

**EirGrid Response
to the Review of the Security
of Energy Supply of Ireland's
Electricity and Natural Gas
Systems Consultation**

28th October 2022



1. Introduction

EirGrid welcomes the publication of this consultation and the opportunity to contribute to the review of the security of supply of Ireland's electricity and natural gas systems.

As Transmission System Operator (TSO) for Ireland's electricity system, EirGrid develops, manages and operates the electricity transmission system. The transmission system refers to the higher capacity electricity network and primarily comprises substations and circuits at 400 kV (i.e. 400,000 Volts), 220 kV, and 110 kV.

The transition to a decarbonised power system will require significant changes to the power system in the future. In order to achieve up to 80% renewable electricity in 2030, we will need to at times accommodate 95% of our demand on an instantaneous basis from non-synchronous sources such as wind. The broader decarbonisation of our power system will also necessitate the introduction of new technologies and approaches to how we utilise demand response and how we procure and utilise system services from a range of low carbon sources.

Through this transition, maintaining Security of Supply is critically important.

Under SI 60 of 2005, European Communities (Internal Market in Electricity) Regulations 2005¹, it is CRU's responsibility to protect security of supply. Where EirGrid is of the view that security of supply is threatened or likely to be threatened, it will continue to advise CRU and make recommendations on measures to address it. CRU then has responsibility for taking such measures (or other measures), as it considers, necessary to protect security of supply.

EirGrid, the Transmission System Operator (TSO) in Ireland, is required to publish forecast information about the power system, as set out in Section 38 of the Electricity Regulation Act 1999 and Part 10 of S.I. No. 60 of 2005 European Communities (Internal Market in Electricity) Regulations.

Since 2016, EirGrid has warned of an increasing tightness between supply and demand. The confluence of several factors has led to declining capacity margins in Ireland. These factors include delayed new capacity and the termination of capacity awarded by the market, increasing demand as the economy grows, an aging generation fleet that is experiencing increased levels of forced outages, the expected closure of plant with emission limits that exceed minimum standards. The lack of a strong investment

¹ [S.I. No. 60/2005 - European Communities \(Internal Market in Electricity\) Regulations 2005 \(irishstatutebook.ie\)](https://www.irishstatutebook.ie/eli/2005/si/60/2005)

signal to promote a balanced portfolio mix to achieve the government's policy ambitions around a secure power system which underpins economic growth, regionalisation, renewable integration, decarbonisation, electrification of heat and transport and datacentre evolution

In the last two years, this led to an increase in the number of System Alerts on the electricity system, at times of low wind generation when the generating margin has tightened to a level where EirGrid begins taking additional actions to protect security of supply. Given the timing of the analysis by CEPA, the report is based on the Generation Capacity Statement 2021. Our most recent Generation Capacity Statement 2022-2031, published in October, further highlights that in the short term, deficits will increase due to the deteriorating availability of power plants, resulting in their unavailability ahead of intended retirement dates and in later years the deficits are expected to reduce as new capacity comes forward through the Single Electricity Market (SEM) capacity auctions.

Our analysis shows that further new electricity generation will be required to secure the transition to high levels of renewable electricity over the coming decades.

A balanced portfolio of new capacity is required, and this includes the need for new cleaner gas fired generation plant which are renewable gas ready, especially at times when the wind and solar generation is low. This balanced portfolio is also crucial to ensuring Ireland meets its carbon budgets between now and 2030 for the electricity sector, which positions the electricity sector to achieve the zero net carbon target by 2050.

To address the challenge, the Commission for the Regulation of Utilities (CRU), incorporating some of the recommendations of EirGrid and in conjunction with the Department of Environment, Climate and Communications (DECC), has developed a programme of work actions that will be delivered over the coming years. These include:

- The delivery, through the all-island capacity auctions, of over 2,000 MW of enduring flexible gas-fired generation capacity, which is renewable gas ready, by 2030.
- Procurement of 650 MW of temporary emergency generation capacity to remain available until the necessary replacement capacity has been secured. This capacity only be called upon in the event of a shortfall in capacity and where alerts on the system are likely.

- Extending the operation, on a temporary basis, of older generators to delay the loss of up to 1,200MW of capacity, to allow time for the enduring measures to be implemented.
- Actions to enhance the responsiveness of Demand Side Units and develop additional demand side capacity.

These temporary measures, if there are all fully implemented in time, help bring the adequacy position back to the standard set by the CRU. There are many risks associated with the deliverability of these measures and the CRU, Department of the Environment, Climate and Communications and EirGrid are all working closely to manage these. Finally note that the delivery of the projects which were successful in the T4 and T3 auctions and are scheduled to deliver capacity in 24/25 and 25/26 are vital in terms of security and adequacy in addition to an upcoming T-4 capacity auction for the October 2026 to September 2027 period will run in late 2022/early 2023 to procure permanent capacity to support us in meeting the future capacity deficits.

