

North Macedonia

Sustainable Development Goal 7.2: Energy Indicators (2016)

Renewable energy (% of TFEC)	21.7	Access to electricity (% of population)	100.0
Energy efficiency (MJ per \$1 of GDP)	4.1	Access to clean cooking (% of population)	65

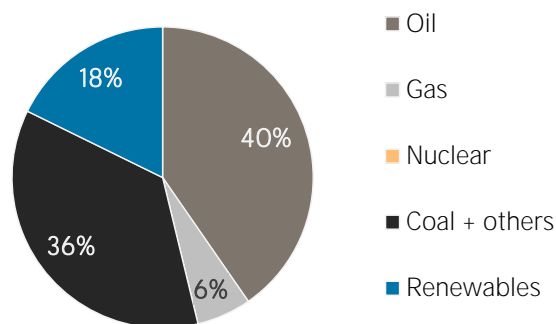
TOTAL PRIMARY ENERGY SUPPLY (TPES)

TPES	2011	2016
Non-renewable (TJ)	114 510	93 182
Renewable (TJ)	20 222	20 097
Total (TJ)	134 733	113 279
Renewable share (%)	15	18

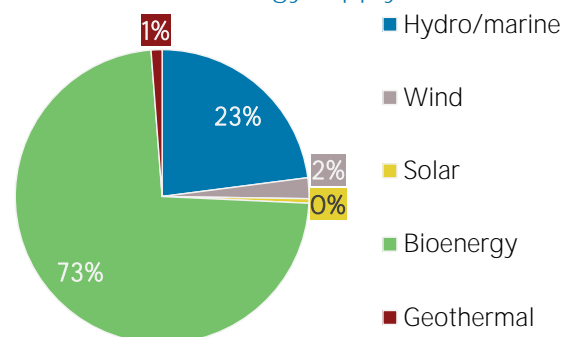
Growth in TPES	2011-16	2015-16
Non-renewable (%)	-18.6	+2.8
Renewable (%)	-0.6	-21.6
Total (%)	-15.9	-2.6

Primary energy trade	2011	2016
Imports (TJ)	76 095	73 830
Exports (TJ)	16 611	7 864
Net trade (TJ)	- 59 484	- 65 966
Imports (% of supply)	56	65
Exports (% of production)	22	16
Energy self-sufficiency (%)	57	42
Net trade (USD million)	- 1 051	- 555
Net trade (% of GDP)	-10.0	-5.2

Total primary energy supply in 2016



Renewable energy supply in 2016



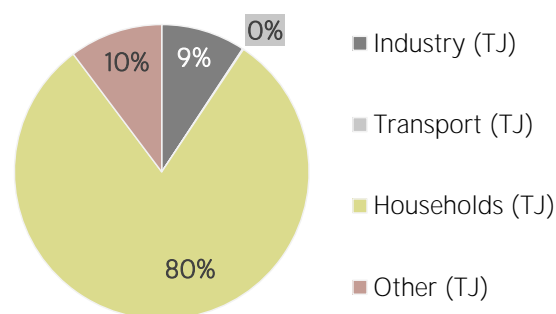
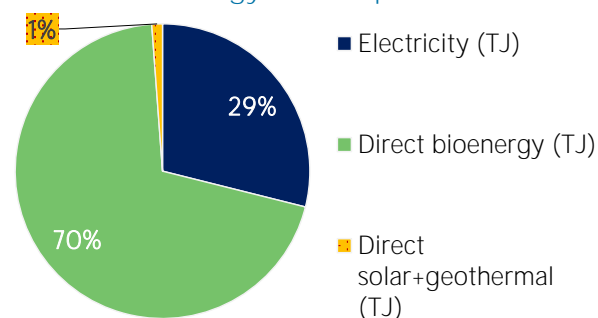
RENEWABLE ENERGY CONSUMPTION

Consumption by source	2011	2016
Electricity (TJ)	4 123	5 205
Direct bioenergy (TJ)	13 994	12 588
Direct solar+geothermal (TJ)	424	211
Total (TJ)	18 541	18 004
Electricity share (%)	22	29

Consumption growth	2011-16	2015-16
Renewable electricity (%)	+26.3	-40.4
Other renewables (%)	-10.0	-14.8
Total (%)	-1.8	-24.3

Consumption by sector	2011	2016
Industry (TJ)	1 898	1 667
Transport (TJ)	21	19
Households (TJ)	15 051	14 472
Other (TJ)	1 570	1 846
Renewable share of TFEC	18.7	21.7

