



Rialtas na hÉireann
Government of Ireland

Review of the Security of Energy Supply of Ireland's Electricity and Natural Gas Systems

Summary of Consultation Responses

April 2023

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1 Introduction

Ireland faces many challenges as it transforms its energy system to transition to a net-zero emissions future. As we decarbonise our energy system, we must ensure that our decarbonisation efforts are underpinned by affordability and security in how we access and use our energy resources.

The Department of the Environment, Climate and Communications (DECC) published a consultation on the Review of the Security of Energy Supply of Ireland's Electricity and Natural Gas Systems on 19th September 2022. The deadline for submissions was 28th October 2022 and the Department received 461 submissions from individuals, organisations, and industry.

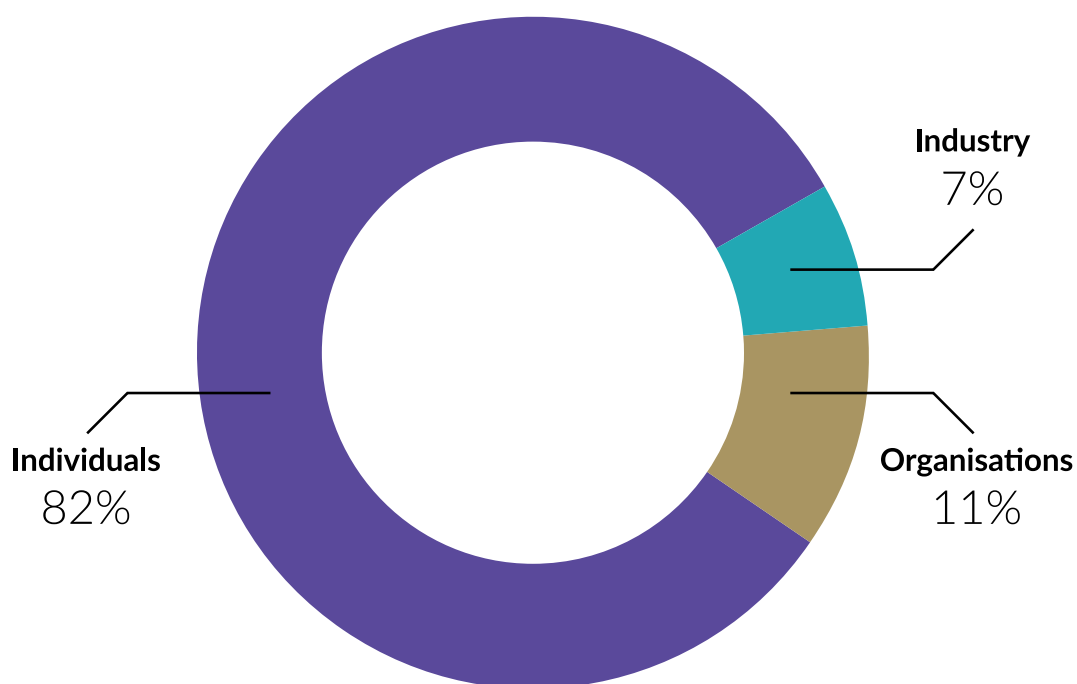


Figure 1. Consultation Respondents

A consultation document to support submissions provided background on Ireland's electricity and gas systems and the supporting policy framework. As part of the consultation, respondents were requested to consider a number of questions when submitting a response, under a number of key aspects such as risk, mitigation options and policy measures.

The consultation submissions were reviewed and analysed, and have provided important insights. This document sets out a high-level summary of the consultation responses under these key thematic areas.



2 Risks to Gas and Electricity Systems

2.1 Consultation Responses

The consultation for the Review of the Security of Energy Supply of Ireland's Electricity and Natural Gas Systems considered electricity and gas security of supply risks in the context of demand side risks and supply side risks. Demand side risks are generally caused by weather-related events such as cold snaps or periods of low wind or a combination of these events. Supply side risks usually occur where there is the loss of supply from production or infrastructure facilities.

The consultation paper asked three questions about risks and scenarios:

- i. Are there any other security of supply risks that you can identify in addition to those set out in section 6 of the consultation paper?
- ii. If there are other risks that you have identified, could you outline some mitigation options to address the risk(s)?
- iii. Are the five shock scenarios that were considered, and the additional scenarios related to the Russian invasion of Ukraine, sufficiently broad?

