

# Portugal

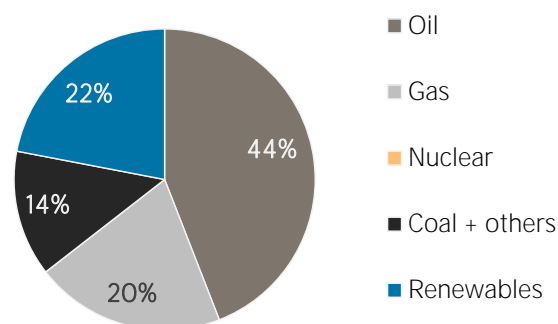
## Sustainable Development Goal 7.2: Energy Indicators (2016)

Renewable energy (% of TFEC)	29.1	Access to electricity (% of population)	100.0
Energy efficiency (MJ per \$1 of GDP)	3.3	Access to clean cooking (% of population)	>95

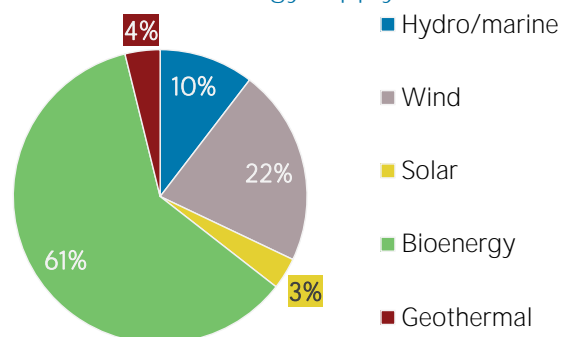
### TOTAL PRIMARY ENERGY SUPPLY (TPES)

TPES	2011	2016
Non-renewable (TJ)	728 308	688 348
Renewable (TJ)	201 056	193 982
Total (TJ)	929 364	882 330
Renewable share (%)	22	22
<b>Growth in TPES</b>		
	2011-16	2015-16
Non-renewable (%)	-5.5	-1.3
Renewable (%)	-3.5	-19.5
Total (%)	-5.1	-5.9
<b>Primary energy trade</b>		
	2011	2016
Imports (TJ)	930 973	1 067 498
Exports (TJ)	145 081	334 651
Net trade (TJ)	- 785 892	- 732 847
Imports (% of supply)	100	121
Exports (% of production)	69	152
Energy self-sufficiency (%)	23	25
Net trade (USD million)	- 10 271	- 3 451
Net trade (% of GDP)	-4.2	-1.7

### Total primary energy supply in 2016



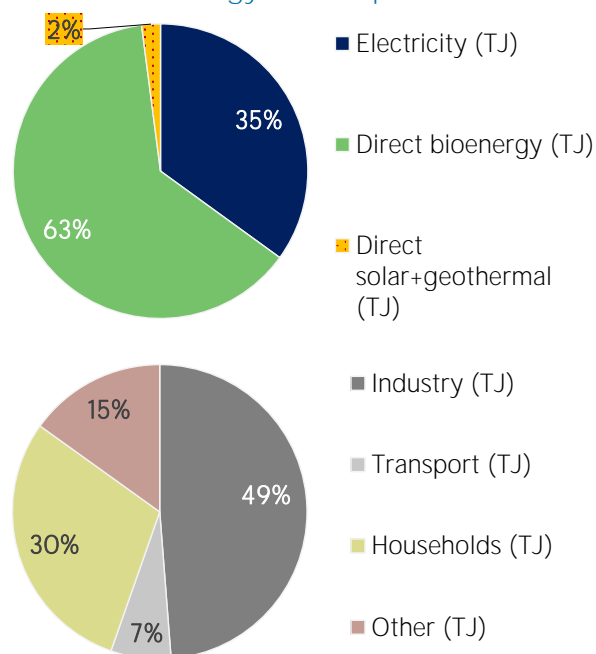
### Renewable energy supply in 2016



### RENEWABLE ENERGY CONSUMPTION

Consumption by source	2011	2016
Electricity (TJ)	64 587	60 702
Direct bioenergy (TJ)	114 709	109 240
Direct solar+geothermal (TJ)	2 556	3 572
<b>Total (TJ)</b>	<b>181 852</b>	<b>173 514</b>
Electricity share (%)	36	35
<b>Consumption growth</b>		
	2011-16	2015-16
Renewable electricity (%)	-6.0	-42.6
Other renewables (%)	-3.8	+3.3
<b>Total (%)</b>	<b>-4.6</b>	<b>-19.3</b>
<b>Consumption by sector</b>		
	2011	2016
Industry (TJ)	93 005	84 618
Transport (TJ)	12 710	11 457
Households (TJ)	49 666	51 249
Other (TJ)	26 471	26 189
Renewable share of TFEC	27.2	29.1

