

Study

MARKET INFO JAPAN – PHOTOVOLTAICS

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by the German Bundestag

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Publisher

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October 2014

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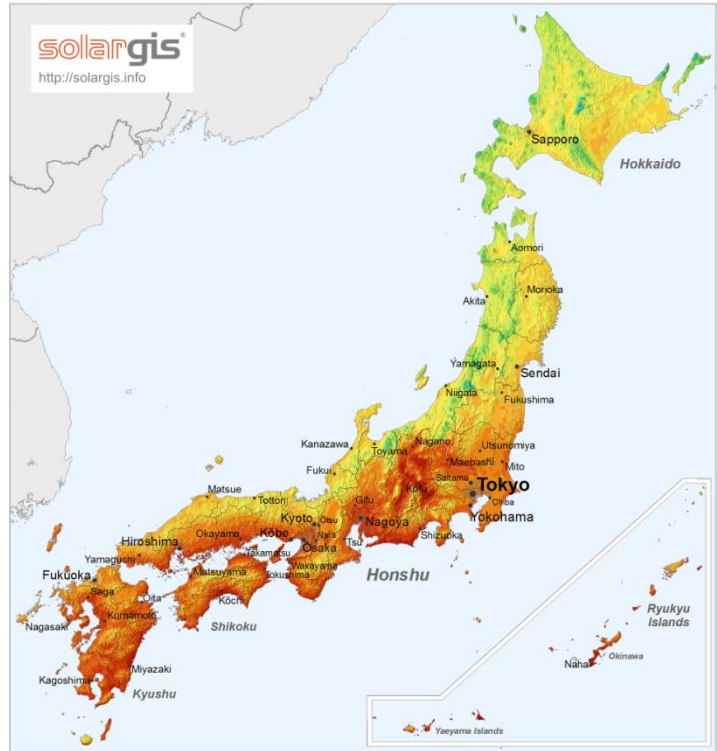
Federal Ministry
for Economic Affairs
and Energy

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SOLAR IRRADIATION & POPULATION DENSITY

Annual Global Solar Irradiation

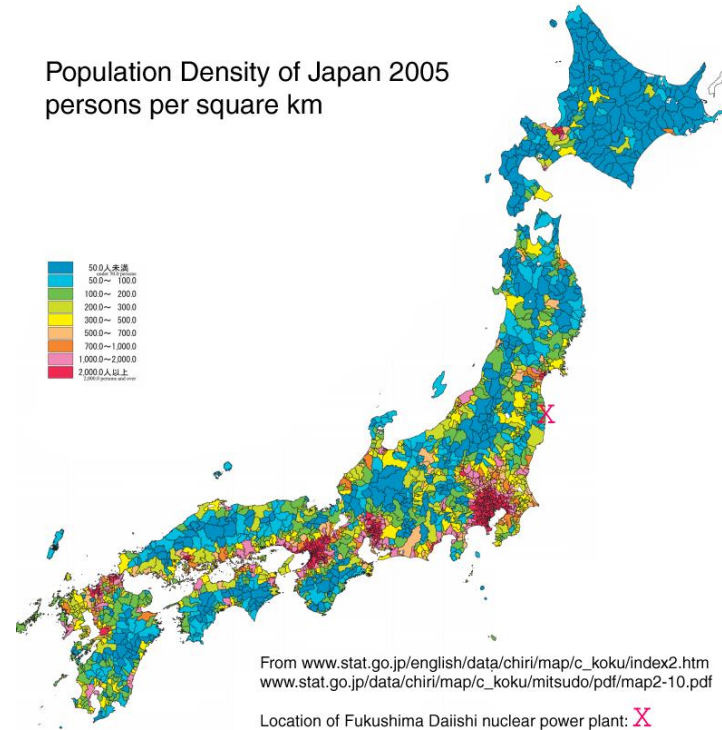
Global Horizontal Irradiation Japan



Source: SolarGIS (2014)

Population Density

Population Density of Japan 2005
persons per square km



From www.stat.go.jp/english/data/chiri/map/c_koku/index2.htm
www.stat.go.jp/data/chiri/map/c_koku/mitsudo/pdf/map2-10.pdf

Location of Fukushima Daiichi nuclear power plant: X

Source: Statistics Bureau (2005)

