

# Winter Outlook 2019/20











## Winter Outlook 2019/20

The EirGrid and SONI Winter Outlook is an annual summary that provides information on expected electricity demand and capacity margin on an all-island basis. The capacity margin is the excess generation and interconnection available to meet the peak electricity demand in Ireland and Northern Ireland. The outlook covers the period from 1 November 2019 to 31 January 2020.

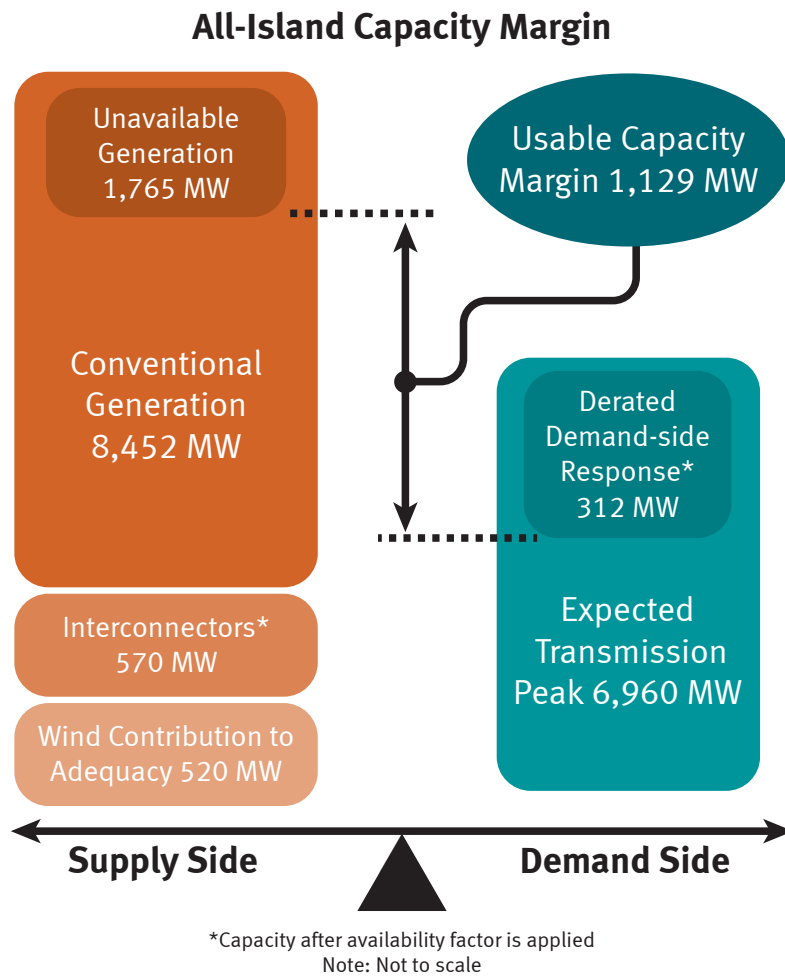
It is expected that there will be adequate capacity to ensure a secure supply of electricity over the coming winter period in Ireland and Northern Ireland. The all-island capacity margin this winter is predicted to be 1,129 MW.

The peak demands in Ireland and Northern Ireland typically do not align. There is expected to be sufficient capacity margin in both jurisdictions to meet their respective peak demands. There is a predicted usable capacity margin of 531 MW over the peak demand in Northern Ireland and 798 MW in Ireland.

