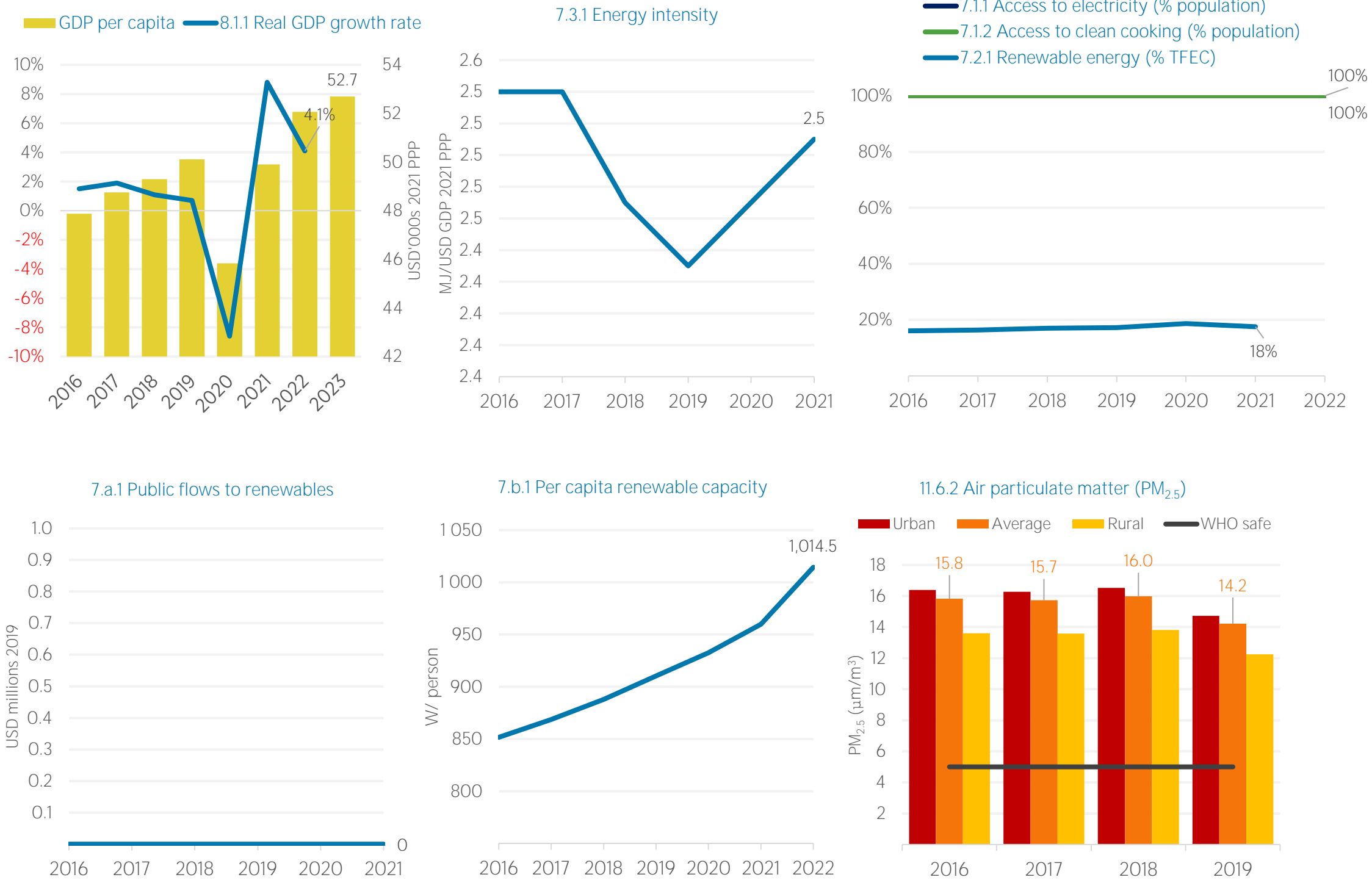


COUNTRY INDICATORS AND SDGS



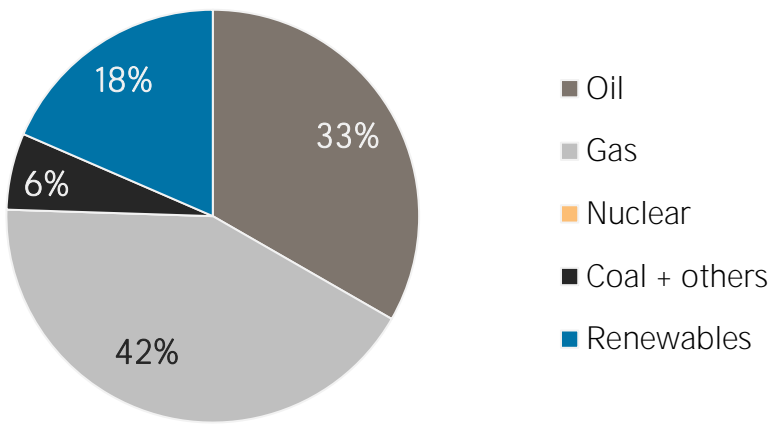
TOTAL ENERGY SUPPLY (TES)

