

Energy transition and climate neutrality



RURACTIVE

RURACTIVE Forum
Background document



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This document outlines key issues related to the energy transition and climate neutrality in rural areas, drawing on policy research and evidence from RURACTIVE activities and the rural innovation hubs (Dynamos). It presents this theme as a Rural Development Driver (RDD), highlighting renewable potential, community engagement, and energy efficiency as elements of rural resilience.

The RURACTIVE Forum – Third meeting is part of a four-session co-creation process exploring early policy directions. Results will inform policy recommendations to be validated at the Fourth meeting on 30 June 2026.

1. Introduction

Rural areas hold major potential to contribute to Europe’s clean-energy transition, from renewable energy production to landscape-based climate mitigation measures. Yet rural territories continue to face persistent structural disadvantages linked to affordability, infrastructure gaps, and the capacity of communities to adopt new energy models that may constrain their capacity to participate in -and benefit from- the green transition.

Within the RURACTIVE project, energy transition and climate neutrality are addressed as a Rural Development Driver (RDD), with Dynamos exploring how local renewable resources, community ownership models and energy-efficient practices can strengthen resilience and create new opportunities. Evidence emerging across territories highlights recurring needs for accessible energy information, improved local planning, and solutions that help rural households and businesses adapt to evolving climate and energy conditions.

2. Strategic EU policy context

The EU’s climate and energy framework provides the overarching policy context shaping rural energy transition. Its main pillars cluster around:

- The **European Green Deal** - set the objective of climate neutrality by 2050, committing Member States to binding emission reduction pathways.
- The **European Climate Law** - establishes the legal foundation for the EU’s climate neutrality objective by 2050. It sets binding emission reduction pathways, embeds the 2030 target into legislation, and requires Member States to align national policies with long term climate objectives. This framework shapes the wider regulatory environment for rural energy transition, influencing planning, investment priorities, and the integration of mitigation and adaptation measures.
- **Fit for 55** - operationalises the interim target of at least a 55% emissions reduction by 2030, increasing decarbonisation pressure on rural sectors that often face limited capacity.
- **REPowerEU** - has further accelerated the transition through measures on solar, biomethane, hydrogen, and joint energy purchasing, all with implications for decentralised rural energy systems. At the same time, revised renewable energy and efficiency targets strengthen the push for electrification, decentralised generation, and demand reduction; areas where rural territories could play a key role but still face implementation barriers.

2.1 Evolving EU policy instruments and opportunities

Several EU instruments could significantly influence rural energy transition:

- **Clean Industrial Deal** and **European Competitiveness Fund** – aims to support clean-tech manufacturing and competitiveness, with potential implications for rural industries and value chains.
- **Revised Renewable Energy Directive implementation** - strengthens renewable targets and sustainability criteria, influencing permitting, grid access and distributed generation in rural areas.

- **Energy Communities Framework** - provides opportunities for community-owned renewable initiatives, enabling local benefit-sharing and decentralised energy models.
- **National Energy and Climate Plans (NECPs)** - define national pathways for meeting EU climate targets; their design affects investment flows and policy focus in rural territories.
- **EU Adaptation Strategy** and forthcoming **European Climate Adaptation Plan** - highlight the need for climate-resilient infrastructure, water systems and land management relevant to rural contexts.
- **Smart energy digitalisation initiatives** - promote digital tools and data infrastructures that can improve rural energy management, consumption awareness and system flexibility.

If **effectively rural-proofed**, these instruments could strengthen decentralised energy systems, community ownership, and territorial resilience

3. RURACTIVE integrated approach to energy transition and climate neutrality

Within RURACTIVE, the energy transition is approached as part of a broader territorial transformation, **explored across Dynamos through participatory discussions and co-creation workshops**. Communities and stakeholders jointly identify local climate and energy-related challenges (including affordability, infrastructure gaps, and technical capacity) and explore context-appropriate ideas for solutions. Engagement involves energy and climate authorities, utilities, land managers, environmental organisations, community groups and vulnerable users, reflecting the socio-technical nature of rural energy transitions. Early experiences point to the added value of combining technological options with social mobilisation, energy literacy and collaborative governance.

3.1 Cross-cutting priority considerations

These priorities are considered when communities identify their main challenges, when ideas for solutions are co-developed, and when these are refined into practical plans:

- **Climate mitigation:** renewable deployment, emissions reduction, modal shifts.
- **Climate adaptation:** water management, ecosystem resilience, climate-proof infrastructure.
- **Biodiversity conservation:** habitat-sensitive land use and nature-positive energy siting.
- **Social justice and inclusion:** energy poverty reduction, gender balance, support for vulnerable groups.

4. Structural energy transition and climate neutrality challenges in rural territories

Evidence emerging from project activities points to a consistent pattern of structural barriers affecting rural energy transition across diverse territorial contexts. Across many rural territories involved in RURACTIVE, challenges follow.

4.1 Reliance on carbon-intensive systems

Many rural economies remain locked into high-emission activities, including peat extraction, fossil-based heating, and diesel-dependent transport. While this creates clear decarbonisation potential, it also risks socio-economic disruption in transition regions.

4.2 Grid and infrastructure constraints

Peripheral regions frequently report limited grid capacity and stability, high connection costs for renewable projects, and insufficient storage infrastructure. These bottlenecks slow renewable uptake even where local ambition is strong.

