



All Island Renewable Connection Report 36 Month Forecast (Q4 2013)

Note: This summary document has been produced by EirGrid and SONI for information and the forecast for renewable connections are indicative only.

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Executive Summary

The level of renewable generation is expected to grow considerably in Ireland and Northern Ireland out to 2020. This growth is driven by the 40% renewable electricity targets and obligations under the European Union (EU) Climate Change package. In 2013, approximately 19% of electricity demand on the island of Ireland was met by renewable generation.¹

This transformation requires significant investment in the necessary grid infrastructure, which is being managed through long term strategic development plans and the connection offer processes in both jurisdictions. A high degree of policy, regulatory and financial certainty for would-be investors in the renewable electricity sector is also crucial to facilitating this transformation.

The purpose of this report is to provide a forecast range of expected renewable connections on the power system across the island over the next thirty-six month period. As wind generation will form the largest percentage share of renewable connections in Ireland and Northern Ireland out to 2020, the primary focus of this report is on expected wind connections over this timeframe.

The rate of these connections is contingent on a number of variables - many of which are outside the control of the system operators – making it difficult to provide a precise connection figure over this period. These variables might include difficulties with securing financing for proposed wind farm projects, obtaining the necessary planning permission, commercial decisions and the construction of the wind farm itself. To cater for this uncertainty, this report will use a Megawatt (MW) range for renewable connections out to the end of Q4, 2016.

In the last report it was estimated that 184 MW of renewable generation was expected to connect in Ireland and Northern Ireland in Q4. The actual total renewables connection figure was 62 MW or 34% of all the expected MWs during Q4.

There is currently 2,793 MW of renewable generation capacity on the power system of Ireland and Northern Ireland. To reach the 40% renewable targets, EirGrid and SONI have estimated that the amount of wind capacity across the island of Ireland will need to reach a capacity of between 4,400 MW and 4,900 MW by the end of 2020. This means that the yearly increase of additional wind capacity required on an all island basis will need to be in the range of 280 MW to 350 MW.²

1. Purpose and Methodology

The purpose of this report is to provide a forecast range of expected renewable connections on the power system across the island over a thirty-six month period. The report will be published on the EirGrid website on a quarterly basis for information and will use Permissible Capacities³ values for existing connections and contracted Maximum Export Capacity (MEC) values for future connections.⁴

¹ The Irish figures are still provisional and may change.

² This projection is based on projected annual connections to December 2020.

³ Permissible capacity refers to the MW level of renewables available to be dispatched by the power system operators.

⁴ Maximum Export Capacity is the contracted maximum capacity the wind farm is allowed to export onto the grid.

There are a number of possible financial, policy and regulatory issues that can impact on the connection rates outlined in this report. In March 2013, DCENR announced that the terms and conditions of REFIT II would be amended so that while the support mechanism will continue to be open for applications until 31 December 2015, projects must be built and operational by 31 December 2017, and the support for any project cannot exceed 15 years and may not extend beyond 31 December 2032. This represents a two year extension to the original terms and conditions which required projects to be built and operational by 31 December 2015 to be eligible for the scheme. Also in March the SEM Committee decision (SEM-13-010) was published. The SEM Committee has decided to implement pro rata with the removal of financial compensation for curtailment by 1 January 2018 as its final decision on the treatment of curtailment in tie-break situations.⁵ Thus, all operational wind farms will be dispatched on a pro rata basis with regard to treatment of curtailment thereby meaning equal treatment for new connections. In addition, compensation for curtailment currently paid to firm wind farm generators will cease in 2018. This represents a significant shift and will change the criteria upon which wind generators make their investments.

In an effort to capture the range of unforeseen variables that can impact on the expected connection rate - including the availability of financing for developers, planning permission, network delivery or commercial decisions on behalf of renewable generators - this report includes a range for expected wind farm connections. Each graph in this report will contain the following information:

- **Maximum Possible Range** is based on a high scenario where 75% to 100% of the contracted wind generation get built.
- **Expected Connection Levels** is the MW range of contracted wind farms that are expected to connect each year. The expected connection levels are based on a connection rate of 50% to 75% of contracted wind farms getting built.
- **Minimum Range** is based on a low scenario where only 25% to 50% of contracted wind generation get built.
- **The Historical Average** is the level of actual RES connection each year over the three years (January 2009-December 2011) and applied over the next three years. This is provided as a reference/context figure.

