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JETforCE strategy and toolkit for Just Energy Transition in Central Europe

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Table of Contents

Introduction

The Just Energy Transition (JET) represents one of the most complex and consequential transformations currently facing European territories. It is not limited to the decarbonisation of energy systems, but entails a profound reconfiguration of economic structures, social relations, governance models, and territorial balances. In this context, justice is not an ancillary objective but a necessary condition for the legitimacy, effectiveness, and durability of the transition itself. Addressing energy poverty, avoiding the concentration of costs on vulnerable groups, ensuring fair territorial development, and enabling meaningful participation in decision-making processes are central challenges that accompany the shift toward climate neutrality.

This document presents the JETforCE Strategy as a consolidated and final strategic framework, the outcome of a structured process of analysis, implementation, and learning developed within the JETforCE project. This jointly developed Strategy translates results from JETforCE project transnational learning and testing into a long-term strategy for Just Energy Transition in CE, by harnessing digitalisation.

The Strategy is grounded in three interrelated pillars: a critical review of the scientific and policy-oriented literature on JET; an in-depth analysis of regulatory frameworks, policies, and practices across the JETforCE partner territories in Central Europe; and the concrete experience generated through the implementation of project activities, digital and capacity enhancing tools, key-actions, and Local Action Plans (LAPs). The integration of these dimensions has allowed the Strategy to move beyond conceptual discussion, incorporating operational insights and addressing limitations encountered during implementation.

The learning process embedded in the JETforCE project has played a decisive role in shaping this Strategy. Technical, governance-related, and engagement challenges identified during the use of digital tools, stakeholder involvement, and local experimentation have been systematically analysed and translated into strategic orientations. Rather than pointing to an open-ended experimental phase, these lessons have been fully capitalised, contributing to the finalisation of both the project's operational approach and the Strategy itself. In this sense, the JETforCE Strategy reflects a mature synthesis of evidence, practice, and policy reflection, offering a robust framework to support fair and inclusive energy transitions in Central Europe.

The document is structured to guide experts, scholars and practitioners through this integrated perspective. The first part establishes the conceptual foundations of the JET, drawing on interdisciplinary literature to clarify the meanings of justice in energy systems and to identify key criticalities related to energy poverty, local development, governance, and socio-economic transformation. The second part situates these concepts within the JETforCE area, analysing European,

national, and regional regulatory frameworks and illustrating how justice-oriented principles are being operationalised across the partner territories. This section also frames the contribution of the JETforCE project within existing policy landscapes, highlighting convergences, divergences, and persistent challenges. The third part translates the analytical insights into strategic guidance, presenting principles, policy recommendations, financing architectures, and governance approaches aimed at supporting justice throughout the energy transition process.

A distinctive feature of this Strategy is its strong and explicit connection with three complementary documents that together form an integrated knowledge and action framework. Annex 1, dedicated to Best Practices for the JET, provides empirical depth by documenting and analysing concrete initiatives implemented across the JETforCE territories. These practices illustrate how principles such as participation, local ownership, territorial cohesion, and social inclusion can be translated into tangible actions, offering transferable lessons for other regions.

Annex 2, focusing on Financial Opportunities for the JET, complements the strategic discussion on financing, mapping relevant funding instruments, financial mechanisms, and support schemes available at European, national, and regional levels to provide decision-makers and practitioners with a practical reference for designing financially viable and socially equitable transition pathways.

Finally, the Collection of Local Action Plans represents the territorial and operational embodiment of the Strategy, demonstrating how the strategic principles outlined in this document are translated into concrete actions adapted to local contexts. While each LAP reflects specific territorial needs and capacities, taken together they form a coherent mosaic of interventions that operationalise distributive, procedural, and recognitional justice across Central Europe. The Collection thus serves not only as an implementation tool, but also as evidence of the Strategy's applicability and relevance at the local level.

Read as a whole, the JETforCE Strategy and its accompanying documents offer a comprehensive framework that links theory, policy, finance, and practice. They are intended to support public authorities, practitioners, and stakeholders in navigating the complexity of the energy transition, providing guidance that is both analytically grounded and operationally actionable, while reaffirming justice as the cornerstone of a sustainable and inclusive energy future.

1. Justice in Energy Transition: the literature

The concept of Just Transition (JT) has evolved into a multifaceted framework essential for equitable transitions. It provides a foundation for addressing climate and energy challenges through justice-oriented strategies, fostering collaboration among diverse stakeholders, and mitigating social and economic inequalities (Wang and Lo, 2021).

JT encompasses the idea of making systemic shifts in the considered sectors, equitable and inclusive. Derived from a labour-oriented context originating in the 1970s, nowadays it integrates broader justice frameworks related to environmental, climate, and energy.

In the latter sense, JT involves the fairness in socioeconomic impacts, addressing job losses and economic disruptions, especially in fossil fuel-dependent industries and regions; equity in distribution, ensuring benefits and burdens of transitions to renewable energy are shared fairly across all societal groups, avoiding harm to marginalized communities; participatory processes, including different stakeholders in decision-making processes to enhance procedural and democratic governance; restorative justice, aiming to repair historical injustices and ensure support for communities disproportionately affected by environmental and economic transitions. Reviewing critically the concept of JT, Wang and Lo (2021) identifies five major thematic areas that frame the discourse on the issue.

First, JT is historically rooted in labour movements, emphasizing worker protection amid energy transitions. Early efforts by labour unions, such as the Oil, Chemical, and Atomic Workers Union (OCAW), sought retraining funds for displaced workers, linking the transition to economic justice (Stevis and Felli, 2015). However, tensions persist between climate activists advocating fossil fuel phaseouts and labour unions prioritizing job security (Kalt, 2021).

Second, JT is framed as an integrated justice framework, incorporating environmental, climate, and energy justice. Environmental justice emphasizes the disproportionate pollution burden on marginalized communities (Schlosberg and Collins, 2014), while climate justice addresses historical emissions responsibility and global equity (Harris, 2019). Energy justice, in turn, focuses on fair distribution and decision-making in energy systems (Sovacool et al., 2017). Scholars advocate integrating these justice strands into the energy issue to ensure equity in low-carbon transitions (McCauley and Heffron, 2018).

Third, JT is analysed as a socio-technical transition theory, exploring systemic shifts in technology, policy, and infrastructure (Geels et al., 2017). The Multi-Level Perspective (MLP) conceptualizes transitions as interactions between niche innovations, socio-technical regimes, and external landscapes (Geels, 2019). However, critics argue that MLP neglects justice concerns, prompting calls for integrating social equity considerations into transition frameworks (Sareen and Haarstad, 2018).

Fourth, JT is understood as a governance strategy, where diverse political systems shape transition outcomes. Democratic regimes favour participatory governance and coalition-building (Newell and Mulvaney, 2013), while authoritarian states often impose top-down policies with limited social protections (Lo, 2020). Scholars debate whether rapid climate action necessitates centralized control or if democratic inclusion can coexist with urgency (Skjølsvold and Coenen, 2021).

Finally, public perception influences JT effectiveness. Studies reveal that communities reliant on fossil fuels often resist energy transitions due to economic insecurity (Cha, 2017). Public support for renewables is linked to environmental concern but varies by proximity to energy projects and perceived fairness in transition policies (Crowe and Li, 2020). Addressing procedural justice and trust-building is essential to securing broader acceptance of JT strategies (Groh and Moellendorff, 2020).

If JT in energy deals with energy poverty and balancing local development in contexts of spatial vulnerability, two issues addressed in next sections, other subjects are considered in literature as well. From macro to micro subjects, they involve the modelling of general economic equilibrium, the distributive justice - an issue strictly related to the energy poverty matter, so that we are going to treat it in next section- and the pursuit of just transition in the industry, addressing the reaction by entrepreneurs and employees.

With respect to the first topic, Hafnera et al. (2020) provides a systematic review of ecological macroeconomic models that consider the low-carbon energy transition. It evaluates whether these models integrate complexity, non-equilibrium dynamics, deep uncertainty, and financial considerations, addressing the shortcomings of traditional neoclassical economic models like Computational General Equilibrium (CGE) and Dynamic Stochastic General Equilibrium (DSGE) models.

More specifically, the article claims that traditional neoclassical models' reliance on equilibrium-based frameworks prevents accurate simulation of climate risks, financial instabilities, and policy effects of energy transition. Other macroeconomic models with higher emphasis on ecological issues emerged in last years, integrating uncertainty and complexity and better assessing the implications of decarbonization, but problematic in terms of comparability and standardization. Within this category, heterodox models such as System Dynamics (SD), Agent-Based Models (ABM), Stock-Flow Consistent (SFC) models, and Macro-Econometric models show a good performance in capturing non-equilibrium dynamics, reflecting heterogeneous actors and decision-making processes, integrating finance and monetary flows, and accounting for policy feedback loops and tipping points, demonstrating to fit better than neoclassical ones with the multi-facet and fluid environment of energy transition.

Hafnera et al. (2020) highlights the urgent need for a new approach in economic modelling to support the low-carbon energy transition. Traditional economic models are inadequate, and ecological macroeconomic models offer a more realistic, policy-relevant framework. However, improvements in model comparability, institutional integration, and financial modelling are necessary to fully capture the complexity of the energy transition.

A confirmation of this approach is given by Jacques et al. (2023), which applies a SFC macroeconomic model to analyse the economic implications of a global energy transition. The model integrates energy return on investment, financial dynamics, and capital constraints to assess the feasibility of a transition to 100% renewable energy under the 1.5°C target of the Paris Agreement. The authors highlight that achieving a rapid energy transition is possible but economically challenging. Massive investments, inflationary pressures, and financial risks necessitate a war-like economic mobilization. A slower economic growth rate and strong government intervention significantly ease the transition, making it more feasible and socially just.

Related to industry and energy transition, Gong et al. (2024) addresses the acceptance of Sustainable Energy Technologies (SET) by frontline practitioners in the glass manufacturing, a highly energy-intensive industry. It examines how social, psychological, and contextual factors influence their willingness to adopt low-carbon technologies, a critical step in ensuring a just transition towards decarbonization. The study highlights the importance of employee support in transitioning to sustainable technologies in the glass industry. While psychological and corporate-level factors play a key role in SET acceptance, broader economic and regulatory incentives are needed to accelerate adoption. A just transition requires both technological innovation and social inclusion to ensure sustainability and fairness in the industry.

Thomas et al. (2024) explores the factors influencing the ET of Small-Medium Enterprises (SMEs) in Italy, a country whose secondary sector is deeply characterized by this kind of firms (Becattini and Bellandi, 2022). While much of the existing research on ET focuses on large companies, this paper highlights how small but innovative firms engage with sustainability, moving beyond traditional incentive-based policies.

After remarking that 63% of SMEs' direct business is driven by carbon emissions in the EU, so that they collectively play a major role in emissions and energy consumption despite their lower individual environmental impact, the study challenges conventional wisdom that regulations and incentives drive SMEs toward green practices. Instead, analysing 348 Italian SMEs it finds that corporate culture is the primary force behind ET investments in innovative SMEs, including awareness of sustainability issues and long-term commitment to green practices.

1.1 Just Transition and energy poverty

Energy poverty refers to the condition in which individuals or households cannot access adequate and reliable energy services, such as electricity or heating, due to economic constraints. It often results from a combination of low income, high energy costs, and inefficient housing or appliances, which exacerbate the challenges of maintaining basic living conditions.

This phenomenon has significant impacts on quality of life and health, including cold or overheated homes, leading to increased risks of respiratory and cardiovascular diseases, reduced access to energy services, which can impair daily living, education, and social inclusion

The concept of JT emphasizes the equitable distribution of benefits and costs during the shift from fossil fuels to renewable energy sources. Energy poverty is deeply intertwined with this issue because transition policies often neglect marginalized and low-income groups, who are less likely to afford energy-efficient upgrades or access clean energy solutions.

An example is given by the fairness and distributional impacts of France's low-carbon strategies, focusing on the 2015 Factor Four goal and the 2020 Net Zero Emissions (NZE) target, assessed by Ravigné et al. (2022). The research evaluates how environmental taxation, subsidies, and policy packages affect households and firms across different income levels, geographic locations, and economic conditions, concluding that the transition to a low-carbon economy must address income and regional inequalities to be fair and socially acceptable. While NZE provides greater emission reductions and economic benefits, carbon tax policies must be carefully designed to avoid disproportionately impacting low-income and rural populations. A balanced mix of taxation, subsidies, and redistribution is essential for a socially just and politically viable energy transition in France.

García-García et al. (2023) examines whether welfare states facilitate a JET in Europe. It revisits the hypothesis of synergy, which argues that social-democratic welfare regimes are better positioned to achieve a fair and sustainable energy transition, analysing how welfare states interact with environmental policies across 23 European countries (2008–2016).

One of the smartest Italian theorists on energy poverty (Carrosio, 2020) remarks that energy transition policies at the national and the EU levels often neglect social justice, excluding vulnerable populations and marginalized territories from the benefits. The priority is integrating social and environmental policies to enhance the living conditions of vulnerable groups, making the energy transition socially desirable and equitable. The article emphasizes that tackling energy poverty and achieving a socially JET requires rethinking current policies to include marginalized groups. This framework proposes that social justice should be central to energy transition policies, ensuring that they address both ecological and socio-economic crises effectively.

The problem is addressed even by McKenna et al. (2024) in cold climates, analysing how transitioning from natural gas heating to electric heat pumps impacts energy burden, housing efficiency, and affordability, particularly for low-income households. Without substantial policy interventions, the transition could worsen energy poverty. However, targeted subsidies, better electricity pricing, and increased weatherization efforts could make the clean energy transition both feasible and just.

A wide review on energy poverty in Europe is proposed by Ben Cheikh et al. (2023), which develops an Energy Poverty Indicator to scrutinize 25 European countries in 2006–2019 searching for its key macroeconomic drivers. Energy poverty, which affects over 54 million European citizens, is primarily

driven by income levels and distribution, energy prices, inequality and efficiency, and is worsened by high energy prices, poor insulation, and housing conditions. Urban areas perform better in addressing energy poverty due to infrastructure advantages, while institutional quality has a minor impact in developed economies but remains a critical factor in other regions.

On the use of indicators to explores energy poverty, Castaño-Rosa et al. (2019), emphasizes the lack of a standardized definition and the need for a multidimensional approach to its measurement. Traditional indicators, such as the 10% income threshold and self-reported conditions, often fail to capture the complexity of energy vulnerability, which is influenced by infrastructure, energy efficiency, social and economic status, and health. The study highlights the weaknesses of existing Energy poverty metrics and proposes a multiple-indicator approach that integrates thermal comfort, income, and housing conditions. This framework aims to improve policy targeting and better identify vulnerable households, ensuring more effective interventions to mitigate Energy poverty across the EU.

The problems of inconsistencies in measuring energy poverty across the EU is raised by Menyhért (2024) as well, which argues that current indicators provide fragmented insights into energy-related deprivations. By integrating EU Statistics on Income and Living Conditions (EU-SILC) with European Household Budget Survey (EU-HBS) microdata for Hungary, the study reveals that expenditure-based and self-reported measures identify vastly different populations as energy poor, with less than one-third of affected households experiencing multiple forms of Energy poverty. Key findings highlight that Energy poverty is highly seasonal, weakly correlated with income, and varies significantly by housing conditions. The study calls for a multidimensional measurement approach, better data harmonization, and direct assessment of household energy consumption to enhance policy effectiveness.

The different performances in addressing energy poverty shown by urban and rural places in Europe is the subject of Santos Pereira and Marques (2023). Using 2005–2018 data from 12 EU countries, the study investigates how different forms of energy consumption (oil, wood/biomass, natural gas, and electricity) impact energy poverty across three degrees of urbanisation, namely cities, towns and suburbs, and rural areas. The results claim that there is no “one-source-fits-all” possibility, to reduce Energy poverty, and while in cities electricity seems to be the best option, it shifts to gas and biomass in town and suburbs, and to wood/biomass in rural areas. In general, a careful planning is required for the energy transition to avoid worsening energy poverty.

About the role of renewables in tackling energy poverty, is worth mentioning Simionescu et al. (2023), which examines how renewable energy consumption and innovation affect arrears on utility bills in the EU. Using panel data models from 2003 to 2021, the study finds that patents for renewable energy technologies and renewable energy consumption per capita initially increase energy poverty due to high upfront costs, while foreign direct investment and energy efficiency help alleviate it. Unemployment is a key driver of energy poverty, creating a cycle of financial hardship. The findings suggest that long-term government incentives and targeted policies are needed to make renewable energy more

accessible to vulnerable consumers while promoting employment and investment in energy efficiency to mitigate Energy poverty.

1.2 Just Transition and local development

The spatial concentration of vulnerability, particularly in rural regions, poses significant challenges for achieving a JT. A poorly managed transition exacerbates social inequities, eroding public support for environmental/climate policies.

Carrosio and de Vidovich (2023) addresses the issue for Italy, focusing on the relationship between ecological transition (both ecological and energy) policies and social inequalities in Italy. The study critically examines how environmental policies structured under the paradigm of ecological modernization fail to account for social and territorial differences, leading to the reproduction and even exacerbation of inequalities.

The central issue addressed is how the dominant model of ecological modernization in policymaking tends to overlook social and spatial heterogeneity, assuming a neutral and uniform approach to incentives and regulations. This perspective, which aligns with neoliberal policy frameworks (Barca, 2019), suggests that market-based solutions and regulatory mechanisms alone are sufficient to drive sustainable transitions (Mol and Spaargaren, 2000; York and Rosa, 2003). However, the study argues that access to incentives, renewable energy projects, and regulatory constraints is unevenly distributed across different social classes and geographical areas, creating disparities in the benefits and burdens of the transition.

Ecological modernization policies produce three main types of inequality: distributive, procedural, and recognition-based. Distributive inequalities arise from market-driven incentives, which primarily benefit middle-to-upper-class households capable of investing in solar panels, energy-efficient home renovations, and electric vehicles. This results in a regressive wealth redistribution, where public subsidies are disproportionately captured by wealthier social groups, leaving low-income and precarious populations excluded from the benefits of the transition. Territorial inequalities emerge as large-scale renewable energy projects, particularly photovoltaic installations and wind farms, are disproportionately located in economically weak rural areas, often owned by external investors who extract value without reinvesting in local communities (O'Sullivan et al., 2020). This pattern contributes to the peripheralization of rural regions, reinforcing their dependence on external capital rather than fostering local resilience.

Procedural inequalities stem from the lack of inclusive decision-making processes in energy transition projects. Many green infrastructure developments, including wind farms, biomass plants, and large-scale solar installations, face opposition from local communities due to inadequate consultation and the perceived imposition of external interests (Pellizzoni, 2011). The study highlights that public participation in environmental policymaking is often limited, and resistance movements against green

projects - especially in marginalized rural areas - are not only about environmental concerns but also about demands for greater democratic control over territorial transformations (Bobbio and Zeppetella, 1999).

