Winter Outlook 2022/23

October 2022

EIRGRID SONI

Disclaimer: While every effort has been made in the compilation of this Winter Outlook to ensure that the information contained herein is correct, EirGrid and SONI cannot accept responsibility or liability whatsoever for any damage howsoever caused by reliance on the information presented here.

Introduction

EirGrid and SONI operate the electricity transmission system in Ireland and Northern Ireland respectively. Together we are responsible for the planning and operation of a safe, secure, reliable, economic and efficient electricity transmission system to ensure all reasonable demands for electricity are met. Both EirGrid and SONI are providing the Ireland and Northern Ireland consumers with a high quality and increasingly clean energy supply, while also managing an increasingly complex supply and demand dynamic.

There are inherent challenges in all complex power systems. Electricity transmission system operators around the world face a wide range of demands and challenges, from geo-political pressures, to the weather (including very cold spells and storms), to outages at power stations and on interconnectors. We utilise our deep technical expertise to deal with these, however a confluence of these pressures at any one point can create an imbalance on the system which could, in rare cases, lead to localised loss of supply.

EirGrid and SONI do not generate electricity, deliver demand response or control market flows on interconnectors. As transmission system operators, we depend on others to have the power we need when we ask for it. These are the challenges that we manage every second of every day on behalf of communities and businesses across the island.

The annual All-Island Generation Capacity Statement published by EirGrid and SONI presents information on generation adequacy studies that assess the balance between supply and demand over the subsequent ten years. This Winter Outlook presents a more detailed view, focusing on the upcoming winter in Ireland and Northern Ireland. This document helps inform the electricity industry and supports preparation for the coming months. We study the expected generation capacity and the forecast demand to determine if there is adequate generation capacity margin. We identify periods where the margin between generation capacity and forecast peak demand is low, and the security of supply of the electricity system may be at risk. The winter outlook for 2022/23 covers the period from 31 October 2022 to 2 April 2023. The data-freeze date for the outlook was 2 September 2022.

Two-System Approach

EirGrid and SONI take a two-system approach to the assessment, studying Ireland and Northern Ireland separately. This is due to system constraints which limit the amount of electricity that can be transmitted between the two systems, typically limited to a maximum of 400 MW in each direction. While there might be times where there is excess generation capacity in one system and not enough generation capacity in the other, we may not be able to transmit the full excess due to this constraint.

Key Technical Terms

Here we explain some of the key technical terms used in the report. A full glossary of other terms can be found in the following section.

Loss of Load Expectation (LOLE) is a mathematical formula, based on studies, of the number of hours in a period (typically a year[1]) during which the available generation plant will be inadequate to meet the instantaneous demand. The higher this number is the greater the risk that there will be insufficient generation available to meet the demand at all times. The regulator in Ireland, Commission for Regulation of Utilities, and the Department for the Economy in Northern Ireland set LOLE standards which act as a maximum level of risk that they have judged the respective systems should be operated at. In Ireland the LOLE standard is 8 hours per year and in Northern Ireland it is 4.9 hours per year.

Expected Unserved Energy (EUE) is the expected amount of energy, based on the same LOLE studies, not supplied during a period (typically a year) due to insufficient generation being available.

Alert State is when a single event on the electricity power system would give rise to a reasonable possibility of one or more operational security limits being violated, e.g. failure to meet the demand. This designation is used across the EU and UK.

Emergency State is when one or more operational security limits on the electricity power system are violated, e.g. failure to meet the demand. This designation is used across the EU and UK.

De-rated Generation Capacity is the capacity of generation that can be expected to contribute to capacity adequacy. It is typically based on the historical performance of each generator on the system. A generator that has performed poorly in the past, by being unavailable for long periods due to breakdowns, will have a lower de-rated capacity, as its contribution to capacity adequacy is deemed to be less.

De-rated Margin is the sum of the de-rated generation capacity from all available generating units and interconnectors, less the forecast demand and reserve requirement.

1 For Winter Outlook 2022 LOLE is assessed over the period 31 October 2022 to 2 April 2023

Glossary

Acronym/ Abbreviation	Term	Explanation
	capacity	The rated continuous power output of a generator
	capacity/ generation adequacy	When there is sufficient generation capacity to meet the demand and reserve requirements
	capacity market auction	The Capacity Market is a mechanism designed to ensure that the island has enough electricity to power homes, businesses and industry in both Ireland and Northern Ireland. The market takes the form of an auction, held every year, for capacity for the future
CCGT	combined cycle gas turbine	A type of thermal generator that typically uses natural gas as a fuel source. It is a collection of gas and steam turbines; where waste heat from the gas turbine(s) is passed through a heat recovery boiler to generate steam for the steam turbine(s)
	conventional generating unit	The general term applied to generating units that produce electricity from coal, oil, or natural gas
	demand	The amount of electrical power consumed by the power system
DSU	demand side unit	A unit consisting of one or more individual demand sites that can be dispatched by the TSO to reduce demand
	de-rating factor	The percentage of a generating unit's capacity that reliably contributes to capacity adequacy. It is typically based on forced outage rates
	dispatchable generating unit/ generation	Sources of electricity that can be used on demand and dispatched at the request of the TSOs. Does not include wind and solar generation which are non-dispatchable generation
EWIC	East West Interconnector	A 500 MW Interconnector that connects the electricity transmission systems of Ireland and Great Britain
	forced outage	An event where a generator is unavailable for electricity production for a period of time due to unforeseen/ unplanned reasons
	forced outage rate	The proportion of time that a generation unit is expected to be unavailable for electricity production due to unforeseen/ unplanned outages
	forecast demand	The amount of electrical power that is expected to be consumed by the power system in a time period
	forecast peak demand	The maximum amount of electricity that is forecast to be consumed by the power system on a daily, weekly or annual basis
	generating unit	Any apparatus which produces electrical energy
	Generation Capacity Statement	Statement produced by EirGrid and SONI outlining the expected electricity demand and the level of generation capacity that will be required on the island of Ireland over the next ten years

	interconnector	An electrical link that connects two systems
MW	megawatt	Unit of power; 1 Megawatt = 1,000,000 Watts
	North-South Tie Lines	The electrical link that connects the transmission system of Ireland to the transmission system of Northern Ireland
	outage	A partial or total reduction in the availability of a generating unit such that the generating unit is unavailable to achieve its maximum capacity
	peaker plant	A dispatchable generating unit that is typically used to meet evening peak demand
	renewable	A natural resource or source of energy, such as wind, solar and hydro
	reserve requirement	The additional generation capacity that is required to be available to meet demand in the event that the forecasted supply of power is disrupted
	scheduled outage	Outage where a generator is unavailable for electricity production due to planned reasons, e.g. for maintenance
	security of supply	The electricity system's capability to ensure uninterrupted availability of electricity at a reasonable cost
	system constraints	Congestion at one or more parts of the transmission network that prevent power being transmitted to the location of demand
	thermal generating unit	Generating units that produce electricty from coal, oil, or natural gas, using steam to power a turbine(s)

Executive Summary

Northern Ireland

The Loss of Load Expectation (LOLE) in Northern Ireland for the five months of the winter period being studied is 1.5 hours. This is within the 4.9 hours per year standard meaning the system will operate within the acceptable level of risk that is set by the Department for the Economy. The results suggest that with the loss of just a single large unit in Northern Ireland, there is a risk of the system entering the Alert State, most likely at periods of low wind and interconnector imports. The risk of the system entering the Emergency State, due to insufficient generation being available to meet the demand, is low. A key assumption underpinning the winter outlook analysis, based on best information available at the time of writing, is that there will be uninterrupted reserves of natural gas, with no shortage issues.

Ireland

The Loss of Load Expectation (LOLE) in Ireland for the five months of the winter period being studied is 51 hours. The LOLE has increased from 17.4 hours last winter and is outside the 8 hours per year standard. This means the system will operate at a higher level of risk than is set by the Commission for Regulation of Utilities. There is an expectation that the system will enter the Alert State at times, most likely at periods of low wind and low interconnector imports. There is a high probability of the system entering the Emergency State at times, due to insufficient generation being available to meet the demand. The Expected Unserved Energy (EUE) figure would suggest that, on average, electricity consumers could potentially be without supply for approximately 4 hours over the winter period. LOLE is a metric used to measure the risk or likelihood of such an event happening. This does not necessarily mean that electricity consumers will be without supply for any period.