### Renewable energy consumption in 2016

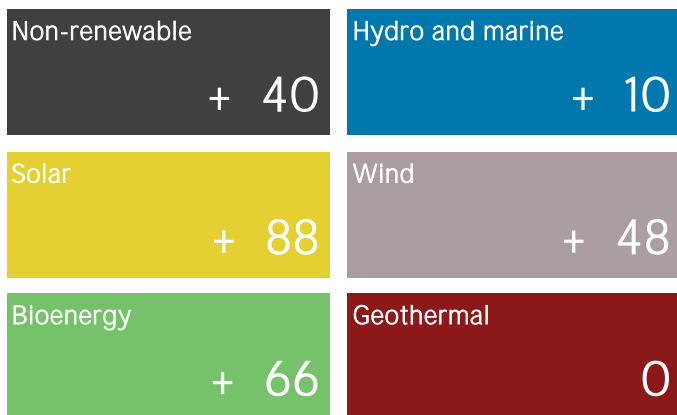


## ELECTRICITY CAPACITY AND GENERATION

Capacity in 2018	MW	%
<b>Non-renewable</b>	<b>7 432</b>	<b>35</b>
<b>Renewable</b>	<b>13 753</b>	<b>65</b>
Hydro/marine	7 236	34
Solar	667	3
Wind	5 172	24
Bioenergy	648	3
Geothermal	29	0
<b>Total</b>	<b>21 186</b>	<b>100</b>

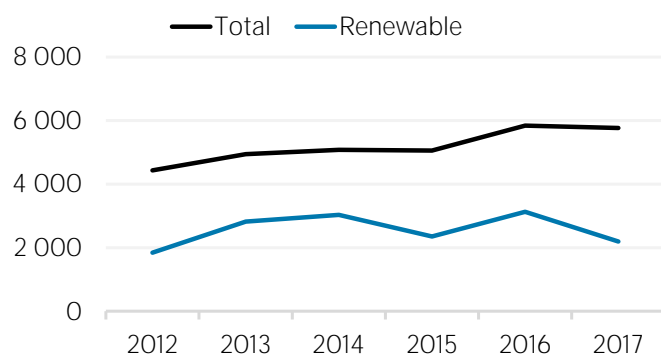
Capacity change (%)	2013-18	2017-18
<b>Non-renewable</b>	<b>- 4</b>	<b>+ 0.5</b>
<b>Renewable</b>	<b>+ 23</b>	<b>+ 1.6</b>
Hydro/marine	+ 28	+ 0.1
Solar	+ 125	+ 15.2
Wind	+ 12	+ 0.9
Bioenergy	+ 18	+ 11.3
Geothermal	+ 16	0.0
<b>Total</b>	<b>+ 12</b>	<b>+ 1.2</b>

### Net capacity change in 2018 (MW)

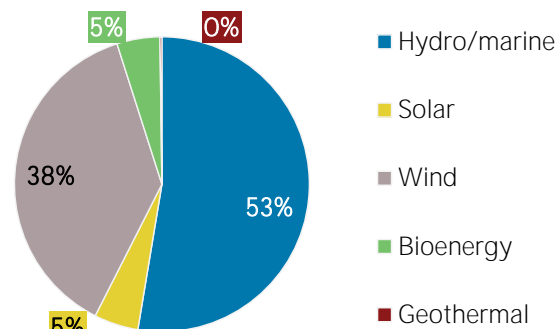


Generation in 2017	GWh	%
<b>Non-renewable</b>	<b>36 858</b>	<b>62</b>
<b>Renewable</b>	<b>22 573</b>	<b>38</b>
Hydro and marine	5 897	10
Solar	992	2
Wind	12 248	21
Bioenergy	3 220	5
Geothermal	217	0
<b>Total</b>	<b>59 432</b>	<b>100</b>

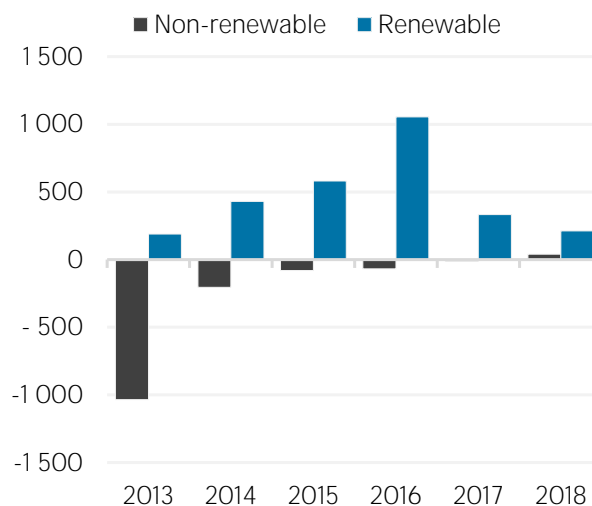
### Per capita electricity generation (kWh)