BASIC DATA

General Basic Data (2013)			
Area	377,915 km ²	GDP	478,368 bn Yen (~3,622.9 bn €*)
Population	127.37 Mio.	GDP (per capita)	3,756,589 Yen (~ 28,450 €*)
Language	Japanese	GDP growth	1.5 %
Government type	Constitutional monarchy, parliamentary democracy with two chambers	Inflation	0.4 %
Administrative division	Central administration; 8 regions with 47 prefectures and 20 major cities	Unemployment rate	4 %
Basic Energy Market Data (2011)			
Primary energy consumption	5,755.68 TWh		
Electricity consumption (total/per capita)	894.8 TWh / approx. 7,046 kWh		
Total electricity import	-		
Electricity price (industrial) (2013)	18.85 Yen/kWh (14.28€ct/kWh*)		
Electricity price (residential) (2013)	26.85 Yen/kWh (20.33 €ct/kWh*)		
Proportion of renewable energy (electricity consumption)	9 %		
Forecast electricity consumption (2035)	Between 976 TWh and 1,201 TWh		
Global solar irradiation	1,307 kWh/m ² a		

* Average exchange rate 2013: 1 Euro = 132.04 Yen

PHOTOVOLTAIC MARKET INDICATORS

Indicators				
Market size (annual installed capacity)	2012: 2 GW	2013: 6.9 GW	2014e: 8 GW	2015e: 6 GW
National PV target 2030	<ul style="list-style-type: none"> PV share in electricity mix: 6 % 		<ul style="list-style-type: none"> RE share in electricity mix: 25 - 30 % (depending on scenario) 	
Main market drivers 2013	<ul style="list-style-type: none"> Highest PV feed-in tariff worldwide, therefore particularly relevant for large-scale plants (but limited availability of land) Shutdown of nuclear power plants after Fukushima disaster and growing interest in alternative forms of energy generation 			
Tariff 2013	<ul style="list-style-type: none"> Japan's support scheme is based on a feed-in tariff policy. Plants larger than 10 kW are receiving 32 Yen/kWh incl. tax and plants smaller than 10 kW receive 37 Yen/kWh (details on support since 1st of April 2014 see next slide). 			
Changes to the PV support regulation	<ul style="list-style-type: none"> At the beginning of the new financial year on 1st April 2014, the Japanese Government has cut feed-in tariffs for commercial PV plants (>10 kWp) by 11 % and for residential PV installations (≤ 10 kWp) by 2.6 %. The Ministry of Economy, Trade and Industry in Tokyo has implemented the reduction suggested by the Procuring Committee for Solar Energy in March 2014. The tariff for systems with a capacity of > 10 kWp (commercial installations) has been reduced to 32Yen/kWh (before 38 Yen), for rooftop-systems below 10 kWp (households) to 37 Yen (before 38 Yen). The tariff applies to PV plants, which are connected to the grid between 1st April 2014 and 30th March 2015, for a duration of 20 years (≤ 10kW: for 10 years). 			

MAIN PV SUPPORT SCHEME: METI PV FEED-IN TARIFF

Support Scheme	Details
Act on Purchase of Renewable Energy Sourced Electricity by Electric Utilities	<ul style="list-style-type: none"> ▪ Art. 6: Operators are receiving the applicable feed-in tariff for 20 years, if the Ministry of Economy, Trade, and Industry (METI) has issued permission by 30th March 2015. All documents for the permission must be handed in in Japanese. ▪ Requirements for modules: <ul style="list-style-type: none"> ▪ Monocrystalline or polycrystalline silicon: capacity factor of 13.5 % (average yearly load) or higher ▪ Thin film semiconductors: capacity factor of 7.0 % or higher ▪ Compound semiconductors: capacity factor of 8.0 % or higher ▪ Next adjustment to the feed-in tariff are expected for March 2015. ▪ Feed-in tariffs are generally valid for plants, which have or will receive approval from METI between 1st April 2014 and 30th March 2015.

	≤ 10 kW (private households)	> 10 kW (commercial installation)
Tariff according to capacity	37 Yen / kWh (28.02€ct / kWh*) Fixed for 10 years.	32 Yen / kWh (24.24€ct / kWh*) Fixed for 20 years.

