

Energy poverty and renewable potential in rural areas

Data and analyses from the Rural Observatory

Hormigos Feliu, C., Florio, P., Dijkstra, L., Auteri, D. and Bertozzi, C., [*Exploring rural energy poverty and needs*](#), 2025, JRC142243.

Perpiña Castillo, C., Hormigos Feliu, C., Dorati, C., Kakoulaki, G., Peeters, L., Quaranta, E., Taylor, N., Uihlein, A., Auteri, D. and Dijkstra, L., [*Renewable Energy production and potential in EU Rural Areas*](#), 2024, JRC135612.

Clara Hormigos Feliu

Joint Research Centre (JRC)

RURAL PACT

Rural Pact Conference

17 September 2025, Kortrijk/Courtrai (Belgium)

Energy poverty in the Energy Efficiency Directive

Definition

Art.2, [recast EED](#), 2023

A household's **lack of access to essential energy services**, where such services provide basic levels and decent standards of living and health, [...] caused by **a combination of factors**, including at least **non-affordability, insufficient disposable income, high energy expenditure and poor energy efficiency of homes**

Indicators

Art.8, [recast EED](#), 2023
EU-SILC and HBS



Inability to keep home adequately warm



Dwellings with a leaking roof, dampness or rot



Arrears on utility bills



At-risk-of-poverty rate
(<60% median equivalised income)

