

Japan

Sustainable Development Goal 7.2: Energy Indicators (2016)

Renewable energy (% of TFEC)	6.6	Access to electricity (% of population)	100.0
Energy efficiency (MJ per \$1 of GDP)	3.7	Access to clean cooking (% of population)	>95

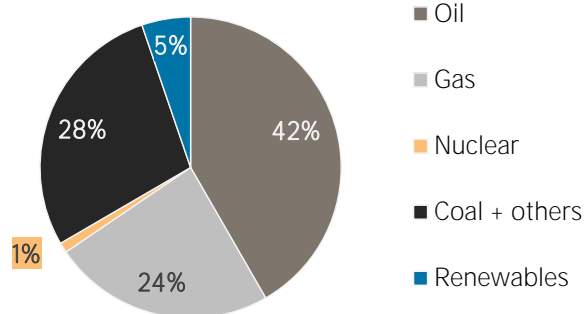
TOTAL PRIMARY ENERGY SUPPLY (TPES)

TPES	2011	2016
Non-renewable (TJ)	18 533 826	16 935 665
Renewable (TJ)	795 495	936 721
Total (TJ)	19 329 321	17 872 386
Renewable share (%)	4	5

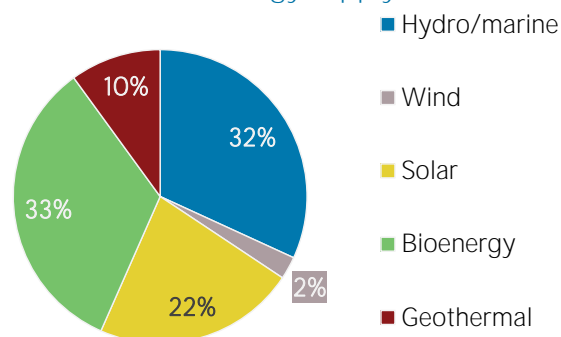
Growth in TPES	2011-16	2015-16
Non-renewable (%)	-8.6	-1.4
Renewable (%)	+17.8	-5.5
Total (%)	-7.5	-1.6

Primary energy trade	2011	2016
Imports (TJ)	18 201 704	17 546 518
Exports (TJ)	606 952	796 778
Net trade (TJ)	-17 594 752	-16 749 740
Imports (% of supply)	94	98
Exports (% of production)	28	53
Energy self-sufficiency (%)	11	8
Net trade (USD million)	- 258 358	- 101 506
Net trade (% of GDP)	-4.2	-2.1

Total primary energy supply in 2016



Renewable energy supply in 2016



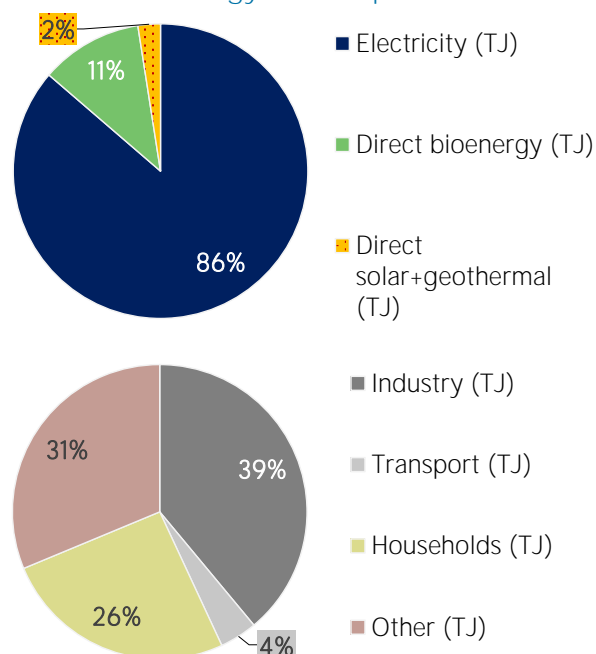
RENEWABLE ENERGY CONSUMPTION

Consumption by source	2011	2016
Electricity (TJ)	352 654	551 760
Direct bioenergy (TJ)	109 089	71 704
Direct solar+geothermal (TJ)	20 670	15 753
Total (TJ)	482 413	639 217
Electricity share (%)	73	86