Based on information at the time of the data freeze, late November to mid-December and early-January to mid-February are expected to be the most onerous periods from a capacity margin perspective.

There is no risk of a system-wide “blackout” (a total loss of control of the electricity system) solely due to insufficient generation in Ireland or Northern Ireland under any circumstances this winter. Other conditions would have to be present or multiple and significant failures occur to cause a system wide blackout. A key assumption underpinning the winter outlook analysis, based on best information available at the time of writing, is that there will be uninterrupted reserves of natural gas from both the Moffat terminal and the Corrib gas field, with no shortage issues.

Winter 2021/22 Review

Northern Ireland

No System Alerts[2] were experienced on the Northern Ireland power system during Winter 2021/22. This was in part due to the mild weather experienced.

Winter 2021/22 was a relatively mild winter, with no prolonged periods of very cold weather. On average, temperatures at the time of daily peak demand over the winter period were 1.2°C higher than the 15-year average. Similarly, minimum temperatures over the same period were approximately 1.1°C higher than the 15-year average. With consideration of the temperature-effects, the sent out peak demand (not temperature corrected) of 1,528 MW was close to our forecast from last year's Winter Outlook.

The forced outage rate of dispatchable generation (excluding DSUs) over the winter period was 19.9%. This was well above our assumption of 9.5%. This was primarily due to an overrun of a planned outage of a large generator and two units being unavailable on a fuel that allows a higher output.

Wind generation output over the winter period was consistent with recent winters, supplying 42% of the electricity demand. However, wind generation output varied from 0 MW to 1,061 MW over the period. In terms of wind generation's contribution to capacity adequacy, we apply a capacity credit to account for the variability of its output. Solar generation output is typically reduced throughout the winter period due to shorter, colder days. With the winter peak demand typically occurring after sunset, the installed solar capacity has been assigned a capacity credit of zero.

During the ten evening demand peaks with the tightest generation margin, the average import from Ireland was 31 MW on the North-South Tie Lines and 398 MW from Great Britain on the Moyle Interconnector.

2 There were 71 days during the winter period where the system was reliant on wind generation and/or interconnection from Ireland and Great Britain to keep the system out of the Alert (62 days) and Emergency (9 days) States.

Ireland

No System Alerts[3] were experienced on the Ireland power system during Winter 2021/22. This was in part due to the mild weather experienced.

Winter 2021/22 was a relatively mild winter with no prolonged periods of very cold weather. On average, temperatures at the time of daily peak demand over the winter period were 1°C higher than the 15-year average. Minimum temperatures over the same period were approximately 2.5°C higher than the 15-year average. The sent out peak demand (not temperature corrected) of 5,391 MW was in line with our median forecast from last year's Winter Outlook.

The forced outage rate of dispatchable generation (excluding DSUs) over the winter period was 15.3%. This was broadly in line with our assumption of 14.5%.

Wind generation output over the winter period was consistent with recent winters, supplying 40% of the electricity demand. However, wind generation output varied from 0 MW to 3,618 MW over the period. In terms of wind generation's contribution to capacity adequacy, we apply a capacity credit to account for the variability of its output.

During the ten evening demand peaks with the tightest generation margin, the average import from Northern Ireland was 82 MW on the North-South Tie Lines and 338 MW from Great Britain on the East West Interconnector.

3 There were 31 days during the winter period where we were reliant on wind generation and/or interconnection from Northern Ireland and Great Britain to keep the system out of the Alert (19 days) and Emergency (12 days) States.

Northern Ireland Winter Outlook

Northern Ireland Demand

The sent out transmission peak demand (not temperature corrected) over last winter was 1,528 MW and occurred on 5 January 2022 at 17:19. As can be seen in Figure 1, the annual sent out peak electricity demand in Northern Ireland has remained broadly static over the last five years.

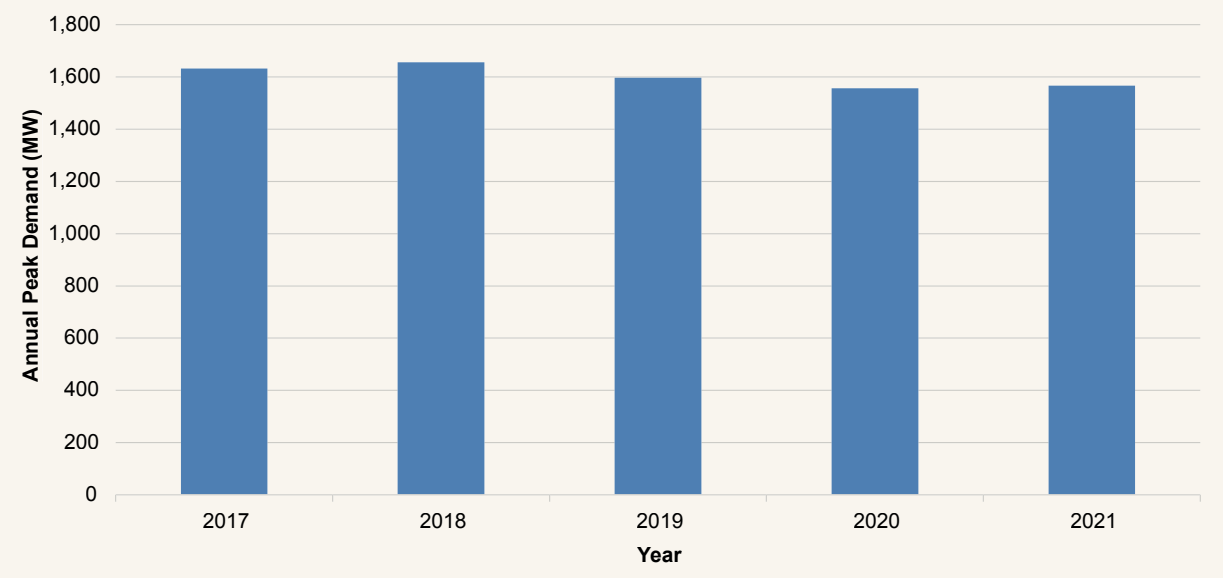

Figure 1: Northern Ireland historical annual sent out peak demand

We anticipate a Northern Ireland peak demand of between 1,545 MW and 1,745 MW this winter. Figure 2 compares the weekly peak demand for the 2020/2021 and 2021/2022 winter periods, to the median forecast weekly peak demand for the 2022/2023 winter period.

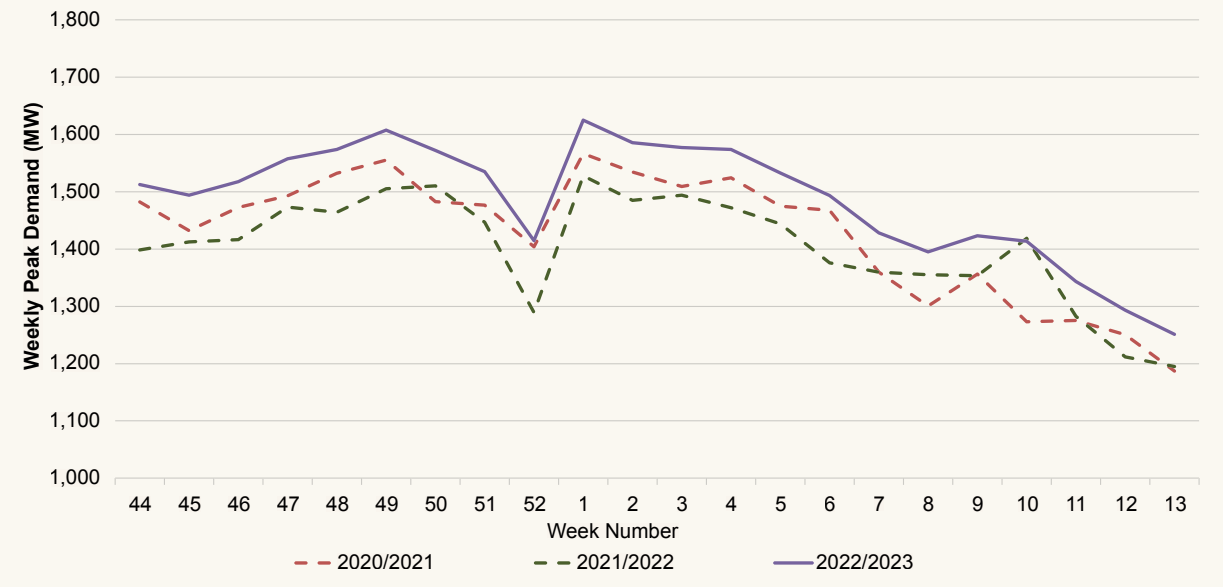

Figure 2: Northern Ireland weekly peak demand for 2020/2021 and 2021/2022 winter periods versus forecast median weekly peak demand for 2022/2023 winter period

