

# Approaches for a rural low-carbon economy



A Policy Brief from the Policy Learning Platform on  
Low-carbon economy

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## Summary

Rural areas make a unique and important contribution to our economy and way of life but are often left out of low-carbon planning and strategies, which frequently have an urban focus. Rural areas face distinct challenges compared to urban areas, specifically a declining and aging population, less access to opportunities, and greater challenges in transport and energy infrastructure. However, they also have many advantages, particularly in renewable energy generation and carbon-positive environment management, with an abundance of resources available to them to develop new climate-friendly and socio-economically beneficial actions. This policy brief explores the challenges faced by rural areas, and how decarbonisation can benefit them, focusing on low-carbon energy, sustainable transport modes, and environmental management for ecosystem services. It highlights good practices and project achievements from Interreg Europe projects that may prove inspirational for other rural regions in Europe and draws together materials from the Policy Learning Platform to provide a comprehensive overview of other available guidance.

## Europe's Rural Challenges

Rural and remote areas are vital to our way of life, supporting primary production of food and raw material, as well as providing leisure activities and contributing to overall wellbeing and environmental health through ecosystem services. Their abundance and unique characteristics mean they need to be considered individually and separately to urban-focused policies; rural areas cover around 83% of Europe and are home to about 30% of Europe's population.<sup>1</sup> Roughly 45% of Europe is classified as 'remote', that is, distant from urban centres.

National plans and policies for low-carbon development are often focused on urban areas, which is understandable considering they represent most of Europe's population, carbon emissions and economic activity. However, with their abundance of renewable resources, rural and remote areas have a vital part to play in the development of a sustainable and low-carbon economy. At the same time, strategies to mobilise these resources also need to tackle the distinct challenges of rural areas.

Populations in rural areas have a higher risk of poverty and social exclusion, less access to essential infrastructure, services, and opportunities, including educational facilities, healthcare, public transport, cultural services and activities, and job opportunities than their urban counterparts. As a result, rural areas are seeing significant shifts in demographics as people move to where these opportunities are available. As a result, they have a lower percentage of under 50s than the European average, and the remaining rural population has a lower level of tertiary education, and also lower digital skills than the European average.<sup>2</sup> As well as the economic impact from a less active and modern workforce, this also makes provision of public services a challenge and individuals become dependent on private mobility, to connect with larger nearby settlements and transport hubs.

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<sup>1</sup> European Commission – [EU Rural Areas in Numbers](#)

<sup>2</sup> European Commission – [EU Rural Areas in Numbers](#)



With this said, rural regions also have particular strengths that can be harnessed to improve quality of life. Rural populations tend to have more solid local identities, higher trust in local institutions, and high levels of voluntary and collaborative activities within the community. These strengths create significant opportunities for making use of collaborative models to unlock opportunities in industries such as the bioeconomy, renewables, and mobility and in tourism. The opportunities are grand. The bioeconomy in the EU has an annual turnover of 2.2 million EUR employing 17.5 million people, 75% of whom are working in agri-food. The European Commission expects this employment figure to grow by 700,000 by 2050.

Tackling the challenges of rural areas while also ensuring sustainable development and economic growth will require an interface between a number of policy areas such as rural development, agricultural policy, bioeconomy strategies, energy and mobility policy, and research and innovation. Regions will need to develop integrated rural strategies to empower businesses and citizens to use resources sustainably, through new value chains, skills and collaborative models. Each rural area is unique and will need to reflect its different resources, ecosystems, and businesses. Working with its specific stakeholders, actions need to be decided and tailored at the local level, bringing all relevant actors together, and making use of available financial resources, especially EU funds.

### European policy for the rural low-carbon economy

The European Commission aims to support sustainable rural development through a number of initiatives, encompassed in the framework of the **European Green Deal** which aims to enable Europe to become a climate-neutral and resource efficient economy by 2050. As well as ensuring Europe meets its contributions to the Paris Agreement, the EGD will support economic growth after the COVID-19 pandemic and the Union has allocated one third of investments under the **Multiannual Financial Framework, 2021-2027** and the **NextGenerationEU Recovery Plan** to green investments.

The Green Deal itself is implemented via other policy initiatives. Perhaps the most important initiative at present for rural areas is the **Long-term vision for rural areas**, launched in mid-2021, to identify major challenges for rural regions and accompanied by both a **Rural Pact and Rural Action Plan**. The long-term vision seeks to strengthen rural areas by empowering citizens to take part in governance, provide new services and digital tools and connect rural areas via improved public transport and digital infrastructure. It also aims to make rural areas more resilient by restoring landscapes, greening agriculture, and supporting carbon neutrality through leadership in the bio- and circular-economy, as well as improving digital literacy and diversifying economic activities.

