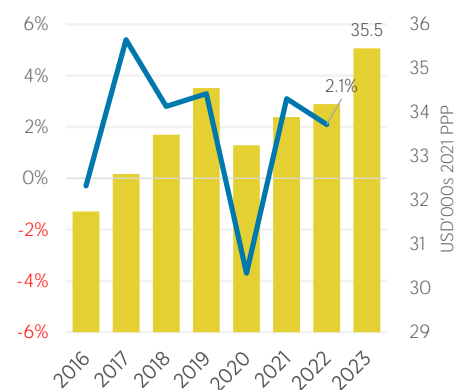
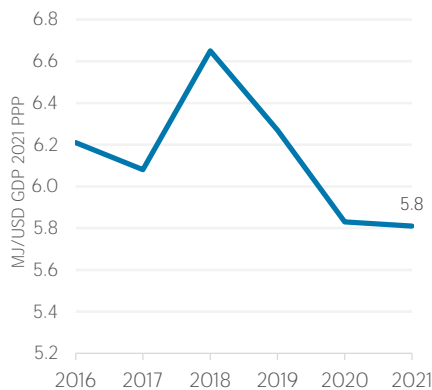
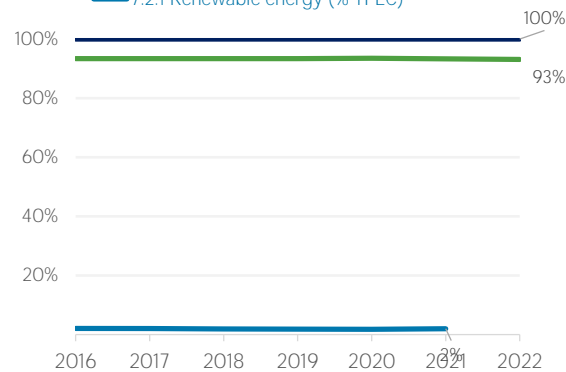


COUNTRY INDICATORS AND SDGs

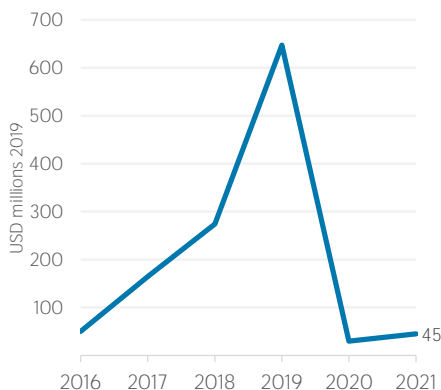
GDP per capita — 8.1.1 Real GDP growth rate



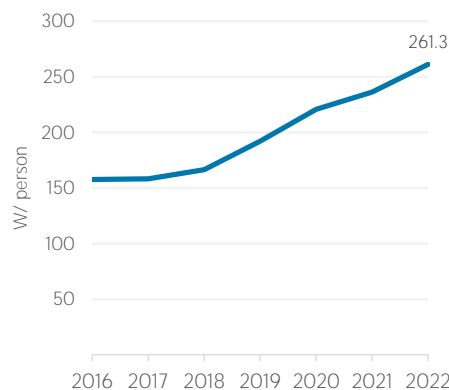
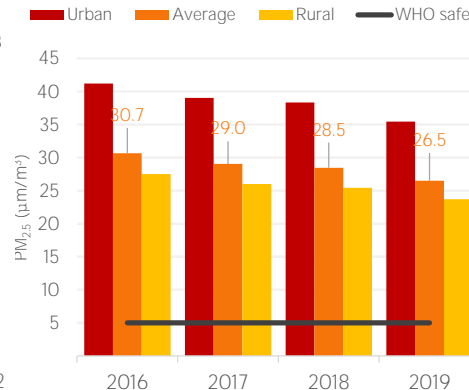
7.3.1 Energy intensity


 7.1.1 Access to electricity (% population)
 7.1.2 Access to clean cooking (% population)
 7.2.1 Renewable energy (% TFE)


7.a.1 Public flows to renewables



7.b.1 Per capita renewable capacity

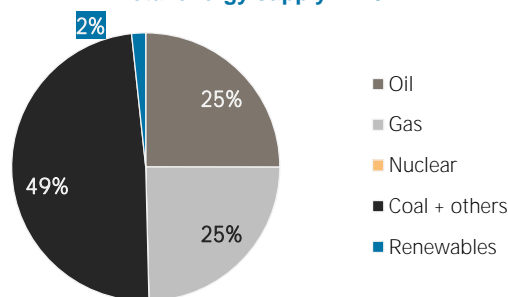
11.6.2 Air particulate matter (PM_{2.5})