Total Energy Supply (TES)	2016	2021
Non-renewable (TJ)	5 178 010	5 048 243
Renewable (TJ)	1 111 842	1 145 275
Total (TJ)	6 289 852	6 193 518
Renewable share (%)	18	18

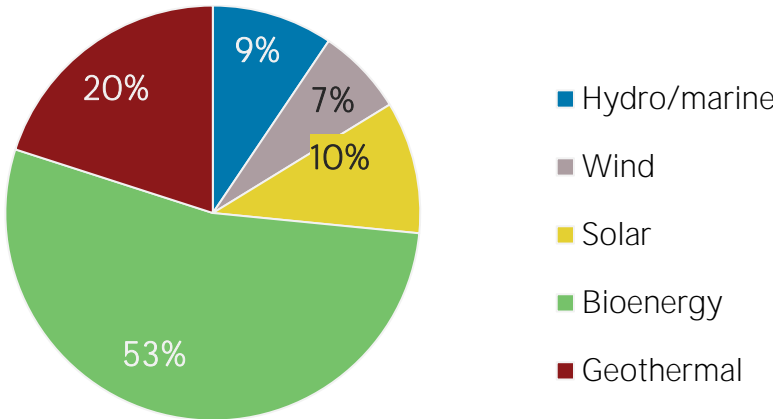
Growth in TES	2016-21	2020-21
Non-renewable (%)	-2.5	+10.2
Renewable (%)	+3.0	-1.2
Total (%)	-1.5	+7.9

Primary energy trade	2016	2021
Imports (TJ)	6 390 475	6 031 192
Exports (TJ)	1 310 588	1 237 048
Net trade (TJ)	-5 079 887	-4 794 144
Imports (% of supply)	102	97
Exports (% of production)	95	90
Energy self-sufficiency (%)	22	22