Renewable energy consumption in 2016

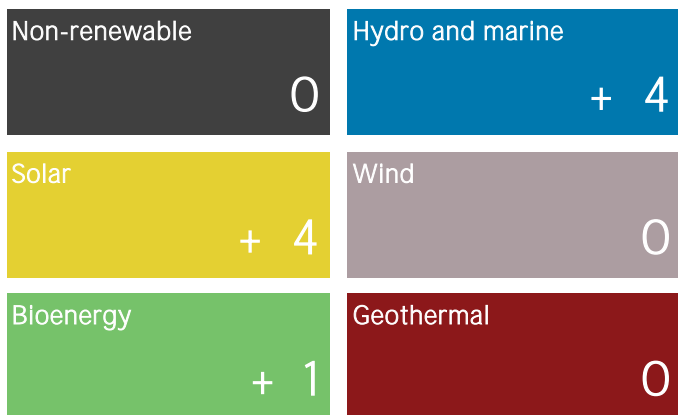


ELECTRICITY CAPACITY AND GENERATION

Capacity in 2018	MW	%
Non-renewable	1 104	60
Renewable	740	40
Hydro/marine	674	37
Solar	21	1
Wind	37	2
Bioenergy	8	0
Geothermal	0	0
Total	1 844	100

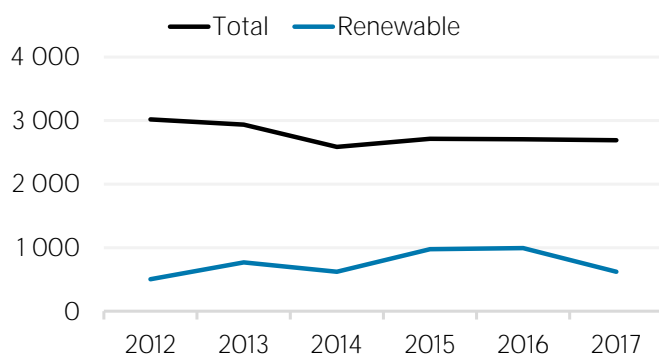
Capacity change (%)	2013-18	2017-18
Non-renewable	- 0	0.0
Renewable	+ 19	+ 1.2
Hydro/marine	+ 9	+ 0.5
Solar	+ 194	+ 23.4
Wind	0	0.0
Bioenergy	0	+ 17.1
Geothermal	0	0.0
Total	+ 7	+ 0.5

Net capacity change in 2018 (MW)

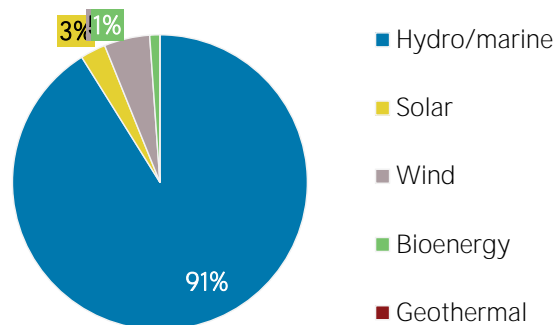


Generation in 2017	GWh	%
Non-renewable	4 304	77
Renewable	1 296	23
Hydro and marine	1 110	20
Solar	24	0
Wind	110	2
Bioenergy	52	1
Geothermal	0	0
Total	5 600	100

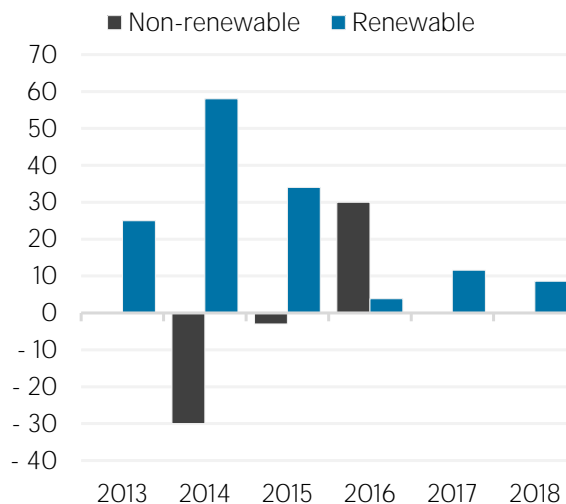
Per capita electricity generation (kWh)



