ENERGY PROFILE

# Switzerland

## SUSTAINABLE DEVELOPMENT GOAL 7: ENERGY INDICATORS (2018)

| | | | |
|---|---|---|---|
| Renewable energy (% of TFEC) | 24.2 | Access to electricity (% of population) | 100.0 |
| Energy efficiency (MJ per $1 of GDP) | 1.7 | Access to clean cooking (% of population) | >95 |
| Public flows renewables (2018 USD M) | n.a. | Per capita renewable capacity (W/person) | n.a. |

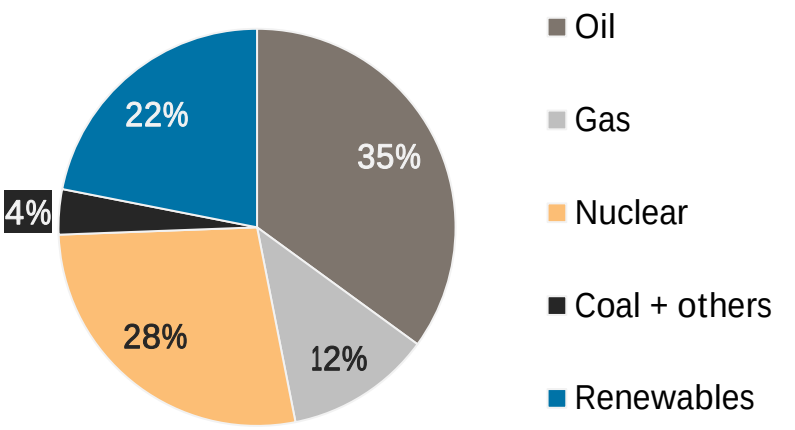
## TOTAL PRIMARY ENERGY SUPPLY (TPES)

| TPES | 2013 | 2018 |
|---|---|---|
| Non-renewable (TJ) | 890 928 | 785 845 |
| Renewable (TJ) | 206 242 | 220 528 |
| Total (TJ) | 1 097 170 | 1 006 373 |
| Renewable share (%) | 19 | 22 |

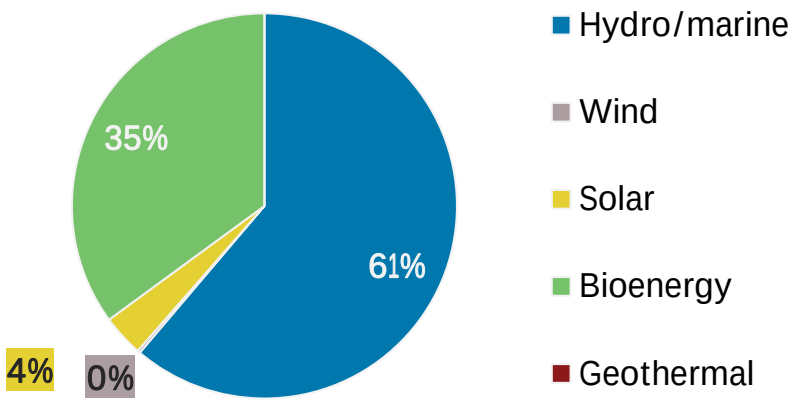
| Growth in TPES | 2013-18 | 2017-18 |
|---|---|---|
| Non-renewable (%) | -11.8 | +2.4 |
| Renewable (%) | +6.9 | -1.0 |
| Total (%) | -8.3 | +1.7 |

| Primary energy trade | 2013 | 2018 |
|---|---|---|
| Imports (TJ) | 775 324 | 674 688 |
| Exports (TJ) | 140 418 | 135 511 |
| Net trade (TJ) | - 634 906 | - 539 177 |
| Imports (% of supply) | 71 | 67 |
| Exports (% of production) | 27 | 26 |
| Energy self-sufficiency (%) | 48 | 52 |
| Net trade (USD million) | - 12 046 | - 6 761 |
| Net trade (% of GDP) | -1.7 | -0.9 |

