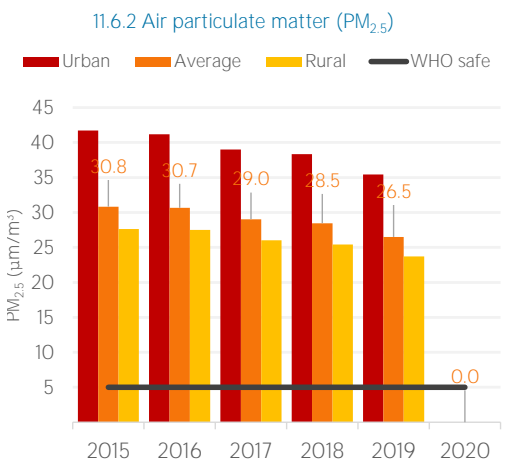
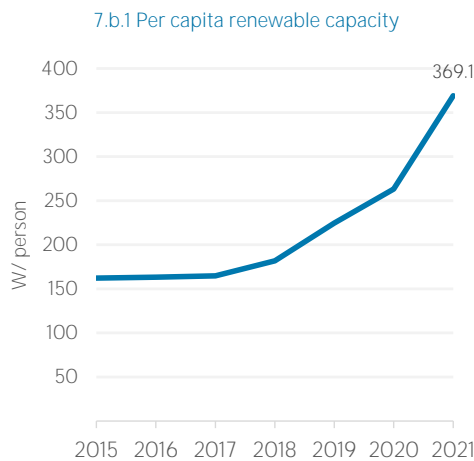
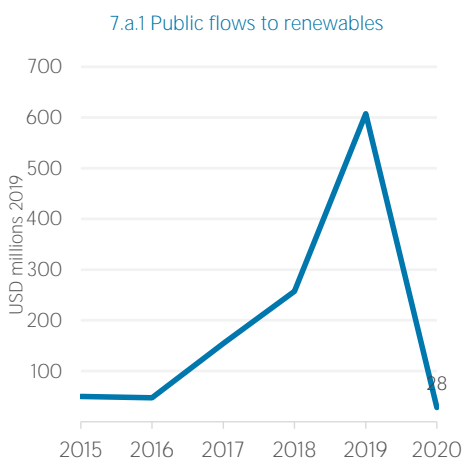
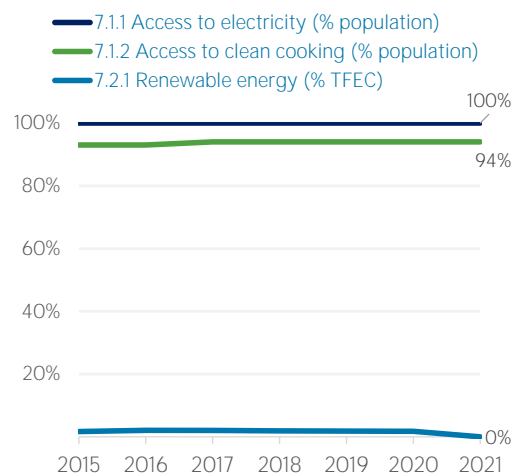
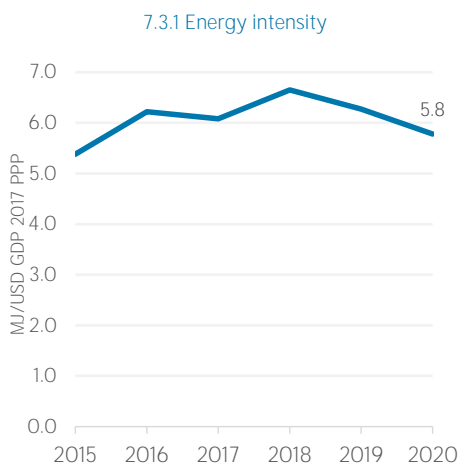
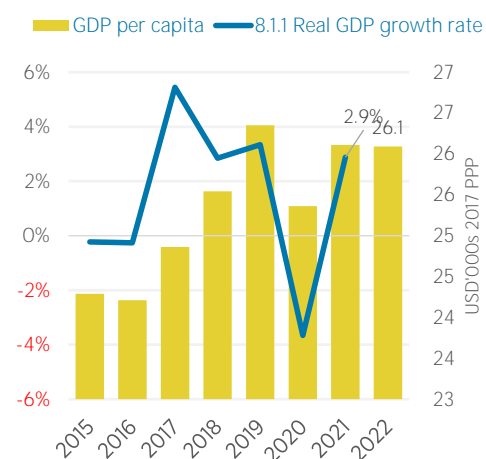