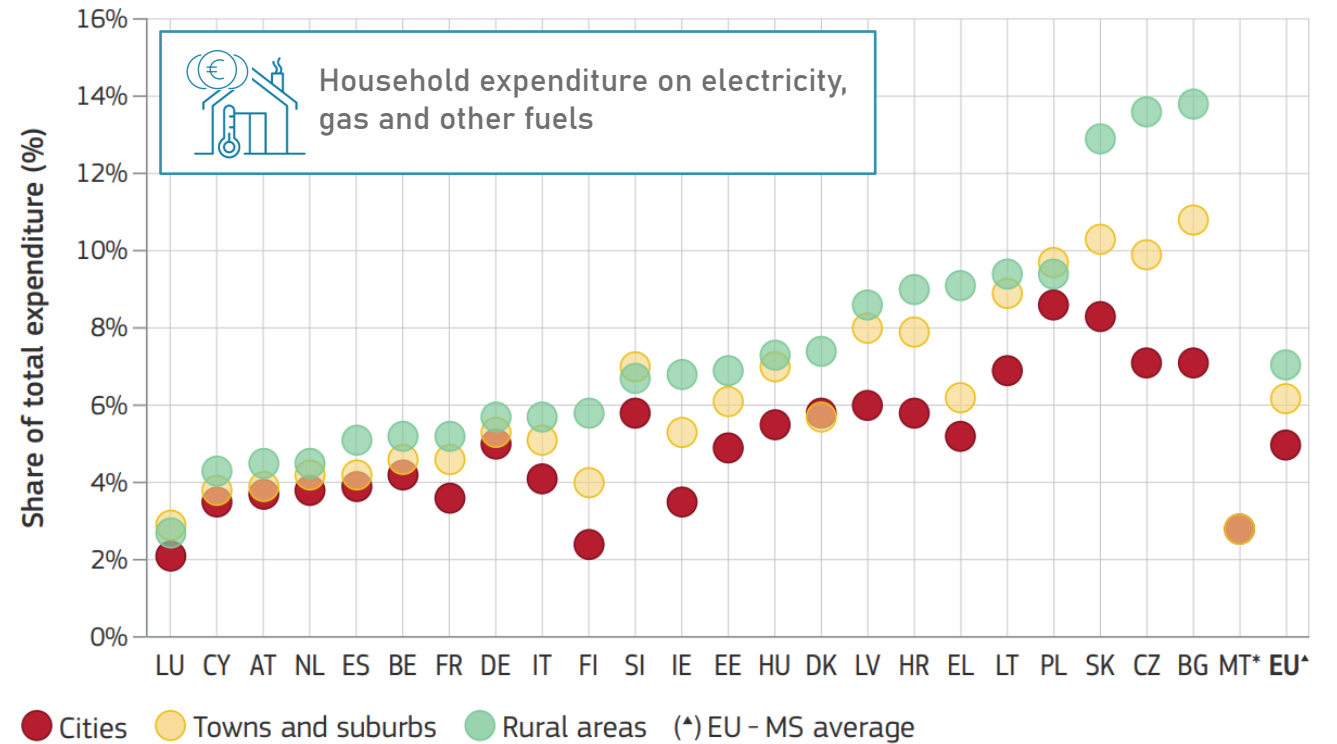
+



Household expenditure on electricity, gas and other fuels

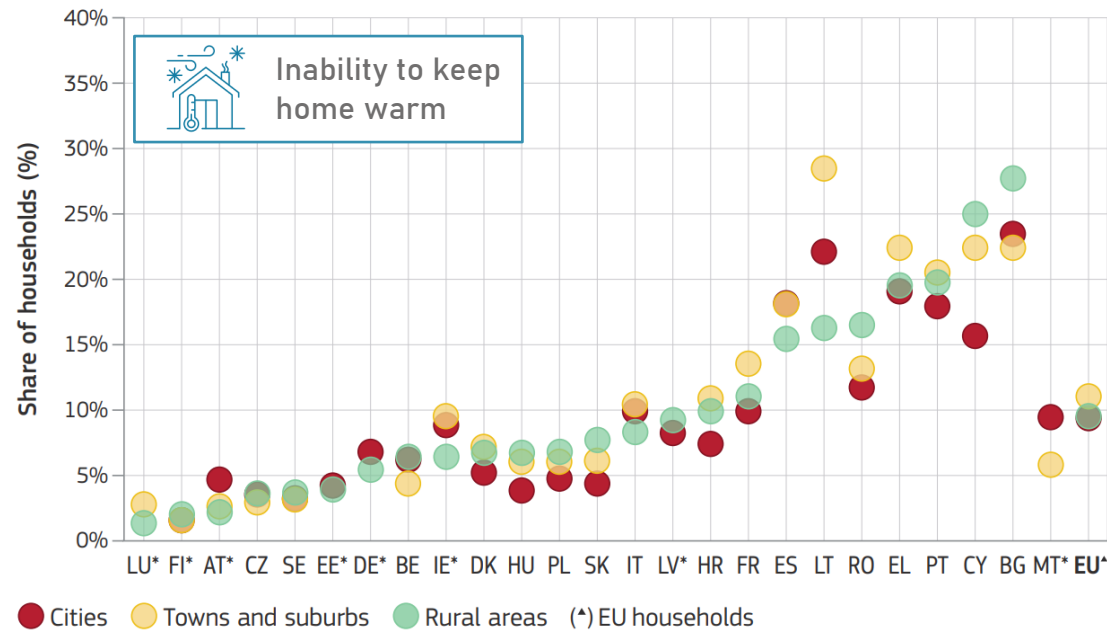
Energy expenditure

- Share of household **expenditure on energy higher in rural areas** (7% of household expenditure, on average between MS)

