Denmark - Rural Energy Data

130 million people live in rural areas across Europe. These communities matter and need to be understood. To deliver a just energy transition, policy should reflect conditions in rural areas. However, data is often difficult to find.

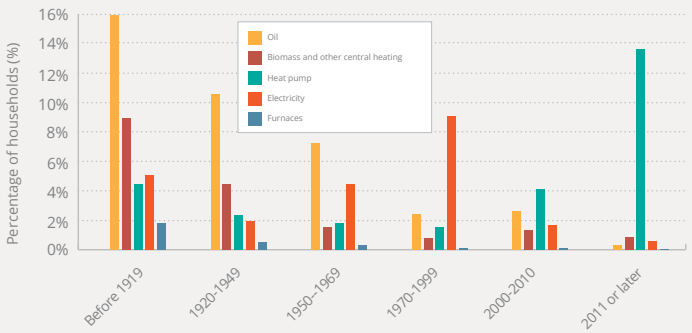
This series of country-profiles provides the reader with an accessible overview of the key rural energy challenges in selected EU member states and brings together important datapoints in an accessible review.

Rural Energy Matters

- **The building stock in Denmark is old.** Most homes (74%) were built before 1980. Heating oil and biomass are used more prominently in the oldest dwellings, which are typically less energy efficient and harder to upgrade.
- **Rural greenhouse gas emissions (GHG) have fallen.** Since 1990, Denmark's rural emissions have fallen by 78%, due to reductions in oil and coal emissions. Emissions have continued to fall recently, by 2% since 2016.

AGE BREAKDOWN OF BUILDINGS IN DENMARK

Fuel use for heating (excluding district and natural gas)

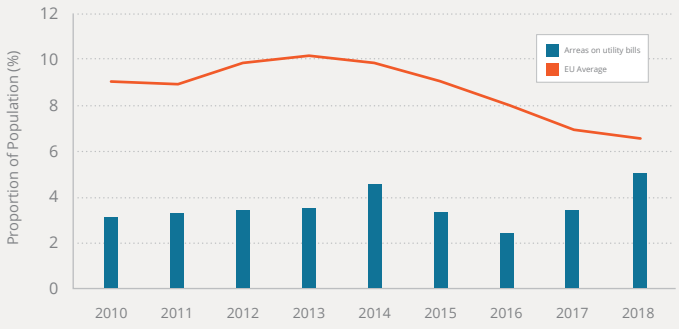


- In Denmark, most homes are heated via district heating (~64%). However, ~40% of the energy mix comes from fossil fuels.
- Older properties are more commonly heated by oil (typical off-grid fuel) or biomass. These homes are relatively less energy efficient and have higher fuel bills than modern homes.
- There are around 252,000 oil-fired boilers used for household heating – 9% of total domestic heating installations.
- For the whole building stock, the majority of homes (74%) are relatively old and were built before 1980. In 1979, the Danish building code (BR77) was enforced with demanding energy efficiency requirements.

Source: StatBank Denmark and Danish Energy Agency

ENERGY POVERTY IN DENMARK

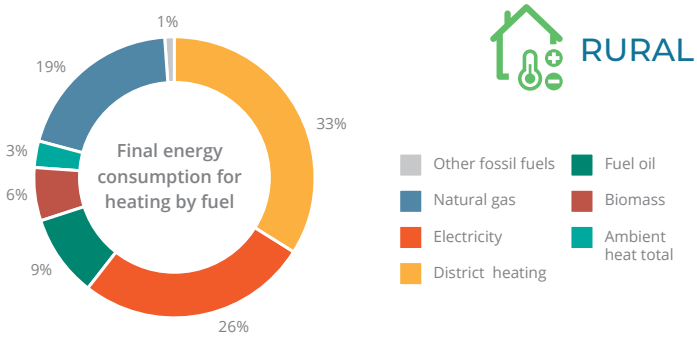
Energy Poverty in Denmark



- Energy poverty in Denmark has gradually been increasing since 2010, with 5% of the population with arrears on utility bills in 2018.
- However, in comparison to the EU average, this is much lower. Energy poverty is less of an issue in Denmark than elsewhere in Europe.

