current set of performance incentives are scheduled to run until 2015. EirGrid also has a set of Operating Security Standards, which set out the criteria to which the TSO aims to operate the system at all times.

There are a number of additional initiatives in place to protect the security of electricity supplies. EirGrid has ancillary services contracts in place with a number of generators. These ancillary services include operational reserve, reactive power and black start capabilities. The rates for ancillary services require regulatory approval. There is also a requirement on generators to hold additional fuel stocks on their sites. Gas fired generation for instance, must be capable of running on an alternative fuel. The number of days that generators must hold stocks depends on the type of plant. For example, baseload gas generation must hold five days back up fuel in storage on site.

At present there is a tie line in place between Ireland and Northern Ireland with a 450MW transfer capacity North to South and 400MW South to North. EirGrid is currently developing a second tie line to enhance the integrity of the systems. Although not directly connected to Ireland’s transmission system, the 450MW Moyle interconnector connects the Northern Ireland and Scotland systems. EirGrid is currently building an electricity interconnector linking the Irish and

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1 Represents a 20% drop from original estimate of 4 billion.
British transmission systems. The East West Interconnector will have bi-directional capacity of 500MW and is scheduled for completion in Q3 2012.

The level of renewable generator penetration in Ireland has increased to approximately 20% of delivered energy on an annual basis in 2011. The CER has requested that the system operator analyse the effect of increasing penetration level of renewable generations on security of supply and will use the findings to inform the development of the electricity market. A number of key developments of a technical and infrastructural nature are being implemented to future proof the electricity system and accommodate these increasing renewable sources.

In order to accommodate increased levels of interconnection and to ensure compliance with EU rules on congestion management the CER and the Utility Regulator have cited the efficient use of current and future SEM interconnectors with neighbouring markets as a key priority. Considerable work has been carried out in this area over the last year and will continue in the coming years to ensure that appropriate market changes are in place to accommodate increased interconnection.

**Conclusion**

The CER is confident that the current monitoring arrangements are sufficient to identify credible threats to the security of supply of electricity and that no such threats are likely. The CER is also satisfied that the market framework in place is appropriate to encourage new investment and enhance security of supply. However, given the vital importance of Ireland’s security of supply the CER will continue to assess the appropriateness of the current framework and identify where any improvements can be made.
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Legislative Basis

The Commission for Energy Regulation (the CER) is required to produce and submit a report to the European Commission every two years on the details of its monitoring arrangements with respect to security of supply of electricity. This is the fourth such report. The legal requirement to complete this report is contained in Statutory Instrument 60 of 2005\(^2\) (SI 60). SI 60 transposed Directive 2003/54/EC\(^3\) and Directive 2005/89/EC\(^4\) into Irish law. From 31st March 2011, Directive 2003/54/EC has been repealed and replaced by Directive 2009/72/EC\(^5\). The requirements in the new Directive regarding security of supply replicate the requirements contained in Article 4 of Directive 2003/54/EC as transposed by SI 60.

Directive 2003/54/EC

This Directive was transposed into Irish law by Statutory Instrument 60 of 2005, which was signed by the then Minister for Communications, Marine and Natural Resources. This directive placed monitoring duties for electricity security of supply on Member States and in Ireland, SI 60 placed those obligations on the CER.

SI 60 expanded the statutory duties and functions of the CER and the TSO in relation to security of supply\(^6\). The specific security of supply provisions are set out in Part 10 Regulation 28 of the SI. The provisions can be summarised as follows:

Regulation 28(1) states that it is the duty of the CER to monitor security of supply of electricity. The specific matters required to be monitored under SI 60 are contained in Regulation 28(2). The following is required to be monitored:

- Balance between supply and demand;
- Level of expected future demand;
- Envisaged additional capacity being planned or under construction;
- Quality and level of maintenance of transmission networks;
- Measures to cover peak demand; and,
- Measures to deal with shortfall of capacity by suppliers.

Regulation 28(3) and 28(4) places a duty on the TSO to report to the CER on issues relating to security of supply.

\(^3\) Official Journal of the European Union, 26th June 2003
\(^4\) Official Journal of the European Union, 18th January 2006
\(^5\) Official Journal of the European Union, 13th July 2009
\(^6\) Part 10 Paragraph 28 (1) & (2)
Regulations 28(5) – (10) of SI 60 details the CER’s role with regard to necessary measures to be taken to protect the security of supply. In summary;

- The CER is given the power to take measures necessary to protect security of supply; and,
- These include the running of competitions to acquire additional generation capacity and/or securing the provision of energy efficiency/demand side measures.

Regulation 28(11) requires the CER to publish a report every two years on its monitoring of security of supply and the measures taken or envisaged to address any issues identified. This report must be submitted to the European Commission. The specific monitoring and actions taken under SI 60 are detailed in section 1.

**Directive 2005/89/EC**

This directive strengthens the provisions in directive 2003/54/EC and establishes measures aimed to further safeguard security of supply and to ensure the proper functioning of the internal market for electricity. This directive contains the following requirements:

- Article 2 states that this report should be prepared in close cooperation with the TSO and that, if appropriate, the TSO should consult with neighbouring TSOs.
- Article 3 requires Member States to define all the roles and responsibilities of competent authorities.
- Article 4 addresses operational network security. It requires minimum operational rules and obligations on network security. Under this article, Member States are required to ensure that transmission operators set and meet quality of supply and network security performance objectives.
- Article 7 (reporting) refers to this report which is to be submitted to the European Commission. It details the reporting requirements regarding:
  (a) Operational network security;
  (b) The projected balance of supply and demand for the next five-year period;
  (c) The prospects for security of electricity supply for the period between five and 15 years from the date of the report; and,
  (d) The investment intentions, for the next five or more calendar years, of transmission system operators and those of any other party of which they are aware, as regards the provision of cross-border interconnection capacity.

In relation to part (d) of Article 7, the arrangements need to take account of:

(i) The principles of congestion management, as set out in Regulation 1228/2003/EC;
(ii) Existing and planned transmission lines;
(iii) Expected patterns of generation, supply, cross-border exchanges and consumption, allowing for demand management measures, and,
(iv) Regional, national and European sustainable development objectives, including those projects forming part of the Axes for priority projects set out in Annex I to Decision 1229/2003/EC.
Structure of this Report

The purpose of this report is to present findings and messages arising from monitoring required under Regulation 11 of S.I. 60 and Article 7 of Directive 2005/89/EC. These reporting requirements include:

- Operational network security;
- The projected balance of supply and demand for the next five-year period;
- The prospects for security of electricity supply for the period between five and 15 years from the date of the report; and,
- The investment intentions, for the next five or more calendar years, of transmission system operators and those of any other party of which they are aware, as regards the provision of cross-border interconnection capacity.

The report is structured around the key reporting requirements in the applicable legislation. The remainder of the report is set out as follows:

Section 1: Security of Supply Framework
This section sets out the high level security of supply reporting framework employed by the CER. It also sets out some security of supply initiatives currently in place.

Section 2: Balance between Supply and Demand
This section takes a forward looking view at the prospects for electricity supply and demand balances for the next five years. The section also contains details of the peak demand reduction initiatives both in place and planned, and developments on the smart metering trials and roll out.

Section 3: Future Market Investment
This section examines the prospects for future investment in generation in Ireland. Part of the section details the overall framework for new connections. The section also examines current investment plans and the market mechanisms that are in place to incentivise the required generation in the future.

Section 4: Transmission Networks
This section contains an overview of Ireland’s transmission system. The section also contains information on the transmission system investment program planned over the next number of years. In particular reference will be made to the Grid25 programme in place to ensure modernisation of the Grid will be capable of facilitating renewables.

Section 5: Operational Network Security
This section also examines the operational security of the network and details the incentives and requirements placed on the TSO in operating the system. In particular reference will be made to the technical programmes in place by EirGrid as TSO to facilitate non synchronous wind capacity (DS3 Programme)
Section 6: Interconnection and Regional Market Integration
This section contains a description of current interconnector development plans in Ireland and any market changes that will be required to accommodate increased interconnection including changes to Intra-Day Trading. Plans for future regional market integration and regulatory treatment of interconnectors are also summarised. The East West Interconnector is a significant infrastructure project that will markedly change the interconnection landscape between Ireland and Britain.
1.0 Security of Supply Framework

Security of electricity supplies is of paramount importance in building and sustaining the long term economic health of the country. For this reason the ongoing monitoring of security of supply is of great importance. Given this importance it is critical that a joined up approach is taken by all involved parties right through from the law makers, to market players and to customers. As stated previously, the CER’s security of supply monitoring obligations were established in Directive 2003/54/EC (which was replaced by Directive 2009/72/EC) which was transposed into Irish law through SI 60 of 2005. In addition, Directive 2005/89/EC placed further obligations and reporting requirements on the CER.

In response to the legislative requirements a security of supply monitoring framework has been established. The framework sets out the items that are reported on and the frequency of reporting. The framework is useful for interested parties in understanding what level of reporting is available and what information can be accessed. The purpose of this section is to set out and explain the monitoring framework at a high level.

1.1 Key Stakeholders

1.1.1 The European Commission

The European Commission has been working to create an internal electricity market in Europe. It states that a key objective for the successful operation of the internal market is “the guarantee of a high level of security of electricity supply7.” Securing European energy supplies is therefore high on the EU’s agenda. Besides promoting energy efficiency, the EU promotes a broad mix of energy sources8. One of the key roles of the European Commission in security of supply is the pan European legislation it develops to foster market integration and eliminate congestion at cross border interconnection.

As part of the further integration of a single European electricity market the European Commission has published a Communication “Energy 2020: A Strategy for competitive, sustainable and secure energy”9. This document outlines the approach to be taken EU wide to reach renewable targets of 20% and a 20% improvement in energy efficiency. In particular it makes reference to the continuing development of secure and competitive sources of energy to come from low carbon sources. To achieve this the Communication envisages that an

7  Introduction to Directive 2005/89/EC.
8  From the EC Energy Website http://ec.europa.eu/energy/security/index_en.htm
investment of around 1 trillion euro\textsuperscript{10} will be required up to 2020 to modernise and adapt infrastructures and cater for changing demand.

Additionally the European Commission has produced a further Communication, “Energy Roadmap 2050\textsuperscript{11}” which outlines the longer term goals of reaching a “secure, competitive and decarbonised” energy system by 2050\textsuperscript{12}. A key requirement for future energy is the focus on energy efficiency and switching to renewable energy sources. The Communication envisages a more European approach to be taken regarding these issues in the future.

1.1.2 Department of Communications, Energy and Natural Resources
The Department of Communications, Energy and Natural Resources (DCENR) has an overarching policy formation role, as prescribed in the Electricity Regulation Act 1999, in relation to promoting the continuity, security and quality of supplies of electricity. Furthermore, certain specific actions, which may be taken by the CER with respect to measures to protect the security of supply, require the consent of the Minister of that Department. The Department published a White Paper on “Delivering a Sustainable Energy Future for Ireland” in 2007. This sets out the government policy standards regarding renewable energy. A target of 40% renewables has been established with the ability to meet this target primarily being achieved from non synchronous wind capacity.

1.1.3 The Commission for Energy Regulation (CER)
The CER is the independent statutory body responsible for regulating and overseeing the liberalisation of the electricity and natural gas sectors in Ireland. Its primary functions are granted under the Electricity Regulation Act 1999 and the Gas (Interim) Regulation Act 2002, as amended. In carrying out its duties under the Electricity Regulation Act 1999, the CER must have regard to the need to promote the continuity, security and quality of the supply of electricity. The CER is responsible for ensuring that the appropriate measures are in place for the monitoring, assessing and managing security of supply. The CER is also responsible for taking any necessary actions to protect security of supply.

