

# Solar PV

**Figure 1** Japan is a leading producer of solar energy



Source: IGES stock image.

Japan is one of the leading producers of solar panels and the country's use of solar power has been on the increase since late 1990s. In 2010, Japan's electrical capacity from solar PV was 3.6 GW (EDMC, 2014). Japan introduced a renewables portfolio standard (RPS) in 2003, and then in 2009, it introduced a feed-in-tariff system for promoting solar PV (which was further expanded in 2012 to cover other renewable sectors) (METI, 2012). This incentive system has generated immediate results; in the first quarter of 2013 alone, Japan's solar PV installations increased by 270% in gigawatt terms (Song, 2013). In January 2014, the installed capacity

reached 13.1 GW (METI, 2014a).

## Level 1

Level 1 assumes that the growth of Japan's solar PV sector is rather slow compared to its potential. This is because no additional effort has been made to promote solar PV. Capacity reaches just over 26 GW in 2050, generating 27 TWh/y of electricity. At this level, there is roughly 2.2 m<sup>2</sup> of solar panels per person in Japan, based on an estimate of 8.1 km<sup>2</sup>/GW for the area required for solar system.

## Level 2

Level 2 assumes that Japan's solar PV receives limited effort, and capacity reaches 47 GW in 2030 and 87 GW in 2050. With this capacity Japan produces 92 TWh/y of electricity in 2050. This is equivalent to roughly 7.5 m<sup>2</sup> solar panels per person.

## Level 3

This level assumes that Japan's solar capacity

reaches 76 GW in 2030 and 150 GW in 2050. With about 13 m<sup>2</sup> solar panels per person, Japan generates 158 TWh/y of electricity in 2050.

## Level 4

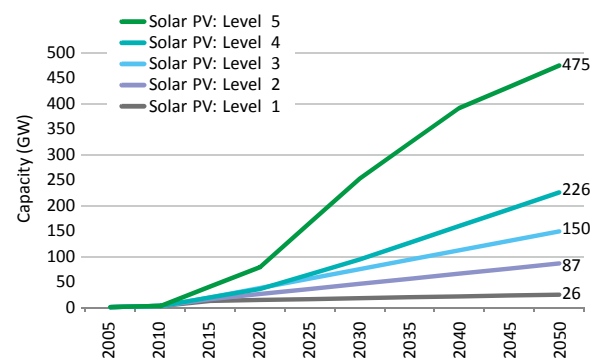
At this level, Japan maximises its efforts in promoting solar PV. This results in capacity increasing to 95 GW in 2030 (producing about 100 TWh/y) and 226 GW in 2050 (producing 238 TWh/y). This is equivalent to roughly 19 m<sup>2</sup> of solar panels per person in Japan.

## Level 5

Level 5 represents Japan's physical and economic potential for developing solar PV capacity. At this level, Japan's capacity reaches 475 GW in 2050, which generates 500 TWh/y electricity.

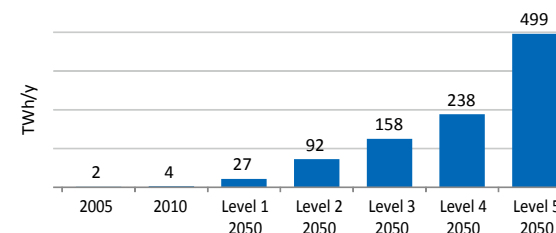
For detailed references related to the level settings, please see the Excel spreadsheet model (Zhou et al., 2014).

**Figure 2** Japan's solar PV capacity versus time



Source: Authors.

**Figure 3** Solar PV electricity generation under different scenarios



Source: Authors.