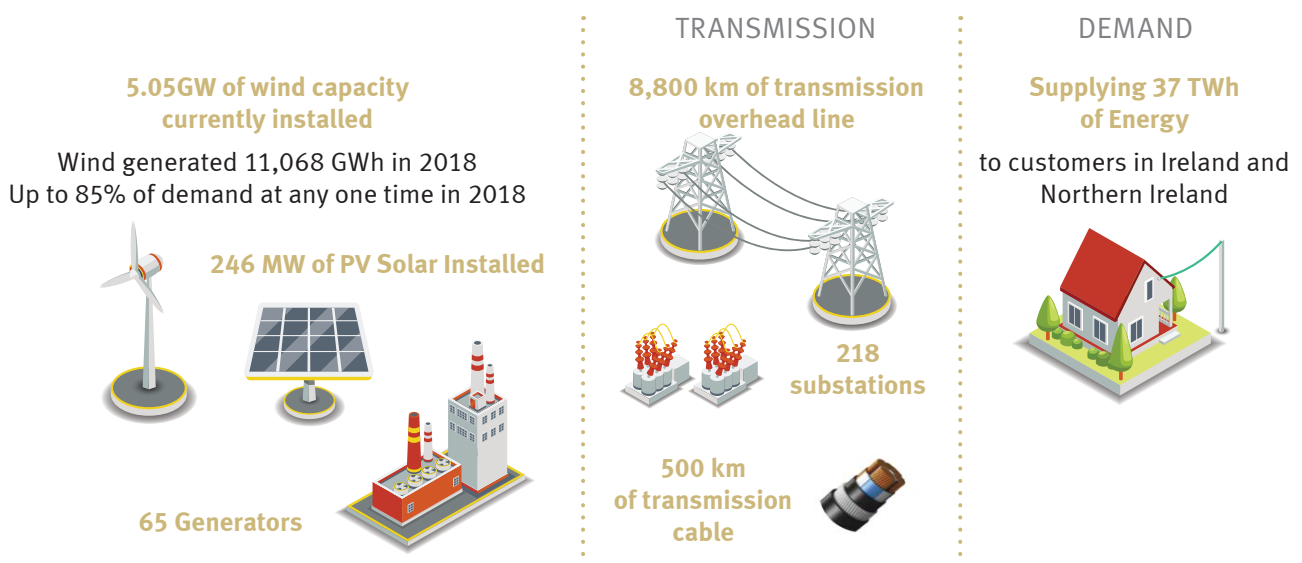
While the capacity margin is expected to be adequate to meet forecast peak demand, there may be periods of low capacity margin if generators are unavailable during low wind conditions over the winter period.

