# Czechia

IRENA
International Renewable Energy Agency

## Sustainable Development Goal 7.2: Energy Indicators (2016)

| | | | |
|---|---|---|---|
| Renewable energy (% of TFEC) | 14.7 | Access to electricity (% of population) | 100.0 |
| Energy efficiency (MJ per $1 of GDP) | 5.3 | Access to clean cooking (% of population) | >95 |

## TOTAL PRIMARY ENERGY SUPPLY (TPES)

| TPES | 2011 | 2016 |
|---|---|---|
| Non-renewable (TJ) | 1 680 284 | 1 567 067 |
| Renewable (TJ) | 138 725 | 175 103 |
| Total (TJ) | 1 819 009 | 1 742 171 |
| Renewable share (%) | 8 | 10 |

| Growth in TPES | 2011-16 | 2015-16 |
|---|---|---|
| Non-renewable (%) | -6.7 | -1.1 |
| Renewable (%) | +26.2 | +1.0 |
| Total (%) | -4.2 | -0.9 |

| Primary energy trade | 2011 | 2016 |
|---|---|---|
| Imports (TJ) | 893 357 | 903 018 |
| Exports (TJ) | 365 753 | 323 901 |
| Net trade (TJ) | - 527 604 | - 579 117 |
| Imports (% of supply) | 49 | 52 |
| Exports (% of production) | 27 | 28 |
| Energy self-sufficiency (%) | 75 | 66 |
| Net trade (USD million) | - 9 027 | - 3 765 |
| Net trade (% of GDP) | -4.0 | -1.9 |

### Total primary energy supply in 2016



- Oil 19%
- Gas 17%
- Nuclear 15%
- Coal + others 39%
- Renewables 10%
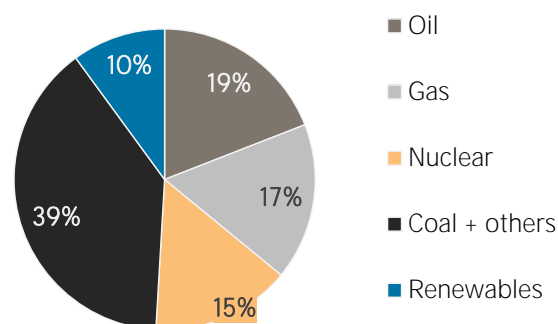
### Renewable energy supply in 2016



- Hydro/marine 4%
- Wind 1%
- Solar 5%
- Bioenergy 90%
- Geothermal
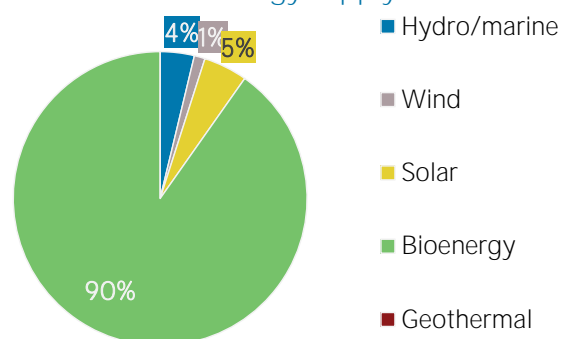
## RENEWABLE ENERGY CONSUMPTION

| Consumption by source | 2011 | 2016 |
|---|---|---|
| Electricity (TJ) | 18 701 | 24 618 |
| Direct bioenergy (TJ) | 98 165 | 115 546 |
| Direct solar+geothermal (TJ) | 455 | 787 |
| Total (TJ) | 117 321 | 140 951 |
| Electricity share (%) | 16 | 17 |

| Consumption growth | 2011-16 | 2015-16 |
|---|---|---|
| Renewable electricity (%) | +31.6 | +5.5 |
| Other renewables (%) | +18.0 | +2.0 |
| Total (%) | +20.1 | +2.6 |