2. Data Sources

The information for this report is taken from a range of sources. Information on renewable connections for Ireland is derived from the Gate 3 process with updates on the distribution connected units provided by the Distribution System Operator (DSO). For Northern Ireland, information on connections is generated by SONI, with information on the current connection assumptions underpinning the anticipated development of Network 25 from Northern Ireland Electricity (NIE) too.

The level of wind capacity needed to reach the 2020 renewable electricity targets is derived from the All-Island Generation Capacity Statement (2014-2023) and the 2012 National Renewable Energy Action Plan update. The historical average connection rate is taken from Transmission System Operator (TSO) and DSO connection information.

⁵ The SEMC has decided that all wind generation will be curtailed on a pro-rata basis.

3. Current All-Island Renewable Connections

At the end of Q4, 2013, there was 2,793 MW of renewable capacity connected across the island of Ireland. This all-island figure is split between 2,210 MW in Ireland and 583 MW in Northern Ireland. The breakdown by MW and technology type is set out in Figure 1 below:

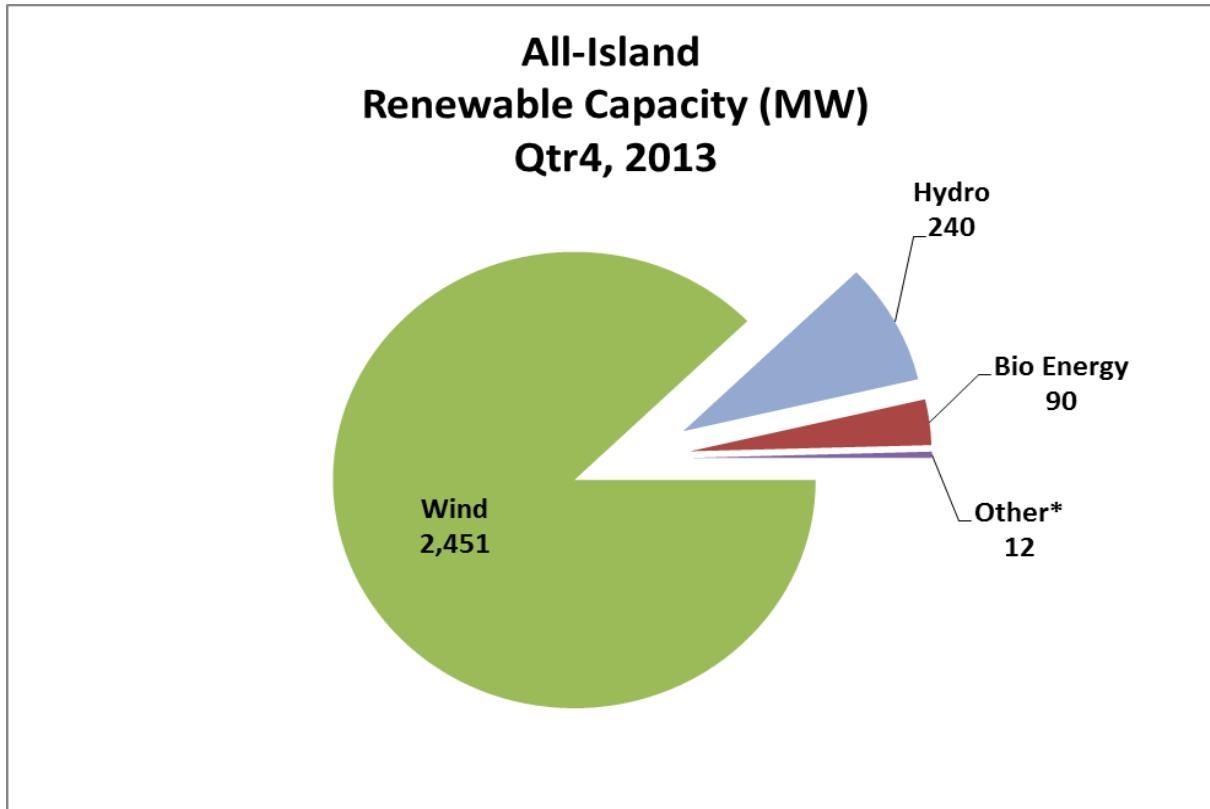


Figure 1: Current total All-Island Renewable Capacity by Technology Type (December 2013).
* Other = CHP RES, Tidal, and Solar (see Appendix 1 for breakdown by technology type and jurisdiction).

Based on information in the All-island Generation Capacity Statement 2014-2023, it is projected that in order to meet the renewable electricity targets, wind capacity across the island of Ireland will need to reach a level of between 4,400 MW and 4,900 MW by 2020.

This means the average yearly increase of additional wind capacity on an all island basis will need to be in the range of 280 MW to 350 MW to meet the 40% renewable electricity targets.

- For Ireland this translates into a connection range of 190 MW to 260 MW of additional wind capacity on average each year.
- In Northern Ireland this translates into a connection level of 90 MW of additional wind capacity on average per year to the end of 2020.

4. Ireland – 36 Month Wind Connection Forecast

Ireland currently has 1,896 MW of wind power, 238 MW of hydro power and 76 MW of smaller renewable sources (ocean energy, RES CHP, solar and bio-energy) connected to the power system. Wind generation is split between the transmission and distribution systems.⁶ Figure 2 below sets out the existing and expected wind connections for Ireland to Q4, 2016.