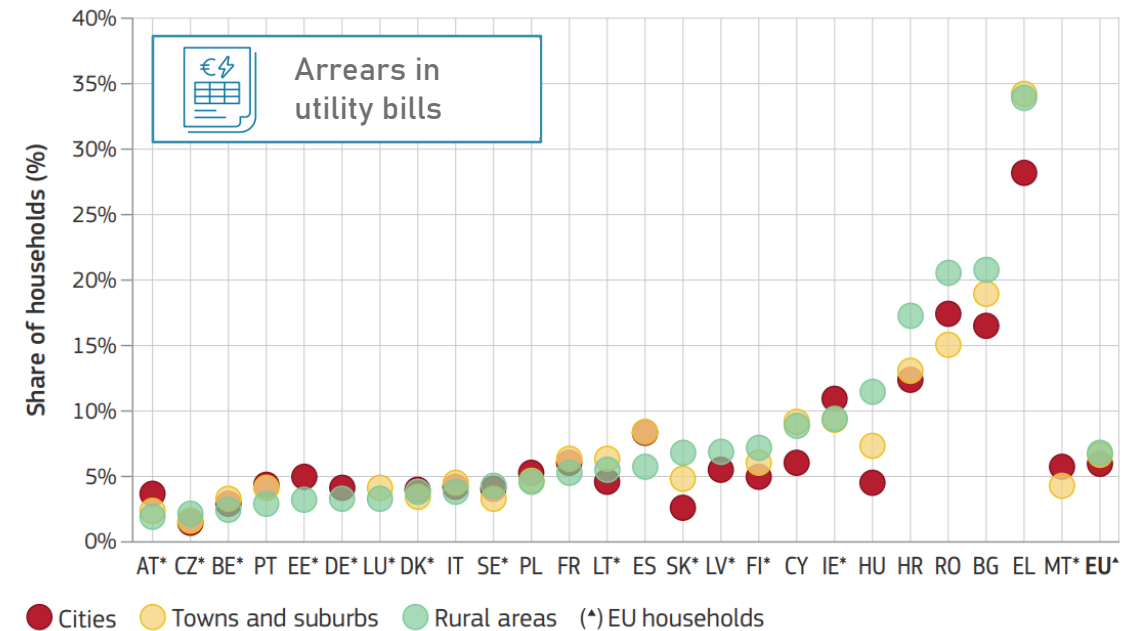


Source: [JRC142243](#) from Household Budget Survey, 2020

Energy poverty indicators



- No clear urban-rural pattern EU-wide, differences between and within MS



- In MS where many households fail to pay utility bills, rural areas are more affected

* Limited data
Source: [JRC142243](#), based on EU-SILC microdata, 2022

Energy poverty index

- Inability to keep home adequately warm
- Arrears on utility bills
- At-risk-of-poverty rate
- Dwellings with a leaking roof, dampness or rot

+

- Household expenditure on electricity, gas and other fuels



standardised average

Energy poverty index

Energy poverty index

- Inability to keep home adequately warm
- Arrears on utility bills
- At-risk-of-poverty rate
- Dwellings with a leaking roof, dampness or rot