2.1.1 Additional Risks

Many of the consultation respondents identified additional risks for consideration while some respondents reiterated the risks outlined in the consultation document. The risks that were reiterated were geopolitical crises, extreme weather events and significant increased gas demand from Large Energy Users (LEUs). The risk of cyber-attacks was identified by some respondents.

The technical analysis outlined that shocks related to cyber security were out of scope and that the energy system's cyber vulnerabilities were not assessed; however cyber risk was included as a potential source of disruption for some of the key risks that were analysed.

The technical analysis is underpinned by data from 2020 and 2021 and this was identified as a risk due to the fact that more recent data became available shortly before the consultation was published. One of the assumptions that underpins the assessments carried out on the mitigation options is that Ireland's climate action targets related to the electrification of demand, the delivery of offshore wind capacity, geothermal energy, district heating and energy efficiency are broadly achieved by 2030. Consultation respondents identified that there is a risk that we will fail to achieve these targets and therefore will be unable to reduce our reliance on fossil fuels.

Another risk that was identified is that planning, permitting/licensing, and grid access systems would act as barriers leading to delays in the delivery of renewable projects because these systems are not properly resourced. A risk was raised that insufficient grid capacity will lead to a situation where new renewable energy projects in highly constrained areas will not be able to be progressed.

Other risks raised in relation to renewables are that competing policy objectives may make the repowering of existing renewable assets difficult, thus decreasing Ireland's indigenous supply of energy.

In addition, a risk was identified that certain design facets of the Renewable Electricity Support Scheme (RESS), i.e., not including planning as a pre-requisite, reward criteria as cost per kW and not including storage, may lead to a reduced number of completed projects. A secure supply chain of critical resources, technologies, and materials is needed to help Ireland meet its climate action targets and a risk was identified that the supply chains in renewable sectors may not be secure.

In addition, a risk was identified that there is a critical skills gap with regard to the need for technically skilled personnel and engineers required to meet the challenges in transforming our energy system for a net zero emission future.

A risk that the creation of Ireland's green hydrogen supply is delayed or under-resourced was identified and that this could lead to a missed opportunity for meeting our increased renewables ambition and supporting energy security.

A risk was raised that in examining our energy security requirements our climate obligations would not be addressed sufficiently.

In addition, a concern was raised that new fossil fuel infrastructure could be prioritised without analysis of adverse carbon lock-in and stranded assets impacts and that demand reduction measures would not be adequately considered or actively ignored.

A risk was raised that the Sectoral Emissions Ceilings would not be taken into account.

Some consultation respondents highlighted import dependency on gas from Great Britain, reliance on combined cycle gas turbines (CCGTs), outages from older conventional generation plants, the lack of indigenous storage and the removal of Liquefied Natural Gas (LNG)/Floating Storage and Regasification Unit (FSRU) mitigation options as risks for security of supply.

A risk was raised in relation to the fact that Ireland does not meet the N-1 criterion of EU Regulation 2017/1938 concerning measures to safeguard the security of gas supply.

A risk was raised about energy infrastructure being in foreign ownership and that this could have a negative impact on Ireland's energy security.

Risks were also raised about market design in two ways. Firstly, it was highlighted that further reform of the Capacity Remuneration Mechanism (CRM) are required. Secondly, and more broadly, it was suggested that there is a risk that fundamental changes to the way international and EU electricity markets function could make some current business models questionable. This could result in inhibiting the delivery of Ireland's 2030 ambitions thus prolonging our reliance on imported fossil fuels.

2.1.2 Mitigation Options for Additional Risks

Many consultation respondents suggested mitigation options for the additional risks identified. For example, in order to address the risk of failing to achieve renewable targets it was suggested that policy measures should be in place to ensure a robust electricity grid, streamlined planning processes and the facilitation of hybrid connections. It was also suggested that the organisations involved in planning and permitting should be resourced sufficiently to ensure that project timelines are kept on track to help Ireland reach its targets. Developing indigenous gas supply and storage was suggested as a means of mitigating against geopolitical crises.

For extreme weather events it was suggested that more interconnection and understanding the likelihood of the occurrence of correlated meteorological events affecting multiple renewable energy resources simultaneously would be advantageous. It was suggested that Ireland needs a national strategy for ensuring secure supply chains of critical resources, technologies, and materials to deliver its CAP targets. A strongly developed, flexible and future-proofed CRM was advocated for, and it was suggested that investment certainty be considered in all aspects of market reform to encourage investor confidence.

