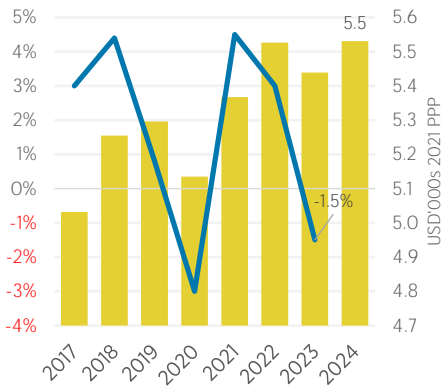
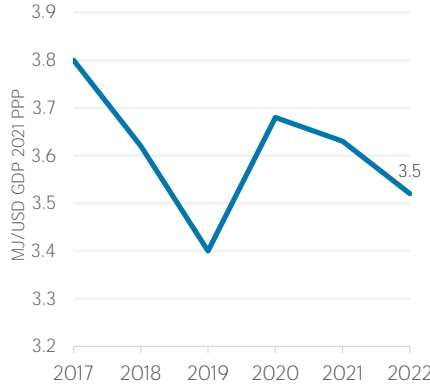


COUNTRY INDICATORS AND SDGS

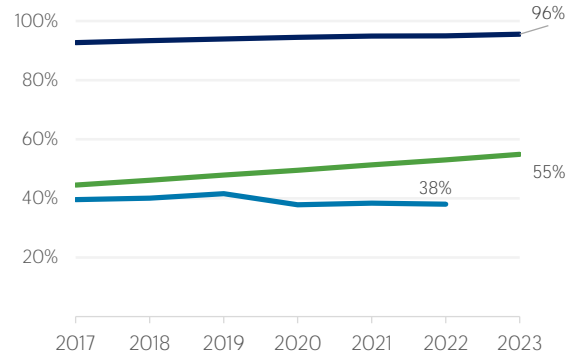
GDP per capita 8.1.1 Real GDP growth rate



7.3.1 Energy intensity



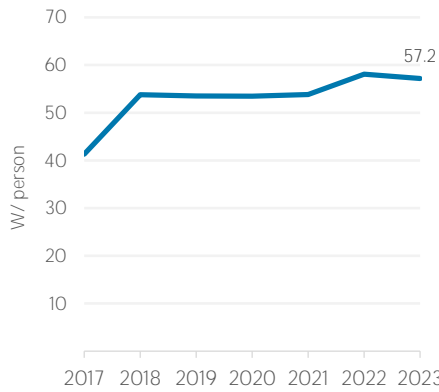
7.1.1 Access to electricity (% population)  
7.1.2 Access to clean cooking (% population)  
7.2.1 Renewable energy (% TREC)



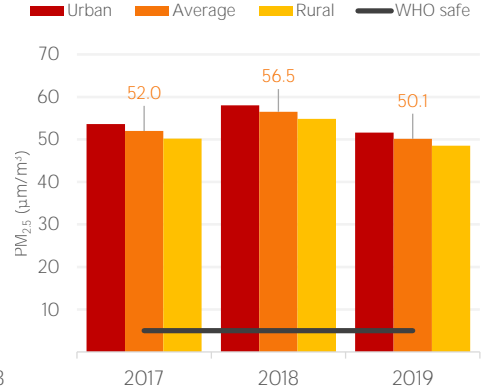
7.a.1 Public flows to renewables



7.b.1 Per capita renewable capacity



11.6.2 Air particulate matter (PM<sub>2.5</sub>)



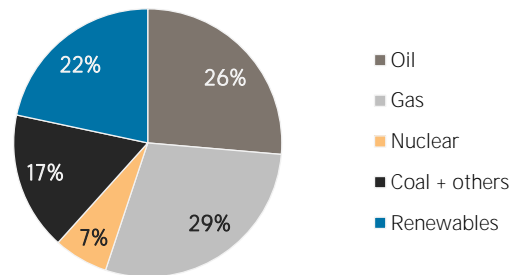
TOTAL ENERGY SUPPLY (TES)