Northern Ireland Generation Capacity versus Forecast Demand

The total generation capacity in Northern Ireland is made up of a variety of different types of generating units; combined cycle gas turbines (CCGTs) (gas), thermal generation plant (coal, heavy fuel oil, biomass), peaker plant (gas and distillate), renewables (mostly wind and solar), demand side units (DSUs), aggregated generating units (AGUs) and a small volume of other technologies. There are two interconnectors; the 500 MW Moyle interconnector connecting Northern Ireland and Scotland, and the North-South Tie Lines which connect Northern Ireland and Ireland.

We apply de-rating factors to the generation capacity to reflect the contribution of each generator to capacity adequacy to calculate a de-rated generation capacity. For conventional dispatchable generating units the de-rating factor is typically based on forced outage rates in a rolling three-year period. For wind generation and interconnection, the de-rating factors are those used in the Generation Capacity Statement 2022-2031. A further de-rating has been applied to the Moyle Interconnector based on recent analysis of flows on Great Britain interconnectors and following engagement with National Grid Electricity System Operator. The assumption of 200 MW support from Ireland on the North-South Tie Lines in the Generation Capacity Statement 2022-2031 has been reduced to 100 MW, based on the tight margins expected in Ireland this winter.

The de-rated margin is the sum of the de-rated generation capacity from all available generating units and interconnectors, less the forecast demand and the reserve requirement. The more positive the de-rated margin is, the greater the likelihood that we will have sufficient capacity to meet demand, while a negative de-rated margin indicates there may be a shortage of capacity to meet demand.

Figure 3 shows the total generation capacity on the system, the de-rated generation capacity and the forecast demand plus reserve for the day with the lowest margin, across the upcoming winter period.

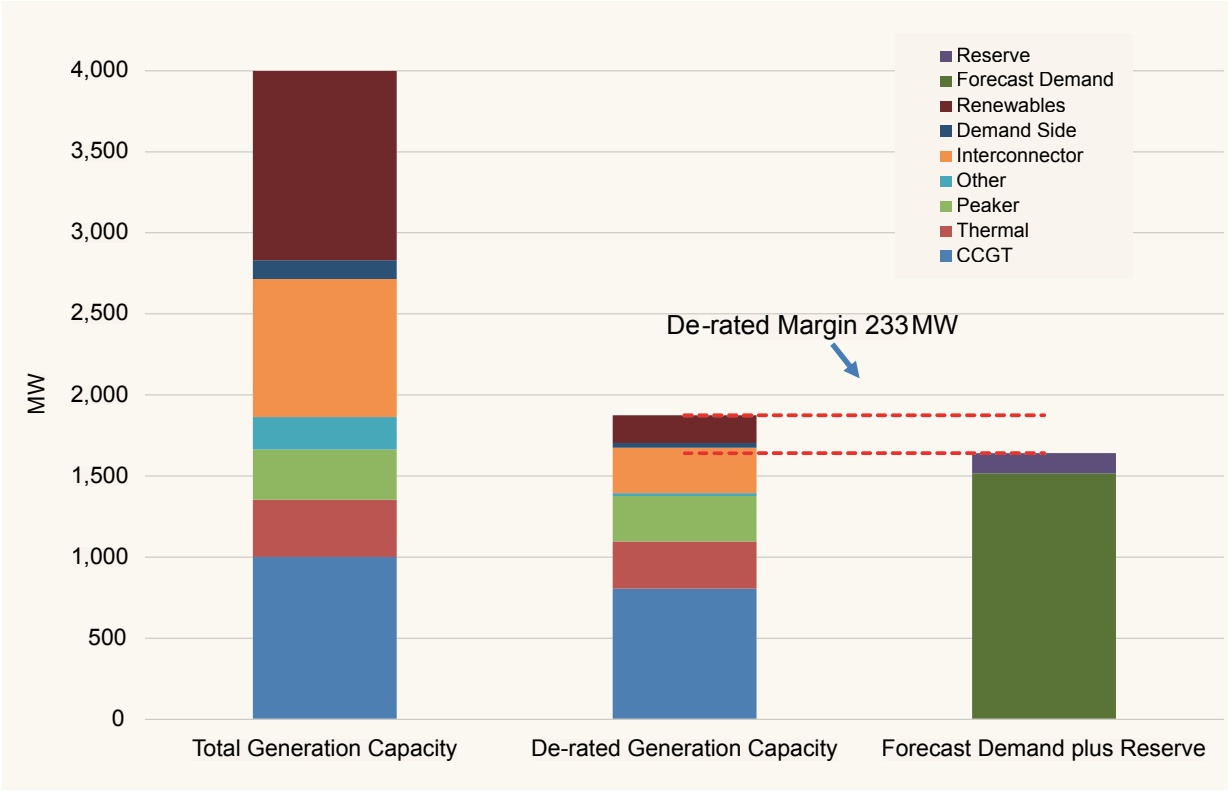

Figure 3: Northern Ireland generation capacity versus forecast demand for the day of lowest capacity margin

Northern Ireland LOLE and De-rated Margin

The Loss of Load Expectation (LOLE) for Northern Ireland for the five months of the winter period being studied is 1.5 hours. This is within the 4.9 hours per year standard, meaning the system will operate within the level of risk that is set by the Department for the Economy. The minimum de-rated margin over the winter period is expected to be in the range of 112 MW to 313 MW. The results suggest that with the loss of just a single large unit in Northern Ireland, there is risk of the system entering the Alert State, most likely at periods of low wind and interconnection. The risk of the system entering the Emergency State, due to insufficient available generation, is low.

Table 1: Northern Ireland key metrics for median demand level

	2022/23 Base Case
Loss of Load Expectation (LOLE)	1.5 hours
Expected Unserved Energy (EUE)	107 MWh
Minimum de-rated margin (MW) over winter period	233 MW
Minimum de-rated margin (%) over winter period	13.7%

Figure 4 shows the de-rated margin, as a percentage of demand plus reserve, for the day with the lowest margin across the winter period for three demand scenarios. An approximate figure for the de-rated margin associated with an LOLE of 4.9 hours per year is also shown.

