

Turkey

Sustainable Development Goal 7.2: Energy Indicators (2016)

Renewable energy (% of TFEC)	13.2	Access to electricity (% of population)	100.0
Energy efficiency (MJ per \$1 of GDP)	3.0	Access to clean cooking (% of population)	>95

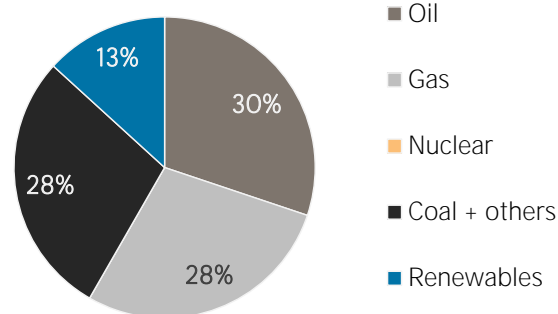
TOTAL PRIMARY ENERGY SUPPLY (TPES)

TPES	2011	2016
Non-renewable (TJ)	4 246 111	4 937 641
Renewable (TJ)	502 114	752 982
Total (TJ)	4 748 226	5 690 622
Renewable share (%)	11	13

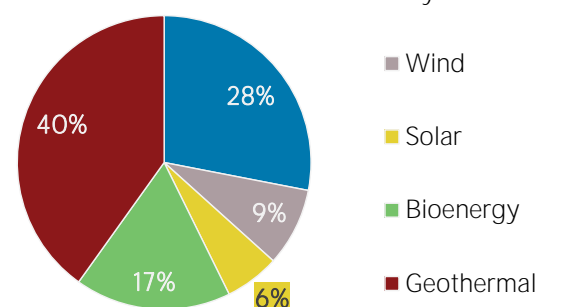
Growth in TPES	2011-16	2015-16
Non-renewable (%)	+16.3	+5.6
Renewable (%)	+50.0	+3.5
Total (%)	+19.8	+5.3

Primary energy trade	2011	2016
Imports (TJ)	3 726 043	4 693 422
Exports (TJ)	355 252	306 437
Net trade (TJ)	-3 370 791	-4 386 985
Imports (% of supply)	78	82
Exports (% of production)	26	20
Energy self-sufficiency (%)	29	27
Net trade (USD million)	- 47 579	- 23 958
Net trade (% of GDP)	-5.7	-2.8

Total primary energy supply in 2016



Renewable energy supply in 2016



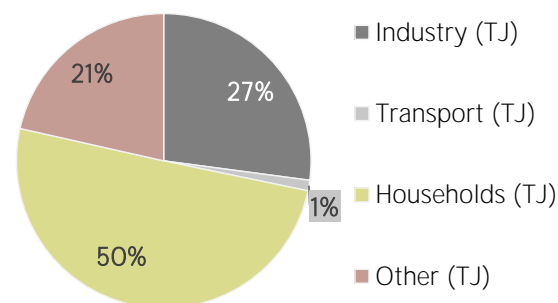
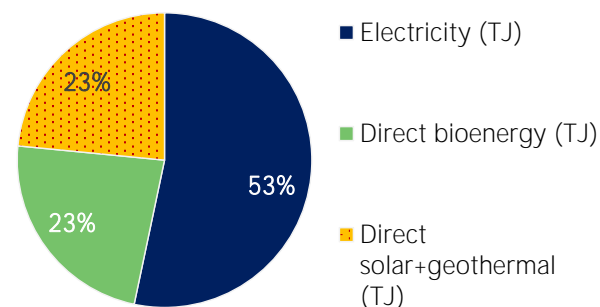
RENEWABLE ENERGY CONSUMPTION

Consumption by source	2011	2016
Electricity (TJ)	189 446	258 545
Direct bioenergy (TJ)	148 495	112 681
Direct solar+geothermal (TJ)	87 629	113 755
Total (TJ)	425 570	484 981
Electricity share (%)	45	53

Consumption growth	2011-16	2015-16
Renewable electricity (%)	+36.5	-2.9
Other renewables (%)	-15.8	-5.5
Total (%)	+11.4	-3.8

Consumption by sector	2011	2016
Industry (TJ)	96 332	131 473
Transport (TJ)	1 332	5 594
Households (TJ)	273 138	243 772
Other (TJ)	54 767	104 142
Renewable share of TFEC	12.7	13.2

