



ELECTRICITY
ASSOCIATION
OF IRELAND



SECURITY OF SUPPLY

Overview

The ongoing transition to zero carbon from a high carbon electricity system carries with it a level of risk for the all-island system. This insight paper aims to set out the various roles of those involved in maintaining Security of Supply on the Island of Ireland, the factors that contribute to Security of Supply and the recommendations of the Electricity Association of Ireland regarding Security of Supply.

The amount of generation required in the Single (All-Island) Electricity Market (SEM) is set by the capacity requirement, as calculated by EirGrid and SONI and set out in a detailed design decision [paper](#). The EAI believe the current supply issue is the result of not procuring the additional electricity generation capacity that is required for an Island system undergoing significant transition. A number of recommendations that could improve the outlook for Security of Supply on the island are also presented in this paper.

EAI's recommendations:

- In the immediate term, the CRM should be independently reviewed to ensure that it can meet its core objectives of a secure electricity system with a focus on 2030. The implementation of the CRM at present (parameter, settings etc.) is not conducive to this and is encouraging exit of generation capacity rather than entry.
- We know from the "[Our Zero Emission Future](#)" study, and many others, that we will need a core fleet of dispatchable generation on an enduring basis.
- The CRU, through the SEM Committee, must revisit the security standard and set it at 3 hours or less. It is untenable to retain a standard which is out of kilter with GB and France.
- For the medium/long term, Government should set a net zero target for the power system of 2040 (indicatively set followed by confirmation studies) and put in place a regulatory and policy strategy to achieve this.
- We would encourage greater policy alignment at Government Department across the island and would encourage a more visible role for the All-Island Joint Steering Group (JSG).

Responsibility for Security of Supply (SOS)

The Department of Environment Communications and Climate Action (DECC) has ultimate responsibility for Security of Supply through its overarching policy formation role, as prescribed in the Electricity Regulation Act 1999, in promoting the continuity, security and quality of supplies of electricity.

A decarbonised future powered by electricity

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Furthermore, certain specific actions, which may be taken by the CRU with respect to measures to protect the Security of Supply, require the consent of the Minister of that Department.

The Commission for the Regulation of Utilities (CRU) is empowered by DECC to set the security standard, monitor and take action to ensure Security of Supply. The electricity market is governed by the SEM Committee, of which the CRU is a member, along with the Utility Regulator in Northern Ireland and an independent member. Energy markets are governed by EU and national policy and legislation.

The EU has set out the broad design of the regulatory framework for SOS. Whilst Member States (MS) retain a degree of competence for example in relation to fuel mix, energy became a shared competence with the EU when the Lisbon Treaty came into force in 2009. Since then, EU-level institutions have taken on a greater role in determining SOS in each member state. EU legislation now defines the approach to determining the desired reliability standard in each Member State, informing National Resource Adequacy Assessments (RAA's) and a European-level RAA to be carried out by the European Network of Transmission System Operators for Electricity (ENTSO-e) on an annual basis. This assessment is important and will determine MS approach to regulation and markets. DECC also plays an important role in leading the State Aid process and works closely with the Regulatory Authorities (RA) to make the case for the necessity of revenue streams such as the Capacity Remuneration Market (CRM) and Renewable Energy Support Scheme (RESS).

EirGrid Group is the Transmission System Operator (TSO) and the Market Operator (MO) of the wholesale electricity market in Ireland. EirGrid Group is also the owner of System Operator Northern Ireland (SONI), the licensed TSO in Northern Ireland. EirGrid procures capacity on behalf of customers (via the CRM) and under section 28(4) of SI No. 60 of 2005, has a specific duty to report and advise the CRU if it is of the view that SOS is threatened or likely to be threatened.

In its most recent information [note](#) on SOS, the CRU expressed confidence that the implementation of a programme of measures in line with the recommendations of EirGrid, and in co-operation with the DECC, the energy industry and other stakeholders, will address the capacity shortfall identified in the [Generation Capacity Statement](#) for 2021. These measures include:

- The procurement of new, enduring, capacity through several forthcoming capacity auctions, which is complementary to renewable electricity and central to the low carbon transition, and steps to ensure successful delivery of this capacity.
- The procurement of additional temporary emergency generation capacity.
- The extended availability and operation of older generation capacity, on a temporary basis, that was otherwise expected to retire in this timeframe.
- Measures to improve the performance and availability of existing generators, Demand Side Units, and develop additional demand side responsiveness.
- Temporary transmission outage planning system services to be procured by EirGrid.





- Appropriate oversight and reporting arrangements to ensure the successful delivery of this programme.

