

Tidal stream

Tidal stream technologies harness the energy from the tides using underwater turbines. The stream flows through the stationary turbines, causing them to turn using the same principle as a wind turbine. There are various different designs of tidal stream turbines such as seabed standing and surface floating designs.

While tidal barrage or range technology is a firmly established technology, tidal stream technology is in its infancy. The world's first commercial scale tidal stream power generating device called SeaGen was installed in Strangford Lough, Northern Ireland in 2008 (see figure 21). It generates 1.2 MW for between 18 and 20 hours a day. The majority of Ireland's tidal power lies on the east coast, with the potential on the west coast concentrated in the Shannon Estuary and Bull's Mouth. Note that the maximum potential for tidal stream is lower than wave or offshore due to resource constraints (see Figure 16).

Trajectory 1

Trajectory 1 assumes that no tidal stream devices are installed in the Republic of Ireland by 2050.

Trajectory 2

Trajectory 2 assumes that tidal stream capacity grows to 100 MW by 2050, equivalent to roughly 50*2 MW tidal stream devices, larger than the 1.2-MW SeaGen device shown in figure 21. This capacity generates 300 GWh/y of electricity.

Trajectory 3

Trajectory 3 assumes that tidal stream capacity grows to 300 MW by 2050, equivalent to 150*2 MW devices. This generates 900 GWh/y of electricity.

Trajectory 4

Trajectory 4 assumes that tidal stream capacity grows to 800 MW by 2050, equivalent to 400*2 MW devices. This generates 2.5 TWh/y of electricity.

Figures 21 and 22: SeaGen, Strangford Lough and Tidal Flow Map for Ireland. Source: SEAI

Figure 22: Electricity produced under 4 trajectories (TWh/yr)

