

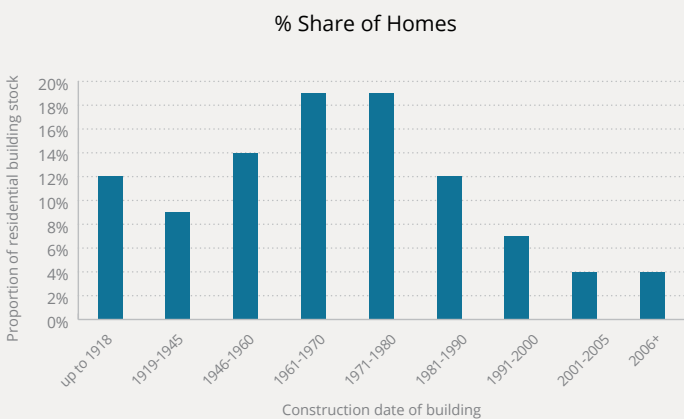
130 million people live in rural areas across Europe. These communities matter and need to be understood. To deliver a just energy transition, policy should reflect conditions in rural areas. However, data is often difficult to find.

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

- **Rural air quality is a problem.** Around 90% of air quality measurement stations reported PM_{2.5} emissions above WHO guideline levels. This was equivalent to an estimated €11.5 billion of damage costs to the economy.
- **Household PM emissions have risen sharply.** Household PM emissions have increased nine fold due to a surge in biomass consumption. Italy's bioenergy market has grown rapidly to meet its 2020 renewable energy target.
- **Energy poverty is a problem.** 14% of Italy's population reported they were unable to keep their home warm.

AGE BREAKDOWN OF ITALIAN BUILDINGS

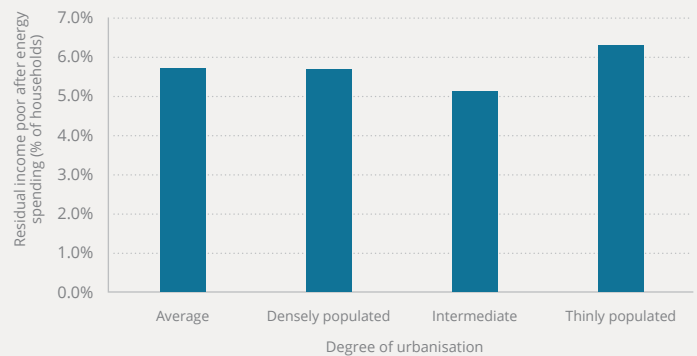


- As a large proportion of Italian homes (54%) were built before 1971, the Italian building stock is old. These homes are more likely to be off-grid, with 14% of the stock using solid fuels, and 5% using oil.
- Older homes are typically less energy efficient and have higher fuel bills than modern homes.

Source: [ISTAT](#)

ENERGY POVERTY IN RURAL ITALY

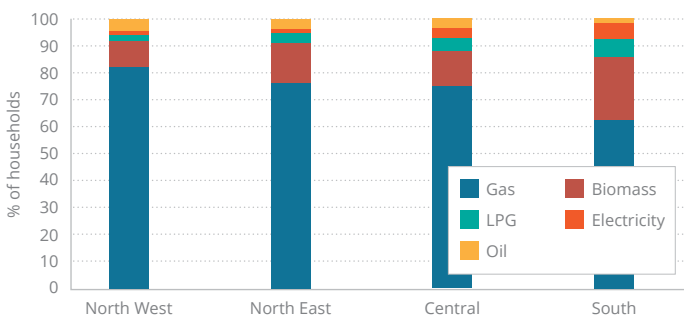
Over 6% of rural homes are residual income poor after energy spending



- Energy poverty is an issue across the country in Italy, with 6.3% of the population in thinly populated areas unable to afford to pay their energy bills in 2011. This is above the national average for Italy as a whole (5.7%).
- 14% of the population reported they were unable to keep their home warm.

Source: [Bocconi University](#) and [Eurostat](#)

Final energy consumption for heating by fuel
% of households by main heating type



Source: [ISTAT](#), [Ecofys](#)

RURAL HEAT DEMAND

~70% of households use natural gas to provide heating. Heating by biomass ranks second (~15%), followed by other significant fuels such as LPG (~6%), electricity (~5%) and oil (~4%).

This consumption pattern does not differ greatly between urban, intermediate and rural households. However, there is a noticeable distinction in energy consumption between regions in Italy.

Biomass, oil and LPG supply a higher share of heating in the South compared to regions in the North. Households in southern regions such as Campania, Calabria, and Mezzogiorno have a higher share of LPG heating (~12%) compared to northern regions. These regions (including Molise) also have a higher than average share of heating from biomass (~25%).

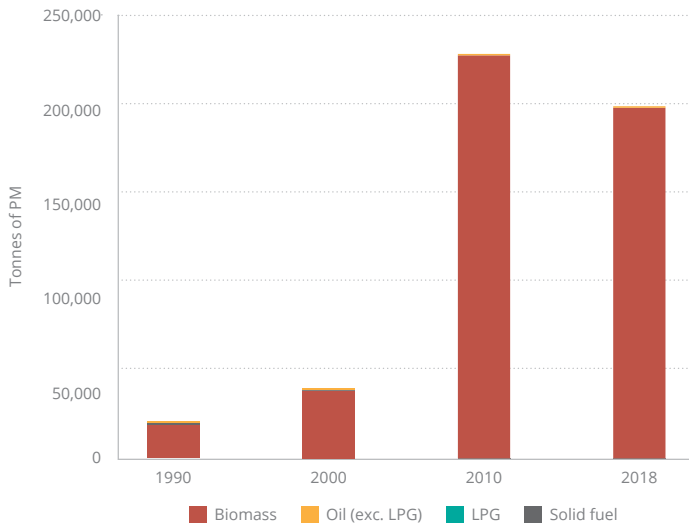


Italy - Rural Energy Data



AIR QUALITY EMISSIONS

Household PM emissions



- Household particulate emissions (PM) are estimated to have risen 844% between 1990 and 2018. This has been due to a sharp rise in biomass consumption for heating.
- Italy's bioenergy market has experienced continuous growth in order to meet country's renewable energy targets for 2020.
- Households are the main final users of wood biomass in Italy, using firewood, pellets and chips in small-scale systems (i.e. boilers and stoves).
- Several studies have shown that energy-wood consumption in Italy is much higher than official estimates – likely underestimating PM emissions.

Sources: [Eurostat](#), [International Energy Agency](#), [European Environment Agency](#) and [Università degli Studi di Padova](#)



RURAL AIR QUALITY CHALLENGES

The majority of rural air quality stations in Italy reported PM emission levels above WHO guidelines

Map of rural air quality stations reporting PM_{2.5} emissions above WHO guidelines in 2017



- 87% of rural air quality monitoring stations reported PM_{2.5} background emission levels in exceedance of WHO guidelines in 2017.
- Fine particulate matter (PM_{2.5}) exposure has been attributed to 58,600 premature deaths in Italy. This represents 16% of total deaths attributed to PM_{2.5} in the EU, the second largest impact after Germany.
- In Italy, the damage cost imposed on the economy from emitting PM_{2.5} was equivalent to an estimated €11.5 billion in 2017.

Source: [European Environment Agency](#), [DEFRA](#)

RURAL ENERGY MATTERS

Around 18 million people live in rural areas in Italy, which accounts for 30% of Italy's population. These rural communities are often not connected to the natural gas grid. As a substitute, heating oil and biomass are widely consumed for heating purposes. Residents in small cities often rely on these fuels too.

Decarbonising heat will be necessary if Italy 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 Italy'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.