TOTAL ENERGY SUPPLY (TES)

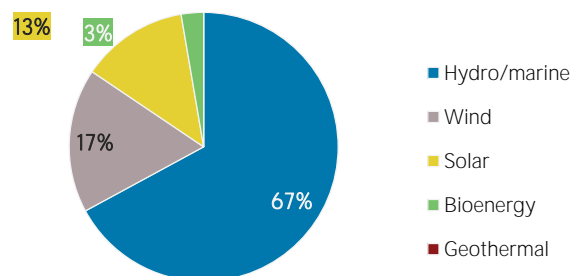
Total Energy Supply (TES)	2016	2021
Non-renewable (TJ)	3 314 435	2 840 461
Renewable (TJ)	43 765	48 825
Total (TJ)	3 358 200	2 889 286
Renewable share (%)	1	2

Growth in TES	2016-21	2020-21
Non-renewable (%)	-14.3	+4.7
Renewable (%)	+11.6	+2.7
Total (%)	-14.0	+4.7

Total energy supply in 2021



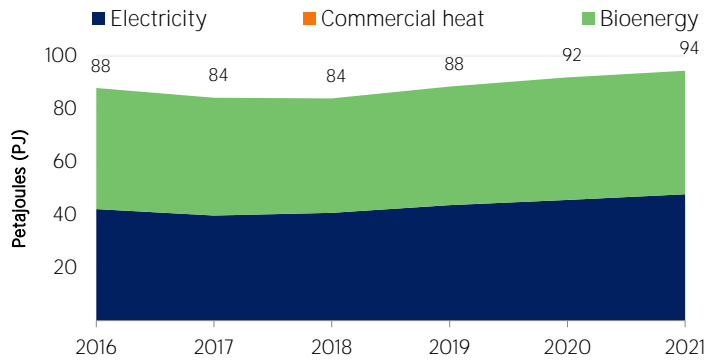
Renewable energy supply in 2021



Primary energy trade	2016	2021
Imports (TJ)	347 663	162 273
Exports (TJ)	3 786 335	3 996 877
Net trade (TJ)	3 438 672	3 834 604
Imports (% of supply)	10	6
Exports (% of production)	56	60
Energy self-sufficiency (%)	201	230

RENEWABLE ENERGY CONSUMPTION (TFEC)

