

JAPAN – Status quo and outlook for the solar market

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Presentation of ADLER Solar

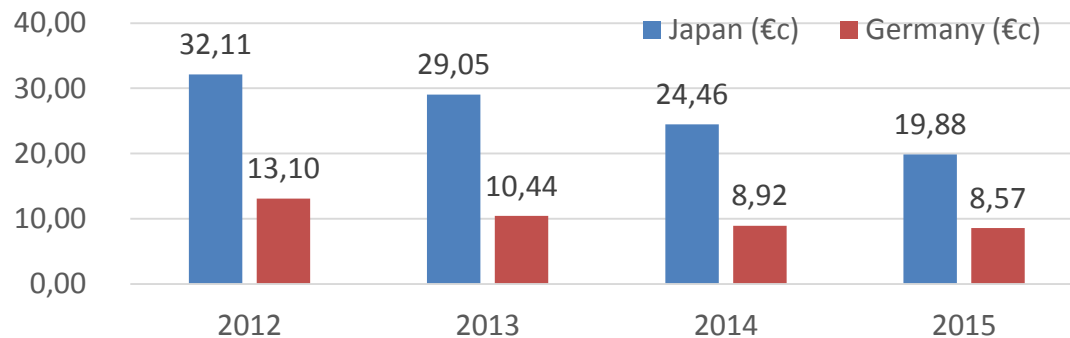
- Bremen-based ADLER Solar Services GmbH is an international company with 120 employees that was founded in 2009. It opened another branch in Anzing near Munich in 2014.
- Since 2015, ADLER Solar has been operating the **ADLER Solar Works** joint venture with the Japanese EPC company YKD in Yokohama, Japan.
- ADLER Solar as a full solar service provider offers technical services for PV systems and components during the complete life time of solar power plants.
- ADLER Solar's customers are manufacturers, wholesalers, insurance companies, operators, PV advisors, EPC contractors/installers, investors and banks.

Japanese energy supply and energy politics

- **March 11, 2011: nuclear reactor disaster at Fukushima. Nuclear power plants shut down.**
- **Consequently fossil fuel burned for energy:**
 - the highest consumption of liquid natural gas in the world, second-largest importer of coal, and third-largest importer of mineral oil in the world.
 - the “**Setsuden**” – **saving electricity movement**, in order to reduce by 20 % the use of electricity by the population.
- **Summer 2012: renewable energy promotion law enacted in accordance with the model prevalent in Germany at that time.**
- Along with PV; wind power, geothermal power, water power, biogas, and biomass are promoted.
- **Step-by-step nuclear phase-out by 2040** decided.

Japanese energy supply and energy politics

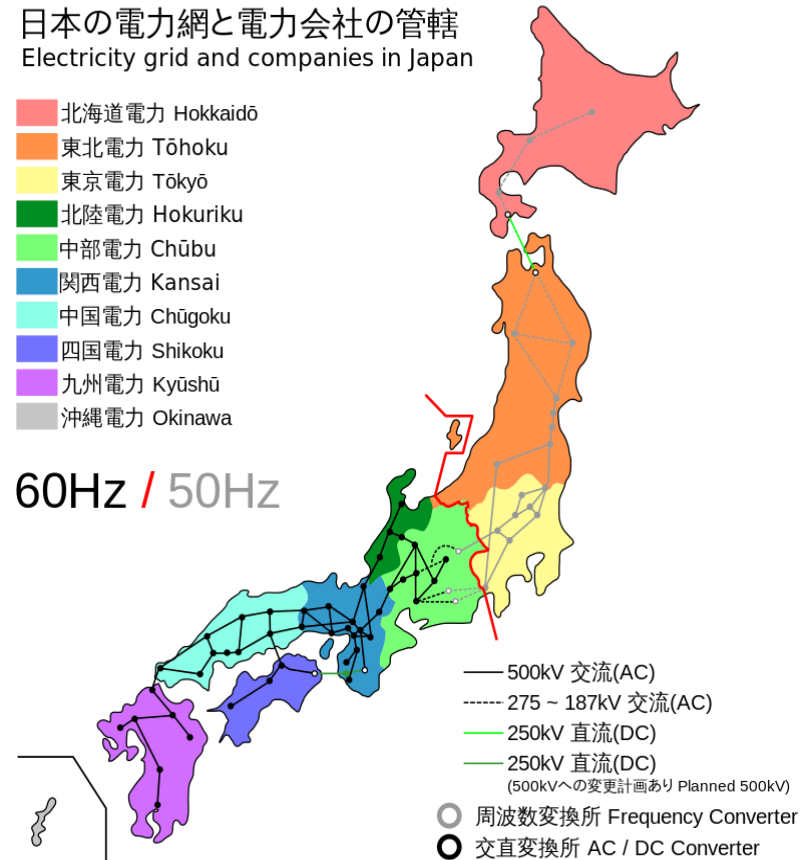
- PV expansion targets were strategically set at **28 GW by 2020** and **53 GW by 2030**.
- Overview **feed-in compensation**