The **Rural Pact** provides a framework for co-operation between public authorities and stakeholders at European, national, regional, and local level, creating a process to simplify interaction and exchange of ideas, while the **Rural Action Plan** will implement flagship initiatives for a rural revitalisation platform. The Plan will support research and innovation for rural communities; enable exchange of best practice in sustainable multimodal mobility, energy transition and climate change mitigation; build up carbon sinks; and support entrepreneurship and social economy. These measures reflect the need to create new collaborative frameworks and actions at local level, which is often missed out in strategic documents.



Within these key frameworks, the European Union supports rural areas to achieve European-level goals through the Common Agricultural Policy, the Environmental Action Programme, the European Structural and Investment Funds, and the Horizon Europe research programme.

- The **Common Agricultural Policy** supports Europe's farmers to enable food security, improve agricultural productivity, tackle climate change, manage natural resources and maintain rural areas. While the bulk of the CAP involves income support for farmers and landowners to produce food and feed, it also supports rural development through national and regional programmes, accounting for almost a quarter of the CAP budget. These rural development programmes aim to support competitiveness and territorial development via the European Agricultural Fund for Rural Development (EAFRD), which promotes resource efficiency, low-carbon and climate resilient development, ecosystem preservation and social inclusion. EU countries implement the EAFRD through Regional Development Programmes, with at least 30% of the budget on climate and environmental issues.
- The **Environmental Action Programme**, first launched in 1973 and currently in its eighth iteration, sets out the long-term vision for Europe's environment and aims to accelerate the transition to a climate-neutral and regenerative economy, with objectives aligned to the European Green Deal, including achieving net neutrality by 2050, pursuing zero-pollution ambition for air, soil and water, and restoring biodiversity and natural capital.
- The **European Structural and Investment Funds** are the main tools for European regional policy, supporting job creation and helping to achieve the Union's main priorities, including low-carbon transition and management of natural resources. For 2021-2027, the ESIFs have 'a greener, low-carbon transitioning towards a net zero carbon economy' as a key priority, especially under the European Regional Development Fund and the Cohesion Fund.
- **Horizon Europe** provides grants for research and innovation in Europe, with a greater focus than ever before on tackling the climate crisis and supporting the low-carbon transition.<sup>3</sup>

### Interreg Europe projects on rural low-carbon economy

The Commission's initiatives recognise the need for comprehensive rural development taking account of multiple sectors. Many of these necessary parameters will fall outside of the scope of this policy brief, which will focus only on aspects of the low-carbon transition. However, these considerations must be remembered as being within the policy framework outlined above.

This policy brief draws on the lessons learned, and experiences identified, in Interreg Europe's low-carbon economy projects. Relevant good practices can be found in many projects, but the following have a particular focus on the topic, whether exploring the link between renewable energy and agriculture, mobility for rural tourism, sustainable energy in remote regions, or decarbonisation of mining regions.

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<sup>3</sup> For more information, see out story on '[the low-carbon economy in Horizon Europe](#)'



	<b>Investing in Renewable Energies for Agriculture</b>
	Duration: 2019-2023 Website: <a href="https://interregeurope.eu/agrores">interregeurope.eu/agrores</a>
	<b>Sustainable regional bioenergy policies: a game changer</b>
	Duration: 2016-2020 Website: <a href="https://interregeurope.eu/bio4eco">interregeurope.eu/bio4eco</a>
	<b>Supporting the clean energy transition of coal-intensive EU regions</b>
	Duration: 2018-2023 Website: <a href="https://interregeurope.eu/decarb">interregeurope.eu/decarb</a>
	<b>Delivering Efficient Sustainable Tourism with low-carbon transport Innovations</b>
	Duration: 2018-2022 Website: <a href="https://interregeurope.eu/desti-smart">interregeurope.eu/desti-smart</a>
	<b>Integrating renewable energy and ecosystem services in environmental and energy policies</b>
	Duration: 2019-2023 Website: <a href="https://interregeurope.eu/irenes">interregeurope.eu/irenes</a>
	<b>Sustainable mobility for the last mile in tourism regions</b>
	Duration: 2016-2020 Website: <a href="https://interregeurope.eu/lastmile">interregeurope.eu/lastmile</a>
	<b>Supporting energy efficiency and renewable energy in European islands and remote regions</b>
	Duration: 2018-2022 Website: <a href="https://interregeurope.eu/resor">interregeurope.eu/resor</a>

Drawing from these projects, as well as others, this policy brief will explore three aspects of the low-carbon transition in rural areas, specifically:

- 1) **Sustainable energy in rural areas:** looking into renewables, decentralisation of energy, and co-operatives;
- 2) **Low-carbon mobility for rural areas,** exploring mobility sharing, multimodality, and efficient public transport;
- 3) **Supporting ecosystem services for the low-carbon economy,** including environmental rehabilitation and carbon offsetting.