Total primary energy supply in 2018




Renewable energy supply in 2018




## RENEWABLE ENERGY CONSUMPTION

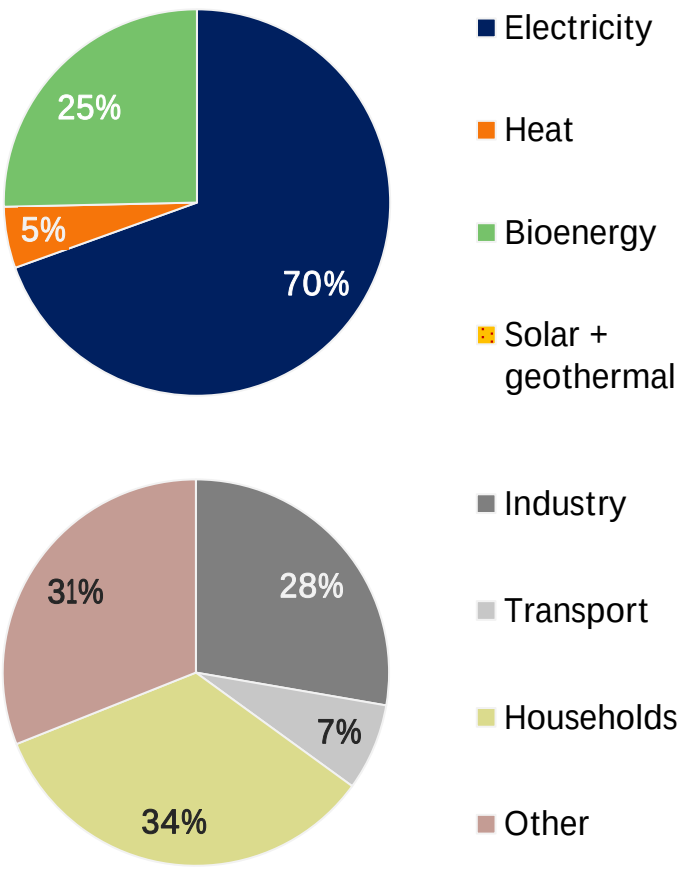
| Consumption by source | 2013 | 2018 |
|---|---|---|
| Electricity (TJ) | 126 333 | 133 172 |
| Heat (TJ) | 12 474 | 9 839 |
| Bioenergy (TJ) | 57 955 | 48 554 |
| Solar + geothermal (TJ) | 0 | 0 |
| **Total (TJ)** | **196 762** | **191 565** |
| Electricity share (%) | 64 | 70 |

| Consumption growth | 2013-18 | 2017-18 |
|---|---|---|
| Renewable electricity (%) | +5.4 | -2.2 |
| Other renewables (%) | -17.1 | +2.1 |
| **Total (%)** | **-2.6** | **-0.9** |

| Consumption by sector | 2013 | 2018 |
|---|---|---|
| Industry (TJ) | 54 399 | 53 101 |
| Transport (TJ) | 7 177 | 13 946 |
| Households (TJ) | 72 814 | 65 070 |
| Other (TJ) | 62 372 | 59 448 |

| | | |
|---|---|---|
| Renewable share of TFEC | 21.8 | 24.2 |

Renewable energy consumption in 2018



# ELECTRICITY CAPACITY AND GENERATION

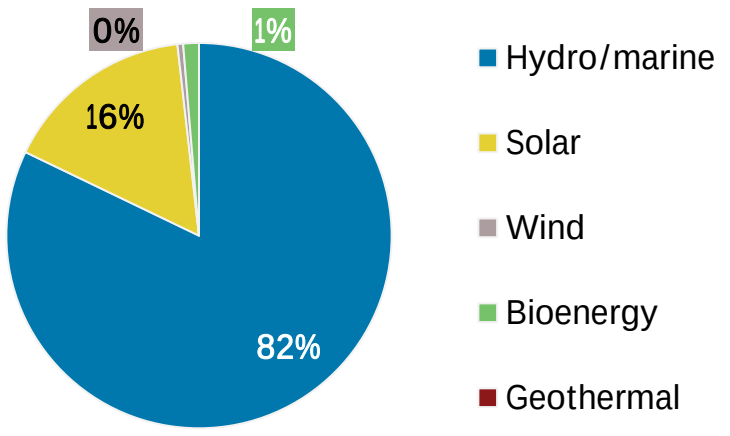
| Capacity in 2020 | MW | % |
|---|---|---|
| **Non-renewable** | **4 194** | **19** |
| **Renewable** | **18 314** | **81** |
| Hydro/marine | 15 043 | 67 |
| Solar | 2 943 | 13 |
| Wind | 87 | 0 |
| Bioenergy | 241 | 1 |
| Geothermal | 0 | 0 |
| **Total** | **22 508** | **100** |