* Average exchange rate 2013 : 1 Euro = 132.04 Yen



English version of the act <http://k.lenz.none/LB/?p=6240>

OVERVIEW OF OTHER PV SUPPORT SCHEMES

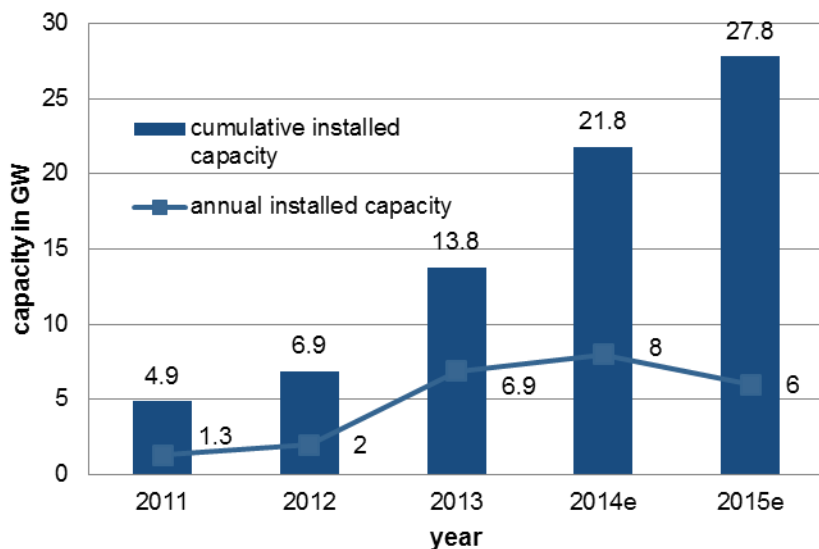
Institution	Support Scheme
METI	Special depreciation of solar projects: two options - 100 % depreciation of costs of solar components or 30 % depreciation of costs of solar components (remaining costs will be covered by the yearly depreciation).
METI	Tax relief for SMEs of more than 7 % for PV components, which will reduce the tax revenue. Contact: Green investment tax credit: http://www.enecho.meti.go.jp/greensite/green/index.html
METI	Covers 10 % of implementation costs for PV-systems (up to 80.000 Yen/kW) in the regions that suffered from the earthquake in 2011. The support applies to systems larger than 10 kW.
MoE	Finances of up to 50 % of project costs in order to support the reduction of greenhouse gas emissions. Funding is intended primarily for low-energy housing. The MoE provides the possibility to fund 50 % of the project costs when implementing rooftop systems. The “Law Concerning the Promotion of Measures to Cope with Global Warming“ provides the legal basis for this.
MLIT	The MLIT covers operation costs for greenhouse gas reduction projects or provides lump sum payments for the implementation of these projects. PV projects can apply for these support schemes.
MAFF	Support of PV systems in rural areas: this support scheme covers e. g. PV systems on agricultural buildings, fishery buildings, and forestry establishments. The “Project for early establishment of renewable energy supply models in rural areas” started in 2012.



All programs and schemes are subject to verification by the respective Ministries and authorities. Therefore, the actual payment can vary. Furthermore, regional prefectures, counties, and municipalities offer schemes to promote renewable energies. In 2012, according to the International Energy Agency 1,096 different support schemes were provided. In general, regional schemes are drafted on a yearly basis. In 2012, they were between 10,000 and 50,000 Yen/kW installed capacity depending on the region. Further information can be found at local Invest Japan Business Support Center (IBSC) and banks.

MARKET DEVELOPMENT AND BARRIERS

Development of installed PV capacity



The main barrier of the Japanese PV market

Scarcity of Areas

Based on Japan's topography exists a limited availability of areas for ground-mounted PV systems. Due to the rapid development of ground-mounted systems are large amounts of available sites already used.

Grid infrastructure

Japan is currently expanding its grid infrastructure in order to integrate more renewable power.

Sources: dena (2013), dena (2014), EPIA (2014), projection until 2015 based on GlobalData (2014) and BSW-Solar

MARKET NEWS (1/3)

Date	Topic	Source
07/10/2014	Tokyo Electric upgrading grid with 100-km-long transmission line Tokyo Electric Power Co. is building a 100-kilometer-long electricity transmission line in central Japan as part of the country's efforts to upgrade its grid infrastructure in view of surging renewable power.	PV-Magazine
01/10/2014	Japan May Apply Solar Brakes With Rate Overhaul, Yomiuri Reports Japan may revise its incentive program for clean energy to stem the rush of solar power producers trying to secure higher rates before the end of the fiscal year, the Yomiuri newspaper reported today. Under the current program, renewables producers qualify to sell their power at the fixed rate set at the time they win approval from the government. The rules may change so that solar developers will only be able to get the price at the time they begin producing power, which is typically lower, according to the newspaper, which did not say where it got the information.	Bloomberg
24/09/2014	Japan poised to top 8 GW solar installations this year Pro-solar initiatives laid down by Japan's Ministry of Economy, Trade and Industry (METI) will add more than 8 GW of solar PV capacity this year, according to research by consulting firm GlobalData.	PV-Magazine
11/09/2014	Japan's METI Says 1,820 Megawatts of Solar Projects Canceled Developers have canceled or abandoned 1,820 megawatts of solar power projects in Japan as the government investigates whether approved developments are moving ahead as planned. So far, 647 projects have been canceled or abandoned after getting approval in fiscal 2012, Yoichi Kimura, an official in charge of clean energy projects for the ministry of Economy, Trade and Industry, said at a taskforce meeting yesterday.	Bloomberg
01/09/2014	Utility scale projects boosting Japan's domestic solar sector According to data compiled by the Japan Photovoltaic Energy Association (JPEA), local solar shipments reached 1,882 MW in the three months up to June 30, representing a first quarter increase of 14% on last year, when shipments were 1,654 MW for the same period (In Japan, the first quarter of the year is calculated from the beginning of April).	PV-Magazine