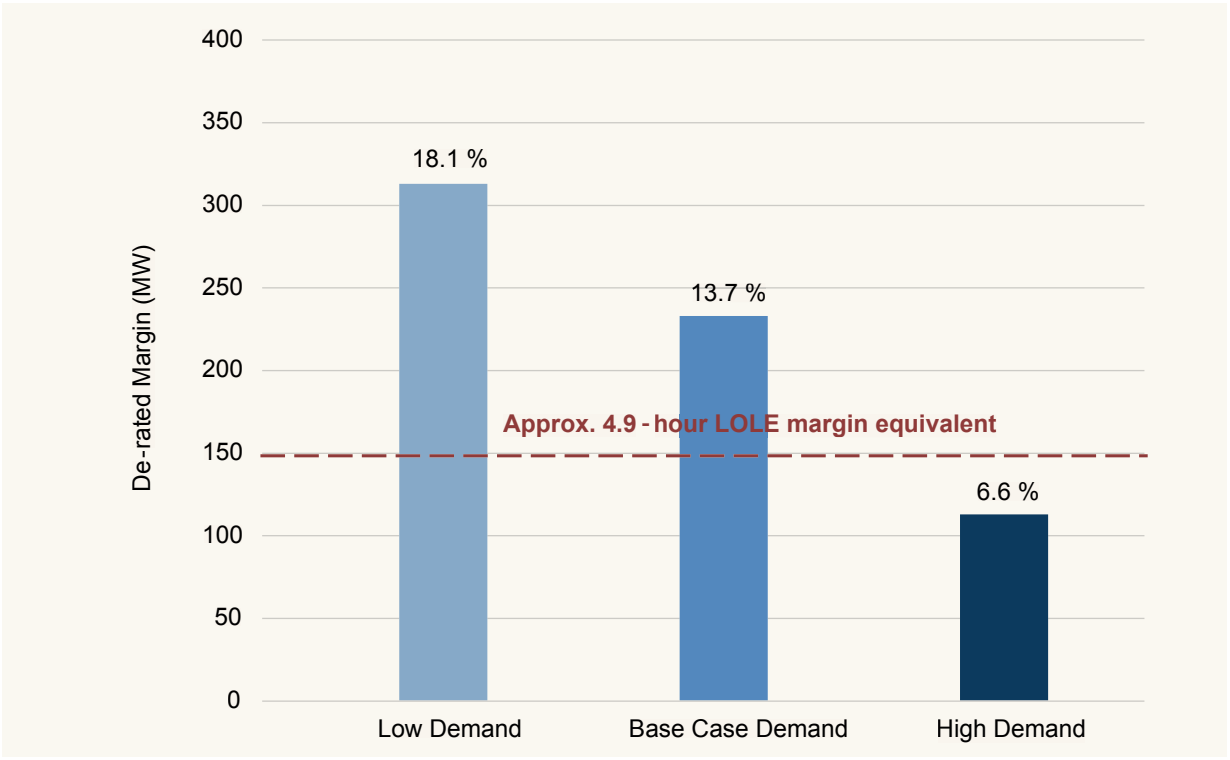

Figure 4: Northern Ireland de-rated margin for low, median and high demand scenarios for the day of lowest capacity margin

Northern Ireland Weekly Analysis

We study the expected de-rated generation capacity and the forecast demand for each week across the winter period. This allows us to identify weeks when the de-rated margin is low and when the system is at risk of entering the Alert and Emergency states. We look at three interconnector (Moyle and North-South Tie Lines) import scenarios; low (0 MW), medium (280 MW) and high (850 MW) imports. It should be noted that our studies also include probabilistic analysis of forced outages which can have a more significant impact than outlined below.

Figure 5 shows the weekly de-rated generation capacity in the medium import scenario. The de-rated generation capacity fluctuates throughout the winter period due to known scheduled outages of generating units occurring during the period.

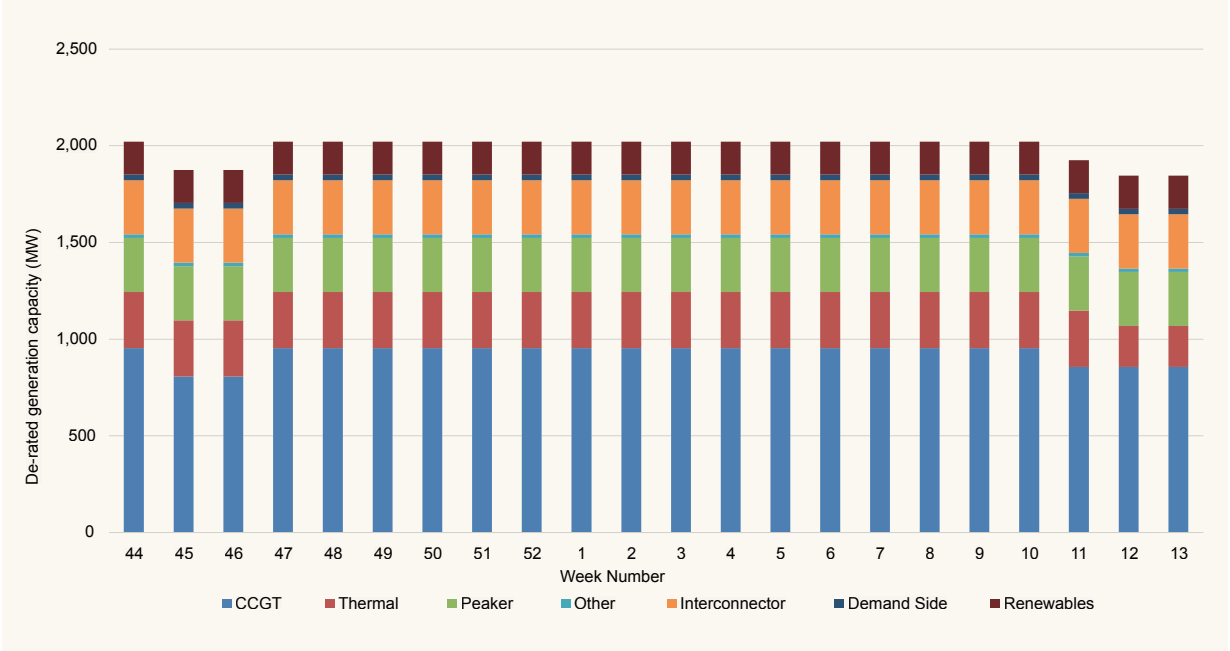

Figure 5: Northern Ireland weekly de-rated generation capacity per type of generating unit

Given the small generation portfolio in Northern Ireland and the size of the largest unit relative to the size of the system (26% of peak demand), it is important to also consider the unavailability of the single largest unit when assessing the winter outlook. Therefore, we assess two scenarios for Northern Ireland; one based on de-rating factors of all units and one based on the largest unit being unavailable.

Figure 6 shows the weekly de-rated generation capacity based on de-rating factors for each import scenario versus the forecast demand plus reserve. In the low import scenario, there are three weeks in which the demand plus reserve requirement exceeds the de-rated capacity. The risk of the system entering the Alert and Emergency states is higher in these weeks (November and early January).

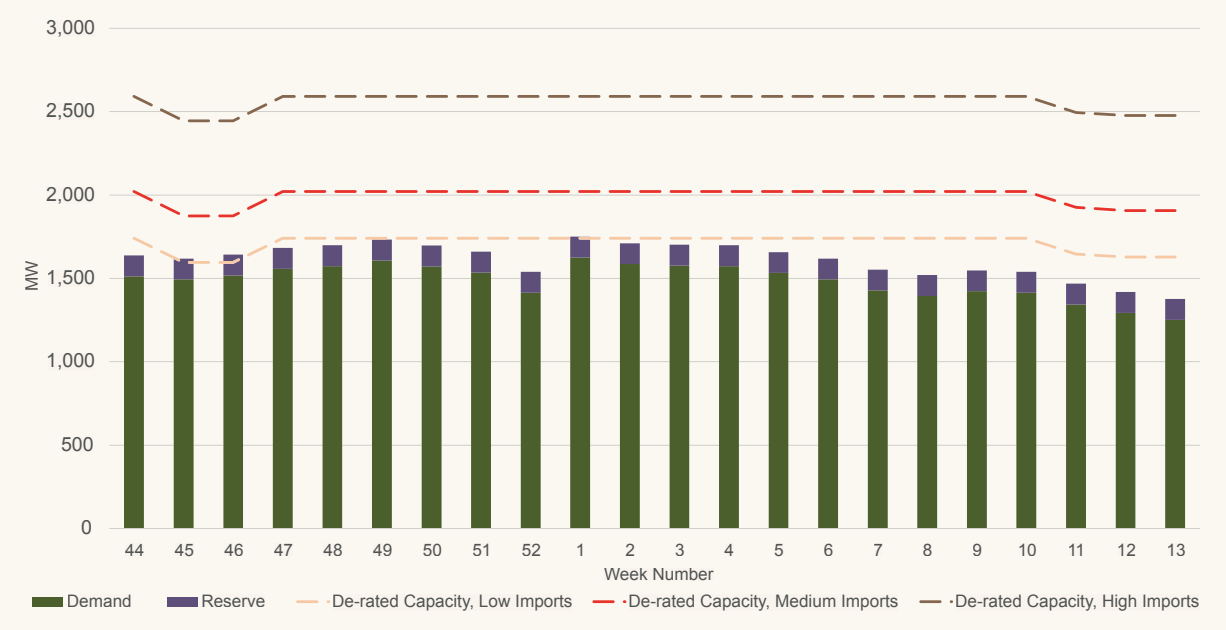

Figure 6: Northern Ireland weekly de-rated generation capacity based on de-rating factors (dashed lines) for each import scenario versus the forecast demand plus reserve (bars)

Figure 7 shows the weekly expected Northern Ireland de-rated generation capacity based on the largest unit being unavailable for each import scenario versus the forecast demand plus reserve. In the low import scenario, there are fourteen weeks in which the demand plus reserve requirement exceeds the de-rated capacity. The risk of the system entering the Alert and Emergency states is higher in these weeks.