## Sustainable energy in rural areas

Renewable energy sources are abundant in rural areas – wind, solar, biomass, hydropower, and geothermal energy are all available, depending on geography – and rural areas have the space for installations and large scale projects which are not possible for urban areas. These benefits can not only provide clean energy for use in the region, but also new economic opportunities for powering urban centres and exporting power.

Nevertheless, there are barriers in place to rural renewable energy use, including complex permitting and subsidy schemes, lack of finance and high investment costs, limited access to credit, lack of awareness and skill, lack of capacity to develop business models and understand profitability, and, in some remote cases, distance from grid connections and infrastructure.



The Clean Energy Package (2019) set out the requirement for member states to place citizens at the heart of the energy transition and enable a bottom-up approach, especially through self-consumption and energy communities. The package encourages states and regions to develop support programmes and frameworks. Subsidies and feed-in tariffs are amongst the most important drivers for uptake of renewables, and small scale grants for technology uptake, such as ProEnergia in the Azores, can stimulate uptake in rural and remote areas, without a significant cost to public budgets. **Self-consumption** of renewables provide a number of benefits (environmental, financial and security) for regions. Solar photovoltaics (PV) are an especially attractive prospect in many regions as costs are reaching grid parity, but geothermal, bioenergy and wind are also used, though typically at a larger scale using community schemes, or for large farms and rural industries.<sup>4</sup>

Rural areas which are also remote regions can also benefit from decentralised energy and decentralised grids. Indeed, the benefits of rural areas – cohesiveness and community spirit – also contribute to the necessary framework for **community energy initiatives** and **energy co-operatives**, which are especially beneficial for such set-ups, particularly for bioenergy, solar and wind power projects where technologies are mature, proven and can be implemented cost-effectively at scale, with benefit for the whole community (see Good Practice 1).<sup>5</sup>



### Good Practice 1: Templederry Community Wind Farm

In the village of Templederry in County Tipperary, Ireland, local citizens have established a Community Wind Farm, which can power around 3,500 local homes. The farm, comprised of two 2.3MW turbines is 100% owned by the community and began operation in 2012, making it a pioneering project in Ireland. The project leveraged public funding to secure bank financing, and also made of tax relief. Specifically, the project involved a 1,000 EUR investment from 29 local inhabitants, LEADER funding of 200,000 EUR, 1.2 million EUR of equity funding under Ireland's Employment and Investment Incentive Scheme and 4.8 million EUR from De Lage Landen bank, with technical and financial advice from Tipperary Energy Agency. The farm is owned by the initial 29 investors, with shares also held by a community co-operative to benefit the rest of the community. Instead of taking a dividend, however, the shareholders have re-invested revenues into grid connection and planning permission for other energy communities in Ireland and have established a virtual power plant to act as Ireland's first community owned energy supplier.

For more information, [visit the Policy Learning Platform](#).

<sup>4</sup> For more, see our policy brief on '[Renewable energy self-consumption](#)'

<sup>5</sup> For more, see our policy brief on '[Renewable Energy Communities](#)'.



### **Achievement 1: AgroRES Good Practice Guide**

Agriculture accounts for around 10% of CO<sub>2</sub> emissions in the EU, but there is significant potential for renewable energy generation on farms due to availability of wind, sunlight, and biomass, including agricultural wastes. The AgroRES project aims to raise awareness of benefits from investing in renewables and identify good practices for overcoming barriers to renewable energy projects. As part of the project work, AgroRES partners have identified more than seventy good practices related to the use of renewable energy in farms. Practices identified by the project fit into four main categories of intervention: Photovoltaics, wind energy and other energy sources; Biomass-based energy sources; Renewable energy funding programmes; and, Renewable energy advancement projects.

All of the good practices have been made available in the AgroRES Good Practice Guide, which is available to download from the project website in three parts: [Part 1](#), [Part 2](#) and [Part 3](#).

With an abundance of biological resources, it is not surprising that **bioenergy** provides significant opportunities for rural areas in their decarbonisation and socio-economic development. Biomass should, as far as possible, come from agri-food and forestry wastes, as well as other organic wastes; rural areas with significant agricultural or forestry industries have opportunities in making use of wastes for bioenergy application (see Good Practices 2, 3 and 5). Where primary materials are used, the sources of these materials must be sustainably managed, to avoid having an overall negative environmental impact.<sup>6</sup>

Of the bioenergy technologies, biogas has very high potential, as it can not only help to transition to sustainable energy, but also to tackle waste management challenges. The Waste Management Directive now prohibits the diversion of organic waste to landfill and incineration, contributing to a new business case for anaerobic digestion technologies. Biogas has many benefits as a renewable fuel – it can provide heat and electricity through co-generation but can also be stored to balance other intermittent renewables and provide a baseload, and can also be used for district heating systems. Conversion processes also result in an organic digestate which can be used as a natural fertiliser, also helping to develop sustainable agriculture. Bioenergy village concepts are perhaps the emerging throughout Europe, as rural areas seek to take control of their own energy, manage their waste, and provide cost-effective and clean energy.