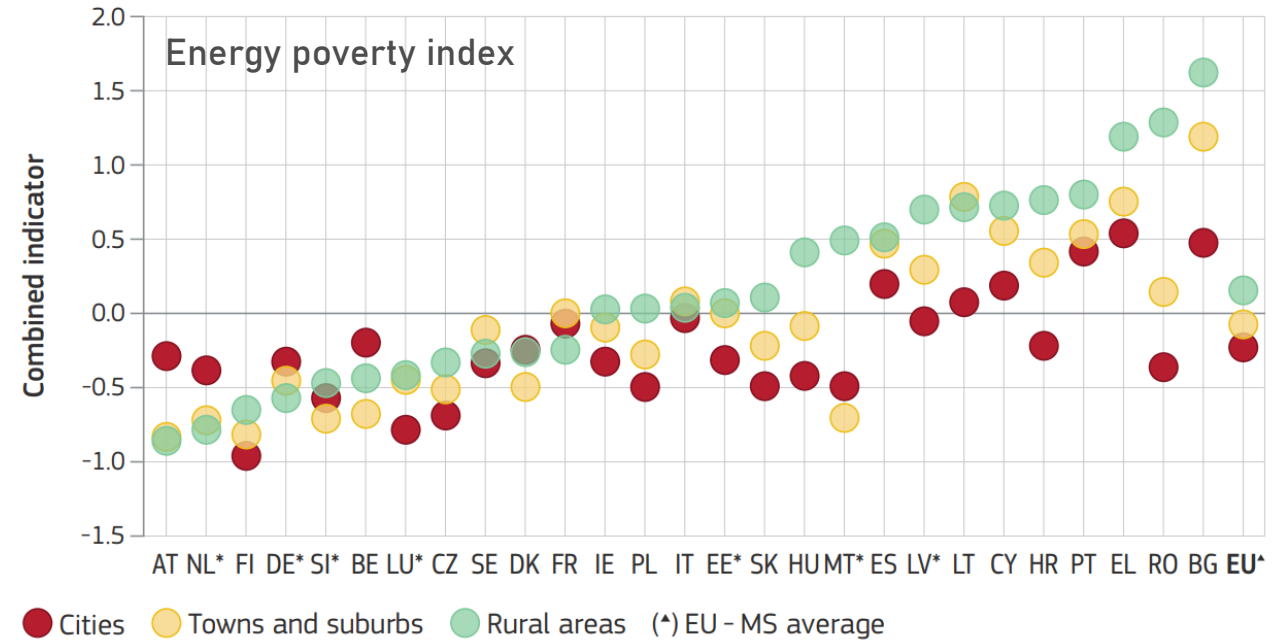
+

- Household expenditure on electricity, gas and other fuels



standardised average

Energy poverty index



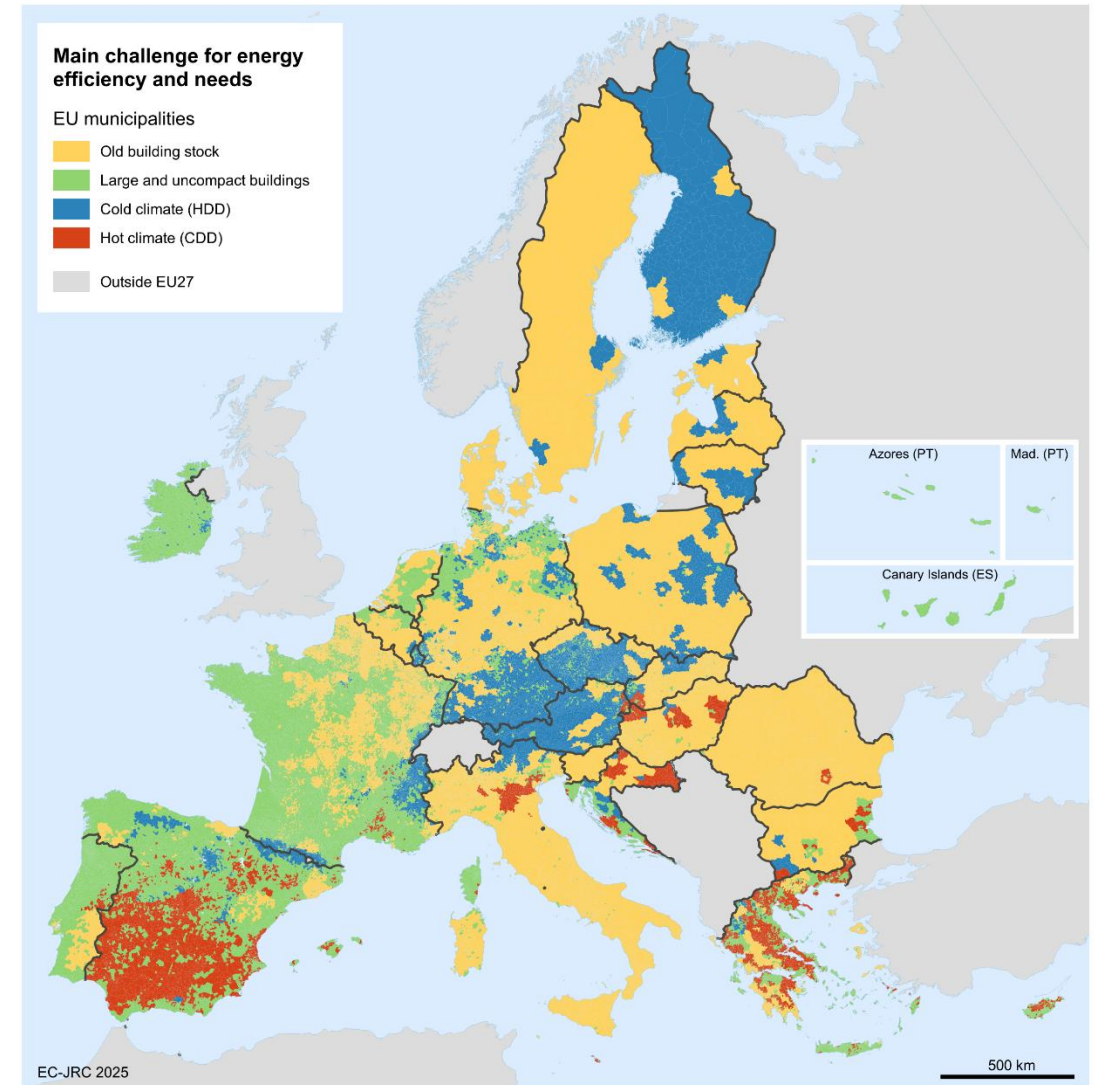
* Limited data in multiple indicators
Source: [JRC142243](#), based on HBS and EU-SILC, including microdata, 2020-2023

- **Rural areas in many MS experience higher levels of energy poverty**, especially in Bulgaria, Romania and Greece
- In Member States where energy poverty levels are above the EU average, rural areas are generally the most affected

Energy efficiency and needs in the building stock

High-resolution analysis of

- **Building** volumes and shapes (compactness)
 - **Climate** (Heating and Cooling Degree Days)
 - **Age** of the building stock (NUTS 3)
- Rural areas: common challenges are large and uncompact buildings, colder temperatures