EAI Members' Commitment to Maintain Security of Supply

EAI members are acutely aware of the link between Security of Supply, our economic prosperity, FDI and Ireland's international reputation. Our members' commitment to maintaining Security of Supply is demonstrated daily by:

- Implementing Certified Maintenance programmes
- Developing and utilising the Expertise of generation plant operators
- Continual investment in their assets and compliance with relevant grid codes

This commitment has been particularly evident since the start of the Covid-19 pandemic when the industry immediately took measures to ensure their assets remained operational and worked hard to navigate difficult, unknown territory. The response to Covid-19 necessitated an extraordinary operational regime and limited the availability of key staff. Companies were required to segregate shifts, the movement of essential work was restricted, rigorous testing and tracing regimes leading to the prolonged absence of key staff.

EirGrid operated an extraordinary running regime where plant was required to operate in a way that would not have been planned for and which put pressure on operational limits and compliance requirements. The pattern of demand shifted, with the overall quantum reducing slightly and the timing of peak demand moving more to the lunchtime period.

Covid-19 impacted on scheduled maintenance as key maintenance outages had to be postponed due to unavailability of international crews or global supply chain issues that negatively impacted stockpiling and logistics. Overall, the electricity industry has remained resilient; however, the system should be able to withstand plants closing for unplanned maintenance, forecasted increases in demand and fluctuations in wind availability.

As we emerge from Covid-19 restrictions, we are seeing supply issues across the economy, as the economy seeks to recover and makes up for lost time. The [ESRI](#) is predicting double digit economic growth for the Irish economy for the year 2021.

Contributory Factors to System Security

Factors which have a material impact on the Security of electricity Supply in Ireland are the physical characteristics of the power system, including its size, the high penetration (and expected significant growth) of renewables, and its relative isolation from the rest of Europe, made more pronounced by Brexit.





1. **Small market size** – The all-island market, one of the smallest in the EU, is a small synchronous system, with no AC interconnection to any other market. In small markets the absence of a large generation facility can have a disproportionate impact on Security of Supply, relative to other larger markets.
2. **High penetration of renewables** – The Irish Government has set a target of 70% renewables by 2030, with similar proposals set in Northern Ireland. The all-island electricity market has currently the highest penetration of renewable generation, as a percentage of system size, in Europe. This level of renewable penetration requires a capacity mechanism to maintain investment in the capacity needed to run the power system and keep the lights on when the wind does not blow.
3. **Operational challenges** – Despite a high coverage of grid, in Km per capita, the all-island system is highly constrained i.e., power is often unable to flow to where it is needed. As a result of this, in order to balance the system in real time, the system operator plays a more central role than it might in less constrained markets.
4. **Limited interconnection** – Since the UK's departure from the EU and pending the arrival of the Celtic Interconnector to France (expected operation in 2027), the island of Ireland is not physically connected to another EU Member State. Interconnection (IC) with GB is maintained via two long distance sub-sea interconnectors, Moyle and EWIC, with further interconnection planned over the coming years via projects such as Greenlink. Both existing interconnectors use High Voltage Direct Current (HVDC) technology. Interconnection between the two jurisdictions on the island (ROI and NI) will be enhanced with the addition of a second North-South tie-line that is currently estimated to be commissioned, during 2025 and become available for its first full year of operation in 2026. The extent to which interconnection with other markets can contribute to Security of Supply is a live question for energy policy makers and influences how IC capacity is rated in tradable markets. As weather patterns tend to converge relative to geographic distance, it cannot be assumed that 100% of interconnector capacity will be available when needed i.e. during a “dunkleflaute” or periods of cold, cloudy weather with no wind (See P.30 [Our Zero Emission Future - MaREI](#)).

Electricity Capacity

The most recent 2021 [Generation Capacity Statement](#) produced jointly between SONI and EirGrid sets out the likely balance between electricity demand and supply during the years 2021 to 2030 covering both Northern Ireland and Ireland. The statement confirmed that there were a number of system alerts in the winter of 2020/21 that indicates that capacity margins are tight, and a loss of a generator could mean difficulty in meeting demand.