**Note:** The data used to calculate the capacity margin is the latest available data as at 10 September 2019.

**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. Note that the fuel mix is reliant on third party data.



**Figure 1: All-Island Capacity Margin at time of highest peak demand (corresponds to lowest margin)**



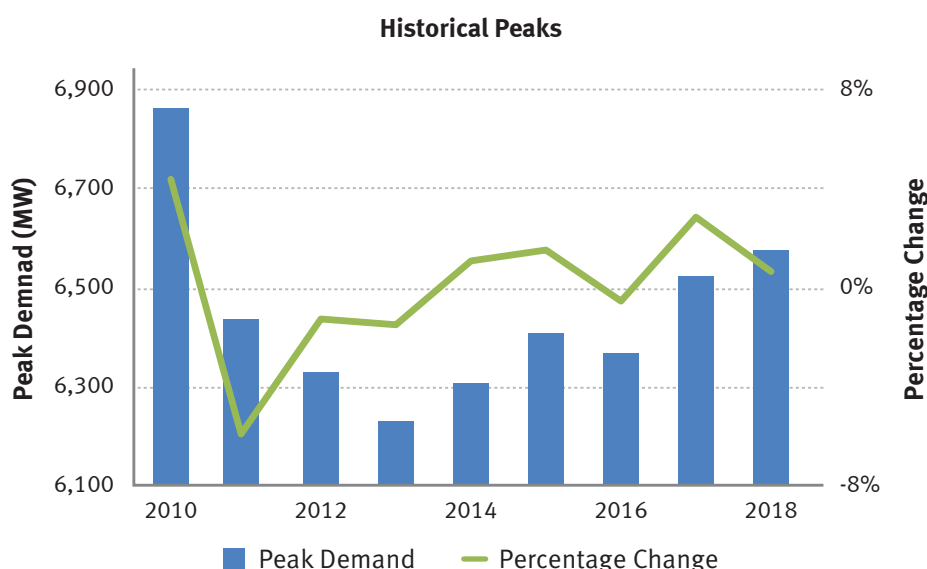






# Demand

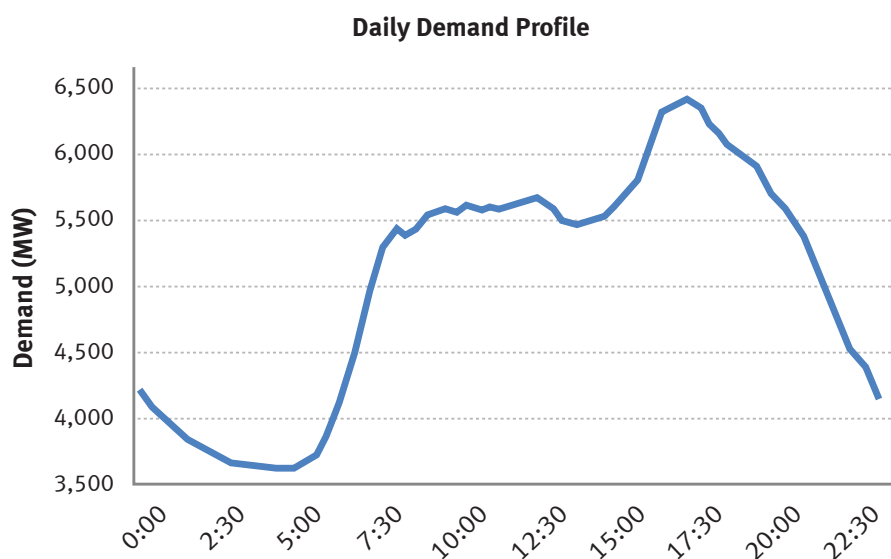
The economic downturn and efficiency improvements on the user side led to significant reductions in the peak demand, as illustrated in Figure 1. However, we (EirGrid and SONI) are seeing a trend of increasing all-island peaks over the last five years. On the basis of the median demand forecasts in the Generation Capacity Statement<sup>1</sup> we anticipate a peak demand of up to 5,350 MW in Ireland and 1,710 MW in Northern Ireland for this winter.



**Figure 2: Historical Transmission Peak**

## Winter Daily Demand Profile

Figure 3 shows a typical winter's day demand profile. Whilst the lowest daily demand period for both jurisdictions is usually co-incidental, the peak demand in Northern Ireland usually occurs 15-30 minutes before the daily peak in Ireland. The graph shows the typical shape of the daily demand curve throughout the winter period, with two major demand increases occurring from 06:00 to 08:00 and from 16:00 to 18:00.



**Figure 3: All-Island Daily Transmission Demand Profile**

<sup>1</sup> Demand Growth based on all-island Generation Capacity Statement 2019-2028 Median Forecast

## Peak Demand

The annual peak demand in Ireland and Northern Ireland do not always coincide. However, the peak demand for both Ireland and Northern Ireland is most likely to occur during December or January.

Last year, the annual peak demand for electricity in Ireland was 4,934 MW occurring on 04 December 2018. In Northern Ireland, the annual peak demand was 1,656 MW, occurring on 10 January 2018.

This year, we anticipate a combined peak demand across both jurisdictions of up to 6,960 MW.