4.3 Climate impacts threatening rural livelihoods

Observed risks include flooding, drought and water scarcity, and peatland and forest degradation. These pressures increase the urgency of integrated mitigation–adaptation approaches tailored to territorial conditions.

4.4 Limited administrative, technical, and financial capacity

Small municipalities often lack specialised climate expertise, project development capacity, and investment readiness. This capacity gap constrains effective absorption of EU funding and the scaling of local initiatives.

4.5 Social vulnerability and energy poverty

Rising energy costs disproportionately affect rural households, which typically face higher heating needs, older building stock, and more limited access to clean technologies. Fairness and just transition concerns therefore remain central to rural energy policy design.

The examples presented in Table 1 illustrate some of the challenges collaboratively identified in two different rural innovation hubs (Dynamos) as well as various proposed solutions to address them.

Table 1 Energy transition and climate neutrality examples from RURACTIVE Dynamos

Dynamo 9 – Zadar, Croatia		Dynamo 11 - Gotland, Sweden	
Identified challenges	Solutions developed	Identified challenges	Solutions developed
<p>Water scarcity and climate stress on island ecosystems.</p> <p>Inefficient wastewater and biowaste management requiring low-energy solutions.</p> <p>Need for energy-efficient environmental monitoring on dispersed islands.</p>	<p>IoT-Based Water & Ecosystem Monitoring: low-energy sensors for water systems and climate adaptation.</p> <p>Open-Call Solutions:</p> <ul style="list-style-type: none"> • Turning Silba into a Composting Island, biowaste-to-compost. • ISLEMET and SEAWISE, energy-efficient wastewater and water treatment. 	<p>Grid and infrastructure limitations: hinder rapid uptake of renewables and electrification.</p> <p>Affordability & fairness issues in energy transition: energy poverty and uneven access to clean technologies.</p> <p>Climate impacts: droughts, water scarcity, and heat stress: affect ecosystem resilience and energy needs.</p>	<p>Energy Bag 2.0 (community lending kits): a smart toolkit (thermal camera, hygrometer, smart plug) supporting household energy savings; includes digital advice tool and workshops.</p> <p>Sockeneffekt (rural climate lifestyle network): peer-learning and climate literacy initiative enabling local action.</p> <p>Co-creative flexible public transport: supports decarbonisation of mobility through community co-design.</p>

5. Emerging innovation pathways and local responses

Despite structural constraints, RURACTIVE regions are piloting diverse place-based solutions:

Nature-based climate mitigation	Digital tools for energy literacy
<p>Several territories prioritise ecosystem restoration and climate-smart land management, such as peatland restoration in Finland (<i>Dynamo 1</i>) or biodiversity-enhancing practices in multiple regions.</p> <p>These interventions position rural areas as providers of carbon sinks and nature-based solutions.</p>	<p>Digital platforms and guidance tools are deployed to improve household energy awareness and encourage behavioural change:</p> <ul style="list-style-type: none"> • Energy Bag 2.0 and community digital toolkits • Tailored support for vulnerable groups <p>Measures to strengthen capacity for adopting decentralised and clean energy technologies.</p>
Community energy and decentralised systems	Governance and social innovation
<p>Regions experiment with local energy hubs, micro-biogas installations, and energy communities:</p> <ul style="list-style-type: none"> • Prosumer-led generation and distribution • Resilient small-scale networks maintaining energy supply during disruptions <p>Initiatives combining technical innovation with local empowerment to enhance rural energy resilience.</p>	<p>Experiences highlight the importance of participatory and community-led approaches:</p> <ul style="list-style-type: none"> • Eco-social compensation mechanisms • Community hubs as focal points for knowledge and coordination • Participatory governance models <p>Integration of social and environmental objectives, supporting just and territorially balanced energy transitions.</p>

6. Persistent gaps in EU funding and Performance Framework

Stakeholder feedback across RURACTIVE highlights structural weaknesses in current EU support systems. Key concerns include:

- **performance frameworks remain heavily supply-oriented** (MW installed, grid kilometres);
- **insufficient monitoring of energy poverty**, affordability, and social fairness;
- **limited support for small-scale community** energy projects;
- **high administrative burden** for low-capacity rural actors;
- **weak indicators capturing behavioural change** and resilience outcomes.

Consultations on the future MFF underline the risk that benefits of the energy transition may remain unevenly distributed if distributional justice metrics are not strengthened.

7. Implications for proto-policy development

Evidence across RURACTIVE activities suggests that achieving climate neutrality in rural Europe will require a shift from infrastructure-centric approaches toward place-based, socially grounded energy ecosystems.

Key questions for proto-policy discussion include:

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- **How can EU policy better support decentralised, community-led energy systems**, ensuring that rural areas can generate and benefit from local clean energy?
 - **How can performance frameworks move beyond capacity metrics** to capture affordability, energy poverty reduction, and territorial resilience?
 - **What mechanisms can strengthen rural administrative and technical capacity**, enabling small municipalities and communities to access and manage transition funding?
 - **How can eco-social compensation and just transition principles be operationalised**, particularly in regions affected by fossil phase-outs or restoration obligations?
 - **How can grid planning, storage investment, and digital tools be better aligned with rural realities**, ensuring reliable, future-proof energy systems?

8. ADDITIONAL READING

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