1.1.4 EirGrid - Transmission System Operator
The Transmission System Operator (TSO) in Ireland, EirGrid, is the entity with operational control of the electricity system – the scheduling and dispatch of generators and the development, maintenance and operation of the transmission network. The TSO, under section 28(4) of SI 60, has a specific duty to report and

\textsuperscript{10} Introduction to “Energy 2020 A strategy for competitive, sustainable and secure energy”. P 2

\textsuperscript{11} \url{http://ec.europa.eu/energy/energy2020/roadmap/index_en.htm}
advise the CER if it is of the view that security of supply is threatened or likely to be threatened. In the preparation of this report the CER has consulted in depth with EirGrid and has relied on them for all operational information.

1.1.5 Market Participants and Customers
Collectively market participants are key in ensuring security of electricity supplies in Ireland. Participants provide the required generation to meet demand. Also, many of the required demand side measures and ancillary services offered by customers are facilitated and incentivised by market participants. The Distribution System Operator also plays an active role in ensuring security and continuity of supplies to customers.

1.2 Security of Supply Monitoring
The CER has established formal monitoring and reporting arrangements with EirGrid that are categorised in terms of short term, medium term, long term and other reporting activities. Figure 1-1 below sets out CER monitoring activities.

<table>
<thead>
<tr>
<th>Scope of Monitoring</th>
<th>Inputs/Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short Term Monitoring</td>
<td>Operational Report&lt;br&gt;Weekly Generation System Reports&lt;br&gt;Additional Monitoring</td>
</tr>
<tr>
<td>Medium Term Monitoring level</td>
<td>Operational Reports&lt;br&gt;Monthly Availability Reports&lt;br&gt;Winter Outlook Reports&lt;br&gt;Adhoc Reporting</td>
</tr>
<tr>
<td>Long Term Monitoring</td>
<td>Generation Capacity Statements&lt;br&gt;Transmission Forecast Statement&lt;br&gt;Transmission Development Plan</td>
</tr>
<tr>
<td>Other Monitoring</td>
<td>Other Networks Monitoring Fuel Monitoring</td>
</tr>
</tbody>
</table>

The primary outputs of the above monitoring activities are a number of reports produced mainly by EirGrid but also by the Distribution System Operator and other market participants. Many of the EirGrid published reports are referred to later in this report and include the Generation Capacity Statement, Winter Outlook Reports and the Transmission Forecast Statement. These reports feed into the security of supply monitoring activities of the CER (and other...
stakeholders) and are available on the EirGrid website\textsuperscript{13}. In addition, the published reports are important for existing and potential market participants in assessing the viability of existing and new projects.

1.3 Security of Supply Initiatives

Ensuring security of electricity supply continues to form an important part of the CER’s activities. In 2010, 64\% of electricity generated in Ireland was produced from natural gas. In 2011 due to a corresponding increase in wind generation this fell to 55\%. This highlights the impact that continuing wind connections can have on the system and the ability to reduce reliance on a single fuel source.

The East West Interconnector, a 500 MW electrical interconnector, is currently nearing completion and will be operational by Q3 2012. This will give Ireland access to a large system with a more diverse fuel mix and access to the systems on the European mainland.

Another area as outlined in the National Renewable Energy Action Plan is the further development of energy storage. At present Ireland relies primarily on pumped storage at Turlough Hill providing 294MW\textsuperscript{14} which has been operational since the 1970’s. A number of developments are currently being investigated for further developments in the Pumped Hydro area.

There is 21MW of small scale hydro installed at present. Regulatory support via REFIT 2 has been extended to include hydro. In the medium term this is likely to further bolster investment in this area which contributes to overall renewable levels.

1.3.1 Task Force on Emergency Procedures

The Task Force on Emergency Procedures was established in 2005. The Task Force comprises representatives from the CER, the Department of Communications, Energy and Natural Resources, Gaslink, Bord Gáis Networks, EirGrid and ESB Networks. A major focus of the Taskforce has been the creation of mutually agreed procedures and chain of communications in the event of emergency events, with specific focus recently on interactions between the communications and electricity networks and the testing of communication protocols in the event of a complete system blackout.

In 2011 a study “Exercise Gailleann” was concluded on the management rehearsal of a widespread disruption to the electricity and telecoms networks.

\textsuperscript{13}http://www.eirgrid.com/aboutus/publications/

\textsuperscript{14}Upgrade works have been ongoing on Turlough Hill and are nearing completion in July 2012.
The exercise focused on key areas that would be most affected by such an event. A number of issues were identified such as how information would flow between industry, government and the media. From a security of supply perspective the exercise concluded that more supple and flexible communication procedures should be adopted to ensure all key stakeholders were updated and aware of the required steps.

### 1.3.2 Construction Reports

As part of its security of supply monitoring the CER receives quarterly updates on the progress of new plant construction and the large scale refurbishment of older large plant. The large generation projects monitored by the CER recently include:

<table>
<thead>
<tr>
<th>Plant under Construction</th>
<th>Expected Completion Date</th>
<th>Size (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Great Island</td>
<td>March 2014</td>
<td>459 MW&lt;sup&gt;15&lt;/sup&gt;</td>
</tr>
<tr>
<td>Turlough Hill</td>
<td>July 2012</td>
<td>292 MW&lt;sup&gt;16&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

Table 1.1 – Large plants under construction

Great Island is 459MW of additional capacity (CCGT) which will be added to the system. This replaces 212MW of capacity that is removed at the same site. However it should be noted that the Firm Access Quantity (FAQ) will be 216MW at this site until additional FAQ is assigned in 2021. Table 1.2 below lists a number of project developers with connection offers that are currently considering when to develop their project.

<table>
<thead>
<tr>
<th>Project</th>
<th>Status</th>
<th>Size (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nore</td>
<td>Connection Offer Accepted</td>
<td>98 MW</td>
</tr>
<tr>
<td>Suir</td>
<td>Connection Offer Accepted</td>
<td>98 MW</td>
</tr>
<tr>
<td>Caulstown</td>
<td>Connection Offer</td>
<td>55 MW</td>
</tr>
</tbody>
</table>

<sup>15</sup> This will replace the current 212MW of oil distillate at the same site.

<sup>16</sup> Unit 3 will be connected to the system on 28<sup>th</sup> July 2012.
<table>
<thead>
<tr>
<th></th>
<th>Accepted</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dublin Waste</td>
<td>Connection Offer Accepted</td>
<td>62MW</td>
</tr>
<tr>
<td>Cuilleen</td>
<td>Connection Offer Accepted</td>
<td>98MW</td>
</tr>
</tbody>
</table>

Table 1.2 Projects with connection offers yet to commence construction

Key Messages

- The CER has developed a security of supply monitoring framework to satisfy obligations in Directive 2003/72/EC and Directive 2005/89/EC.
- There are a number of key stakeholders involved in security of supply in Ireland including the European Commission, the DCENR, the CER and the TSO.
- The CER is of the view that the monitoring arrangements currently in place are comprehensive and are adequate to assist the CER in protecting Ireland’s security of supply.
- Since the submission of the last Security of Supply Report in 2010 there has been a slight diversification of fuel in Ireland. This contributes positively both to EU renewable targets and to supply security.
2.0 Balance between Supply and Demand

The requirements in Directive 2005/89/EC build upon the 2003 directive and require Member States to take appropriate measures to maintain a balance between the demand for electricity and the availability of generation capacity. More specifically, the Directive 2005/89/EC requires Member States to encourage the establishment of a wholesale market framework that provides suitable price signals for generation and consumption and to require transmission system operators to ensure that an appropriate level of generation reserve capacity is available and/or to adopt equivalent market based measures.

In order to provide a framework for new generation investment, the CER and the Northern Ireland Authority for Utility Regulation developed a Single Electricity Market (SEM) which went live on 1st November 2007. This is a gross mandatory pool market with an explicit Capacity Payment Mechanism (CPM). The wholesale market arrangements are discussed further in Section 3.2. The remainder of this section sets out the projected electricity supply and demand balance for the next seven years. This section also lists some of the demand side initiatives currently being undertaken in Ireland.

**EirGrid Generation Capacity Statement**

EirGrid, as TSO produces an annual Generation Capacity Statement (GCS). The GCS forecasts the demand for electricity in a forward ten year period, the likely production capacity that will be in place to meet this demand, and assesses the consequences in terms of the overall supply/demand balance. The outputs from the current EirGrid GCS are the main inputs to this section of the report. Several findings from the GCS are presented in this report.

It should be noted that from 2012 EirGrid and SONI (System Operator Northern Ireland) include an assessment of generation adequacy on an Ireland, Northern Ireland and All-Island basis in the Generation Capacity Statement. It is expected that an All-Island assessment is appropriate once the Irish and Northern Irish systems are adequately interconnected. This would be the case with the completion of the second North-South tie line due to be operational in 2017. This is reflected in the figures and tables in the following section.

2.1 Fuel Diversity

At the outset it is useful to set out the fuel mix of electricity generated. The most recent fuel mix published refers to 2011 and are set out in Figure 2-1 below.
A noticeable feature of the generation portfolio in Ireland is the significant reliance on imported fossil fuels. However it should be noted that renewable sources of energy are playing an increasingly important part in the generation portfolio with a particular emphasis on wind generation. In 2010 renewables contributed 13% of electricity needs with 10% coming from wind powered generation. The remaining renewable generation came from Hydro 1.72% and Biomass 0.3%. In 2011 renewable generation rose to 20% with 17% of this figure arising from wind, 3% from hydro and 0.2% from LFG. The significant increase in electricity produced by wind powered generators has resulted in a corresponding reduction in electricity generation from gas with the corresponding reducing reliance on imported fossil fuels, although it does highlight the significant unpredictability that comes with electricity produced from wind.

In 2011 70.3% of electricity generation came from imported fuels of which 55% was natural gas, 15% was coal and 0.3% was oil. 8% of electricity was generated by peat- an indigenous fuel. This compares with 77% of electricity generated in 2010 from imported fuels of which 63% was gas, 13% coal and 1.1% oil. This highlights a decrease in dependence on gas and oil with a slightly increased dependence on coal. Peat is an indigenous energy source which has been declining in importance although installed capacity has remained the same.

At present there are 2 gas entry points from Moffat in Scotland and from the Inch Entry Point in Cork. The entry point from Moffat supplies the majority of gas requirements. A second Interconnector (IC2) was completed in 2002 to meet the
proposed increase in demand. These Interconnectors supply approximately 95% of total Irish annual demand.

Production from Kinsale is now in decline and is operated as a seasonal gas storage facility. The Inch entry point is used to help refill the Kinsale storage facility during the summer months.

There are two natural gas projects at various stages within Ireland. The Corrib Gas Field has a total value of 594 billion cubic feet of recoverable gas. This is estimated to provide 60% of Ireland’s gas needs in the medium term with a lifespan of 15-20 years\(^\text{17}\).

Shannon LNG (Liquefied Natural Gas) is also at the planning stages. A 257 acre terminal is proposed in Co. Kerry on the estuary of the River Shannon. LNG can positively impact supply security by contributing stable stocks of gas which may dampen potential supply issues that may arise. At present the project has received planning permission but construction has not commenced.

**Categories of Plant**

When the TSO examines the plant available for planning and operations purpose there is a distinction between certain categories of plant. There are 3 categories of plant: dispatchable, partially dispatchable and non-dispatchable. Dispatchable plant is generation capacity that can be monitored and controlled by EirGrid. This would typically include thermal plants such as gas fired CCGTs and coal stations. Larger wind farms (above 5MW) can also be monitored and are considered partially-dispatchable i.e. their output can be reduced if required (e.g. due to transmission constraints). In addition to dispatchable plant, there is generation connected to the system whose output is not currently monitored by EirGrid and whose operation cannot be controlled. This non-dispatchable plant includes small wind farms, small scale hydro and industrial backup generation etc.

**Dispatchable Plant**

In the Generation Capacity Statement EirGrid carries out a review of the expected new plant and retiring of old plant over the next 10 years. This analysis is summarised below. Further to this, the report examines the future generation market investment expected over the next number of years. Table below sets out the expected new and retired plant as per the EirGrid/SONI Generation Capacity Statement 2012-2021.