## Demand Side Units

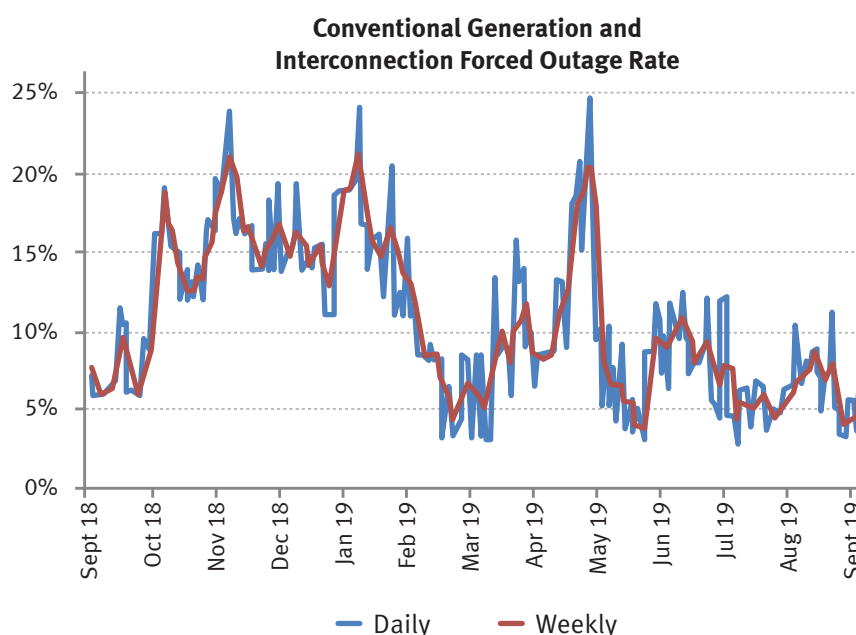
A Demand Side Unit is a single demand site, or group of demand sites, that can be instructed to reduce electricity demand. A combination of plant shutdown and/or on-site generation is used to deliver the demand reduction in response to an instruction from EirGrid or SONI. The current capacity of demand side response is 527 MW in Ireland and 96 MW in Northern Ireland. However, these values are subject to the demand reduction availability of the individual sites that make up the DSU which can change on a seasonal, daily and day/night basis. Based on analysis, an availability factor of 50% of maximum capacity has been assumed.

# Installed Capacity and Generation Unit Performance

The installed capacity of conventional generation in Ireland is 6,558 MW. The installed capacity of conventional generation in Northern Ireland is 1,894 MW. These installed capacity figures do not allow for forced outages which may occur during the winter period.

## Generation Unit Performance

Figure 4 shows the daily and weekly forced outage rates. Forced outage rates can vary sharply with security of supply implications. At times over the past year daily forced outage rates neared 25% with over 2,300 MW of plant forced off. The average across the year was 10.5% compared to the five-year average of 7.5%. Forced outage rates have increased every year for the past three years.