Total energy supply in 2021

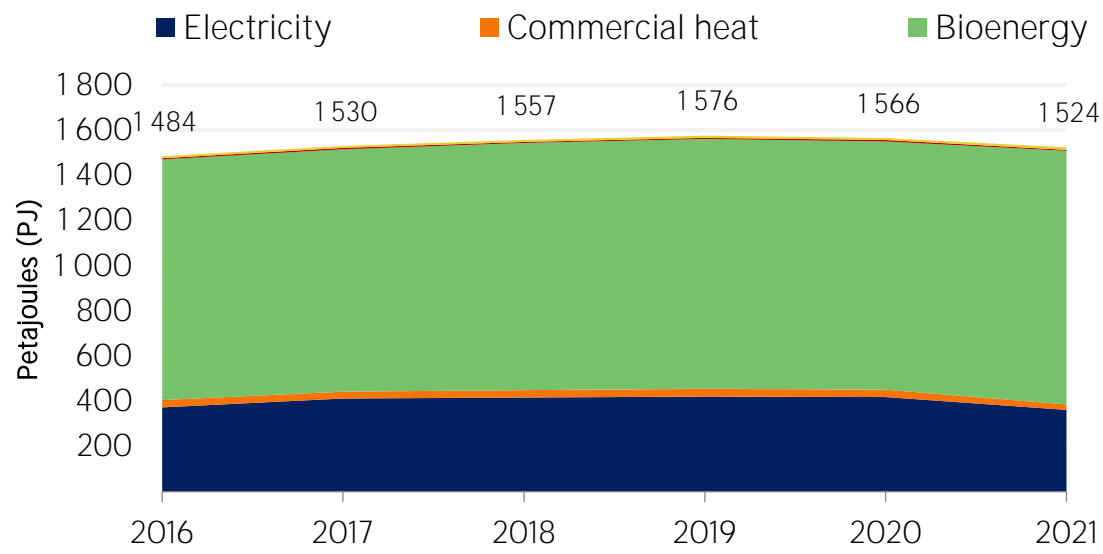


Renewable energy supply in 2021



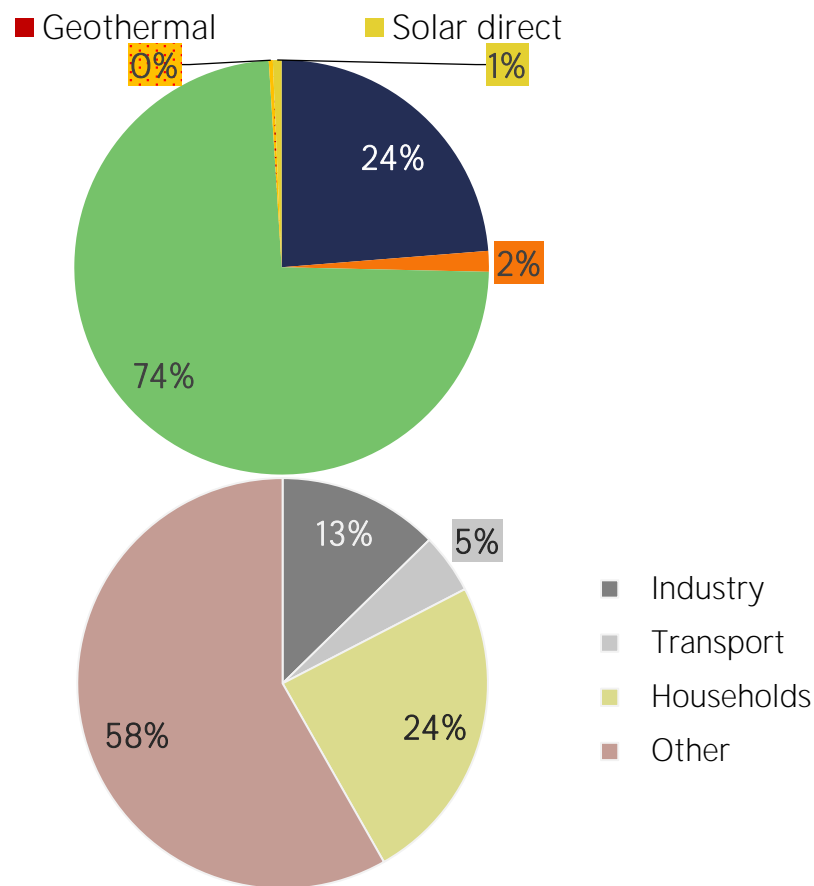
RENEWABLE ENERGY CONSUMPTION (TFEC)

Renewable TFEC trend



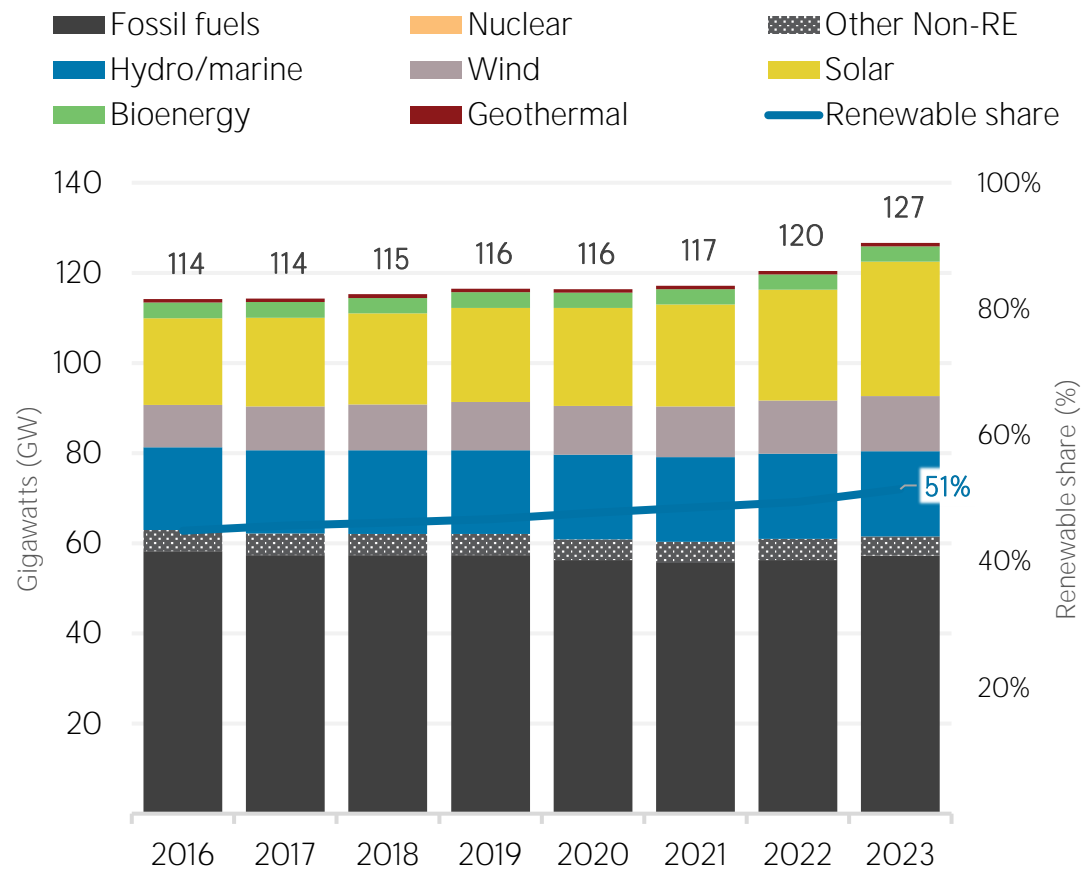
Consumption by sector	2016	2021
Industry (TJ)	184 553	193 149
Transport (TJ)	57 606	72 140
Households (TJ)	356 698	371 439
Other (TJ)	885 579	887 139