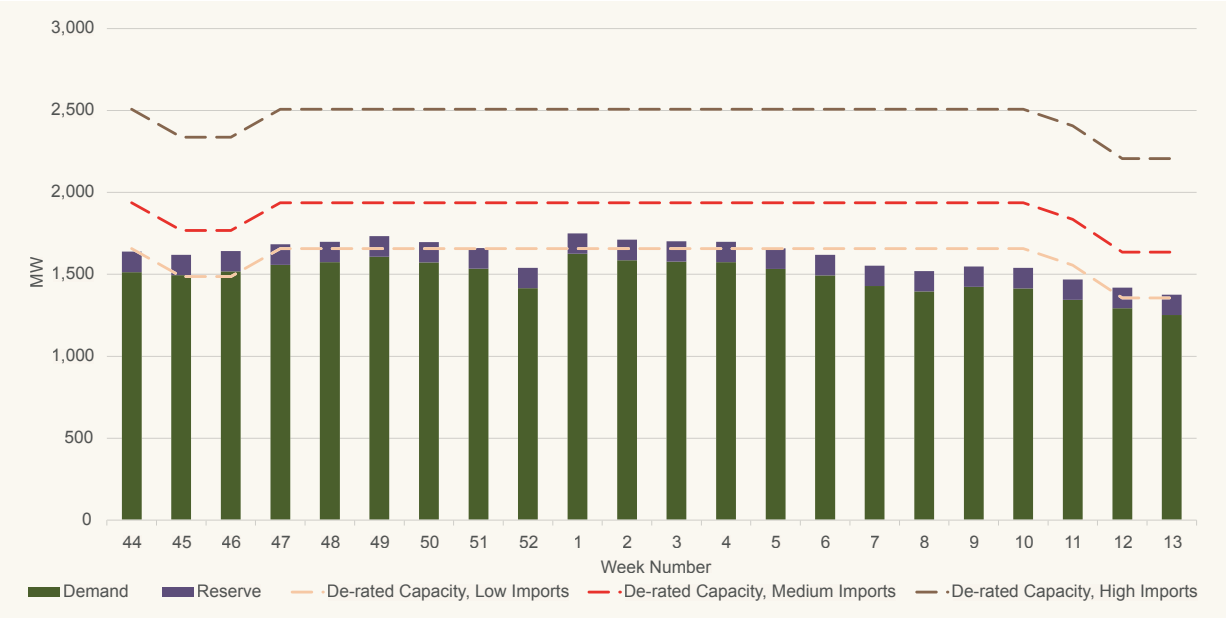

Figure 7: Northern Ireland weekly de-rated generation capacity based on the largest unit being unavailable (dashed lines) for each import scenario versus the forecast demand plus reserve (bars)

Northern Ireland Forced Outage Rates

The recent dispatchable generation (excluding DSUs) forced outage rate in Northern Ireland is near the upper end of the historical range. For 1 January 2022 to 30 June it stands at 11%.

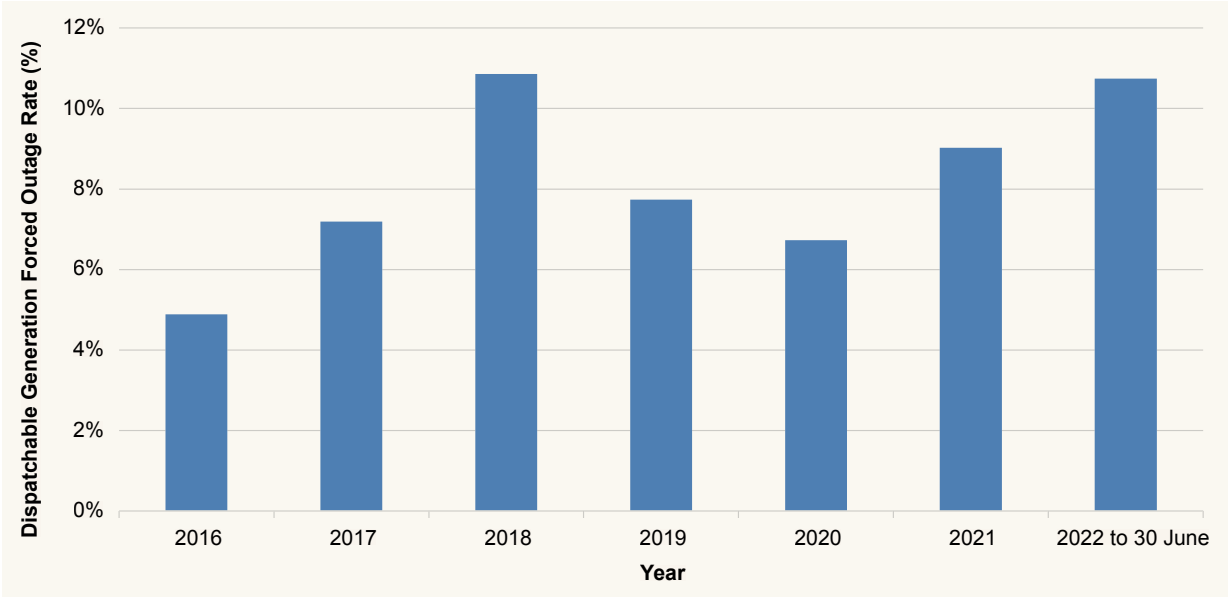

Figure 8: Northern Ireland historical dispatchable generation annual forced outage rates

Ireland Winter Outlook

Ireland Demand

As can be seen in Figure 9, the transmission peak electricity demand in Ireland has been growing over the last number of years. The 2021 sent out transmission peak demand (not temperature corrected) was a record of 5,391 MW, which occurred on 8 December at 17:24. The analysis of Ireland's peak demand over winter indicates that a 1°C decrease in outside temperature results in a 40 MW increase in peak demand (50 MW when wind-chill is taken into account), and vice-versa, meaning electricity demand in the winter is heavily influenced by weather conditions.

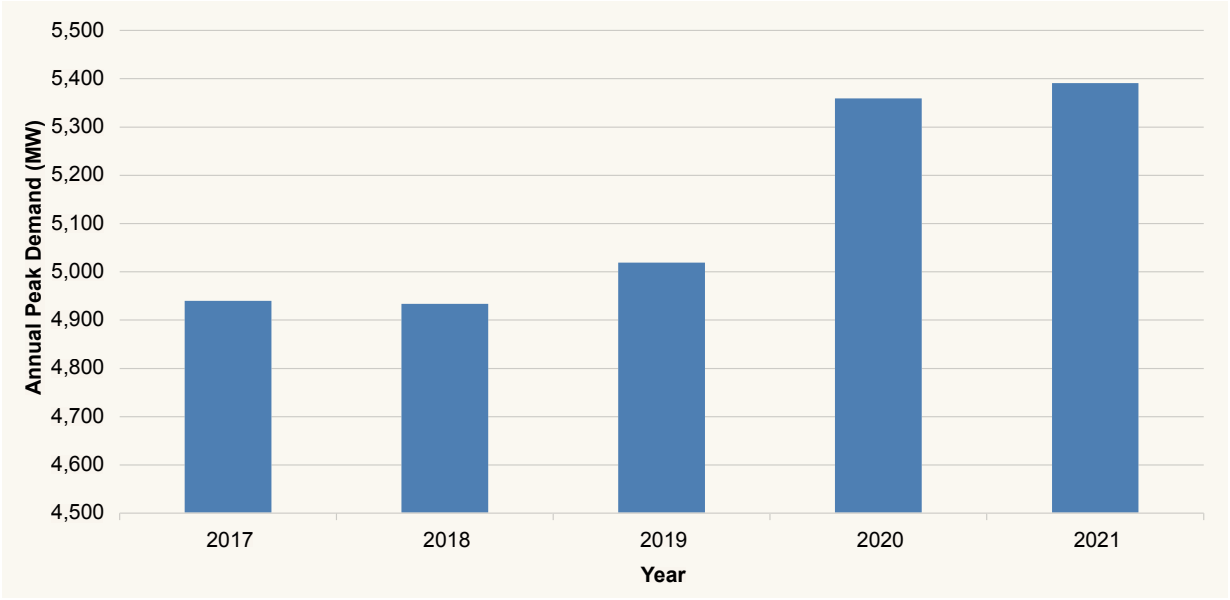

Figure 9: Ireland historical annual peak demand

We anticipate a sent out peak demand of between 5,456 MW and 5,786 MW in Ireland this winter. Figure 10 compares the weekly peak demand for the 2020/2021 and 2021/2022 winter periods to the median forecast weekly peak demand for the 2022/2023 winter period.