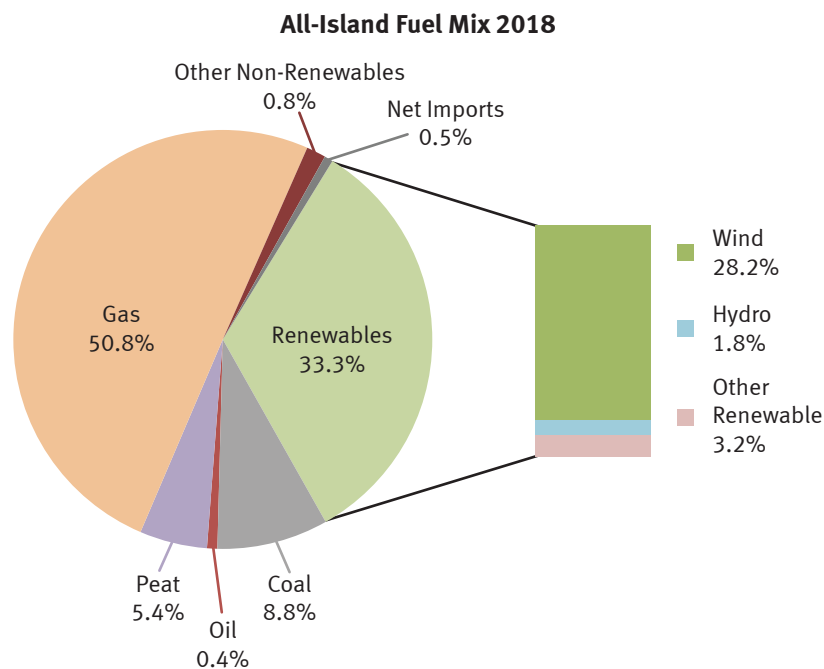


**Figure 4: Forced Outage Rates for Conventional Units**

## Fuel Mix

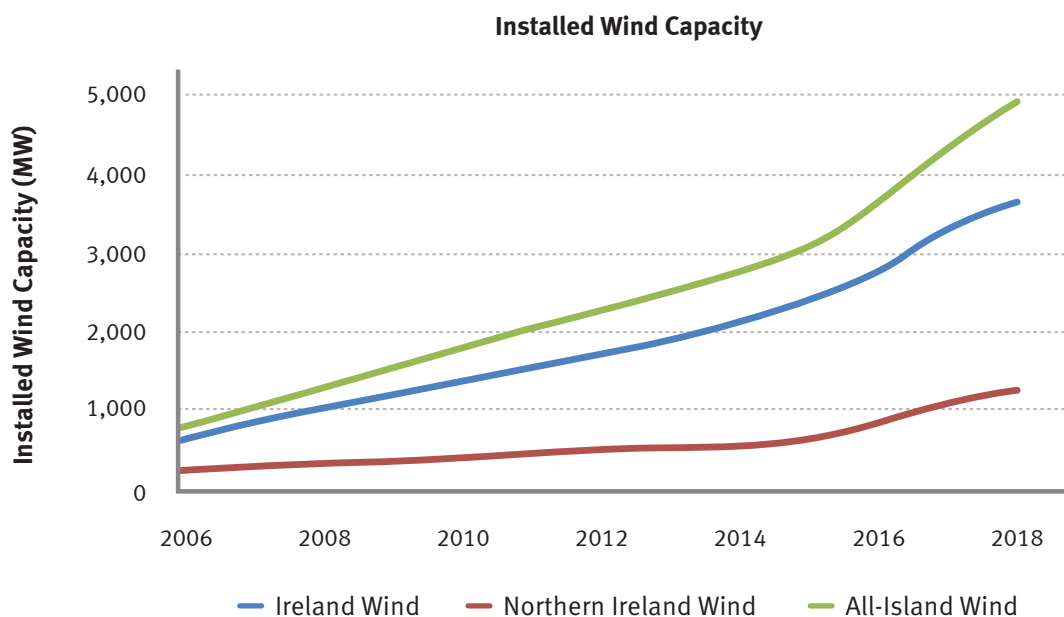
The all-island fuel mix for 2018 is shown in Figure 5.

- The all-island fuel mix shows that the largest portion of our power generation needs was met by gas (50.8%).
- Wind energy was the second largest source of energy at 28.2%.
- Coal was the third largest source of fuel, accounting for 8.8% of the all-island fuel mix in 2018.



**Figure 5: All-Island Fuel Mix in 2018**

## Wind and Solar Generation



**Figure 6: All-Island Installed Wind Capacity**



Installed wind generation continues to grow in both jurisdictions. As of August 2019, the all-island installed wind capacity was 5,045 MW. Based on the Capacity Market derating factor of 0.103 for wind in the 2019/2020 T-1 Capacity Auction<sup>2</sup>, this corresponds to 520 MW of wind capacity for adequacy purposes.