\(^{17}\) GoodBody Economic Consultant Report
Table 2-1 above shows that there is 870MW of new capacity expected on the system by 2016. The majority of this plant is gas CCGT with 459MW of the capacity arising from CCGT at Great Island. EirGrid forecasting also expects the retirement of 802MW of plant. The majority of this capacity is heavy fuel oil fired plant. Table 2-2 below pulls the previous information together and sets out EirGrid’s expected trend in the levels of dispatchable plant out to 2018.

<table>
<thead>
<tr>
<th>Year</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity Added</td>
<td>459</td>
<td>215</td>
<td>98</td>
<td>98</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Capacity Retired</td>
<td>212</td>
<td>351</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>East West Interconnector</td>
<td>440</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Dispatchable Capacity</td>
<td>7,269</td>
<td>7,128</td>
<td>7,228</td>
<td>7,321</td>
<td>7,319</td>
<td>7,323</td>
</tr>
</tbody>
</table>

Table 2-2 Expected Dispatchable Capacity out to 2018 Source: EirGrid GCS 2012

Partially Dispatchable and Non Dispatchable Plant

The above table shows a significant increase in generation capacity on an All-Island basis in 2013 with ongoing connections over the medium term. This added capacity will be further bolstered by the ongoing connections of renewables especially wind. As already outlined the next Gate Process will focus on a wider range of renewable sources and may contribute to a more varied and secure energy mix. Support through REFIT 2 is also being extended to a wider range

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18 See Section 1.3.2. “Construction Reports” for a detailed breakdown of new plant connections as well as current projects with connection agreements.

19 For the purposes of this reporting period only Great Island & Tarbert has been taken into consideration. The redevelopment of Tarbert may be completed but will not be until after 2014.

20 Ballylumford (510MW) will be retiring but is excluded for the purposes of this report as it is in Northern Ireland.

21 DGCOMP has signalled its intentions not to object to the extension of REFIT see http://ec.europa.eu/competition/elojade/isef/case_details.cfm?proc_code=3_SA_31236
of renewables. REFIT 3 will specifically cover support for 310MW of biomass technology\textsuperscript{22}. At the time of submission of this report a request had been submitted to DG Comp for the extension of REFIT 1 for a 2 year period up to 2027.

As part of their annual Generation Capacity Statements, EirGrid carries out substantial analysis and forecasting of future levels of both partially and non-dispatchable plant. The technologies examined by EirGrid include:

- Industrial generation
- Small scale CHP
- Small scale hydro
- Biomass/LFG
- Wind generation

Wind forms the highest percentage of plant in this category and substantial analysis is being carried out on future levels of wind and also the credit this generation can be given when planning for the future.

Set out below is EirGrid’s assessment of partially and non-dispatchable plant. In assessing the potential benefits of renewables EirGrid’s assessment takes into consideration the assumption that to achieve a 40% renewable target whilst maintaining system and supply security would require an installed capacity of between 3,500MW and 4,000MW. This is premised on the assumption that the capacity factor of onshore wind is 31% and the capacity factor for offshore wind is 37%.

The portion of wind energy in particular has increased dramatically in Ireland over the past decade from 1.6% in 2002 to 17% in 2011. However in the past decade the annual wind capacity factor has varied from 23.8% to 35%. As a result, EirGrid as TSO in its predictions of how wind can contribute to the overall generation security perspective refers to the capacity credit, which is an estimated measure of how much wind generation contributes to generation adequacy. In addition to wind there are other small but significant changes in the generation portfolio. These are;

- Demand side generation
- Small Scale Combined Heat & Power (CHP)
- Biofuel
- Small Scale Hydro
- Marine

\textsuperscript{22} State Aid clearance was granted by the European Commission in October 2011 see http://ec.europa.eu/competition/elojade/isef/case_details.cfm?proc_code=3_SA_31861
Demand side generation contributes a total of 9MW. CHP in Ireland contributes 302MW\textsuperscript{23}. Fossil fuel CHP has been withdrawn from supported generation activities but High Efficiency CHP is supported under the REFIT regime. Therefore it may in the future contribute more effectively to a secure fuel mix. Biofuel contributes a total of 38MW mainly through landfill gas. A target of 150MW is aimed at through support from the REFIT 3 Process.

Small scale Hydro provides 21MW of capacity. This will increase in the medium term due to the extension of regulatory support being given to Hydro through the REFIT 2 process.

Marine energy does not at present provide electricity generation to the grid in Ireland. However the installation of a tidal generating unit in Strangford Lough is connected to the grid providing 1.2MW of capacity to the system in Northern Ireland. This is the first in the world to provide capacity to a national grid. However this technology is not expected to contribute significantly to supply in the medium term due to the infancy stage of this technology.

<table>
<thead>
<tr>
<th>Year</th>
<th>Capacity 2012(MW)</th>
<th>Capacity 2020(MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demand Side Generation</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Centrally dispatched CHP</td>
<td>161</td>
<td>161</td>
</tr>
<tr>
<td>Small Scale CHP</td>
<td>141</td>
<td>141</td>
</tr>
<tr>
<td>Biofuel</td>
<td>46</td>
<td>196 (target)</td>
</tr>
<tr>
<td>Small scale Hydro</td>
<td>21</td>
<td>21</td>
</tr>
<tr>
<td>Marine</td>
<td>0</td>
<td>75</td>
</tr>
<tr>
<td>Wind</td>
<td>1,600</td>
<td>3,500-4,000 (2020 target)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2,225</strong></td>
<td><strong>4,103-4,603</strong></td>
</tr>
</tbody>
</table>

Table 2-3 Assessment of Partially and Non-Dispatchable Plant Source: EirGrid

The total capacity from these renewable sources contributes 1,914MW to supply in 2012 with the vast majority (1,847MW) arising from wind capacity. By 2020 the total arising from renewable sources is expected to rise to between 3,800MW-4,300MW. An installed wind capacity requirement of between 3,500MW and 4,000MW\textsuperscript{24} is predicted to meet the 40% renewable targets.

\textsuperscript{23} This includes Aughinish Alumina (161MW)

\textsuperscript{24} Generation Capacity Statement 2012-2021
2.2.1 Importance of Plant Availability

Having ample capacity on the system is very important but it is equally important that the installed capacity represents a reliable supply of generation when required. For this reason the availability of generation plant is very important. In general each power station goes on an annual planned outage for required maintenance. This is coordinated and planned with the TSO so that not all plant is unavailable at the same time and that there is sufficient plant available to meet demand. For example, if all baseload power plants went on annual outage in June there may not be enough remaining capacity left to satisfy demand or the remaining plant may be much more expensive to run causing price spikes. EirGrid publishes an annual schedule of power station planned outages which is updated monthly throughout the year.

In addition to planned outages there are unexpected or forced outages that occur throughout the year. These are where part or all the output of a power station is unavailable for generation due to an unforeseen problem. There may be many reasons for such outages. EirGrid monitors the overall levels of these forced outages. They also communicate with generators about forced outages to understand the underlying causes. A series of Generator Performance Incentives (GPI’s) are in place to optimise generator performance and ensure a balanced All-Island generation market. Late Synchronisation by generators for example will incur a penalty. GPI’s such as this incentivise generators to perform to best capability at all times thus ensuring supply security.

Figure 2.2 below shows the historic and forecast outage rates in Ireland.

![Figure 2.2 Historic and Forecast Forced Outage Rates](image-url)
As can be seen from the graph above, the forced outage rate peaked in 2007. The reductions from 2007 onward were caused by a combination of factors, including new generators joining the system, older generators decommissioning, and upgrading of existing plant. EirGrid expects that the forced outage rate will continue to drop as new efficient plants come on line. There are a number of changes ongoing in generation plants in Ireland. Peat fuelled plants are being converted to biomass to ensure that Ireland reaches its 2020 carbon reduction targets. However these plant conversions have been noted and are accounted for in plant outages.

Outlined below is the total of dispatchable, partially dispatchable and non dispatchable generation for 2012.

<table>
<thead>
<tr>
<th>Generation Type</th>
<th>Total Capacity (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dispatchable</td>
<td>6,585</td>
</tr>
<tr>
<td>Partially dispatchable (wind)</td>
<td>1,847</td>
</tr>
<tr>
<td>Non-dispatchable</td>
<td>265</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>8,697</strong></td>
</tr>
</tbody>
</table>

Table 2-3 Total dispatchable, partially and non-dispatchable capacity

### 2.2.3 Generation Reporting

At present both the CER and NIAUR (as Northern Ireland Regulator) are proposing to enhance current reporting requirements for generators. This would allow for a clearer financial picture to be established. This would assist in the creation of a transparent and effective generation market profile. This is of particular importance given the significant market changes that have occurred in Ireland since the opening up of electricity to competition. As a result the number of generation players has increased. It is crucial that an objective assessment of profitability can be monitored. This ensures that the correct level of investment is being delivered at a regulatory and policy level.

The profit reporting requirements are intended to only be applicable to those generators which have an impact on generation security. This is proposed at a combined installed generation capacity equal to or greater than 20MW. This would apply to all types of generation capacity including both renewable and conventional generation.

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25 See REFIT 3 specific to biomass.
Additionally generation operations in Ireland are required to submit their annual accounts to the CER. This allows the CER to carry out analysis of the proper functioning of market players and investment. This ensures the electricity market is conducive to future investment to ensure continued security of supply. Given that Ireland now operates a Single Electricity Market that is open to competition; this unique transparency is of significant value to ensure a mature, effective and secure supply.

### 2.3 Demand

In developing the annual GCS, EirGrid carries out detailed analysis on future electricity demand forecasts using their electricity forecast model. The model is explained in detail in the GCS and put simply predicts electricity demand based on changes in Gross Domestic Product (GDP), Personal Consumption of Goods and Services (PCGS) and population. Additional scenarios such as extreme weather events, plant availability, loss of interconnection with Great Britain and loss of CCGT plant are all scenarios which are planned for. This allows for numerous scenarios to be analysed.

Since the last CER Security of Supply Report in 2010 there has been a slight increase in electricity demand in 2010 only. This was largely due to a period of extremely cold weather during the latter half of 2010 which resulted in an increase in demand. In 2011 a decrease in demand of approx. 3% was seen. In 2012 the GCS was prepared on the expectation that GDP would rise by 2.3% (volume) in 2012 and increase by 3.0% in the period 2013-2015. As a result in the median scenario electricity demand is expected to rise slowly by 0.9% in 2012 and by 1.9% in 2013. Annual growth values then decrease, reaching 1.1% by 2019.

As TSO, EirGrid qualify demand assessments by utilising a high, median and low demand scenario. This is of particular significance given economic uncertainty in the Eurozone as a whole at present. As a result it is accepted that the median forecast is the best prediction to utilise for demand forecasting. A median forecast model assumes a low return to growth rate over the next number of years with demand returning to 2008 levels in 2015.

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26 EirGrid, Generation Capacity Statement 2011-2021 page 18

27 Note that economic growth rates for Ireland have since publication of economic forecasts for this report been revised downwards see [http://www.oecd.org/document/9/0,3746,en_33873108_33873500_45269961_1_1_1_1,00.html](http://www.oecd.org/document/9/0,3746,en_33873108_33873500_45269961_1_1_1_1,00.html)
It is beneficial to note TER for the previous years to better understand the overall electricity requirements over the medium term in Ireland.

EirGrid carried out an analysis of electricity requirements in 2011 for the years up to and including 2021. In all scenarios total electricity requirements are expected to rise. In a low growth scenario growth is expected to grow by 0.7% in 2012 and 1.7% in 2013 & 2014. In a median growth scenario a rate of 0.9% is expected in 2012 with 1.9% and 1.8% in the following years. Finally utilising a high demand scenario a rate of 1.1% would be expected for 2012 with this rising to 2.1% in 2013 and 2014.