Total Energy Supply (TES)	2017	2022
Non-renewable (TJ)	3 155 069	3 079 590
Renewable (TJ)	839 370	851 327
Total (TJ)	3 994 439	3 930 917
Renewable share (%)	21	22

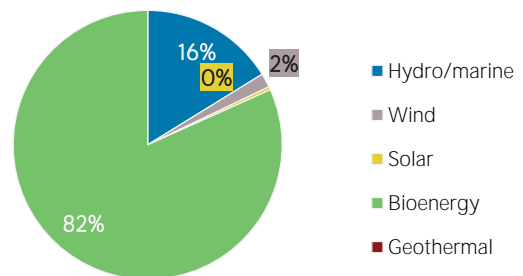
Growth in TES	2017-22	2021-22
Non-renewable (%)	-2.4	-12.8
Renewable (%)	+1.4	+0.1
Total (%)	-1.6	-10.3

Primary energy trade	2017	2022
Imports (TJ)	1 703 540	1 689 820
Exports (TJ)	32 696	25 564
Net trade (TJ)	-1 670 844	-1 664 256
Imports (% of supply)	43	43
Exports (% of production)	1	1
Energy self-sufficiency (%)	58	58

Total energy supply in 2022

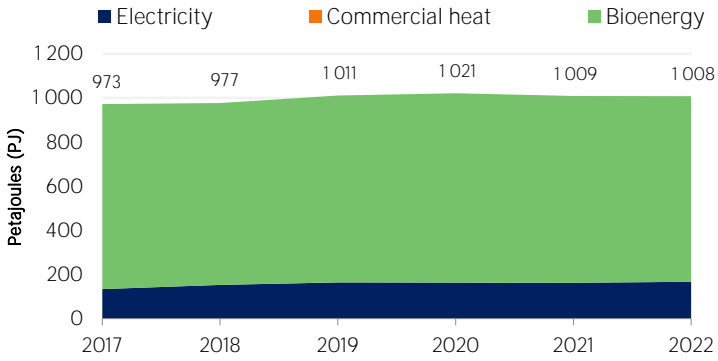


Renewable energy supply in 2022



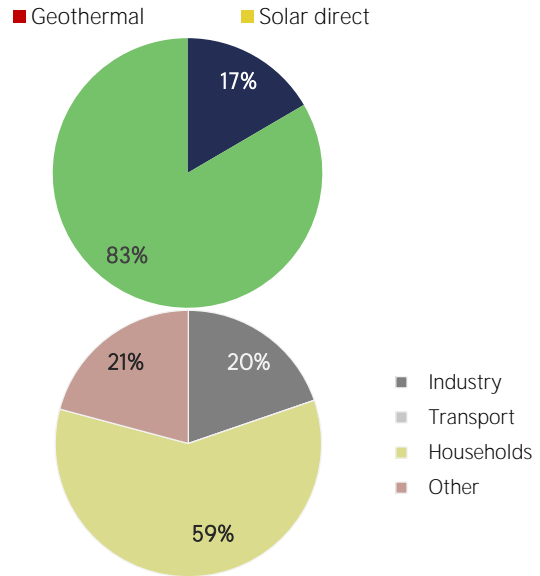
# RENEWABLE ENERGY CONSUMPTION (TFEC)

### Renewable TFEC trend



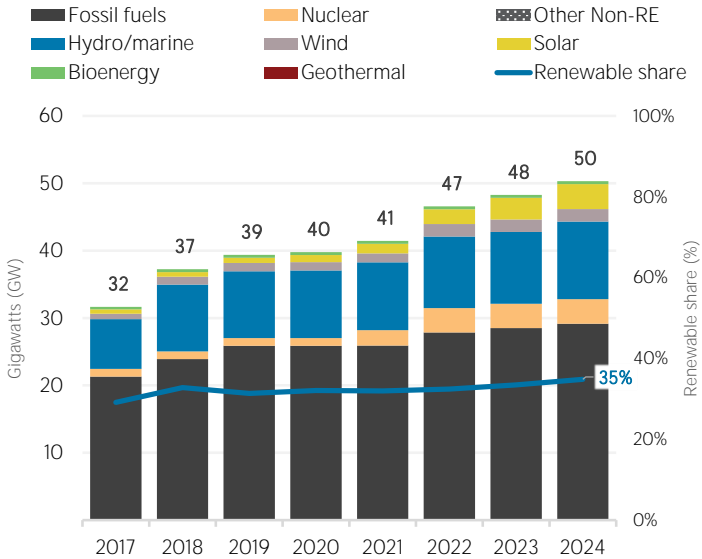
Consumption by sector	2017	2022
Industry (TJ)	179 075	198 966
Transport (TJ)	0	0
Households (TJ)	605 577	598 906
Other (TJ)	187 917	210 059