Consumption growth	2011-16	2015-16
Renewable electricity (%)	+56.5	+11.8
Other renewables (%)	-34.3	-35.9
Total (%)	+32.7	+2.0

Consumption by sector	2011	2016
Industry (TJ)	222 553	249 054
Transport (TJ)	14 645	26 288
Households (TJ)	120 856	163 986
Other (TJ)	124 359	199 888
Renewable share of TFEC	4.9	6.6

Renewable energy consumption in 2016

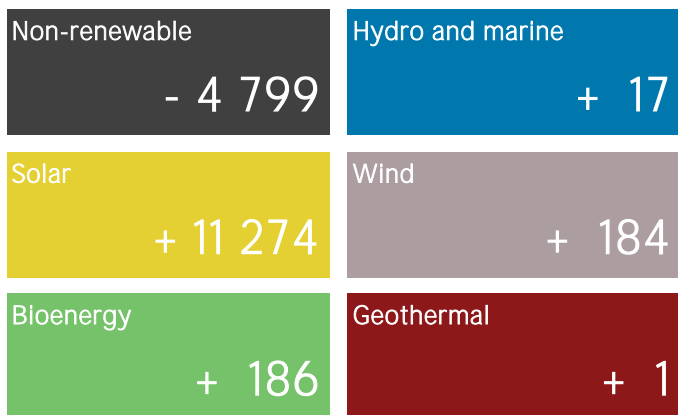


ELECTRICITY CAPACITY AND GENERATION

Capacity in 2018	MW	%
Non-renewable	250 712	73
Renewable	90 579	27
Hydro/marine	28 137	8
Solar	55 500	16
Wind	3 667	1
Bioenergy	2 793	1
Geothermal	482	0
Total	341 291	100

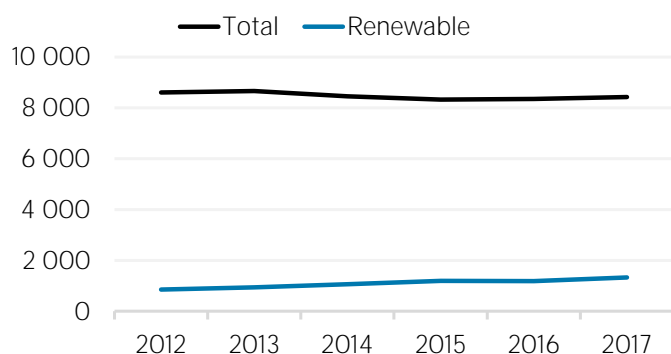
Capacity change (%)	2013-18	2017-18
Non-renewable	- 3	- 1.9
Renewable	+ 103	+ 14.8
Hydro/marine	+ 1	+ 0.1
Solar	+ 358	+ 25.5
Wind	+ 39	+ 5.3
Bioenergy	+ 85	+ 7.1
Geothermal	- 6	+ 0.2
Total	+ 13	+ 2.1

Net capacity change in 2018 (MW)

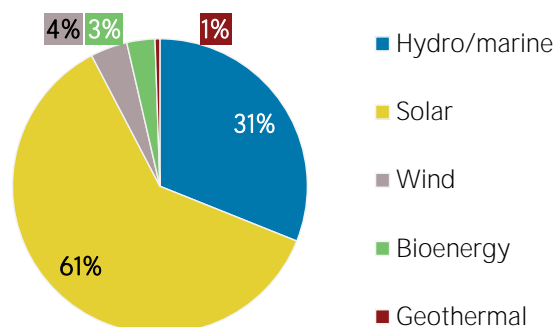


Generation in 2017	GWh	%
Non-renewable	900 086	84
Renewable	168 236	16
Hydro and marine	82 854	8
Solar	55 068	5
Wind	6 490	1
Bioenergy	21 367	2
Geothermal	2 457	0
Total	1 068 322	100