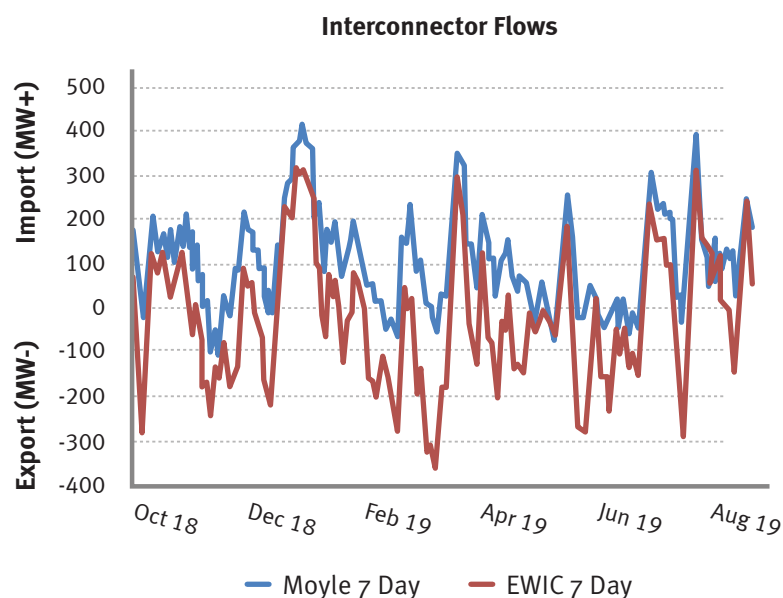
In Ireland, installed wind capacity has grown by over 400 MW in the past two years to 3,769 MW, with a corresponding contribution of 388 MW to capacity for adequacy purposes. Installed wind capacity in Northern Ireland is now 1,276 MW (including small-scale), with a corresponding contribution of 132 MW to capacity for adequacy purposes.

Installed solar capacity in Northern Ireland is 246 MW. As the winter peak typically occurs after sunset, solar capacity has been assigned a capacity credit of zero.

## Interconnection

The East West Interconnector (EWIC) links the electricity grids of Ireland and Great Britain (GB) through a High Voltage Direct Current (HVDC) undersea cable. The available Net Transfer Capacity (NTC) from GB to Ireland for winter 2019/20 is expected to be 500 MW.

The Moyle Interconnector links the electricity grids of Northern Ireland and Great Britain through two HVDC undersea cables. The total installed capacity of the link is 500 MW but the transfer capability is constrained by network limitations on both sides. The available NTC from GB to Northern Ireland for winter 2019/2020 is expected to be 450 MW.



**Figure 7: Seven-day rolling average of Import from/Export to GB since I-SEM Go-Live**

### North South Tie-Line

The ability to exchange power over the North-South tie-lines between the Ireland transmission system and the Northern Ireland transmission system is an important feature of the Single Electricity Market. The level of import/export available at any point in time is dependent on generation availability in Ireland and Northern Ireland, the status of the Moyle interconnector, the status of the transmission network on both the Ireland and Northern Ireland systems and operating reserve requirements.

<sup>2</sup> [https://www.sem-o.com/documents/general-publications/Final-Auction-Information-Pack\\_FAIP1920T-1.pdf](https://www.sem-o.com/documents/general-publications/Final-Auction-Information-Pack_FAIP1920T-1.pdf)



# Key Developments

- The Utility Regulator in Northern Ireland granted derogations on 09 November 2018, which allowed Ballylumford Units B4 and B5 to close, without giving three years notice: B4 closed on 09 November 2018; B5 closed on 01 January 2019.
- North Wall NW5 is on a three-year scheduled outage to facilitate repowering of the plant from 1 October 2019 to 30 September 2022.
- The all-island wind energy record was broken on 12 December 2018 with 3,990 MW of wind on the system.
- All-island installed wind capacity is now 5,045 MW corresponding to 520 MW of capacity for adequacy purposes.
- Forced outage rates have increased every year for the past three years. The annual forced outage rate is 10.5% and the forced outage rate for the last winter period was 16%.

# Expected Outlook

Analysis was carried out to examine the ability to meet peak demands over the winter period. The analysis indicates an expected all-island capacity margin of 1,129 MW this winter which should be sufficient to meet peak demands, reserve requirements and ensure that the security of supply standard will be maintained.