We will now address each of the sections in the consultation document. EirGrid looks forward to continuing to engage with the Department, the Regulatory Authorities and other stakeholders on the critical area of ensuring our secure transition to a decarbonised power system as outlined in the Government targets. In addition, we look forward to engaging in the independent review being conducted by Dermot Carthy on behalf of the Minister to understand how the present situation occurred.

2. Response to Consultation Questions

Questions on Risk

- 1. Are there any other security of supply risks that you can identify in addition to those set out in section 6?**

While there are a series of potential risks, EirGrid agrees with the risks outlined for both the demand and supply side as the most pertinent. We would argue that the increased demand from LEUs and electrification of heat and transport are not risks but intended outcomes of our national policy and economic development and therefore should be planned for accordingly and updated as national policy continues to evolve.

As the island of Ireland seeks to address the challenges of climate change, decarbonise the energy sector and facilitate greater levels of renewable energy generation on the grid it will be important for system security to incentivise the right level of investment in new flexible dispatchable gas generation and an overall balanced portfolio of technologies to effectively manage the energy transition, reduce curtailment and meet climate target.

A further risk that should be considered is a security of supply consideration on oil supplies. Oil is currently used by some of the generation portfolio and is a source of secondary fuel for many generators on the Irish system.

In addition, imports from the UK can also be a risk from an electricity perspective. Given our relative proximity and shared meteorological conditions, many of the outcomes that contribute to electricity system 'tightness' in Ireland will likely materialise in a similar timeframe in UK. Therefore, imports may not always be available at the times they are required for security purposes. Also given our gas supplies come directly through Britain impacting British Gas supplies will directly impact Irish gas and electricity.

2. If there are other risks that you have identified, could you outline some mitigation options to address the risk(s)?

The electricity supply side risk relating to capacity deficits is a critical one. Securing investment in the new portfolio of technologies, including low carbon dispatchable plant is key to our energy security. The correct investment signals are required to incentivise the balanced portfolio of generation to ensure a secure power system while delivering on the Irish Governments policies on renewable integration and decarbonisation ambitions. A well-functioning Capacity Remuneration Mechanism (CRM) proposition is a key enabler.

The environment to allow successful generators that come through the capacity auctions to deliver on time. The overall requirements on these projects while known are impacting the ability of projects to deliver on time and as a result will put pressure on our capacity adequacy, as if they don't deliver then we need alternatives.

A key component of support the secure transition to the 2030 and indeed longer term targets will be the implementation of EirGrid's Shaping Our Electricity Future, outlining a roadmap for the networks, markets, operations and engagement requirements to deliver the future electricity system.

Our Network Delivery Portfolio² will connect renewable energy projects and support economic growth. This will ensure that we have a robust network that can facilitate the increased level of renewables without the need to constrain them down at peak periods of generation and demand. The portfolio currently provides for over 150 projects which connect Solar, Onshore and Offshore Wind in addition to system reinforcement projects required to strengthen the backbone of the electricity system in Ireland.

Delivery of the North South Interconnector, Celtic and Greenlink Interconnector projects will facilitate an increase in the use of renewable energy, enable Ireland to benefit directly from the European integrated electricity market and to better cope with contingencies and spikes in electricity consumption.

From a natural gas perspective, while not directly a matter for EirGrid we propose there is merit in considering a curtailment of gas within the UK market as a key risk to the Ireland and therefore electricity market. A curtailment in the UK, to any degree, will result in a curtailment in Ireland and consequent load shedding. Gas is still a significant part of the generation portfolio of Ireland and if there are Gas shortages then there will be electricity generation shortages under most circumstances.

3. Are the five shock scenarios that were considered, and the additional scenarios related to the Russian invasion of Ukraine, sufficiently broad?

We agree with the shock scenarios outlined in the document and have outlined some considerations below that the Department may wish to consider in finalising them:

- In addition, we propose it would be merited to consider a further scenario involving 5 days low wind and low solar and a high impact low probability occurrence such as a forced outage of an existing power plant.
- Based on the additional risk outlined in relation to oil supplies, there may be merit in considering oil supplies in one or a number of the scenarios.
- In the context of the interconnector outages referenced in the scenarios, it is worth noting that depending on the nature of any fault with the interconnectors, outages could last much longer than the 30 days specified.