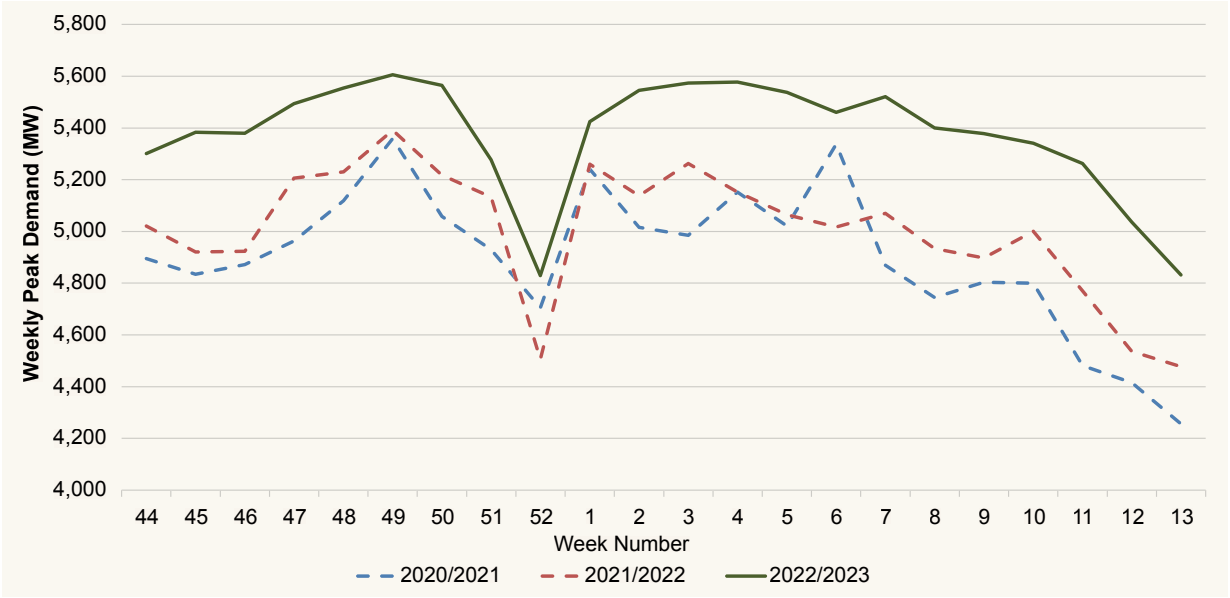

Figure 10: Ireland weekly peak demand for 2020/2021 and 2021/2022 winter periods versus forecast median weekly peak demand for 2022/2023 winter period

Ireland Generation Capacity versus Forecast Demand

The total generation capacity in Ireland is made up of a variety of different types of generating units; combined cycle gas turbines (CCGTs) (gas), thermal generation plant (coal, heavy fuel oil, peat/biomass), peaker plant (gas and distillate), renewables (mostly hydro and wind), demand side units (DSUs) and a small volume of other technologies. There are also two interconnectors; the 500 MW East West Interconnector (EWIC) connects Ireland and Great Britain, and the North-South Tie Lines connect Ireland and Northern Ireland.

We apply de-rating factors to the generation capacity to reflect the contribution of each generator to capacity adequacy, to calculate a de-rated generation capacity. For conventional dispatchable generating units, the de-rating factor is typically based on forced outage rates in a rolling three-year period. For wind generation and interconnection, the de-rating factors are those used in the Generation Capacity Statement 2022-2031. A further de-rating factor has been applied to the East West Interconnector based on recent analysis of flows on Great Britain interconnectors and following engagement with National Grid Electricity System Operator.

The de-rated margin is the sum of the de-rated generation capacity from all available generating units and interconnectors, less the forecast demand and the reserve requirement. The more positive the de-rated margin is, the greater the likelihood that we will have sufficient capacity to meet demand, while a negative de-rated margin indicates there may be a shortage of generation capacity.

Figure 11 shows the total generation capacity on the system, the de-rated generation capacity and the forecast demand plus reserve for the day with the highest peak demand/ lowest capacity margin, across the upcoming winter period.

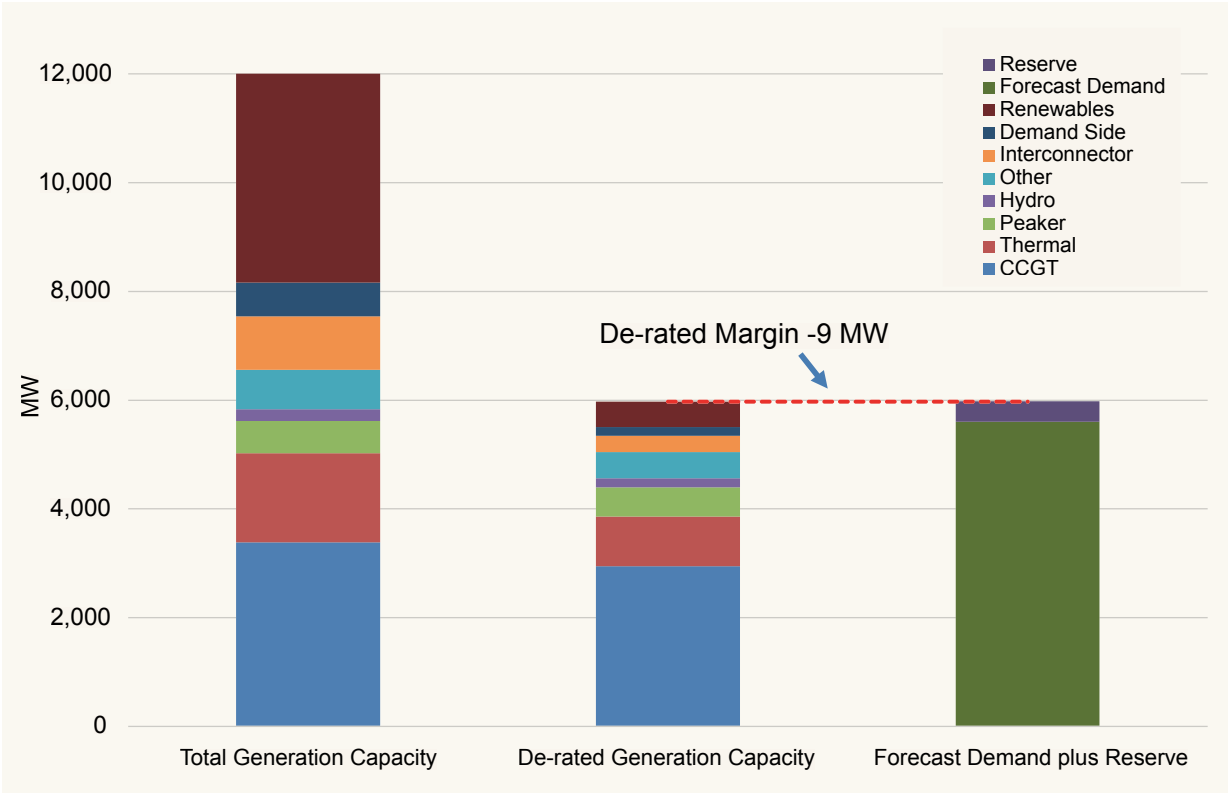

Figure 11: Ireland generation capacity versus forecast demand for the day of highest peak demand / lowest capacity margin

Ireland LOLE and De-rated Margin

The Loss of Load Expectation (LOLE) in Ireland for the five months of the winter period being studied is 51 hours. This is outside the 8 hours per year standard meaning the system will operate at a higher level of risk than is set by the Commission for Regulation of Utilities. The minimum de-rated margin over the winter period is expected to be in the range of -189 MW to 141 MW. There is an expectation that the system will enter the Alert State at times, most likely at periods of low wind and low interconnector imports. There is a high probability of the system entering the Emergency State at times due to insufficient generation being available to meet the demand. The Expected Unserved Energy (EUE) figure would suggest that, on average, electricity consumers could potentially be without supply for approximately 4 hours over the winter period. LOLE is a metric used to measure the risk or likelihood of such an event happening. This does not necessarily mean that electricity consumers will be without supply for any period.