**Peak Demand Forecast**

The EirGrid peak demand model is based on the historical relationship between the annual electricity consumption and the winter peak. The relationship between average and peak consumption is often referred to as a customer’s load factor. In general large energy users with round the clock operations will have a high load factor as their demand is quite constant. A domestic customer on the other hand generally has a low load factor where they use large amounts of electricity for short periods of time, typically between 17:00 and 19:00 and have small loads during the night. In general electricity is most expensive to generate at peak times as more expensive less efficient plants need to be called upon. Historically, EirGrid has found that the winter peak is somewhat erratic and
difficult to model as it is subject to many disparate influences. Figure 2-4 below shows the results of EirGrid’s peak demand forecasting as per the latest GCS.

![Historic & Forecast Peak Demand](image)

Fig 2-5: Historic\(^{29}\) and Forecast Peak Demand (Source: EirGrid)

Demand is highly influenced by temperature. By modelling historical energy and temperature data, it is possible to apply a temperature correction to past winter peaks i.e. these are the peaks that would have occurred had the temperatures been average defined the Average Cold Spell (ACS) which is an average temperature assessed from a number of winters. The ACS is estimated from an average of 10 years. Peak demands are forecast for future years assuming the weather will be average. Also a one-in-10 year peak was forecast where the temperatures are the coldest experienced in a 10-year dataset.

In addition a high and low peak demand are forecast around the median, based on the high and low energy forecasts. Note that the one-in-10 year peaks are all

\(^{29}\) A peak demand of 5090MW was reached on the 21\(^{st}\) December 2010 due to inclement weather.
higher than the high scenario peaks, showing how influential the weather can be on the winter peak.

2.4 Supply and Demand Balance

This section compares the forecast levels of generation capacity with the forecast demand that needs to be satisfied out to 2016. EirGrid uses a software program for forecasting surplus available capacity or deficit. This software takes the outage rates for generators into account and also considers the system security of supply standard into account which is set using a loss of load expectation. A detailed description of the adequacy assessment methodology used by EirGrid is set out in their annual GCS. Figure 2.5 below sets out the forecast generation adequacy levels under the different aforementioned EirGrid demand scenarios.

The EirGrid data above shows that there is an expected increase in surplus capacity in the coming years peaking between 2015 and 2020. The resulting positive adequacy levels are due to the continuing connections onto the system. In 2013 EWIC will positively influence the assessment. In the following year Tarbert 1,2,3 will be decommissioned resulting in a lowered adequacy which will be compensated by the connection of Great Island. Tarbert 4 will be decommissioned in 2021. Demand growth due to predicted prevailing economic conditions and wind penetration are taken into consideration.
Further adequacy assessments are carried out taking into consideration various scenarios that may impact on demand or supply. These are:

- The loss of a CCGT station
- The loss of Interconnectors with Great Britain
- Older plant removal (such as peat)
- One in 10 year weather conditions

The loss of a CCGT would be expected to lower the generation adequacy surplus to 584MW in 2012. However, with the connection of EWIC and further new generation, this adequacy indicator rises to an average of 891MW up to and including 2021. The loss of Interconnection would result in an adequacy capacity reduction to 902MW in 2015 with an average adequacy level of 896MW per annum. Where older plant is removed from the system, perhaps due to environmental or public levy changes inadequate in lowest in 2020 with just 344MW of surplus capacity. The average adequacy surplus over the 10 year period in this scenario is 843MW.

Finally, 1 in 10 year weather conditions may result in a low surplus of 858MW in 2012, 100MW lower than the situation with average weather conditions. The average adequacy in this scenario is 1120MW. Adequacy assessments taking these factors into consideration are essential to a secure and reliable adequacy assessment. Each scenario results in a surplus in all years in Ireland. This reliably indicates positive adequacy in these scenarios up to 2021.

Due to the nature of the Single Electricity Market it is important to note the adequacy levels on an All-Island basis.
Generation surplus is enhanced when an All-Island approach is taken to adequacy scenarios. This is physically possible only when a second North-South tie-line is in place, possibly by 2017. Results for 2012-2016 are shown for illustrative purposes only.

Adequacy is lowest towards the end of the assessment period at 1578MW of adequacy in a median scenario, 1727MW in a low demand scenario and 1373MW in a high demand scenario.

2.4.1 Demand Side Initiatives

Article 5 of Directive 2005/89/EC allows members states to take measures to encourage real-time demand initiatives. Demand side initiatives are generally used to reduce peak electricity demand. Under certain conditions it may be more cost effective to pay for a reduction in demand at peak times rather than starting a potentially inefficient high cost plant. As Ireland has moved successfully to a Single Electricity Market system, coupled with a reduction in demand and increase in generation capacity the need for centrally organised demand side initiatives has diminished.

The Winter Peak Demand Reduction Scheme (WPDRS) is being withdrawn from 2013. A concurrent scheme “Powersave” will continue to be run during “Powersave Events” when system demand is close to available supply. EirGrid as TSO monitors these situations where necessary. Further to this, electricity suppliers generally offer a night saver tariff where electricity prices are cheaper during night hours which incentivise customers to move their load from day time.
to lower demand times at night. At present circa 11% of domestic customers in Ireland are on a night saver tariff.

Figure 2.2 Demand Side Management

2.4.2 Smart Meter trial conclusions

Smart meters are recognised at an EU wide level as an integral component in ensuring continuing security and allowing consumers to become more active in their consumption patterns. As stated earlier, Article 5 of Directive 2005/89/EC allows Members States to take measures to encourage real-time demand technologies including advanced metering systems. Smart metering benefits security of supply by transforming consumers from a passive state to being active consumers. This encourages efficiency in usage on the demand side. In a Communication, “Smart Grids: From Innovation to Deployment” the Commission explicitly refers to the need for maximum energy efficiency so as to effectively handle the development of the internal market, energy efficiency, and security of the system. Annex 1.2 of the Electricity Directive 2009/72/EC specifically refers to smart meters as a key implementation in the future rollout of Smart Grids. Reference is made to the need to accurately reflect actual consumer consumption. In 2010 a task force on smart grids was established which places the area of smart grids and meters at the core of EU Commission energy policy.

The CER, in conjunction with ESB Networks and Bord Gáis Networks, commenced a smart metering project in late 2007. The purpose of the project was to establish what impact a smart meter would have on patterns of consumption of both electricity and gas so as to determine the cost benefit analysis of the proposed rollout of smart meters. 6,500 meters were installed as part of the project. For the purposes of this report consideration shall be given to...
the findings of the electricity Customer Behaviour Trial (CBT). The CBT looked at the measurable reduction in electricity consumption overall and more specifically during peak demand periods. The trial concluded that there was,

- a decrease in overall electricity consumption of 2.5%
- a reduction of 8.8% during peak demand periods.

The rollout of smart meters represents a major national infrastructure project and the publication of the cost benefit analysis is a defining milestone in the delivery of the smart meter rollout.

Alongside the Customer Behaviour Trial (CBT) a Technology Trial was also conducted. This allowed the CER:

- To enable learning about providing supporting systems, testing and deploying smart meters.
- To assess the performance of representative available smart metering systems and communications technologies in the Irish environment.
- To identify risks and issues for a national smart metering rollout.
- To provide information for inputting into a cost-benefit analysis for a national rollout of electricity smart metering.

The technology trial was based on the benefits of varying types of communications technology. This is of particular significance from the perspective of Ireland where a sparse rural population necessitates a careful consideration of communications that are best suited to the requirements of the system. The Smart Meter trials were concluded with the aim of assessing the Cost benefit for demand side consumers and the benefits for suppliers in providing differing types of meters that are best suited to the future requirements of the Smart Grid. In total 12 Smart Meter rollout options were analysed with total Net Present Values (NPVs) estimated for each scenario. In all scenarios there was a significant positive NPV. All of these scenarios may help to bolster supply security within the Single Electricity Market.

As a result it may be concluded that the options available for Smart Metering are likely to bring about substantial benefits for the electricity system in Ireland. As part of a wider European low carbon, Smart Grid future this trial provides unique insights into the advantages of Smart Meters. These insights provide the CER with an ability to better understand how Smart Meters can alter demand and contribute positively to supply security. In particular Supply Security may be heightened by altering peak demand. This change in demand times to correspond more with times of cheaper tariffs may result in more renewable capacity being facilitated when available and therefore minimising the generation demand of conventional generation. A reduction in conventional generation may heighten security by positively impacting energy independence and usable diversity.
CER published a consultation on Smart Meters in January 2012\textsuperscript{30} as to the proposed rollout. Specifically issues of high level design, functionality and implementation approaches of the rollout. Specific issues in the consultation include mandating the rollout to residential electricity customers, mandating In Home Displays (IHD) and the possibility of energy statements and tariffs designed to accurately reflect time of use. A timeframe for each work package has been published with efforts being concentrated on high level market and smart meter design to begin with. This will then move to a more detailed testing, design and consumer awareness period in approximately 2 years time. The rollout of Smart Meters is expected to commence approximately 2-4 years after the successful completion of this stage.

### Key Messages

- Adequacy assessments for Ireland demonstrate that there will be sufficient capacity in a low, medium and high demand scenario. An assessment of adequacy using differing scenarios such as loss of plants, interconnectors and inclement weather also illustrate adequate levels in these scenarios.
- A demand side Smart Meter Trial has been concluded and the next steps in a meter rollout have been informed by the results of this trial. A consultation on high level design, functionality and implementation is ongoing as to the next steps.

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\textsuperscript{30} CER 11191
3.0 Longer Term Security of Electricity Supplies

Article 7 of the 2006 Directive requires Member States to report on the prospects for security of electricity supply out to 10 years from the report date. While it is quite difficult to forecast new generation capacity out to ten years, this section of the report sets out the policy and market framework that is currently in place in Ireland and also the current generation investment intentions. The Department of Communications, Energy and Natural Resources is currently planning a review of the White Paper to ensure that the policy objectives remain aligned to the evolving European framework and fit for purpose for Ireland’s needs.

3.1 Government and EU Energy Policy

The current framework for Government energy policy out to 2020 is set out in the White Paper on Energy published in 2007. The underlying strategic goals of the White Paper are to:

- Ensure that electricity supply consistently meets demand
- Ensure the physical security and reliability of gas supplies to Ireland
- Enhance the diversity of fuels used for power generation
- Deliver electricity and gas to homes and businesses over efficient, reliable and secure networks
- Create a stable attractive environment for hydrocarbon exploration and production
- Be prepared for energy supply disruptions

Some of the key targets relating to electricity generation are as follows;

- A target of 15% of electricity consumption to come from renewable energy sources by 2010; (14.4% achieved in 2010, 20% achieved in 2011).
- A target of 33% of Ireland’s electricity consumption to come from renewable sources by 2020 (This target has since been increased by the Minister of Communications, Energy and Natural Resources to 40%).

To proactively achieve these strategic goals a National Renewable Energy Action Plan (NREAP)\(^{31}\) was published which establishes in detail how Ireland will meet EU renewable targets as per Article 4 of Directive 2009/28/EC\(^{32}\). This action plan was submitted to the European Commission in July 2010.

\(^{31}\) As required by Article 4 Directive 2009/28/EC

Directive obliges ongoing reporting on Member States. To this effect Ireland submitted its first report to the Commission in January 2012.\(^{33}\)

The Action Plan details the financial, regulatory and technical measures being implemented alongside infrastructure projects to ensure Ireland's renewable targets are met whilst ensuring security of supply. The wide range of measures practically aimed at ensuring Ireland meets renewable targets are succinctly laid out in the Action Plan. The broad range of examples reflects the aim of ensuring a sustainable and secure supply system. The range of measures in place ensures that reliance and dependence is not overly weighed on any one specific aspect. The NREAP consolidates numerous measures in place as of 2012 that positively impacts on supply security.