² <https://www.eirgridgroup.com/customer-and-industry/general-customer-information/network-delivery-portfolio/index.xml>

- In addition, there may be merit in considering the impact of a 2 week cold spell around the time of the system peak (typically in December) from an electricity perspective.
- A scenario of low wind, gas shortages and low availability of distillate to fuel units on secondary fuel during the December January time period

4. Do you have any additional mitigation options that you think should be considered?

EirGrid supports the mitigations options proposed however have made comments on how a number should be implemented in response to Question 8.

However, the consultation doesn't outline the explicit need for investment in further gas-powered generation. We have identified the need for investment in at least 2GW of gas generation in the period to 2030. One point to consider in incentivising this investment is the potential to future proof it by making it renewable gas (e.g. hydrogen) ready. This may be easier than the retrofitting of existing plant for hydrogen, however this is a matter for the operators of each plant. Also promoting long term storage solution greater than 6 Hours in addition to promoting flexible demand solutions for short term peak shaving to assist is moving load and flattening the demand profile. The cleanest MW is the one that is not consumed.

5. Which gas supply mitigation options, if any, should be considered for implementation?

We have no comments on this section other than to note that gas generation will continue to remain an important component of our generation portfolio for some time to come and hence gas security is a vital component of our energy security overall. In relation to the onshore storage aspects, consideration should be given to expanding the storage of oil if required to support secondary fuelling at power generators.

6. Which electricity supply mitigation options, if any, should be considered for implementation?

There are associated delivery and timing risk associated with each of the mitigation options. We propose that a number of them, if not all of them, should be progressed in parallel.

7. What measures should be considered on the demand side to support security of supply of electricity and gas?

Microgeneration has an important role to play in reducing carbon emissions from both domestic and commercial properties, while offsetting demand and supporting Ireland's energy security of supply. Microgeneration technologies can contribute towards our national targets for reducing greenhouse gas emissions by 80% by 2050, help alleviate fuel poverty and improve fuel security by increasing access to more affordable and locally available supplies of both electricity and heat. Measures also need to ensure that demand side can deliver the actual MWs it signs up to provide such that it can be planned on. We also recommend that all new EV charging is controllable, so it has the ability to switch on and off. For all new builds and retrofitting that all domestic heat is controllable when we have excess renewable generation so we can switch on domestic hot water and thereby avoid this load coming on at times of peak demand.

8. Do you have any views on how the mitigation options should be implemented?

We have outlined below some considerations in the context of the implementation of each of the mitigation options. In an overall sense – we need to ensure investment in the right portfolio of technologies. As noted earlier in this submission, a balanced portfolio of new capacity is required in the electricity system and this includes the need for new cleaner gas fired generation plant which are renewable gas ready, especially at times when the wind and solar generation is low, storage technologies and renewable generation.

This balanced portfolio is also crucial to ensuring Ireland meets its carbon budgets between now and 2030 for the electricity sector, which positions the electricity sector to achieve the zero net carbon target by 2050. A well-functioning Capacity Remuneration Mechanism (CRM) proposition is a key enabler.

Furthermore, a key component of supporting the secure transition to the 2030 and indeed longer term targets will be the implementation of EirGrid's Shaping Our Electricity Future, outlining a roadmap for the networks, markets, operations and engagement requirements to deliver the future electricity system. One of the key findings of this analysis is that a plan led approach will be required to achieve the outcomes sought by 2030 and we propose this is an important consideration in implementing any of the mitigation options.

We now outline some considerations on each of the mitigation options:

- Interconnection:
 - Preliminary analysis by EirGrid as part of the next iteration of Shaping Our Electricity Future indicates further interconnection can be a significant mitigant of security of supply risks. This work is still underway but, undoubtedly further electrical interconnection is a key component in facilitating the development of Ireland's decarbonisation ambitions. We would welcome further engagement with the Department on this matter as EirGrid concludes this analysis.
 - The 2030 timeframe for delivery of an additional interconnector to France is challenging. In addition to the delivery of the interconnection infrastructure, there is need to consider broader grid reinforcements in both jurisdictions that will be required to 'enable' the flows on the interconnector in addition to the construction of the direct link.
- Pumped Storage
 - To achieve a grid that is 100 per cent renewable – i.e., not dependent on fossil fuel generation during times of high demand – the ability to store electricity during times of excess supply is essential. Markets and system operators must be able to keep pace and capitalise on storage opportunities, thus recognising storage as an essential tool in achieving an electricity system that is 100 per cent renewable. Ultimately, storage is a flexible asset that can provide different supports to the market and grid.
 - Given their critical importance in supporting the energy transition, it is vital that storage technologies and storage innovation are incentivised and supported; no one storage technology will be able meet the needs of a 100 per cent renewable electricity system, which is likely to require a range of new and existing storage solutions.
- Additional dispatchable capacity – biomass
 - EirGrid considers that investment in at least 2GW of low carbon dispatchable plant is required in the period to 2030. Fuel diversity is an important consideration in this as outlined in the consultation. The main consideration here is the timeframe in which a 450MW generation plant will be a feasible option.
- Increased secondary fuel at power plants:

