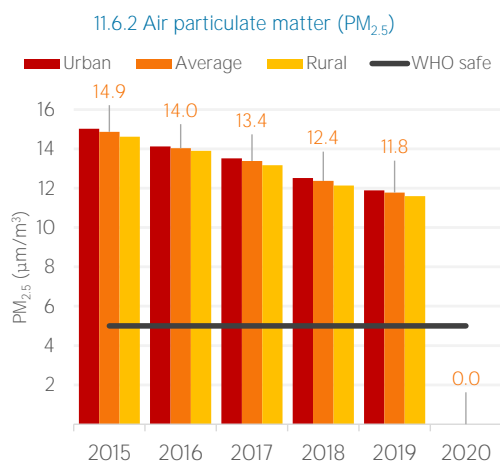
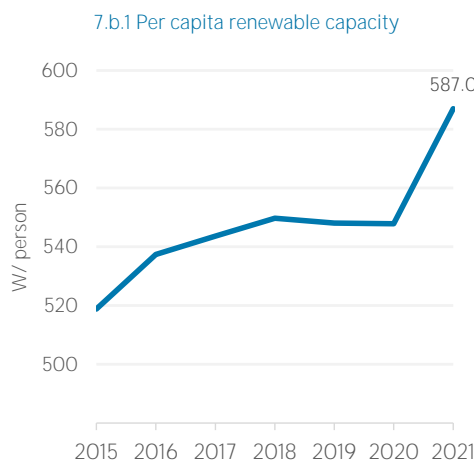
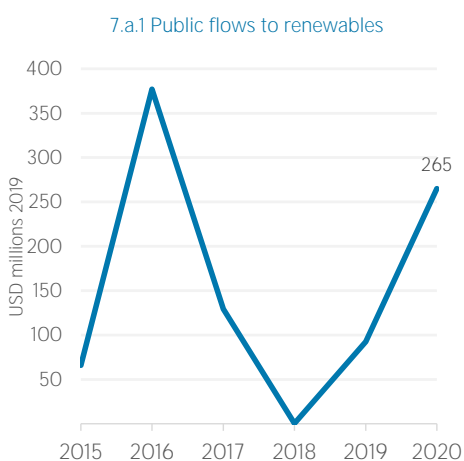
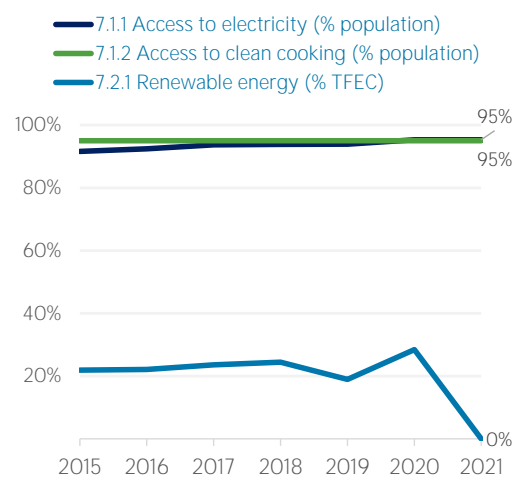
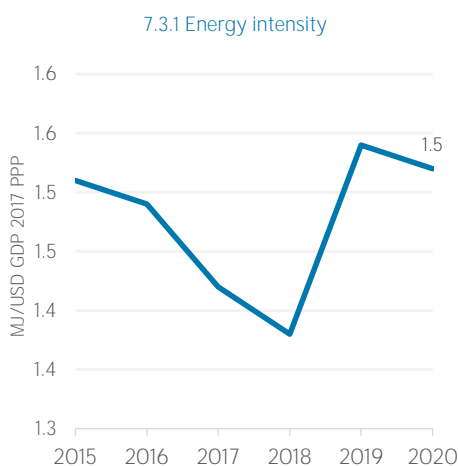
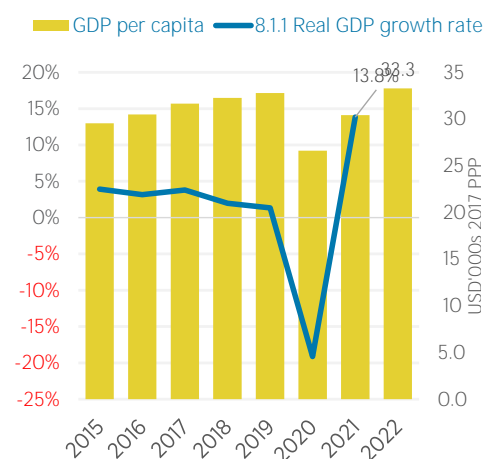