Renewable energy consumption in 2016

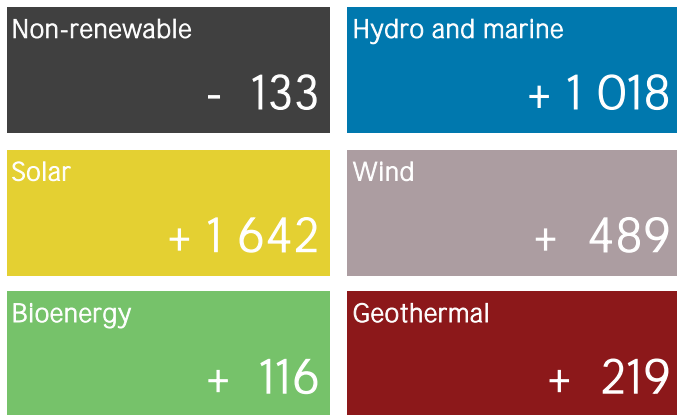


ELECTRICITY CAPACITY AND GENERATION

Capacity in 2018	MW	%
Non-renewable	46 321	52
Renewable	42 230	48
Hydro/marine	28 291	32
Solar	5 064	6
Wind	7 005	8
Bioenergy	587	1
Geothermal	1 283	1
Total	88 552	100

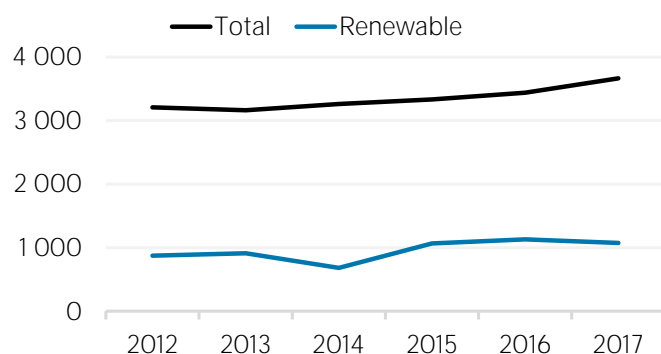
Capacity change (%)	2013-18	2017-18
Non-renewable	+ 20	- 0.3
Renewable	+ 65	+ 9.0
Hydro/marine	+ 27	+ 3.7
Solar	+ 26 978	+ 48.0
Wind	+ 154	+ 7.5
Bioenergy	+ 242	+ 24.5
Geothermal	+ 312	+ 20.6
Total	+ 38	+ 3.9

Net capacity change in 2018 (MW)

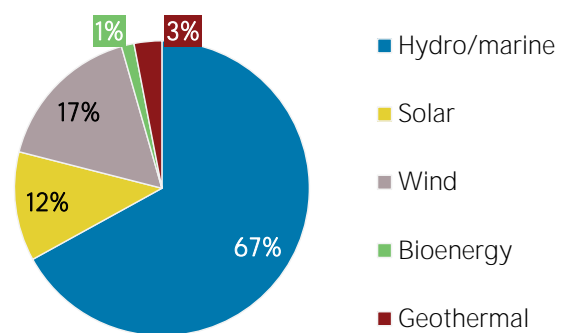


Generation in 2017	GWh	%
Non-renewable	210 042	71
Renewable	87 239	29
Hydro and marine	58 218	20
Solar	2 892	1
Wind	17 904	6
Bioenergy	2 096	1
Geothermal	6 127	2
Total	297 281	100

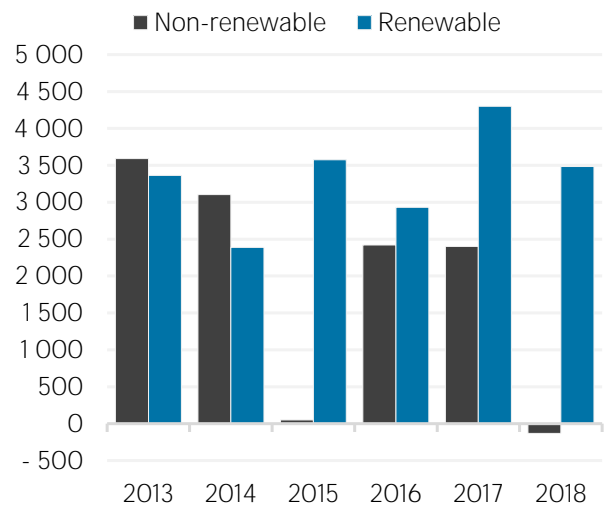
Per capita electricity generation (kWh)