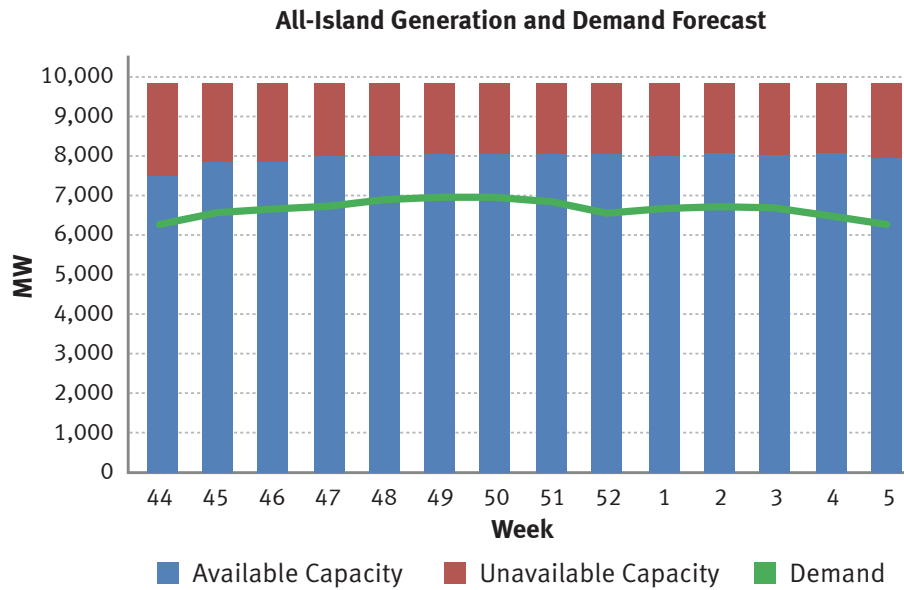
This overall margin includes the available generation capacity (including typical forced outage probability), the wind contribution to adequacy and imports from GB via the interconnectors. Security of supply is dependent on a number of factors, not just the capacity margin. The following assumptions have been used in the analysis:

- There will be uninterrupted reserves of natural gas from the Corrib and Kinsale Gas fields as well as from the Moffat terminal with no shortage issues.
- A 16% forced outage rate for available conventional generation based on the average rate last winter.
- Unavailable Generation takes into account the forced outage rate, scheduled outages and a known operational constraint on Dispatchable Generation in the South region<sup>3</sup>.
- In line with the Generation Capacity Statement 2019 – 2028, we assume the capacity credit value of interconnectors to GB to be 60%.
- A fully intact network will be available.
- In line with the Generation Capacity Statement 2019 – 2028, we assume capacity reliance between Ireland and Northern Ireland of 100 MW north to south and 200 MW south to north.
- Demand Side Units are energy limited and we have assumed an availability factor of 50% of their capacity.
- The availability of system services will not affect capacity margin.
- All-Island installed wind capacity of 5,045 MW with a 520 MW contribution to capacity for adequacy purposes.
- Due to the winter peak typically occurring after sunset, the installed solar capacity has been assigned a capacity credit of zero.

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<sup>3</sup> A weekly Constraint Update report is published on the SEM-O website detailing forecast constraints





**Figure 8: Forecast Weekly Generation Capacity and Demand**

## Conclusion

Based on the assumptions, the outlook for the winter period 2019/20 is that the capacity margin will be sufficient to ensure the security of supply standards are maintained in Ireland and Northern Ireland. EirGrid and SONI will continue to manage and monitor the system carefully and to keep all relevant stakeholders updated.





The Oval, 160 Shelbourne Road,  
Ballsbridge, Dublin D04 FW28  
Tel: +353 (0)1 677 1700  
[info@eirgrid.com](mailto:info@eirgrid.com)  
[www.eirgrid.com](http://www.eirgrid.com)



Castlereagh House, 12 Manse Road,  
Belfast BT6 9RT  
Tel: +44 (0)28 9079 4336  
[enquiries@soni.ltd.uk](mailto:enquiries@soni.ltd.uk)  
[www.soni.ltd.uk](http://www.soni.ltd.uk)



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