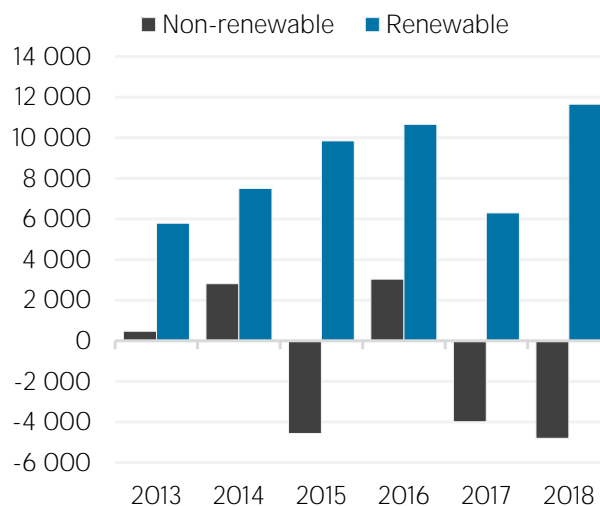
Per capita electricity generation (kWh)



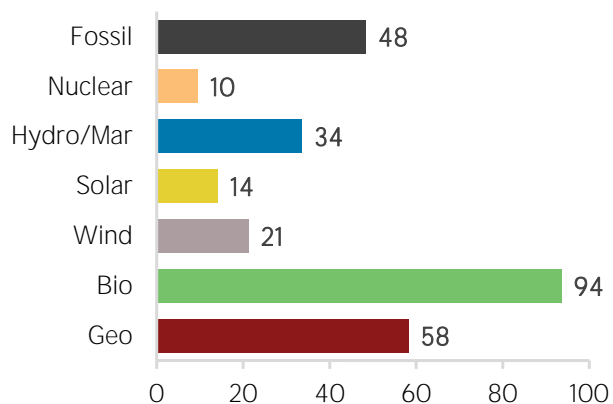
Renewable capacity in 2018



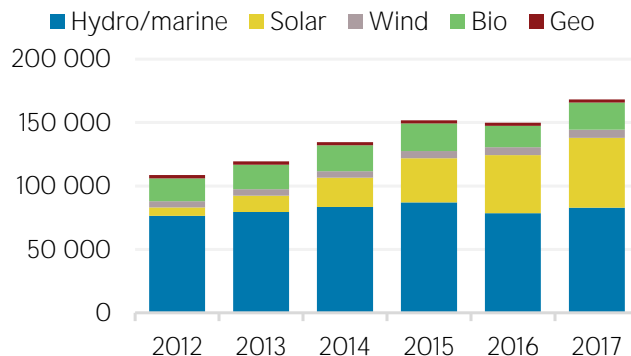
Net capacity change (MW)



Capacity utilisation in 2017 (%)



Renewable generation (GWh)



TARGETS, POLICIES AND MEASURES

Most immediate clean energy targets & NDCs

	year	target	unit
Renewable energy:			
Renewable electricity:	2030	22-24	%
Renewable capacity:			
Renewable transport:			
Liquid Biofuel blending mandate:			
Other transport targets:			
Renewable heating/cooling:			
Renewable Hydropower	2030	9	%
Off-grid renewable technologies:			

Energy efficiency (Energy):

Energy efficiency (Electricity):

Latest policies, programmes and legislation

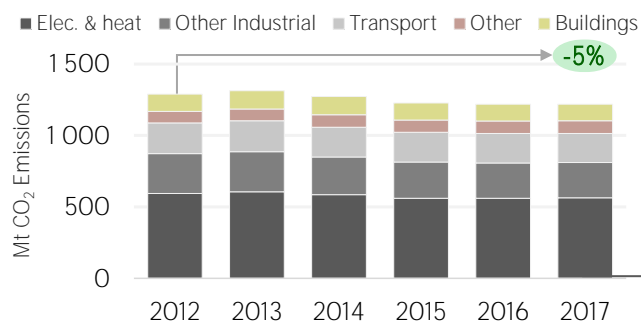
1 Long-term Energy Supply and Demand Outlook	2015
2 Strategic Energy Plan (2014)	2014
3 Feed-in Tariff for renewable electricity and solar PV auction	2012
4 Global Methane Initiative	2010
5 Cool Earth-Energy Innovative Technology Plan	2008