Table 2: Ireland key metrics for median demand level

	2022/23 Base Case
Loss of Load Expectation (LOLE)	51 hours
Expected Unserved Energy (EUE)	12,525 MWh
Minimum de-rated margin (MW) over winter period	-9 MW
Minimum de-rated margin (%) over winter period	-0.2%

Figure 12 shows the de-rated margin as a percentage of demand plus reserve for the day with the highest peak demand and the day with the lowest margin across the winter period for three demand scenarios. An approximate figure for the de-rated margin associated with an LOLE of 8 hours per year is also shown.

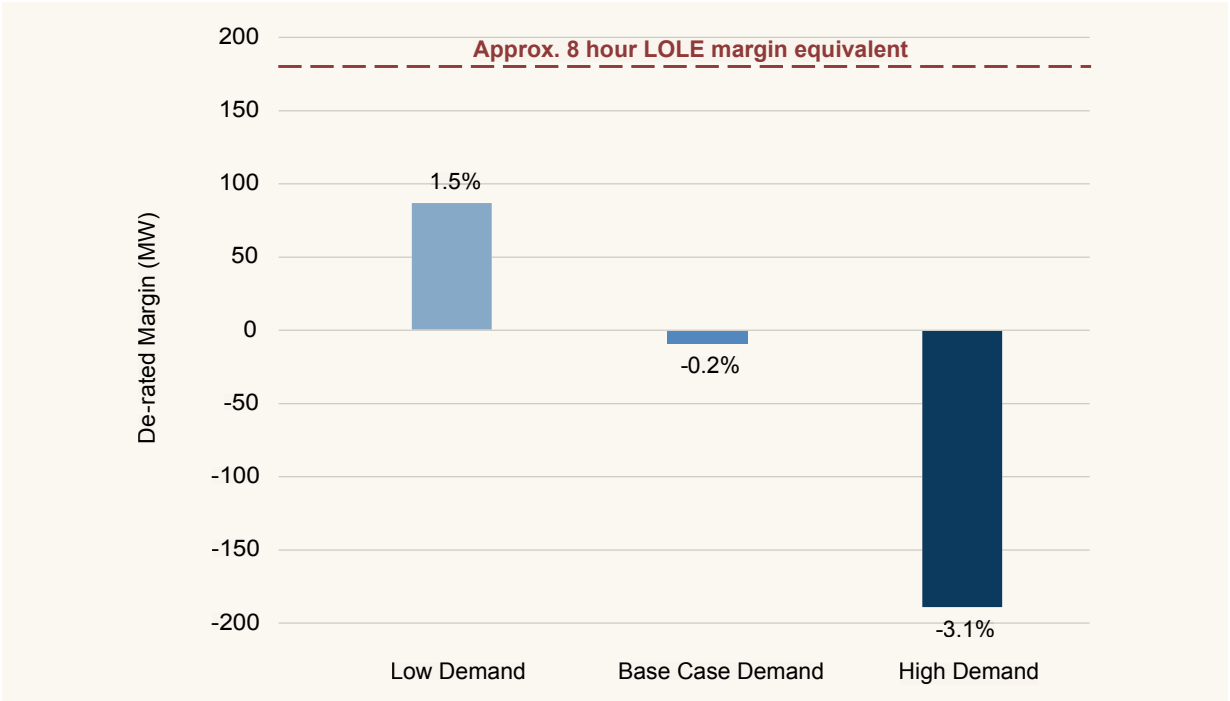

Figure 12: Ireland de-rated margin for low, median and high demand scenarios on day of highest peak demand / lowest capacity margin

Ireland Weekly Analysis

We study the expected de-rated generation capacity and the forecast demand for each week across the winter period. This allows us to identify weeks when the de-rated margin is low and when the system is at risk of entering the Alert and Emergency states. We look at three interconnector (East West Interconnector and North-South Tie Lines) import scenarios; low (0 MW), medium (300 MW) and high (900 MW) imports. It should be noted that our studies also include probabilistic analysis of forced outages, which can have a more significant impact than outlined below.

Figure 13 shows the expected weekly de-rated generation capacity in the medium import scenario. The de-rated generation capacity remains broadly static throughout the winter period, as there are relatively few scheduled outages of generating units.

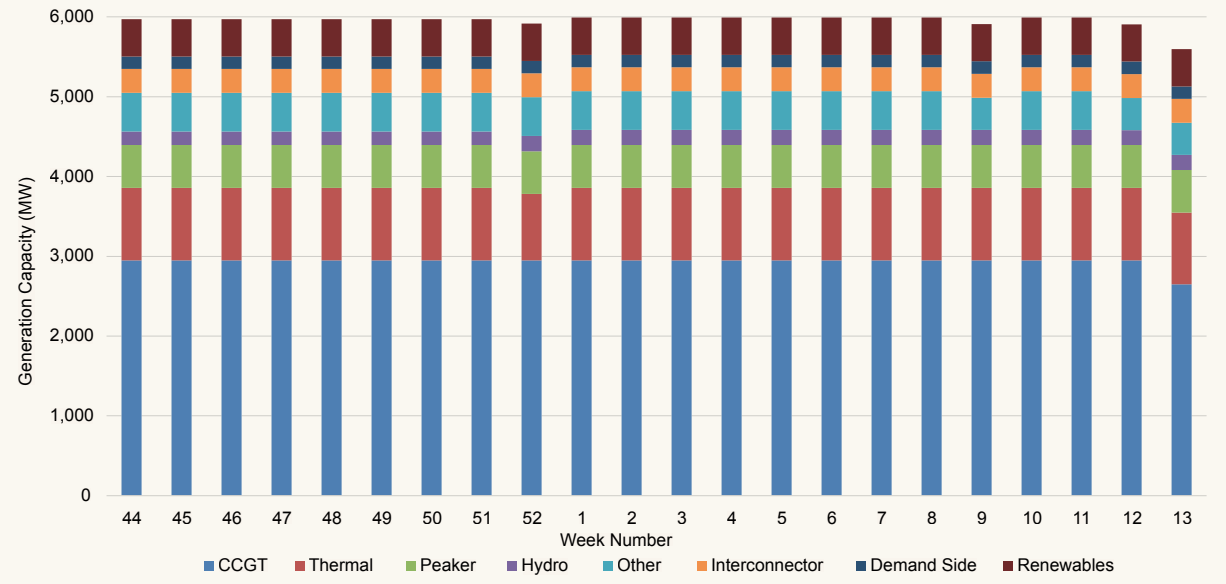

Figure 13: Ireland expected weekly de-rated generation capacity per type of generating unit

Figure 14 shows the expected weekly de-rated generation capacity for each import scenario versus the forecast demand plus reserve. In the medium import scenario, there is one week in which the demand plus reserve requirement exceeds the de-rated capacity, while this increases to seventeen weeks in the low import scenario. The risk of the system entering the Alert and Emergency states is higher in late November to mid-December and early-January to mid-February.