Some respondents highlighted the risk of a high reliance on additional gas-powered generation to achieve security of supply and pointed to options such as hydrogen generation and storage, Compressed Air Energy Storage (CAES), flow battery technologies, and heat to power solutions as alternatives. In addition, investments in indigenous renewables and renewable energy supply back-up were proposed.

Exporting green hydrogen was seen by some respondents as being a way for Ireland to play a key role in changing the risk of geopolitical instability by creating a renewable source of European energy.

2.1.3 Consideration of Scenarios

While many consultation respondents felt that the scenarios considered in the consultation were sufficiently broad, other respondents felt that there should be additional scenarios e.g., modelling a cyber-attack or that the timelines for each scenario should be increased e.g., from a 30-day outage to a 60- or 90-day outage. There were also suggestions for sensitivity analysis to be carried out on some of the scenarios in the technical analysis. In particular, the non-achievement of renewable energy targets and demand reduction actions was highlighted as a suggestion for sensitivity analysis.

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3 Mitigation Options

3.1 Consultation Responses

The consultation paper outlined that the technical analysis identified a long list of security of supply mitigation options and considered all of these options in the context of three key criteria i.e., consistency with the Climate Action Plan, security of supply, impact and feasibility of implementation. The consultation paper set out the short list of mitigation options that were considered to meet the key criteria and these were grouped into gas supply mitigation options and electricity supply mitigation options. The consultation paper then asked five questions broadly related to the mitigation options:

- i. Do you have any additional mitigation options that you think should be considered?
- ii. Which gas supply mitigation options, if any, should be considered for implementation?
- iii. Which electricity supply mitigation options, if any, should be considered for implementation?
- iv. What measures should be considered on the demand side to support security of supply of electricity and gas?
- v. Do you have any views on how the mitigation options should be implemented?

3.1.1 Additional Mitigation Options

The consultation responses highlighted some additional mitigation options such as enhanced indigenous gas resources from existing licences, enabling hybrid connections, carbon capture and storage, hybrid industrial boilers, exploiting smart metering, nuclear power generation, CO₂, small scale hydro, solar generation, small scale decentralised combined heat and power (CHP), Liquid Petroleum Gas (LPG), Dimethyl Ether (rDME), deep bore geothermal energy and energy demand reduction programmes.

Many respondents highlighted the need for storage with some favouring gas storage (underground, commercial, hydrogen, natural gas, strategic LNG storage in another Member State) while others pointed to the need for longer duration electricity storage, batteries, and peak shaving.

Some respondents expressed concern about increased strategic oil storage as a secondary fuel for gas fired power generation.

Hydrogen was identified as an additional mitigation option by many respondents with suggestions for green hydrogen infrastructure for domestic use, the development of an Irish green hydrogen supply chain, a subsea hydrogen interconnector pipeline to Europe, using hydrogen from the gasification of biomass, coupling offshore wind with hydrogen/electro-fuels and direct investment in green hydrogen power generation.

Many respondents placed an emphasis on renewable energy as a mitigation option and highlighted the need for effective regulatory and market frameworks for connecting renewables, encouraging renewable biomass in electricity generation, Power-to-X solutions, massively expanded Renewable Energy Sources-Based Electricity (RES-E) deployment and increased supports for solar PV.

A number of respondents pointed to commercial LNG and commercial gas storage as relevant mitigation options. Both of these options were identified in the long list of mitigation options within the technical analysis and while they were not included in the short list of options they were considered as part of the review.

3.1.2 Gas Supply Options

There was a mixed response to the gas supply mitigation options in the consultation paper. While some support was provided for all of the gas supply mitigation options, with gas storage and floating LNG being the more favourable mitigation options, there were many respondents not in favour of LNG or gas storage.

Many of the objections to LNG were on the basis of environmental concerns, methane emissions and lack of sustainability. There were also concerns about the availability of FSRUs in the near term and the effectiveness of using a FSRU for strategic storage. It was suggested that a FSRU would be an ineffective mitigation option unless it was coupled with additional storage. Some stated that LNG and LNG infrastructure should not be supported in any circumstances and there was a call to make the current moratorium on LNG and fracked gas imports permanent through legislation. It was highlighted that as a result of the level of methane emissions throughout the LNG supply chain, there is no benefit to LNG over other fossil fuels such as oil and coal.