Renewable energy consumption in 2021

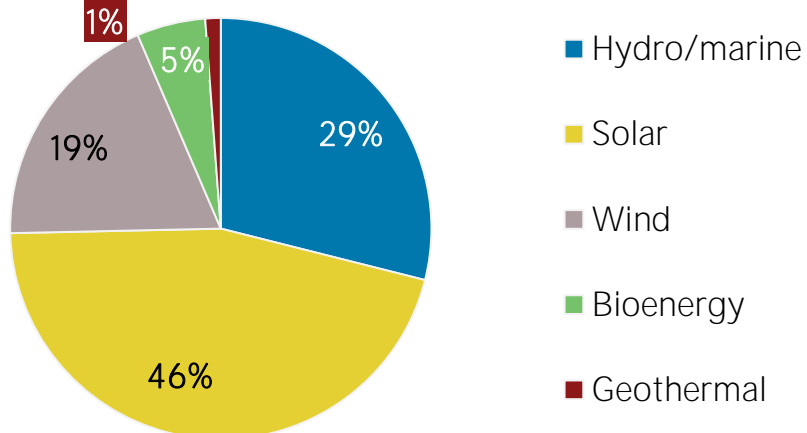


ELECTRICITY CAPACITY

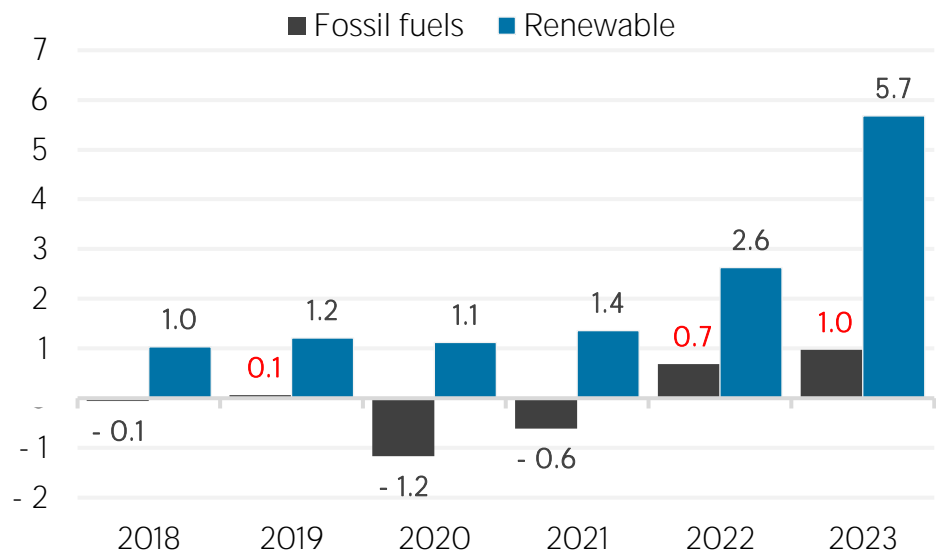
Installed capacity trend



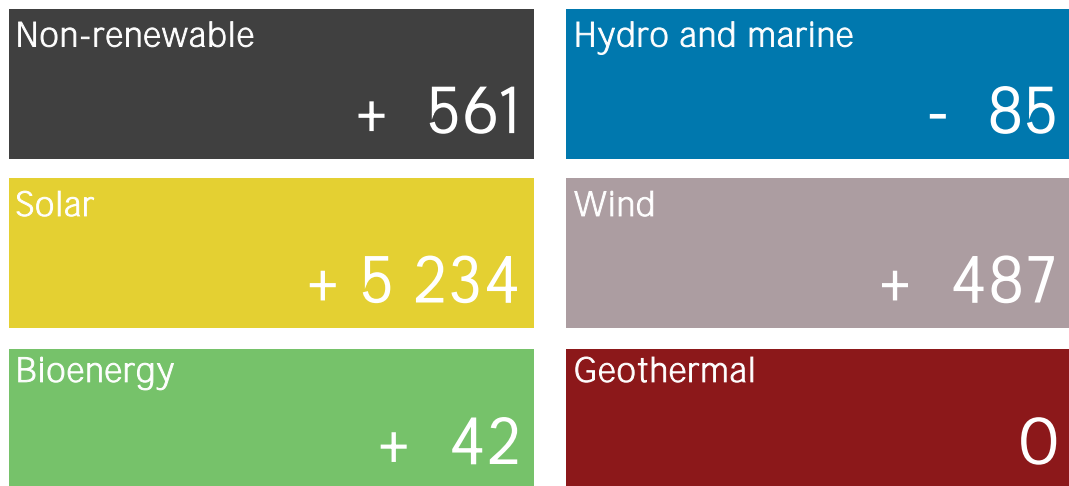
Renewable capacity in 2023



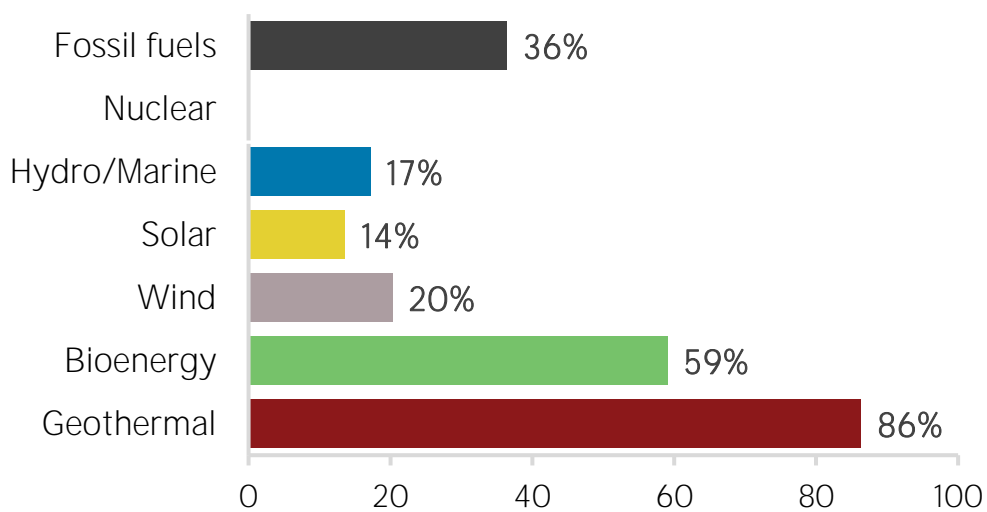
Net capacity change (GW)



Net capacity change in 2023 (MW)