COUNTRY INDICATORS AND SDGS



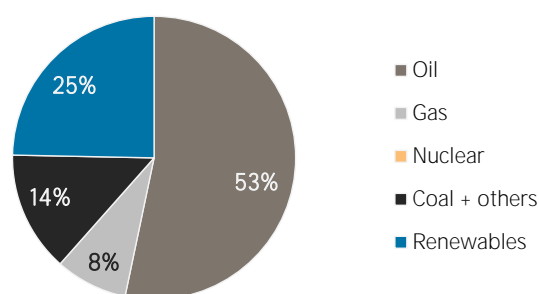
TOTAL ENERGY SUPPLY (TES)

Total Energy Supply (TES)	2015	2020
Non-renewable (TJ)	135 167	134 039
Renewable (TJ)	37 627	43 924
Total (TJ)	172 794	177 963
Renewable share (%)	22	25

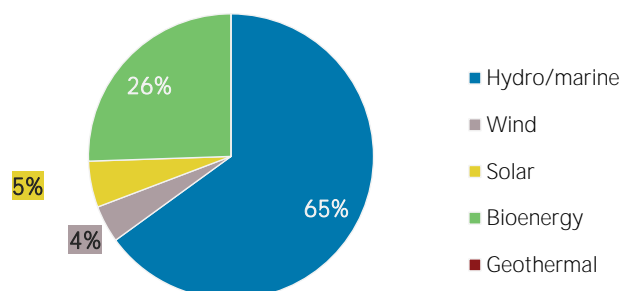
Growth in TES	2015-20	2019-20
Non-renewable (%)	-0.8	-24.2
Renewable (%)	+16.7	+7.5
Total (%)	+3.0	-18.3

Primary energy trade	2015	2020
Imports (TJ)	266 414	307 915
Exports (TJ)	625	2 046
Net trade (TJ)	- 265 789	- 305 869
Imports (% of supply)	154	173
Exports (% of production)	2	5
Energy self-sufficiency (%)	22	25