| Capacity change (%) | 2015-20 | 2019-20 |
|---|---|---|
| **Non-renewable** | **- 8** | **- 8.8** |
| **Renewable** | **+ 22** | **+ 2.7** |
| Hydro/marine | + 13 | + 0.2 |
| Solar | + 111 | + 17.8 |
| Wind | + 45 | + 16.0 |
| Bioenergy | + 0 | 0.0 |
| Geothermal | 0 | 0.0 |
| **Total** | **+ 15** | **+ 0.4** |

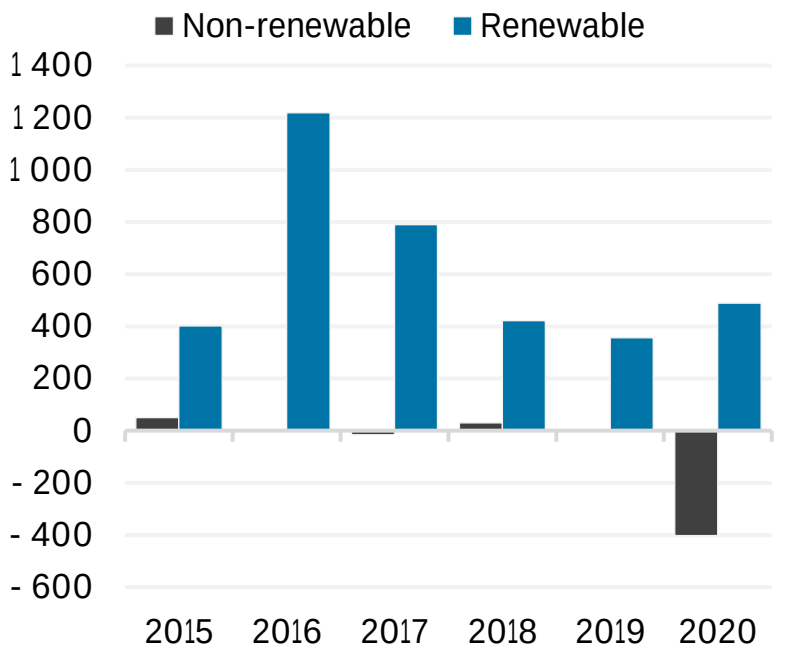
## Net capacity change in 2020 (MW)

| Non-renewable | Hydro and marine |
|---|---|
| - 403 | + 31 |
| **Solar** | **Wind** |
| + 445 | + 12 |
| **Bioenergy** | **Geothermal** |
| 0 | 0 |