References to sustainable energy in Nationally Determined Contribution (NDC)

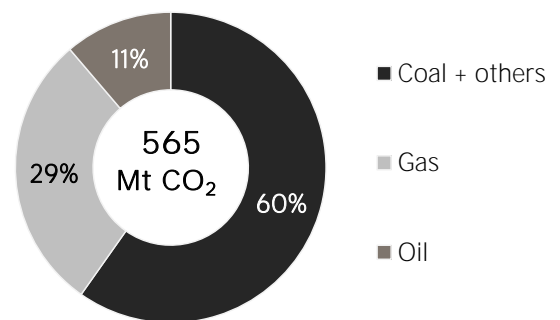
	Conditional	Unconditional	unit
- Renewable energy		22-24	
- electricity			
- transport			
- heating/cooling			
- Energy efficiency			

ENERGY AND EMISSIONS

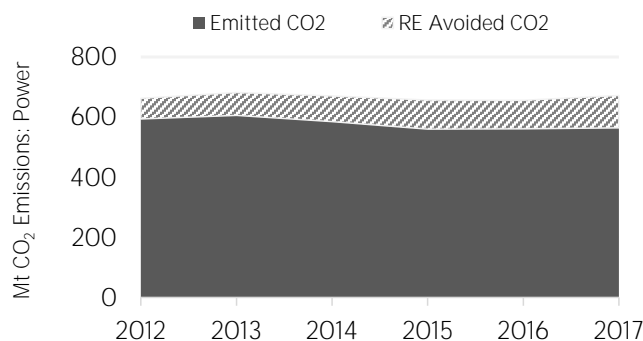
Energy-related CO₂ emissions by sector



Elec. & heat generation CO₂ emissions in 2017

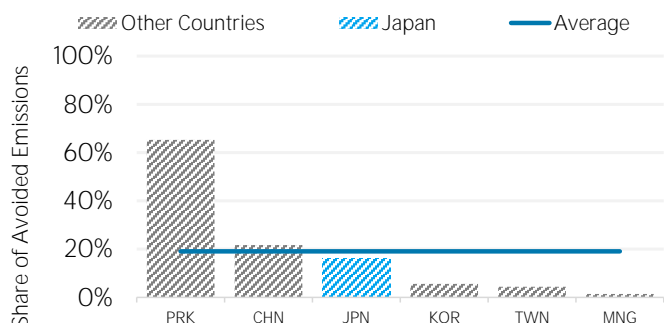


Avoided emissions from renewable power



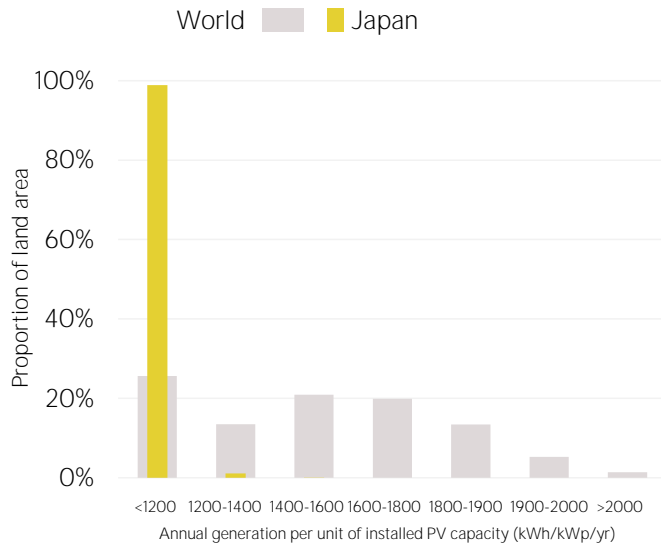
Avoided emissions based on fossil fuel mix used for power