## COUNTRY INDICATORS AND SDGS



## TOTAL ENERGY SUPPLY (TES)

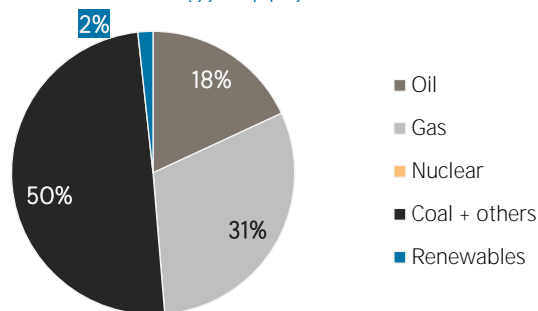
Total Energy Supply (TES)	2015	2020
Non-renewable (TJ)	3 143 769	2 713 294
Renewable (TJ)	45 551	47 527
Total (TJ)	3 189 321	2 760 820
Renewable share (%)	1	2

Growth in TES	2015-20	2019-20
Non-renewable (%)	-13.7	-8.3
Renewable (%)	+4.3	+2.0
Total (%)	-13.4	-8.1

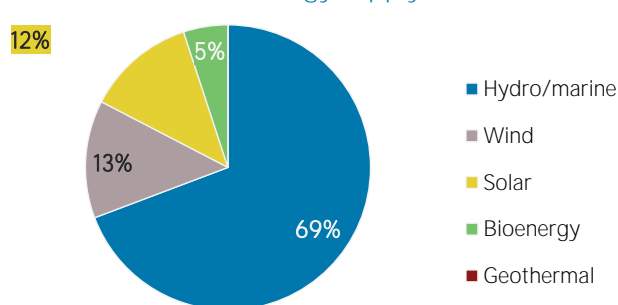
Primary energy trade	2015	2020
Imports (TJ)	312 102	545 472
Exports (TJ)	3 909 725	4 403 254
Net trade (TJ)	3 597 623	3 857 782

Imports (% of supply)	10	20
Exports (% of production)	57	66
Energy self-sufficiency (%)	214	241