- While the merits of this option are understood, consideration may need to be given to the capability of the generation fleet to run for increased periods of time on secondary fuel. This would require engagement with the operators of the plant to understand any implications. Consideration should also be given to strategic oil reserves/storage in the implementation of this mitigation option.
- Conversion of a gas fired power plant to hydrogen
 - As outlined earlier in this submission, consideration should be given to the capability of an existing gas generator to be converted to hydrogen. It may also be prudent to look at ensuring investment in new gas generation is in technology that is renewable gas or hydrogen ready.
 - Consideration should also be given to ensuring that sufficient supplies of green hydrogen are available in the given timeframe. The conversion of hydrogen in itself is an interesting interplay with the electricity system in both presenting the ability to absorb electricity generation but also the potential to be a large demand on the electricity system. The location of the hydrogen infrastructure both in terms of proximity to the renewable generation and in terms of being large electricity demand loads in themselves are important to consider in the context of an overall plan led approach. Consideration should be given to this in the development of the hydrogen strategy.
- Electricity Mitigation Package:
 - Demand flexibility will play a key role – we note that the Climate Action Plan 2021 call for a Demand Side Strategy to be developed by the CRU. This needs to ensure that up to 30% of demand, across industrial, commercial and residential demand, is fully participating in supporting system needs (not just congestion management) with high levels of renewable generation, and seeking to facilitate active participation by consumers and communities in the energy market.
 - As outlined under our reflections on the pumped storage option above, the ability to store electricity during times of excess supply is essential. Ultimately, storage is a flexible asset that can provide different supports to the market and grid.
 - Given their critical importance in supporting the energy transition, it is vital that storage technologies and storage innovation are incentivised and supported; no one storage technology will meet the needs of facilitating a 100 per cent renewable

electricity system, which is likely to require a range of new and existing storage solutions.

- Although batteries could plausibly store enough energy to cope with day-to-day peaks in demand, they are not a solution to monthly or seasonal fluctuations, which will be a significant challenge in creating a 100 per cent renewable electricity model. To achieve a decarbonised energy sector, a cost-effective means for the long-term storage of renewable energy will be required.

9. Do you support the policy measures proposed in section 8 of the consultation paper?

In relation to joint planning, we agree that there will be increased interdependencies between the electricity and gas networks over time. A collaborative relationship already exists between EirGrid and GNI reflecting this greater degree of interdependence that exists. EirGrid and GNI work closely together in the production of our annual Generation Capacity Statement (electricity) and Network Development Plan (gas) respectively. Both of these documents look out over a 10-year horizon. We propose that retaining separate but aligned reports from the respective system operators may be more favourable than a joint report. The current collaborative approach can ensure alignment in the analysis and assumptions underpinning these reports.

Both System Operators are also involved in the development of studies at EU level under ENTSO-E and ENTSO-G which look at longer time horizons and there may be merits and efficiencies in utilising the analysis from these exercises to inform domestic considerations.

In relation to the proposal to have regular reviews of energy security, it would be useful to understand further the two components proposed by the Department, namely the two-year technical analysis and then the energy security review every four years. As outlined in the introduction of this submission, there is already a legislative construct in place for ensuring security of supply from an electricity perspective in Ireland and we propose that consideration would also need to be given to the standing of the proposed technical review, in particular, and the energy security review relative to that legislative construct.

10. What further tools and measures do you think would contribute the most to Ireland's energy security of supply?

A critical component to ensure security of supply in the electricity sector will be to obtain the system services that we require from the portfolio of technologies on the electricity system, in addition to energy. These services include system inertia, reactive power and frequency regulation.

The Future Arrangements for System Services programme is a critical component of ensuring the right framework for ensuring we continue to get the services we require including a much broader suite of system services that are required in the context of a decarbonised power system with a very different balanced portfolio of technologies relative to the current generation portfolio.

2. Conclusion

EirGrid welcomes the publication of this consultation and the opportunity to contribute to the review of the security of supply of Ireland's electricity and natural gas systems.

The range of risks, shock scenarios and mitigation options are all considered to be prudent and we have made a number of points in this submission that we propose would merit consideration in finalising the review.

EirGrid looks forward to further engaging with the Department on this critical piece of work as they conclude their review and recommendations.