Reduction in power emissions due to RE in 2017

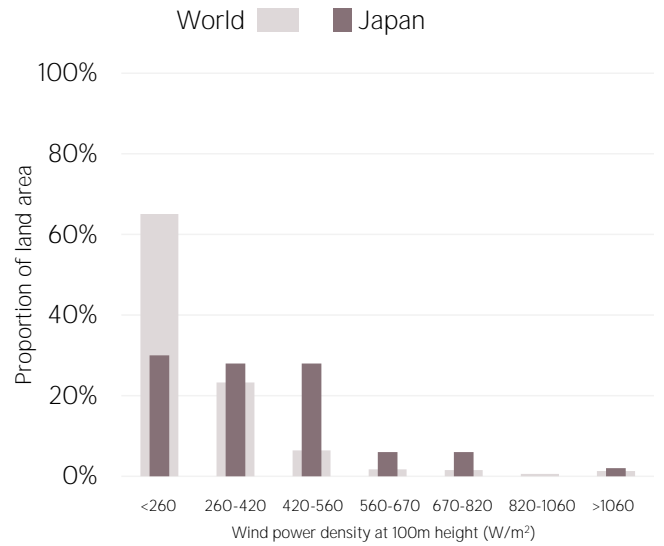


Reduction is RE Avoided divided by sum of avoided and emitted

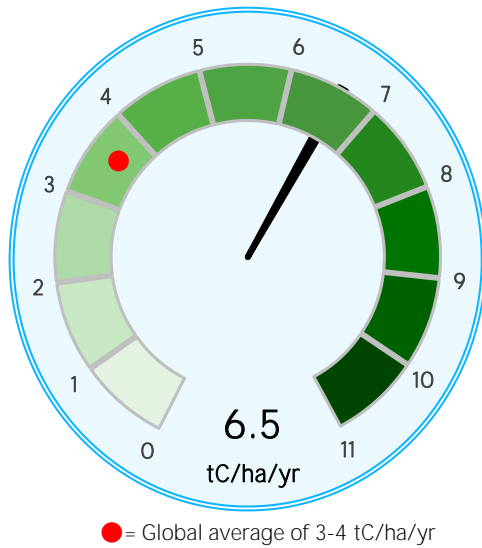
Distribution of solar potential



Distribution of wind potential



Biomass potential: net primary production



Indicators of renewable resource potential

Solar PV: Solar resource potential has been divided into seven classes, each representing a range of annual PV output per unit of capacity (kWh/kWp/yr). The bar chart shows the proportion of a country's land area in each of these classes and the global distribution of land area across the classes (for comparison).

Onshore wind: Potential wind power density (W/m^2) is shown in the seven classes used by NREL, measured at a height of 100m. The bar chart shows the distribution of the country's land area in each of these classes compared to the global distribution of wind resources. Areas in the third class or above are considered to be a good wind resource.

Biomass: Net primary production (NPP) is the amount of carbon fixed by plants and accumulated as biomass each year. It is a basic measure of biomass productivity. The chart shows the average NPP in the country (tC/ha/yr), compared to the global average NPP of 3-4 tonnes of carbon per year.

Sources: IRENA statistics, plus data from the following sources: UN SDG Indicators Database (original sources: WHO; World Bank; IEA; IRENA; and UNSD); UNSD Energy Balances; UN COMTRADE; World Bank World Development Indicators; EDGAR; REN21 Global Status Report; IEA-IRENA Joint Policies and Measures Database; IRENA Global Atlas; and World Bank Global Solar Atlas and Global Wind Atlas.

Additional notes: Energy self-sufficiency has been defined as total primary energy production divided by total primary energy supply. The value of energy trade has been defined as including all commodities in Chapter 27 of the Harmonised System (HS). Capacity utilisation has been calculated as annual generation divided by capacity x 8,760. Avoided emissions from renewable power have been calculated as renewable generation divided by fossil fuel generation multiplied by reported emissions from the power sector. This assumes that, if renewable power did not exist, fossil fuels would be used in its place to generate the same amount of power and using the same mix of fossil fuels. In countries and years where no fossil fuel generation occurs, an average fossil fuel emission factor has been used to calculate the avoided emissions.

This note has been produced to provide policy makers with a brief overview of developments in renewable energy in a country. The IRENA statistics team would welcome comments and feedback on its structure and content, which can be sent to statistics@irena.org.

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