Total energy supply in 2020

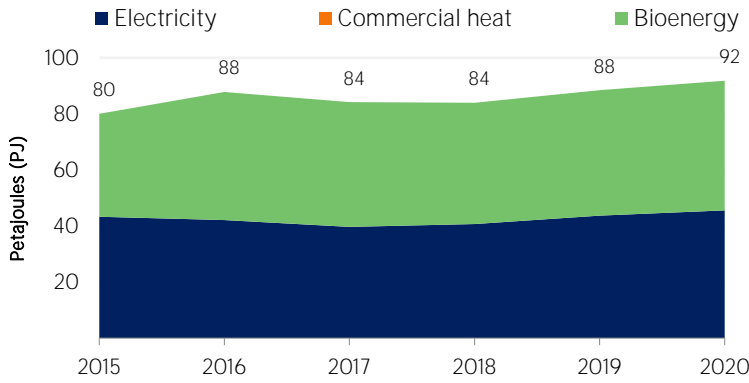


Renewable energy supply in 2020

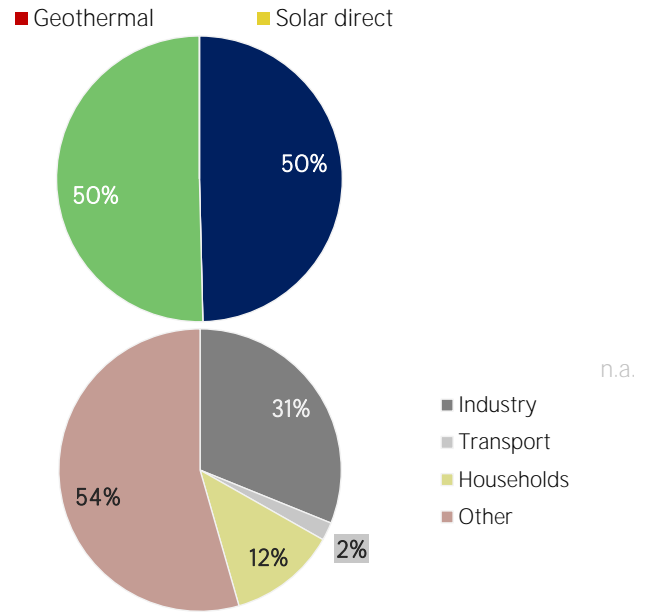


# RENEWABLE ENERGY CONSUMPTION (TFEC)

## Renewable TFEC trend



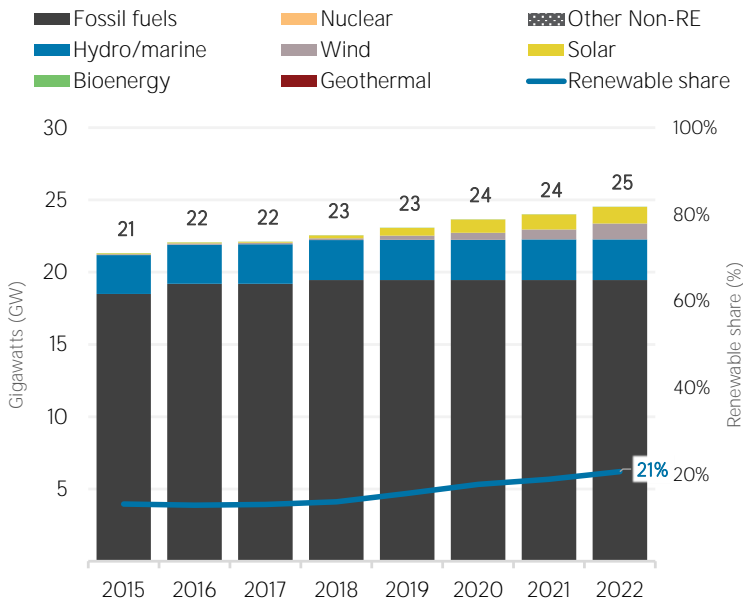
## Renewable energy consumption in 2020



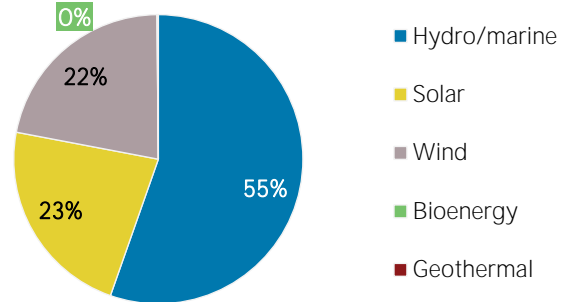
Consumption by sector	2015	2020
Industry (TJ)	28 646	28 574
Transport (TJ)	2 269	1 909
Households (TJ)	9 139	11 345
Other (TJ)	39 933	49 992

