Bulgaria

IRENA
International Renewable Energy Agency

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 (% TFEC)

7.a.1 Public flows to renewables

7.b.1 Per capita renewable capacity

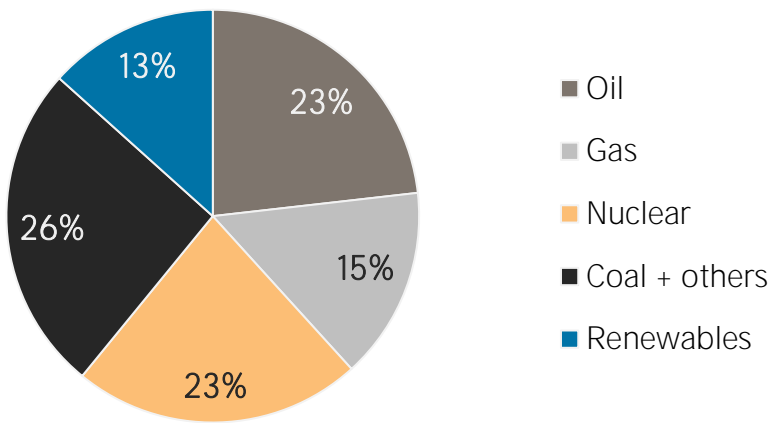### 11.6.2 Air particulate matter (PM$_{2.5}$)
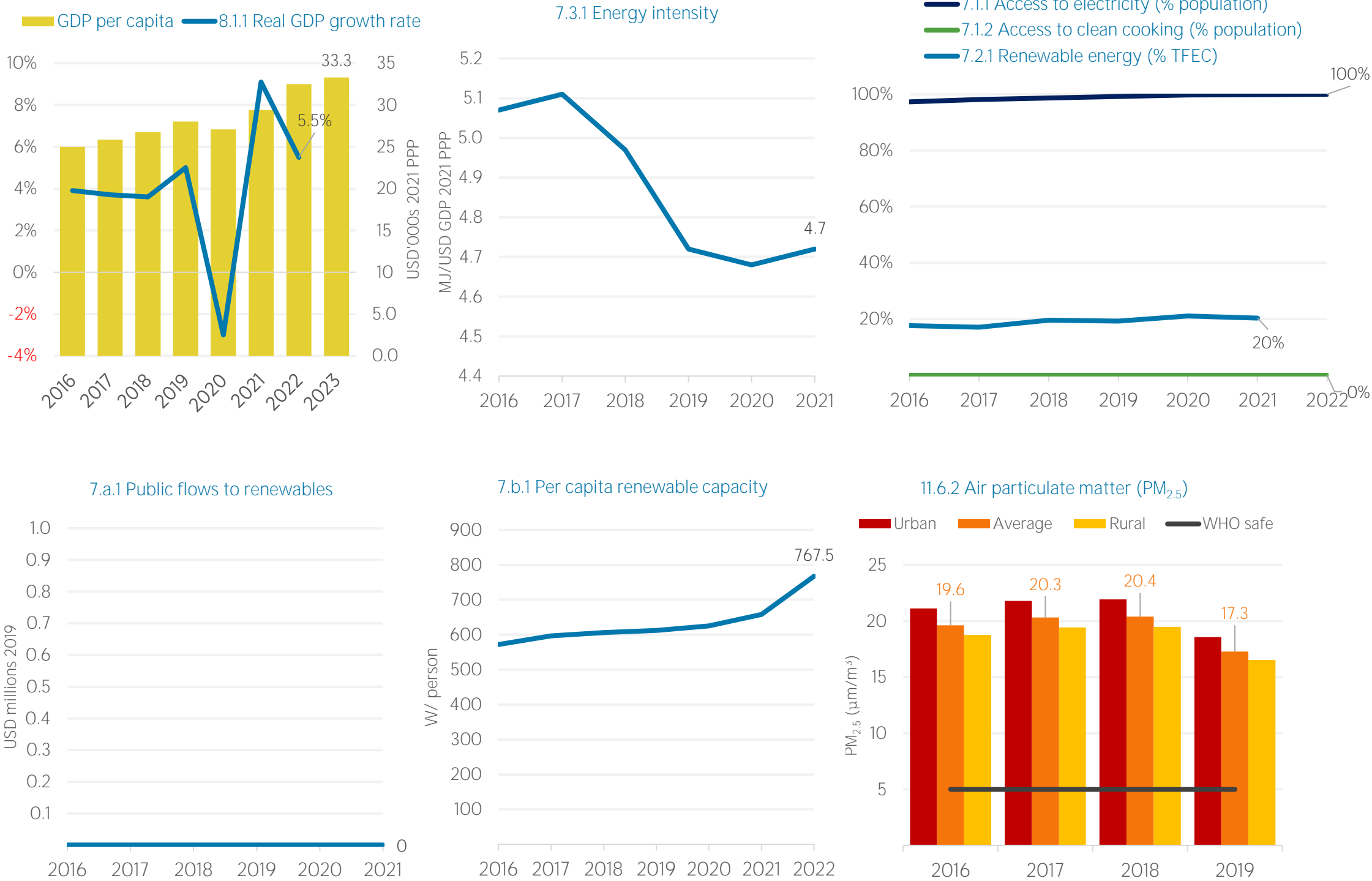
TOTAL ENERGY SUPPLY (TES)