Recognition-based inequalities relate to the marginalization of local identities and knowledge systems in ecological modernization. The study provides an example of conflicts over wildlife conservation policies, such as the protection of wolves in rural Italy, which have sparked strong reactions from livestock farmers and rural communities. These groups perceive conservation policies as urban-driven impositions that ignore their cultural and economic realities (Lamont, 2018). Such policies, while framed as ecologically necessary, are seen as symbolic of broader territorial injustices, where local knowledge and traditions are dismissed in favour of technocratic, top-down environmental governance.

The study concludes that ecological modernization as currently implemented is not neutral, but deeply embedded in existing socio-economic and territorial structures. The assumption that environmental policies can be universally applied without addressing structural inequalities risks to alienate communities, fostering social resentment, and ultimately undermining support for the green transition. The author argues for a more socially inclusive approach to ecological policies, one that integrates redistributive justice, participatory governance, and localized recognition of socio-territorial identities. Without such adjustments, environmental transitions risk reinforcing, rather than mitigating, existing social and spatial inequalities, leading to further resistance and political backlash against sustainability initiatives (Carrosio and de Vidovich, 2023).

The territorial consequences of transition from decarbonization in the USA are analysed by Mark et al. (2024), which examines the impact of coal mine closures on unemployment across 3,072 US counties. The authors explore how economic decline in coal-dependent regions unfolds over time and space, and they assess the potential for JT policies to mitigate these impacts. Referring to theoretical and empirical works on just transition policies (McCauley and Heffron, 2018; Pollin and Callaci, 2019), energy transitions and employment impacts (Newell and Mulvaney, 2013; Snyder, 2018), and on fossil fuel dependency and local labour markets (Black et al., 2005; Raimi, 2021), the paper uses dynamic panel econometrics and spatial econometric models to quantify these effects from 2002 to 2019.

The findings reveal that coal mine closures lead to an immediate and statistically significant rise in county-level unemployment rates, with spillover effects on neighbouring counties, with evidence suggesting weak recovery over a two-year period and shrinking labour force since displaced workers exit the job market rather than find new employment. A one-size-fits-all JT policy is insufficient and recommends tailored interventions, such as investment in alternative industries, workforce retraining and reskilling, relocation support for workers in rural areas, policies supporting mobility and childcare to boost female labour force participation. The authors also highlight that spatially targeted policies are necessary to mitigate the regional spillover effects of coal decline. Lastly, they caution that if transition policies fail to address these localized unemployment challenges, they may erode public support for decarbonization efforts (Mark et al., 2024).

The same issue is addressed by Tarasova (2024), which treats explores the differing visions of a just transition in Poland, particularly in the coal-heavy Silesian region. It examines how different stakeholders - including public authorities, businesses, and civil society - conceptualize a JET, identifying both conflicts and alignments in their perspectives. The study highlights the political nature of JTs, arguing that power struggles and competing ideas shape their realization.

The central issue is how a JET is envisioned by different actors in Poland, a country heavily dependent on coal. Poland's energy system, where over 80% of electricity and heat come from coal, faces major challenges due to EU policies, economic shifts, and societal pressures. Despite Poland's commitment to phasing out coal by 2049, disagreements persist over what a just transition should entail, who should benefit, and how it should be implemented.

Three primary visions of JT emerge: JT as social justice for labour, JT as regional transformation, and JT as systemic change. The first vision focuses on protecting coal miners and related industries by ensuring job security and economic stability. The second frames the transition as a broader socio-economic shift, affecting not just miners but entire communities and local economies. The third views the transition as an opportunity to reshape Poland's energy system, emphasizing decentralization, renewables, and citizen participation.

The study claims that Poland's JT process is shaped by historical, economic, and political factors. Coal remains deeply embedded in Poland's national identity, economy, and energy security discourse. Power struggles exist between coal-friendly actors (trade unions, businesses, nationalist politicians) and pro-transition actors (EU institutions, local governments, environmental NGOs). EU fundings such as the Just Transition Fund (see *infra*) are a major driver of regional development policies, but scepticism exists about its effectiveness. Procedural justice (inclusion in decision-making) is emphasized across all visions, but participation is often limited in practice. Conflicts between different visions are inevitable, they should be acknowledged rather than suppressed and addressed through a politicized process, where different actors negotiate the terms of transition (Tarasova, 2024).

More transparent and participatory governance is needed to face scepticism and mistrust about transition policies. Tailored regional strategies should account for differences between urban and rural communities, coal-heavy and coal-independent regions. Better coordination between national, regional, and EU policies can help ensure more effective implementation. Recognition of coal-dependent workers and communities is crucial for social acceptance, but the transition should not be limited to protecting coal jobs, and it must address broader economic and environmental concerns.

Another relevant work (Hecher et al., 2016) focuses on the energy transition in the Southern-Austria energy region (*ökoEnergieland*) towards energy self-sufficiency. The study adopts a historical and integrative perspective, analysing the interplay between technical energy infrastructure and institutional developments over the period 1990-2010. It employs Energy Flow Analysis to measure changes in energy production and consumption, combined with actor and institutional analysis to

examine the role of key stakeholders in shaping the transition. The central issue addressed is how regional energy transitions occur and what factors drive or hinder their success. The study examines the development of energy self-sufficiency, focusing on the shift from a centralized, fossil-fuel-based energy system to a decentralized, renewable energy-based system. The *ökoEnergieland* region serves as a case study due to its long-standing efforts in renewable energy, its experience with decentralized energy projects, and its recognition as an energy model region.

The paper builds upon a rich body of literature on energy transitions and socio-technical systems. Key references include studies on multi-level perspectives on transitions (Geels, 2002; Rotmans et al., 2001), the role of regional initiatives in energy policy (Späth and Rohracher, 2010), and the importance of actor networks and institutions in shaping energy transformations (Foxon, 2011; Hauber and Ruppert-Winkel, 2012). The authors also engage with broader discussions on regional energy self-sufficiency (Müller et al., 2011) and the interplay between technical and social dimensions of energy transitions (Scholz, 2011; Verbong and Geels, 2007).

The findings highlight that biomass played a central role in enabling energy self-sufficiency, with regional energy generation increasing from 20% in 1990 to 52% in 2010. The establishment of a decentralized district heating network, coupled with investments in cogeneration plants, solar energy, and biogas, significantly reduced dependence on fossil fuel imports. The process was not linear, with substantial time delays between the initial vision for energy self-sufficiency and the realization of large-scale energy infrastructure. Institutional milestones, such as the founding of the European Center for Renewable Energy (EEE) within the district, played a key role in coordinating energy projects, securing funding, and fostering stakeholder engagement. The study emphasizes that regional energy transitions require strong leadership, coordinated networks, and institutional support. In the case of *ökoEnergieland*, visionary individuals and political commitment were essential in driving early initiatives, while later phases relied on scientific expertise, industrial partnerships, and international recognition. The paper also notes challenges, including low public engagement, financial uncertainties, and dependency on biomass, which shaped the pace and direction of the transition (Hecher et al., 2016).

A major conclusion from the work is that energy transitions are inherently socio-technical processes requiring a combination of institutional innovation, infrastructure development, and social acceptance. The study underscores the importance of cross-sectoral collaboration, particularly in integrating research, industry, and governance structures. The *ökoEnergieland* case suggests that while technical advancements in renewable energy can drive local sustainability, institutional frameworks and stakeholder coordination determine the long-term viability of such transitions. The authors argue that future energy regions must consider broader societal implications, such as economic diversification and community engagement, to sustain the momentum of regional energy transformations.

1.3 Criticalities and issues from JET according to literature

The notion of a JET has evolved from its origins in labour movements into a broader framework encompassing environmental, climate, and social justice. While initially concerned with protecting workers displaced by industrial changes, contemporary interpretations stress the need for fairness in the distribution of both the burdens and benefits of decarbonization. However, despite the growing sophistication of the concept, critical issues remain that must be addressed to ensure that energy transitions do not perpetuate or exacerbate existing inequalities.

Given the inadequacy of traditional economic models in capturing the complex realities of energy transitions, with the risk of producing policy prescriptions insufficiently responsive to real-world challenges, the main critical point lies in the social integration of technological change. While technological innovation is central to decarbonization and climate justice, its success ultimately depends on societal acceptance, particularly within industries and communities historically dependent on fossil fuels. Workers' willingness to adopt sustainable technologies is influenced by psychological, social, and contextual factors, which are often overlooked in policy design. At the same time, the assumption that regulatory or financial incentives alone will drive small and medium-sized enterprises toward sustainable practices underestimates the role of internal corporate cultures and long-term values. A JT requires that technological change be accompanied by strategies fostering cultural shifts, capacity building, and social inclusion within industries and territories.

Energy poverty represents another enduring obstacle to a fair transition. Low-income and vulnerable households often lack the means to access the benefits of clean energy, such as energy-efficient housing or affordable renewable technologies. Transition policies that rely heavily on market-based mechanisms risk deepening inequalities if they do not include compensatory measures. Current methods of measuring energy poverty are fragmented and fail to capture its multidimensional nature, leading to inadequate targeting of interventions. Without a comprehensive, harmonized framework for identifying and supporting energy-poor households, the energy transition risks becoming socially regressive, burdening those least able to adapt.

Spatial inequalities and territorial specializations further complicate the transition process. Rural and economically marginalized regions often bear the physical burdens of renewable energy developments without receiving equivalent benefits. Large-scale projects, typically financed and controlled by external investors, can lead to new forms of resource extraction that deepen regional disparities. Simultaneously, incentives designed to promote renewable energy adoption often disproportionately benefit wealthier urban populations who are better positioned to take advantage of them. Policies based on assumptions of neutrality and universal applicability fail to recognize the diverse socio-territorial realities that structure access to resources and opportunities. Without territorial sensitivity, transition strategies may alienate local populations, generate social resentment, and provoke resistance against decarbonization initiatives.

Governance approaches to the energy transition also present significant shortcomings. Top-down decision-making processes, often justified by the urgency of climate action, can marginalize communities and exacerbate distrust. Procedural justice, understood as the fair inclusion of affected populations in decision-making, remains insufficiently prioritized. Participation is frequently tokenistic, with real influence concentrated among powerful actors. Furthermore, visions of just transition often differ significantly between stakeholders, reflecting underlying power struggles and conflicting interests. Failure to recognize and negotiate these conflicts risks rendering transition policies ineffective or socially unsustainable.

Addressing these critical points requires an overhaul of existing transition strategies. Economic modeling must evolve to embrace complexity, uncertainty, and diversity, moving beyond static equilibria and incorporating dynamic interactions between financial systems, technological innovation, and social behaviour which characterize systemic change.

Societal dimensions of technological transitions must be acknowledged and addressed. Strategies should not only promote the diffusion of sustainable technologies but also support cultural change within industries and communities. Training programs, participatory innovation processes, and community-based initiatives are necessary to ensure that the transition is inclusive and accepted by those it affects most directly.

Energy poverty can be tackled through proactive and targeted interventions that recognize its multidimensional causes and manifestations. Harmonized indicators, integrated social policies, and direct financial support mechanisms are essential to ensure that clean energy is widely accessible, not broadening the gap between energy-rich and energy-poor populations.

Territorial justice is a central pillar of transition strategies. Policies must be place-based and differentiated according to regional socio-economic structures, levels of vulnerability, and local capacities. Renewable energy projects should be designed to benefit host communities, with mechanisms for local ownership, profit-sharing, and reinvestment. Rural areas must be supported not merely as sites for energy production but as active participants in the shaping of sustainable futures.

Finally, governance models must shift toward genuine democratic participation. Decision-making processes must be transparent, inclusive, and responsive to the voices of marginalized communities. Conflict between competing visions of just transition should be anticipated and addressed through political negotiation rather than suppressed through technocratic management. A JET cannot be engineered solely through technical fixes or economic instruments; it must be socially constructed through dialogue, contestation, and compromise. Without these profound adjustments, the energy transition risks reproducing the very injustices it seeks to overcome. Achieving a just transition demands that equity, inclusion, and recognition of diversity be embedded at every stage of the transformation, from modelling and policy design to implementation and governance.

2. The just transition in the JETforCE area

In this section, we explore how the nine territories involved in the JETforCE project operationalize the JET topic through regulatory basis, financial mechanisms, and policy instruments. The latter are given on the one hand by the EU's framework for JET, rooted in the European Climate Law, Renewable Energy Directives, and the Energy Efficiency Directive; on the other hand, by national and regional strategies, addressing in particular socio-economic challenges in coal-dependent and vulnerable areas.

The analysis highlights diverse approaches, giving attention to SMEs, marginalized groups, and regional disparities. Case studies across the partner territories illustrate innovative practices like Renewable Energy Communities (REC), agrivoltaics, energy renovations, and resilience projects.

A final reflection identifies convergences around fairness, inclusion, and territorial equity, not ignoring the persistence of challenges such as governance complexity, administrative barriers, and capacity gaps. Justice is seen as an operational principle, not as a rhetorical goal, and the importance of embedding participatory governance and place-based strategies into transition pathways is stressed.

2.1 Regulation and policies for Just Energy

2.1.1 The European Union framework

The EU has developed a comprehensive regulatory and policy framework to support JET, aimed to ensuring that the shift to sustainable energy systems is socially equitable, economically viable, and environmentally responsible. The foundation of this framework is embedded in key EU policies, legislative measures, and financial instruments designed to facilitate a fair transition, particularly for regions and communities historically dependent on fossil fuels.

The legal framework is based upon the European Climate Law (Regulation EU 2021/1119), formally adopted by the EU Council on 28th June 2021, which establishes the legal framework for achieving climate neutrality within the EU by 2050, enshrining into law the EU's commitment to reducing greenhouse gas (GHG) emissions and aligning EU policies with the goals of the Paris Agreement.

The regulation addresses several key challenges related to climate change, a fundamental threat to the environment, human health, and economic stability. The EU recognizes the need to decouple economic growth from fossil fuel consumption and mitigate the risks associated with climate change, such as heatwaves, wildfires, floods, food security threats, and rising sea levels. Furthermore, ensuring a just and socially balanced transition to a climate-neutral economy is a critical concern, as vulnerable communities and economic sectors could be disproportionately affected by decarbonization policies.

The European Climate Law's central goal is to achieve net-zero greenhouse gas emissions by 2050, ensuring that emissions produced within the EU are balanced by removals, including carbon sinks such

as forests and technological solutions like Carbon Capture and Storage (CCS). Additionally, the regulation establishes an intermediate target for 2030, requiring a 55% reduction in net GHG emissions compared to 1990 levels. It also commits the EU to a 2040 climate target, to be proposed based on the outcomes of global stock takes under the Paris Agreement.

Regulation EU 2021/1119 outlines tools and mechanisms to meet the prospected objectives. It reinforces the EU Emissions Trading System (EU ETS) as the primary market-based mechanism to drive emission reductions cost-effectively. The regulation also mandates sectoral roadmaps for industries to transition toward climate neutrality, ensures scientific oversight through the European Scientific Advisory Board on Climate Change, and requires national governments to adopt and implement adaptation strategies to strengthen resilience against climate change impacts. Moreover, the regulation introduces a carbon border adjustment mechanism to prevent carbon leakage by imposing tariffs on imports from countries with weaker environmental standards.

Additionally, the law mandates regular assessments and reporting by both the EC and Member States to ensure progress, asking additionally to the last ones to integrate climate targets into their national energy and climate plans and long-term strategies.

The final result of this framework include a fundamental transformation of the European economy towards sustainability and resilience, with enhanced energy efficiency, renewable energy deployment, and carbon sequestration capabilities. The regulation aims to position the EU as a global leader in climate action, encouraging other nations to increase their commitments under the Paris Agreement. The transition to climate neutrality is anticipated to drive innovation, create high-quality jobs, and improve overall societal well-being while ensuring economic competitiveness and fairness across Member States.

Less general, but equally relevant regulations are given by the Renewable Energy Directives (Directive EC 28/2009; RED II, Directive EU 2001/2018, and RED III, Directive (EU) 2413/2023), and the Energy Efficiency Directive (Directive EU 1791/2023), which establish legally binding targets for renewable energy adoption and energy savings.

The Renewable Energy Directives address critical challenges such as climate change, energy security, and energy independence in the wake of new geopolitical instability, which exposed the EU's reliance on fossil fuels. The directive acknowledges that the energy sector is responsible for over 75% of the EU's greenhouse gas emissions, making a shift to renewables essential.

RED III establishes binding renewable energy targets across sectors, increasing the EU's overall renewable energy target to 42.5% by 2030, with an additional aspirational goal of 45%. It also imposes sector-specific targets, including a 49% renewable share in buildings, accelerated decarbonization of industry, and higher quotas for renewable fuels in transport. The directive reinforces the principle of energy efficiency first, advocating for the prioritization of cost-effective and environmentally sustainable energy use.

To meet these goals, the directive enhances permitting procedures by simplifying and accelerating approval processes for renewable energy projects, introducing renewables acceleration areas where projects will receive streamlined approvals. It also promotes grid modernization to accommodate increased renewable capacity and prioritizes electrification in industry and transport. Financial incentives and support mechanisms, such as power purchase agreements and investment in innovative renewable technologies, are also introduced.

Expected results include increased renewable energy deployment, reduced fossil fuel dependency, and strengthened energy security. By fostering innovation, industrial transformation, and public-private partnerships, RED III aims to position the EU as a global leader in clean energy while ensuring a just and equitable transition for all sectors and communities.

The Energy Efficiency Directive (EU1791/203) strengthens the EU's commitment to reducing energy consumption as part of the European Green Deal and the Fit for 55 package. The directive addresses climate change, energy security, and economic resilience by promoting efficiency measures across all sectors. It acknowledges that the energy sector is a major contributor to greenhouse gas emissions and that improving energy efficiency is key to achieving climate neutrality by 2050.

To tackle these challenges, the directive sets binding energy efficiency targets, requiring a 11.7% reduction in energy consumption by 2030 compared to projected levels. Public bodies must cut their final energy consumption by at least 1.9% annually, and at least 3% of public buildings must be renovated yearly to meet nearly zero-energy or zero-emission standards. The directive also promotes energy audits, digitalization, and efficiency obligations for businesses and industries.

It introduces tools such as faster permitting for efficiency projects, improved metering and billing systems, financial incentives, and strengthened governance mechanisms. Expected results include lower energy costs, reduced reliance on fossil fuel imports, job creation in green sectors, and enhanced competitiveness while ensuring a fair and inclusive transition to a sustainable energy system.

The previous legal acts are bundled and strengthened through the European Green Deal, adopted in 2019 and serving as the EU's overarching strategy for achieving climate neutrality and decoupling economic growth from resource use. It includes specific mechanisms to ensure that no region or worker is left behind in the transition to clean energy.

To operationalize the Green Deal, the EU introduced the Fit for 55 package and the Just Transition Mechanism (JTM). The former, aimed to reducing GHG emissions by at least 55% by 2030, includes updates to key legislative instruments such as the EU ETS and the mentioned Renewable Energy and Energy Efficiency Directive, ensuring that emission reductions are balanced with economic and social considerations.