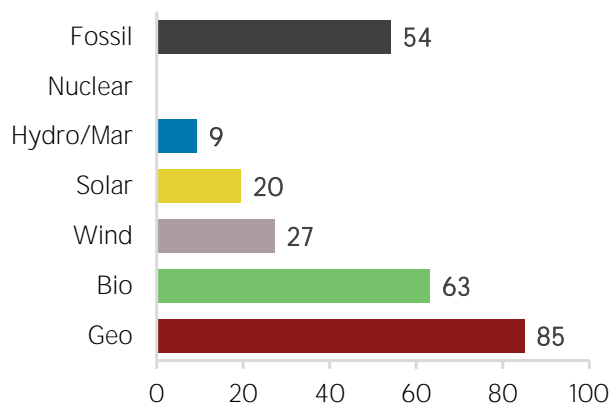
### Renewable capacity in 2018



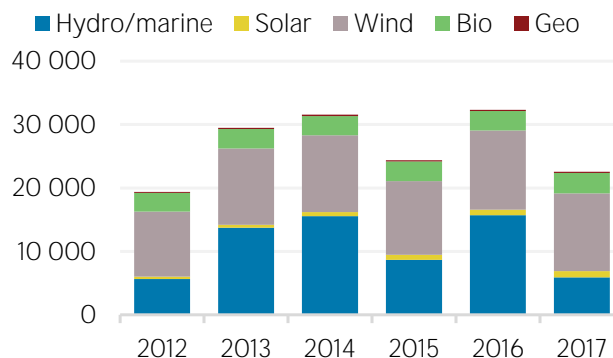
### Net capacity change (MW)



### Capacity utilisation in 2017 (%)



### Renewable generation (GWh)



## TARGETS, POLICIES AND MEASURES

### Most immediate clean energy targets & NDCs

	year	target	unit
<b>Renewable energy:</b>	2020	31	%
Renewable electricity:	2020	55	%
Renewable capacity:			
Renewable transport:	2020	10	%
Liquid Biofuel blending mandate:			
Other transport targets:			
Renewable heating/cooling:	2020	31	%
Renewable Hydropower			
Off-grid renewable technologies:			

Energy efficiency (Energy):

Energy efficiency (Electricity):

### Latest policies, programmes and legislation

1 Portugal Green Growth Commitment 2030	2015
2 Law on Self-consumption Decree-Law No. 153/2014	2014
3 Mini Production Law amendment (Decree Law 34/2011)	2011
4 Implementation of the CHP Directive	2010
5 Microgeneration Law (Application Decree Law 118-A/2010)	2010

### References to sustainable energy in Nationally Determined Contribution (NDC)

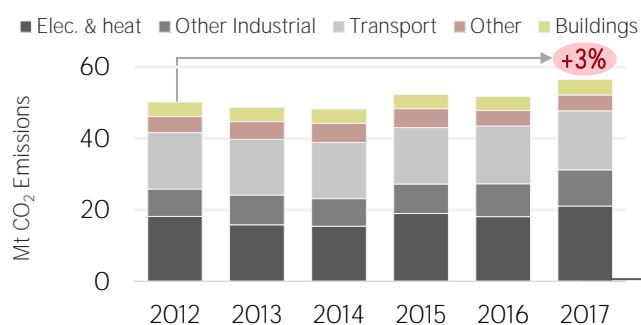
#### - Renewable energy

- electricity
- transport
- heating/cooling
- Energy efficiency

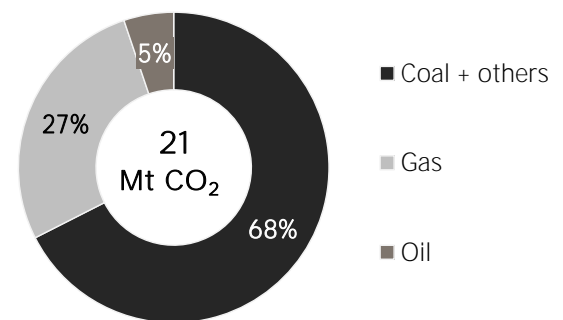
Conditional      Unconditional      unit

## ENERGY AND EMISSIONS

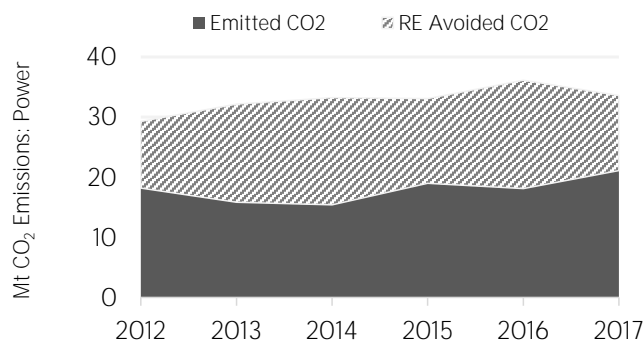
### Energy-related CO<sub>2</sub> emissions by sector