Total Energy Supply (TES)	2016	2021
Non-renewable (TJ)	679 282	683 985
Renewable (TJ)	72 756	105 423
Total (TJ)	752 037	789 409
Renewable share (%)	10	13

Growth in TES	2016-21	2020-21
Non-renewable (%)	+0.7	+8.0
Renewable (%)	+44.9	+2.0
Total (%)	+5.0	+7.2

Primary energy trade	2016	2021
Imports (TJ)	537 520	423 270
Exports (TJ)	240 694	130 541
Net trade (TJ)	- 296 826	- 292 729
Imports (% of supply)	71	54
Exports (% of production)	51	26
Energy self-sufficiency (%)	62	63

Total energy supply in 2021

Oil 23%
Gas 15%
Nuclear 23%
Coal + others 26%
Renewables 13%

Renewable energy supply in 2021

Hydro/marine 12%
Wind 5%
Solar 8%
Bioenergy 74%
Geothermal 1%
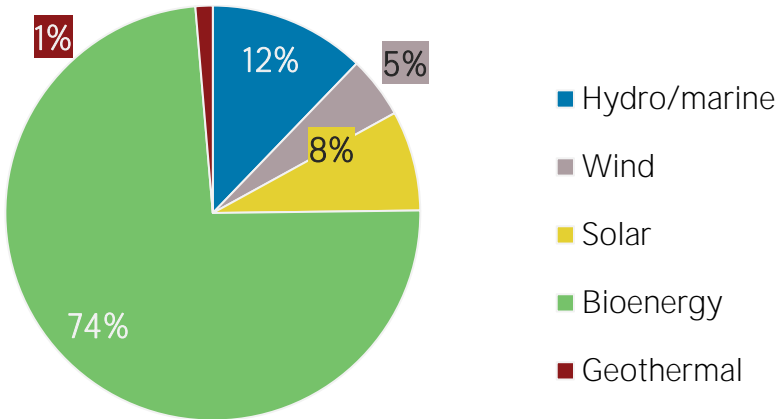
RENEWABLE ENERGY CONSUMPTION (TFEC)

Renewable TFEC trend

- Electricity
- Commercial heat
- Bioenergy
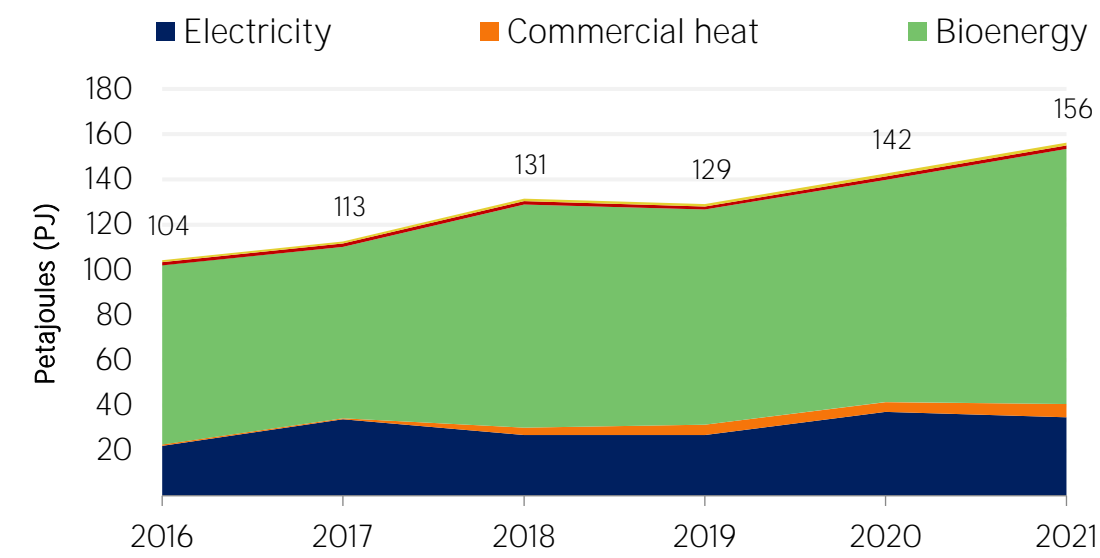
Consumption by sector	2016	2021
Industry (TJ)	18 302	20 352
Transport (TJ)	6 936	7 564
Households (TJ)	40 563	48 560
Other (TJ)	38 529	79 760