## Renewable capacity in 2020

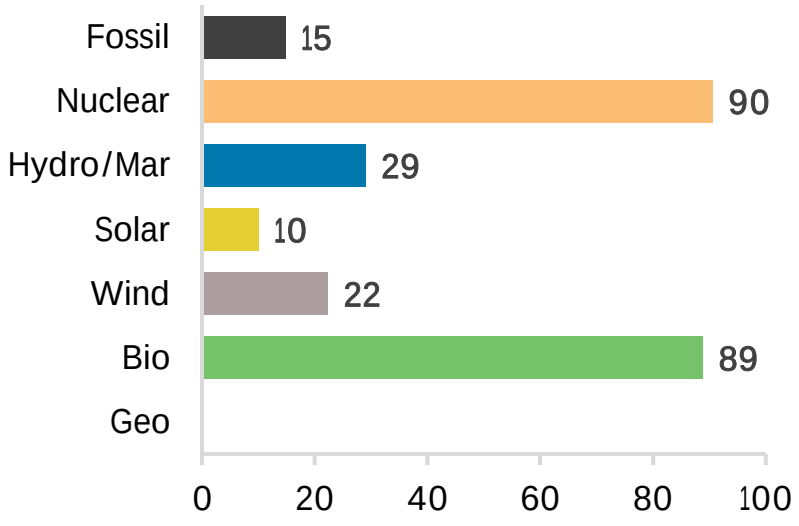



## Net capacity change (MW)

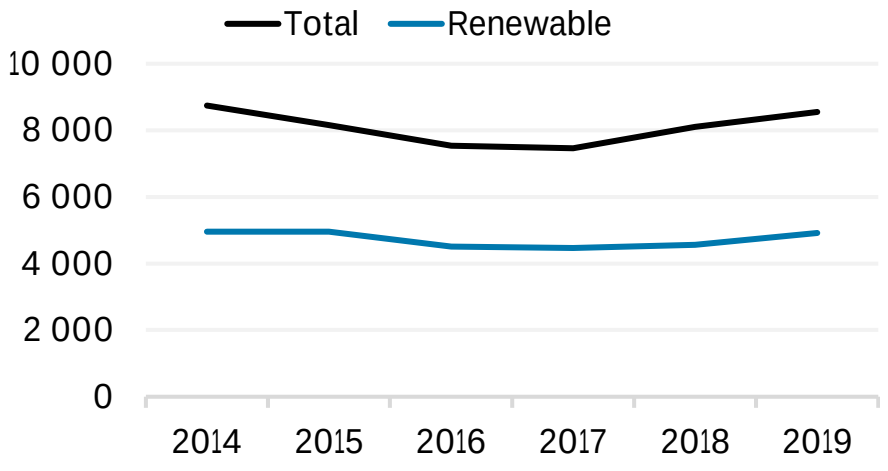



| Generation in 2019 | GWh | % |
|---|---|---|
| **Non-renewable** | **31 235** | **43** |
| **Renewable** | **42 238** | **57** |
| Hydro and marine | 38 040 | 52 |
| Solar | 2 178 | 3 |
| Wind | 146 | 0 |
| Bioenergy | 1 874 | 3 |
| Geothermal | 0 | 0 |
| **Total** | **73 473** | **100** |

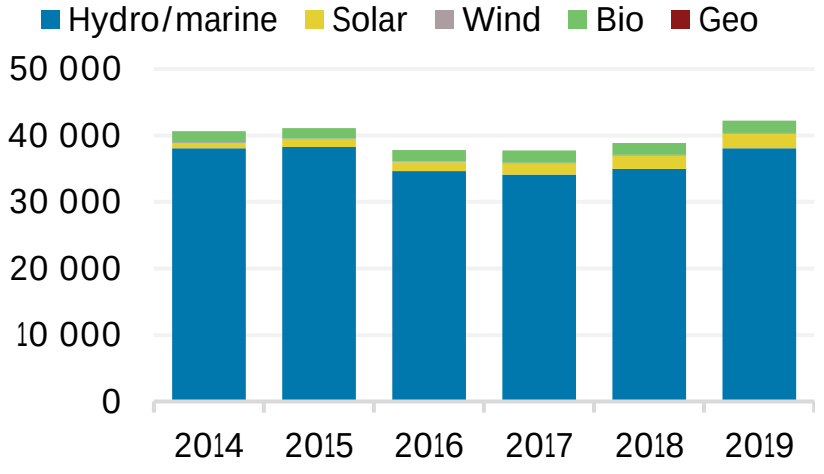
## Capacity utilisation in 2019 (%)




## Per capita electricity generation (kWh)




## Renewable generation (GWh)



## TARGETS, POLICIES AND MEASURES

### Most immediate clean energy targets & NDCs

| | year | target |
|---|---|---|
| **Renewable energy:** | | |
| Renewable electricity: | | |
| Renewable capacity: | | |
| Renewable transport: | | |
| Liquid Biofuel blending mandate: | | |
| Other transport targets: | | |
| Renewable heating/cooling: | | |
| Renewable Hydropower | | |
| Off-grid renewable technologies: | | |
| Energy efficiency (Energy): | | |
| Energy efficiency (Electricity): | | |