The JTM is a dedicated EU financial instrument designed to assist carbon-intensive regions in their transition away from fossil fuels. It consists of three main pillars:

- the Just Transition Fund (JTF), which provides grants to regions most affected by the transition, supporting economic diversification, reskilling programs and job-search assistance, active inclusion of jobseekers' programmes, environmental rehabilitation, clean energy, and infrastructure investments. The JTF is equipped with EUR €19.2 billion and it is expected to mobilise around EUR €25.4 billion in investments with national co-financing and voluntary transfers from other funds. JTF will alleviate the socio-economic costs triggered by climate transition, supporting the economic diversification and reconversion of the territories concerned;
- the Invest EU Just Transition Scheme, which mobilizes private investments to complement public funding for green energy projects and employment opportunities in affected regions;
- the Public Sector Loan Facility, which supplies concessional loans to public authorities to fund transition projects.

Furthermore, recognizing the socio-economic impacts of climate policies, the EU created the Social Climate Fund, which aims to mitigate energy poverty and assist vulnerable households, micro-enterprises, and transport users in adapting to cleaner energy solutions.

Each EU Member State is requested to submit a Territorial Just Transition Plan (TJTP) outlining how JTF funds will be allocated to support workers, businesses, and communities affected by the transition. These plans ensure that funds are tailored to regional needs and that transition measures align with national energy and climate strategies.

The EC supports Member States through the implementation of a Just Transition Platform, i.e. a single access point and helpdesk for technical and advisory assistance. Authorities and beneficiaries can access information on funding, regulations, and sector-specific initiatives, helping in preparing the TJTPs, outlining priority areas for support and strategies to address social, economic, and environmental challenges.

Finally, to assess the effectiveness of JET policies, the EU employs robust monitoring mechanisms. The European Environment Agency (EEA) and the EC publish periodic reports tracking progress on emissions reduction, social impact, and economic transformation in transition regions.

Looking ahead, the EU continues to refine its JET framework through policy adjustments, increased funding, and enhanced cooperation among member states. The upcoming revision of the Energy Taxation Directive and the expansion of the ETS to new sectors are expected to further align economic incentives with social equity goals. The EU's JET framework represents a comprehensive, multi-faceted approach to achieving a sustainable and inclusive energy transformation. By integrating legal mandates, financial instruments, and participatory governance mechanisms, the EU seeks to ensure that the shift to clean energy benefits all citizens, leaving no one behind.

2.1.2 National and Regional policies

The European Union's ambitious climate goals, anchored in Regulation (EU) 2021/1119 (European Climate Law), define a legally binding path toward climate neutrality by 2050. This framework, strengthened through directives such as RED III (Directive (EU) 2413/2023) and the Energy Efficiency Directive (Directive (EU) 1791/2023), cascades into the national strategies of Member States. A core pillar of implementation at the national level is the Just Transition Mechanism (JTM), including the Just Transition Fund (JTF), designed to provide socio-economic support during the energy transition. This chapter critically reviews how nine Member States - Hungary, Italy, Germany, Slovenia, Croatia, Czechia, Slovakia, Poland, and Austria - have interpreted and operationalized this EU framework, focusing on legislative instruments, key actors, targeted beneficiaries, and the justice dimensions of their national energy transitions.

Hungary's strategy centers on the implementation of the Just Transition Fund (JTF), targeting three counties (Baranya, Borsod-Abaúj-Zemplén, and Heves) where industries like coal and cement dominate the regional economies. The legislative framework supporting these actions is provided through the Government Decree 256/2021, enabling the allocation of approximately EUR 250 million in EU funds. These interventions seek not only to reduce emissions but to restructure local economies through SME support and the retraining of workers. The emphasis on justice is explicit, addressing the vulnerability of local SMEs, workers, and households. However, the implementation has been marred by delays and conflicts of interest, particularly with stakeholders resistant to phasing out coal.

Regional projects in the country exemplify a multifaceted strategy targeting deeply entrenched coal economies through structural transformation, social mitigation, and legal reform. The "LIFE-IP North-HU-Trans" and "Environment and Energy Efficiency Operational Programme Plus (EEEOPP)" initiatives directly support the National Energy and Climate Plan (NECP) and the national application of the Just Transition Fund (JTF). These projects address the Mátra Power Plant and the coal-intensive counties of Baranya, Borsod-Abaúj-Zemplén, and Heves, targeting decarbonization while safeguarding socioeconomic equity.

Key beneficiaries include lignite-sector workers, SMEs, and low-income households. Activities range from creating transition roadmaps, training experts, and establishing energy communities, to retrofitting buildings and repurposing mining lands for tourism. Particularly noteworthy is the establishment of the Coal Commission—a multistakeholder platform to guide policy development—showcasing alignment with EU principles of participatory governance. Nonetheless, challenges such as institutional coordination, limited innovation capacity, and entrenched socio-economic dependencies on fossil industries persist. Hungary's regional plans, while ambitious and EU-aligned, remain constrained by systemic implementation barriers.

Italy's Just Transition Fund implementation is focused on the heavily deindustrialized regions of Taranto and Sulcis Iglesiente, both out from the JETforCE area. The national legal and institutional apparatus

includes the Department for Cohesion Policies and the Prime Minister's Department, supported by regional governments and municipal agencies. Italy's strategy aligns with EU principles by emphasizing economic diversification, requalification of workers, and environmental remediation. Projects such as green fuel synthesis and phytoremediation of polluted lands exemplify the integration of ecological restoration with job creation. However, the regions' historical economic dependence on metallurgy and mining poses significant transformation challenges.

Regional strategies such as those found in Emilia-Romagna under the ERDF framework emphasize ecological transition through energy efficiency, renewable energy, and resilience building, reinforcing Italy's broader Just Transition objectives. ERDF targets a wide array of stakeholders -public bodies, private enterprises, and vulnerable households - addressing both infrastructural transformation and social equity. Key activities involve building renovations, decentralization of renewable energy systems, and urban resilience projects. Importantly, the plan integrates climate goals with inclusive socioeconomic planning, evident in its attention to energy poverty and regional equity.

Particularly interesting is the Italian Strategy for the Inner Areas (SNAI), inaugurated in 2017 in a pilot form to support the socio-demographic development of municipalities in areas furthest from service provision nodes, and evolved in last years in projects supported at the regional level. This is what happens in Emilia-Romagna with the Territorial Strategy for Inner and Mountain Areas (STAMI), which is applied since 2021 in 15 mountain municipalities of the Metropolitan City of Bologna. The strategy includes projects promoting energy and digital transitions, such as energy-efficient upgrades to public facilities, schools, and public lighting. This transition is not only technological but socially equitable, as interventions are locally tailored and community-driven, ensuring benefits are distributed across the 15 participating municipalities. By aligning ecological goals with localized needs, the project fosters both environmental sustainability and social inclusion.

Despite its progressive orientation, Italy's challenge lies in overcoming structural inertia and bureaucratic rigidity, particularly in harmonizing local initiatives with national priorities and EU funding streams. Nonetheless, the regional approach demonstrates the potential for leveraging EU cohesion policy to cultivate localized, sustainable energy ecosystems.

Germany has adopted a dual legislative strategy: the *Klimaschutzgesetz* (Climate Protection Act) and the National Hydrogen Strategy. The former mandates binding, sector-specific emission reductions aiming for climate neutrality by 2045. It is accompanied by extensive monitoring and adaptation mechanisms. The hydrogen strategy complements this by promoting industrial decarbonization, especially in coal-dependent areas like Lusatia and North Rhine-Westphalia. A strong emphasis is placed on retraining workers and establishing hydrogen infrastructure. While Germany exemplifies comprehensive climate governance, its ambitious targets—such as the goal of installing 10 GW of electrolysis capacity by 2030—highlight financial and infrastructural challenges.

Germany's regions exemplify a high level of institutional maturity and funding coherence, yet face persistent challenges such as local resistance to change, high upfront investment requirements, and the need for long-term intergovernmental coordination. Nevertheless, their strategic embrace of hydrogen technology positions Germany as a frontrunner in aligning regional development with the EU's net-zero trajectory.

Regional projects, such as the Just Transition Fund in Saxony and the Net Zero Valley initiative in Lusatia, reflect the dual emphasis on technological innovation and labour market resilience. These align closely with Germany's national legislative tools and the overarching objectives of the European Climate Law. The Just Transition Fund in Saxony supports economic diversification, education, and green infrastructure, directly benefitting workers and communities in coal-dependent regions. Lusatia's Net Zero Valley initiative seeks systemic transformation by converting legacy industries into decarbonized production hubs, emphasizing stakeholder engagement, inclusive planning, and robust public-private partnerships.

Slovenia's approach is deeply rooted in regional revitalization, guided by its Territorial Just Transition Plan. The JTF focuses on the coal-dependent regions of Savinjsko-Šaleška and Zasavska, with the dual goals of reducing greenhouse gas emissions and fostering inclusive economic growth. The strategy includes the development of clean technologies, such as green hydrogen and battery labouratories, and the rehabilitation of post-mining industrial zones. Local communities play an active role in decision-making, aligning with EU principles of participatory governance. However, progress remains nascent, with projects still in initial stages and facing complex structural and economic challenges.

Slovenia's regional programs, particularly the ERDF and Podravje Development Plans, present a holistic and inclusive model for energy transition. They emphasize enhancing energy efficiency, renewable energy deployment, and infrastructural resilience, while centring equity and territorial cohesion. Beneficiaries span municipalities, SMEs, and educational institutions, reflecting a broad and community-centric engagement strategy. Activities include climate adaptation projects, local energy communities, business incubation, and low-carbon mobility infrastructure. The justice dimensions are clearly embedded—access to clean energy, mitigation of urban-rural disparities, and support for socially vulnerable groups are prioritized.

Administrative decentralization and a strong role for regional development agencies ensure alignment with both the EU Green Deal and national frameworks. However, the uneven distribution of funds and underutilization of renewable energy potentials signal the need for more effective policy implementation and greater financial inclusion mechanisms.

Croatia demonstrates a layered policy framework. Its National Development Strategy (until 2030), Integrated National Energy and Climate Plan (NECP), and JTF implementation all converge on shared goals: emission reductions, economic modernization, and energy poverty alleviation. Key beneficiaries include rural populations and aging demographics, with strategies addressing regional inequalities and

migration trends. Notably, Croatia incorporates dedicated energy poverty mitigation measures, such as housing retrofitting and renewable energy access in marginalized areas. While these policies promise broad social inclusion, challenges persist in administrative inefficiencies and disparities between urban and rural development capacities.

The Istrian County Implementation Programme illustrates Croatia's distinctive approach to just transition, primarily focusing on human capital development. Measures target secondary education reform, vocational training, and curriculum alignment with future labour markets, thereby contributing indirectly to energy justice by enhancing employability in green sectors. Although not primarily an energy policy, the plan complements national strategies by preparing the labour force for structural shifts in the economy. The program's alignment with the JTF underscores Croatia's recognition of the social underpinnings of the green transition.

Yet, Croatia's regional efforts are hindered by infrastructural deficits and limited financial and human resources. As noted, the rigidity of the educational system and inadequate funding mechanisms pose risks to the successful operationalization of transition goals. Nevertheless, the program lays essential groundwork for long-term labour market flexibility and regional resilience.

Czech Republic aims for a complete coal phase-out by 2033, supported by a suite of policies including the National Energy and Climate Plan and National Recovery and Resilience Plan. The dual leadership of the Ministry of Environment and Ministry of Industry and Trade reflects a balance between ecological goals and energy security. Emphasis is placed on developing renewable and nuclear energy, retraining displaced workers, and investing in energy efficiency. However, resistance from coal regions and financial limitations pose obstacles to implementation and complicates the pathway to a just transition.

Czechia's regional focus, exemplified by the Vysočina Region's Spatial Energy Concept, integrates long-term energy planning with district heating modernization, energy efficiency, and stakeholder coordination. This technocratic orientation aligns with national frameworks such as the National Energy and Climate Plan and leverages EU support through instruments like the Just Transition Fund

The region adopts a systematic approach to upgrading energy systems while also fostering stakeholder participation through working groups. Primary beneficiaries include DHS operators, public institutions, and users of alternative fuels. Activities are infrastructural and regulatory in nature—ranging from guidelines for compliance and renewable integration to workshops and awareness campaigns.

Despite its comprehensive design, Czechia's energy transition at the regional level faces financial and coordination challenges, particularly in scaling renewable deployment. However, its commitment to transparent governance and alignment with both EU and national energy strategies offers a replicable model for policy integration and implementation.

Slovakia's legislative and strategic landscape is anchored in its Territorial Just Transition Plan and the National Energy and Climate Plan. The JTF targets three critical regions, addressing economic diversification, environmental remediation, and skills development. The national framework places

strong emphasis on education, research, and SME support. Key results include the termination of coal combustion in Upper Nitra and Vojany by early 2024. Despite this progress, limited local administrative capacities and the short timeframe of EU funding present barriers. The participatory design of the TJTP is regarded as a best practice, emphasizing localized solutions and community involvement.

Slovakia presents a nuanced and robust suite of regional projects, spanning from educational investments in the Banská Bystrica region to transformative actions in the Upper Nitra coal basin. These initiatives directly respond to the JTF framework and the EU's climate neutrality mandate, emphasizing socioeconomic stabilization during industrial restructuring. Key initiatives include vocational school modernization, retraining programs, and energy audits in public buildings. Projects target a diverse group: students, unemployed workers, and marginalized populations. Activities are designed to mitigate social displacement while preparing the labour market for green technologies and digitalization.

Challenges include mono-industrial dependency, demographic decline, and infrastructural gaps. However, the projects demonstrate a clear recognition of these barriers and integrate multi-scalar solutions—ranging from community energy projects to national retraining schemes. The strategic interplay between regional specificities and EU policy frameworks marks Slovakia as a proactive actor in operationalizing just transition principles.

Poland adopts a decentralized and consumer-focused approach, exemplified by the "My Electricity" (*Mój Prąd*) program. This policy empowers households to become energy prosumers by installing photovoltaic systems, heat pumps, and energy management technologies. The program provides subsidies covering up to 50% of eligible costs, thereby democratizing access to renewable energy. However, challenges such as low public awareness and limited familiarity with EU funding mechanisms hinder widespread adoption. Poland's energy transition also includes regional anti-smog resolutions and urban decontamination programs, reflecting a growing municipal engagement in national decarbonization efforts.

Poland's Lodzkie Region strategy ("European Funds for Lodzkie in Transformation") exemplifies a decentralized, innovation-led approach to energy transition. Rooted in the Territorial Just Transition Plan, the program addresses regional economic transformation, skills enhancement, and energy decentralization. The regional program emphasizes digitalization, renewable energy development, and vocational upskilling. Projects support SMEs, vocational schools, and public institutions across 35 communes affected by lignite mining decline. Importantly, it seeks to empower individuals through adult education vouchers and career consulting.

Despite being in its early stages, Poland's approach reflects an agile response to regional economic vulnerabilities. However, challenges in public engagement, service accessibility, and spatial equity highlight the need for sustained institutional support and civic participation. Poland's model underscores the critical role of territorial planning in achieving EU-wide decarbonization goals.

Austria's legislative cornerstone is the Climate and Energy Fund (*Klima und Energiefonds*), a long-standing financial instrument supporting innovation and green regional development. The fund backs over 440,000 projects, investing more than EUR 3.7 billion to date. Emphasis is placed on decentralized energy systems, spatial planning, and model climate-energy regions. Austria's strategy also includes significant subsidies for replacing fossil-based heating systems, especially in low-income households. Challenges include governance complexities and long-term infrastructure planning. Nevertheless, Austria has successfully institutionalized climate innovation and promoted regional self-sufficiency as core transition principles.

Austria's regional framework is structured around its long-standing "Climate and Energy Fund," showcasing a mature and systemic approach to energy transition. With over EUR 3.7 billion invested in more than 440,000 projects, Austria exemplifies how sustained institutional commitment can enable regional innovation and climate adaptation.

Regional projects focus on decentralized energy systems, climate-energy model regions, and low-income household support for heating system replacement. The approach is both participatory and forward-looking, involving municipalities, research institutions, and citizens in shaping localized transition strategies. Governance complexities and the need for long-term infrastructural planning remain notable challenges. Nevertheless, Austria's success in embedding energy transition within regional development paradigms demonstrates the value of policy continuity, institutional robustness, and public engagement.

Across the involved Member States, a common strategic orientation is evident: a commitment to achieving climate neutrality by 2050, in alignment with the EU's overarching climate legislation and goals as articulated in the European Climate Law (Regulation EU 2021/1119). While countries like Hungary, Germany, and Slovakia have formalized these objectives within binding legislative frameworks, directly referencing neutrality targets and sector-specific carbon budgets, others such as Croatia and Slovenia have opted to internalize the EU's climate objectives through broader, often development-focused instruments. These include National Energy and Climate Plans (NECPs), territorial JT strategies, and long-term development plans that address decarbonization as one of several concurrent national priorities. In some instances, notably in Germany and Italy, the national transition agenda extends beyond climate mitigation alone, encompassing comprehensive industrial modernization, technological leadership in emerging sectors (e.g., hydrogen, green fuels, and circular economy systems), and systemic innovation designed to reposition these economies at the forefront of the low-carbon transformation.

When it comes to identifying the principal targets of policy interventions, there is widespread convergence among the Member States. All countries prioritize carbon-intensive territories -particularly former or existing coal mining regions and industrial areas - as focal points for intervention. These areas often face significant socio-economic vulnerabilities, stemming from historical dependency on fossil fuel-based employment and infrastructure. As a result, displaced workers, especially from mining, metallurgy, and heavy industry, are systematically identified as key beneficiaries. Similarly, rural

communities, which are frequently isolated from innovation ecosystems and infrastructural investments, receive targeted support aimed at reducing regional disparities and counteracting depopulation trends. SMEs are also widely recognized as potential engines of green growth and local revitalization across national strategies, especially in Hungary, Slovakia, and Germany, as recipients of both financial support and capacity-building initiatives. Beyond these, particular attention is given to youth populations, low-income households, and marginalized communities, as in Austria, Poland, Slovenia, and Croatia, which have integrated mechanisms to promote energy equity and mitigate the risk of social exclusion during the transition.

A diverse array of policy measures is employed by the Member States to operationalize the energy transition at the national and subnational levels. Retraining and upskilling programs, especially those aimed at workers in declining fossil sectors, feature prominently in Hungary, the Czech Republic, and Slovakia, often embedded within broader regional transformation packages. Support for SMEs emerges as a consistent instrument for stimulating endogenous economic diversification, notably through grants, innovation hubs, and advisory services, particularly visible in Slovakia, Germany, and Hungary. Renewable energy deployment, whether through infrastructure investment, prosumer support, or fiscal incentives, is a leading intervention in Poland, Germany, and Croatia, complemented by grid modernization and storage solutions. Environmental remediation is a key focus in heavily polluted or degraded areas, with innovative examples in Italy (e.g., phytoremediation in Taranto) and Slovenia (e.g., coal region revitalization). Meanwhile, countries like Austria and Germany emphasize infrastructure development, not only in terms of physical assets (e.g., green hydrogen pipelines or public transport systems), but also in digital and administrative systems necessary to facilitate coordination and service delivery across jurisdictions.

