



PV Power Systems (Vol. 6): A Future Vision of the PV Power System Industry as a Major Power Source for 2050

The prospects of the photovoltaic (PV) power system industry were discussed based on preceding LCS's research results. The extended future PV potential in Japan was estimated considering technology development. Strategies were also presented to expand the photovoltaic (PV) system industry, enabling it to become one of major power sources.

- After summarizing the current industry and market trends, the future PV installed capacity, employees, and market size of PV industry in Japan and the world towards a zero-carbon society were estimated. 400 to 1,400 GW of PV installations were forecasted; however, Japan's share of the global market is shrinking (Table 1). Therefore, it is required to establish strategies of PV technology development that can lead global expansion and measures to improve labor productivity.
- Expanding PV power system resource potentials are estimated in the range from 652 to 1,437 GW with improved module conversion efficiency, use of abandoned agricultural land, and improved utilization of installed areas.

Table 1: Estimates of PV installed capacity, employees, and market size of PV industry in Japan and the world towards a Zero-Carbon (ZC) society

		2010 (Actual)	2018 (Actual)	2030	2050	
					A: 80% reduction	B: ZC power
World	Installed capacity [GW]	70	480	2,000	10,000	20,000
	Annual module production [GW]	17	100	140	500	1,000
	Market size [trillion JPY/year]	7	14	14	25	50
	Employees [thousands] (Note 2)	510	3,400	3,000	5,000	5,000
Japan	Installed capacity [GW]	3	60	170	500	1,400
	Annual module production [GW]	1	5 (10 (Note 1))	11	30	70
	Market size [trillion JPY/year]	0.4	3	1	1.5	3.5
	Employees [thousands] (Note 2)	90	300	220	300	350

Note 1: Current annual installed capacity in Japan

Note 2: The ratio of Employees in the PV industry is

(Module manufacturing : Installation : Sales and management = 20% : 30% : 50%)

Proposals for Policy Development

The following industry strategies are proposed based on the results; the future vision of the PV power system industry as one of major power sources, with the aim to establish a zero-carbon power system.

- 1) It is important to establish a quantitative and long-term strategy to achieve high penetration of PV power systems, along with timely assessment results that contribute to technological and industrial development.
- 2) R&D that contributes to higher efficiency to cope with cost reduction requirements and land limitations must be evolved into technological developments that aim at to the global market. Progress must also be made with an industrial strategy that accounts for transitions amongst the energy industry.
- 3) Proposed PV deployment plans must take into consideration regional characteristics, for example, power systems designed for long-term and long-distance electric power transmission.