Total energy supply in 2020

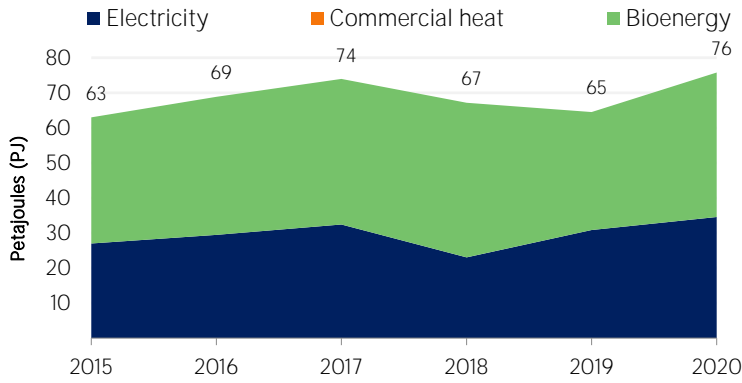


Renewable energy supply in 2020

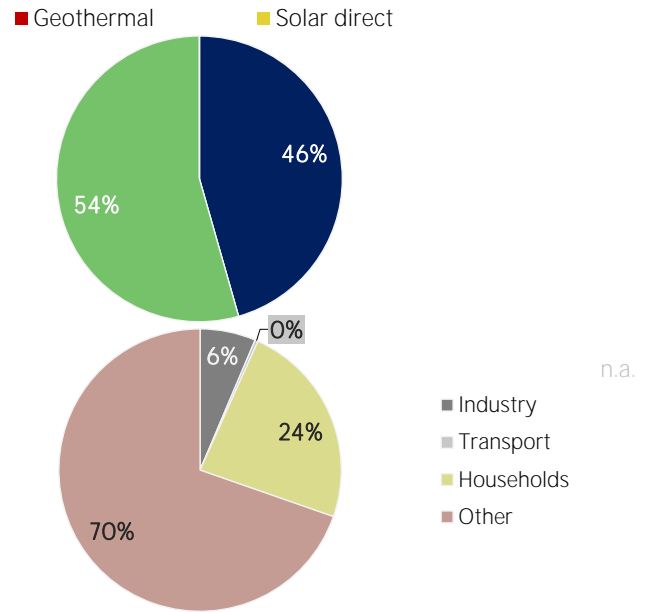


RENEWABLE ENERGY CONSUMPTION (TFEC)

Renewable TFEC trend



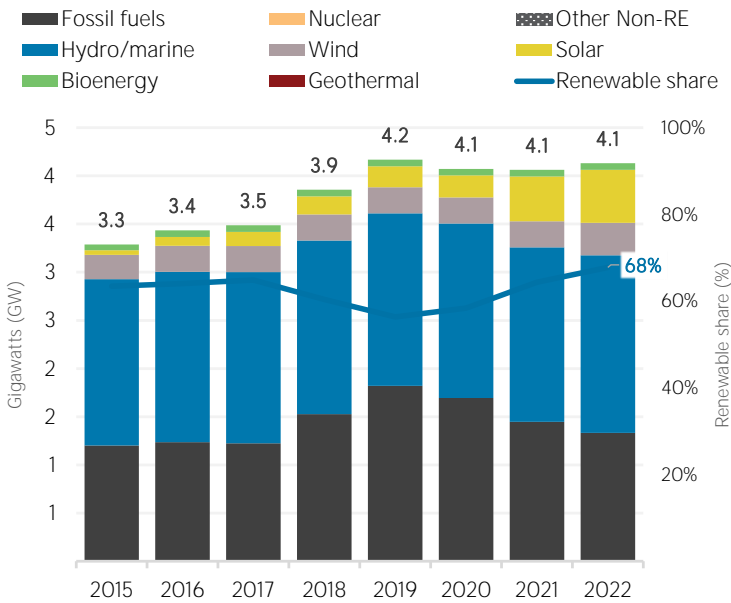
Renewable energy consumption in 2020



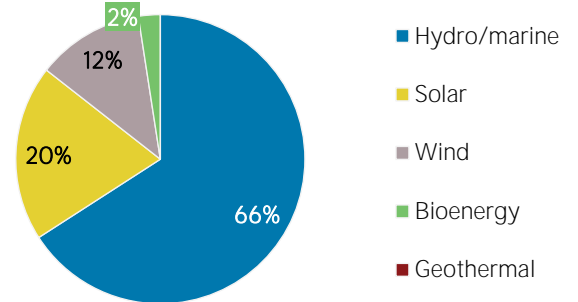
Consumption by sector	2015	2020
Industry (TJ)	5 368	4 830
Transport (TJ)	133	262
Households (TJ)	14 359	17 905
Other (TJ)	43 151	52 799

