STATISTICAL PROFILE

Spain

Sustainable Development Goal 7.2: Energy Indicators (2016)

Renewable energy (% of TFEC)	17.1	Access to electricity (% of population)	100.0
Energy efficiency (MJ per $1 of GDP)	3.2	Access to clean cooking (% of population)	>95

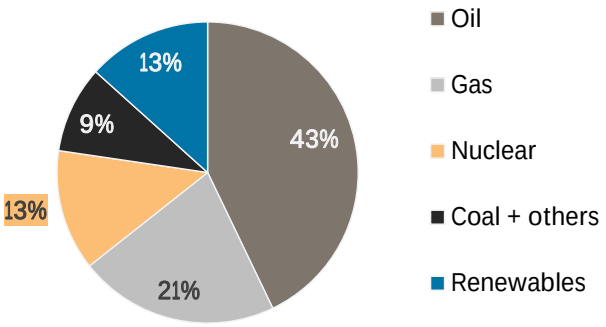
TOTAL PRIMARY ENERGY SUPPLY (TPES)

TPES	2011	2016
Non-renewable (TJ)	4 626 565	4 230 096
Renewable (TJ)	622 745	650 846
Total (TJ)	5 249 310	4 880 941
Renewable share (%)	12	13

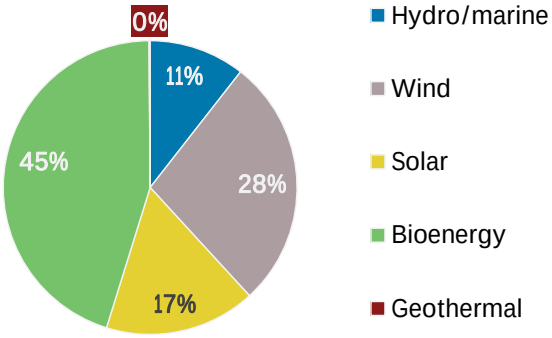
Growth in TPES	2011-16	2015-16
Non-renewable (%)	-8.6	-0.2
Renewable (%)	+4.5	-5.8
Total (%)	-7.0	-1.0

Primary energy trade	2011	2016
Imports (TJ)	5 113 071	5 229 864
Exports (TJ)	713 520	1 293 740
Net trade (TJ)	-4 399 551	-3 936 124
Imports (% of supply)	97	107
Exports (% of production)	53	97
Energy self-sufficiency (%)	26	27
Net trade (USD million)	- 55 546	- 21 735
Net trade (% of GDP)	-3.8	-1.8

Total primary energy supply in 2016



Renewable energy supply in 2016



RENEWABLE ENERGY CONSUMPTION

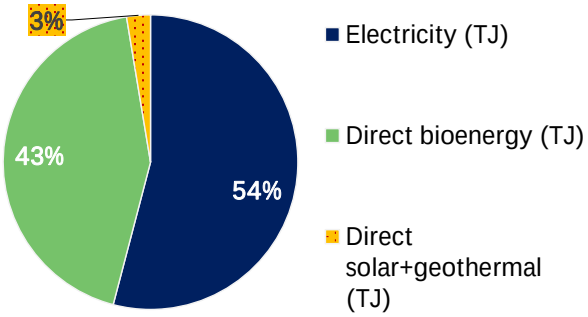
Consumption by source	2011	2016
Electricity (TJ)	260 407	270 552
Direct bioenergy (TJ)	232 938	216 636
Direct solar+geothermal (TJ)	9 222	13 067
Total (TJ)	**502 567**	**500 255**
Electricity share (%)	52	54

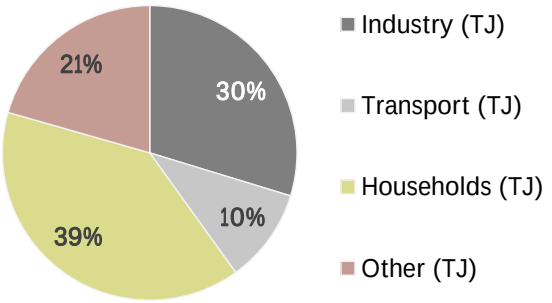
Consumption growth	2011-16	2015-16
Renewable electricity (%)	+3.9	-14.5
Other renewables (%)	-5.2	+3.8
Total (%)	**-0.5**	**-7.0**

Consumption by sector	2011	2016
Industry (TJ)	131 144	148 665
Transport (TJ)	75 636	51 837
Households (TJ)	192 139	196 823
Other (TJ)	103 639	102 920