A number of respondents raised concerns about gas storage, such as the timeframe for delivery of this mitigation option as well as the potential costs involved. Although the depleted Kinsale gas field was suggested as a possible gas storage site, other respondents raised concerns about this not being a suitable location as it has been fully decommissioned and now lacks both the infrastructure and cushion gas for operating as a storage facility. Concerns were also raised that developing gas storage in a depleted gas field could be a long and costly process.

With regard to those in favour of gas storage, some respondents were supportive of exploring the use of underground gas storage (UGS) in relation to flexibility for natural gas sources, including biomethane and green hydrogen. The use of offshore salt caverns as reservoirs for storing green hydrogen was also suggested. Some respondents suggested considering commercial storage rather than just considering strategic storage or else having a mix of commercial and strategic storage.

With regard to those in favour of LNG, it was suggested that it would be prudent to utilise a FSRU with storage capabilities in Ireland. In addition, and from an energy security perspective, it was suggested that it would make sense for the State to take a stake in any LNG projects or else to develop projects completely within State control. There was also a suggestion to use spare LNG storage capacity in the UK for storing LNG for Ireland's own use. Some of the respondents in favour of having a FSRU (with a LNG jetty) cited the flexibility of potential gas storage and having access to additional supply sources as important benefits.

It was highlighted that the potential benefits of future-proofed emergency gas storage and/or back-up direct access to emergency LNG would provide important security to Ireland's energy systems as we transition to a renewable system. There was support from some respondents for the gas mitigation package with the injection of biomethane and hydrogen into the gas grid being seen as a positive step for both energy security and reducing the carbon intensity of gas.

3.1.3 Electricity Supply Options

There were different levels of support across all of the electricity supply mitigation options with the conversion of a gas fired plant to hydrogen, the electricity mitigation package and additional electricity interconnection being the mitigation options most supported by respondents.

There was support for demand side management (DSM) and the energy efficiency first principle. DSM has been highlighted as having an important role to play in the Irish electricity market by enhancing security of supply. It was also noted that by introducing demand side response services and utilising electricity storage, these could act as an alternative to reinforcing the network and may reduce costs and improve reliability. It was suggested to assess how best to maximise the potential for demand side response and that key reforms were needed to better facilitate demand

response, such as reforming regulatory frameworks and improving system operation practices. Batteries were highlighted as being useful assets, particularly for system stability and security but that the investment signals for these assets have been depleted and consideration needs to be given on how to incentivise their delivery. Storage was highlighted as being a flexible asset that can provide different supports to the market and grid. It was suggested that storage technologies and storage innovation should be incentivised and supported as it is likely that a range of new and existing storage solutions will be needed. It was also noted that in order to achieve a decarbonised energy sector, a cost-effective means for the long-term storage of renewable energy will be required.

There was support for more electricity interconnection and the advantages of being better connected to a more efficient European electricity system were acknowledged. However, concerns were raised about the timelines for developing a new interconnector with France and about the security of supply value of interconnection in a situation where the connected country was facing its own supply challenges.

Concerns were raised about the costs and viability of increasing the volume of secondary fuel stored on site at power generators to deal with gas supply emergencies. It was highlighted that there could be practical, planning, and environmental challenges with this option, and it warrants a more robust dedicated assessment.

It was suggested that zero carbon dispatchable generation will need to be developed before 2030 and that the development of a new hydrogen ready Combined Cycle Gas Turbine (CCGT) should be considered alongside the hydrogen CCGT conversion mitigation option. It was highlighted that new, renewable-ready gas fired generation is needed in the short term and that it would be a dependable source of physical supply. Some respondents raised concerns about the viability of additional biomass to support a new biomass plant and it was also suggested that biomass at scale is not a viable option in the near term for dispatchable generation. There was support for further pumped hydro capacity being developed in Ireland, but concerns were raised about its deliverability in a medium timeframe.

There was support from some respondents for prioritising energy efficiency, offshore wind, solar, battery storage and further interconnection.

3.1.4 Demand Side Measures

With regard to demand side measures to support gas and electricity security of supply, a number of consultation respondents raised concerns about the level of demand from LEUs, particularly data centres. Some respondents felt that there should be a moratorium on new data centres while others felt that data centres should provide system flexibility in times of need and that heat from data centres could be used for district heating schemes. Many respondents highlighted the need for improvements in energy efficiency and more supports for customers and businesses to invest in, or enhance their, energy efficiency measures. Smart meters and smart solutions were highlighted as an option that could deliver benefits but only if the correct incentives are in place for consumers to ensure that these solutions can deliver demand side benefits. Respondents also highlighted the need to have supports to expand demand side management to ensure that it too is delivering demand side benefits and contributing to security of supply.