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<sup>6</sup> For more, see out policy brief on '[Supporting local bioenergy development](#)'





### Good Practice 2: Biogas and fertiliser from agro-food waste

The Genesis BIO1 biogas and cogeneration plant built by Genesis Biotech in the rural town of Filipeștii de Pădure, Romania makes use of organic wastes in the agri-food sector to produce renewable energy and heat. The biogas and cogeneration plant is located next to a Cris-Tim cold meats factory. The wastes (manure, crop residues, and organic waste from meat processing) are first converted into biogas through anaerobic digestion, before being filtered, cooled and sent to the cogeneration plant. The heat that is recovered is used in industrial processes at factory, electricity is sold into the grid, and the remaining digestate is used as a natural fertiliser. Per year, the biogas plant converts around 23,000 tonnes of biowaste into four million Nm<sup>3</sup> of biogas, delivering more than 8,000 MWh of electricity into the national grid and producing 7,000 MWh of thermal energy. As well as supporting the circular economy and sustainable energy generation, the practice also supports organic farming from the natural fertiliser digestate and has created 20 jobs.

For more information, [visit the Policy Learning Platform](#).



### Good Practice 3: Maccarese Agricultural Company Biopower Plants

The Maccarese farm in Lazio, Italy, founded in 1930 and the largest farm in Italy has worked since 2010 to develop renewable energy technologies to power farm activities. The farm, which breeds cattle and grows cereals and fruits, has built two plants for generating electricity from biogas. The first uses cattle slurry and silage, while the second uses cereal silage only. Together the plants are able to produce more than 13 million Kw net/year, with the resulting liquid digestate used to improve soil quality, while the solid part is used as cattle litter. The plants were built with the company's own funds (totalling 6 million EUR) but benefits from national incentives via a fixed feed-in tariff for renewable electricity. Six-seven percent of the electricity is self-consumed to power the plants, while the rest is fed into the grid.

For more information, [visit the Policy Learning Platform](#).



#### Good Practice 4: Solar photovoltaic pumping for field irrigation

In Extremadura, Spain, the Irrigation Community of Canal del Zújar has sought to reduce its high energy costs by investing in photovoltaics for electricity generation. Using a grant from the Extremadura Regional Government under the European Agricultural Fund for Rural Development to cover around 75% of the investment, the community installed six self-consumption PV facilities in the irrigable area. The PV plants are small enough to fit into adjacent land, without the need to purchase or rent additional land, and have enabled cost savings from irrigation activities and savings of 527 tonnes of CO<sub>2</sub> per year.

For more information, [visit the Policy Learning Platform](#).



#### Good Practice 5: Biomass Co-operatives

Co-operatives are recognised as an excellent structure for the development of renewable energy companies in rural areas, creating new revenue streams from biomass resources, for bioenergy application.

- In Devon (UK), the Dartmoor Woodfuel Co-operative sought to bring down the cost of biomass by enable co-operation between residents of Dartmoor national park looking to reduce their carbon footprints. The co-operative sought to unlock the potential of biomass resources from small woodlands, by providing its members with knowledge, contractors, machinery, and storage facilities. It also encourages installation of wood boilers, manage woodlands sustainably, and develop public awareness of renewable energy. The co-operative has 30 members now, with a turnover of 300,000 GBP, storing more than 7,000m<sup>3</sup> of wood chips and 2,000 tonnes of timber.
- The Eno Energy Co-operative in North Karelia, Finland, is a community-based enterprise founded in 1999 by twelve local forest owners, but currently owned by 55. The co-operative provides wood for three district heating plants for the local community, with the members providing around 30% of the necessary wood – other resources are gathered from other forestry companies. The co-operative gives affordable heat to both municipal buildings and private customers, saving around 4 million EUR over fifteen years compared to fuel oil, with forest owners benefitting from additional income and the creation of ten new jobs.

Click for more information on the [Dartmoor Woodfuel Co-operative](#) and the [Eno Energy Co-operative](#).



As well as taking the lead in project development, regions can also steer regional energy through strategies and plans, as in Normandy, which has established a regional Biogas Production Plan and a technical committee to support project development assess feasibility, with a particular focus on community energy.<sup>7</sup> Both Lubelksie (Poland) and Catalonia (Spain) have integrated bioenergy into their regional planning as a result of Interreg Europe projects, with lessons for other regions looking to learn from (see Achievements 2 and 3).