Source: Eurostat

RURAL HEAT DEMAND



The majority of final energy consumption for heating in Denmark is derived from district heating (33%), biomass (26%), and natural gas (19%).

In rural areas, where district heating is often not available, the consumption of biomass is more likely. Biomass generates high local emissions. Heating oil, which is carbon-intensive and generates local emissions, is also consumed in off-grid areas.

Source: DG Energy

A FREE (Future of Rural Energy in Europe) report with data provided by Ecuity Consulting and supported by SHV Energy

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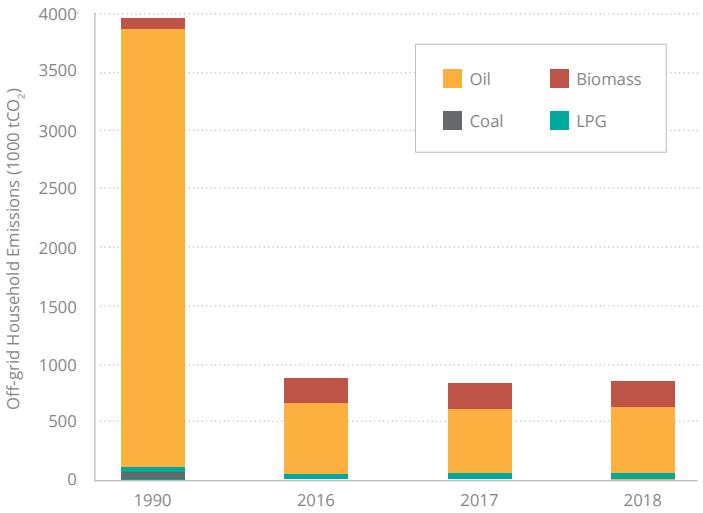
RURAL CO_2 EMISSIONS TRAJECTORY

Off-grid household emissions have fallen over time



- CO_2 emissions from rural fuel* consumption have fallen by 78% since 1990, due to a 90% reduction in emissions from oil consumption.
- Since 2016, rural emissions have fallen by 2% with a switch from oil, to biomass and LPG.
- Denmark's greenhouse gas (GHG) emissions stand at 50.8 million tonnes (Mt) CO_2e. This has fallen 29% from 1990 emissions (72.1 MtCO_2e).
- Per capita emissions are at 8.8 tCO_2e, which are down 36% from 2000 levels (13.7 t CO_2e).

Sources: Eurostat energy balance data, GHG emissions, emissions per capita
* here defined as heating oil, coal, LPG and biomass

RURAL AIR QUALITY CHALLENGES

Rural air quality in Denmark is less of an issue than elsewhere in Europe

Map of the rural air quality station reporting $PM_{2.5}$ emissions in 2017

- In Denmark, fine particulate matter ($PM_{2.5}$) exposure has been attributed to 2,700 premature deaths in 2016.
- $PM_{2.5}$ emissions caused estimated damage costs of €1.3 billion in 2017.
- However, the rural air quality monitoring station did not report $PM_{2.5}$ background emission levels in exceedance of WHO guidelines in 2017 (emission limits of 10 µg/m³ per calendar year).

Source: European Environment Agency, WHO and OECD

RURAL ENERGY MATTERS

Rural areas account for 12% of Denmark's population. These rural communities are often not connected to the natural gas grid. As a substitute, heating oil and solid fuels are widely consumed for heating purposes.

Decarbonising heat will be necessary if Denmark is to meet its climate change targets. To do this in a just and effective way, policymakers need to balance emission reduction, air quality and energy affordability challenges, all of which impact Denmark's rural communities.

The Future of Rural Energy in Europe (FREE) initiative was created by SHV Energy in 2010 to promote the use of sustainable energy within rural communities. FREE is supported by a variety of stakeholder groups, together giving a voice to all those who believe that rural energy needs are important, and aiming to add new perspectives to the EU's energy and climate debate. Identifying untapped potential in Europe's rural areas to decarbonise and improve air quality in a cost-effective manner. Filling in rural energy data gaps. Engaging and supporting rural communities is essential if government energy, climate and environment policies are to be realised.