### Latest policies, programmes and legislation

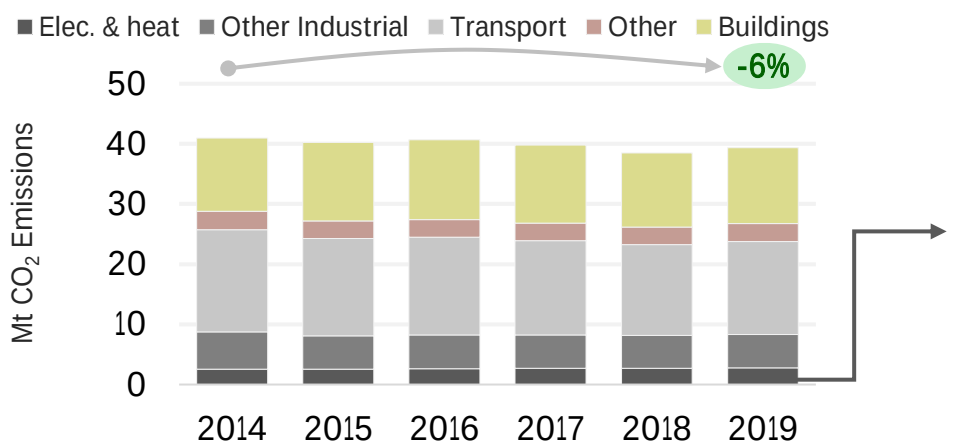
| | | |
|---|---|---|
| 1 | Incentives for rooftop solar (Solar PV rebate scheme) | 2020 |
| 2 | Feed-in Tariffs for RES and investment grants for small and large (>100kW) PV, hydropower, and biomass | 2018 |
| 3 | Law on Energy | 2018 |
| 4 | Market premium for large-scale hydropower | 2018 |
| 5 | Switzerland Energy Act of 30 September 2016 | 2018 |

### References to sustainable energy in Nationally Determined Contribution (NDC)

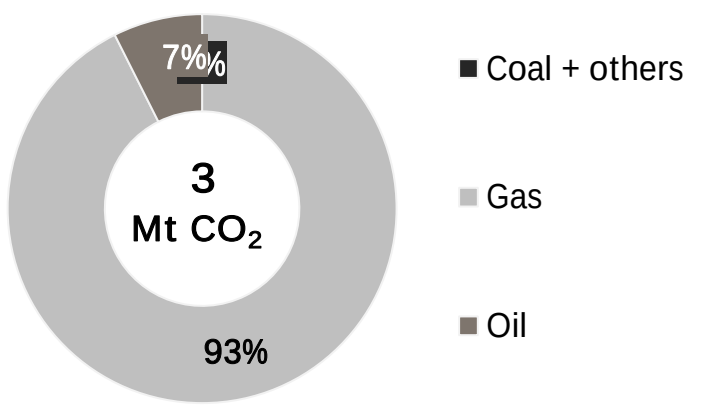
| | Conditional | Unconditional | unit |
|---|---|---|---|
| - Renewable energy | | | |
| - electricity | | | |
| - transport | | | |
| - heating/cooling | | | |
| - Energy efficiency | | | |