3.1.5 Implementation of Mitigation Options

When asked about how mitigation options should be implemented many consultation respondents highlighted the need for a well-functioning planning system with some suggesting that reforms are needed e.g., the timing of planning decisions in particular. Other suggestions from respondents were about the need for more stakeholder engagement, having a plan led rather than developer led approach, economic evaluation of mitigation options, clear governance, and links to the Climate Action Plan.



4 Policy Measures

4.1 Consultation Responses

In addition to the mitigation options that have a strong focus on infrastructure development to enhance Ireland's energy security of supply, the consultation paper also set out a number of tools and measures such as joint planning, regular energy security reviews and international arrangements. The consultation paper asked two questions about policy measures:

- i. Do you support the policy measures proposed in section 8 of the consultation paper?
- ii. What further tools and measures do you think would contribute the most to Ireland's energy security of supply?

4.1.1 Proposed Policy Measures

Some consultation respondents were supportive of joint planning especially with regard to incorporating renewable gases while a small number of respondents suggested enhancing the current approach with additional information sharing and collaboration to ensure full alignment of the annual electricity and gas forecasting plans¹. A number of respondents suggested that there should be more stakeholder engagement, consideration of Northern Ireland/energy security in an all-island context and that joint planning should facilitate a demand side response to help Ireland meet its climate commitments.

There was broad support for regular energy security reviews from the consultation respondents with some suggestions to make the technical analysis and reviews more frequent than every two years and every four years, respectively, as set out in the consultation document.

A number of respondents suggested that the technical analysis and reviews should cover the whole energy system, not just electricity and gas. Some respondents suggested that the reviews should be incorporated into the annual development plans and adequacy forecasts completed by the network operators and that there should be a list of actions and a timeline for implementation. It was suggested that the reviews should focus on sustainability, carbon budgets and achieving net zero emissions by 2050, and that the reviews should be linked to the Climate Action Plans. There were also some suggestions for increased stakeholder engagement with regard to future energy security reviews.

There was support from some consultation respondents for policy measures focused on international agreements with the UK, especially where clarity and confirmation of arrangements is achieved.

4.1.2 Other Tools and Measures

Many consultation respondents highlighted an urgent need to address deficiencies in planning/permitting with one respondent suggesting that certain areas should be designated as strategic energy zones to allow faster delivery of energy projects. In addition, an overhaul and consolidation of Irish planning processes was suggested to enable prioritisation for strategic energy infrastructure, while preserving protections against undue environmental impacts and facilitating appropriate stakeholder engagement and participation.

A number of respondents highlighted the need for electricity market reform with a specific emphasis on the capacity market, some suggestions on this topic included investment in retention, looking at long term cost and benefits and incentivising the conversion of existing gas fired power plants to hydrogen. Some respondents raised the need for adequate electricity grid infrastructure with suggestions for enhanced grid connection timelines e.g., biannual connection

¹ The generation capacity statement is prepared by EirGrid, and the network development plan is prepared by Gas Networks Ireland.

to the grid instead of the current annual window for connection applications. System stability and system services were highlighted as being critical for security of supply. A suggestion was made that in future a digitally enabled network with a high level of automation and artificial intelligence would be essential for managing an increasingly dynamic and complex grid.

The need for indigenously produced biomethane was raised by a number of respondents with a suggestion that roadmaps for indigenously produced sustainable biomethane and green hydrogen should be produced which would contribute to the conversation on Ireland's security of supply.

In relation to hydrogen there have been calls for a comprehensive national hydrogen strategy, research into the development of indigenous green hydrogen at scale in Ireland and incentivisation for indigenous renewable gas markets for biomethane and green hydrogen. It was also suggested that internationally recognised standards in safety and certification for hydrogen should be adopted.

A national review and strategy to ensure the availability of critical skills including engineers and technically skilled personnel to deliver Climate Action Plan targets was suggested.

It was also suggested that there should be a focus on energy security at household and community level, as well as the co-benefits of energy efficiency, district heating, community energy, solar PV and building renovations.

A number of respondents suggested the need for greater stakeholder engagement with one respondent suggesting a national customer engagement and education programme.