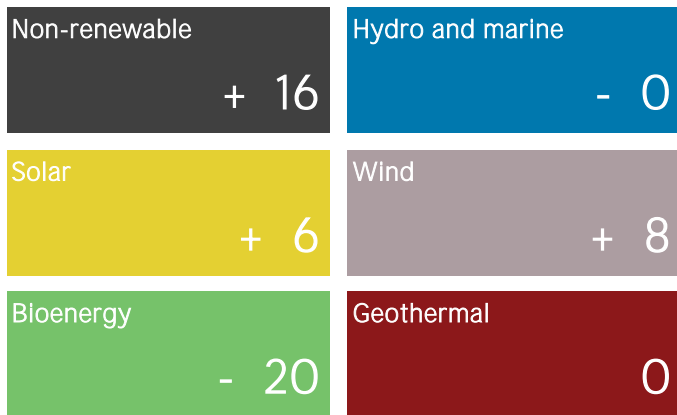| Consumption by sector | 2011 | 2016 |
|---|---|---|
| Industry (TJ) | 24 181 | 30 363 |
| Transport (TJ) | 13 052 | 13 254 |
| Households (TJ) | 70 387 | 81 569 |
| Other (TJ) | 9 701 | 15 766 |
| Renewable share of TFEC | 12.1 | 14.7 |

### Renewable energy consumption in 2016



- Electricity (TJ) 17%
- Direct bioenergy (TJ) 82%
- Direct solar+geothermal (TJ) 1%



- Industry (TJ) 22%
- Transport (TJ) 9%
- Households (TJ) 58%
- Other (TJ) 11%
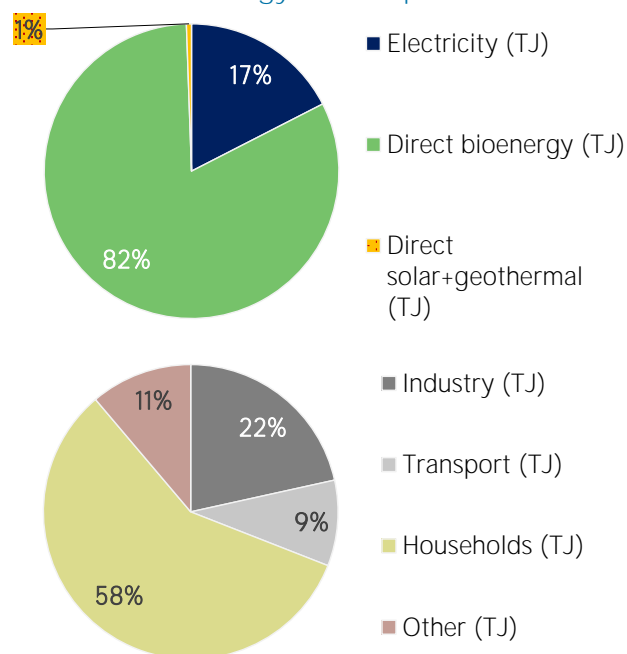
| Capacity in 2018 | MW | % |
|---|---|---|
| Non-renewable | 18 011 | 81 |
| Renewable | 4 265 | 19 |
| Hydro/marine | 1 093 | 5 |
| Solar | 2 075 | 9 |
| Wind | 316 | 1 |
| Bioenergy | 782 | 4 |
| Geothermal | 0 | 0 |
| Total | 22 276 | 100 |

| Capacity change (%) | 2013-18 | 2017-18 |
|---|---|---|
| Non-renewable | + 6 | + 0.1 |
| Renewable | + 4 | - 0.2 |
| Hydro/marine | + 1 | - 0.0 |
| Solar | + 1 | + 0.3 |
| Wind | + 21 | + 2.6 |
| Bioenergy | + 13 | - 2.5 |
| Geothermal | 0 | 0.0 |
| Total | + 6 | + 0.0 |