<table>
<thead>
<tr>
<th><strong>Financial</strong></th>
<th>Renewable Energy Feed-in Tariff Scheme (REFIT)</th>
<th>Increase in electricity from renewable sources via a feed in tariff mechanism.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Regulatory</strong></td>
<td>Revised application procedures for authorisations to construct and licences' to generate.</td>
<td>SI 383 and 384 of 2008 simplify the granting of authorisations and licences to generating stations with installed capacity of 10MW or less. CER/10/098 introduced a simplified procedure for generators with installed capacity up to 40MW.</td>
</tr>
<tr>
<td><strong>Technical</strong></td>
<td>Smart Metering Pilot Programme</td>
<td>Cost benefit analysis trial conducted into benefits of Smart Metering rollout.</td>
</tr>
<tr>
<td><strong>Infrastructure</strong></td>
<td>East West Interconnector</td>
<td>A 500MW interconnector between Ireland and Britain will allow for electricity exports from Ireland to the UK and facilitate integration of renewable generation on the Irish system.</td>
</tr>
</tbody>
</table>

\(^{33}\) http://www.dcenr.gov.ie/NR/exeres/0B956228-14AC-4BA0-B795-EDD53EBA19FB.htm
Table 3-1 NREAP Current actions

To help achieve this and to promote and accommodate longer term security of supplies the CER (in conjunction with the Utility Regulator in Northern Ireland in many instances) has endeavoured to ensure the economic viability of renewable energy.

An issue raised in the NREAP is the possibility of conflict between wind potential harnessing capacity and the desire to ensure the preservation of these areas. Conflict may arise in the future arising from the placement of turbines in areas where other considerations such as Natura 2000 are in direct conflict with the preservation of peat lands. However in Ireland continued regulatory and financial support for onshore wind has been affirmed as of March 2012 with the extension of REFIT 2. Connections to the network are made on the basis of a “Group Processing Approach” (GPA) where all developers within a “Gate” are given a connection offer. There have been three Gates to date. Gate 3 Direction (CER/08/260) allows for the connection of 3900MW of renewables and over 1300MW of conventional plant. The GPA process allows for the efficient and optimal connection of generation onto the system and will assist in reaching the 40% target of renewables by 2020. The Gate 3 connection process has been the largest Gate to date and includes sufficient renewable generation to meet the 2020 targets, particularly given the fall in forecasted 2020 demand since the Direction was published.

2009 Renewable Energy Sources Directive- A European Perspective

In addition to domestic targets there is new over-arching renewables legislation in the form of Directive 2009/28/EC on the promotion of the use of energy from renewable sources. This Directive, which came into force on 25 June 2009, establishes a common framework for the promotion of energy from renewable sources in order to limit greenhouse gas emissions by promoting renewable energy, cleaner transport and energy efficiency. This Directive sets an EU wide target for 20% of final gross energy consumption to be made up of renewables. As part of this Ireland is required to produce 16% of final gross energy from renewable sources and to meet this there is a government target for 40% of electricity consumption to come from renewable sources.

Additionally there has been a number of Communications and Directives at European level which Ireland is obliged to follow. This includes the Energy End Use Efficiency and Energy Services Directive 2006/32/EC. This Directive specifically references the aim of creating stronger demand side incentives. Article 13 of the Directive also references the need for competitively priced smart meters availability to accurately reflect demand side consumption. There is

34 Article 7, Directive 2006/32/EC
ongoing discussion on a revised and updated Directive to accurately reflect energy targets.

**REFIT- Financial Support for long term security.**
To support this target REFIT has been extended to include a number of renewable energy sources. REFIT currently covers onshore wind, small scale hydro, biomass landfill gas and other biomass. REFIT 3 specifically covers Biomass technologies and was notified by the Minister for Communications, Energy and Natural Resources on the 27th March 2012. Subject to State Aid clearance (as per Article 87 (ex Article 9) REFIT will be extended to include anaerobic, high efficiency CHP, offshore wind and ocean energy. This will help to encourage the further development of a wide and sustainable fuel mix to ensure delivery of a secure and sustainable electricity supply that meets the established renewable targets. Due to the high levels of onshore wind capacity being installed in Ireland there is no requirement from a generation security perspective to extend REFIT at present to include offshore wind production.

### 3.2 High Level Market Framework

The Single Electricity Market (SEM) is a bi-jurisdictional market governed by Ireland and Northern Ireland and consists of a gross pool market into which all electricity generated (from generators above 10MW in size) 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. In addition to the pool there is also a capacity payment mechanism. The SEM which went live on 1st November 2007 is governed by the SEM Committee. The SEM Committee is a committee of both CER and NIAUR (together the Regulatory Authorities) that, on behalf of the Regulatory Authorities, takes any decision as to the exercise of a relevant function of CER or NIAUR in relation to a SEM matter. Figure 3-1 below sets out the high level workings of the SEM.
3.2.1 The SEM and the Capacity Payment Mechanism

As stated previously, the SEM is a gross mandatory pool with an explicit capacity mechanism. The Capacity Payment Mechanism (CPM) provides a stream of revenue for generators based on their availability rather than just receiving revenue streams when they generate electricity. Without this explicit capacity mechanism generators would need to recover all their cost when they run. This would have the potential to cause price spikes in times of low margin when lesser used peaker plants are called on. Some of the advantages of an explicit capacity mechanism are below:

- Stability in pricing
- Reduced barriers to market entry
- Greater transparency
- Increased potential for competition
- Stable investment signal

The CPM is designed to reimburse the fixed costs of a Best New Entrant (BNE) peaking plant in the SEM. The BNE peaker is seen as the marginal plant and may not run very often in the market. The CPM therefore ensures that the investment and ongoing costs of the BNE plant are reimbursed whether or not the plant actually runs thereby significantly reducing the risk on the investor. The capacity payment is paid to all generators based on their availability. The total pot of capacity revenue is currently calculated on a year ahead basis by looking at the cost of the BNE plant and also the capacity requirement for the coming year.

In March 2012 the SEM Committee published a Medium Term Review of the Capacity Payment Mechanism. The review has lead to some minor changes to the operation of the mechanism but has otherwise confirmed that the mechanism remains fit for purpose.

3.2.2 The Gate Connection Process

The Government target to generate 40% of electricity from renewable sources by 2020 is expected to be met mainly by wind generation. The process for offering new generation connection (including wind) to the electricity network in Ireland is now largely governed by a procedure known as the “Group Processing Approach” (GPA). The CER, along with the TSO and DSO, developed this process in 2005 as a response to the significant increase in parties requesting connection of renewables. As the name suggests the process allows for the processing of applications in groups or “Gates”. To date there have been three Gates which have been sequentially larger.
Gate 3 allows for the connection of sufficient capacity to meet the Government’s 2020 renewable electricity sources target of 40%. As of Q1 2012 just over 1,200MW of Gate 3 connection offers have been accepted. It is expected that the majority take up of Gate 3 will become clear in 2013 post completion of the SEM Committee review of the Tie breaks in Dispatch\(^\text{35}\) and the issuance of EirGrid’s constraints reports.

The CER continues to chair the Gate 3 Liaison Group, a group comprising the TSO, the DSO and industry participants, which has turned to examining post issue matters. Once the take up of Gate 3 is known the CER will consider the appropriate post Gate 3 connection process. The Gate process has proved reliable in ensuring that multiple source generation are being facilitated into the transmission system by EirGrid.

**Gate 3 and Conventional Plant**

In conjunction with Gate 3 the CER also carefully considered the balancing of the increasing level of renewables on the system with the ongoing need for security of supply and improved generation efficiency. Accordingly, after extensive public consultation, the CER published in December 2009 a direction relating to Gate 3 which decided on the criteria for deciding which conventional (non-renewable) applicants will receive a connection offer to the electricity network. The total connection offer amount was based on criteria rather than an absolute number and provided for the issuance of connection offers to approximately 1,300 MW of conventional generation projects and, in addition, a merchant interconnector project. From these projects a CCGT and an OCGT generation have advance to construction and 3 other OCGT’s have accepted their connection offer.

**Connections outside the Gate Process**

In addition there is also a process in place to address the treatment of small, renewable and low carbon generators outside the group processing approach. This approach was consulted upon in 2009 and provides a route for fast tracking new generation capacity where it satisfies specific public interest criteria such as diversity of fuel mix, environmental benefits and research. As Ireland diversifies

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\(^{35}\) SEM-12-028, 28\(^{\text{th}}\) April 2012
its fuel mix with various renewables it is expected that connections outside the Gate Process may increase. This is as a result of the additional support that will be given to varied renewables under REFIT 3. Below are new connections that have occurred outside the Gate Process.

<table>
<thead>
<tr>
<th>Energy Type</th>
<th>Number of Connections</th>
<th>Connected &amp; energised Capacity (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biogas</td>
<td>3</td>
<td>3.72</td>
</tr>
<tr>
<td>Small Wind (&lt;0.5MW)</td>
<td>3</td>
<td>6.51</td>
</tr>
<tr>
<td>Hydro</td>
<td>3</td>
<td>0.32</td>
</tr>
<tr>
<td>Biomass</td>
<td>1</td>
<td>0.09</td>
</tr>
<tr>
<td>LFG</td>
<td>4</td>
<td>2.84</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>1</td>
<td>0.31</td>
</tr>
<tr>
<td>CHP</td>
<td>4</td>
<td>2.40</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>19</strong></td>
<td><strong>16.18</strong></td>
</tr>
</tbody>
</table>

Table 3-3 Connections outside the Gate Process

These connections outside the Gate Process although small, contribute to a diverse fuel mix which in turn contributes to facilitating a secure and reliable supply security. Some will also contribute to 2020 renewable generation targets.

### 3.3 Planned Investment

#### 3.3.1 Conventional Generation

There is a significant capacity of new generation currently contracted to connect to the system in Ireland. EirGrid publishes listings of both contracted and connected plant on its website. The table below shows the larger stations with connection agreements in place.
<table>
<thead>
<tr>
<th>Plant</th>
<th>Fuel Type</th>
<th>Capacity (MW)</th>
<th>Expected Commissioning Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>East-West Interconnector</td>
<td>N/A</td>
<td>500</td>
<td>Q3 2012</td>
</tr>
<tr>
<td>Endesa (Great Island) CCGT</td>
<td>Gas/Distillate</td>
<td>459</td>
<td>2014</td>
</tr>
<tr>
<td>Nore OCGT</td>
<td>Gas/Distillate</td>
<td>98</td>
<td>NA</td>
</tr>
<tr>
<td>Caulstown OCGT</td>
<td>Gas/Distillate</td>
<td>58</td>
<td>NA</td>
</tr>
<tr>
<td>Dublin Waste</td>
<td>CHP</td>
<td>62</td>
<td>NA</td>
</tr>
<tr>
<td>Cuilleen OCGT</td>
<td>Gas/Distillate</td>
<td>98</td>
<td>NA</td>
</tr>
<tr>
<td>Suir OCGT</td>
<td>Gas/Distillate</td>
<td>98</td>
<td>NA</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>-</td>
<td><strong>1,373</strong></td>
<td>-</td>
</tr>
</tbody>
</table>

Table 3-4 New Large Power Stations with Connection Agreements in Place.

In addition there are a number of other developers that have expressed an interest in connecting to the network in the next number of years. However commissioning dates have not been provided and therefore have been excluded from this assessment.

### 3.3.2 Renewable Generation

The Government target to generate 40% of electricity from renewable sources by 2020 is expected to be met mainly by wind generation but also with hydropower, wave, tidal, biomass, solar and landfill gas. To enable the realisation of ambitious renewable energy targets the Government launched the renewable energy feed in tariff (REFIT) scheme in 2006. The programme provides support to renewable energy projects over a fifteen year period.

REFIT 2 opened in March 2012 and increases the quantity of onshore wind supported under the original REFIT scheme. Further regulatory support is being given to small scale hydro and landfill gas. A further REFIT 3 scheme specifically targets biomass. Further to this, renewable generation in Ireland receives priority dispatch whereby they are dispatched by the system operator in preference to conventional generation.