### Renewable energy consumption in 2022

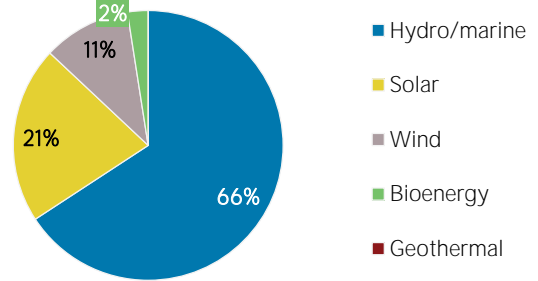


# ELECTRICITY CAPACITY

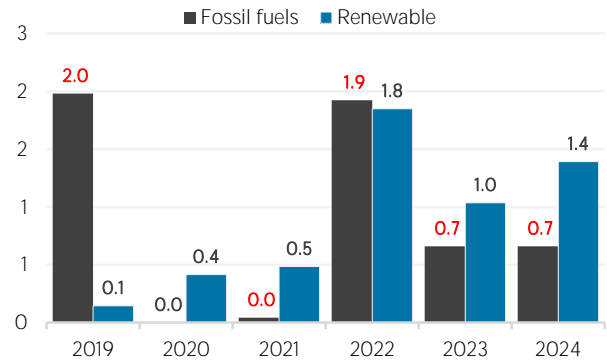
### Installed capacity trend



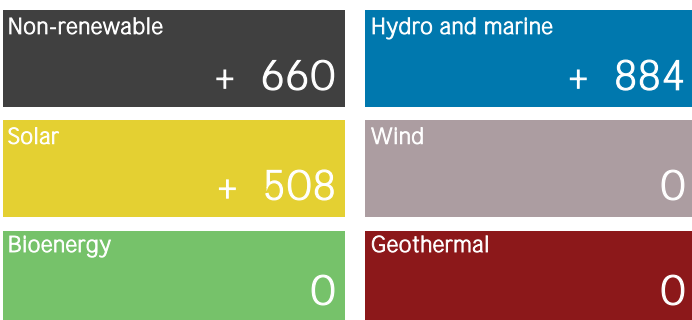
### Renewable capacity in 2024



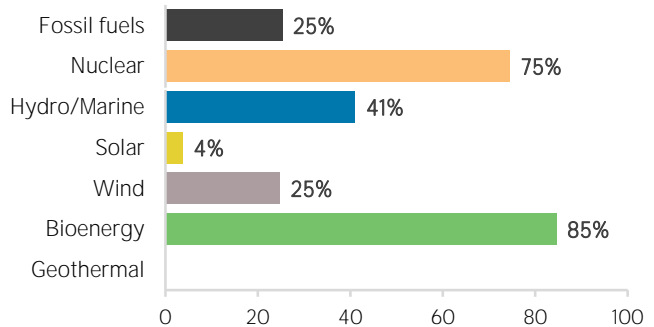
### Net capacity change (GW)



### Net capacity change in 2024 (MW)



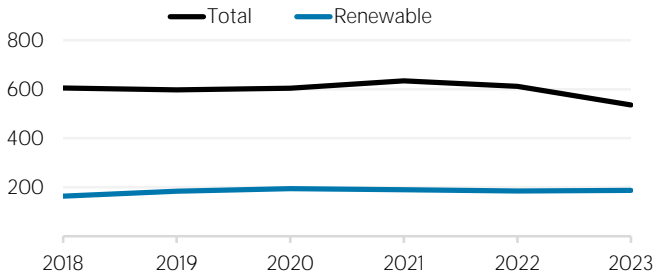
### Capacity utilisation in 2023 (%)