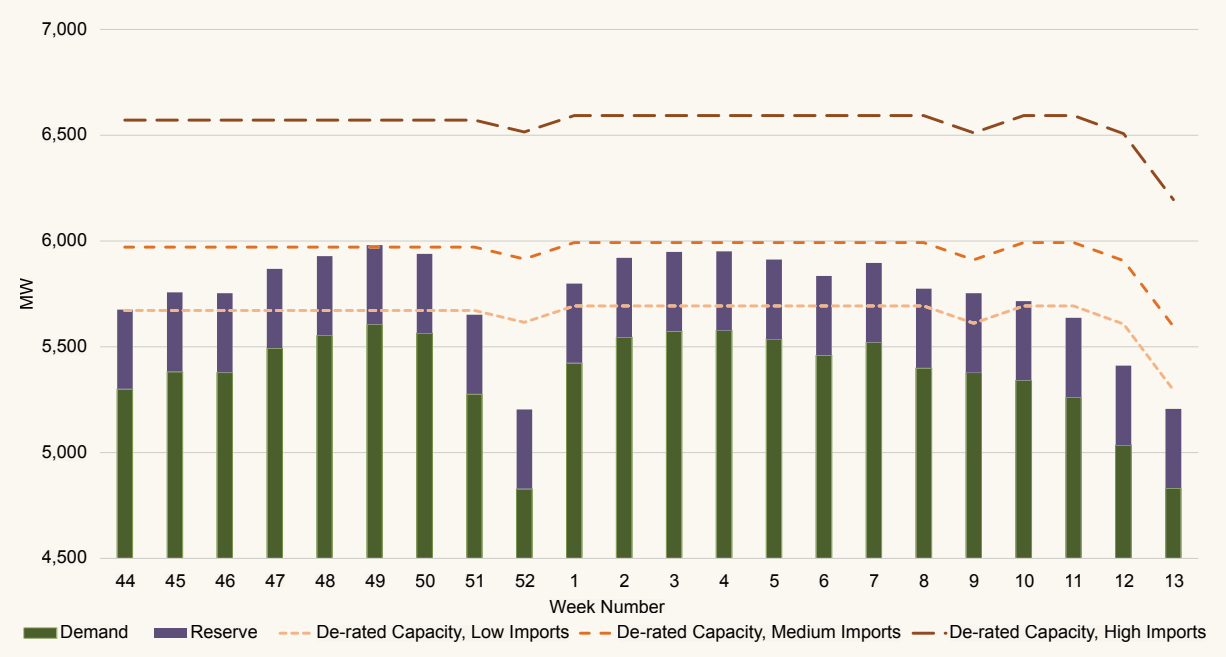

Figure 14: Ireland weekly de-rated generation capacity (dashed lines) for each import scenario versus the forecast demand plus reserve (bars)

Ireland Forced Outage Rates

The dispatchable generation (excluding DSUs) forced outage rate in Ireland has increased every year for the past five years. For January 2022 to June it stands at 17%. This has led to very tight margins in 2022, resulting in the system entering the Alert state on seven occasions since April and has impacted the system's ability to accommodate generator and transmission planned outages, with several outages being postponed.

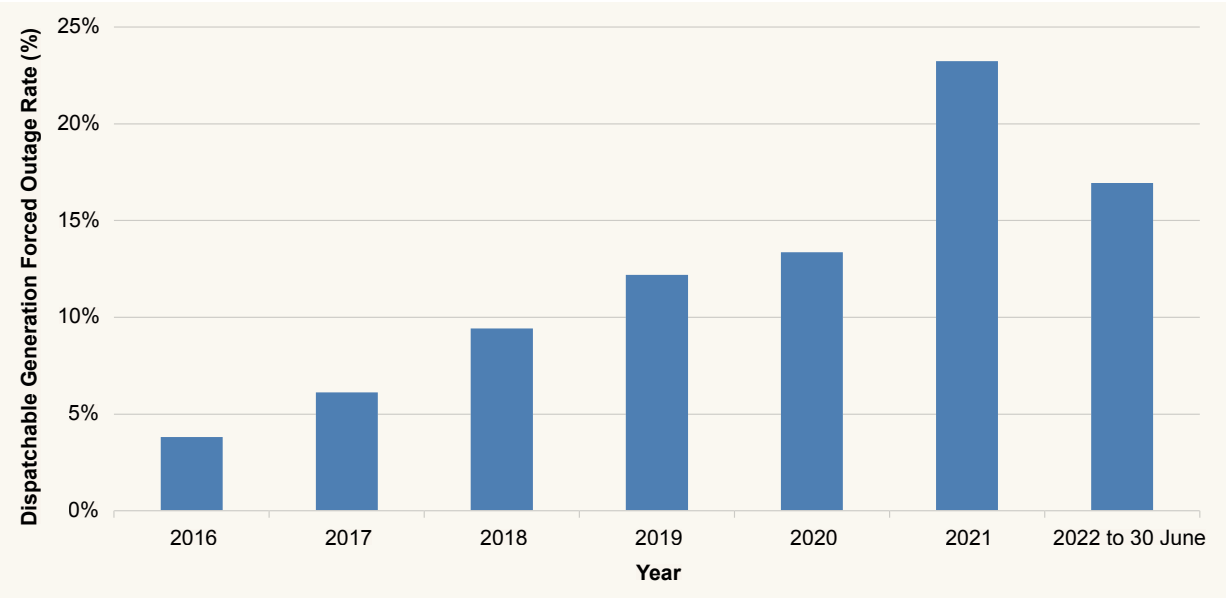

Figure 15: Ireland historical dispatchable generation annual forced outage rates

Assumptions

Northern Ireland

- There will be uninterrupted reserves of natural gas from both the Moffat terminal and the Corrib gas field, with no shortage issues.

- Northern Ireland de-rating factors / capacity credits:
    - CCGT and large thermal units (high and mid-merit units) de-rating factors based on forced outage rates in a rolling three-year period from July 2019 to Jun 2022;
    - Peaker de-rating factor: 0.9;
    - DSU, battery and wind as per Generation Capacity Statement 2022-2031;
    - Moyle Interconnector de-rating factor (based on recent analysis of flows on Great Britain interconnectors and following engagement with National Grid Electricity System Operator): 0.4 (180 MW); and
    - North-South Tie-Line de-rated to 100 MW for flows from Ireland to Northern Ireland (this is 100 MW lower than that assumed in the Generation Capacity Statement 2022-2031 due to the tight margins expected in Ireland this winter).

- A fully intact network will be available.

- Due to the winter peak typically occurring after sunset, the installed solar capacity has been assigned a capacity credit of zero.

- Northern Ireland reserve requirement as per Generation Capacity Statement 2022-2031. The operational reserve requirement is 125 MW.

- Demand scenarios: low, median (base case) and high as per the Generation Capacity Statement 2022-2031 with a downward adjustment of 15 MW to account for the impact of higher energy prices on usage.

- Northern Ireland interconnector scenarios:

	Low (MW)	Median (MW)	High (MW)
Moyle Interconnector	0	180	450
North-South Tie Lines	0	100	400
Total	0	280	850

Ireland

- There will be uninterrupted reserves of natural gas from both the Moffat terminal and the Corrib gas field, with no shortage issues.
- Ireland de-rating factors / capacity credits:
    - CCGT and thermal and hydro units (high and mid-merit units) de-rating factors based on forced outage rates in a rolling three-year period from July 2019 to Jun 2022;
    - Peaker de-rating factor: 0.9;
    - DSU, battery and wind as per Generation Capacity Statement 2022-2031;
    - East West Interconnector de-rating factor (based on recent analysis of flows on Great Britain interconnectors and following engagement with National Grid Electricity System Operator): 0.4 (200 MW); and
    - North-South Tie-Line de-rated to 100 MW for flows from Northern Ireland to Ireland as per Generation Capacity Statement 2022-2031.
- A fully intact network will be available.
- Due to the winter peak typically occurring after sunset, the installed solar capacity has been assigned a capacity credit of zero.
- Ireland reserve requirement as per Generation Capacity Statement 2022-2031. The operational reserve requirement is 375 MW.
- Demand scenarios: low, median (base case) and high as per Generation Capacity Statement 2022-2031 with downward adjustments of 124 MW for slower than expected ramp of a number of large energy users and the impact of higher tariff/ energy prices on usage.
- Ireland interconnector scenarios:

	Low (MW)	Median (MW)	High (MW)
East West Interconnector	0	200	500
North-South Tie Lines	0	100	400
Total	0	300	900

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