#### 3.3.2.1 Wind Generation

The explicit Government support for renewables and the gate connection regime has seen large numbers of wind farm developers seeking connection to the
system. Wind has been by far the most popular renewable technology choice to date which may not be surprising given Ireland’s specific weather attributes and the advanced stage of wind technology compared to other renewable energy technologies. As already outlined onshore wind is supported through the REFIT 1 & 2 programmes. REFIT 2 has been expanded to include other renewable areas that are to be supported. However it is expected that onshore wind, due to its proven technology is likely to continue to be a major component of the supported energy sources. Table 3-2 below sets out the wind generation already connected as of the data freeze for this report.

<table>
<thead>
<tr>
<th>System</th>
<th>Capacity (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transmission</td>
<td>782</td>
</tr>
<tr>
<td>Distribution</td>
<td>811</td>
</tr>
</tbody>
</table>

Table 3-5 Transmission & Distribution Capacity of connected wind farms
Source: EirGrid

The connections dates for the contracted plant will depend on electricity network developments and how early the new capacity can be accommodated. This is discussed in further detail in the Networks section of this report.

### 3.3.2.2 Other Renewable Generation

In addition to wind, it is expected that there will be significant connection of other renewable energy sources. There are also explicit government targets for these non wind renewable sources. Table 3-3 below sets out the non wind renewables greater than 5MW recently connected and contracted for connection to the system.

Further connection Feed in Tariffs (REFIT) will continue to expand the support available for other sources of energy as outlined above. Whilst in its infancy, there are two marine energy test sites in the West of Ireland at present. These projects aim to assess the ability of wave and tidal energy to contribute to the electricity requirements of Ireland. Due to advances in technology Ocean Energy may in time contribute to a secure and reliable fuel mix.
3.4 Summary
This section has looked at matters relevant to the security of electricity supplies over 10 years. In addition it is also useful to examine the prospects for longer term security of supply. Forecasting new levels of generation further than a few years is quite difficult given that a view is being taken on the investment intentions of commercial organisations. This will inevitably be subject to other factors such as electricity demand, the financial climate and the ability to raise finance. The CER maintain a watching brief on the longer term security of electricity supplies and implements measures that are designed to provide for longer term security of supply.

Key Messages
- The Single Electricity Market (SEM) has resulted in a successful wholesale market for the Island of Ireland. The nature of the market ensures that there is sufficient capacity to meet demand in the medium term.
- A review of the capacity payment mechanism has been completed which has confirmed that it is fit for purpose.
- There is significant capacity of new generation at various stages of construction, including an interconnector with Britain, currently contracted to connect to the system in Ireland.

<table>
<thead>
<tr>
<th>Fuel Type</th>
<th>Capacity (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biogas/LFG</td>
<td>23.56</td>
</tr>
<tr>
<td>Hydro</td>
<td>0.32</td>
</tr>
<tr>
<td>Biomass</td>
<td>17.09&lt;sup&gt;36&lt;/sup&gt;</td>
</tr>
<tr>
<td>CHP</td>
<td>64.4&lt;sup&gt;37&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>105.37</strong></td>
</tr>
</tbody>
</table>

Table 3-6 Other Renewable Connections

<sup>36</sup> Includes Meath Waste to Power (17MW)

<sup>37</sup> Includes Dublin Waste to Energy (62MW). May generate as a Biomass unit. Regardless the unit will contribute to the overall 105.37MW of other renewable connection.
• There is a Government target to generate 40% of electricity from renewable sources by 2020. To this effect a National Renewable Energy Action Plan has been published which outlines how this target is to be achieved. An update to this action Plan was submitted to the European Commission in January 2012.

• Gate 3 offers have been successfully completed by July 2011 with offers made of approximately 3900MW of renewables and 1300MW of conventional plants. A clear picture will emerge by 2013 as regards connection offers accepted.

• Support is now being given to new types of renewable generation via REFIT 2 & 3. Those supported generation types include biomass, hydro, further onshore wind, and biomass gas.
4.0 Networks Investment

Article 6 of the 2006 Directive requires member states to establish a regulatory framework that provides investment signals for both the transmission and distribution system network operators to develop their networks in order to meet foreseeable demand from the market and facilitates maintenance and, where necessary, renewal of their networks.

This section contains a description of the electricity network in Ireland. The section also sets out the regulation framework in place and a high level description of investment intentions.

4.1 Network Description

The national grid plays a vital role in the supply of electricity, providing the means to transport power from the generators to the demand centres using a system comprising 400 kV, 220 kV and 110 kV networks. The 400 kV and 220 kV networks form the backbone of the grid.

The key components of the transmission system are set out in Table 4-1 below.

<table>
<thead>
<tr>
<th>Power Lines</th>
<th>Total Line Lengths (km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>400kV</td>
<td>439</td>
</tr>
<tr>
<td>275kV</td>
<td>42</td>
</tr>
<tr>
<td>220kV</td>
<td>1,862</td>
</tr>
<tr>
<td>110kV</td>
<td>4,035</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Transformers</th>
<th>Number Of</th>
</tr>
</thead>
<tbody>
<tr>
<td>400/220kV</td>
<td>5</td>
</tr>
<tr>
<td>275/220kV</td>
<td>3</td>
</tr>
<tr>
<td>220/110kV</td>
<td>44</td>
</tr>
</tbody>
</table>

Table 4-1 Source: EirGrid Transmission System Performance Report 2011

In addition to the current transmission system in place there are a number of projects underway to provide stability and security to the system. This investment is focused on increasing the capacity of the transmission system and is of particular importance to facilitate the increasing amounts of renewable energy which is located along the West coast of Ireland. These projects focus primarily on upgrading transmission lines to 400kV or 220kV where necessary. These projects of a technical and regulatory nature will be detailed below.

4.2 Regulatory Framework

EirGrid, a semi-state company, is the operator of the electricity transmission network and was granted a licence to operate the system by the CER. ESB, another semi-state, owns the transmission and distribution system and holds
Transmission Asset Owner (TAO) and Distribution Asset Owner (DAO) licences. The distribution system is operated by ESB Networks Ltd, a wholly owned subsidiary of ESB. ESB Networks Ltd was set up and licensed in 2009 to satisfy the legal unbundling requirements under Article 15 of EU Directive 2003/54/EC. The CER regulates EirGrid, ESB and ESB Networks.

4.2.1 Revenue Regulation
By their nature, the electricity networks are operated as monopoly businesses - it does not make sense, either economically or environmentally, to construct or operate competing electricity networks. Regulation of the monopoly network owners and operators is therefore a fundamental role for the CER.

The bodies involved – ESB Networks as Distribution System Operator (DSO) and Transmission Asset Owner (TAO) and EirGrid as Transmission System Operator (TSO) are required to submit their proposals for required revenues, including capital expenditure over the five-year period of the review. The CER analyses and reviews their proposals, with the aim of achieving operational efficiencies while ensuring the correct level and type of investment in the electricity networks. The companies are benchmarked against similar organisations internationally and areas of their business where improvements need to be made are targeted. To date there have been three electricity networks revenue reviews.

4.3 Network Investment
Grid 25 - Ensuring regional investment in the future network.
Grid 25 is a significant investment programme which relates to the upgrading of existing infrastructure and the construction of new stations and circuits where required. It represents an investment of €3.2 billion in the transmission system which will ensure that Ireland’s Grid is future ready. This nationwide investment is required due to the increasing amount of renewable energy being connected to the Grid at present. Grid 25 will allow for increased capacity to match the changing generation and demand landscape in Ireland.

There are specific investment projects in place under Grid 25. These include new 110kV and 400kV transmission lines and substations in addition to the strengthening of existing circuits.

The significant investment in strengthening capacity connections between regions allows regional demand to be met in the best way possible. This is of particular importance due to the geographical distribution of demand in Ireland. Whereas maximum wind potential is located along the West coast where wind levels are significant, Ireland’s population is concentrated along the East coast. As a result it is of vital importance that the grid is capable of facilitating this regional increase in future generation on the network and successfully facilitate its transmission.
The successful rollout of an upgraded electricity network is a key requirement in achieving the ambitious renewable generation targets and for maintaining a secure and reliable system. To this end there will be significant investment in the transmission and distribution networks in the coming years. The timely rollout of Grid25 and the development of the network will require a joined up approach and co-operation between government bodies, market participants and electricity customers.

![Pie chart showing proposed expenditure by region.](image)

**Figure 4-1. Proposed Expenditure by Region**\(^{38}\) (€m). Source: EirGrid. Grid25 Strategy

### Monitoring of Grid 25

EirGrid as TSO regularly updates the CER regarding progress\(^ {39}\). A number of Grid 25 projects have already been completed and are set out below. In addition to these completed projects there are a further 39 capital projects at various stages of development. Regular reports submitted to CER assist in ensuring that Grid 25 is delivered in a timely fashion. These reports are jointly submitted by EirGrid as TSO and ESB Networks as TAO.

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\(^{38}\) Total cost has been revised downwards to €3.2 billion from the initial €4 billion.

\(^{39}\) With specific reference to capital projects over €10 million in value.
The most recent submission was made in Q1 2012 in respect of the reporting period Q1 January 2012 to the end of March 2012.

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Project Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tarbert-Tralee</td>
<td>110KV New Line</td>
</tr>
<tr>
<td>Cashla Ennis</td>
<td>110KV Line Uprate</td>
</tr>
<tr>
<td>Arva Navan</td>
<td>110KV Line Uprate</td>
</tr>
<tr>
<td>Glanagow-Raffeen</td>
<td>220KV Cable Project</td>
</tr>
<tr>
<td>Kilbarry-Mallow</td>
<td>110KV Line Uprate</td>
</tr>
<tr>
<td>Lodgewood</td>
<td>220KV New Station</td>
</tr>
<tr>
<td>Athy</td>
<td>110KV New Station</td>
</tr>
<tr>
<td>Charleville-Killonan</td>
<td>110KV Line Uprate</td>
</tr>
<tr>
<td>South West Scheme-Millstreet-Knockraha Reinforcement</td>
<td>Deferred</td>
</tr>
</tbody>
</table>

Table 4-2 Updated Grid 25 Investment Projects from Q1 2012 Capex Monitoring Report

Public consultation was launched on the Grid Link Project in April 2012. This project will involve the construction of a new high voltage circuit linking the provinces of Munster and Leinster and will reinforce the transmission system by transferring needed capacity to the south and east of the country. Another example is the refurbishment of the 110kV Ardnacrusha Station. This particular station provides the only 110kV link between the 110kV networks of County Kerry/Limerick and Clare. Therefore the refurbishment of the station will provide essential reinforcement in the region so as to secure future renewable energy supplies.

Conclusion
The electricity system in Ireland is regulated by CER with specific roles held by EirGrid as TSO and ESB Networks as TAO. As a result of changes in generation policy a coordinated approach is required from all players to ensure continuing investment in the electricity network.
Key Messages

- The CER regulates the transmission and distribution system operators and owners in Ireland.
- The successful rollout of an upgraded electricity network is a key requirement in achieving the ambitious targets for renewable generation and maintaining an integral system especially with the ongoing renewable connections onto the system.
- The EirGrid Grid 25 work plan was put in place in anticipation of changing demand and supply patterns.
- As a result work has already begun to reinforce and upgrade the essential infrastructure needs of the network with many projects in the development stages.
5.0 Operational Network Security

Article 4 of the 2006 Directive contains requirements in relation to operational network security. In particular the Directive requires Member States to ensure that transmission system operators (and where appropriate distribution system operators) set and comply with minimum operational rules and obligations on network security.

This section describes the operational framework in place for the operation of the system and also the measures in place for ensuring operational network security.