Renewable share of TFEC	14.8	17.1

Renewable energy consumption in 2016





ELECTRICITY CAPACITY AND GENERATION

Capacity in 2018	MW	%
Non-renewable	**55 480**	**53**
Renewable	**48 257**	**47**
Hydro/marine	16 747	16
Solar	7 068	7
Wind	23 405	23
Bioenergy	1 037	1
Geothermal	0	0
Total	**103 737**	**100**

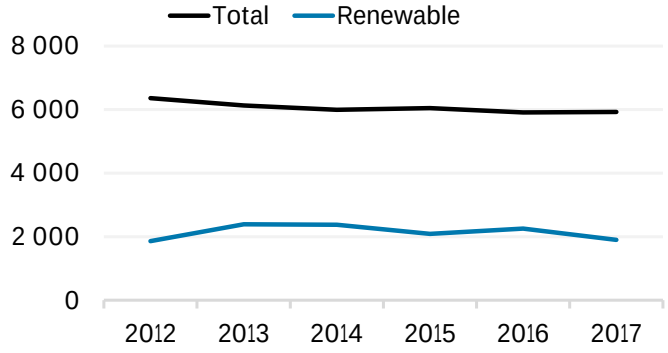
Capacity change (%)	2013-18	2017-18
Non-renewable	**- 5**	**- 0.8**
Renewable	**+ 1**	**+ 0.7**
Hydro/marine	+ 0	+ 0.0
Solar	+ 1	+ 0.6
Wind	+ 2	+ 1.2
Bioenergy	+ 4	+ 1.4
Geothermal	0	0.0
Total	**- 2**	**- 0.1**

Net capacity change in 2018 (MW)

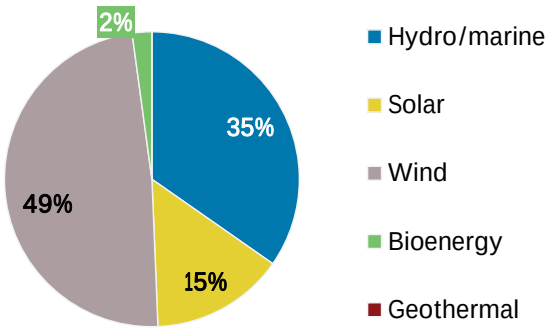
Non-renewable: - 462	Hydro and marine: + 1
Solar: + 41	Wind: + 281
Bioenergy: + 14	Geothermal: 0

Generation in 2017	GWh	%
Non-renewable	**187 802**	**68**
Renewable	**88 384**	**32**
Hydro and marine	18 782	7
Solar	14 397	5
Wind	49 127	18
Bioenergy	6 078	2
Geothermal	0	0
Total	**276 186**	**100**

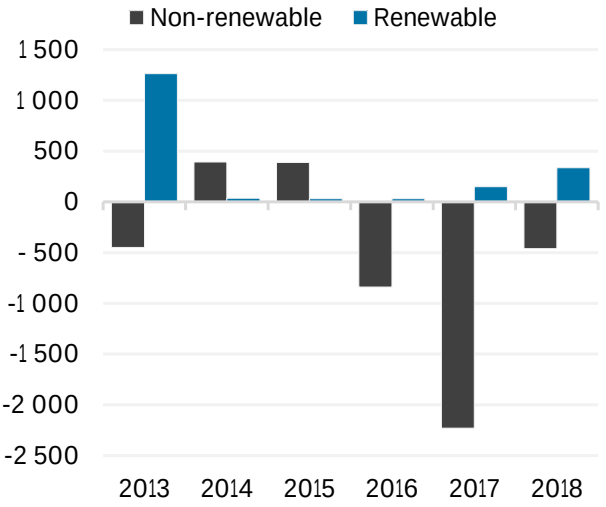
Per capita electricity generation (kWh)