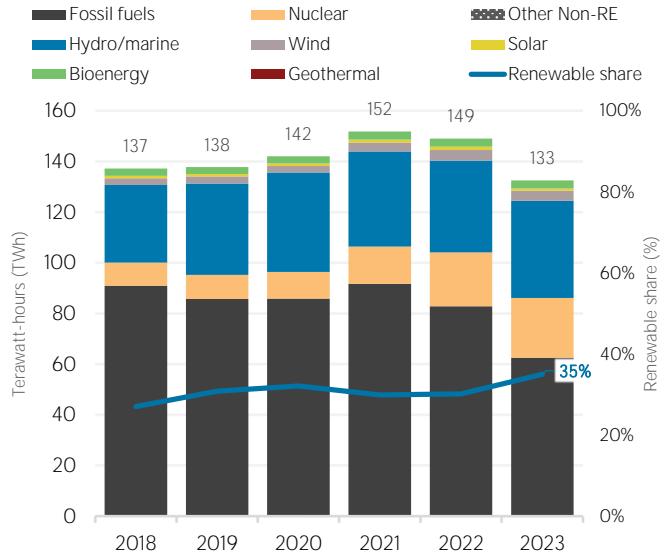
## ELECTRICITY GENERATION

Generation in 2023	GWh	%
<b>Non-renewable</b>	<b>86 158</b>	<b>65</b>
<b>Renewable</b>	<b>46 406</b>	<b>35</b>
Hydro and marine	38 295	29
Solar	900	1
Wind	4 009	3
Bioenergy	3 202	2
Geothermal	0	0
<b>Total</b>	<b>132 564</b>	<b>100</b>

### Per capita electricity generation (kWh)



### Electricity generation trend

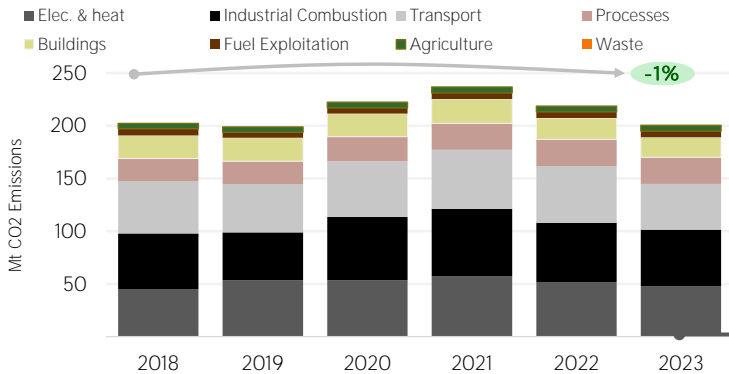


## LATEST POLICIES, PROGRAMMES AND LEGISLATION

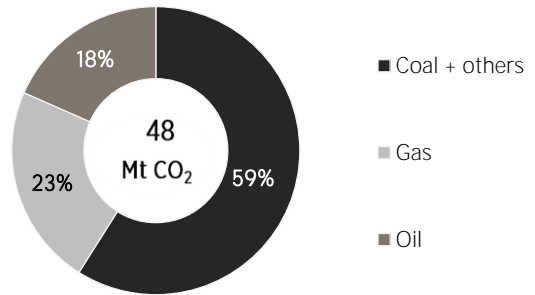
- 1 National Hazardous Waste Management Policy, 2022 2022
- 2 Pakistan Import Policy Order 2022 2022
- 3 Revised/Updated NDC of Pakistan 2021
- 4 Pakistan MEPS and labelling for electric fans 2016
- 5 Pakistan net metering policy for solar PV and wind projects 2015