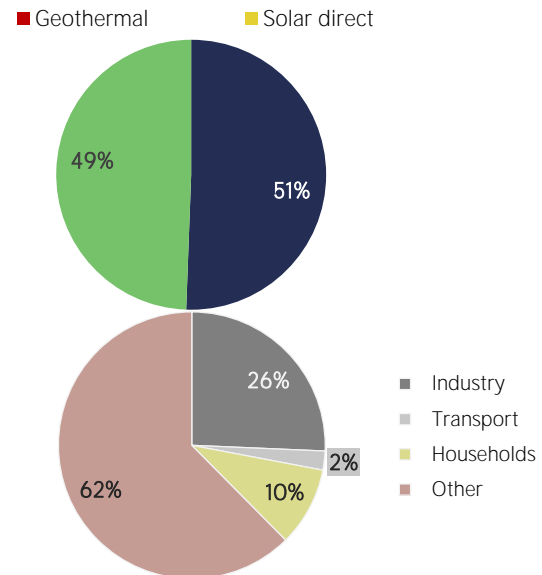
Renewable TFEC trend



Consumption by sector

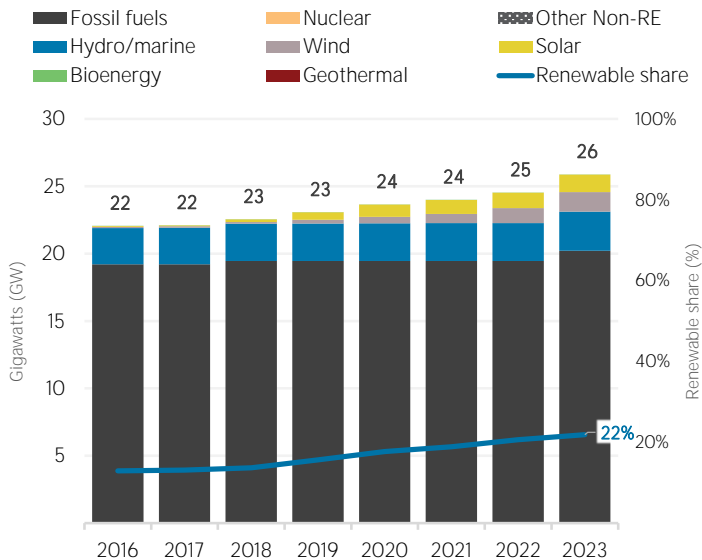
	2016	2021
Industry (TJ)	28 264	24 236
Transport (TJ)	2 073	2 166
Households (TJ)	9 272	9 061
Other (TJ)	48 223	58 895

Renewable energy consumption in 2021

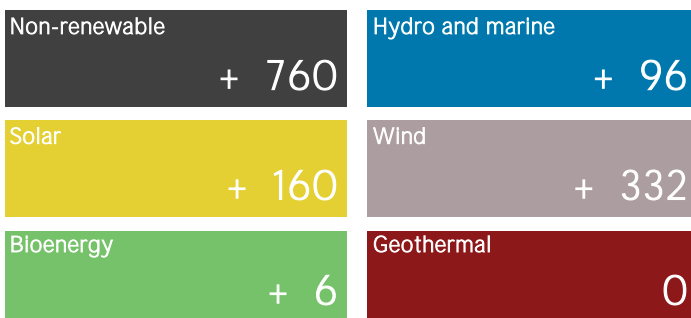


ELECTRICITY CAPACITY

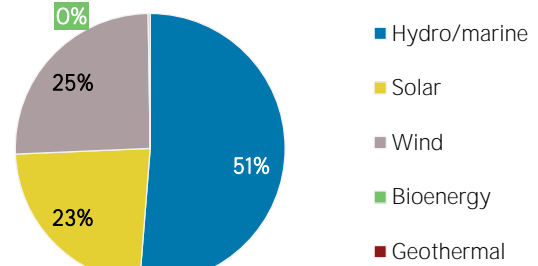
Installed capacity trend



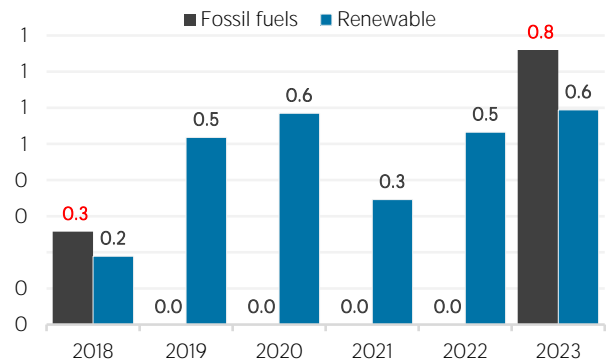
Net capacity change in 2023 (MW)



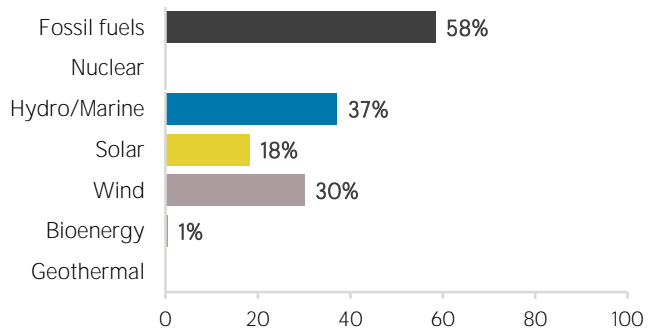
Renewable capacity in 2023



Net capacity change (GW)



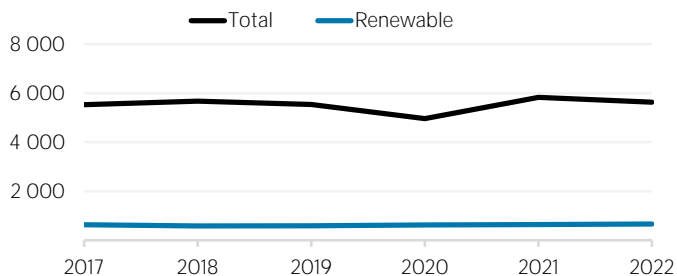
Capacity utilisation in 2022 (%)