Renewable energy consumption in 2021

- Geothermal
- Solar direct

- Industry
- Transport
- Households
- Other
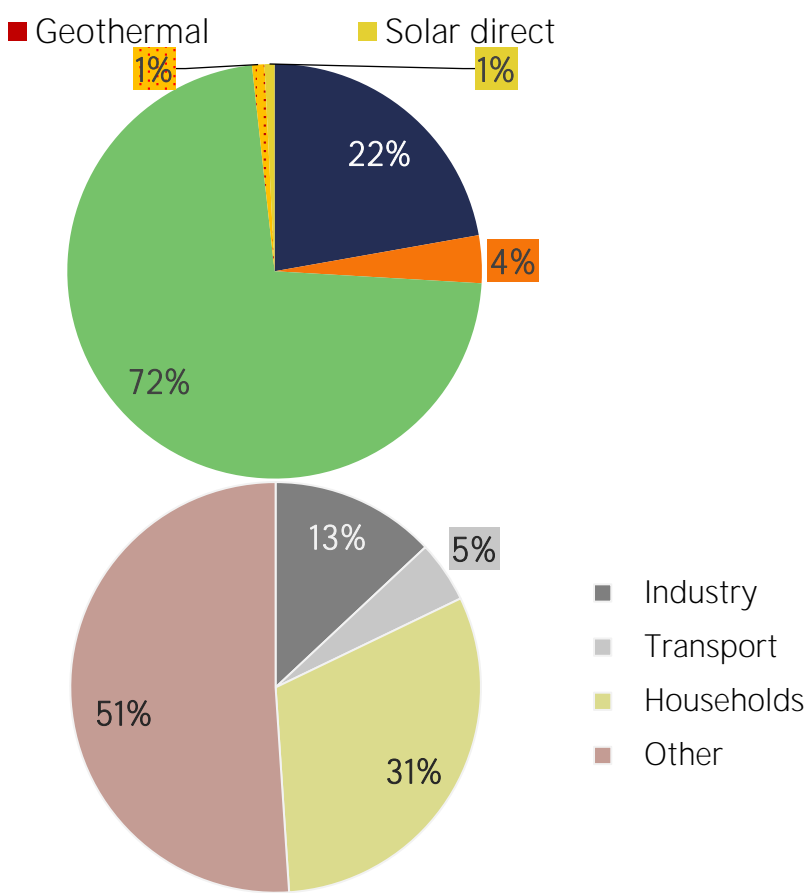
ELECTRICITY CAPACITY

Installed capacity trend

- Fossil fuels
- Nuclear
- Other Non-RE
- Hydro/marine
- Wind
- Solar
- Bioenergy
- Geothermal
- Renewable share

Net capacity change in 2023 (MW)

Non-renewable	+ 4	Hydro and marine	0
Solar	+ 1 200	Wind	0
Bioenergy	0	Geothermal	0
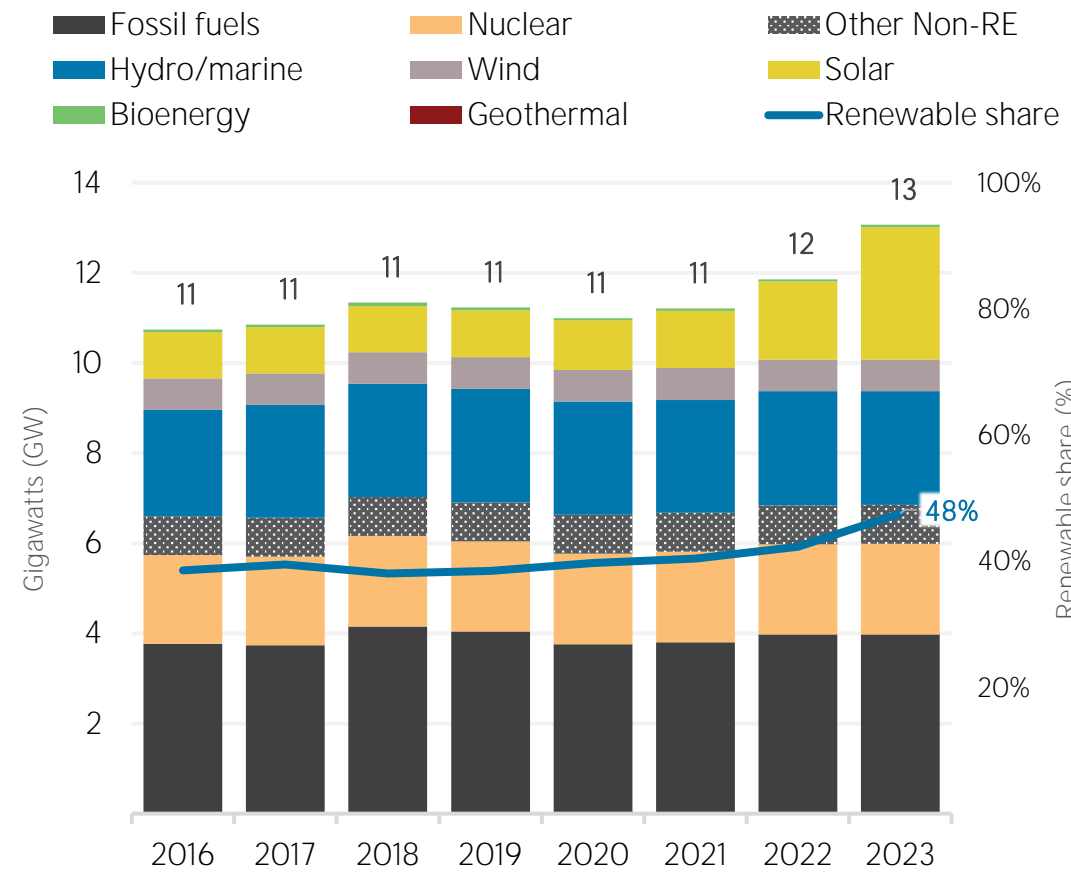
Renewable capacity in 2023