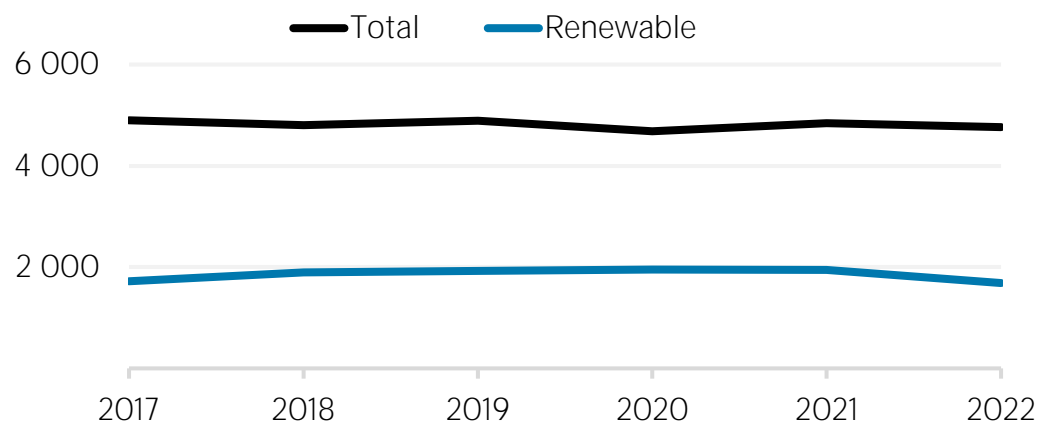
Capacity utilisation in 2022 (%)



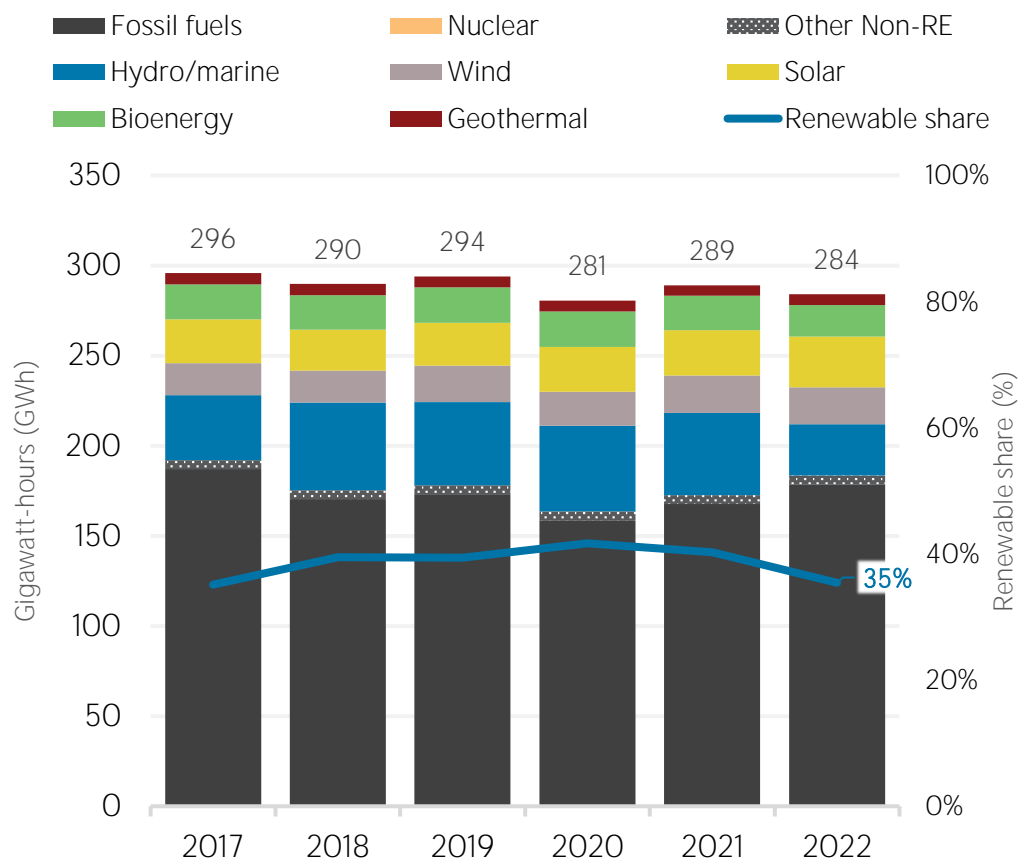
ELECTRICITY GENERATION

Generation in 2022	GWh	%
Non-renewable	183 495	65
Renewable	100 479	35
Hydro and marine	28 398	10
Solar	28 134	10
Wind	20 494	7
Bioenergy	17 616	6
Geothermal	5 837	2
Total	283 974	100