- In 2012 the first **reactor blocks of some nuclear power plants are restarted** to avoid power shortages.
- December 2012: change of government. After his election, the new Prime Minister Shinzo Abe announces that **new nuclear power plants will be built**.

Structure of the energy supply

- Ten regional energy providers currently divide Japan up among themselves. Japan is spread across **6,582 islands** with **127 million** residents. There is **50-Hz** grid in the east/north and a **60-Hz** grid in the west/south of Japan
- Starting in 2016, similar to Germany, the energy market will be opened up gradually up to 2020



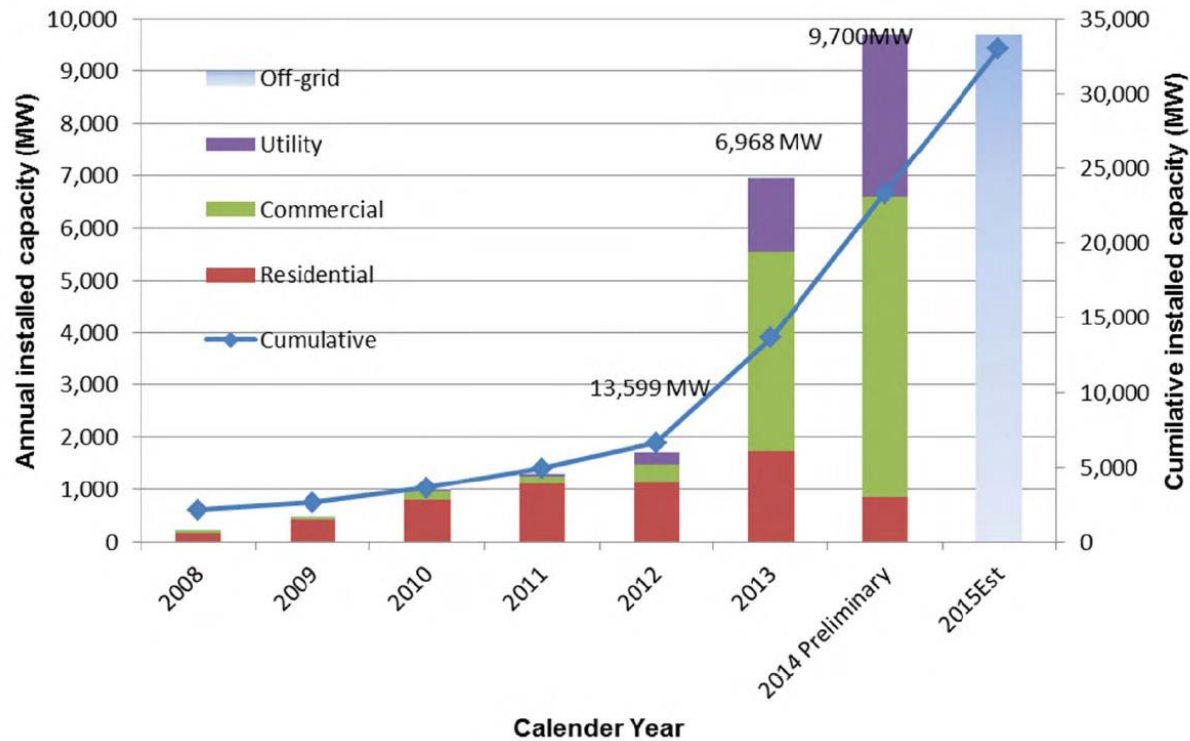
Source: https://de.wikipedia.org/wiki/Stromerzeugung_in_Japan