- Hydro/marine
- Solar
- Wind
- Bioenergy
- Geothermal
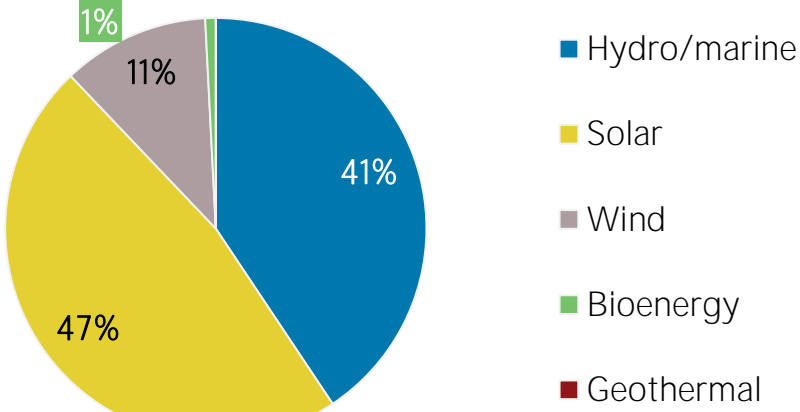
Net capacity change (GW)

- Fossil fuels
- Renewable

Capacity utilisation in 2022 (%)

Fossil fuels	71%
Nuclear	94%
Hydro/Marine	17%
Solar	16%
Wind	24%
Bioenergy	100%
Geothermal	
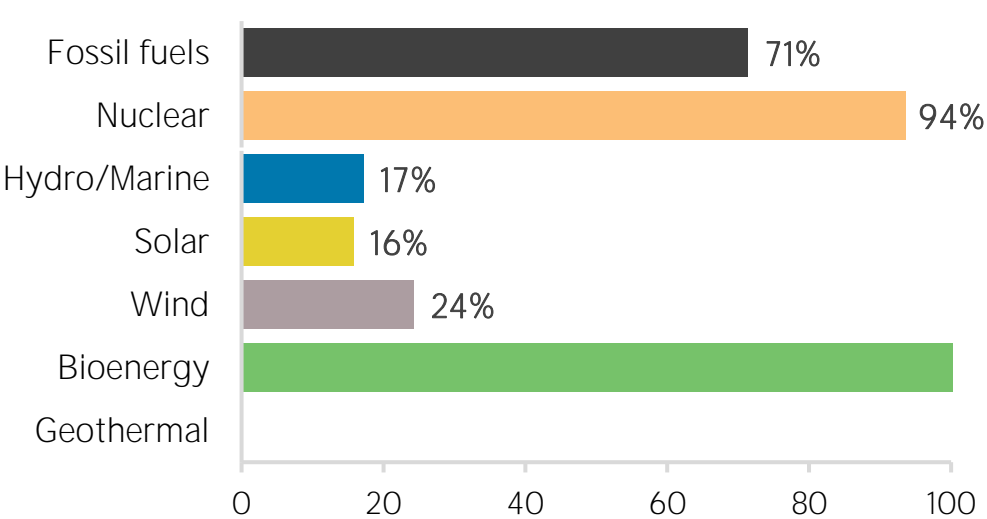
ELECTRICITY GENERATION

Generation in 2022

Generation in 2022	GWh	%
Non-renewable	40 859	81
Renewable	9 640	19
Hydro and marine	3 803	8
Solar	2 094	4
Wind	1 499	3
Bioenergy	2 244	4
Geothermal	0	0
Total	50 499	100

Per capita electricity generation (kWh)