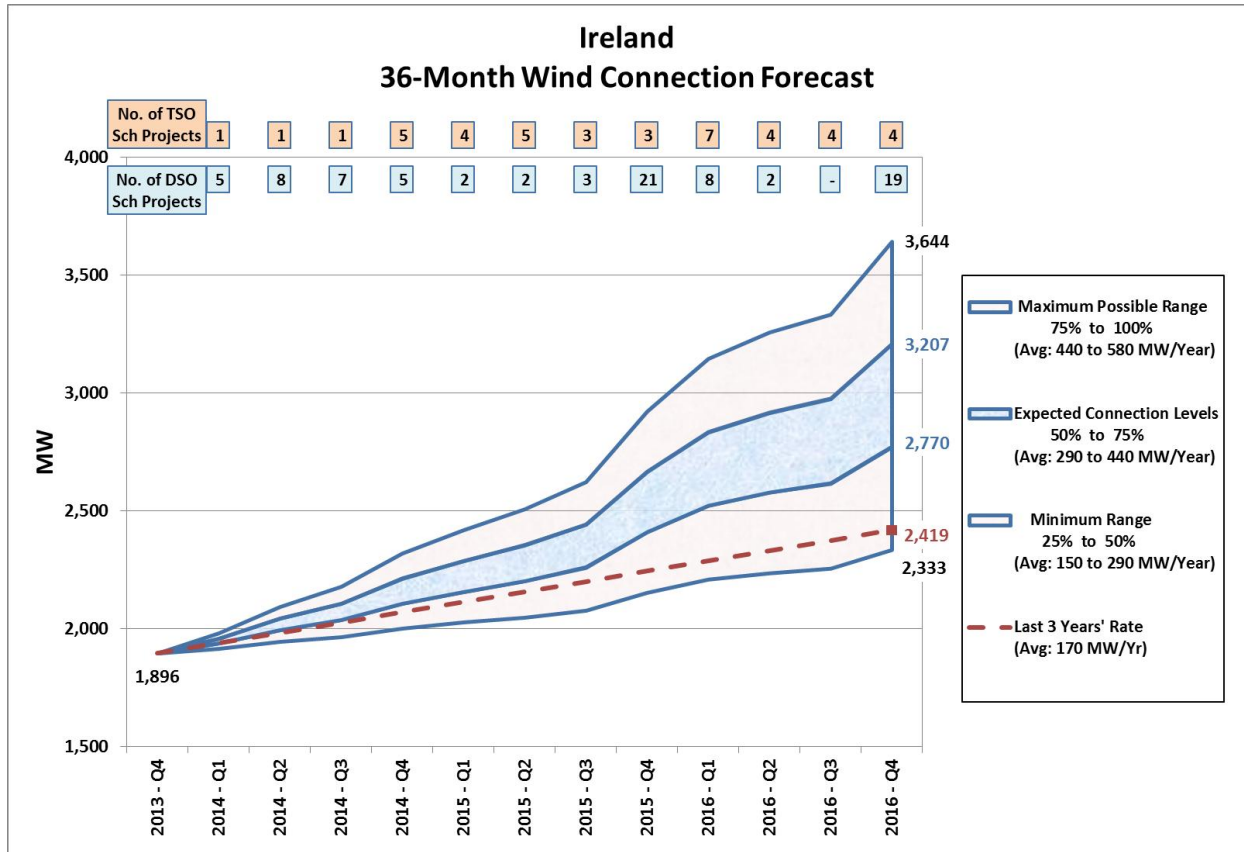


Figure 2: Existing and Estimated Ireland Wind Connections (MEC) to Q4, 2016 and the number of scheduled projects.
Note: the 100% connection figure is based on all contracted wind farms with scheduled dates proceeding on time.

⁶ Wind figures on the Distribution System are provided to EirGrid from the DSO. Existing Wind connections includes one offshore wind farm in Ireland.

5. Northern Ireland – 36 Month Wind Connection Forecast

Northern Ireland currently has 554 MW of wind power and 29 MW of other RES (hydro, ocean energy, RES CHP, solar and bio-energy) connected to the power system. Figure 3 below sets out the existing and expected wind connections for Northern Ireland to Q4, 2016.