### **Achievement 2: Amending the Development Strategy for the Lubelskie Voivodeship**

Lubelskie Voivodeship (Poland) is an agricultural region, with agricultural land accounting for 70% of the area, and with the agri-food region industry playing a large part in the regional economy. The region has achieved significant growth in renewable energy use, but it is focused on big renewable energy installations, with few small-scale installations. To improve this, the Voivodeship included renewable energy within its Regional Development Strategy, supported with its ERDF Operational Programme, but was unclear on how to boost uptake of small-scale renewables. The region identified infrastructure delays, low awareness and a poor financial situation as difficulties, and noted that while authorities had opened programmes for the public, they were ineffective in rural areas.

Lubelskie has used the AgroRES project to inform both its revision of the Development Strategy and an update to its Operational Programme. In the project, Lubelskie learned the potential of bottom-up initiatives like community energy groups and the importance of citizen engagement in implementing new projects. The Dartmoor Woodfuel Co-operative (see Good Practice 5) provided a great deal of inspiration in setting up groups and clusters, as well as dedicated communication and forms of support. The updated Development Strategy was adopted in March 2021, and the exchange of experience resulted in the inclusion of bottom-up initiatives like renewable energy communities and setting new goals for the agricultural sector. New actions are focused on improving the competitiveness of farms by increasing energy efficiency and increasing renewable energy generation. This will be achieved by defining a plan and programme specifically for energy development, bringing together stakeholders to exchange good practices and create organisations to support sustainable energy.



### **Achievement 3: Implementing Catalonia’s Action Plan for biomass valorisation**

The BIO4ECO project (2016-2020) aimed to improve regional and national policy processes addressing the transition to a low-carbon economy, with a particular focus on laying the groundwork for future integrated strategies and programmes on bioeconomy and carbon neutrality. Six years on from the start of the project, the partners have made significant progress in implementing their Action

<sup>7</sup> For more on the region’s efforts, see the story [‘Enabling community energy in the Region of Normandy’](#)



Plans, with six partners reporting policy improvements. The most comprehensive improvement may be in Catalonia, Spain, which set out seven actions in its [Action Plan](#), which can also provide inspiration for other regions looking to boost the use of bioenergy:

1. Fostering the use of biomass by sectors and improvement of social perception – Catalonia has developed a communication plan to promote the use of biomass, building from a diagnosis of previous communication efforts to define new actions for different target groups;
2. Training for agents involved in the biomass sector – Organising seven conferences to update and improve the knowledge of biomass stakeholders;
3. New tools to improve management and information of biomass in Catalonia – Catalonia established a map of biomass information points to show where stakeholders can access information and support;
4. Simplification of administrative procedures – A single application form has been created for requesting approval of forestry exploitation activities, and all processes can now be managed online;
5. Revision of the legal framework related with biomass – A proposal has been made to amend regulations to allow construction of warehouses for forest products on rural land;
6. Propose the evolution from a biomass strategy to a bioeconomy strategy – Catalonia is evaluating the inclusion of its biomass strategy within the future bioeconomy strategy and the possibility to extend the strategy to also include biomass for energy purposes;
7. Propose the creation of a specific administrative unit for the promotion of biomass – A new unit has not yet been created, but relevant committees will be consolidated with greater collaboration amongst units.

It is also worth briefly touching upon **energy efficiency** in buildings. Rural areas face many of the same challenges as urban areas – that buildings are inefficient, with a lack of expertise and knowledge available for renovation. **One-Stop-Shops** and **Financial Instruments** can be applied to overcome these barriers.<sup>8</sup> With this said, many rural areas have traditional housing and building types, in some cases being hundreds of years old, or being of important cultural heritage. Specific guidance is needed for such buildings, as established, for example in [Dobrogea, Romania](#).<sup>9</sup>

## Low-carbon mobility for rural areas

The low population density of rural areas and their disconnect from transport hubs provide significant challenges for rural public authorities. Urban centres are increasingly using carbon neutral **public transport** and promoting individual **electric mobility** as solutions for reducing carbon emissions, but such solutions are not as easily transferred to rural areas. Instead, rural communities are highly dependent on motorised private vehicles, and the distance between locations often makes **active transport** (walking and cycling) seem a time consuming and impractical option.

**Public transport**, however, is a lifeline for many communities, especially for those who are economically marginalised, or for those who are not able to use private mobility, such as young people and the elderly. Rural public transport faces a challenge, not only of decarbonisation,

<sup>8</sup> For more, see our policy briefs on '[Supporting energy renovation of private households through One-Stop-Shops](#)' and '[Funding Energy Efficiency through Financial Instruments](#)'

<sup>9</sup> For more practices visit the [VIOLET project website](#), or read our story, '[Energy renovation of heritage buildings](#)'.



but in many cases also of simple economic sustainability, a challenge made all the more difficult as a result of COVID-19 where fewer people used public transport.