Legend: Total, Renewable
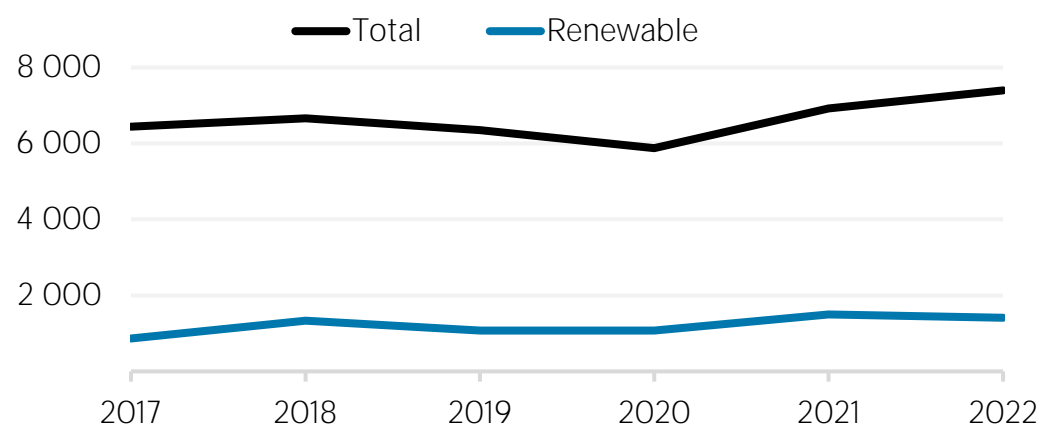
Electricity generation trend

Legend: Fossil fuels, Nuclear, Other Non-RE, Hydro/marine, Wind, Solar, Bioenergy, Geothermal, Renewable share

Gigawatt-hours (GWh) / Renewable share (%)

Values: 46 (2017), 47 (2018), 44 (2019), 41 (2020), 48 (2021), 50 (2022)

19%
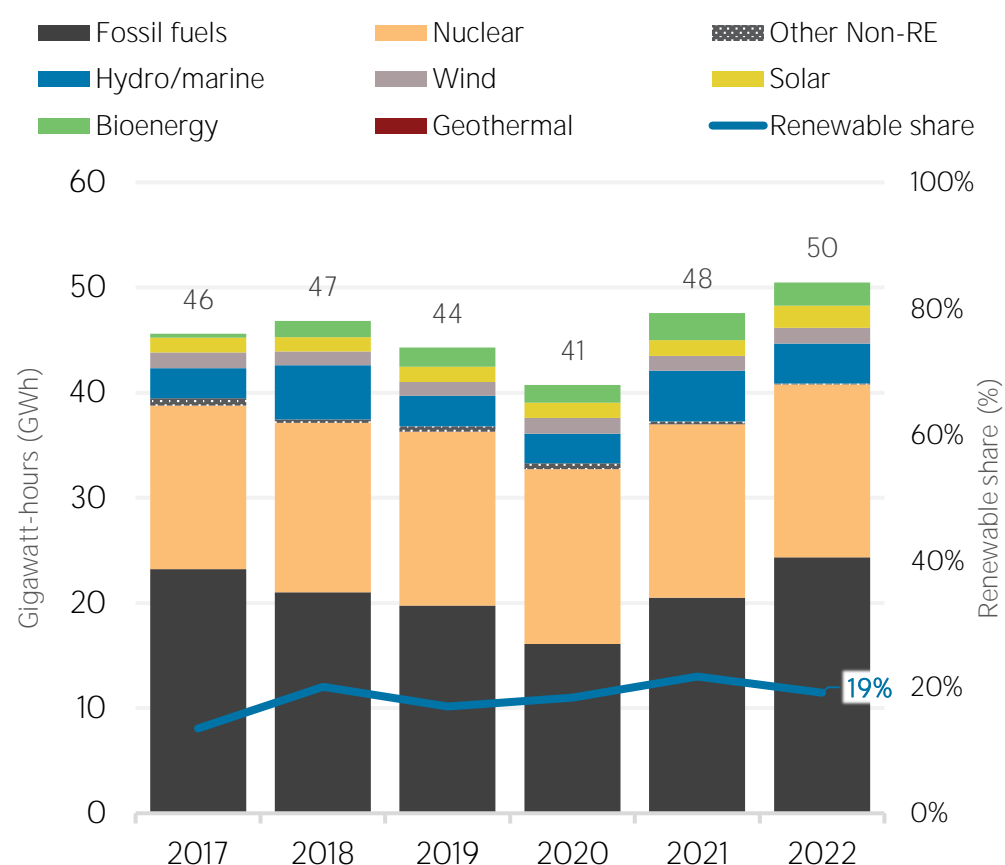
LATEST POLICIES, PROGRAMMES AND LEGISLATION
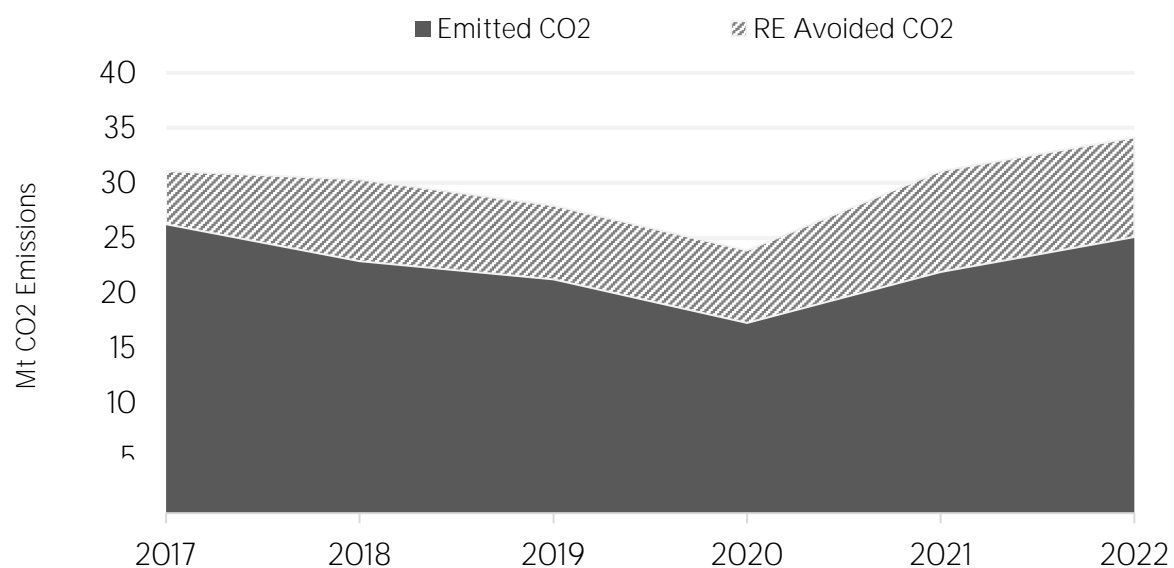
1	Electricity price ceiling of BGN 200/MWh for non-household consumers	2023
2	Anti-Inflation package [DECREE No. 170 of Supplementary Budget 2022]	2022
3	One-time heating subsidies	2022
4	Purchase Subsidies Bulgaria	2018
5	Energy Act	2013

