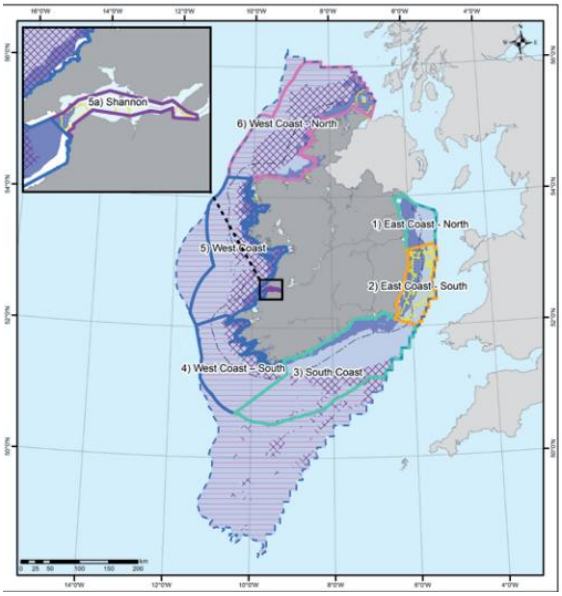
Offshore wind

Ireland has jurisdiction over about 650,000 km^2 of marine territory, 10 times the country's land area. The Sustainable Energy Authority of Ireland (SEAI) Wind Energy Roadmap identifies offshore wind potential of up to 30 GW capacity in Irish waters by 2050.[37] Full deployment of offshore wind is centred around the potential to export energy to the UK and participation in a future North West European energy market which is not included in the present analysis. As the levelized cost of offshore wind continues to decline, the competitiveness of offshore and onshore wind farms are expected to align post 2030.[38] We have therefore included a maximum choice for both in trajectory 4 equivalent to current domestic electricity demand. [39] If selecting trajectory 4, there would be no requirement for onshore wind to meet domestic demand.

Trajectory 1

In 2013, Ireland had 25 MW of offshore wind located in the Arklow Bank Wind Park, off County Wicklow, consisting of 7*3.6 MW turbines. Trajectory 1 assumes that Arklow Bank Wind Park is decommissioned and no further offshore wind is built up to 2050.



Trajectory 2 assumes that further development of offshore wind off the east coast goes ahead with capacity reaching 520 MW by 2030 (phase 2 of Arklow Bank Wind project). By 2050, offshore wind capacity exceeds 1.5 GW. This is equivalent to around 260*5.8 GW turbines. The sea area occupied by wind farms is 76 km^2. 1.5 GW of offshore wind turbines with a capacity factor of 45% in 2050 generates around 6 TWh/y.

Trajectory 3

Trajectory 3 assumes that capacity rises to 3.7 GW by 2050. This is equivalent to around 640*5.8 MW turbines by 2050 and a sustained build rate of around 160 MW (or 15-25 turbines) per year from 2030 to 2050. The sea area occupied by wind farms is 190 km^2. 3.7 GW of offshore wind turbines with a capacity factor of 45% generates around 15 TWh/y in 2050.

Trajectory 4

Trajectory 3 assumes that capacity rises to 6 GW by 2050. This is equivalent to around 1,000*5.8 MW turbines by 2050 and a sustained build rate of around 350 MW (or 60 turbines) per year from 2040 to 2050. The sea area occupied by wind farms is 190 km^2, over double the size of Lough Derg. 6 GW of offshore wind turbines with a capacity factor of 45% generates around 23 TWh/y in 2050, which is equivalent to current total electricity demand.

Figure 16. Strategic Environmental Assessment of Wave, Tidal and Offshore Wind Development in Irish Waters. Source: SEAI, AECOM

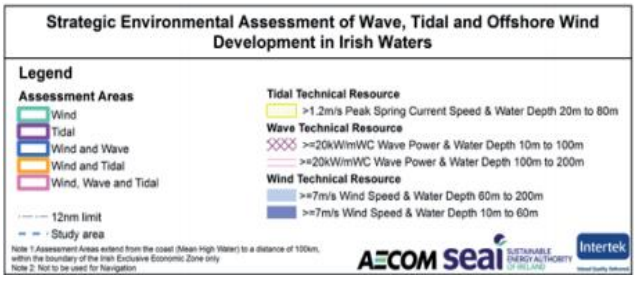


Figure 17. Electricity generated by offshore wind, (TWh/yr)