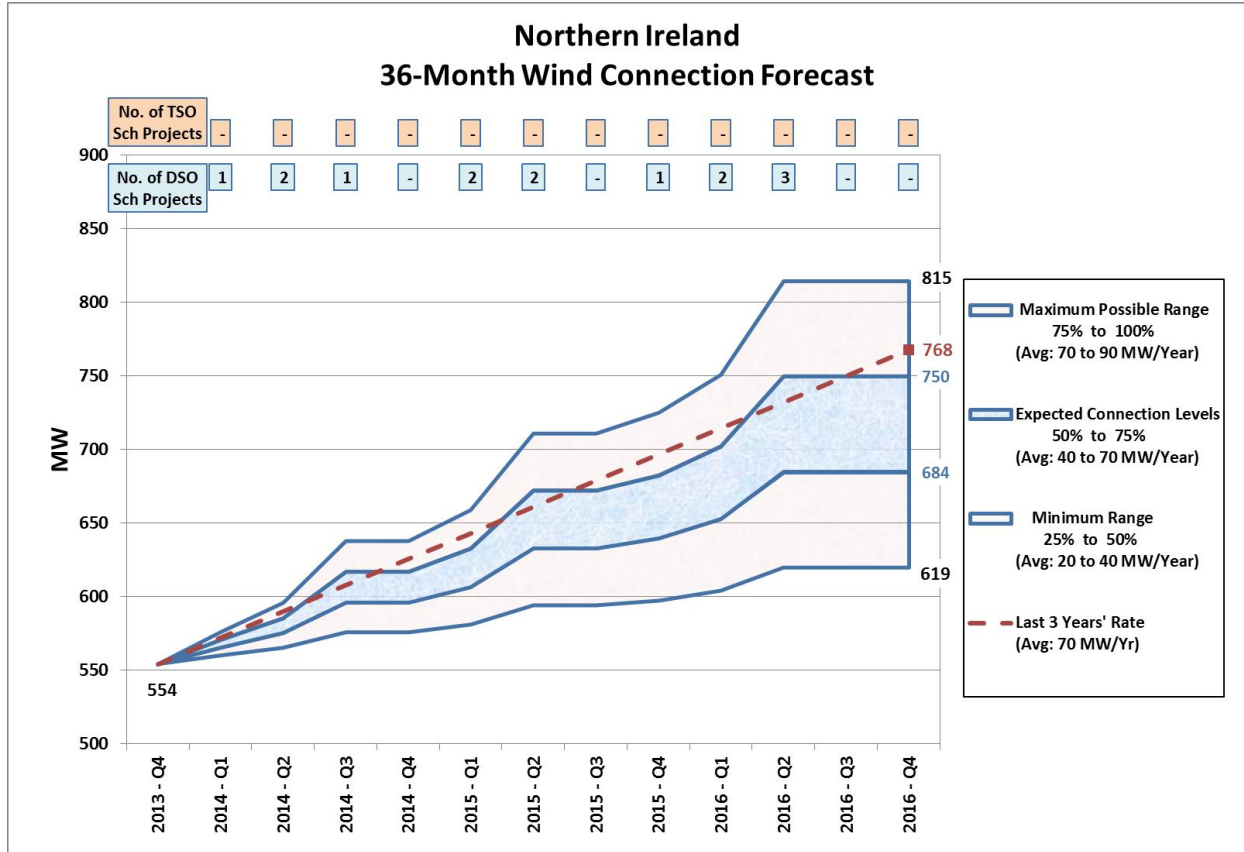


Figure 3: Existing and Estimated Northern Ireland Wind Connections (MEC) to Q4, 2016 and the number of scheduled projects.
Note: the 100% connection figure is based on all contracted wind farms with scheduled dates proceeding on time.

6. All-Island Wind Connection Forecast

At the end of 2013, there was 2,451 MW of wind generation connected on an all island basis. The projected wind connections across the island over the next three years are set out in Figure 4 below.