ELECTRICITY CAPACITY

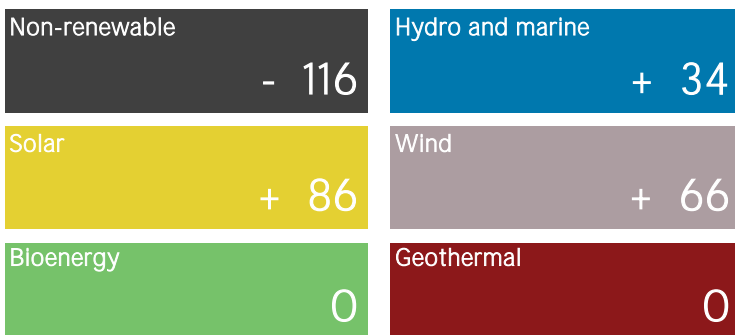
Installed capacity trend



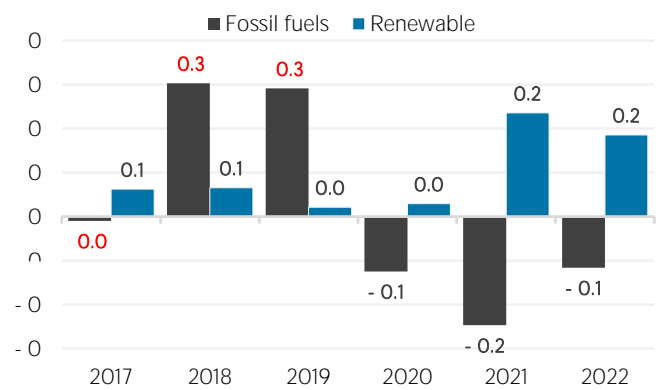
Renewable capacity in 2022



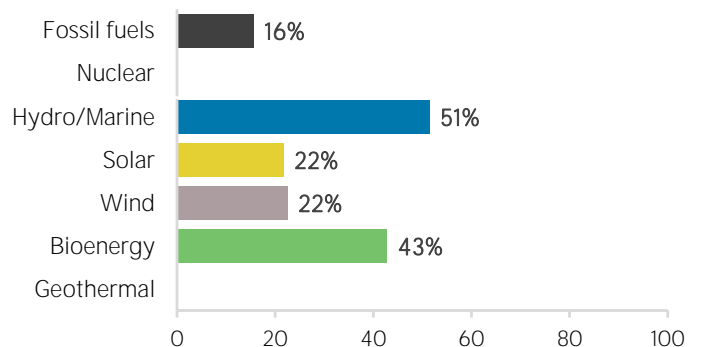
Net capacity change in 2022 (MW)



Net capacity change (GW)



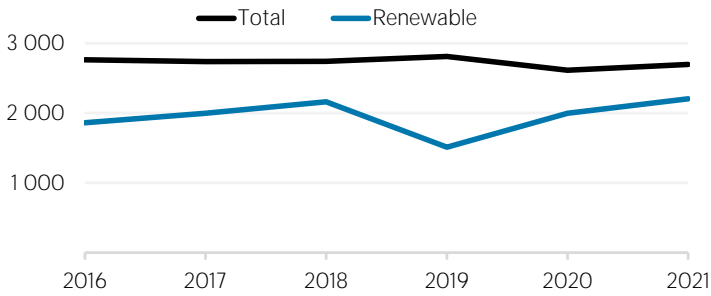
Capacity utilisation in 2021 (%)



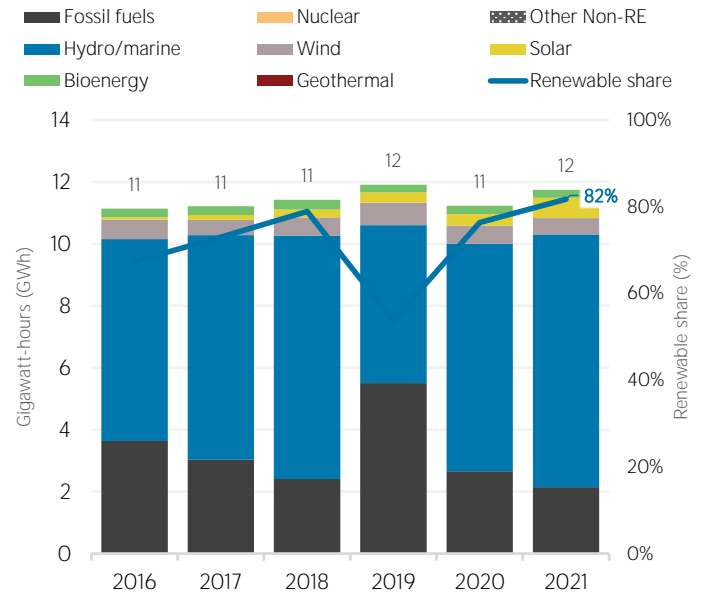
ELECTRICITY GENERATION

Generation in 2021	GWh	%
Non-renewable	2 146	18
Renewable	9 597	82
Hydro and marine	8 154	69
Solar	657	6
Wind	530	5
Bioenergy	255	2
Geothermal	0	0
Total	11 743	100