Public authorities therefore face the challenge of how to provide public transport that is convenient for users, but also economically sustainable, while ensuring inclusivity of vulnerable groups. Regional authorities can start by taking account of their situation to understand actual use and the effectiveness of services, determining capacity and the most essential routes. When dealing with limited resources, public transport providers may choose to focus on particular users first (such as vulnerable or elderly users) who need the service, extending services later to other users once the system has been proven. The challenge in the long-run will be to demonstrate clear benefits over individual transport modes if rural inhabitants are to make the shift. Multimodality will be a key tool here, providing connections from villages and settlements to other transport hubs (see Good Practice 6 and Achievement 4).



#### Good Practice 6: Ireland's Local Link Rural Transport Programme

Ireland's Local Link is a nationwide network of fifteen rural public transport companies, run for and by the local community, to provide public transport which can respond to community needs. In each location, the service connects remote rural households and areas with supermarkets, social centres and medical facilities, and to also connect with visitor attractions and urban public transport hubs. This connectivity to hubs enables multimodal transport with transfers to buses or trains, and the Local Link buses are synched, as far as possible, with other transport timetables. The service provides a combination of scheduled and flexible services, providing home-to-hub services, with bookings made by phone or email.

The Local Link programme is a brand under the Irish National Transport Authority with the programme funded for 14.3 Million EUR per year. Each local branch of the scheme is co-funded by the local government, with additional funds from passenger fares. The practice could be transferred to other regions, working with local public transport companies, focusing on flexibility, necessity and connectivity.

For more information, [visit the Policy Learning Platform](#).

One solution, where it is not possible to maintain routes with set timetables, on-demand services can be implemented. **Demand Responsive Transport (DRT)** are flexible modes of transport based around user demand. Users will book the service via app, website or telephone, and the transport provider can plan their route accordingly. Setting up such systems can be complicated, but they are also highly adaptive – services can run a set route with drop-off points determined by demand, they can make deviations from a set route, or they can be fully-flexible door-to-door services with custom routes. They can also be provided for particular vulnerable groups, or be open to all, and make use of different vehicle types.<sup>10</sup>

<sup>10</sup> For more on DRT, see the [Policy Brief on Demand Responsive Transport](#)



Other options for rural areas include **car sharing schemes**, though existing systems such as the FLUGS e-carsharing programme in East Tyrol, Austria, are focused on providing an alternative to second car ownership, rather than outright ownership, but even this is an improvement in carbon emission reductions. **Charging infrastructure for e-vehicles** in rural areas is often viewed as being more challenging in rural areas than in urban (as a result of fewer users and sparser populations), but the use of decentralised grids and use of self-generated electricity can help to overcome some of these challenges in the long-run.

Rural tourism travel is an additional challenge. While tourists visiting cities expect to make use of public transport, the sparsity and infrequency of public transport in rural makes vehicle rental the easier option. Carsharing systems using e-vehicles are one solution, but other options include combining mobility and culture via re-opening of historic routes for ‘nostalgic’ train journeys, as in Bānītis (Latvia) or Košice (Slovakia), or otherwise combining touristic and mobility ticketing and specific tourist services to popular destinations.



#### Good Practice 7: DefMobil – Hailed shared taxi for an alpine valley

DefMobil is a shared taxi system operated in East Tyrol, Austria to fill gaps in mobility supply in three mountainous municipalities. The terrain and the low population density of the region made operation of a regular bus line too expensive. The DefMobil system instead provides mobility for residents and tourists on a fixed timetable, but changing the route based on demand. Users can book their journey via a phone call at least one hour before needed. More than 40,000 people have used the system, and it has now been integrated into the provincial transport association of Tyrol which provides funding and integrates into other timetables and mobility options, with harmonised ticket pricing.

For more information, [visit the Policy Learning Platform](#).



#### Achievement 4: MATCH-UP’s 10-Minute Town Framework

Within the MATCH-UP Project, the Southern Regional Assembly of Ireland’s Regional Planning Team and the transport consultants Arup have developed a framework and methodology for implementing the ‘10 Minute Town’ concept, seeking to ensure all daily necessities, community facilities and services are provided within a 10-minute walk or cycle, or are accessible from rural settlements by high-quality public transport services.

Discover the framework, its methodology and resources in the story ‘[Exploring the 10-Minute Town Framework](#)’.



### Good Practice 8: Combined tourist attraction and train ticket in Corfe Castle

Tourist attractions are often visited by car, resulting in congestion, noise and air pollution and greenhouse gas emissions. In Dorset, UK, tourists are offered combined tickets to visit Corfe Castle and its Model Village covering both entry and rail ticket to the site. The ticket also provides discounts on entry to museums and a discount at the local pub. As well as these benefits, tourists also save from not needing to pay for parking. This approach can be replicated in many regions. Combined ticketing can work in destinations served by public transport operators to the benefit of both the touristic site and the transport operator, while also reducing carbon emissions.