Particularly noteworthy are the robust strategies developed by Germany and Italy, both of which have advanced beyond conventional transition planning by embedding green hydrogen and circular economy principles into their core legislative instruments. Germany's National Hydrogen Strategy and Italy's pilot projects on Green Fuel Synthesis exemplify how Member States can leverage the energy transition to drive industrial innovation, attract investment, and stimulate research and development across a wide range of economic sectors.

Justice and equity considerations are increasingly becoming integral to national energy transition policies. These concerns manifest through a variety of mechanisms: from financial subsidies and grants for low-income households (as seen in Austria and Poland) to inclusive participatory planning processes involving civil society and local communities (e.g., Slovenia, Slovakia). Slovenia and Slovakia in particular stand out for their strong participatory governance models, which include regional development agencies, citizen workshops, and stakeholder forums to ensure that local voices shape decision-making. By contrast, Hungary and the Czech Republic still face challenges in institutionalizing equity, often due to political resistance, low public awareness, or underdeveloped mechanisms for social inclusion, especially in historically coal-dependent regions. Nonetheless, there is an emerging

recognition across all countries that procedural fairness and distributive justice are indispensable components of sustainable policy success.

The implementation architecture across Member States reveals the complexity of multi-level governance required to translate EU mandates into actionable national and regional policies. National ministries typically assume strategic coordination roles (e.g., Ministries of Economy, Environment, and Regional Development), while regional authorities, municipalities, and EU bodies participate in operational management and resource distribution. Germany demonstrates a mature institutional model with bodies such as the Climate Protection Council and Hydrogen Council playing strategic advisory roles. In contrast, countries like Slovenia and Slovakia rely extensively on regional development agencies and cross-sectoral committees to foster local ownership and tailor interventions to place-based needs. The effectiveness of these institutional arrangements varies significantly, influencing not only the pace of implementation but also public trust and long-term policy continuity.

Despite these well-structured efforts, several common challenges persist across the reviewed countries. Among the most pressing are socio-economic resistance to change, particularly in regions where the transition threatens livelihoods and cultural identities tied to extractive industries. This is compounded by limited administrative and technical capacity, especially at the local level, where bottlenecks in project design, fund absorption, and stakeholder coordination can delay implementation. Financial and technological constraints also hinder progress, particularly in countries where clean energy infrastructure and innovation ecosystems are still nascent. However, these challenges are counterbalanced by an array of anticipated benefits, including the creation of new and diversified employment opportunities, acceleration of technological innovation, enhancement of public health through improved air quality, and bolstered energy security and resilience—especially significant in the wake of geopolitical tensions affecting energy supply chains.

Considered at the Country level, the energy justice policies implemented in the JETforCE area reveals national approaches that, while shaped by unique historical, socio-economic, and institutional contexts, collectively embody the spirit and substance of the EU's JET agenda. There is a clear convergence around key principles: environmental sustainability, social inclusivity, technological innovation, and economic resilience. The EU's legislative instruments provide a cohesive framework, but their success is contingent on national governments' ability to translate policy into practice through effective coordination, place-sensitive implementation, and long-term financing. As the transition progresses, the challenge for Member States will be to balance ambition with equity, ensuring that no region or community is left behind while harnessing the full potential of a decarbonized future. The pathways highlighted by these national experiences can serve as valuable references for cross-country learning, policy harmonization, and continued refinement of the European green transition model.

The comparative insight in the JETforCE area testifies the critical role of regional governance in driving the EU's energy and climate transition. By embedding justice in localized energy strategies and aligning

with broader national and EU legal frameworks, these initiatives provide blueprints for a more equitable and resilient energy future.

The regional projects mentioned present a rich tapestry of transition strategies shaped by national contexts and EU frameworks. A shared emphasis across all countries is the prioritization of economic diversification, workforce adaptation, and inclusive governance. Most programs explicitly address energy justice, either through targeted support for vulnerable groups, participatory processes, or infrastructure equity.

Variations emerge in focus and execution. Germany and Austria exhibit high institutional capacity and financial maturity, deploying integrated frameworks to scale innovations. In contrast, Croatia and Slovakia, while ambitious, face constraints in infrastructure, funding, and social inclusion. Hungary, Czechia, and Poland adopt region-specific interventions that reflect both historical energy dependencies and emerging resilience strategies.

In terms of beneficiaries, while all projects recognize workers and SMEs, only some, such as those in Slovenia and Italy, systematically include marginalized households and youth. Key activities likewise range from energy system overhauls and job retraining to urban renewal and education reforms. Institutional arrangements are diverse, with varying degrees of decentralization and cross-sector collaboration.

Finally, common challenges include capacity gaps, funding absorption, public resistance, and the inertia of legacy systems. However, the benefits—reduced emissions, job creation, social equity, and energy security—offer compelling incentives for sustained effort.

2.2 The JETforCE at work

The JETforCE project does not define the strategy completely *ex-novo*, but contributes to its consolidation by operationalising, testing and scaling existing principles through concrete tools and actions.

Rooted in the EU's objectives to promote sustainability while ensuring equitable access to energy resources, the JETforCE project aims to develop digital tools that engage citizens and policymakers in mapping energy transition challenges and evaluating responsive technologies. A structured monitoring and evaluation framework guides the initiative, incorporating performance indicators, periodic assessments, and oversight by a transnational Monitoring Committee to ensure alignment with project goals and the generation of reliable data for policy formulation.

The implementation process involved extensive preparatory activities, including stakeholder meetings, technical testing, and local launch events tailored to regional conditions. The Digital Challenge Mapping tool was introduced across multiple partner regions to engage citizens in identifying local energy transition challenges, which would then inform policy and technological interventions. Engagement

strategies varied, incorporating collaborations with municipal authorities, universities, and businesses invested in sustainability.

The results obtained reveal a mixed but promising picture. Several countries successfully introduced the tool to citizens, collecting a significant number of challenges related to energy poverty, inefficiencies in renewable energy deployment, infrastructure gaps, and policy barriers. The variety of reported challenges underscores the complexity of the energy transition and the importance of localized solutions. Despite this progress, challenges emerged in user engagement and technical performance, with concerns raised about usability, accessibility, and the long-term management of the collected data.

Among the key strengths identified is the high level of interest among certain stakeholder groups, particularly students, local governments, and businesses committed to sustainability. The initiative fostered collaboration between diverse actors, creating a foundation for sustained engagement. The monitoring methodology proved effective in identifying gaps and allowing for mid-course corrections, ensuring a responsive and adaptive approach to implementation.

However, weaknesses also surfaced. Technical difficulties with the Challenge Mapping tool, including login issues and data input inconsistencies, hindered broader adoption. Moreover, there was skepticism among users regarding the tool's long-term impact, as many feared that reported challenges would not lead to concrete action. Some regions experienced low participation rates, highlighting the need for enhanced outreach strategies, incentives for engagement, and clearer communication of the tool's purpose and benefits.

The evidence gathered through implementation has been essential in consolidating the JETforCE Strategy in its final form. The identification of technical and engagement-related limitations has informed concrete adjustments aimed at improving the usability and reliability of digital tools, strengthening stakeholder engagement, and clarifying the role of policymakers in responding to locally identified challenges. The integration of digital solutions within the LAPs has emerged as a key condition for their effectiveness and has been embedded as a core strategic principle. The lessons learned have been fully capitalised within the Strategy, translating user feedback and operational insights into actionable policy orientations. In this sense, the JETforCE experience constitutes the process through which the Strategy have been finalised, reinforcing its contribution to a fair and inclusive energy transition in Central Europe.

2.3 Best practices for JET from the JETforCE area

The Just Energy Transition is neither an abstract nor an unknown concept across Central Europe: it is unfolding through a network of concrete local experiences that combine technical innovation, social participation, and institutional learning. The territories involved in the JETforCE partnership have just witnessed different, albeit often isolated or non-systematic, best practices for JET. From energy communities to agrivoltaic projects, from urban poverty alleviation to coal-region reconversion, these

initiatives illustrate how climate neutrality can be achieved through inclusive governance, cooperative ownership, and territorial solidarity.

The best practices summarized and interpreted in this Section are collected and described more specifically in Annex 1 to this document.

2.3.1 Community Energy and Democratic Governance

Across the region, Renewable Energy Communities (RECs) are proving to be the most tangible manifestation of the Just Energy Transition. They empower citizens to become producers, not just consumers, of clean energy while redistributing both the environmental and economic benefits of decarbonization.

In Austria, the *Energiewerk Weiz* stands as a landmark example. Built upon strong municipal leadership, it allows households—including low-income ones without direct access to photovoltaic systems—to share renewable electricity at reduced tariffs. Beyond energy production, it promotes energy literacy and fosters civic trust, turning the Weiz model into a blueprint for small and medium-sized towns across the EU.

A comparable spirit animates the Luče energy community in Slovenia, which achieved near-complete energy independence through the integration of solar panels, battery storage, and electric mobility infrastructure. The cooperative governance of Luče ensures equal participation of all residents, embedding procedural and recognitional justice in its operational DNA.

In Germany, community autonomy is epitomized by *Feldheim*, often cited as Europe's first fully energy self-sufficient village. Its integration of wind, solar, and biogas under citizen control demonstrates how energy democracy can translate into local prosperity and resilience.

2.3.2 Agrivoltaics

Another vibrant field of innovation is agrivoltaics, which merges renewable energy generation with agricultural productivity. This approach responds to one of the most pressing challenges in rural Europe: how to decarbonize without undermining food systems or landscape identity.

In Italy, the *EAGER – Easing Agrophotovoltaic for Europe* project, coordinated by the Metropolitan City of Bologna, stands out for its scale and policy impact. It seeks to harmonize nine regional policy instruments to facilitate agrivoltaic expansion, promoting synergy between agriculture and energy sectors. Its ambition is to ensure that farmers become protagonists of the green transition, not victims of it.

Similarly, Slovenia's *Deržič project* merges sheep farming with solar power generation, using elevated photovoltaic structures that provide shade for animals while generating electricity. This model—simple, affordable, and replicable—demonstrates how climate resilience and rural development can advance hand in hand.

In Emilia-Romagna, smaller farm-based initiatives confirm this integrated approach: combining renewable installations with mixed crop systems to create self-sufficient, low-impact farms that embody both environmental and distributive justice.

2.3.3 Addressing Energy Poverty through Social Innovation

Many best practices from the JETforCE area confront the intertwined crises of energy poverty and social exclusion.

In Croatia, the *Zagreb Energy Poverty Programme*—developed with the NGO DOOR—demonstrates how municipalities can target vulnerable households with audits, advisory services, and renovation support. Its success lies in its dual approach: immediate assistance for struggling families and long-term reduction of energy dependency through structural retrofits.

In Italy, the *Microareas Programme of Trieste* connects social services, health institutions, and academic research to tackle energy vulnerability in public housing districts. By integrating energy efficiency into community welfare, it redefines social innovation as a driver of decarbonization.

Meanwhile, Slovenia's national scheme to combat energy poverty, jointly managed by the Jožef Stefan Institute and the Eco Fund, distributes non-repayable incentives for home renovation. This not only improves living standards but also symbolizes recognitional justice: acknowledging that climate transition must begin with those who can least afford it.

2.3.4 From Coal Regions to Green Economies

The Just Energy Transition also has a territorial dimension, particularly in former coal-dependent regions where structural change requires both vision and empathy.

Slovakia's Territorial Just Transition Plans (TJTPs) stand as one of the EU's most structured frameworks for balancing economic diversification and social support. Concentrated in Upper Nitra, Košice, and Banská Bystrica, they direct significant Just Transition Fund resources toward green technologies, reskilling programs, and sustainable agriculture. The partnership with Hyundai Mobis to produce EV components illustrates how industrial reconversion can create new employment while preserving community identity.

Similarly, the Czech Ústecký region has pioneered retraining and renewable projects for former coal workers, ensuring that they are not displaced but re-employed in the green economy. These initiatives integrate energy justice directly into labor policy, offering a model for post-carbon industrial strategy across Europe.

In Poland, where the Bełchatów region faces Europe's largest lignite phase-out, spatial planning and economic diversification strategies are being deployed to transform mining landscapes into renewable energy zones. Supported by the Energy Forum Foundation, these actions combine solar and wind

potential mapping with stakeholder dialogue, turning ecological restoration into a catalyst for new industrial ecosystems.

Best practices also emerge where governance innovation meets territorial planning. In Austria's Styria region, integrated spatial and energy planning tools align land use, infrastructure, and energy objectives through GIS-based modeling. This coordination enables municipalities to optimize renewable siting and efficiency measures, showing that spatial coherence is essential to a fair and sustainable transition.

2.3.5 Education, Skills, and Workforce Transformation

The Just Transition is not only about technology but also about people. Educational best practices within the JETforCE area highlight the transformative role of knowledge and capacity building.

In Istria (Croatia), vocational schools such as Mate Blažine Labin have integrated green skills training into curricula, preparing future technicians and energy managers. The "Kids Can Do It" program extends awareness to younger students, proving that social change starts early.

Slovakia's renovation of vocational schools in Banská Bystrica serves a dual purpose—improving energy performance and upgrading training environments for the next generation of green professionals. The Innovation Centre W.E.I.Z. (Austria) reinforces this educational dimension through continuous public counseling and advisory services that help citizens navigate energy efficiency programs, strengthening both awareness and civic engagement.

While progress toward energy democracy in Central and Eastern Europe remains uneven, the JETforCE experience shows that significant examples of good practice already exist and can serve as a foundation for future development. These cases, even when limited in scale, demonstrate that the region holds valuable potential for translating the principles of justice, participation, and sustainability into concrete, local processes.

From Luče's community resilience to Bologna's agrivoltaic experimentation and Trieste's socially oriented initiatives, the emerging lesson is clear: even in contexts where systemic barriers persist, change becomes possible when local actors, institutions, and citizens collaborate. These experiences confirm that the energy transition cannot be imposed solely through regulation; it must be co-designed and collectively managed, gradually building trust and participation within communities.

The best practices identified across the JETforCE territories suggest several lessons of European relevance. Citizen engagement remains a necessary precondition for fair and lasting transition, while territorial coordination—linking spatial planning and local governance—reduces conflict and optimizes resources. Likewise, the integration of environmental, social, and economic objectives transforms isolated actions into coherent strategies, and education and transparency emerge as indispensable drivers of long-term commitment.

Taken together, these experiences do not yet define a consolidated model of energy democracy but rather a set of promising directions. They show that, despite persistent structural and institutional challenges, Central and Eastern Europe is beginning to contribute meaningful practices to Europe's broader green transformation—examples where cooperation, innovation, and fairness intersect to outline the path toward a more inclusive and sustainable future.

2.4 The »state of the art« in JETforCE area

The scenario emerging from the JETforCE territories reveals an energy transition that is advancing through multiple, uneven, yet converging pathways. Central Europe is not a homogeneous landscape: while some regions display institutional maturity and long-term vision, others still grapple with fragmented governance, limited administrative capacity, and structural dependency on fossil fuels. Yet across this diversity, a shared orientation seems to take shape: an understanding that justice is not a complement to transition but its precondition.

The analysis shows that the European framework has created a solid normative and financial foundation. The Climate Law, the Green Deal, and the Just Transition Mechanism have given governments the tools to connect decarbonization with social equity. What differentiates national outcomes is not ambition, but the ability to translate these instruments into local realities. Where multilevel coordination works, as in Austria, Germany, or North-Eastern Italy, policies turn into coherent programs combining energy innovation, economic diversification, and citizen participation. Where such coordination remains weak, progress is slower and often restricted to isolated pilot actions.

A second lesson concerns the growing centrality of territorial governance. The most dynamic processes are those that embed energy transition in regional planning, land-use management, and social policy. The cases of Styria's integrated planning or Emilia-Romagna's mountain strategy demonstrate that spatial coherence can turn technical decarbonization into territorial regeneration. Conversely, when planning and participation remain disconnected, transitions risk reinforcing inequalities rather than reducing them.

The review also highlights emerging forms of social innovation. RECs, agrivoltaic projects, and cooperative models in Italy, Slovenia, Austria, and Germany show that ownership and participation can redistribute both costs and benefits of the transition. These initiatives are still limited in scale but significant in meaning: they prove that energy democracy can grow from local experimentation rather than top-down mandates. Similarly, programmes tackling energy poverty in Croatia or Trieste illustrate that social policy can act as an engine for environmental change.

Digitalization has opened new frontiers for engagement. The Challenge Mapping platform and the Technology Evaluation Tool, piloted through JETforCE, have begun to connect citizens, institutions, and data in new ways. Their early shortcomings (technical limits, uneven uptake, or low trust) underscore

that technology alone cannot create justice. Nevertheless, their presence signals a cultural shift: governance is gradually learning to listen and respond through transparent, accessible instruments.

Another defining feature is the recognition that skills, knowledge, and education are pillars of just transition. The inclusion of vocational schools and training centres in Istria, Slovakia, and Weiz confirms that preparing workers and citizens for new energy systems is as crucial as building the systems themselves. Where learning accompanies investment, transitions become durable.

Persistent challenges remain. Funding complexity, limited access for small municipalities, and administrative inertia continue to hinder implementation. Resistance from communities tied to extractive economies and doubts about fairness reveal the fragility of public trust. These constraints remind us that achieving a just transition is as much a social negotiation as a technological transformation.

Overall, the analysis of the JETforCE area depicts a region at a transitional crossroads: not yet a mature incubator of energy democracy, but increasingly aware of its potential. The collected experiences indicate that fairness, participation, and territorial cohesion are emerging as structuring principles, gradually transforming energy democracy and justice from an abstract promise into a measurable practice.

The contribution of this strategic document and of the associated Local Action Plans (see Collection) is in the direction of consolidating/strengthening institutional capacity, deepening citizen involvement, and ensuring that the benefits of the green transformation reach all territories.

3. Supporting justice in the energy transition process

3.1 The bright and dark sides of the energy transition

The process of JET represents one of the most profound transformations in contemporary societies, seeking to simultaneously decarbonize economies, regenerate territories, and promote social equity. However, the pathway is fraught with criticalities that emerge in the realms of social justice, territorial transformation, and structural change, all of which expose significant tensions between environmental objectives and socio-economic realities. Understanding who loses in the process, and what precisely is at stake, is essential to designing energy policies that go in the direction of different facets of “justice”.

Renewable energy policies must prioritize social justice, ensuring affordability, accessibility, and spatial equity. Agri-voltaic systems, promoted in Emilia-Romagna and Slovenia, illustrate how renewable expansion can align with agriculture and rural development. Tailored subsidies, dual-use land regulation, and farmer support are key. In cities, decentralized systems like Poland’s My Electricity empower households as energy

prosumers—if support reaches disadvantaged groups and avoids reinforcing a digital-energy divide. Workforce adaptation is crucial. Vocational retraining in Upper Nitra (Slovakia) and educational reforms in Croatia's Istrian County show how labour markets can transition toward green sectors. These programs must be comprehensive, future-oriented, and inclusive of sectors like renewable energy, sustainable farming, and green mobility. Poland's Lodzkie Region piloted adult education vouchers, proving effective when coupled with personalized career support.