# ELECTRICITY CAPACITY

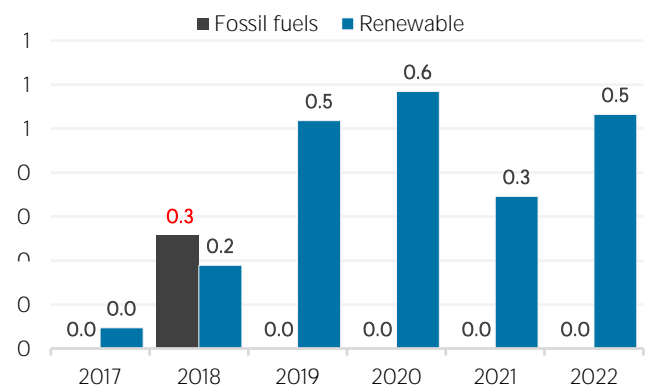
## Installed capacity trend



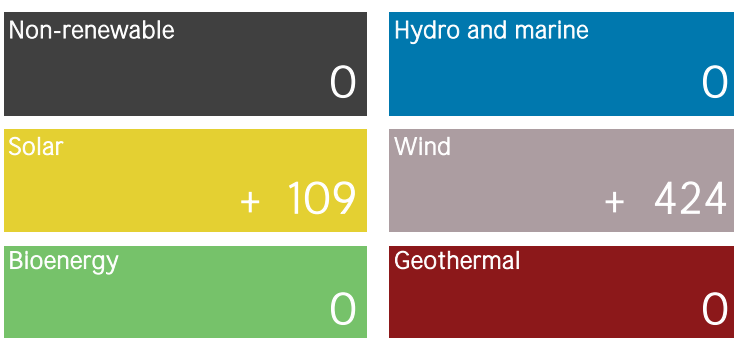
## Renewable capacity in 2022



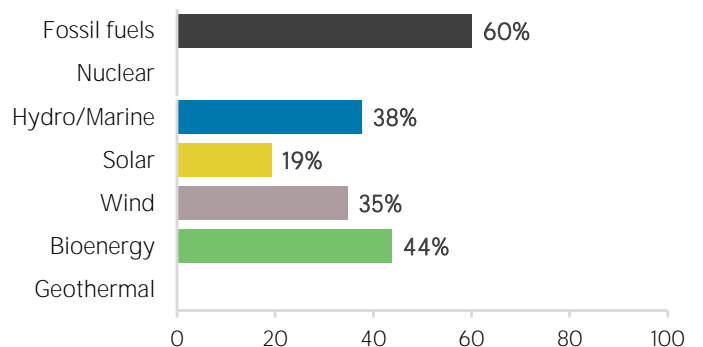
## Net capacity change (GW)



## Net capacity change in 2022 (MW)



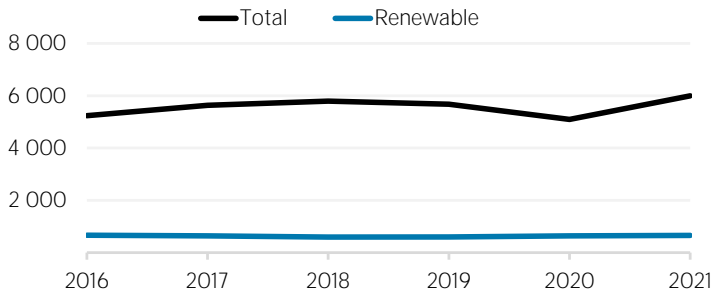
## Capacity utilisation in 2021 (%)



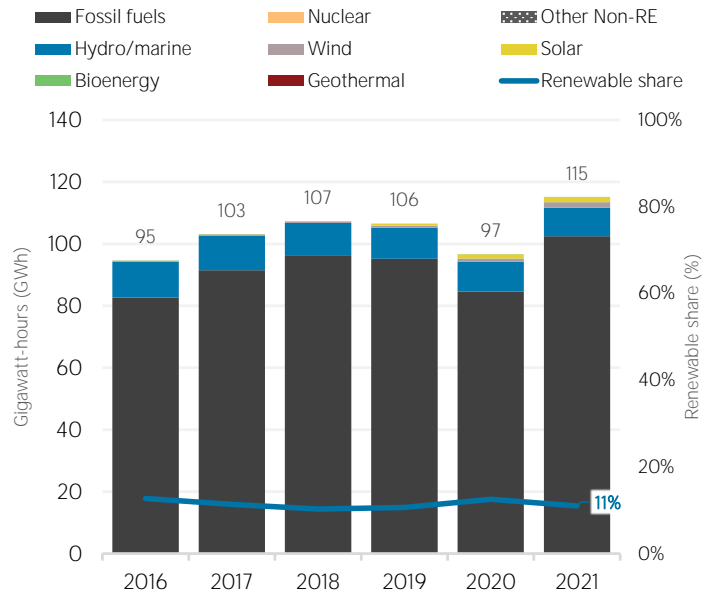
## ELECTRICITY GENERATION

Generation in 2021	GWh	%
<b>Non-renewable</b>	<b>102 436</b>	<b>89</b>
<b>Renewable</b>	<b>12 656</b>	<b>11</b>
Hydro and marine	9 208	8
Solar	1 641	1
Wind	1 776	2
Bioenergy	30	0
Geothermal	0	0
<b>Total</b>	<b>115 092</b>	<b>100</b>