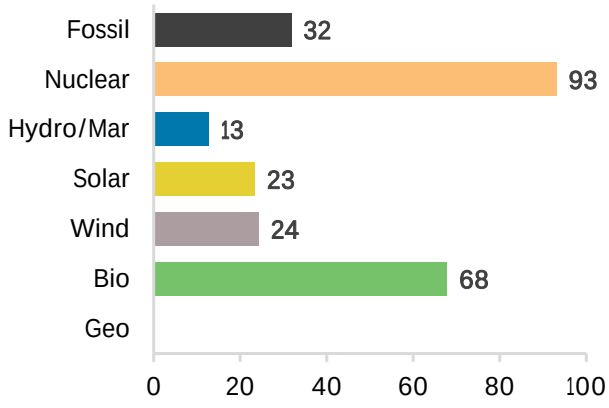
Renewable capacity in 2018



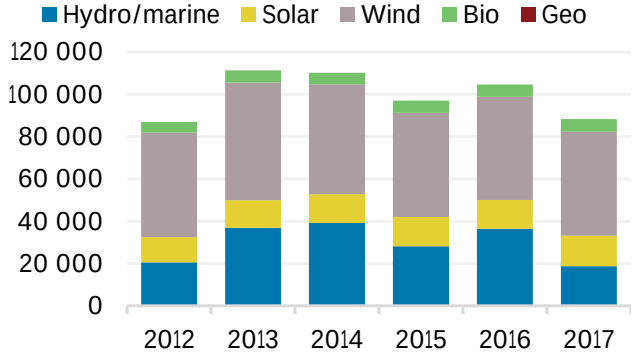
Net capacity change (MW)



Capacity utilisation in 2017 (%)



Renewable generation (GWh)



TARGETS, POLICIES AND MEASURES

Most immediate clean energy targets & NDCs

	year	target	unit
Renewable energy:	2020	23	%
Renewable electricity:	2020	40	%
Renewable capacity:			
Renewable transport:	2020	14	%
Liquid Biofuel blending mandate:			
Other transport targets:			
Renewable heating/cooling:	2020	19	%
Renewable Hydropower			
Off-grid renewable technologies:			

Energy efficiency (Energy):

Energy efficiency (Electricity):

Latest policies, programmes and legislation

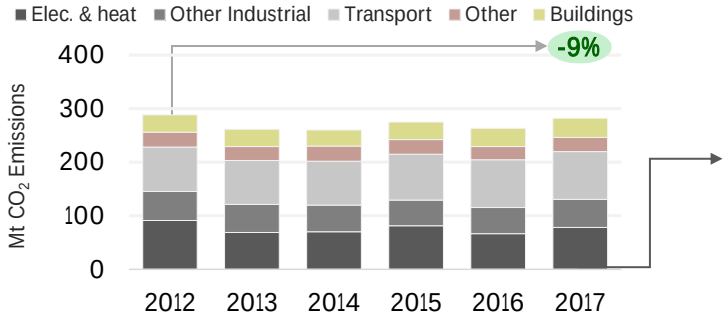
1	Renewable energy auctions (2017)	2017
2	Renewable energy capacity auction (500 MW wind, 200 MW biomass)	2016
3	Development plan of electrical energy transport network 2015-2020	2015
4	Order IET/1045/2014 of 16 June, approving the remuneration parameters for standard facilities, applicable to certain electricity production facilities based on renewable energy, cogeneration and waste.	2015
5	Royal Decree 110/2015 on disposal of photovoltaic modules	2015

References to sustainable energy in Nationally Determined Contribution (NDC)

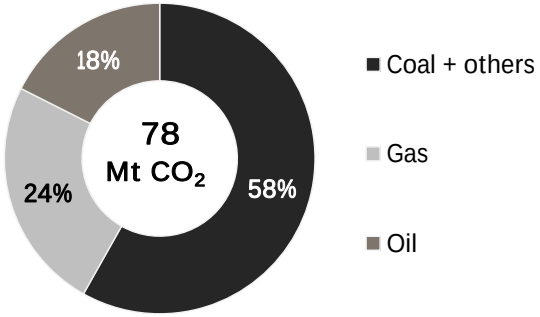
	Conditional	Unconditional	unit
- **Renewable energy**			
- electricity			
- transport			
- heating/cooling			
- Energy efficiency			