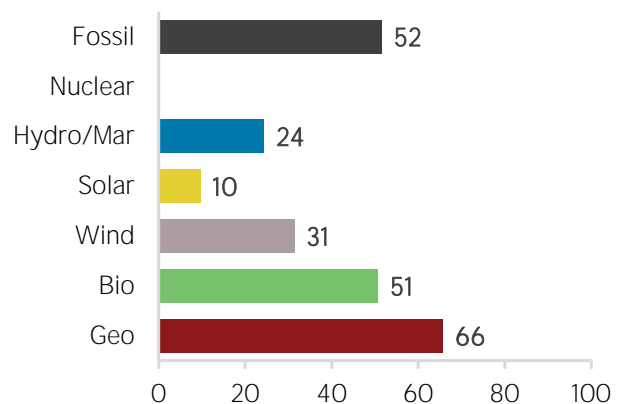
Renewable capacity in 2018



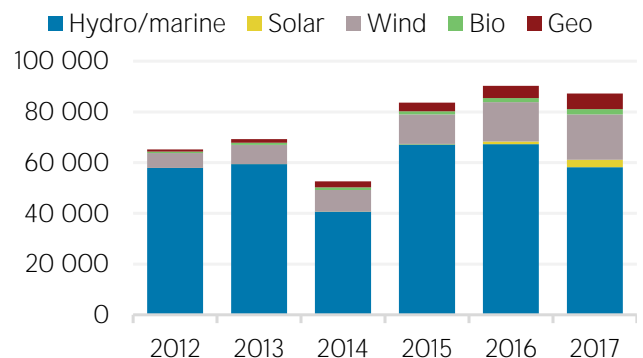
Net capacity change (MW)



Capacity utilisation in 2017 (%)



Renewable generation (GWh)



TARGETS, POLICIES AND MEASURES

Most immediate clean energy targets & NDCs

	year	target	unit
Renewable energy:	2020	19	%
Renewable electricity:	2020	38	%
Renewable capacity:			
Renewable transport:	2020	7	%
Liquid Biofuel blending mandate:			
Other transport targets:			
Renewable heating/cooling:	2020	14	%
Renewable Hydropower	2030	44	GW
Off-grid renewable technologies:			

Energy efficiency (Energy):

Energy efficiency (Electricity):

Latest policies, programmes and legislation

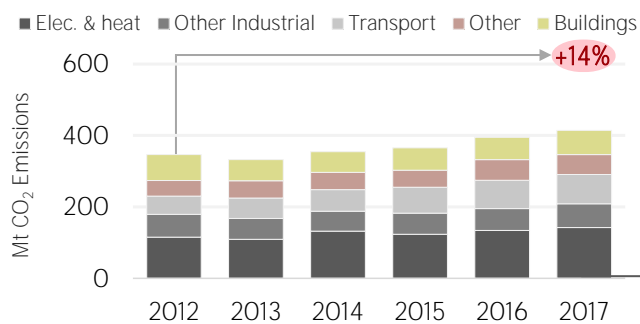
1 Strategy Plan 2015-2019	2015
2 National Climate Change Action Plan 2011-2023	2011
3 Renewable Energy Law 2010	2011
4 National Climate Change Strategy 2010-2020	2010
5 Law on Geothermal Resources and Natural Mineral Waters - Law No 5686	2007

References to sustainable energy in Nationally Determined Contribution (NDC)

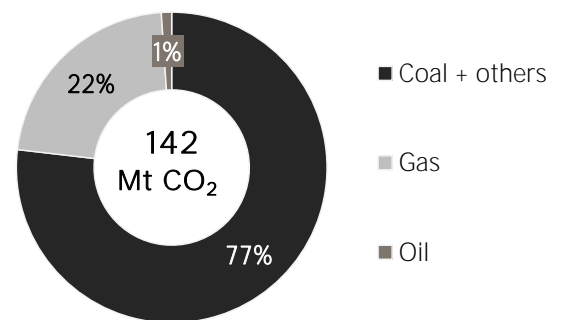
- | | Conditional | Unconditional | unit |
|---------------------------|-------------|---------------|------|
| - Renewable energy | | | |
| - electricity | | | |
| - transport | | | |
| - heating/cooling | | | |
| - Energy efficiency | | | |