Per capita electricity generation (kWh)



Electricity generation trend

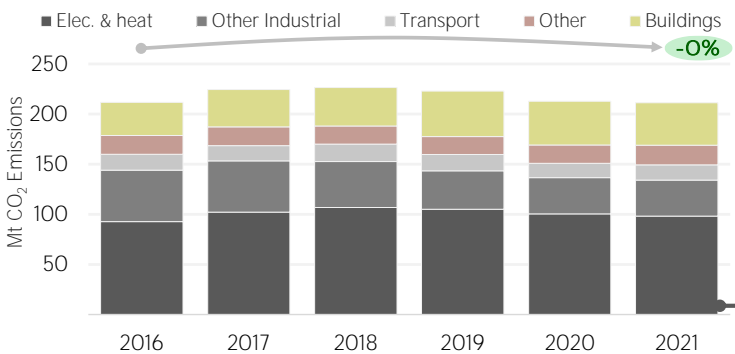


## LATEST POLICIES, PROGRAMMES AND LEGISLATION

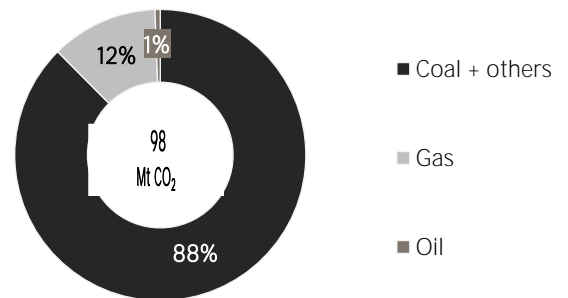
- Ban on export of petroleum products by road 2021
- Environmental Code of the Republic of Kazakhstan, №400-VI (as amended) 2021
- Auction mechanism for the construction of maneuverable capacities 2020
- Code "On subsoil and subsoil use" No. 125-VI (as amended) 2018
- Code "On taxes and other obligatory payments to the budget" (Tax Code) dated December 25, 2017 № 120-VI. 2018

## ENERGY AND EMISSIONS

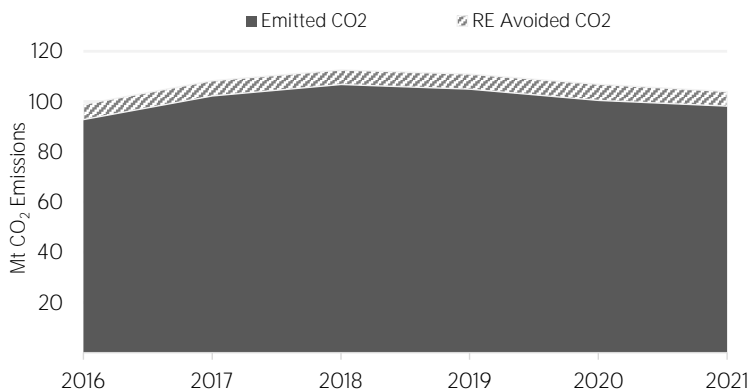
Energy-related CO<sub>2</sub> emissions by sector