5.1 System Operation

5.1.1 Operational Framework and Rules

The rules governing the operation, maintenance, and development of the transmission system, and procedures governing the actions of transmission system users, are set out in the Grid Code. This technical document establishes the rules governing the operation, maintenance and development of the transmission system and sets out the procedures for governing the actions of all transmission system users. Since 2004 the Wind Grid Code, a section specifically written to set out the technical requirements for wind generators, is incorporated into the wider Grid Code.

EirGrid is responsible for the development and maintenance of the Grid Code through the Grid Code Review Panel (GCRP). The GCRP is a standing body mandated to review and discuss the Grid Code, its workings and offers suggestions for amendments to the Code. Any modifications, updates and derogation requests must be approved by the CER.

In addition, EirGrid uses its own Operating Security Standards, which set out the criteria to which the TSO aims to operate the system at all times.

5.1.2 Performance Incentives

The CER has implemented a scheme of performance incentives for the TSO. In July 2011 the CER published a decision on Transmission Incentives to run until 2015. The successful roll out of Gate 3 and the Government’s target of 40% of electricity coming from renewable generation is central to the CER’s thinking in developing incentives. A particular focus of performance incentives is the movement away from incentivising system availability while focusing on incentivising scheduled outages.

In addition the CER has decided to introduce a new TSO network delivery incentive. With regard to the TAO, the CER has decided to introduce an incentive

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40 CER/11/128
mechanism around network delivery, times for the return to operation after scheduled outages and the construction and energisation of transmission assets.

Incentives will be split between system performance (40%) and system development (60%). Within system performance there are 2 separate incentives, systems minutes lost and system frequency. Within transmission system development there are incentives regarding planning permission, project agreement and delivery of enhanced network capacity.

5.1.3 Performance Reporting

As per their TSO licence, EirGrid is required to publish the Transmission System Performance Report annually to cover performance over the previous year. This report is based on performance criteria approved by the CER. The key areas that EirGrid report on are as follows;

- Basic System Data (i.e. throughput, number of connections etc),
- Grid Development and Maintenance
- Transmission System Availability and Outages
- Generation Availability and Outages

The 2011 Performance Report was published in April 2011 and is available on the EirGrid website. Some of the key information from the report is included in Table 5-1 and Table 5-2 below.

<table>
<thead>
<tr>
<th>Generation &amp; Transmission Data</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Operational Generation Capacity</td>
<td>8,473MW</td>
<td>8,660 MW</td>
</tr>
<tr>
<td>Total Energy Produced</td>
<td>27,001 GWh</td>
<td>26,126 GWh</td>
</tr>
<tr>
<td>Peak Winter Demand</td>
<td>5,090 MW</td>
<td>4,644 MW</td>
</tr>
<tr>
<td>Mid-Summer Night Valley</td>
<td>1,582 MW</td>
<td>1,678 MW</td>
</tr>
</tbody>
</table>

Table 5-1 Generation and Transmission Data Source: EirGrid GCS
<table>
<thead>
<tr>
<th>System Availability</th>
<th>2010 %</th>
<th>2011%</th>
</tr>
</thead>
<tbody>
<tr>
<td>400kV Circuit</td>
<td>94.5</td>
<td>97.7</td>
</tr>
<tr>
<td>220kV Circuit</td>
<td>92.42</td>
<td>93.27</td>
</tr>
<tr>
<td>110kV Circuit</td>
<td>96.27</td>
<td>96.36</td>
</tr>
<tr>
<td>Generation System (Average Weekly)</td>
<td>86.55</td>
<td>83.80</td>
</tr>
<tr>
<td>Generation System (Minimum)</td>
<td>74.07</td>
<td>68.22</td>
</tr>
<tr>
<td>Forced Outages (Average Daily)</td>
<td>6.66</td>
<td>8.90</td>
</tr>
<tr>
<td>Forced Outages (Maximum)</td>
<td>14.8</td>
<td>20.69</td>
</tr>
</tbody>
</table>

Table 5-2 System Availability Data

### 5.2 Ancillary Services

As stated earlier, Article 5 of the 2006 Directive requires transmission system operators to ensure that an appropriate level of generation reserve capacity is available and/or to adopt equivalent market based measures. In Ireland this is currently achieved in the relationship between EirGrid and the individual generators and through ancillary services contracts.

Ancillary services are a key requirement in maintaining the supply/demand balance. Ancillary Services can be described as products, other than energy, that are required to ensure the secure operation of the transmission system. Some of the products offered as ancillary services include:

- Operating reserve
- Reactive power
- Black start
- Multimode operation
- Warming contracts

Ancillary services needs are likely to change in the coming years. This is due to the continuing connection of intermittent energy onto the system. System operators are best placed to specify the future requirements for ancillary services.
5.3 **DS3 Programme - Investing in Ireland’s Energy Future**

The Renewable Energy Directive 2009/28/EC states that system operators are obliged to “take appropriate grid and market related operational measures in order to minimise the curtailment of electricity from renewable sources on the electricity system”. In accordance with this Directive EirGrid as TSO is implementing the “DS3 Programme” to ensure a secure, reliable and efficient energy system in a changing environment. To successfully fulfil the 40% renewable target between 4,800 MW and 5,300 MW of wind generation will need to be connected to the system by 2020 on an All-Island basis. This portfolio change poses significant challenges to the network in Ireland above and beyond non-synchronous facilitation challenges posed to other jurisdictions.

To smooth this transition EirGrid have published a “Facilitation of Renewables Report” which indicates that with careful management it is possible to securely operate the system with up to 50% of capacity at any one time coming from non-synchronous generation i.e. wind and Interconnector capacity. The DS3 Programme will help to determine the Grid Code modifications that are necessary to ensure system stability in the future. Changes to the Grid Code include provisions related to the rate of change of frequency (RoCoF) to ensure that there is an operational policy in place that is capable of securely operating at changeable levels of SNSP. For example during 2011 wind capacity contributed up to 38% of total electricity requirements on specific days. The changes to the Grid Code will ensure the necessary standards and performance from all plant are in place to operate the system at SNSP levels from 50% up to a possible 75%. The DS3 programme is also looking at system services (Ancillary Services) and how best to address the needs of the power system in the future, where there is significant wind generation connected e.g. inertial requirements, ramping products, dynamic voltage control.

**5.3.1 System Frequency Response**

System frequency response is of particular importance to the DS3 Programme. Up to 2020 there will be a reduction of 25% in synchronous inertia. This is due to the replacement of capacity on the system with non-synchronous inertia. In tandem with this portfolio change will be a requirement to ensure that ramping requirements are capable of meeting this variability. DS3 aims to tackle the efficiency of generation plants by ensuring a strong incentive system to encourage a minimum stable generation which results in a stable and secure system.
5.3.2 Wind Security Assessment Tool (WSAT)

Another area of technical change is the adoption of WSAT- Wind Security Assessment Tool. This technical tool has been developed to adapt to the unique issues presented by the ongoing connection of wind capacity onto the system. As outlined in the “Facilitation of Renewables” Report there is a reduction of the transient stability of the system as a result of higher levels of wind generation displacing synchronous generators. This issue must be addressed before higher levels of renewable generation can be facilitated on the system whole maintaining system security. WSAT runs fault scenarios on a model of the power system in real time, allowing operators to anticipate problems before they potentially impact on the system. This allows for a continuous picture to be built up of wind capacity. This contributes to ensure that the system security is not compromised by a change in inertia in a non synchronous system.

This allows maximum levels of renewable generation on the system while maintaining system security. This allows for a continuous picture to be built up of wind capacity. This ensures that the system security is not compromised by a change in inertia in a non synchronous system.

5.4 Secondary Fuel Capability Obligations

The 2003 Directive as transposed in Ireland by S.I. 60 of 2005 enhanced the CER’s role in relation to security of supply and enabled the CER to take any necessary actions to protect security of supply. Regulation 5 of S.I. 60 states that “the Commission shall take such measures as it considers necessary, to protect security of supply.”

Secondary fuel obligations are of particular importance in SEM. This is due to the fact that the majority of electricity requirements on an all Island basis are being met from gas. As the majority of gas is supplied through a single entry point onto the island of Ireland it is essential from an electricity supply perspective that emergency provisions are put in place. To this end generators have to hold reserves of either their primary or secondary fuel and they must be capable of running at 90% plus of capacity on a secondary fuel. The specific requirements on generators to hold reserves are set out in table 5.4 below. As TSO, EirGrid has an obligation\textsuperscript{41} to examine fuel stocks and may test fuel stocks twice per annum. To date the majority of generators are in compliance with the testing requirements. In May 2012 EirGrid carried out a Capacity Report to assess the possibility of increasing secondary fuel obligations above the current requirements. The report concluded that various scenarios were possible.

\textsuperscript{41} CER 09/001
including an option for key generation plants in particular to increase their secondary obligations if necessary.

Gas dependency in Ireland has risen between 2005 and 2010 as oil plants have been decommissioned. This trend has been reversed in 2011, with wind generated electricity displacing gas generated electricity. As the predominant generation fuel remains gas the secondary fuel obligations are of particular importance to security. As previously outlined Ireland cooperates regionally with the UK through the UK & Ireland Gas Emergency Group that ensures proportional market sector supplies will be distributed to Ireland if a gas emergency is declared in the UK.

Table 5-3 Percentage of Total Generation

However it should be noted that infrastructural projects such as the East West Interconnector as well as the growing level of renewables play a pivotal role in the supply security balancing act.
<table>
<thead>
<tr>
<th>Primary Fuel Type of the Generating Unit</th>
<th>Requirement to be capable of running on a secondary fuel</th>
<th>Requirement to hold stocks of that fuel</th>
<th>Number of Days Storage Required (Continuous running at primary fuel rated capacity)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas units and CHP units of more than 10MW</td>
<td>Yes (At 90% of units capacity)</td>
<td>Requirement to hold secondary fuel</td>
<td>Higher Merit 5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Lower Merit 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>CHP&gt;10MW 1</td>
</tr>
<tr>
<td>Non-gas units such as oil and coal (excluding renewable and peat units)</td>
<td>No requirement</td>
<td>Requirement to hold primary fuel</td>
<td>Higher Merit 5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Lower Merit 3</td>
</tr>
<tr>
<td>Renewable 42 units</td>
<td>No requirement</td>
<td>No requirement</td>
<td>N/A</td>
</tr>
<tr>
<td>CHP units of 10MW and less</td>
<td>No requirement</td>
<td>No requirement</td>
<td>N/A</td>
</tr>
<tr>
<td>Peat units</td>
<td>No requirement</td>
<td>No requirement</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Table 5-4 Secondary Fuel Requirements

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42 Renewables is as defined in the Electricity Regulation Act 1999
Key Messages

- The rules governing the physical operation of the electricity system are set out in the Grid Code. EirGrid is responsible for the development and maintenance of the Grid Code through the Grid Code Review Panel (GCRP).
- The CER has implemented a scheme of performance incentives for EirGrid.
- Ancillary services are a key requirement in maintaining the supply/demand balance. As part of the Single Electricity Market in Ireland the rates for ancillary services are harmonised in Ireland and Northern Ireland.
- It is expected that the development of new ancillary services will be done against the backdrop to changes in the generation portfolio where more intermittent generation and Interconnectors connect to the system.
- To this end a technical work programme-DS3 has been put in place to ensure that future and current changes in generation can be safely facilitated.
- Gas generators in Ireland must be able to switch from their primary fuel to their secondary fuel while operating continuously and run on their secondary fuel for a defined period of time (1-5 days)
- Non-gas fired generation stations must hold primary fuel in storage to run for a defined number of days (3-5 Days)
- Compliance with the primary and secondary fuel requirements is monitored by EirGrid. The majority of generators are in full compliance with these obligations.
6.0 Interconnection and Regional Market Integration

Article 7 of Directive 2005/89/EC requires Member States to report on the investment intentions for the next five or more calendar years, of transmission system operators and those of any other party of which they are aware, as regards the provision of cross-border interconnection capacity. Article 7 also requires reporting on interconnection to take account of principles of congestion management, existing and planned transmission lines and the level of cross border exchanges.