Per capita electricity generation (kWh)



Electricity generation trend

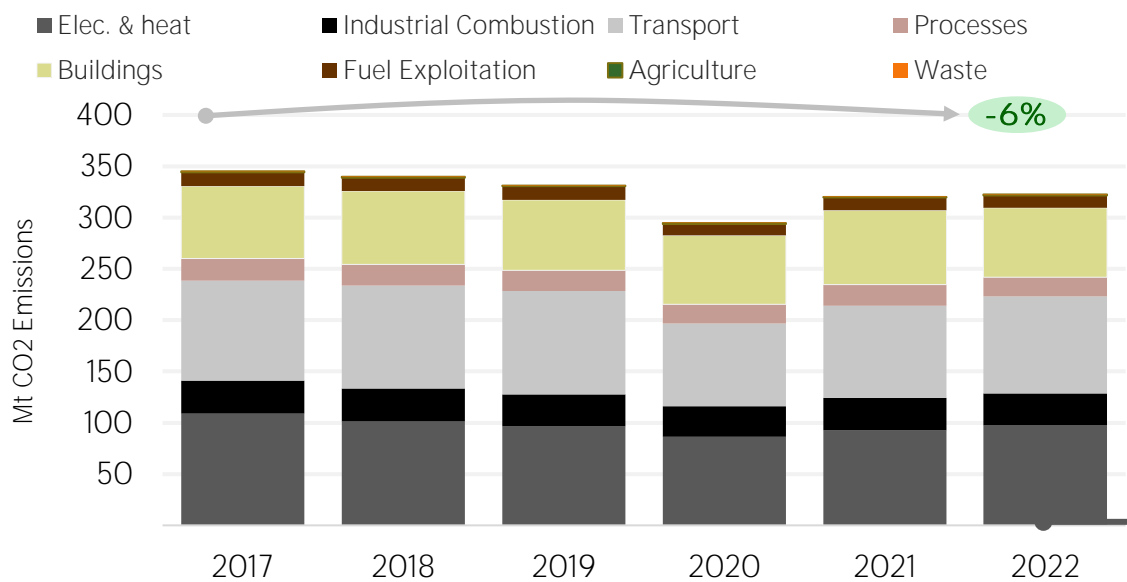


LATEST POLICIES, PROGRAMMES AND LEGISLATION

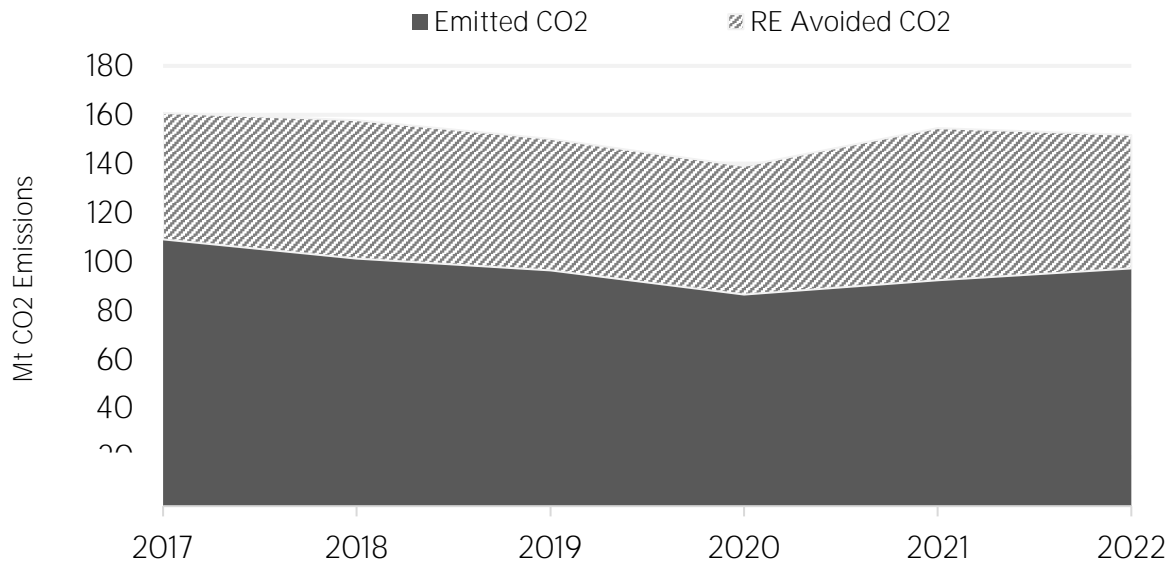
- 1 France-Germany-Italy Joint Communiqué on Critical Raw Materials 2023
- 2 Green hydrogen production for rail transport 2023
- 3 Automotive Fund 2022-2030 2022
- 4 Converting disused industrial areas into hydrogen hub 2022
- 5 GeoSciences IR 2022