## ENERGY AND EMISSIONS

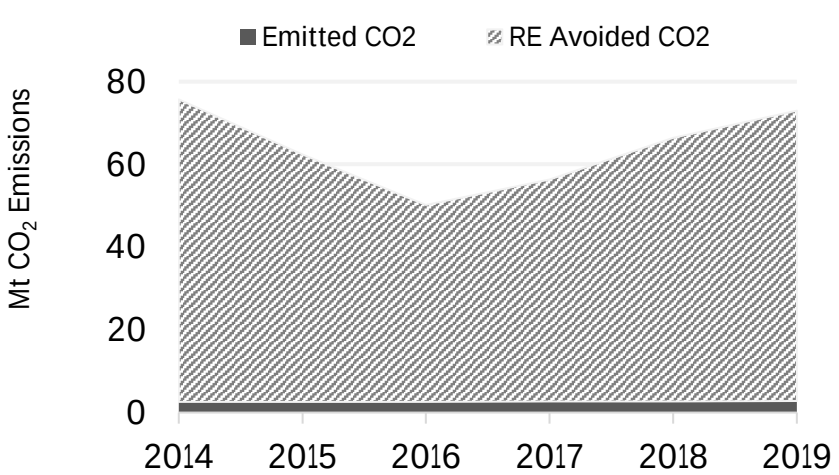
### Energy-related $CO_2$ emissions by sector




### Elec. & heat generation $CO_2$ emissions in 2019

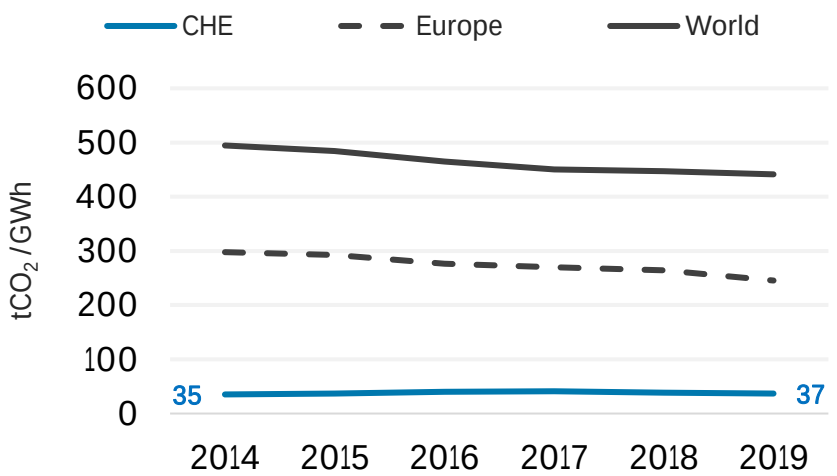



### Avoided emissions from renewable elec. & heat




*Avoided emissions based on fossil fuel mix used for power*

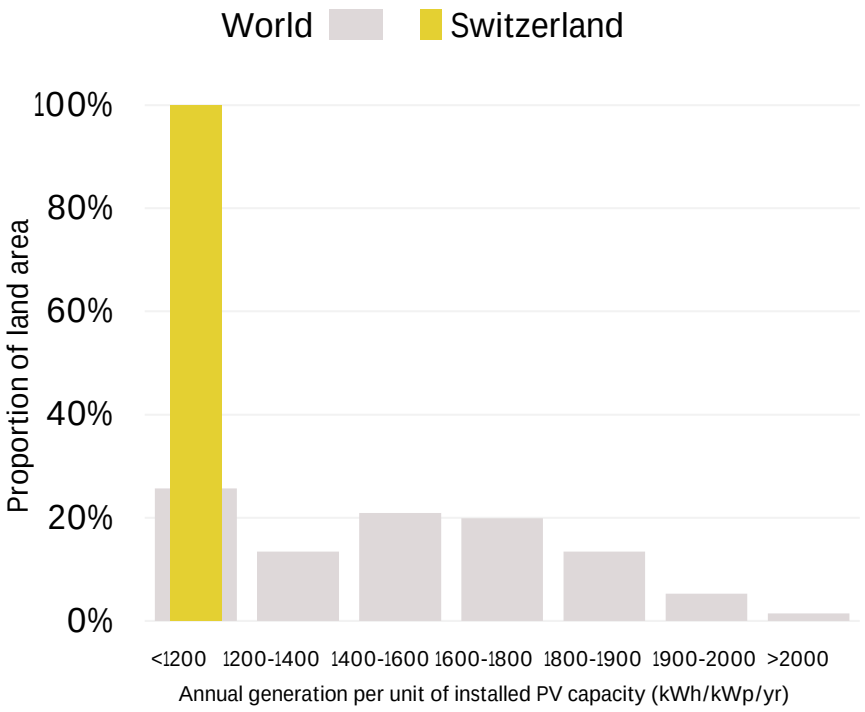
### $CO_2$ emission factor for elec. & heat generation



