Denmark

**ENERGY PROFILE**

**COUNTRY INDICATORS AND SDGS**

### Total Energy Supply (TES)

<table>
<thead>
<tr>
<th></th>
<th>2015</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-renewable (TJ)</td>
<td>467 210</td>
<td>381 450</td>
</tr>
<tr>
<td>Renewable (TJ)</td>
<td>209 653</td>
<td>260 845</td>
</tr>
<tr>
<td>Total (TJ)</td>
<td>676 863</td>
<td>642 296</td>
</tr>
<tr>
<td>Renewable share (%)</td>
<td>31</td>
<td>41</td>
</tr>
</tbody>
</table>

**Growth in TES 2015-20**

<table>
<thead>
<tr>
<th></th>
<th>2015</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-renewable (%)</td>
<td>-18.4</td>
<td>-8.0</td>
</tr>
<tr>
<td>Renewable (%)</td>
<td>-24.4</td>
<td>+2.8</td>
</tr>
<tr>
<td>Total (%)</td>
<td>-5.1</td>
<td>-3.9</td>
</tr>
</tbody>
</table>

### Primary energy trade

<table>
<thead>
<tr>
<th></th>
<th>2015</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imports (TJ)</td>
<td>791 007</td>
<td>770 746</td>
</tr>
<tr>
<td>Exports (TJ)</td>
<td>690 510</td>
<td>452 864</td>
</tr>
<tr>
<td>Net trade (TJ)</td>
<td>-100 497</td>
<td>-317 882</td>
</tr>
<tr>
<td>Imports (% of supply)</td>
<td>117</td>
<td>120</td>
</tr>
<tr>
<td>Exports (% of production)</td>
<td>104</td>
<td>109</td>
</tr>
<tr>
<td>Energy self-sufficiency (%)</td>
<td>98</td>
<td>59</td>
</tr>
</tbody>
</table>

### Total energy supply in 2020

- Oil: 41%
- Gas: 37%
- Nuclear: 9%
- Coal + others: 14%
- Renewables: 9%

### Renewable energy supply in 2020

- Hydro/marine: 24%
- Wind: 74%
- Solar: 2%
- Bioenergy: 0%
- Geothermal: 0%

### Energy intensity

7.3.1

### Access to electricity (% population)

- 2015: 10.7
- 2016: 9.8
- 2017: 9.8
- 2018: 10.0
- 2019: 9.7
- 2020: 9.7

### Access to clean cooking (% population)

7.1.2

### Air particulate matter (PM$_{2.5}$)

11.6.2

### Real GDP growth rate

8.1.1

### GDP per capita

GDP per capita - 59.7

### PM$_{2.5}$ (μm/m$^3$)

- Urban: 10.7
- Average: 9.8
- Rural: 10.0
- WHO safe: 9.7

### Energy intensity

7.3.1

### Per capita renewable capacity

7.b.1

### Public flows to renewables

7.a.1

### Energy self-sufficiency (%)

- 2015: 98
- 2020: 59
### Consumption by sector

<table>
<thead>
<tr>
<th>Sector</th>
<th>2015</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry (TJ)</td>
<td>27,141</td>
<td>34,904</td>
</tr>
<tr>
<td>Transport (TJ)</td>
<td>9,694</td>
<td>11,970</td>
</tr>
<tr>
<td>Households (TJ)</td>
<td>95,664</td>
<td>110,873</td>
</tr>
<tr>
<td>Other (TJ)</td>
<td>184,454</td>
<td>247,921</td>
</tr>
</tbody>
</table>

### Renewable TFEC trend

<table>
<thead>
<tr>
<th>Year</th>
<th>Fossil fuels</th>
<th>Commercial heat</th>
<th>Bioenergy</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>317</td>
<td>339</td>
<td>366</td>
</tr>
<tr>
<td>2016</td>
<td>339</td>
<td>366</td>
<td>372</td>
</tr>
<tr>
<td>2017</td>
<td>366</td>
<td>372</td>
<td>386</td>
</tr>
<tr>
<td>2018</td>
<td>372</td>
<td>386</td>
<td>406</td>
</tr>
<tr>
<td>2019</td>
<td>386</td>
<td>406</td>
<td>435</td>
</tr>
<tr>
<td>2020</td>
<td>406</td>
<td>435</td>
<td>470</td>
</tr>
</tbody>
</table>