ENERGY AND EMISSIONS

CO₂ emissions by sector

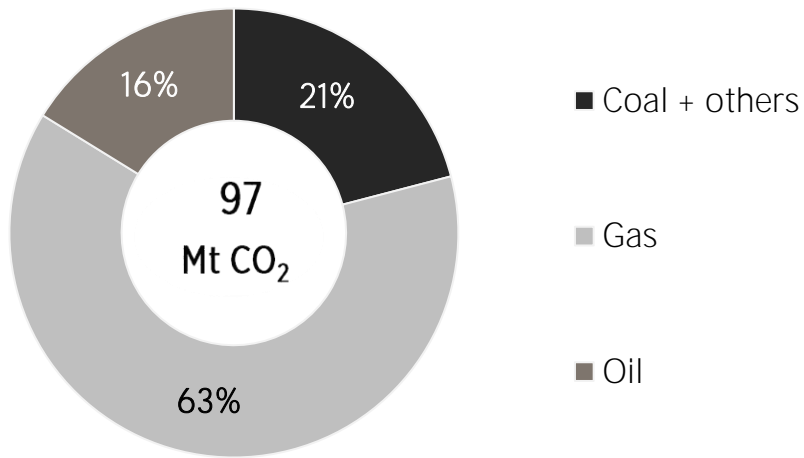


Avoided emissions from renewable elec. & heat

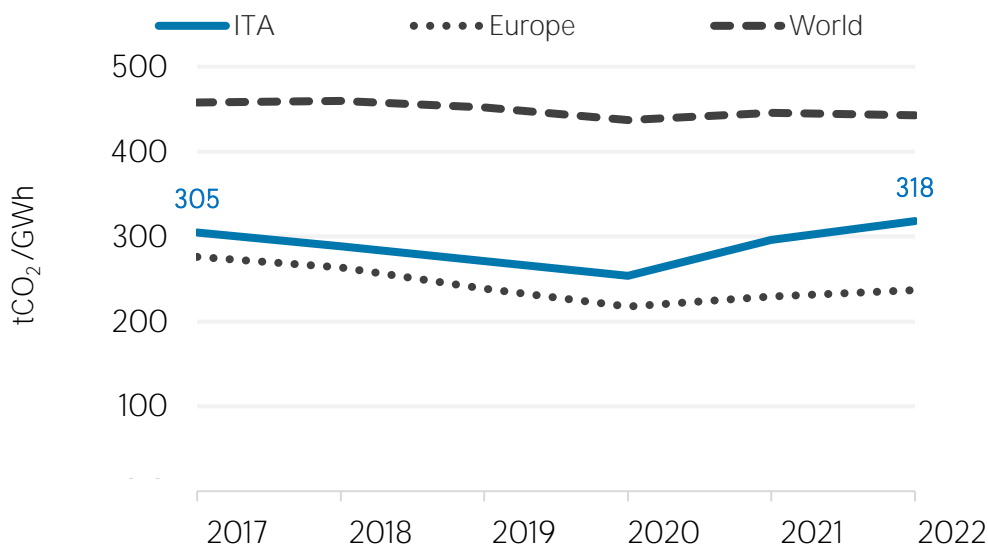


Avoided emissions based on fossil fuel mix used for power

Elec. & heat generation CO₂ emissions in

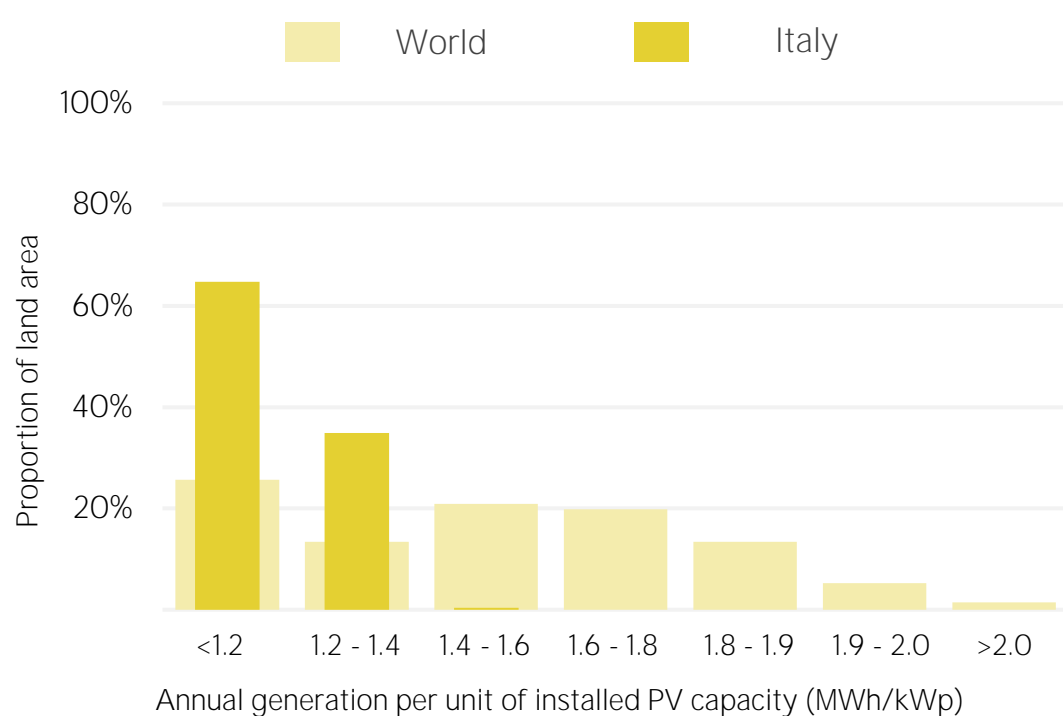


CO₂ emission factor for elec. & heat generation