From the perspective of social justice, a clear and recurring criticality concerns the exposure of vulnerable populations to new forms of disadvantage. Workers in fossil-fuel industries, low-income households, marginalized rural communities, and SMEs are frequently at risk of becoming the primary losers in the transition. Their losses are multifaceted. Workers face the disappearance of entire sectors, notably coal mining and heavy industry, with limited prospects for immediate and equivalent re-employment. The loss here is not only economic but also cultural, as professions and identities tied to extractive industries dissolve. This could generate a profound sense of alienation, mistrust toward political institutions, and resistance to transition policies perceived as exogenously and top-down imposed.

Low-income households confront losses that manifest through energy poverty and affordability crises. Energy transition policies, particularly those that rely heavily on market mechanisms, can lead to higher energy prices and increased costs of living, particularly where carbon pricing – i.e. policy mechanisms that put a financial cost on GHG emissions (carbon taxes, ETS, and so on) - is implemented without compensatory measures. Vulnerable households can lose access to affordable and reliable energy services, a deprivation that exacerbates health issues, social exclusion, and intergenerational poverty. The reliance on traditional economic models, which underestimate the distributive consequences of transition policies, reinforces these patterns. Furthermore, the lack of comprehensive, harmonized measures for identifying and targeting energy-poor households leads to fragmented interventions that fail to reach the most affected groups.

Territorial equity must be systematically integrated into the design of transition policies. Large-scale renewable energy projects should not be imposed on vulnerable territories without mechanisms for local benefit-sharing and participatory decision-making, avoiding the extractive logic that has historically characterized rural and post-industrial areas. Austria's spatial energy planning in Styria offers a blueprint for integrating renewable energy development with land-use strategies that promote sustainability, resilience, and community empowerment. Future policies should mandate that renewable energy projects in rural areas include community benefit agreements, profit-sharing mechanisms, or requirements for local ownership shares. Regions particularly exposed to industrial decline, such as coal mining territories in Slovakia, Poland, and the Czech Republic, should be supported through integrated territorial development programs that combine decarbonization with economic diversification, skills upgrading, and social infrastructure investment.

In the domain of territorial transformation, criticalities emerge from the uneven spatial distribution of benefits and burdens associated with energy transitions. Rural and post-industrial regions often become sites for capital intensive renewable energy developments, such as large-scale solar or wind farms, without

sufficient mechanisms to ensure tangible benefit-sharing for local communities. These territories thus lose control over their resources and sites, becoming mere hosts for external investment flows that do not necessarily translate into local prosperity. Distributive justice failures are compounded by procedural justice deficits: many rural communities experience top-down planning processes with minimal meaningful participation, resulting in opposition, social resentment, and outright resistance to green projects.

The loss here would be twofold: on the one hand, the economic loss of failing to capture the value generated by the energy transition; on the second hand, a loss of agency and recognition, as local communities feel bypassed by decision-making processes that prioritize national targets over localized needs and identities. This dynamic has the potential to widen existing territorial inequalities, marginalizing peripheral regions even further and fuelling social polarization between urban centres, which reap the primary benefits of the green economy, and rural areas, which bear transition costs.

Structural change introduces another set of challenges and criticalities. As economies shift away from fossil fuel dependence, entire industrial structures must be modified, some of them dismantled and replaced with more sustainable sectors. This transformation is not merely technological but deeply socio-economic, affecting production patterns, labour markets, and community structures. The losers in this context are not only workers displaced by deindustrialization, but also SMEs tightly integrated into traditional industrial ecosystems and facing significant barriers to adaptation, including lack of financial resources, limited access to innovation networks, and cultural inertia.

Economic diversification requires direct support for SMEs, cooperatives, and social enterprises. Investing in local R&D centers, incubators, and cooperative platforms helps embed transformation within communities and avoid external dependency. The *Net Zero Valley* in Lusatia, Germany exemplifies how clean tech can drive regional change when paired with social cohesion strategies. Education is central: Croatia's vocational schools incorporating green skills show how curricula must evolve. Governments should invest in sustainability education across all levels, linked to practical skills in renewables, construction, circular economy, and digital tools. Public campaigns and online learning can spread green knowledge widely across society.

Structural change must also integrate climate adaptation. Poland's adaptation plans and Slovakia's economic transformation programs show how joint strategies can strengthen both environmental and social resilience. Adaptation efforts, like flood protection and ecosystem restoration, must prioritize vulnerable populations and be embedded in spatial planning and energy policy.

Another dimension of structural criticality is financial. The transition demands massive investments in infrastructure, technology, and human capital. Regions with pre-existing economic fragilities, limited institutional capacities, and low levels of private investment are at risk of lagging behind. The loss for these territories is strategic: without targeted support, they may miss the opportunity to reposition themselves within the emerging economy, remaining locked in trajectories of decline.

Across all the three axes of social justice, territorial transformation, and structural change, the question of governance emerges as a transversal criticality. Where governance structures are opaque, centralized, or unresponsive, the risk is the erosion of trust in public institutions, undermining individual well-being and threatening the legitimacy of the transition itself. Top-down approaches that neglect procedural justice principles, including transparency, inclusiveness, and responsiveness, could generate opposition movements that derailing or delaying the decarbonization efforts.

The cumulative picture that emerges from the analysis of both the scientific literature and the political and legal framework presented in previous sections of this strategy does not hide a tangible threat. The very populations and territories most affected by climate change - the old people, the rural communities, the economically deprived - are also those most exposed to the adverse effects of poorly managed energy transitions. They risk losing not only material resources but also symbolic assets: professional identities, territorial attachments, social cohesion, and trust in the institutions.

The identified criticalities highlight that the success of the JET cannot be measured solely by emission reductions or technological milestones, but even through its capacity to foster inclusive development, protect vulnerable populations, empower marginalized territories, and build resilient socio-economic systems.

3.2 Towards a JET: guiding principles and policy recommendations

A JET demands a profound rethinking of policy frameworks to ensure that environmental and climate imperatives align with social inclusion, territorial equity, and economic resilience. The criticalities identified require targeted, systemic policy interventions.

The first requirement is the institutionalization of distributive justice within energy transition strategies. Energy poverty must be addressed not as an ancillary issue but as a core objective of decarbonization policies. Policies must integrate multi-dimensional indicators of energy vulnerability that go beyond simple income metrics, incorporating housing quality, access to clean technologies, health outcomes, and territorial disparities. Initiatives like the energy renovation programs in Slovenia and Slovakia, where public subsidies support deep retrofitting for low-income households, offer replicable models. These interventions should be expanded, ensuring that grants, technical assistance, and reduced-interest loans are available to vulnerable populations. Special attention must be given to rural areas, where energy infrastructure deficits magnify poverty risks. Combining building renovation with localized renewable energy deployment, as seen in the integrated strategies pursued in Italy's Inner Areas projects and the STAMI initiative in Emilia-Romagna, can ensure that improvements in energy efficiency coincide with broader social regeneration.

A second crucial domain concerns procedural justice. The governance of the transition must be restructured to promote transparency, participation, and accountability. The participatory governance models piloted in Slovenia and Slovakia, where regional development agencies and citizen workshops play a central role in shaping transition policies, provide valuable models. The happens with RECs projects in Austria, Germany,

Hungary, and Italy, showing that social acceptance, trust, and economic benefits rise dramatically whenever communities are given ownership over energy projects. Attention must be paid to ensuring that marginalized groups, such as rural populations, low-income households, and ethnic minorities, have the capacity and opportunity to participate in and benefit from RECs. Building on the lessons from the Luče energy community in Slovenia and Valsamoggia in Italy, where technological innovation was coupled with inclusive governance models, future initiatives should embed community ownership principles into national and regional renewable energy strategies.

The third pillar to be considered is recognitional justice, which demands sensitivity to territorial, cultural, and economic diversities in implementing energy transition solutions. Without such recognition, transition policies risk alienating the very communities they aim to empower, undermining the legitimacy and social acceptance of decarbonization efforts. It addresses the marginalization of rural areas hosting renewable infrastructures, as seen in the Austrian and German experiences with RECs, which promote local ownership and participation. Similarly, Italy's Inner Areas Strategy and STAMI demonstrates how tailoring transition policies to rural socio-economic contexts fosters inclusive development. Projects like the adaptation initiatives in Poland show the importance of integrating local knowledge, cultural values, and lived experiences into transition pathways.

If the three types of justice are the foundations, the preceding sections have outlined a complex landscape and a multidimensional perspective on the specific measures that constitute a JET policy. Diverse policy experiences from JETforCE partners identify shared principles for a just and inclusive energy transition. While specific measures must be adapted to each territorial context, a set of overarching recommendations can guide action:

- ensure universal accessibility to energy transition opportunities, particularly for vulnerable and marginalized groups.
- adopt a holistic policy framework that reflects the interconnected nature of societal sectors.
- encourage legal innovation and institutional reform to support decentralization, participation, and long-term resilience.
- integrate education and vocational training to spread the knowledge of JET issues and foster a skilled, future-ready workforce.

A central tenet of JET is ensuring equitable access to energy resources and technologies. Exclusionary systems that marginalize specific social groups, such as low-income households, rural communities, and workers in fossil fuel industries, are inherently unjust and unsustainable.

Scholars have long emphasized the need to account for vulnerability in energy policymaking, noting that current policy paradigms often prioritize middle- and upper-class households, thereby deepening pre-existing socio-economic divides. A JET must therefore begin with explicit recognition of energy poverty as a structural challenge, requiring direct and sustained policy responses.

Energy transitions are not confined to isolated sectors; they cut across all aspects of society, from housing and transportation to agriculture and industry. As such, policy responses must adopt A holistic approach that reflects the interdependencies of different sectors. One compelling illustration of this principle is the promotion of agri-photovoltaics, which simultaneously supports agricultural productivity and renewable energy production.

Effective implementation of JET policies requires robust and adaptive legal frameworks capable of responding to evolving challenges. Institutional maturity is particularly critical when addressing place-based needs.

Education plays a dual role in the energy transition: it prepares future generations for ecological citizenship and equips the current workforce with the skills necessary for emerging green jobs. The example of Mate Blažine Labin High School exemplifies how educational reform can support regional economic transformation through green curricula and entrepreneurial training. Similarly, Poland's Lodzkie Region strategy incorporates vocational retraining to address energy decentralization and labour market shifts.

Research highlights how large-scale renewable projects can exacerbate territorial inequalities if local communities are excluded from decision-making and value capture.

These guiding elements form the ethical and operational foundation for JET, i.e. not only to decarbonize economies but also empowering people and strengthening democratic governance. Future efforts under the JETforCE initiative should continue to refine these principles into actionable strategies, ensuring that justice is not merely a policy objective, but a lived reality.

3.3 Financing Just Energy Transition

The transition toward climate neutrality implies substantial capital requirements for renewable generation, energy-efficiency retrofits, heating infrastructure, digital monitoring systems, governance structures, skills development, and social-support mechanisms. These interventions display heterogeneous revenue profiles, different degrees of investment risk, and contrasting levels of market readiness. For this reason, no single financing instrument can address the entire spectrum of needs; instead, a coherent multi-layered financing architecture is required, capable of supporting both economically bankable and non-bankable elements of the transition.

In Central Europe, the financing environment is defined by multi-level funding streams that include European cohesion policy programmes, the Just Transition Fund, the Recovery and Resilience Facility, national incentive schemes, regional development instruments, municipal budgets, and private capital markets. These streams operate under distinct timelines, eligibility criteria, and administrative structures, and their interaction determines the actual feasibility of transition pathways. Public authorities, especially at local and regional level, often face fiscal constraints and limited administrative capacity, while private investors typically require predictable cash flows, stable regulatory environments, and credible risk-

mitigation mechanisms. Financing a just transition therefore involves reconciling distributive objectives, institutional capabilities, and economic constraints.

A consolidated framework emerging from evidence across Central Europe (See Annex 2) identifies four complementary layers of financing instruments that together enable coherent, socially fair, and operationally viable transition pathways:

1. Grants and incentives: applied to non-bankable components, early-stage measures, social and territorial cohesion actions, innovation pilots, and governance functions; essential for reducing entry barriers for vulnerable groups and smaller municipalities.
2. Loans and guarantees: supplied by promotional banks or financial intermediaries for measures with stable savings or revenue streams; allow scale-up of investments while maintaining affordability when combined with grants.
3. Equity and community participation: introduced through cooperative, municipal, or citizen ownership structures, supporting local value retention, social legitimacy, and economic resilience; relevant for energy communities and municipally anchored systems.
4. Technical assistance: provided through EU and national facilities to support feasibility analysis, aggregation, procurement design, governance development, and monitoring; crucial for reducing transaction costs and enabling smaller actors to participate effectively.

These four layers do not operate as discrete elements but rather as interdependent components of a coherent financing architecture. Grants reduce initial barriers and enable actions that cannot generate return on investment. Loans extend the scale and accelerate the implementation of revenue-generating measures, provided that sound measurement and verification frameworks underpin expected savings or income. Equity participation aligns stakeholder incentives and embeds the transition in local socio-economic systems, especially where community ownership is sought as a mechanism of procedural and distributive justice. Technical assistance enhances institutional capacity, reduces administrative complexity, and supports compliance with regulatory requirements such as state-aid provisions, environmental standards, and procurement rules.

A sound interpretation of just transition financing in Central Europe recognises that the combination and sequencing of these layers must reflect the structural characteristics of each measure and the institutional context in which it is deployed. Financing models must differentiate clearly between public-good components—such as governance structures, social-support schemes, or non-commercial enabling measures—and components capable of generating predictable revenue streams. Economic sustainability requires that revenue-based instruments be applied where appropriate, while social sustainability requires that fiscal transfers and targeted incentives ensure equitable access and prevent cost burdens from falling disproportionately on vulnerable groups.

The design of financing architectures must also take into account territorial disparities. Regions with limited fiscal space, post-industrial areas undergoing structural decline, and small municipalities with constrained administrative capacity require stronger reliance on grants, technical assistance, and shared governance models. At the same time, more economically dynamic territories may employ blended finance structures that combine grants, concessional loans, and community or municipal equity participation. The coexistence of these differentiated pathways reflects the polycentric nature of transition governance in Central Europe.

The long-term viability of just energy transition financing depends on the institutionalisation of reinvestment mechanisms that reduce reliance on time-limited EU funding cycles. Revolving funds based on energy savings or revenues from community energy schemes, cooperative surplus reinvestment, and municipal financial instruments contribute to continuity beyond 2027. Similarly, the alignment of financing instruments with the principles of distributive, procedural, and recognitional justice ensures compliance with the objectives of the Just Transition Fund and cohesion policy, while enhancing social legitimacy and participation.

Scientific consensus indicates that systemic effectiveness increases when financing architectures integrate multi-level coordination, transparent monitoring frameworks, and stable regulatory environments. The ability to standardise procedures, aggregate smaller projects into bankable portfolios, and support stakeholders through structured technical assistance is associated with higher absorption rates, more efficient procurement, and greater participation by households, SMEs, and local institutions. The resulting financing ecosystem becomes not only a mechanism for resource allocation but also an enabling infrastructure for territorial resilience and socio-economic cohesion.

Within this perspective, financing a just energy transition in Central Europe is best understood as the construction of an integrated, multi-layered system in which economic rationality, social equity, and institutional feasibility are treated as mutually reinforcing criteria. The combination of grants, loans, equity participation, and technical assistance—applied in a functionally differentiated and context-sensitive manner—provides the structural foundations through which transition strategies can move from planning to sustained implementation.

3.4 The role of JETforCE toolkits: the Challenge Mapping pilot (GloCha)

A key contribution of the JETforCE project to the operationalisation of a JET is represented by the Challenge Mapping pilot (GloCha), conceived as a digital and participatory tool aimed at capturing energy transition challenges directly from citizens and local stakeholders across the partner territories. The pilot was implemented as Transnational Pilot 1 and tested between February and November 2024 in all the partner regions, combining digital engagement with face-to-face facilitation.

The Challenge Mapping tool was designed to support procedural justice within the energy transition by lowering barriers to participation and enabling citizens to articulate perceived injustices, bottlenecks, and risks associated with ongoing or planned energy transition processes. Rather than focusing on predefined

policy categories, the tool allows users to report place-based challenges, describe their social and territorial impacts, and relate them to broader transition dynamics. In this sense, GloCha limits and improves conventional planning instruments by foregrounding lived experience, local knowledge, and everyday constraints.

The piloting phase demonstrated the relevance of this approach. Across the partner regions, more than 500 participants were engaged through local and regional launch events, workshops, and public outreach initiatives, resulting in over 100 validated challenges reported through the platform. The collected challenges covered a wide range of justice-related dimensions, including energy poverty, unequal access to infrastructure, regulatory barriers to renewable energy communities, insufficient grid capacity, lack of advisory services, and concerns related to employment transitions in carbon-intensive sectors. Importantly, many challenges highlighted the uneven distribution of costs and benefits of the energy transition, confirming key insights reviewed in previous Chapters 1 and 2.

Beyond the substantive content of the challenges, the pilot generated significant strategic learning regarding the conditions under which digital participation tools can effectively support a Just Energy Transition. First, the pilot confirmed that digital tools alone are insufficient to ensure meaningful engagement. Active facilitation by local actors, such as municipalities, energy agencies, and civil society organisations, proved essential to build trust, clarify the scope of the tool, and support users in translating individual concerns into structured inputs. Where such mediation was present, the number and relevance of reported challenges increased significantly.

Second, the pilot highlighted the central role of credibility and follow-up in sustaining citizen participation. In several territories, limited engagement was explicitly linked to uncertainty about how reported challenges would be addressed and by whom. This underlines that participatory instruments must be embedded within clear governance arrangements, defining responsibilities for assessment, prioritisation, and response. From a justice perspective, participation without visible feedback risks reinforcing frustration rather than empowerment.

Third, the pilot revealed structural and regulatory constraints that cannot be addressed solely at the local level, such as national energy pricing mechanisms, grid regulation, or legal frameworks for energy communities. While these issues exceed the direct scope of local action, their systematic emergence across regions provides valuable evidence for policy coordination and multi-level governance, reinforcing the need for vertical integration between local insights and higher-level decision-making.

Overall, the Challenge Mapping pilot demonstrates that digital citizen engagement tools can play a meaningful role in supporting procedural and recognitional justice within the energy transition, provided they are embedded in broader institutional processes. GloCha should therefore be understood not as a standalone solution, but as a strategic interface between citizens, local actors, and policy frameworks. Its main contribution lies in making justice-related challenges visible, comparable, and actionable across

territories, thereby informing the development of Local Action Plans (see Section 3.7.2) and the recommendations of the JETforCE strategy.

3.5 The role of JETforCE toolkits: the Technology Evaluation Tool (TET)

While the Challenge Mapping pilot captures justice-related energy transition challenges from the perspective of citizens and local stakeholders, the Technology Evaluation Tool (TET) represents the complementary decision-support instrument of the JETforCE project, translating these challenges into structured, evidence-based assessments of energy technologies and investments. Developed and tested within Transnational Pilot 2, the TET provides public authorities and energy planners with a systematic framework to evaluate technologies through a JET lens, integrating technical, economic, environmental, and socio-economic dimensions into a single analytical process.