General conditions for PV in Japan

- **Reduction of feed-in tariff** from 2013 has direct effects on expansion of capacity, but:
 - still attractive feed-in tariff for permits already granted, many projects with > **29,05 €c/KWh** have yet not been executed.
- Current expansion of capacity and the planning for the coming years (**82.5 GW** METI approved volume – but feasibility in this magnitude improbable. More realistic is **40 GW**).
- At present, strong concentration on **MEGA Solar** field facilities. Currently only low level of expansion of roof installations.

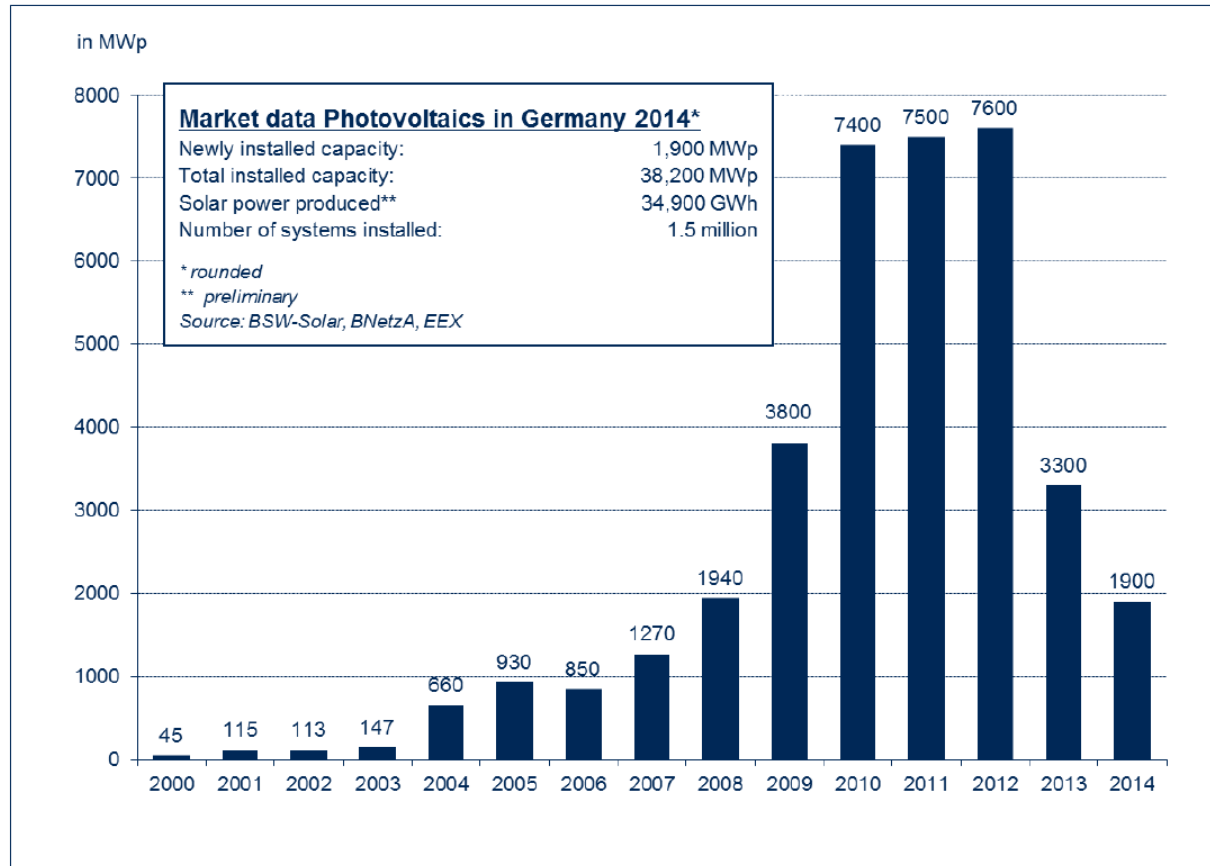
Overview of installed capacity in Japan

2015 market : similar level of 2014



Source: RTS PV

Overview of installed capacity in Germany. Expectation for 2015: 1,3 GW



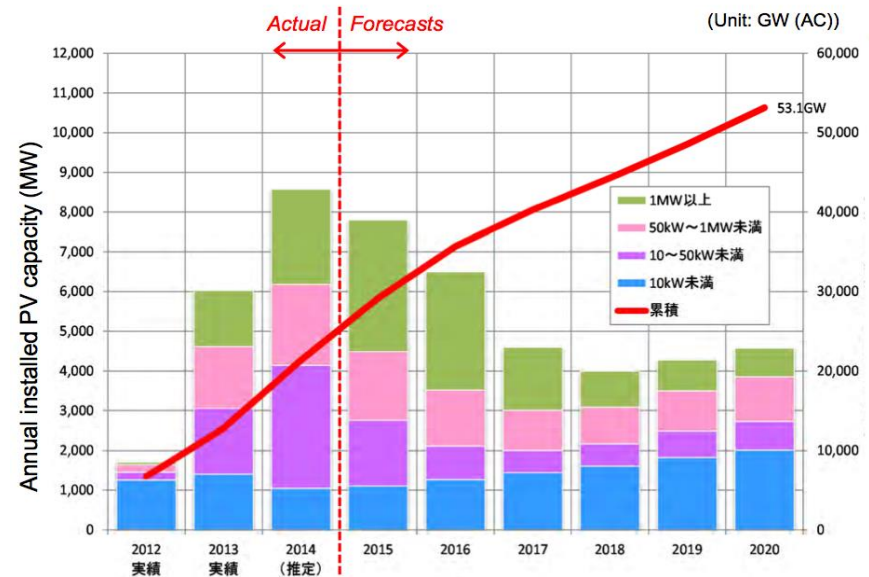
Source: BSW Solar Fact Sheets on Solar Power (6/2015)

Challenges for the Japanese PV industry

- Japanese manufacturers still have a large **market share** related to **feed-in tariffs** up to now. There will be a rising **price pressure**, e.g. from China.
- **High EPC costs** due to higher **BOS costs** (e.g., module prices, substation), labor costs, lack of efficiency and experience
- No awareness of professional O&M and its value by increasing the IRR for investors – **availability guarantees or PR guarantees** are unknown to a large extent.
- **Quality assurance services**, such as incoming goods inspections, TDD and acceptance tests, are not being demanded yet by Japanese investors/banks. The **warranty terms** are much shorter for EPC contractors.

Outlook and expectations for PV in Japan

- An awareness of professional O&M, as well as quality assurance will increase due to initial negative experiences.
- By ~2018: MEGA solar field facilities and capacity expansion rates roughly **5 - 10 GW/p.a.** for 2016-2017, then a distinct reduction and parallel rise of “commercial and residential” roof installations



Source: RTS PV

Outlook and expectations for PV in Japan

- Combinations of PV electricity generation with **storage technologies** get more important.
- High **refitting potential** (e.g., monitoring, insufficient O&M), many MEGA Solar plants without a proper monitoring equipment.
- **Resale market** will develop due to amortization model from the time before 2013
- **Repowering potential** of early installed MEGA Solar power plants can be expected due to lack of quality control at that time

Thank you! ありがとう !

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