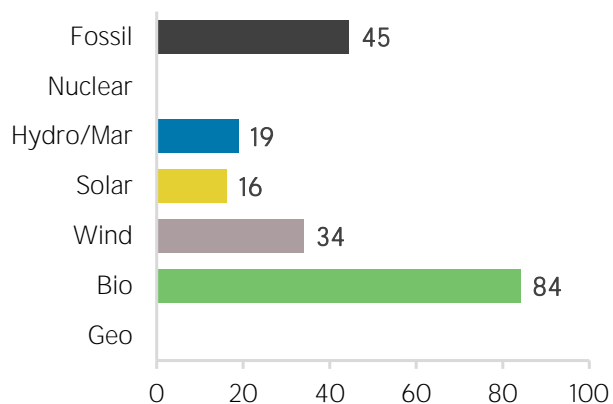
Renewable capacity in 2018



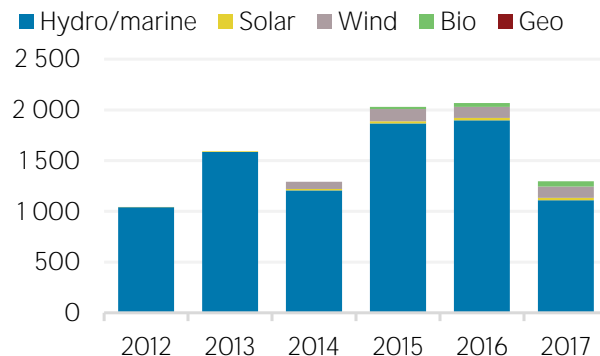
Net capacity change (MW)



Capacity utilisation in 2017 (%)



Renewable generation (GWh)



Most immediate clean energy targets & NDCs

	year	target	unit
Renewable energy:	2020	21	%
Renewable electricity:	2014	20	%
Renewable capacity:			
Renewable transport:	2020	10	%
Liquid Biofuel blending mandate:	2020	10	%
Other transport targets:			
Renewable heating/cooling:	2020	25	%
Renewable Hydropower	2035	853	MW (additional)
Off-grid renewable technologies:			

Energy efficiency (Energy):

Energy efficiency (Electricity):

Latest policies, programmes and legislation

References to sustainable energy in Nationally Determined Contribution (NDC)

- Renewable energy

- electricity
- transport
- heating/cooling

- Energy efficiency

Conditional Unconditional unit

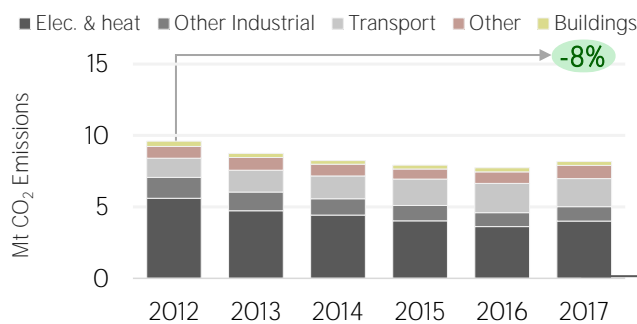
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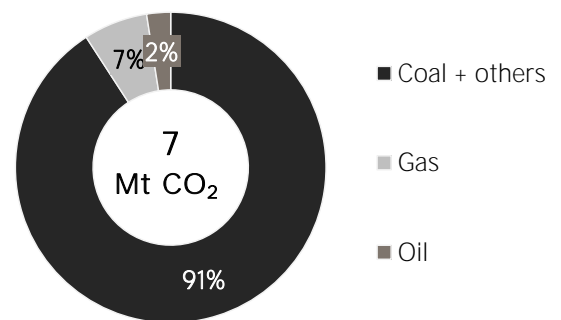
%