The rationale behind the TET responds to a recurring gap identified in both academic literature and regional practice: energy transition investments are often assessed primarily on technical performance and financial viability, while social impacts, distributional effects, and implications for vulnerable groups remain underrepresented or addressed ex post. The TET addresses this imbalance by embedding justice-related criteria directly into the evaluation phase, supporting more transparent and accountable decision-making at the planning stage.

Conceptually, the TET moves beyond traditional cost–benefit analysis by operationalising multiple dimensions of JET. The tool evaluates technologies against criteria such as energy efficiency, economic viability, environmental benefits, social impact, and equity and inclusion. These dimensions are assessed through a structured questionnaire and a weighted scoring system, allowing users to compare concrete investment scenarios with an “ideal” just transition benchmark. In doing so, the tool does not prescribe decisions, but supports informed deliberation by making trade-offs explicit and comparable across different territorial contexts.

The development and testing of the TET followed an iterative and participatory approach. During Stage 1, project partners applied the tool retrospectively to technologies implemented in their territories between 2017 and 2022, using it as an analytical lens to reassess past investments from a justice perspective. This phase highlighted both the added value of the tool and the need for simplification, clearer guidance, and improved usability, particularly for public administrations with limited technical capacity. Partner feedback led to refinements in indicator weighting, data input requirements, and interface design, strengthening the tool’s accessibility and robustness.

Stage 2 shifted the focus towards real-time application in three diverse case studies: photovoltaic systems and capacity-building activities in Croatia, energy monitoring in public buildings in the Czech Republic, and biomass district heating upgrades in Austria. These pilots demonstrated the tool’s flexibility across different technologies and governance contexts, as well as its capacity to integrate operational data with socio-economic considerations. Importantly, the testing phase confirmed that the TET can support adaptive

decision-making, enabling users to revise inputs, explore alternative scenarios, and better understand how changes in social or environmental parameters influence overall outcomes .

From a strategic perspective, the TET plays a crucial role in bridging participatory insights and policy action. The challenges identified through the Challenge Mapping tool provide contextual and qualitative inputs, while the TET offers a structured mechanism to assess which technological options are most appropriate to address those challenges in a just and feasible manner. This linkage is particularly relevant for the development of Local Action Plans, where priorities must be translated into concrete measures, investments, and timelines. By supporting transparent comparison of alternatives, the TET strengthens the coherence and credibility of Local Action Plans, reducing the risk of socially regressive or territorially misaligned interventions (see Section 3.7.2).

More broadly, the TET contributes to procedural and distributive justice by clarifying who benefits from specific technologies, under which conditions, and at what cost. It encourages decision-makers to explicitly consider issues such as affordability, accessibility, skills development, and impacts on vulnerable groups, rather than treating them as secondary considerations. At the same time, its standardised yet adaptable structure supports comparability across regions, facilitating transnational learning and policy alignment.

The TET represents a key strategic output of the JETforCE project. Embedded within a broader framework of citizen engagement and local planning, it supports the transition from problem identification to solution design, ensuring that technological choices are not only efficient and climate-aligned, but also socially fair and territorially grounded. As such, the TET provides a practical and replicable instrument for integrating JET principles into regional energy strategies and Local Action Plans across Central Europe.

3.6 The role of JETforCE toolkits: the Capacity Enhancing Kit

The effective integration of JET principles into regional and local planning depends not only on the availability of digital tools, but also on the capacity of public authorities, stakeholders, and citizens to use them meaningfully. In this respect, the Capacity Enhancing Kit developed within JETforCE represents a cross-cutting strategic component, designed to support, explain, and amplify the use of both the Challenge Mapping tool and the Technology Evaluation Tool across partner territories .

The Capacity Enhancing Kit is conceived as an online and practice-oriented set of resources, guidelines, and capacity-building actions, implemented in each partner country and adapted to local institutional and social contexts. Its primary objective is to reduce technical, cognitive, and social barriers that often limit the uptake of digital participation and decision-support tools, particularly among vulnerable and underrepresented groups. In doing so, the kit directly contributes to procedural justice, ensuring that access to participation and decision-making is not restricted to digitally skilled or institutionally embedded actors.

Structurally, the kit provides guidance on inclusive capacity-building approaches, combining digital training with offline and hybrid engagement formats. It addresses key dimensions such as accessibility, plain-language communication, multilingual materials, and alternative participation channels for citizens without stable internet access or digital devices. These elements respond to challenges consistently identified during the piloting of GloCha and TET, where limited digital literacy and trust in institutional processes emerged as significant constraints to engagement.

A central feature of the Capacity Enhancing Kit is the role of Digital Ambassadors, identified and trained within local communities to act as intermediaries between the tools and citizens. Digital Ambassadors support individuals in using the Challenge Mapping tool, assist stakeholders in interpreting outputs, and facilitate dialogue between communities and decision-makers. This peer-based model proved particularly effective in reaching energy-poor households, elderly citizens, rural populations, and other groups typically excluded from formal consultation processes.

Beyond citizen engagement, the kit also targets public authorities and local stakeholders involved in energy planning. Training sessions, workshops, and guidance materials support administrations in integrating outputs from the Challenge Mapping tool and the Technology Evaluation Tool into Local Action Plans and strategic documents. By strengthening analytical capacity and interpretative skills, the kit helps ensure that data collected through digital tools translates into coherent policy measures rather than remaining isolated technical outputs.

Overall, the Capacity Enhancing Kit functions as an enabling framework that connects participation, analysis, and action. Rather than introducing new instruments, it consolidates and operationalises the two core JETforCE tools, fostering long-term uptake and institutional learning. Its emphasis on inclusiveness, adaptability, and skills development reinforces the strategic orientation of this Strategy, ensuring that Just Energy Transition principles are not only articulated, but effectively implemented across diverse Central European contexts.

3.7 The contributions from the Local Action Plans (LAPs)

3.7.1 The Key-Actions

The previous recommendations, principles and tools guide the definition of Local Action Plans for JET, as well, which on one hand attune the general JETforCE strategy to partners' territory features, and on the other hand serve as a framework for the design and the implementation of JET key-actions at the local level.

The key-action elicited by each national partner are summarize and systemize in Table 3.1

	REC	Energy mgmt and structural change	Sustainable Mobility	Renovation/RES in buildings	RES in agri-culture	Education	Energy and Territorial Development	Renewable plants (district heating, solar)
AUT								

CRO	■					■		
CZE	■			■				
GER	■							■
HUN	■		■	■				
ITA	■				■		■	
POL		■						
SLK				■				■
SLO	■			■				

Table 3.1 The classification of key-action objects in JETforCE LAPs

Across the JETforCE partnership, the analysis confirms a clear convergence around Renewable Energy Communities as the preferred operational model for local implementation of the Just Energy Transition. Alongside them, large-scale retrofits, energy audits, and renewable infrastructure projects provide the physical framework of decarbonization, while observatories, training programs, and governance innovations ensure social inclusion and knowledge diffusion. Collectively, the twenty key-actions compose a multi-level laboratory of energy democracy, demonstrating how technical modernization and social justice can progress hand in hand across Central Europe.

More specifically, RECs appear in seven of the nine Local Action Plans, translating justice principles into tangible community empowerment, shared governance, and localized benefit distribution. Concrete initiatives include the establishment of local energy communities in Weiz (AUT), the creation of regional networks of RECs in Istria (CRO) and Borsod-Abaúj-Zemplén (HUN), the municipal-scale action in Radibor (GER), and new cooperative models in Jihlava (CZE), Bologna (ITA), and Dornava (SLO). These actions combine collective investment, shared renewable production, and democratic management, positioning RECs as the backbone of territorial energy autonomy.

Energy renovation and efficiency upgrades form a central operational field across the LAPs. The Hungarian (HUN) and Slovak (SLK) partners invest in large-scale retrofits of public facilities, including schools and administrative buildings, financed by national and EU programs. The Czech partner (CZE) complements this with targeted renovations guided by energy audits, while Bologna's STAMI project (ITA) focuses on building upgrades in inner-area municipalities to fight energy poverty. Together, these projects represent a solid foundation for emission reduction through infrastructure renewal.

Infrastructure projects provide the material backbone of the transition. The Austrian partner (AUT) expands the Weizberg district heating plant, installs electrical storage systems, and integrates renewables into local grids. The German partner (GER) develops cooperative district-heating networks for villages, while the Slovak LAP (SLK) builds a 4.95 MW solar plant in Prievidza, transforming a former coal-mining site. The Slovenian LAP (SLO) complements these efforts with a community solar power plant on municipal roofs. These renewable infrastructures anchor the transition in visible, shared assets that ensure resilience, reliability, and collective benefit.

Actions for institutional capacity and systemic transformation involve smart-metering systems and energy audits to optimize public-building performance (CZE), and energy audits across regional administrations (SLK), while the Polish partner (POL) institutionalizes transition governance through the Just Transition Observatory, integrating data, monitoring, and stakeholder dialogue. Collectively, these measures strengthen structural planning, policy coherence, and evidence-based management of the transition process.

Education and skills development are pivotal in three LAPs. The Istria Region (CRO) implements vocational training and school-based programs such as *"Kids Can Do It"* to form a skilled green workforce. The Slovak LAP (SLK) renovates vocational schools as learning hubs for energy transition, coupling infrastructure improvement with educational renewal. In Weiz (AUT), the Innovation Centre provides weekly public counseling and technical guidance, enhancing citizen literacy and empowerment. These initiatives ensure long-term capacity and awareness, key to the social sustainability of the transition.

Several partners link energy transition with territorial regeneration. The Polish Observatory (POL) coordinates multi-sectoral strategies for regional development, social dialogue, and entrepreneurship. The Italian LAP (ITA) through STAMI, and the Czech LAP (CZE) through its regional modernization framework, both address inner or rural areas, coupling energy justice with territorial cohesion. These initiatives illustrate the integrative function of energy policy within broader socio-economic development agendas.

Agrivoltaics stands out as a pioneering approach in the Italian LAP (ITA), merging solar energy production with agricultural activity to ensure dual land use, income diversification, and soil protection. The model links renewable deployment to rural development and environmental justice, aligning with EU Common Agricultural Policy principles.

Efforts to decarbonize transport appear in two national contexts. The Croatian partner (CRO) promotes electric public transport and cycling infrastructure to lower urban emissions, while the Hungarian partner (HUN) integrates e-mobility into social services through an electric vehicle experiment for meal delivery and improved pedestrian networks. Though limited in number, these initiatives extend the just transition to mobility systems, emphasizing accessibility and social benefit.

Across the JETforCE partnership, the expected outcomes of the actions converge toward a shared vision of territorial decarbonization, community empowerment, and measurable social inclusion. On the environmental side, all LAPs foresee significant energy savings, efficiency gains, and renewable generation capacity. Renovations of public buildings and vocational schools, district-heating upgrades, and solar plant deployments translate directly into lower energy consumption and CO_2 emissions. Complementary projects—smart metering, audits, and renewable communities—improve energy management and create the analytical basis for long-term planning. These outcomes not only reduce operational costs for municipalities and citizens but also reinforce resilience and independence from fossil fuels.

Economically and socially, the expected impacts are equally robust. Most partners link energy actions to job creation, the stimulation of green entrepreneurship, and skill development, particularly through

education and training initiatives. The establishment of RECs and cooperatives generates new participation models that allow citizens, SMEs, and local authorities to co-own assets and reinvest surpluses in social and environmental improvements. Such mechanisms ensure that economic value circulates locally, enhancing equity and trust.

Finally, from a governance and justice perspective, the LAPs anticipate new collaborative mechanisms that will persist beyond the project's duration. Digital tools, community observatories, and participatory platforms facilitate transparency, citizen dialogue, and shared monitoring. The outcomes therefore go beyond the technical or infrastructural sphere: they consolidate democratic energy governance and institutional capacity. The anticipated results are thus both tangible and intangible—energy efficiency, emission cuts, and renewable generation, but also greater cohesion, awareness, and civic engagement.

Taken together, the twenty key-actions position the JETforCE territories as a living laboratory of fair transition. The expected results show that energy transition, when designed with inclusion, can deliver environmental improvement, economic renewal, and social empowerment in an integrated, durable, and replicable manner across Central Europe.

3.7.2 Governance and participation

Across all LAPs, governance and participation emerge as decisive factors in ensuring that the JET remains both inclusive and durable. Each territory has adapted its institutional architecture to its scale and resources, but a common model prevails: a multi-level governance system anchored in local leadership, supported by regional coordination, and enriched by participatory mechanisms that connect institutions, civil society, and citizens. This model ensures transparency, shared responsibility, and continuity beyond project cycles.

At the local level, municipalities or regional agencies act as primary coordinators—ranging from the Metropolitan City of Bologna and the Innovation Centre WEIZ to agencies such as SIEA or IRENA—while JET Alliances (JETAs) and Digital Ambassadors bridge the institutional and community spheres. Their roles extend from consultation and awareness-raising to facilitation of Renewable Energy Communities and citizen-led initiatives. Civil society organizations, schools, and SMEs participate as partners, ensuring that decision-making reflects the full diversity of local stakeholders.

Citizen participation is structured through workshops, public assemblies, forums, and participatory budgeting processes, supported by digital tools like the GloCha Mapping Platform (see Section 3.5), which makes consultation continuous and traceable. These practices institutionalize procedural justice by embedding community voices into every stage of planning and implementation.

Such governance designs are not limited to administrative coordination; they represent a shift toward collaborative territorial governance, where energy policy becomes a collective enterprise. By linking formal institutions with grassroots participation, the JETforCE partnership transforms the management of energy

transition into an exercise of shared democracy—grounded in accountability, inclusiveness, and mutual learning across all participating regions.

Within the JETforCE framework, the GloCha the TET (see Section 3.6) play a pivotal role in connecting technical innovation with participatory governance. Across all LAPs, these tools serve as both analytical and democratic instruments, ensuring that energy transition processes are transparent, data-driven, and socially inclusive. Their application varies by scale and institutional maturity, but together they form the digital backbone of the project's methodology, enabling partners to align technology, justice, and local engagement within a unified framework.

The GloCha Mapping Platform functions primarily as a participatory interface. It allows citizens, municipalities, and stakeholders to identify barriers, propose solutions, and share local needs regarding energy, mobility, and social equity. In many regions - such as Metropolitan City of Bologna, Istria, and Dornava - it facilitates dialogue between public institutions and communities, ensuring that the transition addresses real social and territorial priorities. The platform also acts as a repository of local challenges and progress indicators, reinforcing horizontal learning among partners and enabling consistent monitoring of justice dimensions.

The TET complements this participatory approach with evidence-based assessment. It supports partners in evaluating the technical, economic, and environmental feasibility of actions such as renewable plants, efficiency retrofits, or education actions. By quantifying performance and justice impacts, TET ensures that each investment decision adheres to sustainability, affordability, and inclusiveness criteria. In regions like Weiz, Radibor, and SIEA's Banská Bystrica, the tool guides technology selection and investment prioritization, transforming digital data into strategic insight.

Together, GloCha and TET create a coherent digital ecosystem that operationalizes the principles of the JET, institutionalizing transparency, participatory planning, and continuous evaluation, turning digitalization into a tool for empowerment rather than exclusion.

3.7.3 Business model and financing at the local level

Across the nine partner territories, business models and financing schemes emerge not simply as technical components but as foundations for social fairness and territorial resilience. Although each region operates within its own institutional and economic constraints, a shared philosophy is visible: financial design must enable climate action while reinforcing community cohesion. Grants, loans, cooperatives, municipal investment, and revolving mechanisms are woven together to ensure that the benefits of the transition circulate locally rather than dissipating outward.

A common baseline is provided by European and national support schemes, which supply the capital needed to initiate transformative action. From Hungary's KEHOP Plusz, Slovenia's ERDF and Eco Fund incentives, and Slovakia's JTF infrastructure envelopes, to Czech, Austrian, and Croatian structural funds, public backing allows municipalities, schools, and small communities to undertake projects that would otherwise

exceed their financial capacity. These frameworks level the playing field, enabling vulnerable or rural partners, such as Dornava, Radibor, or Bükkábrány, to pursue renewable generation, efficiency retrofits, or citizen-driven initiatives on fair terms.

Above this foundation, cooperative and community-centred business models provide depth and durability. In Hungary, Slovenia, Germany, and Austria, RECs and cooperatives mobilize citizen equity, democratize asset ownership, and anchor revenues in the local economy. Savings from heat networks, PV installations, or smart-metering programs are increasingly channeled into revolving funds, reinforcing a cycle of reinvestment. These mechanisms foster trust, stimulate small-scale entrepreneurship, and build local capacity to manage long-term assets.

Finally, hybrid governance–finance arrangements bridge public mandates and private expertise. Regional agencies such as IRENA, BORA 94, Weiz's innovation centre, or Jihlava's municipal energy management office act as intermediaries, bundling small projects into bankable portfolios, securing concessional loans, and ensuring that social safeguards accompany investment decisions. Even non-investment-focused LAPs, like Lodzkie's observatory, envision sustainable funding through technical assistance streams and diversified partnerships.

Together, these financial architectures convert the energy transition into a self-sustaining, socially grounded economic transformation, where climate action and local prosperity reinforce one another.

Conclusions

The Just Energy Transition represents a systemic challenge that goes far beyond the technical decarbonisation of energy systems. As highlighted throughout this Strategy, achieving climate neutrality without addressing social, economic and territorial inequalities risks undermining both the effectiveness and the legitimacy of the transition itself. Justice, therefore, emerges not as a complementary dimension, but as a core condition for the success of energy transition policies in Central Europe.

The JETforCE Strategy builds on a comprehensive analytical framework that integrates scientific evidence, policy analysis and empirical insights from project implementation. The review of the literature has confirmed the multidimensional nature of justice in energy transitions, encompassing distributive, procedural and recognitional aspects. At the same time, the analysis of regulatory frameworks and existing practices across the partner regions has shown that, while the principles of a just transition are increasingly acknowledged at European and national levels, their translation into coherent and territorially grounded actions remains uneven and fragmented.

Within this context, the contribution of the JETforCE project has been instrumental in consolidating the Strategy in its consolidated and final form. The development and testing of digital tools, the engagement of stakeholders, and the implementation of local key-actions have generated concrete evidence on both enabling factors and critical limitations. Rather than representing an open-ended experimental phase, the challenges encountered—related to governance integration, user engagement and technical usability—have been systematically analysed and addressed, informing strategic orientations and reinforcing the internal coherence of the Strategy. The structured learning process embedded in the project has thus allowed to refine approaches, clarify roles and responsibilities, and strengthen the operational relevance of justice-oriented principles.

The Strategy positions itself as a reference framework for policymakers and practitioners seeking to embed justice considerations into energy transition processes. It does not prescribe uniform solutions, but provides a coherent set of principles, policy recommendations and governance orientations that can be adapted to diverse territorial contexts. In this sense, it serves as an architectural framework capable of guiding the alignment of theory, policies, financial instruments and local actions toward shared objectives of fairness, inclusiveness and territorial cohesion.