ENERGY AND EMISSIONS

CO$_2$ emissions by sector

Legend: Elec. & heat, Industrial Combustion, Transport, Processes, Buildings, Fuel Exploitation, Agriculture, Waste

Mt CO2 Emissions

-12%

Elec. & heat generation CO$_2$ emissions in

10% 1%

245
Mt CO$_2$

89%

Legend: Coal + others, Gas, Oil
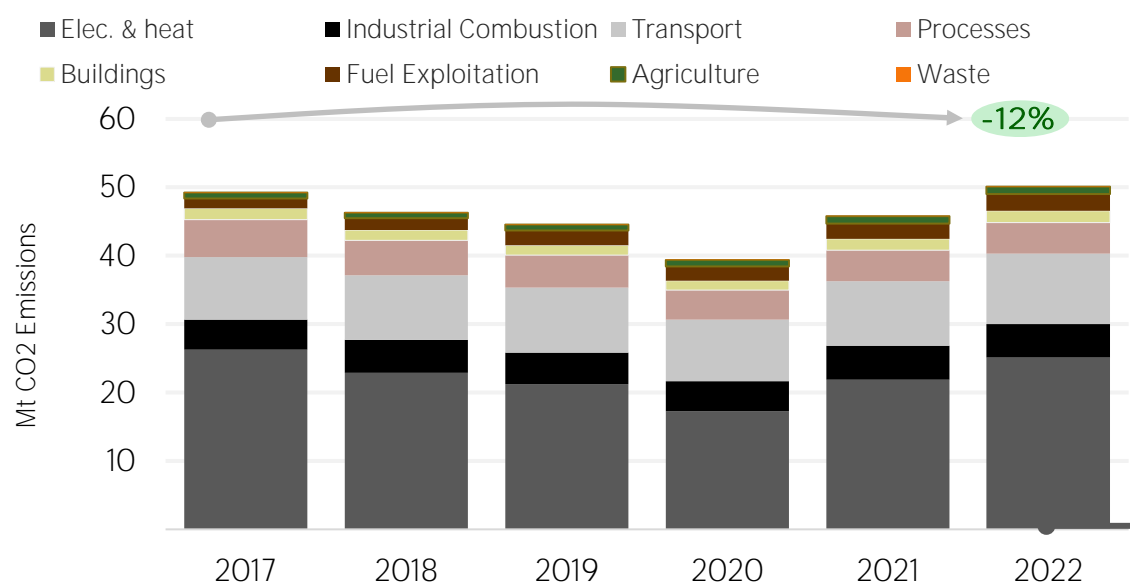
Avoided emissions from renewable elec. & heat