ENERGY AND EMISSIONS

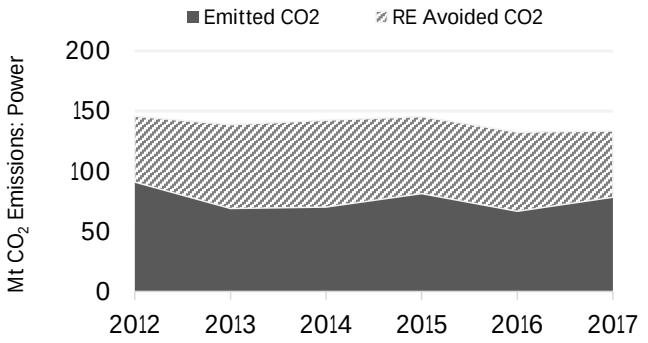
Energy-related CO_2 emissions by sector



Elec. & heat generation CO_2 emissions in 2017

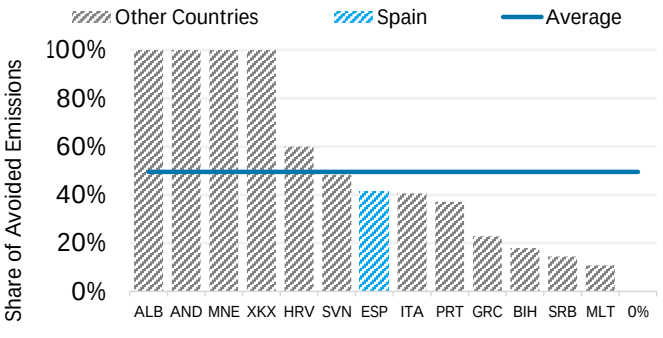


Avoided emissions from renewable power



Avoided emissions based on fossil fuel mix used for power

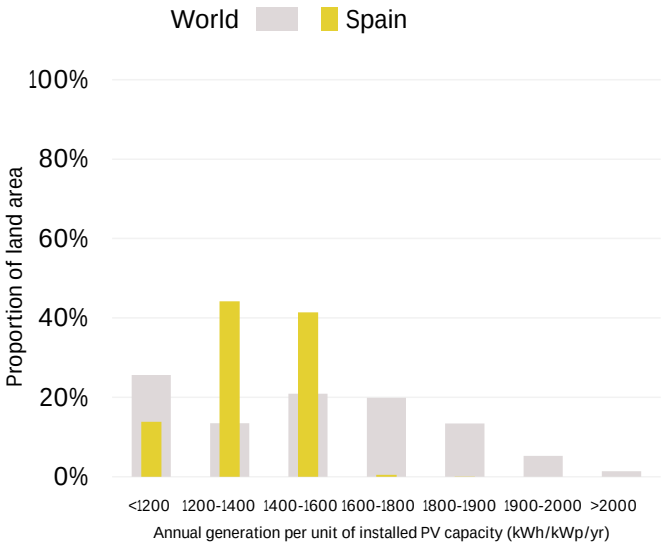
Reduction in power emissions due to RE in 2017



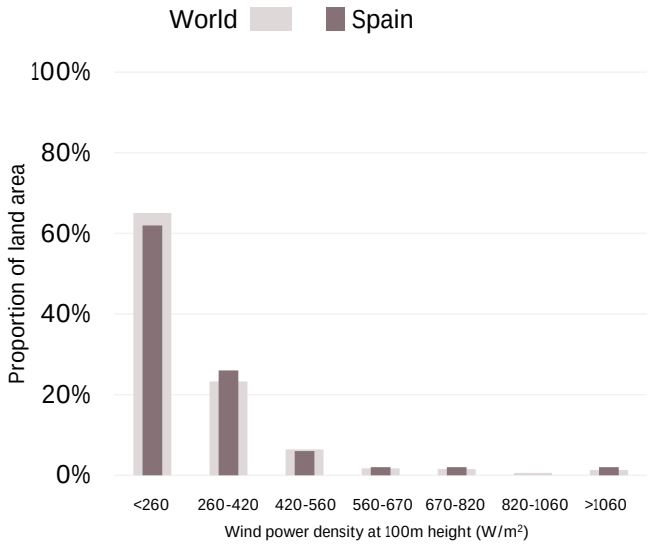
Reduction is RE Avoided divided by sum of avoided and emitted

RENEWABLE RESOURCE POTENTIAL

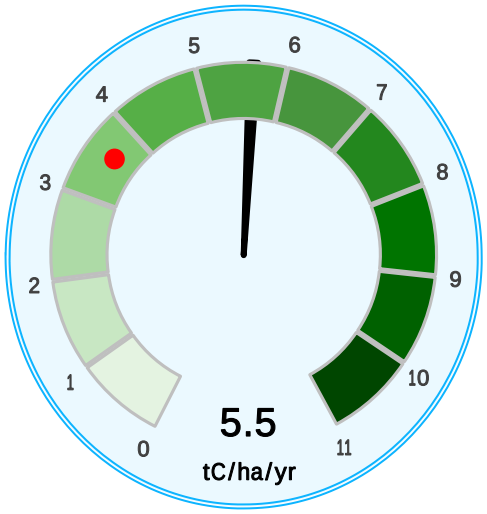
Distribution of solar potential



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 secrtor. 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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