

Onshore wind

Figure 14 Japan has significant potential to develop its onshore wind sector



Source: IGES stock image.

In 2010 Japan had 2.45 GW of installed onshore wind capacity (JWPA, 2014). The country has significant potential for onshore wind power. Most of Japan's onshore potential is concentrated in Hokkaido, Tohoku and Kyushu regions.

Level 1

Level 1 assumes that Japan gives less priority to onshore wind. Technology is frozen, and there is no expansion of the country's onshore wind capacity.

However, the 2.67 GW capacity level of 2014 (METI, 2014a) is maintained up to 2050 by replacing retired turbines. With just over 134 20-MW turbines, Japan's onshore wind sector generates around 4.7 TWh/y of electricity in 2050.

Level 2

In the Level 2 scenario, Japan makes moderate efforts to expand its onshore capacity. The total number of 20-MW onshore turbines reaches over 350 by 2020. Onshore capacity expands to 7 GW by 2020 and this is maintained until 2050. With this capacity, Japan produces 12 TWh/y of electricity in 2050.

Level 3

Level 3 assumes that with significant efforts, Japan will increase its onshore capacity to about 18 GW by 2050. In this scenario, it is estimated that Japan will have approximately 900 onshore wind turbines,

which will produce 32 TWh/y of electricity.

Level 4

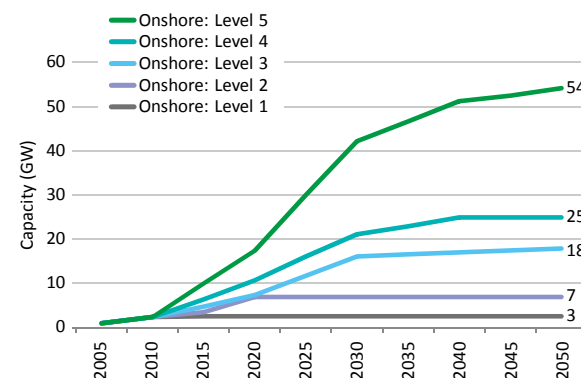
At Level 4, Japan maximises its efforts to promote the country's onshore wind capacity. The country speeds up building new turbines. By 2050, Japan will have about 1250 20-MW turbines. The country's total capacity will rise to 25 GW in 2050, generating 44 TWh/y of electricity.

Level 5

Level 5 represents Japan's physical and economic potential for developing onshore capacity. At this level, Japan's capacity reaches 54 GW in 2050, which generates 95 TWh/y electricity.

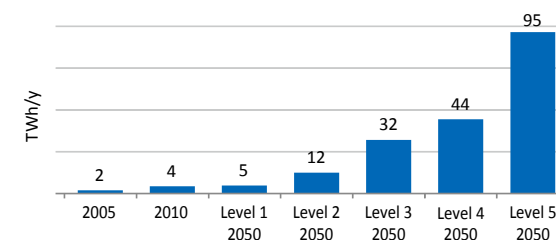
For detailed references related to the level settings, please see the Excel spreadsheet model (Zhou et al., 2014).

Figure 1 Japan's onshore wind capacity versus time



Source: Authors.

Figure 2 Onshore wind electricity generation under different scenarios



Source: Authors.