The operational dimension of the Strategy is further reinforced by its strong integration with the accompanying documents developed within the JETforCE project. Annex 1, dedicated to Best Practices for the Just Energy Transition, demonstrates how justice-oriented principles can be effectively translated into concrete initiatives across different regional contexts, offering transferable insights and practical inspiration. Annex 2, focusing on Financial Opportunities, complements the strategic framework by mapping funding instruments and financial mechanisms that can support both the social and infrastructural

components of a just transition, highlighting the importance of combining public, private and innovative financing approaches.

The Collection of Local Action Plans represents the most tangible and operational expression of the Strategy at the territorial level. Closely aligned with the strategic principles outlined in this document, the LAPs illustrate how justice considerations can be operationalised through context-specific actions that respond to local needs, capacities and vulnerabilities. Together, they demonstrate that the Strategy is not only conceptually sound, but also practically applicable, capable of guiding real-world interventions across Central European regions.

The JETforCE Strategy reaffirms that the energy transition will succeed not only when it is environmentally sustainable, but when it is also socially just and territorially balanced. By integrating analytical rigor with operational experience, and by linking strategic guidance to concrete tools, financial pathways and local actions, the Strategy provides a solid foundation for advancing a fair and inclusive energy transition. Justice, in this perspective, is not merely a normative aspiration, but a necessary condition for the effectiveness, resilience and long-term success of energy transition policies in Central Europe.

Against this background, the Strategy is intended to serve not only as a consolidated synthesis of the evidence and lessons generated within JETforCE area, but also as an operational reference for the post-project phase: a shared framework through which partners and stakeholders can orient subsequent programming, prioritise interventions, and support the mainstreaming and replication of justice-oriented approaches across the involved territories.

To deal effectively with this objective, the JETforCE Strategy, together with the Collection of Local Action Plans, is submitted to formal endorsement by each institutional project partner, thereby consolidating a common commitment to its guiding principles and to their translation into sustained and territorially grounded action, as reflected in the Letter of Intent signed by all JETforCE partners and Associated partners.

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Annex 1 - Best Practices for Just Energy Transition

Title	Recommendations for combating energy poverty in the City of Zagreb
Time frame	January 2020
Country	Croatia
PURPOSE AND IMPLEMENTATION	
Objectives	Analysis of the current state of Energy poverty in Zagreb for establishing a framework for local political decision making, development of recommendations empirically founded on the basis of research organised and carried out by DOOR, showcase of research results
Beneficiaries/ Targets	Energy poor citizens in the city of Zagreb
Key activities	Review of Energy poverty status on European and national level, definitions and key legislation in EU countries, best practices in EU, combating EP in the City of Zagreb, results of project "FER Solutions for a Better Community", modelling energy expenditure in the City of Zagreb, results and conclusions
Justice aspects	Energy poverty is one of the main targets of JET policies
INSTITUTIONS/ORGANIZATIONS INVOLVED AND THEIR ROLE IN THE PROJECT	
DOOR – Society for Sustainable Development Design	Coordinator and mentor for University of Zagreb students during the development of their graduate degree projects
FER, University of Zagreb, Faculty of Electrical Engine-ering and Computing	Involved institution whose graduate degree project results developed by the University students were used in this analysis.
AVAILABLE DOCUMENTATION & COMMUNICATION CAMPAIGN	
Available documentation	https://www.door.hr/wp-content/uploads/2020/09/FER-rjesenja-za-bolju-zajednicu_Preporuke-za-suzbijanje-energetskog-siromastva-u-Gradu-Zagrebu.pdf
Communication campaign	-
CHALLENGES AND BENEFITS IN DEVELOPMENT AND/OR IMPLEMENTATION	
Challenges	Lack of data and research for informed national and local policy making, which prevents insight into the profile of the vulnerable consumer and the characteristics and needs of energy-poor households. This lack of data also makes it difficult to identify specific apartments and houses at risk of energy poverty. It also poses a challenge for any policy that seeks to establish a possible link between energy poverty reduction support and the levels of energy efficiency achieved. Other mentioned challenges are the insufficient understanding of the complex causes of the phenomenon of energy poverty and its consequences, and the limitations of certain short-term measures and their results.
Benefits	Estimated savings of almost 43 million HRK (928,813 EUR) in ten years and improvement of citizens' living conditions through implementation of measures proposed by this report.

KEY LESSONS LEARNED
Data from the City of Zagreb shows that the City spends almost seven million HRK (928,813 EUR) annually on financial measures to combat energy poverty, and field research has shown that, regardless of the city's high energy costs, citizens continue to live in energy-inadequate conditions. The model has shown that investment in energy renovation of buildings where energy-poor citizens live is profitable and has a short payback period, and that measures such as energy renovation are worth investing in the long term.
RESULTS (IF AVAILABLE)
Calculations provided in the report have shown that by investing 50% of the funds earmarked for financial support for the energy-poor and by implementing the measures listed below, the City of Zagreb would achieve savings of almost 43 million HRK in ten years, and at the same time would achieve a change in the living conditions of its citizens. The proposed measures in the report are: • Energy renovation of 30 households from the target group per year, 10 years; • Implementation of small energy efficiency measures in all households (425 yearly): replacement of eight incandescent light bulbs of different wattages with LED bulbs, installation of seals on windows and doors, installation of an energy-saving aerator and use of one extension cord with a switch; • replacement of "old for new" refrigerators and washing machines in half of the households, 5% of households (213) yearly.
OTHER RELEVANT INFORMATION (IF ANY)
The analysis was created within the project "FER Solutions for a Better Community" UP.04.2.1.02.0022, European Social Fund. The content of the analysis is the sole responsibility of the Society for Shaping Sustainable Development. The project "FER Solutions for a Better Community" was implemented from 2018 to 2020 by the Society for Shaping Sustainable Development, the Faculty of Electrical Engineering and Computing, University of Zagreb, and the City of Zagreb - City Office for Social Policy and Persons with Disabilities.

Title	Energy poverty analysis in Croatia
Time frame	July 2021
Country	Croatia
PURPOSE AND IMPLEMENTATION	
Objectives	The aim of the analysis was to review legislation in the Republic of Croatia in the field of energy, but also social welfare, in order to determine existing measures to combat energy poverty and the direction of future development of public policies in the field of energy poverty.
Beneficiaries/ Targets	Energy poor citizens in Croatia
Key activities	Analysis of the terms and definitions surrounding Energy poverty, analysis of legislation surrounding Energy poverty, analysis of the link between energy sector and social care, analysis ov available measures linked to Energy poverty, Energy poverty KPIs, conclusion and recommendations
Justice aspects	Energy poverty is one of the main targets of JET policies
INSTITUTIONS/ORGANIZATIONS INVOLVED AND THEIR ROLE IN THE PROJECT	
DOOR – Society for Sustainable Development Design	Coordinator
AVAILABLE DOCUMENTATION & COMMUNICATION CAMPAIGN	

Available documentation	https://www.door.hr/wp-content/uploads/2021/08/Analiza-energetskog-siromastva-u-RH.pdf
Communication campaign	https://www.door.hr/energetsko-siromastvo/

CHALLENGES AND BENEFITS IN DEVELOPMENT AND/OR IMPLEMENTATION

Challenges	Defining a proper methodology for EP measuring and defining general criteria due to invasion of privacy, oscillations in weather and geographical conditions and cultural sensitivity, defining proper standards of energy services, lack of proper use of legislation and existing measures for EP
Benefits	Defining energy poverty will enable a unified understanding of the concept of energy poverty at the national level, which will certainly contribute to the cooperation of the various sectors involved and the eradication of energy poverty. The establishment of local information and advice centres on measures to combat energy poverty can be a response to challenges in horizontal coordination (between different sectors) as well as vertical coordination (between ministries). Local centres can contribute to better coordination of public policies and programmes to combat energy poverty. Mapping and utilizing existing technical and financial resources at the local and national levels, as well as educating public and civil servants, can greatly facilitate the implementation of measures to combat energy poverty, as well as data collection and monitoring of the impact of measures.

KEY LESSONS LEARNED

Energy poverty in Croatia is part of social policy, given that the criteria for guaranteed compensation for energy services are based on household income. At the national level, energy poverty is still not clearly defined, nor have general criteria or a methodology for determining energy poverty been established. In addition to the lack of a definition, criteria for determination and methodology for monitoring, an additional problem arises at the level of implementation of measures to combat energy poverty envisaged by the existing legislative and strategic framework, and at the level of education and dissemination of information about energy poverty among citizens, but also relevant services that should be involved in the preparation and/or implementation of individual measures. Since increasing the energy performance of buildings by increasing energy efficiency is considered one of the main factors in combating energy poverty, it is necessary to work on the development of new energy efficiency programs that will be aimed at households at risk of energy poverty and households in a state of severe material deprivation. It is also necessary to build a support system of institutions that will provide support to energy-poor households, to work persistently on facilitating access to basic services for citizens at risk of energy poverty, and to remove administrative and other obstacles that prevent citizens from accessing assistance. Ultimately, it is necessary to ensure stable and unhindered financing of measures aimed at combating energy poverty.

RESULTS (IF AVAILABLE)

The study establishes that it is primarily necessary to develop clear and unambiguous criteria for determining energy poverty, and the accompanying national definition of energy poverty.

OTHER RELEVANT INFORMATION (IF ANY)

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Title	Guide to Energy poverty
Time frame	November 2021
Country	Croatia

PURPOSE AND IMPLEMENTATION	
Objectives	The purpose of the guide is to inform relevant stakeholders from interested individuals to local government units and decision-makers on how they can follow the proposed "bottom-up" collaborative approach to alleviating energy poverty, through joint energy initiatives using innovative financing schemes and improving local energy planning.
Beneficiaries/ Targets	Local authority and energy poor citizens in Croatia
Key activities	- Local centers for alleviating energy poverty in local units self-government - POWER-ACT tool (questionnaire) based on a data-driven approach that assesses thermal comfort of users, creates energy profiles and predicts benefits of a measure of increasing energy efficiency. The tool uses the data completed in the questionnaire to obtain a result that corresponds to the extent to which the household is energy poor. - Better integration of activities into SECAPs
Justice aspects	Energy poverty is one of the main targets of JET policies
INSTITUTIONS/ORGANIZATIONS INVOLVED AND THEIR ROLE IN THE PROJECT	
DOOR – Society for Sustainable Development Design	Coordinator
AVAILABLE DOCUMENTATION & COMMUNICATION CAMPAIGN	
Available documentation	https://www.door.hr/wp-content/uploads/2022/11/D5.2-Energy-Poverty-Guidebook-for-Energy-Planning-V2-CRO.pdf
Communication campaign	https://powerpoor.eu/
CHALLENGES AND BENEFITS IN DEVELOPMENT AND/OR IMPLEMENTATION	
Challenges	Understaffing and low technical knowledge of local authorities, lack of engagement from citizens, lack of funding
Benefits	• better mapping of energy-poor citizens and measuring the size of the problem; • conducting a detailed mapping of local needs and the complexity of local factors that influence the occurrence of energy poverty in their region; • defining priority measures and areas of intervention; • designing a set of effective actions that best suit the specific • local context and citizens' needs; • better linking higher-level policies (national governments, EU) and local communities; • combining the strengths of different actors, stakeholders and initiatives at the local level; • ensuring the sustainability of activities and expanding them to city networks and initiatives;
KEY LESSONS LEARNED	
-	
RESULTS (IF AVAILABLE)	

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OTHER RELEVANT INFORMATION (IF ANY)
-

Title	CO-EMEP * Enhancing cooperation for better energy management and reduction of energy poverty on HU-CRO cross-border area: Guidelines for planning to reduce energy poverty for local and regional self-government units
Time frame	June 2021
Country	Croatia
PURPOSE AND IMPLEMENTATION	
Objectives	Improving the cooperation of relevant stakeholders with the inclusion of new actors in the field of energy poverty. Increasing the awareness of public institutions in the cross-border area about the problem of energy poverty. Building capacity and skills of cross-border units of local and regional self-government for better energy planning and management in order to reduce energy poverty. Capacity building of cross-border social institutions on the problem of energy poverty. Increasing the awareness of the owners of family houses facing energy poverty about the importance of energy management to avoid energy poverty. Improving institutional capacities and increasing the efficiency of public administration.
Beneficiaries/ Targets	CS1 – Local/regional authorities CS2 – Local and regional development and energy agencies CS3 – Social institutions CS4 – Homeowners facing energy poverty
Key activities	1. Project management and administration 2. Information and promotion 3. Defining the concept and term energy poverty with the development of guidelines for planning the reduction of energy poverty 4. Identification of problematic sectors with the organization of thematic workshops and info days 5. Development of a comprehensive online tool for energy management 6. Pilot actions through the implementation of 10 energy inspections and measurements of building characteristics of buildings for identified energy-poor households
Justice aspects	Energy poverty is one of the main targets of JET policies
INSTITUTIONS/ORGANIZATIONS INVOLVED AND THEIR ROLE IN THE PROJECT	
MENEA -Međimurje Energy Agency	Coordinator and project partner in project CO-EMEP (HUHR/1901/3.1.1/0019)
Zala Municipality	Coordinator and project partner in project CO-EMEP (HUHR/1901/3.1.1/0019)
AVAILABLE DOCUMENTATION & COMMUNICATION CAMPAIGN	
Available documentation	https://www.menea.hr/wp-content/uploads/2021/07/CO-EMEP_Smjernice-za-planiranje-smanjenja-ES_final.pdf

Communication campaign	https://www.menea.hr/co-emep/hrvatski/o-projektu/

CHALLENGES AND BENEFITS IN DEVELOPMENT AND/OR IMPLEMENTATION

Challenges	Due to the complexity of the approach to solving energy poverty in different regions it is not possible to implement a single solution, which is why local and regional governments they can seek support from other institutions that have expertise in various fields areas, but also to find adequate means to finance reduction measures energy poverty.
Benefits	Local and regional self-government units will be encouraged to receive additional training in order to define and implement measures to reduce energy poverty in their administrative areas.

KEY LESSONS LEARNED

Practice shows that municipalities do not have the capacity to independently implement measures to combat energy poverty, but that with the support of the county center, they could develop additional capacities that could contribute to joint efforts to monitor and implement measures to prevent energy poverty at the local level.

RESULTS (IF AVAILABLE)

Definition of energy poverty in the Hungarian-Croatian cross-border area - 1

Analysis of existing local, regional and national regulations and strategic documents in the cross-border area - 1

Guidelines for local and regional self-government units on how to include measures to reduce energy poverty in future planning and strategic documents - 1

Public call for the involvement of interested households in the energy poverty risk assessment - 2

Guidelines for improving energy efficiency in households facing energy poverty – 1

Organization of info days and workshops for the general public and social institutions in the cross-border area with the aim of improving their knowledge about the problem of energy poverty and possible measures to reduce it - 4

Organization of workshops for local and regional self-government units with the aim of improving capacity in the field of energy planning and energy management - 2

Analysis of financial possibilities for owners of family houses in the cross-border area - 1

Analysis of available technological solutions for improving the energy efficiency of family houses in the cross-border area - 1

Development of a comprehensive online energy management tool for widespread use - 1

Implementation of energy audits for 10 family houses and implementation of measurements of basic construction characteristics for 10 family houses with the development of detailed plans for improving energy efficiency – 10

OTHER RELEVANT INFORMATION (IF ANY)

-

Title	Support to the Implementation of the Just Transition in the Czech Republic
Time frame	2023
Country	Czech Republic

PURPOSE AND IMPLEMENTATION

Objectives	Assist in the deployment of the Just Transition Fund (JTF) in regions heavily reliant on coal.
Beneficiaries/ Targets	Municipalities, SMEs, and NGOs in Moravia-Silesia, Ústí nad Labem, and Karlovy Vary regions.
Key activities	Providing support to small project developers for JTF implementation.
Justice aspects	Ensuring equitable transition support for regions and communities affected by the shift away from coal.
INSTITUTIONS/ORGANIZATIONS INVOLVED AND THEIR ROLE IN THE PROJECT	
European Commission	Provides support for JTF implementation in designated Czech regions.
Czech Ministry of Regional Development (MoRD)	Collaborates on project preparation and implementation strategies.
Czech Ministry of Environment (MoE)	Ensures environmental considerations are integrated into transition projects.
AVAILABLE DOCUMENTATION & COMMUNICATION CAMPAIGN	
Available documentation	Reports and guidelines on JTF implementation strategies and best practices. https://www.dotaceeu.cz/getmedia/f2b5b4ea-2871-4bce-a227-17bd8b129652/D1-IR-_JT-CZ_FINAL-for-publication.pdf.aspx?ext=.pdf
Communication campaign	Workshops and seminars to inform stakeholders about JTF opportunities and processes.
CHALLENGES AND BENEFITS IN DEVELOPMENT AND/OR IMPLEMENTATION	
Challenges	Ensuring effective project preparation among small-scale developers.
Benefits	Facilitated transition for regions dependent on coal through targeted funding and support.
KEY LESSONS LEARNED	
The necessity of tailored support for smaller entities to effectively utilize transition funds.	
RESULTS (IF AVAILABLE)	
Enhanced capacity of municipalities, SMEs, and NGOs to implement transition projects.	
OTHER RELEVANT INFORMATION (IF ANY)	