## Renewable capacity in 2018



- Hydro/marine — 26%
- Solar — 49%
- Wind — 7%
- Bioenergy — 18%
- Geothermal

## Net capacity change in 2018 (MW)

| Non-renewable | Hydro and marine |
|---|---|
| + 16 | - 0 |

| Solar | Wind |
|---|---|
| + 6 | + 8 |

| Bioenergy | Geothermal |
|---|---|
| - 20 | 0 |

## Net capacity change (MW)



Legend: Non-renewable, Renewable (years 2013–2018)
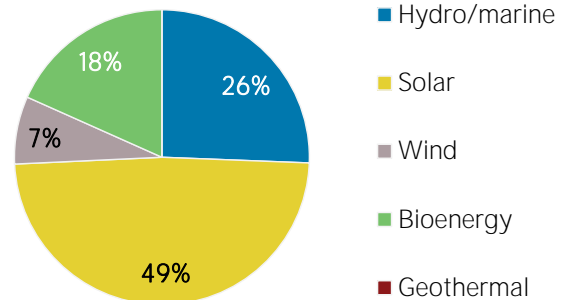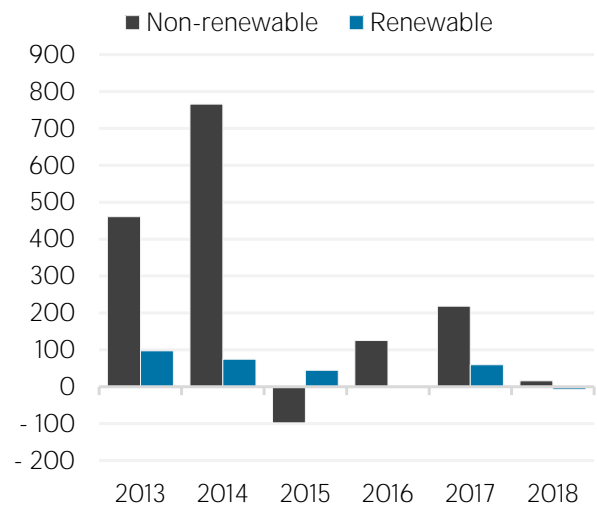
## Capacity utilisation in 2017 (%)



- Fossil — 44
- Nuclear — 75
- Hydro/Mar — 20
- Solar — 12
- Wind — 22
- Bio — 71
- Geo

| Generation in 2017 | GWh | % |
|---|---|---|
| Non-renewable | 77 429 | 89 |
| Renewable | 9 621 | 11 |
| Hydro and marine | 1 869 | 2 |
| Solar | 2 193 | 3 |
| Wind | 591 | 1 |
| Bioenergy | 4 967 | 6 |
| Geothermal | 0 | 0 |
| Total | 87 050 | 100 |

## Per capita electricity generation (kWh)



Legend: Total, Renewable (years 2012–2017)

## Renewable generation (GWh)



Legend: Hydro/marine, Solar, Wind, Bio, Geo (years 2012–2017)
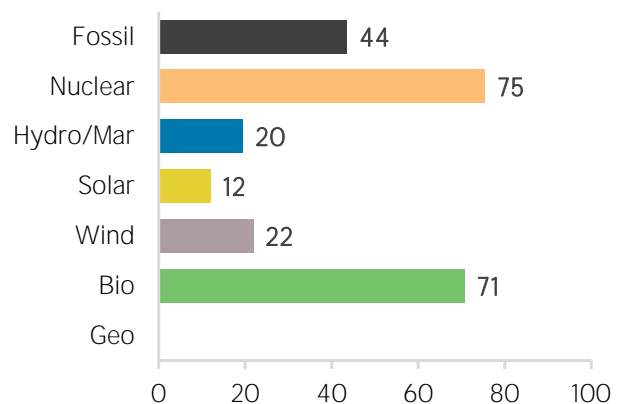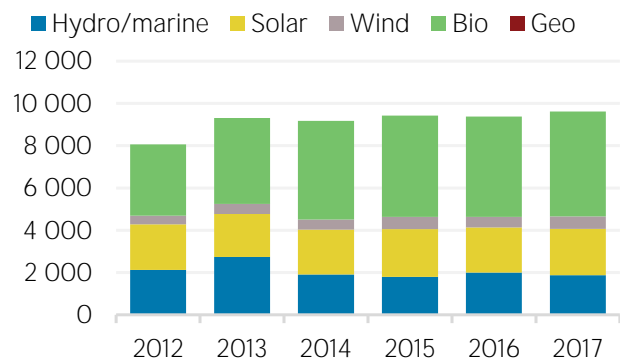
## Most immediate clean energy targets & NDCs

|  | year | target | unit |
|---|---|---|---|
| Renewable energy: | 2020 | 14 | % |
| Renewable electricity: | 2020 | 14 | % |
| Renewable capacity: | | | |
| Renewable transport: | 2020 | 11 | % |
|    Liquid Biofuel blending mandate: | | | |
|    Other transport targets: | | | |
| Renewable heating/cooling: | 2020 | 16 | % |
| Renewable Hydropower | | | |
| Off-grid renewable technologies: | | | |