### Electricity Capacity

<table>
<thead>
<tr>
<th>Year</th>
<th>Fossil fuels</th>
<th>Nuclear</th>
<th>Hydro/marine</th>
<th>Wind</th>
<th>Solar</th>
<th>Bioenergy</th>
<th>Geothermal</th>
<th>Other Non-RE</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>14</td>
<td>14</td>
<td>14</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>17</td>
<td>0</td>
<td>70</td>
</tr>
<tr>
<td>2016</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>17</td>
<td>17</td>
<td>18</td>
<td>0</td>
<td>80</td>
</tr>
<tr>
<td>2017</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>17</td>
<td>17</td>
<td>18</td>
<td>0</td>
<td>80</td>
</tr>
<tr>
<td>2018</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>17</td>
<td>17</td>
<td>18</td>
<td>0</td>
<td>80</td>
</tr>
<tr>
<td>2019</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>17</td>
<td>17</td>
<td>18</td>
<td>0</td>
<td>80</td>
</tr>
<tr>
<td>2020</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>17</td>
<td>17</td>
<td>18</td>
<td>0</td>
<td>80</td>
</tr>
</tbody>
</table>

### Renewable energy consumption in 2020

- **Non-renewable**: 5,385 (30%)
- **Renewable**: 12,366 (70%)
  - **Hydro/marine**: 5 (0%)
  - **Solar**: 3,122 (18%)
  - **Wind**: 7,088 (40%)
  - **Bioenergy**: 2,151 (12%)
  - **Geothermal**: 0 (0%)

### Capacity utilisation in 2021 (%)

- **Fossil fuels**: 13%
- **Nuclear**: 26%
- **Hydro/Marine**: 47%
- **Solar**: 10%
- **Wind**: 28%
- **Bioenergy**: 47%
- **Geothermal**: 0%

### Net capacity change in 2022 (GW)

- **Non-renewable**: -234
- **Solar**: +1,418
- **Wind**: +67
- **Bioenergy**: +1
- **Hydro and marine**: -2
### ELECTRICITY GENERATION

**Generation in 2021**
- **GWh**
- **%**
  - Non-renewable: 6,953 (21)
  - Renewable:
    - Hydro and marine: 26,096 (79)
    - Solar: 1309 (4)
    - Wind: 16,054 (49)
    - Bioenergy: 8,716 (26)
    - Geothermal: 0 (0)
  - Total: 33,049 (100)

**Per capita electricity generation (kWh)**

**Energy and Emissions**

**Avoided emissions from renewable elec. & heat**

**CO₂ emission factor for elec. & heat generation**

**Electricity generation trend**

**LATEST POLICIES, PROGRAMMES AND LEGISLATION**

1. Power-to-X tender
2. 2023 Inflation support measures
3. Danish Energy Agency publishes guidelines for saving energy
4. District Heating Pool
5. DKK 45.9 million to develop green refuelling and charging infrastructure for taxis, trucks and buses

**ENERGY AND EMISSIONS**

**Energy-related CO₂ emissions by sector**

**Elect. & heat generation CO₂ emissions in**

**CO₂ emission factor for elec. & heat generation**

**Per capita emissions**

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

Calculated by dividing power sector emissions by elec. + heat gen.
**Distribution of solar potential**

- **World**: Proportion of land area in different annual generation per unit of installed PV capacity (MWh/kWp) classes.
- **Denmark**: Proportion of land area in the same classes.

**Distribution of wind potential**

- **World**: Proportion of land area in different wind power density at 100m height (W/m²) classes.
- **Denmark**: Proportion of land area in the same classes.

**Biomass potential: net primary production**

- Global average: 3-4 tC/ha/yr
- Chart showing average NPP in the country (tC/ha/yr), compared to the global average NPP 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.

**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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