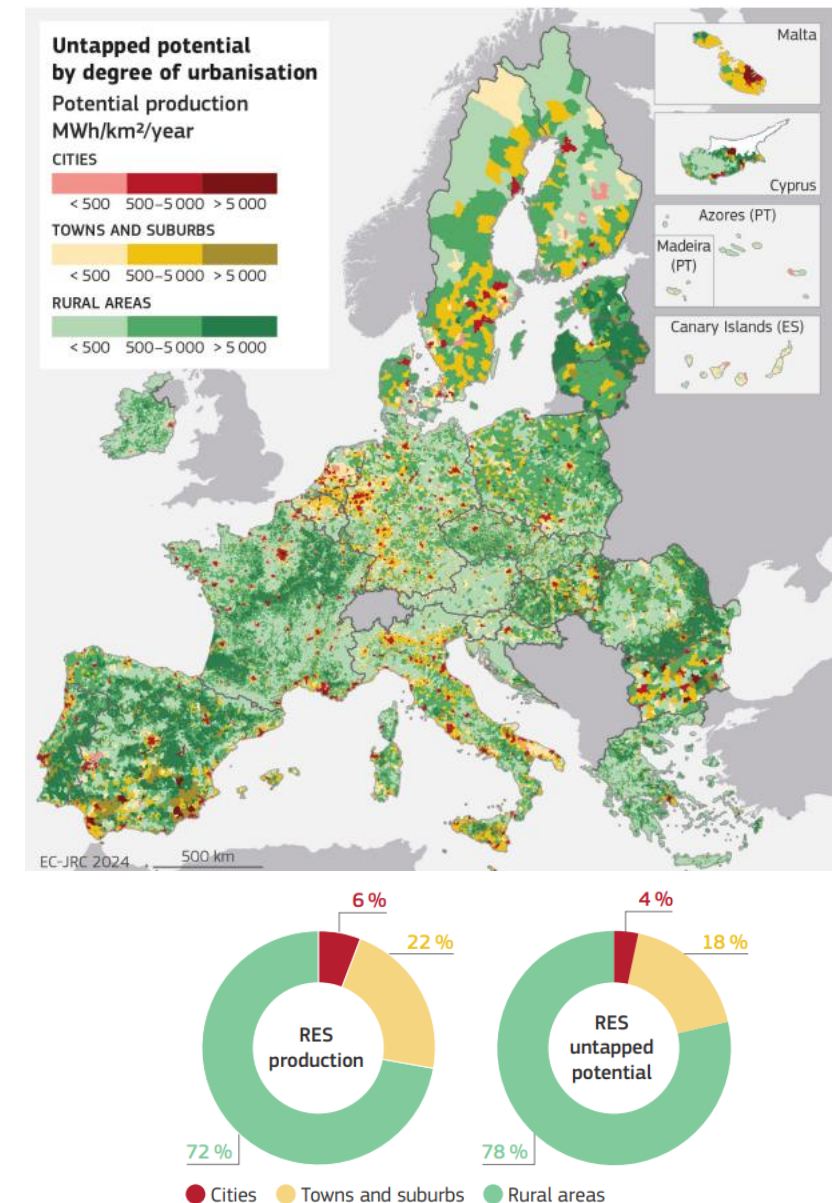


Source: JRC analysis, [JRC142243](#)

Renewable energy in rural areas

- Assessment of **current** and **potential production of renewable energy** with
 - Solar photovoltaics
 - Onshore wind
 - Hydropower
- Analysis of suitable land for sustainable rollout of potential installations, ensuring preservation of natural and agricultural resources