## ENERGY AND EMISSIONS

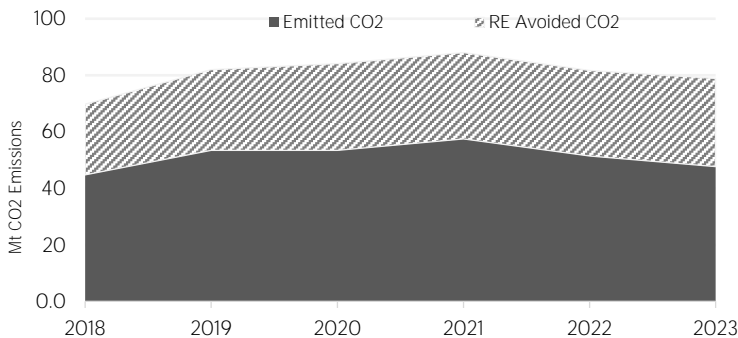
### CO<sub>2</sub> emissions by sector



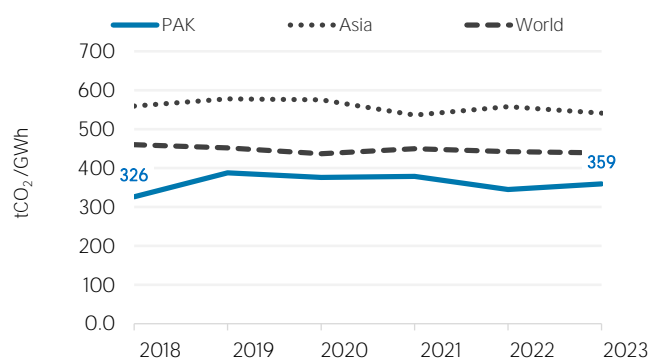
### Elec. & heat generation CO<sub>2</sub> emissions in



### Avoided emissions from renewable elec. & heat



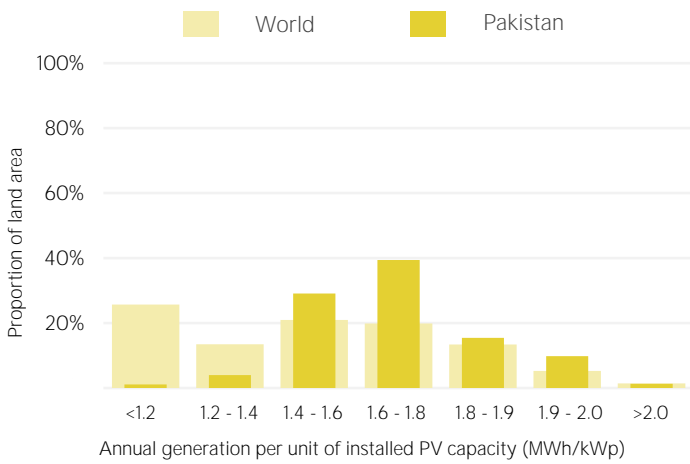
### CO<sub>2</sub> emission factor for elec. & heat generation



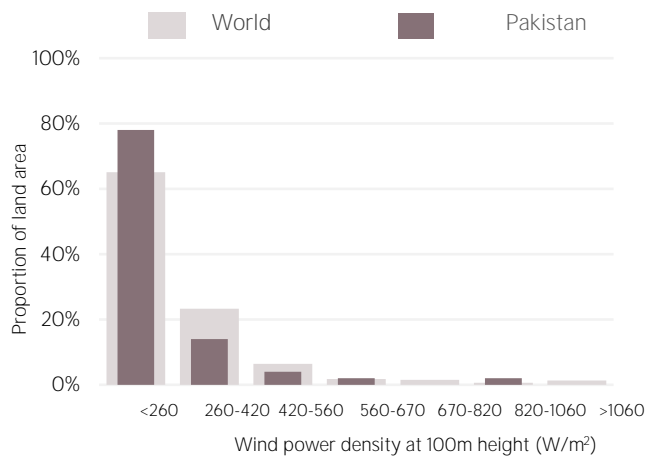
Avoided emissions based on fossil fuel mix used for power

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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