### Elec. & heat generation CO<sub>2</sub> emissions in 2017

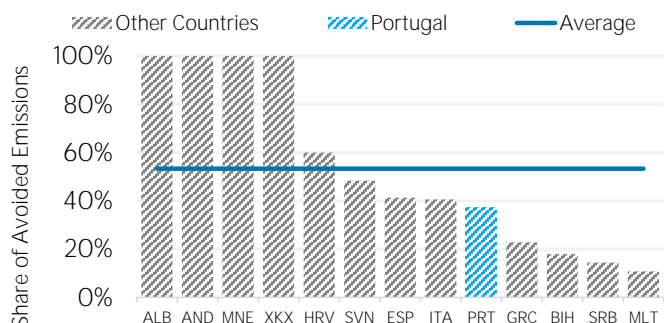


### Avoided emissions from renewable power



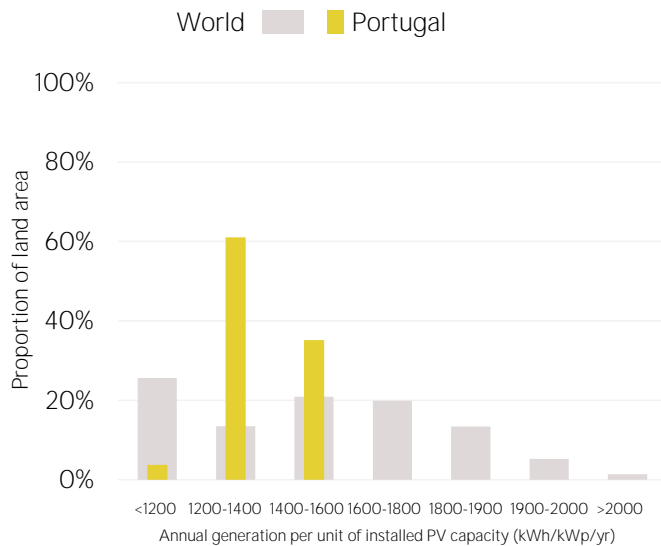
Avoided emissions based on fossil fuel mix used for power

### Reduction in power emissions due to RE in 2017

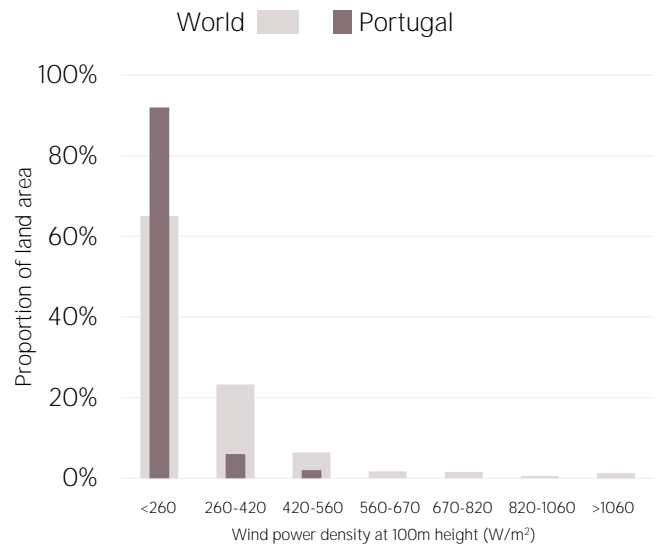


Reduction is RE Avoided divided by sum of avoided and emitted

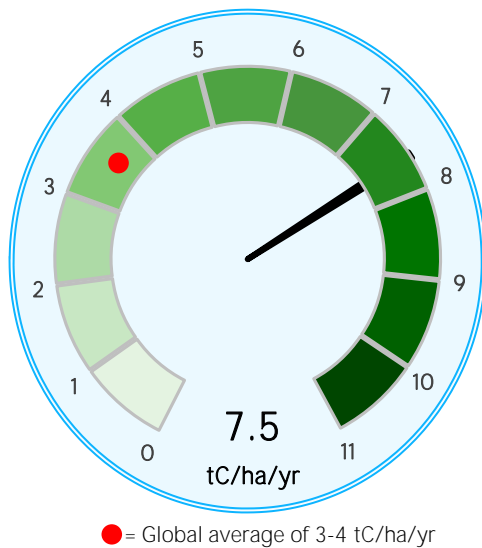
Distribution of solar potential



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](mailto:statistics@irena.org).

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