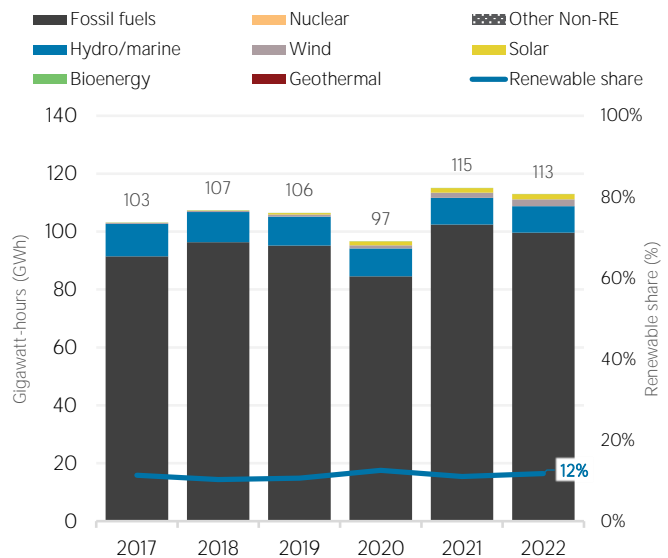
ELECTRICITY GENERATION

Generation in 2022	GWh	%
Non-renewable	99 660	88
Renewable	13 259	12
Hydro and marine	9 142	8
Solar	1 755	2
Wind	2 362	2
Bioenergy	0	0
Geothermal	0	0
Total	112 919	100

Per capita electricity generation (kWh)



Electricity generation trend

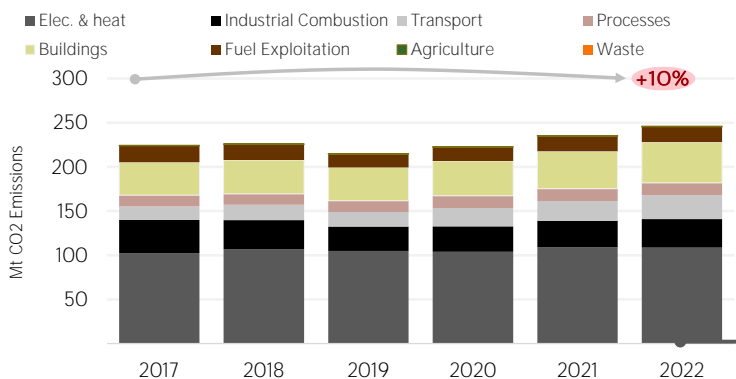


LATEST POLICIES, PROGRAMMES AND LEGISLATION

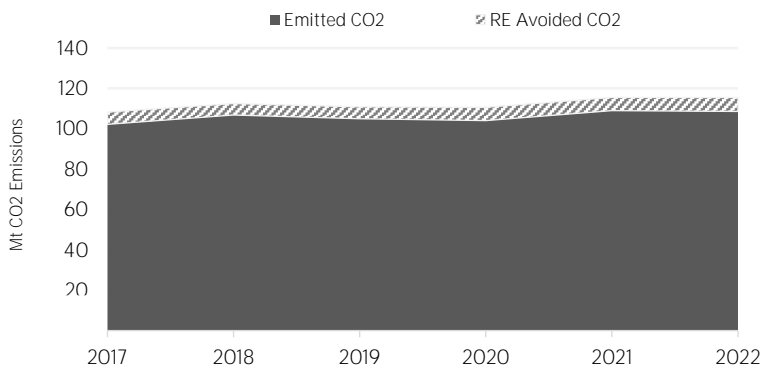
- 1 Kazakhstan-EU Strategic Partnership on Raw Materials **2022**
- 2 Ban on export of petroleum products by road **2021**
- 3 Environmental Code of the Republic of Kazakhstan, №400-VI (as amended) **2021**
- 4 Auction mechanism for the construction of maneuverable capacities **2020**
- 5 Code "On subsoil and subsoil use" No. 125-VI (as amended) **2018**