Per capita electricity generation (kWh)



Electricity generation trend

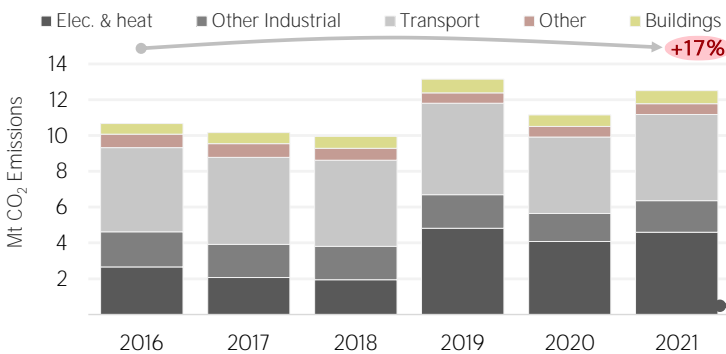


LATEST POLICIES, PROGRAMMES AND LEGISLATION

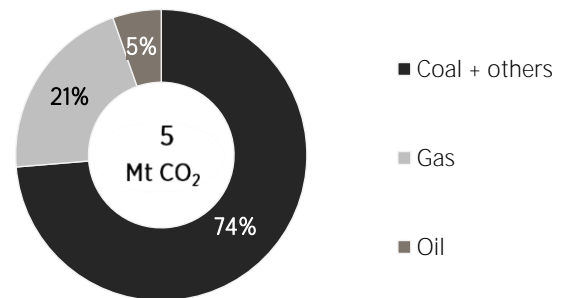
- Resolution N° 114/2017 approved Technical Regulation DGNTI-COPANIT 104:2017 2017
- Resolution n° 115/2017 adopting Technical Regulation DGNTI-COPANIT 103:2017 2017
- Resolution N° 116/2017 adopting Technical Regulation DGNTI-COPANIT 102:2017 2017
- Panama National Energy Plan 2015–2050 2015
- Law establishing incentives for construction and operation and maintenance of solar PV plants in Panama (Law 37 of 10 June 2013, amended by Law 38 of August 9, 2016) (solar PV auctions) 2013