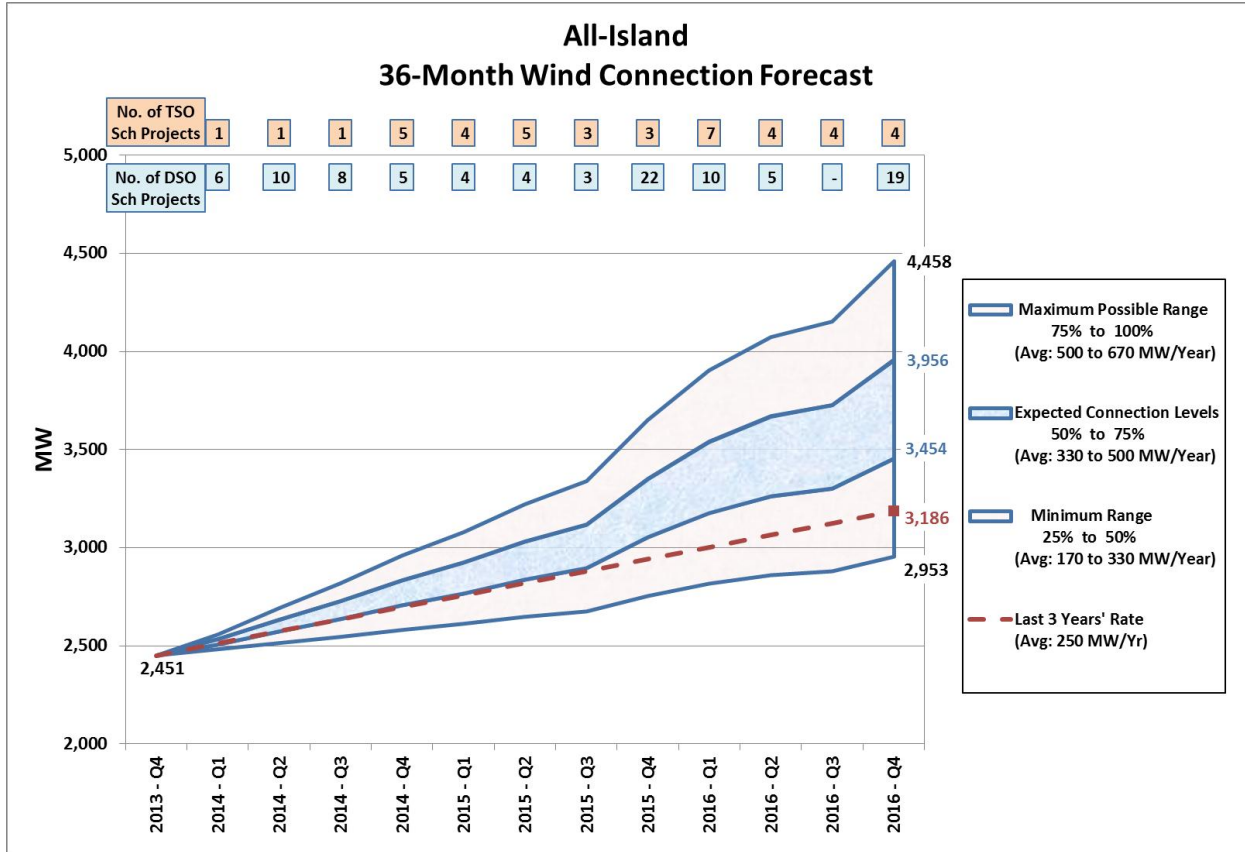


Figure 4: Existing and Estimated All-Island Wind Connections (MEC) to Q4, 2016 and the number of scheduled projects.
Note: the 100% connection figure is based on all contracted wind farms with scheduled dates proceeding on time.

7. Other RES (Renewables Excluding Wind)

Forecasting trends to Q4, 2016 indicate that wind generation will make up the largest percentage share of renewable connections in Ireland and Northern Ireland. However, it is not the only renewable technology expect to connect over this time period. It is expected that 163 MW of other non-wind renewables will connect over the next three years.⁷ This is split between bio-energy, ocean energy and hydro.

8. Meeting the Renewable Electricity Targets

The All-Island Generation Capacity Statement 2013-2023, estimates that in order to meet the renewable electricity targets, the amount of wind generation across the island of Ireland needs to reach between 4,400 MW and 4,900 MW by 2020. To reach this level of wind by 2020, the connection rate on an all-island basis will need to be in the range of 280 MW to 350 MW each year.

Ireland

In order to meet the renewable electricity targets in Ireland, it is estimated that 3,200 MW to 3,700 MW of wind capacity will be required by 2020. This translates into a connection range of 190 MW to 260 MW of wind capacity on average each year.

Northern Ireland

In Northern Ireland, it is estimated that in order to meet the 2020 renewable electricity target 1,200 MW of wind capacity will be required by 2020. This translates into a connection range of a yearly average of 90 MW to the end of 2020.

9. Conclusion

The aim of this report is to provide a connection forecast range of expected renewable connections on the power system across the island over the next thirty-six month period. The figures produced are indicative only and are based on the most recent available information on forthcoming connections.

At the end of Q4, 2013, there was 2,210 MW of renewable generation connected to the electricity system in Ireland. In Northern Ireland, there is currently 583 MW of renewable generation connected. This gives a total all-island renewable figure of 2,793 MW connected as of the end of Q4, 2013.

As noted, in order to meet the renewable electricity targets in Ireland and Northern Ireland a yearly average of between 280 MW - 350 MW of additional wind capacity is needed out to the end of 2020. This report predicts that between 330 MW – 500 MW of wind capacity can be expected to connect to the power system of Ireland and Northern Ireland each year over the next three years. This range is based on a connection rate of between 50% - 75% of the contracted MWs going ahead.

⁷ Estimated connections for other RES are based on information from the DSO.