Legend: Emitted CO2, RE Avoided CO2

Mt CO2 Emissions

Avoided emissions based on fossil fuel mix used for power
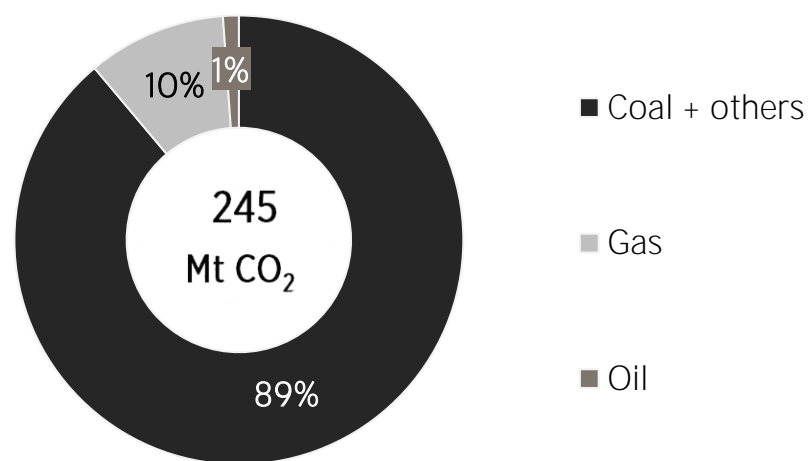
CO$_2$ emission factor for elec. & heat generation

Legend: BGR, Europe, World

tCO$_2$/GWh

459

420
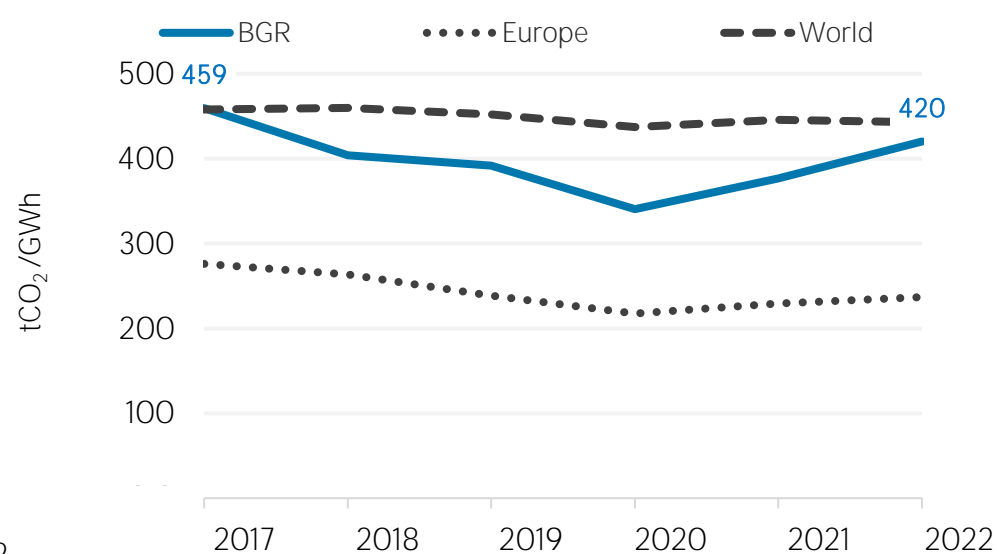
Calculated by dividing power sector emissions by elec. + heat gen.

Distribution of solar potential

World   Bulgaria

Proportion of land area

100%
80%
60%
40%
20%

<1.2   1.2 - 1.4   1.4 - 1.6   1.6 - 1.8   1.8 - 1.9   1.9 - 2.0   >2.0

Annual generation per unit of installed PV capacity (MWh/kWp)
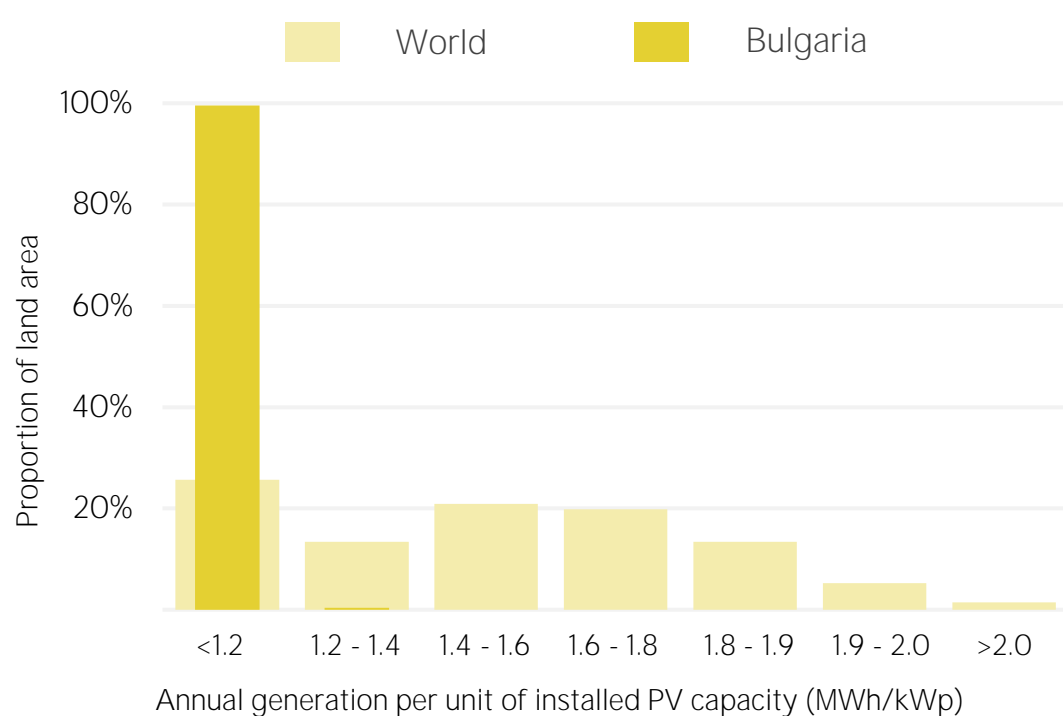
Distribution of wind potential

