# ENERGY PROFILE

# Denmark

# International Renewable Energy Agency



# COUNTRY INDICATORS AND SDGS





#### 7.a.1 Public flows to renewables 1.0 0.9 0.8 0.7 USD millions 2019 0.6 0.5 0.4 0.3 0.2 0.1 • 0 2019 2020 2021 2016 2017 2018



11.6.2 Air particulate matter ( $PM_{2.5}$ )



# TOTAL ENERGY SUPPLY (TES)

Total Energy Supply (TES)	2016	2021
Non-renewable (TJ)	478 153	385 848
Renewable (TJ)	224 338	301 770
Total (TJ)	702 491	687 619
Renewable share (%)	32	44
Growth in TES	2016-21	2020-21
Non-renewable (%)	-19.3	+1.2



Renewable (%)	+34.5	+15.7
Total (%)	-2.1	+7.1

Primary energy trade	2016	2021
Imports (TJ)	766 943	708 602
Exports (TJ)	660 622	472 207
Net trade (TJ)	- 106 321	- 236 395
Imports (% of supply)	109	103
Exports (% of production)	103	120
Energy self-sufficiency (%)	91	57

Renewable energy supply in 2021



# RENEWABLE ENERGY CONSUMPTION (TFEC)



#### Renewable TFEC trend



## ELECTRICITY CAPACITY

 $\bigcap$ 



#### Net capacity change in 2023 (MW)

 $\bigcap$ 

Hydro and marine

Non-renewable

# Installed capacity trend



#### Net capacity change (GW)





# Capacity utilisation in 2022 (%)



# ELECTRICITY GENERATION

Generation in 2022	GWh	%
Non-renewable	6 611	19
Renewable	28 518	81
Hydro and marine	15	0
Solar	2 203	6
Wind	19 028	54
Bioenergy	7 273	21
Geothermal	0	0
Total	35 129	100

## Electricity generation trend



## Per capita electricity generation (kWh)

![](_page_2_Figure_5.jpeg)

# LATEST POLICIES, PROGRAMMES AND LEGISLATION

1 Power-to-X tender	2023
2 2023 Inflation support measures	2022
3 Danish Energy Agency publishes guidelines for saving energy	2022
4 District Heating Pool	2022
5 DKK 45.9 million to develop green refuelling and charging infrastructure for taxis, trucks and buses	2022

![](_page_2_Figure_8.jpeg)

2022

![](_page_2_Figure_9.jpeg)

Avoided emissions based on tossil tuel mix used tor power

2017

Mt CO2 Emissions

2018

2019

2020

2021

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

#### RENEWABLE RESOURCE POTENTIAL

## World Denmark 100% 80% Proportion of land area 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 solar potential

#### Biomass potential: net primary production

![](_page_3_Figure_3.jpeg)

# 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<sup>2</sup>) 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

# Distribution of wind potential

![](_page_3_Figure_9.jpeg)

![](_page_3_Figure_10.jpeg)

# 🐼 IRENA International Renewable Energy Agency

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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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