Energy efficiency (Energy):

Energy efficiency (Electricity):

## Latest policies, programmes and legislation

| 1 | National Climate Change Plan / Climate Protection Policy | 2016 |
|---|---|---|
| 2 | Green Investment Scheme: NEW GREEN SAVINGS 2014+ | 2014 |
| 3 | Operational Programme Environment (2014-2020): Sustainable Use of Energy Sources | 2014 |
| 4 | Building Retrofit Subsidies: PANEL 2013+ programme | 2013 |
| 5 | Act on Promoted Energy Sources and on Amendment of Some Laws (Act No. 165/2012 Coll.) | 2012 |

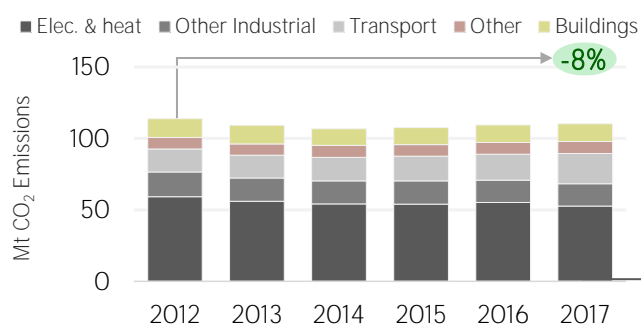## References to sustainable energy in Nationally Determined Contribution (NDC)

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

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



Legend: Elec. & heat · Other Industrial · Transport · Other · Buildings

-8%

Mt $CO_2$ Emissions — years 2012–2017

### Elec. & heat generation $CO_2$ emissions in 2017



7 Mt $CO_2$

50%  0%  95%

- Coal + others
- Gas
- Oil

### Avoided emissions from renewable power



Legend: Emitted CO2 · RE Avoided CO2

Mt $CO_2$ Emissions: Power — years 2012–2017
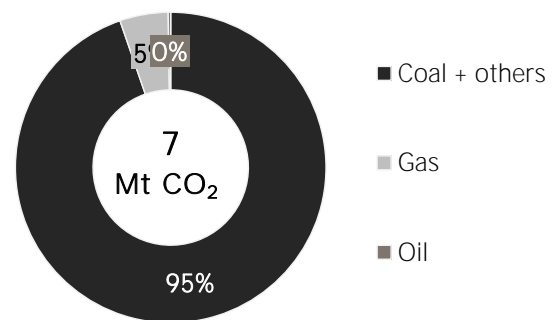
*Avoided emissions based on fossil fuel mix used for power*
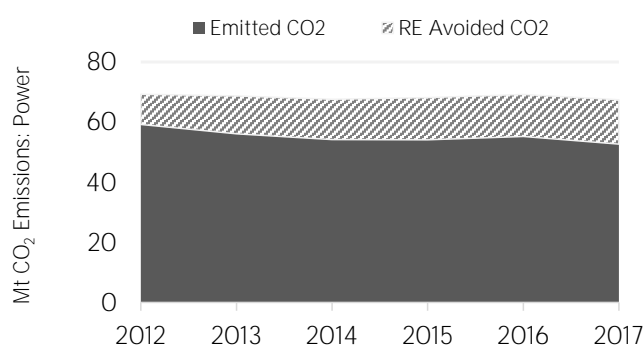
### Reduction in power emissions due to RE in 2017



Legend: Other Countries · Czechia · Average

Share of Avoided Emissions — SVK ROU HUN BLR CZE UKR POL BGR RUS MDA

*Reduction is RE Avoided divided by sum of avoided and emitted*

# RENEWABLE RESOURCE POTENTIAL

## Distribution of solar potential

World ▢   Czechia ▮ (yellow)