World   Bulgaria

Proportion of land area

100%
80%
60%
40%
20%

<260   260-420   420-560   560-670   670-820   820-1060   >1060

Wind power density at 100m height (W/m²)
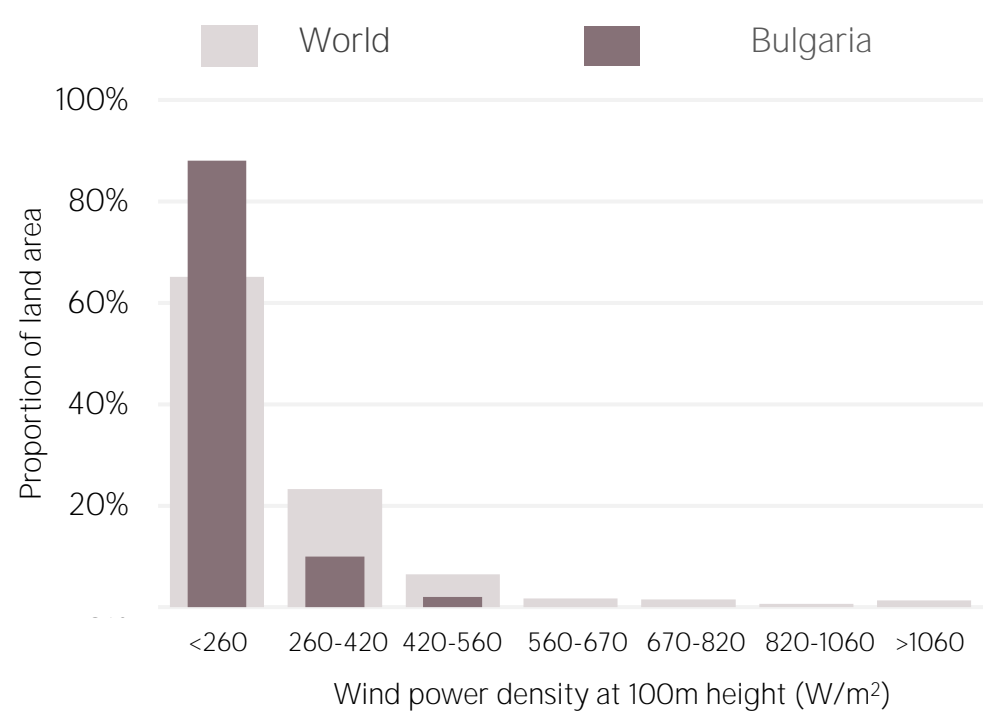
Biomass potential: net primary production

5   6
4   7
3   8
2   9
1   10
0   11

5.5
tC/ha/yr

200

● = Global average of 3-4 tC/ha/yr
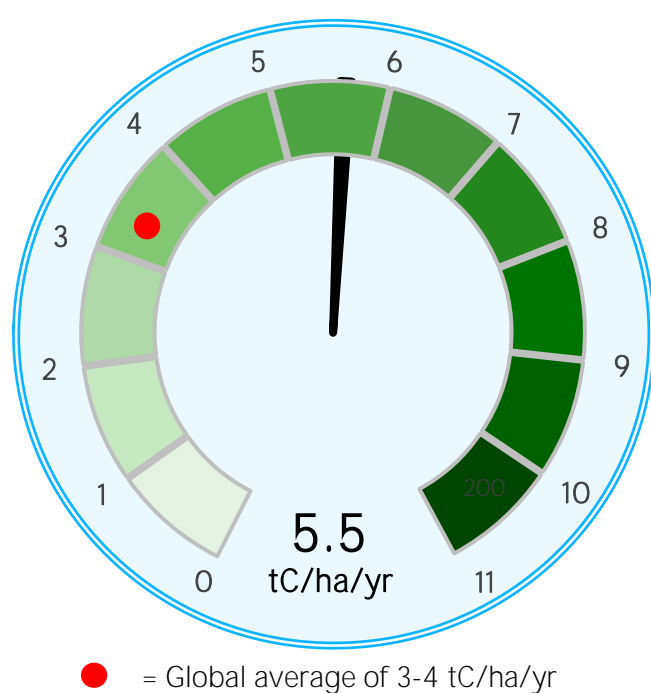
Indicators of renewable resource potential

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

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