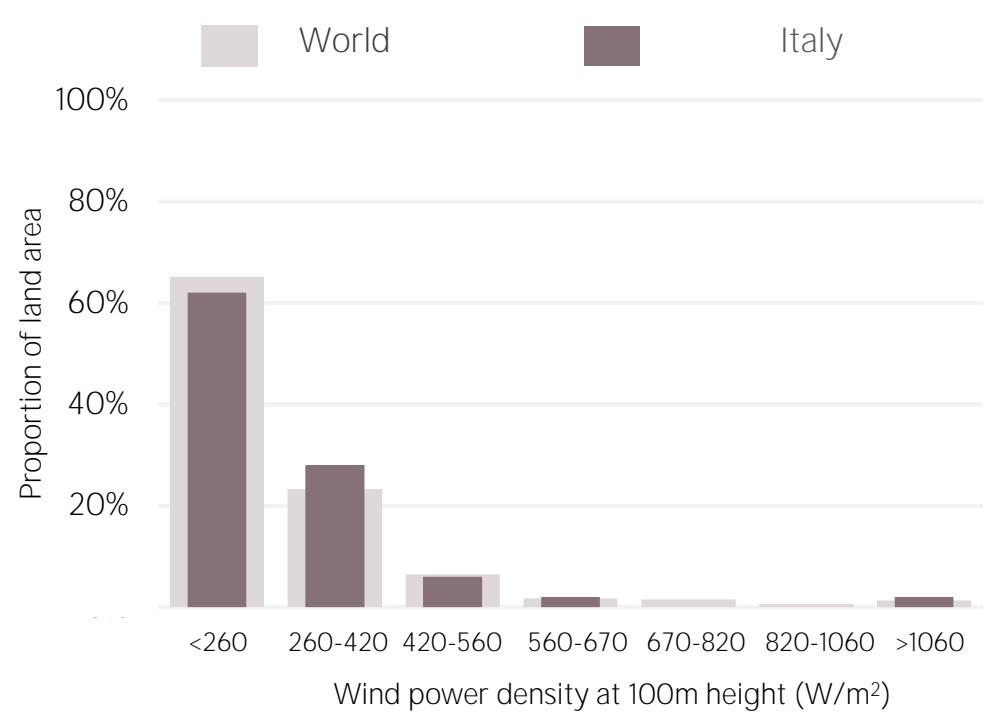


Calculated by dividing power sector emissions by elec. + heat gen.

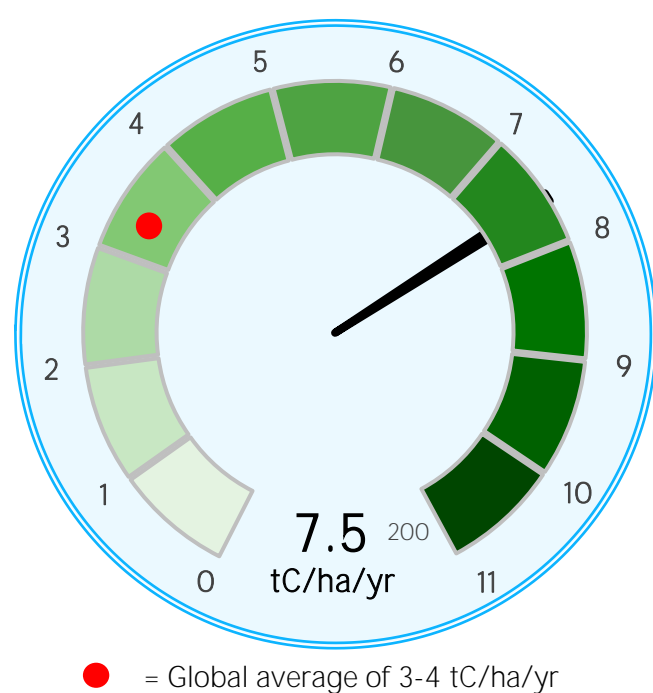
Distribution of solar potential



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/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

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