Appendix 1

- **Total Connected Renewables at the end of 2013**

Total Renewable Capacities (MW) Qtr4, 2013								
Jurisdiction	Wind	Hydro	Bio Energy	RES CHP	Ocean	Solar	Total RES (Excl. Wind)	Total RES
Northern Ireland	554.3	2.3	19.6	0.0	1.2	5.5	28.6	582.9
Ireland	1,896.2	238.1	70.6	5.3	0.0	0.1	314.0	2,210.3
All-Island	2,450.5	240.4	90.2	5.3	1.2	5.6	342.7	2,793.2

- **Contracted MW to connect in the next 3 years and TSO/DSO Breakdown**

Quarter	Northern Ireland			Ireland			All-Island		
	Total	TSO	DSO	Total	TSO	DSO	Total	TSO	DSO
2014 - Q1	21.0	-	21.0	83.4	20.0	63.4	104.4	20.0	84.4
2014 - Q2	20.0	-	20.0	111.7	20.0	91.7	131.7	20.0	111.7
2014 - Q3	42.0	-	42.0	85.6	20.0	65.6	127.6	20.0	107.6
2014 - Q4	-	-	-	142.2	104.4	37.8	142.2	104.4	37.8
2015 - Q1	21.0	-	21.0	98.9	78.5	20.4	119.9	78.5	41.4
2015 - Q2	52.5	-	52.5	89.8	66.4	23.4	142.3	66.4	75.9
2015 - Q3	-	-	-	115.2	65.2	50.0	115.2	65.2	50.0
2015 - Q4	13.8	-	13.8	299.2	60.0	239.2	313.0	60.0	253.0
2016 - Q1	26.3	-	26.3	224.9	128.0	96.9	251.2	128.0	123.2
2016 - Q2	63.7	-	63.7	108.8	84.0	24.8	172.5	84.0	88.5
2016 - Q3	-	-	-	78.0	78.0	-	78.0	78.0	-
2016 - Q4	-	-	-	310.0	82.0	228.0	310.0	82.0	228.0

Appendix 2

- **Accuracy of Expected Connections in Quarter 4, 2013**

RES Type	MW Expected Connections in Qtr4, 2013	Connected MW	Percentage
Wind	176.1	57.4	33%
Other Renewables	8.3	5.0	60%
Total	184.4	62.3	34%

Appendix 3

- Expected Wind Connection Rates to the end of Q4, 2016

The table below provides a MW breakdown of expected wind connections on the TSO and DSO in Ireland, Northern Ireland and on an all-island basis. The expected connection levels are based on a connection rate of 50% (low) to 75% (high). The table also includes the yearly average wind connection rates.

36-Month Wind Connection Forecast		Ireland			Northern Ireland			All-Island			
		Total	TSO	DSO	Total	TSO	DSO	Total	TSO	DSO	
Currently Connected (MW) End of: 2013 - Q4		1,896	818	1,078	554	74	481	2,451	892	1,559	
Expected Connections (MW) by end of: 2016 - Q4	High (75%)	3,207	1,423	1,784	750	74	676	3,956	1,497	2,460	
	Low (50%)	2,770	1,222	1,548	684	74	611	3,454	1,295	2,159	
Avg Connection Rates (MW/Year) by end of: 2016 - Q4		High (75%)	440	200	240	70	0	70	500	200	300
		Low (50%)	290	130	160	40	0	40	330	130	200
Total Contracted by (2016 - Q4)		All (100%)	3,644	1,625	2,019	815	74	741	4,458	1,698	2,760

- Total Number of Connected Windfarms (End of Q4 2013)

Jurisdiction	Total Number of Connected Windfarms at End of Qtr4, 2013	TSO	DSO
Northern Ireland	29	2	27
Ireland	132	19	113
Total	161	21	140

- **Historical Wind Capacities on the Island (MW):**

Year End	Northern Ireland	Ireland	All-Island
2000	36.8	119.4	156.2
2001	36.8	125.8	162.6
2002	36.8	138.5	175.3
2003	76.0	214.0	290.0
2004	89.1	341.6	430.7
2005	108.6	517.2	625.8
2006	131.6	749.0	880.6
2007	214.0	797.6	1,011.6
2008	230.7	1,030.4	1,261.2
2009	301.1	1,265.5	1,566.6
2010	340.9	1,373.8	1,714.7
2011	405.1	1,631.0	2,036.1
2012	488.5	1,763.5	2,252.0
2013	554.3	1,896.2	2,450.5