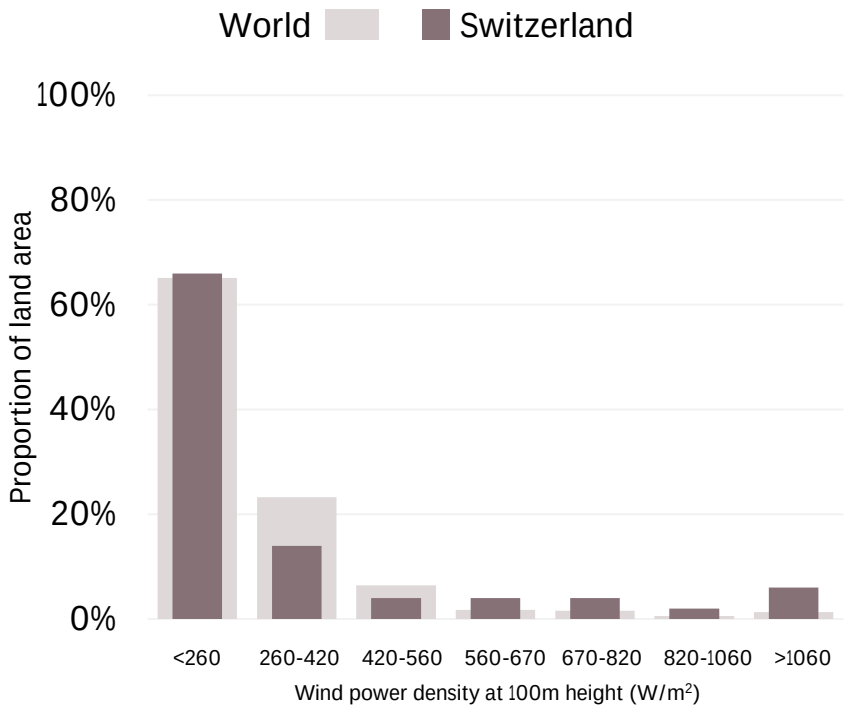

*Calculated by dividing power sector emissions by elec. + heat gen.*

# RENEWABLE RESOURCE POTENTIAL

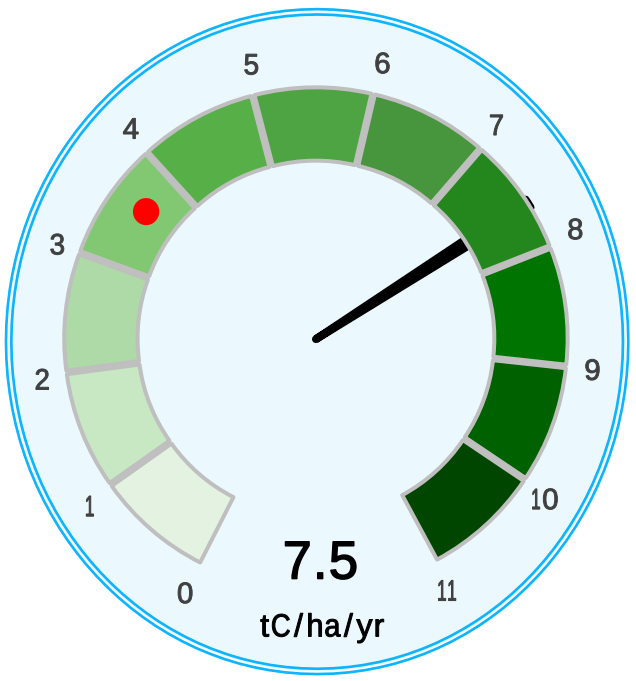
## Distribution of solar potential




## Distribution of wind potential




## Biomass potential: net primary production




●= 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 per year.

**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.

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IRENA
International Renewable Energy Agency

IRENA Headquarters
Masdar City
P.O. Box 236, Abu Dhabi
United Arab Emirates
www.irena.org