ENERGY AND EMISSIONS

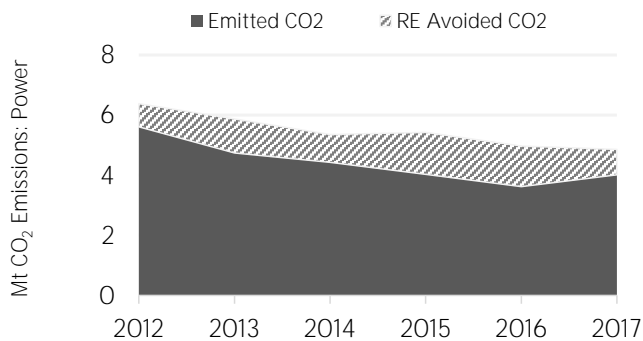
Energy-related CO₂ emissions by sector



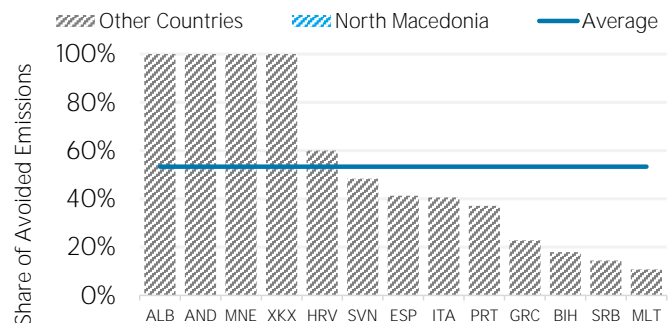
Elec. & heat generation CO₂ emissions in 2017



Avoided emissions from renewable power



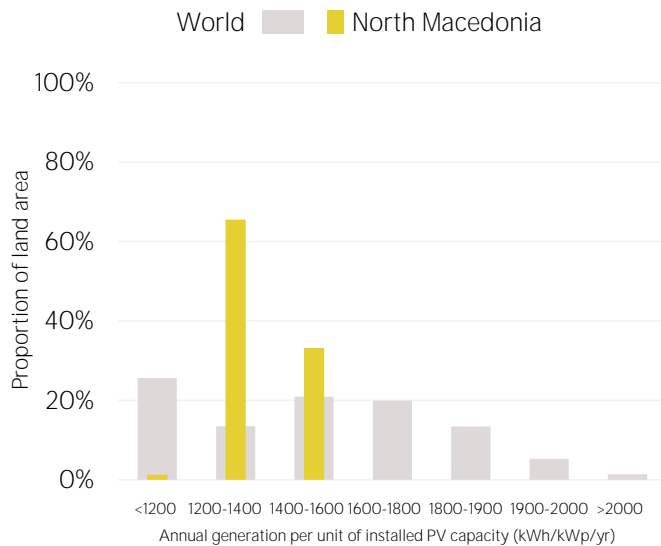
Reduction in power emissions due to RE in 2017



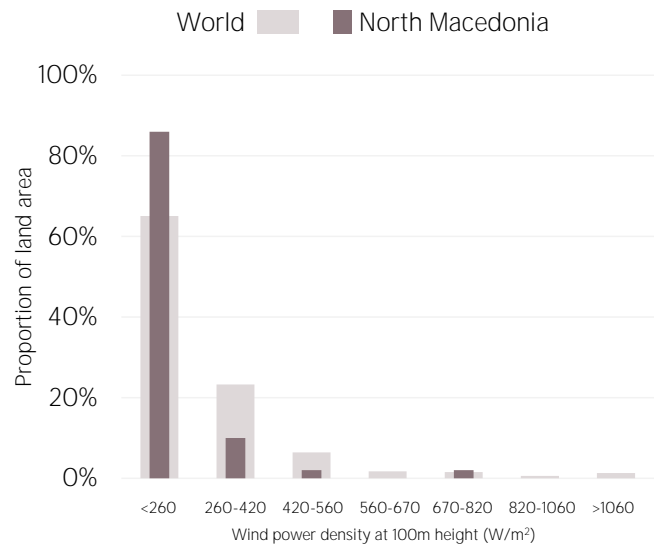
Avoided emissions based on fossil fuel mix used for power

Reduction is RE Avoided divided by sum of avoided and emitted

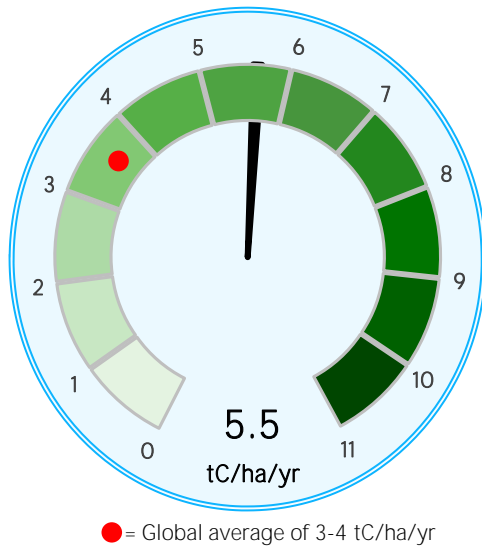
Distribution of solar potential



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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