At present there are a number of EU priority plans under the “Priority Interconnection Plan 2007”. Interconnection is of growing importance in a wider European context given the increases in renewables connecting onto the system EU wide. From an EU policy perspective interconnection allows for;

- Integration of renewables
- Improved market integration and,
- Improved Security of Supply on an EU wide basis.

Ireland has two interconnector projects. A second North-South tie-line is currently in the planning stages with an expected completion date of 2017. This tie-line will strengthen the link between the Irish and Northern Irish transmission systems and reduce physical congestion in the SEM. The East-West Interconnector is a link connecting Irish and British transmission systems. The construction of this link is nearing completion. More information on this interconnector is given in section 6.3 below.

These infrastructure projects are part of a wider Trans European Energy Networks (TEN-E) priority. Within this framework there are 42 projects which are considered essential as part of a Priority Interconnection Plan (PIP). Their priority status arises due to the increasing requirements of renewable facilitation. This “Green Network” is integral to harmonise energy islands and ensure supply security across Europe.

The Ten Year Network Development Plan (TYNDP) contains projects of European significance, some of which have been submitted to the European Commission for consideration as Projects of Common Interest as defined in the 2011 draft Regulations on guidelines for trans-European energy infrastructure. Below are the current proposed projects.
<table>
<thead>
<tr>
<th>Project Name</th>
<th>TYNDP No.</th>
<th>Project Cluster</th>
<th>Other member State</th>
</tr>
</thead>
<tbody>
<tr>
<td>North-South Interconnector</td>
<td>81</td>
<td></td>
<td>UK (Northern Ireland)</td>
</tr>
<tr>
<td>Renewables Integration Development Project</td>
<td>82</td>
<td></td>
<td>UK (Northern Ireland)</td>
</tr>
<tr>
<td>Grid Link</td>
<td>83</td>
<td></td>
<td>None directly</td>
</tr>
<tr>
<td>New Ireland-Great Britain Interconnector</td>
<td>106</td>
<td></td>
<td>UK (Great Britain)</td>
</tr>
</tbody>
</table>

Table 6-1 Proposed Interconnector & Common Interest Projects (Ireland & UK)

### 6.1 SEM & Intra-Day trading

The introduction of intra day congestion management arrangements is required under the Congestion Management Guidelines (as annexed to Regulation 714/2009/EC and was the subject of infringement proceedings brought by the European Commission against Ireland and the UK in 2009 & 2010. Accordingly the Regulatory Authorities in Ireland and Northern Ireland launched a project in 2010 to implement intra day trading in the SEM and on the SEM borders.

The intra-day trading introduces two new gate closures and corresponding unconstrained market optimisations (MSP Software runs) of interconnector flows, one on day D-1 and one on day D for all price making market participants in the SEM.

The new gate closures on day D-1 allows for reallocation of unused interconnector capacity under the Use It Or Lose It/Use It Or Sell It (UIOLI/UIOSI) rule, while the gate closure on day D allows participants to resubmit bids closer to real time operation, to access any remaining unused interconnector capacity and to schedule trades in excess of the physical interconnector capacity through super-positioning.

The SEM Committee issued a decision letter on the final Modification to implement intra-day trading in the SEM on 14th February 2012. It is expected that Intraday Trading will begin on the Moyle Interconnector in July/August 2012. The East-West Interconnector will go live in Quarter 3 2012.
The SEM Committee considers that introduction of these transitional arrangements in the SEM is a significant step forward in the efficient use of cross border capacity as the level of wind generation increases on the island of Ireland.

This improvement in cross border trading opportunities is also of importance to supply security given that these trading arrangements will apply to both Interconnectors serving the island of Ireland. The full utilisation of capacity may be of security benefit within an Ireland-Britain context as it will facilitate the cross border flow of the most efficient energy sources whilst utilising the Interconnectors flexibly in accordance with market conditions.

6.2 North-South Tie-line

There is one major electricity transmission line between the Ireland and Northern Ireland (NI) electricity grids consisting of a 275kV double circuit overhead line. This line is considered to be a tie-line rather than an interconnector because there is one wholesale market in Ireland and Northern Ireland. In addition, there are also two small 110kV standby North-South tie-lines which allow the TSOs in Northern Ireland (SONI) and Ireland (EirGrid) to provide mutual short-term technical assistance.

EirGrid, and its counterpart NIE in NI, is currently in the process of putting another tie-line in place between Ireland and Northern Ireland. This new line will be 138km in length and will be 400kV. Subject to obtaining planning permission EirGrid expects to have the new tie-line in place in 2017.

6.3 Moyle Interconnector

The Moyle Interconnector connects the Northern Ireland and Scottish electricity systems and contributes to the generation adequacy position in Northern Ireland and consequently, benefits the Irish system in terms of capacity adequacy. Northern Ireland relies on the Moyle Interconnector for 450MW of capacity.

In previous years the export capacity of Moyle from Ireland was contractually limited to 80MW. However due to EU obligations pertaining to Article 15(2) of Regulation 714/2009 EC\textsuperscript{43} this limitation has been extended to 295 MW\textsuperscript{44}. The trading conditions for Moyle have also been altered and have been moved towards a computerised auction system. This allows the Interconnector to provide a greater variety of products of differing durations. Revised access rules also allow participants to acquire capacity close to the start of the tariff year to

\textsuperscript{43} “A general scheme for the calculation of total transfer capacity and the transmission reliability margin based on the electrical and physical features of the network” shall be published.

\textsuperscript{44} Between September and April, 287MW May to August
align with customer contracts. An auction platform of both Moyle and EWIC has been procured together. This will provide flexible and competitive trading rules that help to bolster supply security on an All-Island basis.

The Moyle Interconnector is part of a wide scale programme of infrastructure which allows Ireland to connect to a European wide programme of Interconnection. EirGrid as TSO published an Interconnection Economic Feasibility Report which outlines that Moyle and the East West Interconnector (outlined below), from an economic and supply security perspective are integral to the island of Ireland. The Report also concludes that a third Interconnector is economically viable in particular where ongoing renewables are connected onto the system.

6.4 East West Interconnector (EWIC)

EirGrid is currently completing an electricity interconnector linking the Irish and British power systems. The EWIC will have bi-directional capacity of 500MW and uses High Voltage Direct Current (HVDC) technology. The EWIC consists of a 256km cable, 185km of which will be sub-sea with 71km of terrestrial underground cable. Figure 6-1 below sets out a schematic of the EWIC.

![Figure 6-1 East West Interconnector Schematic](Source: EirGrid)

The decision to proceed with the project was pursuant to a Government decision and was included as part of the White Paper on Energy in 2007. A total capital cost of €601 million has been allocated to the project. Partial funding for this project came from the “European Energy Programme for Recovery”\(^{45}\) which states support for “Investment projects that have a rapid, measurable and substantial impact on economic recovery within the Union, increased energy security and the reduction in greenhouse gas emissions”. Specific reference is made to the fact that “providing increased financial incentive is a key element in

\(^{45}\) Regulation 1233/2010 EC establishing a Programme to aid economic recovery by granting community financial assistance to projects in the field of energy.
lowering the barriers that high upfront costs represent and in stimulating sustainable energy improvements.\(^{46}\)

The Interconnector is owned by EirGrid Interconnector Limited (EIL) a wholly owned subsidiary of EirGrid. An operator licence was granted to EIL which was effective as of 7\(^{th}\) October 2011. Furthermore under their licence conditions\(^{47}\) EIL was required to hold a consultation on the charging and access methodology of EWIC. Protocols have been put in place to ensure that capacity on the interconnector is allocated in a fair and transparent manner. Access rules for EWIC were established in October 2011 after public consultations. The establishment of rules pertaining to Interconnector access are to ensure compliance with Regulation 714/2009 EC on conditions for the access to the network for cross border exchanges in electricity.

The project is nearing completion and is expected to be in commercial operation by Quarter 3 of 2012. This Interconnector is of particular importance to overall energy policy and security in Ireland and within the EU. Specifically;

- Energy security for a growing population both within Ireland and in the UK.
- Promotion of competition in the electricity sector. EWIC makes an additional 500MW of bi-directional capacity available between Ireland and Britain.
- Encourages the growth of renewable energy in Ireland by encouraging excess energy to be exported to Great Britain.
- Allows a wider energy market that allows companies in both Ireland and Great Britain to sell to a larger market. This would help foster wider competition and increase security through diversification of generation sources.

6.4.1 Regional Interconnection Projects

The East-West Interconnector will connect Ireland to the wider Northern European grid via Britain. Currently Britain is connected to France by the IFA (2,000MW) and to Netherlands by BritNed (1,000MW). Interconnectors between Britain and Belgium, project Nemo (700MW-1,300MW\(^{48}\)) is currently in development and there are proposals to construct a 1,400MW interconnector between Britain and Norway\(^{49}\).

These projects allow for the interconnection of energy jurisdictions across Northern Europe. This greatly enhances supply security by suitably absorbing the large volumes of wind capacity that are continuously being connected to

\(^{46}\) Regulation 1233/2010 EC Para. 4.

\(^{47}\) Condition 20 (8)

\(^{48}\) Under review

\(^{49}\) At a cost of 12 Billion NOK (Norwegian Kroner)
European Grids as Europe progresses towards a more sustainable and efficient energy future. This ensures that Ireland as an EU member state contributes to the dual goals of renewable targets and to the development of a secure supply system. Interconnection within a wider European context allows for the promotion of secure supplies across jurisdictions.

6.4.2 Regional Market Integration

European Heads of State and Governments have pledged to create an internal market for electricity by 2014. Throughout the European Union, national electricity markets are being reviewed to align with a common European ‘Target Model’ for cross border capacity allocation and congestion management upon which the Internal Electricity Market is to be founded. The Target Model requires national electricity markets to conform to certain minimum criteria across each timeframe (forward, day ahead, intra day and balancing), such that there is a homogenous set of cross border rules and a single market place and rulebook for the same product; all of which is precondition for a functioning internal European electricity market.

The Single Electricity Market (SEM) is likely to require significant modifications to implement the Target Model. The SEM Committee has set out its commitment to implementing these changes and integrating the island of Ireland into the Internal Electricity Market. The magnitude of change required for the SEM to achieve this is considerably greater than other markets in Europe owing to its centralised structure and gross mandatory pool design. For this reason, the Agency for the Cooperation of Energy Regulators (ACER), when it adopted the Framework Guidelines for Capacity Allocation and Congestion Management in July 2011, provided for a two year transitional period for island systems with central dispatch to meet the requirements of the Target Model.

On foot of this, the SEM Committee launched its Market Integration project, led by representatives of the Regulator Authorities and involving the Market Operator (SEMO) and the System Operators (TSOs), to explore options to enable the SEM to meet the provisions of the Target Model. A consultation paper on implementing the European Target Model was published in January 2012 with the purpose of seeking views on a number of options for implementing the Target Model in Ireland and Northern Ireland in a manner that is consistent with national and EU policy objectives.

The SEM Committee is currently considering responses to the Consultation Paper on the Target Model and will make a decision on the next steps in the project by the end of 2012, in conjunction with Member States, the European Commission, ACER and Regulatory and Government colleagues in the France-UK-Ireland electricity region. The deadline for implementation of the Target Model in SEM is 2016.
Key Messages

- There is one major electricity transmission line between the Ireland and Northern Ireland (NI) electricity grids consisting of a 275kV double circuit overhead line.
- The Moyle interconnector connects Northern Ireland and Scotland and has an import capacity of 450MW.
- EirGrid is currently building a 500MW bi directional electricity interconnector linking the Ireland and Great Britain power systems with is expected to enter commercial operation by Q3 2012.
- Regional market integration and the implementation of the European Target Model is a priority work item for the SEM Committee. The SEM will have the European Target Model completed by 2016.