

Floating wind

Japan's narrow continental shelf makes it difficult to develop bottom-mounted offshore wind turbines (GWEC, 2014). Therefore, the country is also exploring floating wind turbines. As of 2010, Japan does not have any floating offshore wind capacity, but it has been recognised that floating offshore wind has vast potential for Japan (JWPA, 2012).

Level 1

Level 1 assumes that Japan's floating wind sector is deprioritised and therefore capacity does not take off. Technology is frozen, the build rate is zero and there is no expansion of the country's floating wind capacity. The trend continues all the way to 2050 and Japan has no floating wind capacity in 2050.

Level 2

In the Level 2 scenario, Japan puts limited efforts into its floating wind sector from 2020 onwards. By 2025, the country's offshore capacity reaches 1.4 GW which nearly doubles over the next five years. Total capacity thus reaches 7.5 GW, which generates over 20 TWh/y of electricity.

Level 3

Level 3 assumes that thanks to policy measures, Japan's floating wind takes off sooner than predicted in Level 2, with capacity reaching 0.1 GW in 2020, 4.1 GW in 2030 and then 16.5 GW in 2050.

Under this level, Japan will produce 17 TWh/y of electricity in 2050.

Level 4

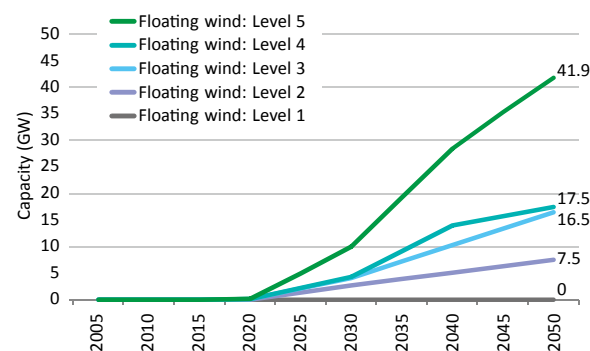
At this level, Japan undertakes an aggressive floating capacity development plan. Early take-off, improved technology and a fast build rate of turbines lead to a capacity rise from zero in 2010 to 4.3 GW in 2030 and 17.5 GW in 2050. At this level, Japan generates over 46 TWh/y of electricity in 2050.

Level 5

Level 5 represents Japan's physical and economic potential for developing floating wind capacity. At this level, Japan's capacity reaches 42 GW in 2050, which generates 110 TWh/y electricity.

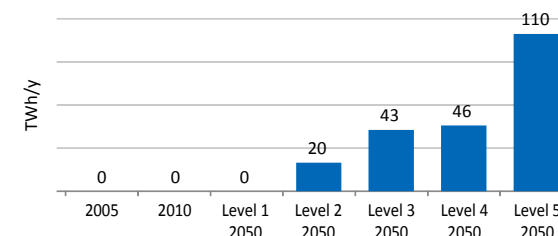
For detailed references related to the level settings, please see the Excel spreadsheet model (Zhou et al., 2014).

Figure 1 Japan's floating wind capacity versus time



Source: Authors.

Figure 2 Floating wind electricity generation under different scenarios



Source: Authors.