The incidence of system alerts is expected to increase over the coming winters as capacity exits and demand increases. Low availability of power plant for this year continues to be a concern with an expectation that the coming winter period will be challenging due to a range of credible risks/uncertainties identified as:





- Demand uncertainty - Demand is driven by economic activity, assumptions on energy efficiency and the growth of large energy users and data centres.
- Decrease in generation availability - The availability of several existing generators, including those plant expected to decommission in the coming years, has been lower than previous years. Furthermore, some new plant capacity may have run hour restrictions which mean they are not fully available across the entire year.
- Forecasted new generation failed to materialise - new generation that was previously successfully cleared in the capacity market auctions has been withdrawn by the developers.
- Delay in building new capacity - Additional new capacity that was forecasted for delivery in 2022/23 has been delayed because of planning compliance, emissions audits and the global pandemic.
- Emissions Limits - Some fossil fuel generation has been excluded from the capacity market from October 2024 because the plant has advised they will exceed new EU emission limits. In the absence of having a capacity contract, early plant closures will be handled in sensitivity studies.
- Operational challenges with interconnector trading, capacity reliance on North to South flows, and risks around extended periods of low renewable output.

The Statement indicates that long-term system electricity demand in Ireland is increasing and is forecast to increase significantly, due to the expected expansion of many large energy users, in particular data centres. EirGrid's analysis shows that demand from data centres could account for 25% of all demand in Ireland by 2030 in the Median demand scenario. Furthermore, by 2030 there will be some new additional load from the heat and transport sectors as they move towards electrification.

In addition, generator availability performance has been poor and has been trending downwards for the last number of years. Their analysis shows that for the Median demand level and low availability scenario, adequacy deficits arise in 2024, meaning that deficits are at least 2 years sooner than previously forecast arising in the capacity year 2023/2024. EirGrid considers this scenario to be the most credible and concerning.

Market Design

The EU has entrusted markets to deliver its energy policy objectives. Since its inception in 2007, the SEM has been complemented by a capacity mechanism, in order to ensure that investors can cover long run costs in markets that are based on short run marginal pricing. Separate auctions may be run to secure capacity up to four years into the future (T-4), and closer to real time depending on necessity (T-1, T-2, T-3 etc). Although the auctions are technology neutral, technologies that are deemed to be less reliable from a generation adequacy perspective, are 'de-rated' as part of the auction process. The new capacity that was successful in the last two T-4 auctions includes gas generation, wind generation, demand-side units and capacity for the Dublin area.





Given the extent of decarbonisation required by 2030 and the aim for net zero by 2050, as well as the Generation Capacity Statement's concerns around a potential capacity shortfall in 2023/2024, we believe that it is timely that the RAs assess and satisfy themselves that the market design will enable the investment required in new and existing capacity. The CRM is not delivering adequate capacity to meet Security of Supply objectives. In the context of the developing Security of Supply situation, the matter of why new or repowered capacity is not forthcoming under the current CRM design needs immediate attention as does the need to ensure that existing capacity, critical to Security of Supply, does not receive inefficient exit signals particularly as we transition to Net Zero with increased penetration of renewables on the system.

The move to the SEM was a fundamental change that moved electricity procurement from a price-based model to a volume based model;

- At the time of this transition EAI and its members highlighted the potential longer-term threats to Security of Supply.
- As part of this transition Ireland should have moved to at most a 3-hour security standard in line with other countries such as GB and France. The current LOLE standard is 8 hours in Ireland, and 4.9 hour LOLE standard in Northern Ireland, which in theory means there could be 8 hours of the year when electricity demand is not met or when load is shed. In reality, demand is served for 100% of the year. In order to ensure that demand continues to be met, it is important that the system operator can accurately anticipate future demand growth and that the reliability standard accurately reflects the value of loss load. This Loss of Load Expectation (LOLE) standard of risk requires
 - the provision of reserves for when plant is not available,
 - managing the power system in the event of a contingency,
 - managing outages of elements of network equipment, including outages for the connection of new customers.
- Ireland maintained a significantly lower standard (8hr) that had we aligned our standards with GB and France (3hr), Ireland would have purchased circa 220MWs of extra electricity capacity per annum. EAI and its members strongly recommended this, as did the experts in the subject matter, EirGrid.
- The under procurement of capacity is a key issue now (as articulated in the EAI data centre consultation [response](#)).

Taken in the round, there is a risk that the market economics will be insufficient to deliver both necessary future investment and ensure the viability of existing investments, required for system security. Any assessment by the RAs of new and existing capacity investment signals should bear in mind the need to maintain Security of Supply as well as competitive outcomes to ensure lowest costs for consumers.





Recommendations

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- We know through the "[Our Zero Emissions Future](#)" study, and many others, that we will need a core fleet of dispatchable generation on an enduring basis.
- The CRU, through the SEM Committee must revisit the security standard and set it at 3 hours or less. It is untenable to retain a standard which is out of kilter with GB and France.
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