For more information, [visit the Policy Learning Platform.](#)

## Supporting ecosystem services for the low-carbon economy

As well as efforts to decrease energy use, increase use of renewable energy and encourage a modal shift to sustainable transport, rural regions should also consider measures related to the environment and agricultural management, both of which have a significant impact on carbon emissions.

The maintenance of rural areas in good environmental condition is vital to the development of a sustainable and low-carbon economy, with ecosystem services provided by nature helping to absorb carbon emissions, produce natural resources, and improve air quality. Broadly, we can consider ecosystem services to be divided into four overlapping categories, as defined by the 2006 Millennium Ecosystem Assessment:

- **Supporting services**, such as nutrient cycling, primary production (the synthesis of organic compounds from carbon dioxide) and pedogenesis (soil formation);
- **Provisioning services** for food, fresh water, fibre and fuels;
- **Regulating services** for climate, flood and disease regulation, as well as water purification;
- **Cultural services** for spiritual, aesthetic, recreation, and education purposes.<sup>11</sup>

Rural areas, as maintainers of the countryside, also bear responsibility for maintaining these ecosystem services and preventing degradation. As well as the benefits for human health, this can also create new economic and touristic opportunities for rural areas.

<sup>11</sup> [Overview of the Millennium Ecosystem Assessment](#)



### Good Practice 9: Bełchatów - Recultivation of open cast mining

The Bełchatów mine, located around 10 kilometres south of the town in Poland, had a significant negative impact on the natural environment in its vicinity. Open-cast (open-pit) mining involves cutting deep pits into the ground, rather than mining with tunnels, and leaves results in a barren, highly polluted environment. In Bełchatów, land rehabilitation efforts have been made on the site of the mine, with 2,200 hectares rehabilitated, including 1,500 hectares of forestation and planting of more than 47 million trees and shrubs. As well as this restoration, a new hill was built from mining overburden, with a ski slope and cycle lanes, to act as a tourist attraction. A wind farm has also been constructed on the hill, of 15 2MW wind turbines, providing electricity for nearby farms. Although this is a very large-scale practice, it has lessons for any region that wishes to improve its environment, contribute to carbon emissions and create new touristic and leisure activities.

For more information, [visit the Policy Learning Platform](#).



### Good Practice 10: Wind energy and peatland rewetting

The municipality of Schwanewede, in Lower Saxony, Germany, as part of the Osterholz district, is aiming to generate 100% of its electricity from renewable resources by 2030. As part of this process, a [wind farm of six 3MW wind turbines](#) has been created, covering 13% of the municipality's electricity and powering 12,000 households. The wind farm was built upon former bogland, which had been drained, but is now restored to its natural state. The landowners – around 80 individuals – have been granted rents and discounted energy. Rewetting the bogland by using dams and foresting 3,000 square metres revives ecosystem services to the region. Specifically, it prevents the release of carbon dioxide from further drainage and degradation, and in the long-term the bog and forest will act as carbon sinks, absorbing and storing carbon dioxide.

For more information, [visit the Policy Learning Platform](#).

Policy-makers need to be aware that rural and agricultural lands have significant potential to absorb CO<sub>2</sub> and reduce greenhouse gas emissions through development as **carbon sinks**, including soils and plants. In fact, plants and soils, together, absorb around 30% of CO<sub>2</sub> emitted by human activity. To this end, **renewal of rural areas**, particularly brownfield sites and **regenerative agriculture** are emerging fields for rural development. Regenerative





agriculture focuses on topsoil regeneration, improving biodiversity and enhancing ecosystem services, including bio-sequestration. Approaches can include making use of agricultural wastes for soil improvement, making efficient use of resources, avoiding use of chemical pesticides and planting of specific crops and crop rotation to maintain environmental conditions and avoid the negative impacts of monocultures.

Making use of carbon sinks to absorb CO<sub>2</sub> is also an economic opportunity in rural areas, being marketed as **carbon offsetting**, whereby carbon absorbing projects are implemented to counter pollution from activities such as air travel. Carbon offsetting can include purchasing credits to invest in carbon reduction projects such as tree planting, renewable energy and energy efficiency interventions, and sustainable agriculture approaches.



### Good Practice 11: Lowland Forest Association for CO<sub>2</sub> compensation

The Italian Lowland Forest Association, comprised of lowland forest owners, aims to support sustainable management of forest resources, and new economic opportunities for forestry owners, including through carbon sequestration projects. As such, the association enables individuals and companies to pay for tree planting to offset their emissions, and the association promotes this opportunity towards citizens and businesses through communication and awareness raising schemes, including the eye-catching figure that the average Italian citizen needs to plant seven trees a year to offset their impact. Off setters can choose the park or forest in which to plant their tree, with options available in Italy, but also in forests worldwide, including in Brazil, Burkina Faso, and Vietnam.