ENERGY AND EMISSIONS

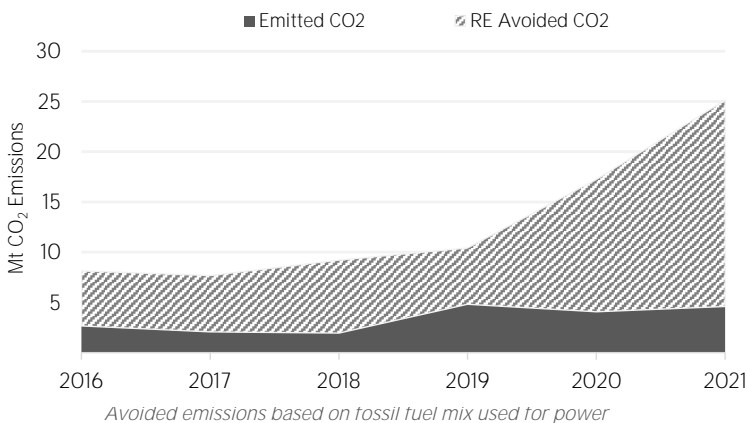
Energy-related CO₂ emissions by sector



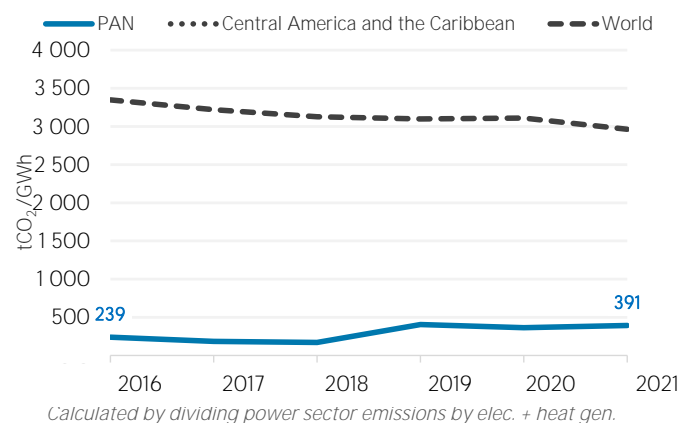
Elec. & heat generation CO₂ emissions in



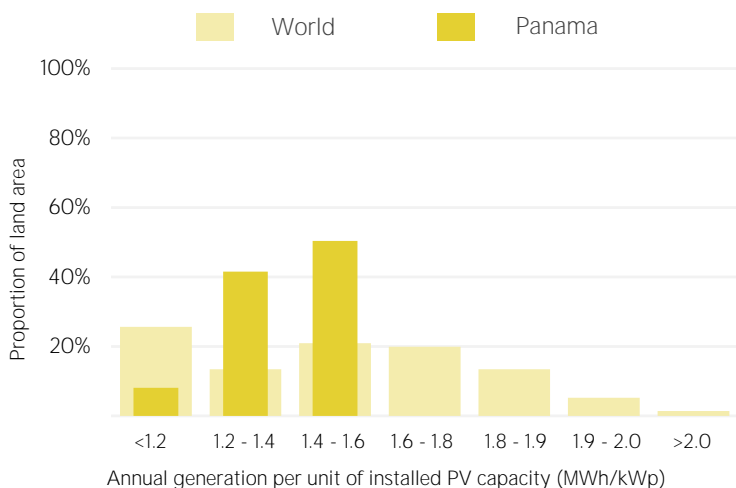
Avoided emissions from renewable elec. & heat



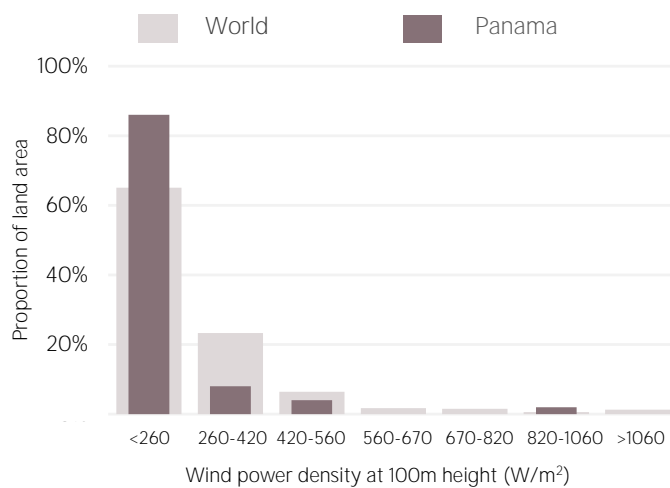
CO₂ emission factor for elec. & heat generation



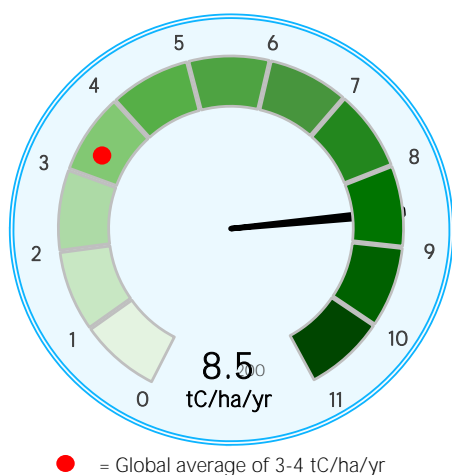
Distribution of solar potential



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: 8th August, 2023