MARKET NEWS (2/3)

Date	Topic	Source
20/05/2014	<p>Japan's solar PV market falls slightly in February 2014 to 532 MW</p> <p>Japan installed 88 MW of residential and 444 MW of “non-residential” solar photovoltaics under its feed-in tariff during February 2014, according to statistics released by the nation's Ministry of Economy, Trade and Industry (METI). This is a 6.5 % fall from January 2014 installation levels, as the fourth month of decline from a peak of 655 MW in October 2013.</p>	SolarServer
23/04/2014	<p>Japan's largest PV plant powers up</p> <p>Commercial operations have begun on Japan's largest utility-scale PV plant to date. The 82 MW ‘mega solar’ plant is located in Oita City, in southern Japan, and was built by conglomerate Marubeni which recently moved in to large-scale solar project construction. Power from the plant will be sold to Kyushu Electric Power Company under a 20-year power purchase agreement, with annual output expected to total 87 million kWh.</p>	PV-Tech
15/04/2014	<p>Japan approved 475 MW PV project in the south of the country (in German)</p> <p>Japan's Ministry of Economy, Trade and Industry approved plans of Photovolt Development Partners GmbH (Berlin) and the U.S. company TeraSol to construct photovoltaic plants with 475 MW rated capacity in total. The plants are to be built at several locations on an island in southern Japan.</p>	SolarServer
26/03/2014	<p>METI approves feed-in tariff reductions</p> <p>Japan's Ministry of Economy, Trade and Industry (METI) has accepted the proposal of an expert committee and approved solar photovoltaic (PV) feed-in tariff reductions for the nation's fiscal year beginning 1st April 2014. Feed-in tariff levels for PV plants larger than 10 kW will fall 11 % to JPY 32 (USD 0.31) per kWh, and levels for plants smaller than 10 kW will fall 2.7 % to JPY 36 (USD 0.35) per kWh. The contract period for plants above 10 kW is 20 years, for smaller plants 10.</p>	SolarServer

MARKET NEWS (3/3)

Date	Topic	Source
14/11/2013	<p>Japan announces closing date for residential PV subsidy applications The Japanese Ministry of Energy, Trade and Industry (METI) has announced that applications for subsidies under the country's feed-in tariff programme for residential PV installations will close at the end of next March.</p>	PV-Tech
27/09/2013	<p>Market for large-scale solar in Japan to wane after 2014 fiscal year, Yano reports The Japanese Yano Research Institute is expecting a reduction in the PV market segment of ground-mounted and large-scale systems for the end of the financial year 2014. This is based on the reduction in tariffs as well as on the lack of available sites in the country.</p>	PV-Magazine
02/09/2013	<p>Eurus is planning 115-Megawatt plant in Japan Eurus Energy Holdings Corporation, a Japanese project developer, has presented plans for the construction of a large scale PV system with a capacity of 115 MW in the north of Japan. The system consists of two parts and will be constructed in the prefecture Aomori in the district of Konikita, according to a press release. The Japanese technology group Mitsubishi Electric Corporation as well as the Japanese subsidiary of the US manufacturer Sunpower will be delivering the modules. The completion of it is scheduled for November 2015.</p>	http://eurus-energy.com

CONTACT INFORMATION

Category	Name	Website
Ministry for Economy	Ministry of Economy, Trade and Industry (METI)	www.meti.go.jp
Institute for Energy	Institute of Energy Economics Japan (IEEJ)	eneken.ieej.or.jp
Agency for Natural Resources and Energy	Agency for Natural Resources and Energy (ANRE)	www.enecho.meti.go.jp
Public R&D-Institution	New Energy and Industrial Technology Development Organisation (NEDO)	www.nedo.go.jp/english
AHK Japan – German-Japanese Chamber of Industry and Commerce	AHK Japan – Deutsche Industrie- und Handelskammer in Japan	www.japan.ahk.de
Office for the Certification of Systems	Japanese Industrial Standard (JIS)	www.jisc.go.jp/eng
Regulatory Authority	Electric Power System Council of Japan (ESCJ)	www.escj.or.jp
Government Financing Institution for Renewable or Solar Projects	New and Renewable Energy Division (NRED)	www.meti.go.jp
Federation of Energy Providers	Federation of Electric Power Companies (FEPC)	www.fepec.or.jp/english
Power Exchange	Japan Electric Power Exchange (JEPX)	www.jepx.org/English/index_e.html