Proportion of land area

100% / 80% / 60% / 40% / 20% / 0%

<1200 | 1200-1400 | 1400-1600 | 1600-1800 | 1800-1900 | 1900-2000 | >2000

Annual generation per unit of installed PV capacity (kWh/kWp/yr)
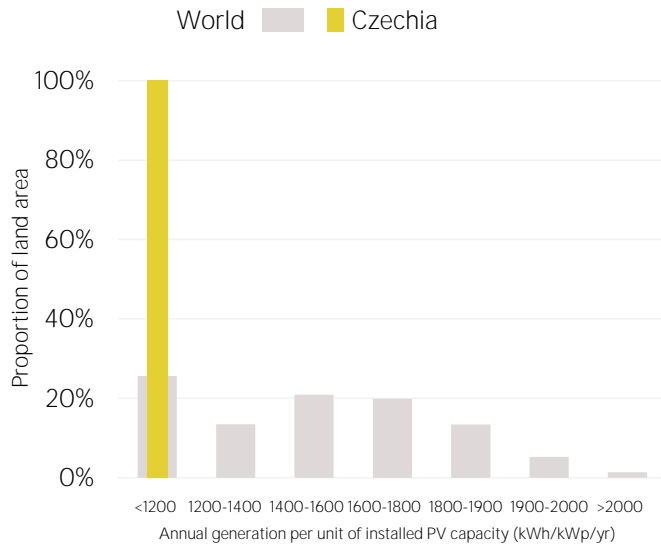
## Distribution of wind potential

World ▢   Czechia ▮

Proportion of land area

100% / 80% / 60% / 40% / 20% / 0%

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

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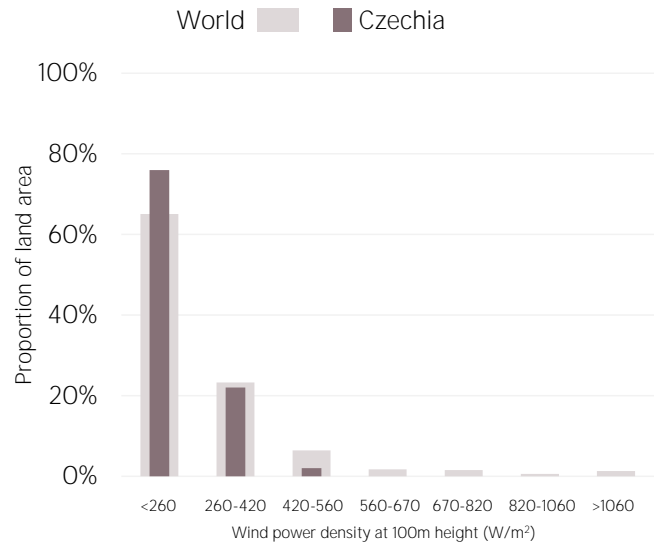
## Biomass potential: net primary production



5.5 tC/ha/yr

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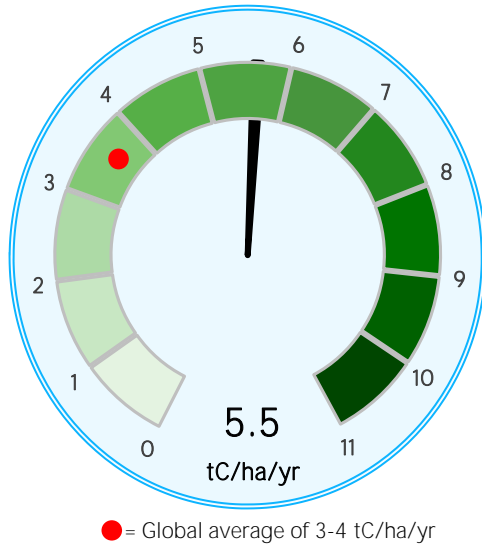
## Indicators of renewable resource potential

**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 Indicators Database (original sources: WHO; World Bank; IEA; IRENA; and UNSD); 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:** Energy self-sufficiency has been defined as total primary energy production divided by total primary energy supply. The value of energy trade has been defined as including all commodities in Chapter 27 of the Harmonised System (HS). Capacity utilisation has been calculated as annual generation divided by capacity x 8,760. Avoided emissions from renewable power have been 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.

This note has been produced to provide policy makers with a brief overview of developments in renewable energy in a country. 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