For more information, [visit the Policy Learning Platform](#).

## Recommendations & key learnings

- Rural regions face specific challenge in relation to their economic development and use of resources, made more difficult as a result of demographic changes. They cannot be treated in the same manner as urban areas, with copy-paste policy frameworks and instruments, but need tailored approaches;
- Energy, Mobility and the Environment are not in silos and need to be considered together in the framework of sustainable rural development. Interventions should focus not only on reducing carbon emissions, but also on answering other rural challenges;
- Community energy and self-consumption are most promising in rural areas, building upon strong community ties, but also increased necessity compared to urban areas. Regional authorities should play an active role in setting frameworks, providing support and raising awareness of potential;



- Rural areas have abundant resources, ready to be mobilised, but new skills and approaches are needed. Attention should be given to training farmers and other actors, within the framework of existing farm advisory services;
- Farming and the agro-food sector are important employers in rural areas, with significant potential for sustainable energy using their wastes and by-products. Policy-makers can focus on raising awareness and providing training for these actors, emphasising benefits for the region as a whole;
- Public authorities can play a central role in establishing bioenergy plants, incentivising waste collection from multiple sources for use in cogeneration and district heating;
- Rural mobility will continue to rely on fossil-powered vehicles in the mid-term due to the challenges of providing alternative fuel infrastructures, but this can be overcome as decentralised energy and grid technologies are deployed;
- Shared mobility and on-demand solutions are the most cost-effective transport options for rural communities, and are also well proven. Learn from successful case studies for quick roll-out. Consider also the needs of inhabitants and proximity to services with the principles of the 10-Minute town concept;
- Environmental interventions, such as rehabilitation and reforestation can not only reduce carbon emissions but also create new touristic and business offers, such as offsetting opportunities;
- While this brief gives an overview of rural challenges and suggests some solutions, many more resources are available from the Policy Learning Platform that go more in-depth on specific topics. See 'sources and further information' at the end of this document for all the relevant links;
- Regions have much to learn from each other. Public authorities should take advantage of opportunities to learn from other regions which have already begun the transition, through Interreg Europe projects and the Policy Learning Platform which can offer on-demand expert support through peer reviews and matchmakings (see below).

### Does your region need support in defining new strategies?

The Policy Learning Platform, provides a number of services to both ongoing projects and the wider regional policy community, including on-demand Expert Support via a helpdesk, matchmaking service and peer reviews:

- At the Policy Helpdesk, Policy-makers may submit their questions to our helpdesk to receive a set of resources ranging from inspiring good practices from across Europe, policy briefs, webinar recordings, information about upcoming events, available European support and contacts of relevant people, as well as recommendations on matchmaking and peer review opportunities.
- A Matchmaking session is a thematic discussion hosted and moderated by the Policy Learning Platform and designed around the policy needs and questions put forward by the requesting public authority or agency. It brings together peers from other regions in Europe to present their experiences and successes to provide inspiration on overcoming regional challenges.
- Peer Reviews are the most deep and intensive of the on-demand services, bringing together peers from several organisations for a two-day working session to examine the specific territorial and thematic context of the requesting public authority of agency, discuss with stakeholders, and devise recommendations.



## Sources and further information

The Policy Learning Platform has produced a significant number of resources to guide the rural low-carbon transition, some of which are referenced throughout the policy brief. The full overview of available resources is provided below.

### *Policy Briefs*

- [Renewable energy Self-Consumption](#)
- [Renewable Energy Communities](#)
- [Supporting Local Bioenergy Development](#)
- [Supporting energy renovation of private households through One-Stop-Shops](#)
- [Funding Energy Efficiency through Financial Instruments](#)
- [Eco-system Services](#)
- [Sustainable Tourism](#)

### *Event Reports*

- [Biogas from organic waste](#)
- [Meeting the biowaste challenge](#)
- [Demand responsive transport](#)
- [Landfill rehabilitation](#)
- [Green transition under the European Recovery and Resilience Facility](#)

### *Stories*

- [Supporting mobility in rural regions](#)
- [Enabling community energy in Normandy](#)
- [Finding synergies between renewable energy and ecosystem services](#)
- [Good Practices for the EU Year of Rail](#)
- [Exploring the 10-Minute Town Framework](#)
- [Energy renovation of heritage buildings](#)
- [Supporting the low-carbon transition in Europe's islands](#)

## External Resources

- Furmankiewicz, Hewitt & Kazak – Can rural stakeholders drive the low-carbon transition? (2021)
- Wisniewski & Kistowski – Agriculture and rural areas in the local planning of low carbon economy in light of the idea of sustainable development (2017)
- [Overview of the Millennium Ecosystem Assessment](#)

*#LowCarbon #Rural #Strategy  
#EnergyTransition #Mobility  
#EcosystemServices*



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