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

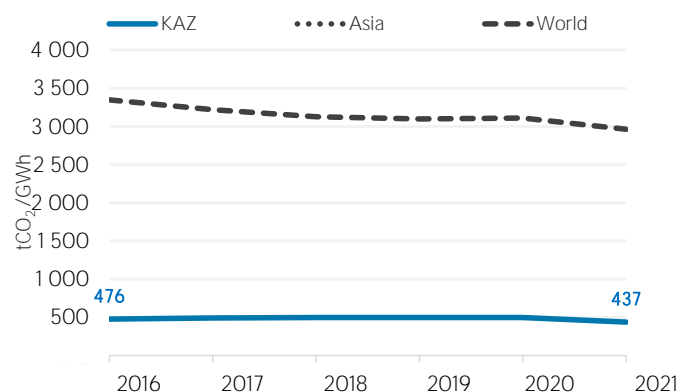


Avoided emissions from renewable elec. & heat



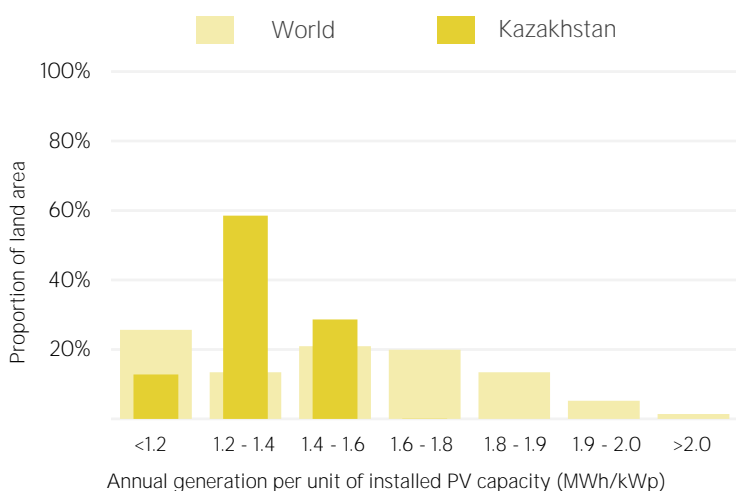
Avoided emissions based on fossil fuel mix used for power

CO<sub>2</sub> emission factor for elec. & heat generation

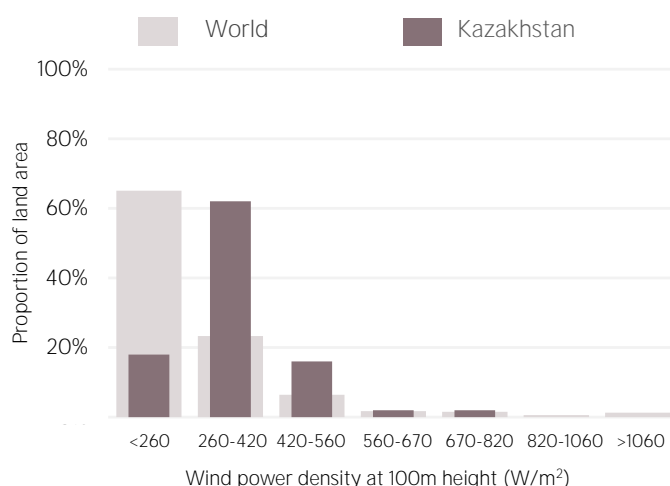


Calculated by dividing power sector emissions by elec. + heat gen.

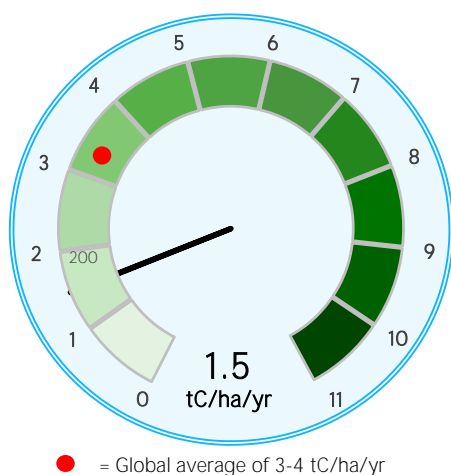
Distribution of solar potential



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

**Sources:** IRENA statistics, plus data from the following sources: UN SDG Database (original sources: WHO; World Bank; IEA; IRENA; and UNSD); UN World Population Prospects; 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:** Capacity per capita and public investments SDGs only apply to developing areas. Energy self-sufficiency has been defined as total primary energy production divided by total primary energy supply. Energy trade includes all commodities in Chapter 27 of the Harmonised System (HS). Capacity utilisation is calculated as annual generation divided by year-end capacity x 8,760h/year. Avoided emissions from renewable power is 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.

These profiles have been produced to provide an overview of developments in renewable energy in different countries and areas. 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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