CONTACT INFORMATION

Category	Name	Website
Solar Industry Association	Japan Photovoltaic Energy Association (JPEA)	http://www.jpea.gr.jp/index.html
Financing	Muziho Financial Group	www.mizuho-fg.co.jp/english/index.html
Support Scheme	Japan Photovoltaic Expansion Center (J-PEC)	http://www.j-pec.or.jp

REFERENCES

- AA, Auswärtiges Amt (2012): http://www.auswaertiges-ont.de/DE/Aussenpolitik/Laender/Laenderinfos/Japan/Wirtschaftsdatenblatt_node.html, accessed on 23.01.2013.
- Baker & McKenzie (Gaikokuho Joint Enterprise) (2013): Renewable and Clean Energy: http://www.bakermckenzie.co.jp/e/material/dl/supportingyourbusiness/newsletter/emi/ClientAlert_201305_EMI_E.PDF, accessed on 22.05.2013.
- CIA, Central Intelligence Agency (2012): The World Fact Book. <https://www.cia.gov/library/publications/the-world-factbook/geos/ja.html>, accessed on 05.02.2013.
- dena (2013): Marktreport Japan – Photovoltaik 2013.
- EIA, U.S. Energy Information Administration (2012): International Energy Statistics, <http://www.eia.gov/countries/country-data.cfm?fips=JA>, accessed on 04.02.2013.
- EPIA, European Photovoltaic Industry Association (2014): Global Market Outlook For Photovoltaics 2014 to 2018, EPIA, Brussels.
- GTAI, Germany Trade and Invest (2014): Wirtschaftsdaten Kompakt Japan, http://www.ahk.de/fileadmin/ahk_ahk/GTAl/japan.pdf, accessed on 04.10.2014.
- IEA, (2013): IEA Key World Energy Statistics 2013. http://www.iea.org/publications/freepublications/publication/KeyWorld2013_FINAL_WEB.pdf, accessed on 25.10.2013.
- IEEJ, The Institute of Energy Economics, Japan (2012): Short-Term Energy Supply and Demand Outlook for Japan, <http://eneken.ieej.or.jp/data/4672.pdf>, accessed on 02.04.2013.
- JETRO (2013c): Feed in Tariffs, <http://www.jetro.go.jp/germany/Energie/index.html/FITFY2013Kopie.pdf>, accessed on 03.05.2013.
- METI, Ministry of Economy, Trade and Industry (2014): Settlement of FY2014 Purchase Prices, http://www.meti.go.jp/english/press/2014/0325_03.html, accessed on 05.06.2014.
- Trading Economics (2013): Japan National Statistics, <http://www.tradingeconomics.com/japan/indicators>, accessed on 28.03.2013.
- PV-Magazine (2013): Market for large-scale solar in Japan to wane after 2014 fiscal year, Yano reports, http://www.pv-magazine.com/news/details/beitrag/market-for-large-scale-solar-in-japan-to-wane-after-2014-fiscal-year--yano-reports_100012857/#axzz2iikkcpQG, accessed on 25.10.2013.

REFERENCES

- PV-Tech (2013): Report: Large-scale solar demand in Japan to fall as domestic PV grows to 2020, http://www.pv-tech.org/news/japanese_research_firm_predicts_residential_pv_sector_to_expand_while_large, accessed on 10.10.2013.
- SolarGIS (2014): Solar Map Japan, http://solargis.info/doc/_pics/freemaps/1000px/ghi/SolarGIS-Solar-map-Japan-en.png, accessed on 23.05.2014.
- SolarServer (2014): Japan hat im Dezember 2013 Photovoltaik-Anlagen mit 587 MW installiert, <http://www.solarserver.de/solar-magazin/nachrichten/aktuelles/2014/kw13/japan-hat-im-dezember-2013-photovoltaik-anlagen-mit-587-mw-installiert.html>, accessed on 05.06.2014.
- Statistics Bureau (2005): Population Density of Japan 2005.
- Trading Economics (2013): Japan National Statistics, <http://www.tradingeconomics.com/japan/indicators>, accessed on 28.03.2013.