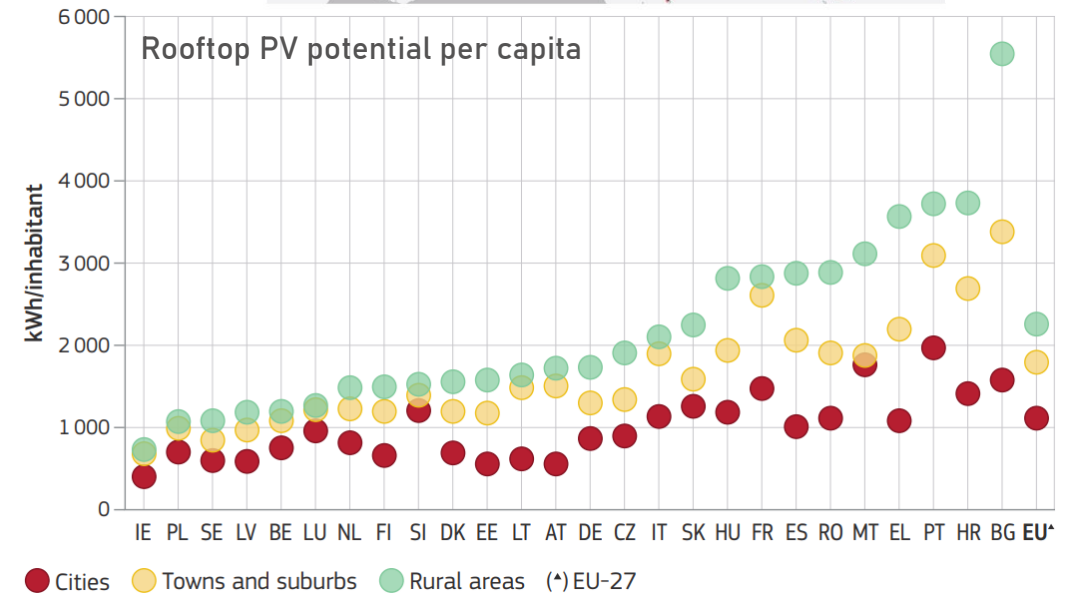
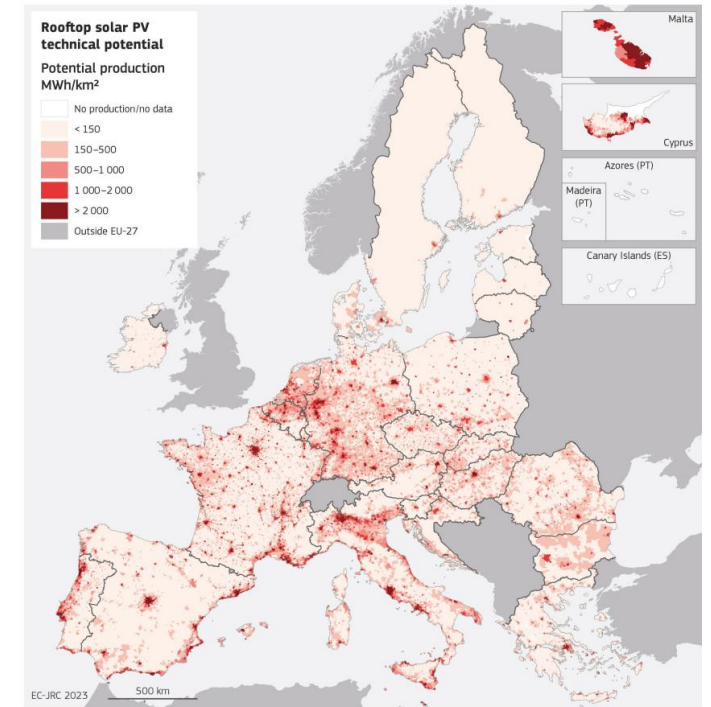
Results highlight: **rural areas produce more than 70% of the EU's renewable energy, and hold almost 80% of the potential**



Source: JRC analysis, [JRC135612](#)

Rooftop photovoltaic potential

- **High rooftop PV potential per inhabitant in rural areas:** more suitable buildings (79% detached or semidetached houses), higher roof area per inhabitant
- Implementation facilitated by high ownership of rural dwellings (78% owned)



Source: JRC analyses, [JRC135612](#) and [JRC142243](#)

Summary

- Rural areas show higher share of consumption expenditure in energy, and experience higher levels of energy poverty in many Member states
- Larger, less compact buildings (mostly houses) pose challenges for rural energy efficiency
- Rural areas are producing more than 70% of the EU's renewable energy with solar PV, onshore wind and hydropower, and hold almost 80% of the EU's renewable potential
- Higher rural ownership and large roof areas per inhabitant make rural households best suited for rooftop PV and self-consumption systems

Thank you

Joint Research Centre (JRC)

EU Science Hub

joint-research-centre.ec.europa.eu



@EU_ScienceHub



EU Science Hub – Joint Research Centre



EU Science, Research and Innovation



EU Science Hub



@eu_science



© European Union 2023

Unless otherwise noted the reuse of this presentation is authorised under the [CC BY 4.0](https://creativecommons.org/licenses/by/4.0/) license. For any use or reproduction of elements that are not owned by the EU, permission may need to be sought directly from the respective right holders.

This work contains indicators based on data from Eurostat, EU-SILC scientific files (years 2022 and 2020, from dataset <https://doi.org/10.2907/EUSILC2004-2022V1> and year 2023, from dataset <https://doi.org/10.2907/EUSILC2004-2023>). The responsibility for all conclusions drawn from the data lies entirely with the authors.



European
Commission