ENERGY AND EMISSIONS

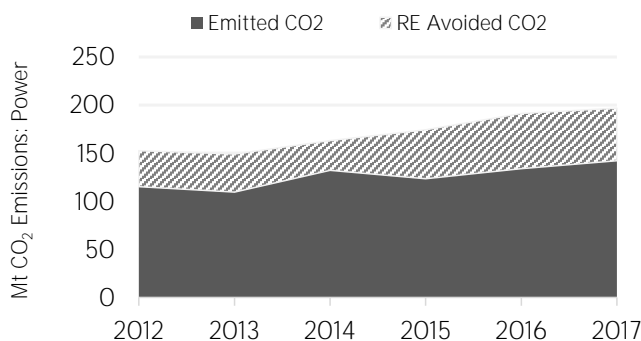
Energy-related CO₂ emissions by sector



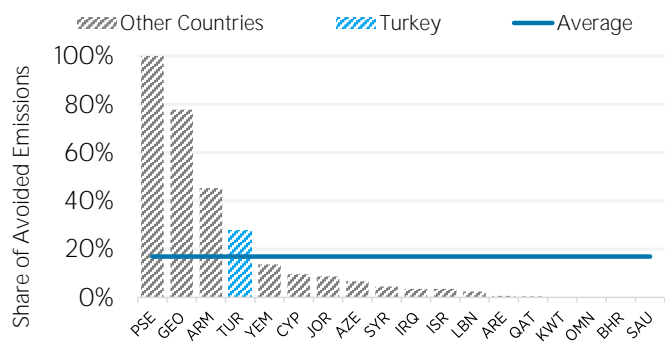
Elec. & heat generation CO₂ emissions in 2017



Avoided emissions from renewable power



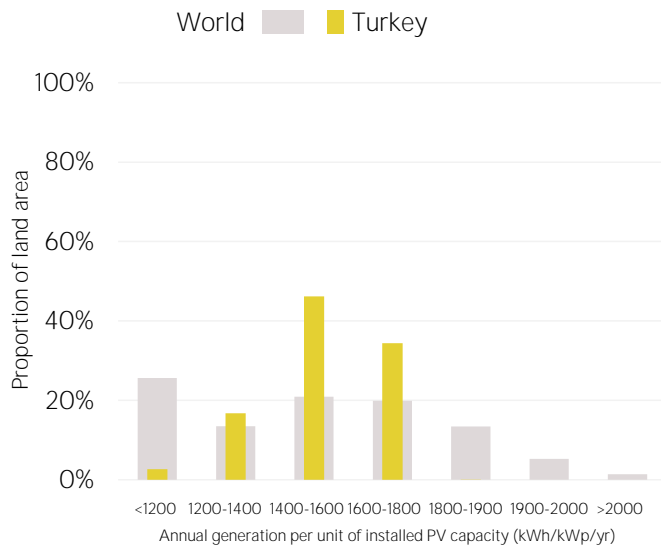
Reduction in power emissions due to RE in 2017



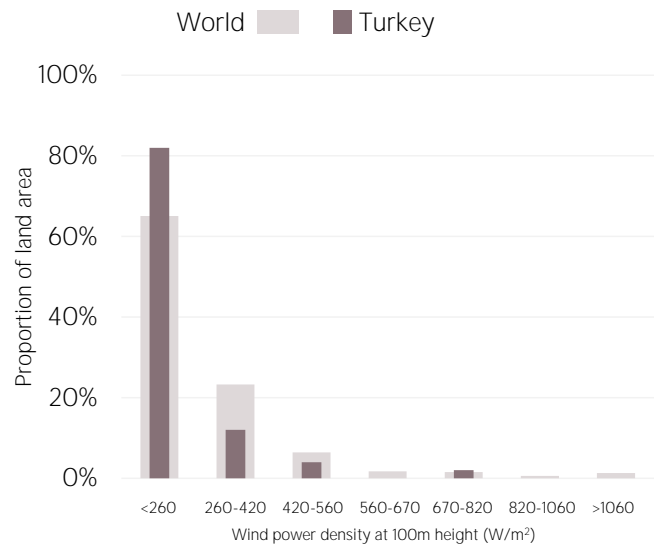
Avoided emissions based on fossil fuel mix used for power

Reduction is RE Avoided divided by sum of avoided and emitted

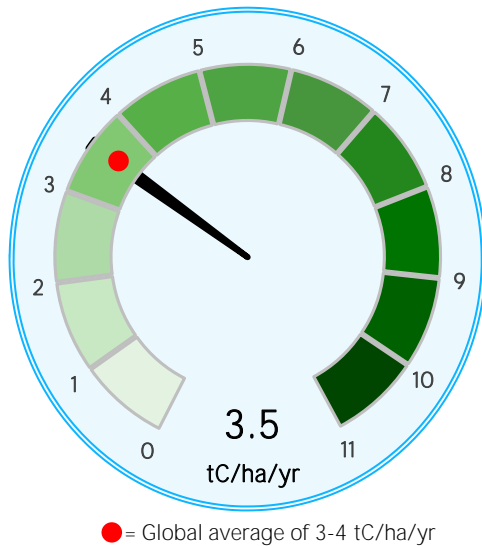
Distribution of solar potential



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/m²) 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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