ENERGY AND EMISSIONS

CO₂ emissions by sector

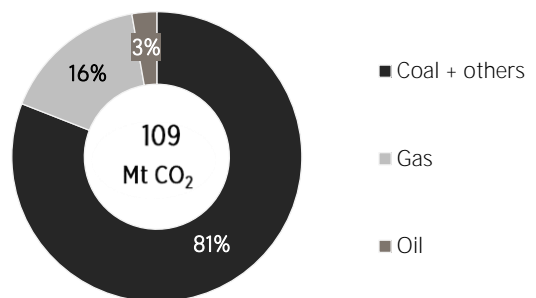


Avoided emissions from renewable elec. & heat

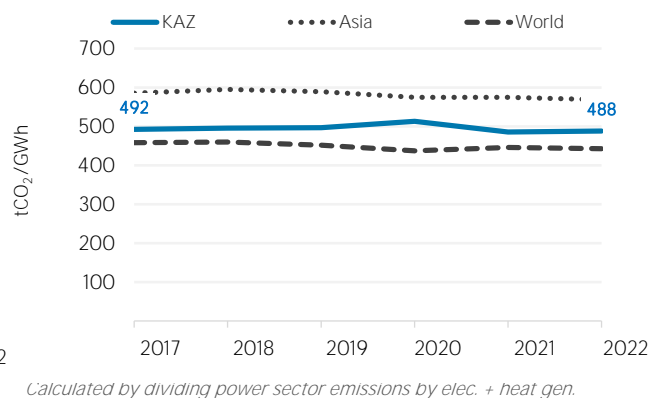


Avoided emissions based on fossil fuel mix used for power

Elec. & heat generation CO₂ emissions in

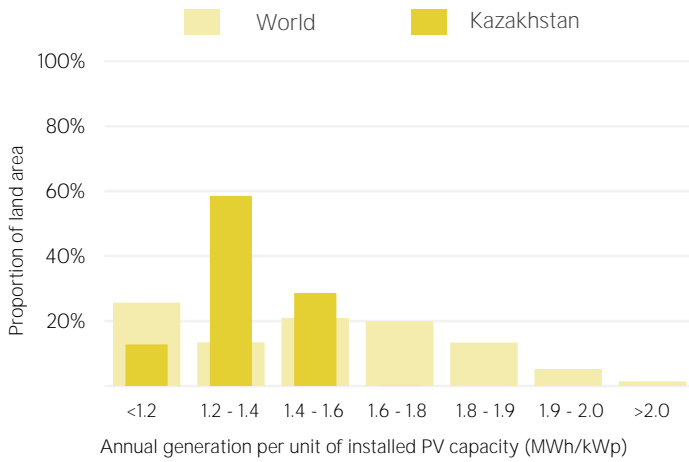


CO₂ emission factor for elec. & heat generation

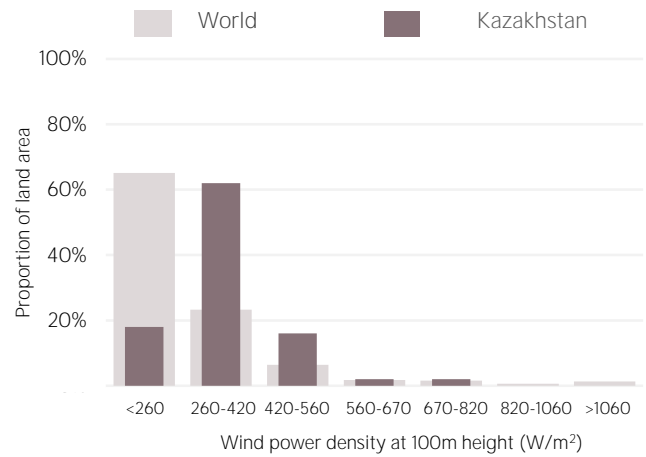


Calculated by dividing power sector emissions by elec. + heat gen.

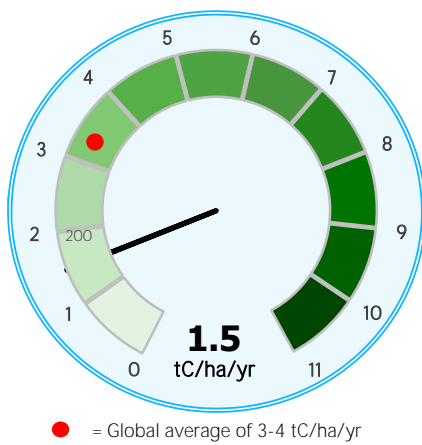
Distribution of solar potential



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.

Last updated on: 31 July, 2024