Title	Territorial Just Transition Plan of Slovakia
Time frame	2022 - 2030
Country	Slovakia
PURPOSE AND IMPLEMENTATION	
Objectives	
Beneficiaries/ Targets	• **Workers and Communities in Coal-Dependent Regions**: The plan focuses on regions like Upper Nitra, Banská Bystrica, and Košice,

	aiming to assist workers transitioning from coal-related industries to new employment opportunities. • **Businesses and Investors in Sustainable Industries**: Companies investing in green technologies and sustainable industries benefit from the TJTP. For instance, Hyundai Mobis, a South Korean company, plans to invest over €170 million in a new plant in Nováky, producing engines and parts for electric vehicles. The Slovak government supports this project with approximately €26 million in incentives, facilitating the region's transition from coal to new industries. • **Small and Medium-Sized Enterprises (SMEs) and Startups**: The TJTP emphasizes economic diversification by supporting SMEs and startups, fostering innovation and entrepreneurship in sustainable sectors. • **Educational and Training Institutions**: Institutions providing reskilling and upskilling programs benefit by aligning their offerings with the emerging needs of a green economy, ensuring the workforce is equipped with relevant skills. These beneficiaries collectively contribute to and gain from Slovakia's efforts to ensure a just and equitable transition to a sustainable, climate-neutral economy.
Key activities	• **Phasing Out Coal and Supporting Affected Industries**: The plan aims to cease coal extraction and coal-fired power generation, particularly in Upper Nitra, by 2023. It also seeks to assist carbon-intensive industries, such as metals and chemicals, in transitioning to more sustainable operations. • **Promoting Economic Diversification and Job Creation**: To mitigate the socio-economic impacts of the transition, the TJTP emphasizes diversifying local economies and creating new employment opportunities. This includes supporting small and medium-sized enterprises (SMEs) and startups, although specific mechanisms for this support are not clearly detailed. • **Investing in Renewable Energy and Energy Efficiency**: The plan supports investments in renewable energy projects and energy efficiency measures. For instance, in Upper Nitra, projects include greenhouses heated by geothermal energy from warm mine waters and solar photovoltaic parks with battery storage on brownfield mine sites. • **Addressing Social Inequalities and Supporting Workforce Transition**: The TJTP prioritizes employment support and job search assistance for workers directly losing their jobs due to the transition, as well as other worker groups who may be indirectly affected. It also recognizes the importance of identifying and addressing existing and future skills, training, and education gaps at the regional level.
Justice aspects	
INSTITUTIONS/ORGANIZATIONS INVOLVED AND THEIR ROLE IN THE PROJECT	
Institution no. 1	**European Commission**: Through the Just Transition Mechanism, the European Commission provides financial and technical support, including

	the allocation of €459 million from the Just Transition Fund to Slovakia, aiding the country's shift towards climate neutrality.
Institution no. 1	**Ministry of Investments, Regional Development and Informatization (MIRRI SR):** This central government body oversees the just transition process in Slovakia, coordinating efforts across different sectors and regions.
Institution no. 2	**Regional Partnership Councils:** Established for each of the three regions—Upper Nitra, Banská Bystrica, and Košice—these councils comprise state institutions, public sector representatives, local governments, non-governmental organizations (NGOs), and businesses. They facilitate stakeholder engagement and ensure that regional perspectives are integrated into the transition planning.
AVAILABLE DOCUMENTATION & COMMUNICATION CAMPAIGN	
Available documentation	https://www.eurofondy.gov.sk/wp-content/uploads/2022/12/SK_TJTPSK_3.0.pdf
Communication campaign	https://ec.europa.eu/commission/presscorner/detail/en/ip_22_7086
CHALLENGES AND BENEFITS IN DEVELOPMENT AND/OR IMPLEMENTATION	
Challenges	• **Comprehensive Transition Planning:** The TJTP currently lacks detailed evidence of an ongoing transition process and a clear path toward achieving the 2030 and 2050 climate targets. This deficiency hampers the ability to effectively guide and measure progress. • **Stakeholder Engagement and Coordination:** Effective implementation requires robust collaboration among government bodies, industries, workers, and civil society. Establishing an inter-ministerial coordination body could enhance communication and transparency, ensuring that policies are responsive to the needs of all stakeholders. • **Economic Diversification and Employment:** Transitioning from coal-dependent industries necessitates the development of new economic sectors to provide alternative employment opportunities. While the TJTP proposes support for small and medium-sized enterprises, concrete strategies for economic diversification and job creation need further elaboration. • **Addressing Regional Disparities:** Slovakia's regions exhibit significant disparities in economic development and energy poverty levels. Tailored approaches are essential to address the unique challenges faced by each region, ensuring that the transition does not exacerbate existing inequalities. • **Capacity Building:** There is a need to enhance the professional capacities for planning and coordinating the path to carbon-neutral regions. Strengthening administrative capabilities at both national and regional levels is crucial for effective implementation of the TJTP. • Addressing these challenges requires a holistic approach that integrates economic, social, and environmental considerations, ensuring that the transition benefits all segments of society.

Benefits	• **Economic Diversification & Growth**
	  • **Development of New Industries**: Encourages innovation and investment in renewable energy, digital transformation, and green technologies.
	  • **Support for SMEs & Entrepreneurship**: Provides financial aid and incentives to small and medium-sized enterprises, fostering economic resilience.
	  • **Increased Attractiveness for Investors**: A stable and well-planned transition can attract foreign and domestic investments in sustainable industries.
	• **2. Job Creation & Workforce Development**
	  • **Reskilling & Upskilling**: Offers training programs to help workers from coal and heavy industries transition to green jobs.
	  • **New Employment Opportunities**: Supports job creation in sectors such as renewable energy, construction (energy-efficient buildings), and sustainable agriculture.
	• **3. Environmental Improvements**
	  • **Reduction of Greenhouse Gas Emissions**: Helps Slovakia move towards climate neutrality by 2050.
	  • **Cleaner Air & Water**: Closing coal mines and high-emission industries improves public health and reduces pollution.
	  • **Sustainable Land Use**: Rehabilitation of former industrial areas for new eco-friendly purposes.
	• **4. Social & Regional Cohesion**
	  • **Reducing Regional Disparities**: Provides targeted support to less developed regions, helping them catch up economically.
	  • **Enhanced Quality of Life**: Cleaner environments and better job opportunities contribute to improved living conditions.
	  • **Stronger Social Support Systems**: Helps prevent social exclusion of workers and communities affected by the transition.
	• **5. Alignment with EU & Global Climate Goals**
	  • **Access to EU Funding**: Ensures Slovakia benefits from EU Just Transition Mechanism funding and other climate-related financial support.
	  • **Stronger Position in the European Green Economy**: Positions Slovakia as a leader in green and sustainable development.

KEY LESSONS LEARNED	
RESULTS (IF AVAILABLE)	
Approval and Funding Allocation: • In November 2022, the European Commission approved Slovakia's TJTP, allocating €459 million from the Just Transition Fund to support the transition to a climate-neutral economy in the regions of Upper Nitra, Košice, and Banská Bystrica. **Regional Initiatives**: • **Banská Bystrica Region**: Projects aim to enhance energy efficiency in public buildings, utilize geothermal energy resources, and provide lifelong learning opportunities for workers. • **Upper Nitra (Trenčín Region)**: Efforts are underway to phase out lignite mining and coal-fired electricity generation by 2023. The plan focuses on creating new employment	

opportunities for former coal sector workers and supporting energy efficiency measures in public buildings. • **Košice Region**: Initiatives include re-skilling approximately 2,400 workers in the steel industry and fostering job creation in renewable energy sectors, energy storage, and the modernization of district heating networks.
OTHER RELEVANT INFORMATION (IF ANY)
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Title	Program of Economic and Social Development of the Banská Bystrica Self-Governing Region for 2022 - 2030
Time frame	2022 - 2030
Country	Slovakia
PURPOSE AND IMPLEMENTATION	
Objectives	
Beneficiaries/ Targets	All groups of citizens living in the target region.
Key activities	Increase the innovation performance, productivity and added value of the regional economy; Improve the sustainability and resilience of the regional economy; Increase tourism revenues and employment through the development of sustainable tourism; Ensure effective protection and restoration of all environmental components with an emphasis on climate change mitigation and increasing the resilience of the region to its adverse effects; Increase the share of residents with a higher level of education and life skills; Increase the quality and accessibility of services for the active inclusion of vulnerable population groups in the region; Build active, resilient and sustainable communities in cities and rural areas; Complete and restore transport infrastructure connected to the superior road and rail network; Support the development of sustainable mobility; Improve broadband internet coverage;
Justice aspects	
INSTITUTIONS/ORGANIZATIONS INVOLVED AND THEIR ROLE IN THE PROJECT	
Institution no. 1	Office of the Banská Bystrica Self-Governing Region
Institution no. 2	District offices of relevant districts in the Banská Bystrica Self-Governing Region (Brezno, Revúca, Rimavská Sobota, Zvolen, Žiar nad Hronom, Žarnovica, Banská Štiavnica).
AVAILABLE DOCUMENTATION & COMMUNICATION CAMPAIGN	

Available documentation	https://www.bbsk.sk/phsr-bbsk-2022-2030
Communication campaign	
CHALLENGES AND BENEFITS IN DEVELOPMENT AND/OR IMPLEMENTATION	
Challenges	
Benefits	
KEY LESSONS LEARNED	
The implementation of this strategic document is still in the initial phase.	
RESULTS (IF AVAILABLE)	
OTHER RELEVANT INFORMATION (IF ANY)	

Title	Program of Economic and Social Development of the Trenčín Self-Governing Region for 2022 - 2030
Time frame	2022 - 2030
Country	Slovakia
PURPOSE AND IMPLEMENTATION	
Objectives	The main objective of this program is to achieve balanced and sustainable development of the region through defined priorities and measures. The main priorities include: • Innovative and competitive economy: Supporting innovation and increasing the competitiveness of local businesses in order to stimulate economic growth and job creation • Better living conditions for the region's residents: Improving the availability and quality of public services, including healthcare, education and social services, to increase the overall quality of life of residents • Developed infrastructure and energy in a favorable environment: Investments in transport and energy infrastructure with an emphasis on ecological solutions and environmental protection • Strategic territorial management and territorially balanced development: Effective planning and management of territorial development in order to ensure harmonious development of all parts of the region.
Beneficiaries/ Targets	All groups of citizens living in the target region.
Key activities	Concerning the support of just energy transition this plan focuses on creating personnel capacities for the implementation of the action plan for the transformation of the Upper Nitra coal region: Supporting the transformation of the region through expert teams and consultancy.

	Relevant complementary key activities resulting from this strategic document: • Update and implemention of measures to improve the economic and social environment in the region. • Introducing innovative procedures and solutions to increase the efficiency and quality of services provided. • Modernization of the geographic information system: Improving spatial planning and territorial management through updated geographic data.
Justice aspects	
INSTITUTIONS/ORGANIZATIONS INVOLVED AND THEIR ROLE IN THE PROJECT	
Institution no. 1	Office of the Trenčín Self-Governing Region
Institution no. 2	Offices of relevant cities in the Trenčín Self-Governing Region (Prievidza, Partizánske, Handlová a Nováky).
AVAILABLE DOCUMENTATION & COMMUNICATION CAMPAIGN	
Available documentation	https://www.tsk.sk/dokumenty/regionalny-rozvoj/strategicke-dokumenty/phsr/2022/phsr-tsk-2022-2030.html?page_id=972157
Communication campaign	
CHALLENGES AND BENEFITS IN DEVELOPMENT AND/OR IMPLEMENTATION	
Challenges	Institutional and organizational arrangements: Effective implementation requires clearly defined competencies between the managing authority (TSK Representative Body), the executive authority (a working group consisting of office employees, members of parliament and external experts) and the control authority (TSK Chief Controller). Coordination of these entities is key to successful program management. Financial resources and management: Securing sufficient financial resources and their effective use represents a significant challenge. The executive authority oversees compliance with the budget and financial management, while it is essential to draw on available resources efficiently and ensure transparency of financial flows. Monitoring and evaluation: Regular preparation of monitoring and evaluation reports at 6-month intervals allows for monitoring progress in program implementation. These reports are submitted to the control authority for assessment and subsequently published to the public, which increases transparency and enables early identification of problems. Update and flexibility: Annual update of the document and action plan is necessary to reflect current needs and conditions in the region. This flexibility allows for adaptation to new challenges and more effective achievement of set goals. Public participation: Ensuring public access to information through the publication of monitoring and evaluation reports on the website of the self-governing region supports transparency and increases citizens' trust in the implementation process.
Benefits	Expected benefits related to Just Energy Transition:

	Environmental protection and sustainability reducing environmental burdens - supporting ecological projects, recycling and the use of renewable energy sources; increasing energy efficiency – modernizing public buildings and supporting alternative energy sources; developing green infrastructure – planting trees, revitalizing parks and protecting nature reserves. Innovation and digitalization digitalization of public administration – improving e-government services for faster communication between citizens and authorities; supporting research and innovation – cooperating with educational institutions and companies to develop new technologies; developing high-speed internet – improving the availability of digital services in rural and urban areas. Citizen participation and transparency - citizen involvement in decision-making – regular consultations, publishing strategic documents and creating participatory budgets.
KEY LESSONS LEARNED	
The implementation of this strategic document is still in the initial phase.	
RESULTS (IF AVAILABLE)	
OTHER RELEVANT INFORMATION (IF ANY)	

Title	Handbook for founders of energy communities
Time frame	2025 - ongoing
Country	Slovakia
PURPOSE AND IMPLEMENTATION	

Objectives	Own housing often represents the largest item in family budgets in Slovakia, which is especially true for residents in regions exposed to the negative impacts of the energy transition. An energy community represents an innovative concept that can help residents of regions affected by energy poverty in transition process from phasing out of fossil fuels to effective and environmentally friendly use of energy from RES. The Handbook for Energy Community Founders provides a comprehensive overview of community energy in Slovakia, its meaning, legal framework and practical aspects of the process of establishing an energy community. Community energy is an innovative and increasingly widespread approach to energy production and distribution in several EU Member States. However, its development in Slovakia still faces many legislative, technical and other barriers that need to be overcome or at least mitigated. Main objectives of energy communities are: • Achieve sustainable and efficient energy production and consumption (more efficient use of renewable energy sources (RES) throughout the entire production period and maximum use of the installed capacity), • Reduce energy costs (incorporating RES into the community increases the efficiency of RES and also reduces installation costs, while the community has the right to decide on the internal price of energy for its members), • Increase energy self-sufficiency, • Reduce energy dependence on fossil fuels, • Joint use the technical elements of RES by several community members, such as battery storage, charging stations for electric vehicles, etc.
Beneficiaries/ Targets	Residents of apartment buildings using the innovative concept of energy communities.
Key activities	• Electricity generation, supply, sharing and storage, • Activities related to energy aggregation and distribution, • Performance of activities related to ensuring the energy needs of members or partners of the energy community.
Justice aspects	
INSTITUTIONS/ORGANIZATIONS INVOLVED AND THEIR ROLE IN THE PROJECT	
Institution no. 1	SAPI - Slovak Association of Sustainable Energy (sapi.sk)
Institution no. 2	KEKS Energy – Cluster for the support of community energy in Slovakia (keks.energy)
AVAILABLE DOCUMENTATION & COMMUNICATION CAMPAIGN	
Available documentation	https://www.sapi.sk/files/132_FINAL_SAPI_Prirucka.pdf
Communication campaign	https://euractiv.sk/section/budovy/opinion/ako-urobit-z-energetickych-komunit-atraktivne-riesenie-pre-slovenskych-spotrebitelov/

	https://www.teraz.sk/spravy/prieskum-energeticke-spolocenstva-by/813832-clanok.html
CHALLENGES AND BENEFITS IN DEVELOPMENT AND/OR IMPLEMENTATION	
Challenges	• Absence of specialized One-stop-shops, • Relatively high fees, • Free installation of smart meters as a crucial feature for monitoring of energy consumed by community members, • Simplification of procedures for small renewable energy producers, • Better engagement of general public to the energy community planning procedures.
Benefits	Within the framework of energy transformation, the energy community represents an innovative concept that enables residents of regions affected by energy poverty caused by transition from fossil fuels the fair use of energy from renewable sources in order to maintain environmentally friendly principles.
KEY LESSONS LEARNED	
RESULTS (IF AVAILABLE)	
In Slovakia, we already have the first cases of positive feedback on the concept of energy communities, both from users (energy consumers) as well as from energy managers. However, the implementation of this concept in the country is still in its initial phase, especially in the more developed regions of Slovakia that are not affected by energy poverty.	
OTHER RELEVANT INFORMATION (IF ANY)	

Title	Just Green Transition - The need and potential for a fair climate transition in Hungary
Time frame	24-30.09.2021. (online and phone survey time frame)
Country	Hungary
PURPOSE AND IMPLEMENTATION	
Objectives	The Foundation for European Progressive Studies (FEPS), the Foundation for Social Democracy and the Foundation for a Renewable Hungary aimed to examine how the inevitable steps in the fight against climate change can be reconciled with principles of social justice and how the framework for a socially just climate transition can be developed. The study assessed the attitudes of Hungarian society towards climate change and action against it through a questionnaire based on literature and previous public opinion research, and mapped the expectations and fears related to the climate transition and the green turn.
Beneficiaries/ Targets	The survey was conducted in Hungary, among the local population.

Key activities	Desk research for previous surveys, online and phone survey conducted between 24-30.09.2021. to find out what is the general opinion/view about the climate change (e.g. who is most responsible, who can do the most to prevent it, what can ordinary citizens do for climate protection, etc.)
Justice aspects	In the survey and the study, one of the most important aspects are to be in line with the principles of social justice and how to create a socially just climate transition framework.
INSTITUTIONS/ORGANIZATIONS INVOLVED AND THEIR ROLE IN THE PROJECT	
Progressive Hungary Foundation	The aim of the Foundation for a Renewable Hungary is to present and promote green-left values and to promote active social responsibility. The Foundation was established by the Dialogue for Hungary (PM) in June 2014. They started their operational activities in December 2014. Their main field of activity is community building. In this spirit, they have launched and are continuously expanding our Green Terrace network connecting self-organising local communities, and they have also started community building in the virtual space. They also conduct research, organise conferences and produce publications to provide a tangible and responsible vision for Hungarian society. They consider the involvement of younger generations in public life and the development of informed citizenship to be a priority area. In the implementation of their programmes, they count on the contribution of experts, public figures, local and national NGOs, research institutions, think tanks and volunteers.
AVAILABLE DOCUMENTATION & COMMUNICATION CAMPAIGN	
Available documentation	https://mmaa.hu/wp-content/uploads/2022/01/Zold_Fordulat-tanulmany_A4.pdf
Communication campaign	https://mmaa.hu/2022/01/10/beszamolo-az-igazsagos-zold-atallas-tanulmany-bemutato-es-szakpolitikai-kerekasztal-beszelgetesrol/
CHALLENGES AND BENEFITS IN DEVELOPMENT AND/OR IMPLEMENTATION	
Challenges	The Hungarian government insist on keep applying a so called “overhead reduction” method on the electrical consumption of the population. This on one hand can be considered as a good thing, since people can pay less for electricity usage. But on the other hand, this approach will never encourage the transition towards using energy more responsibly.
Benefits	The study provides several important suggestions for the entire population of Hungary on how to sustainably and justly support climate protection efforts and as part of it, the just transition process.
KEY LESSONS LEARNED	
The survey shows that Hungarian society's expectations of the climate transition are overwhelmingly positive, with hopes of beneficial consequences outweighing fears of risks. However, the dominance of anxieties about the cost of living dominates the negative effects, with the rising cost of living and the reduction in social support leading the fears. Moreover, these fears	

are significantly stronger among groups with lower education and (based on the type of residence) lower estimated income, while positive expectations are weaker.
RESULTS (IF AVAILABLE)
The study made proposals in several main areas: energy, green mobility, job creation and green democracy. The most important of these is energy, which affects people the most. And within this, a flagship programme is the priority support for building energy renovation, with a programme of EUR 300 billion per year, substantial non-reimbursable subsidies and soft loans without co-payments. This will also allow households to carry out this type of renovation and improvement for which they would otherwise not have the equity.
OTHER RELEVANT INFORMATION (IF ANY)
Additional link to other data, information, studies on energy poverty in Hungary: https://www.uni-corvinus.hu/post/hir/one-million-hungarian-households-struggle-with-energy-poverty/?lang=en

Title	Study and expert framework for developing measures to combat energy poverty – Action Plan for Reducing Energy Poverty.
Time frame	2022 - 2026
Country	Slovenia
PURPOSE AND IMPLEMENTATION	
Objectives	Reducing the share of energy-poor households. Implementing investments in energy efficiency and renewable energy in energy-poor households. Achieving energy savings through the implementation of measures in energy-poor households.
Beneficiaries/ Targets	Households with low income and difficulties in meeting basic energy needs due to inadequate living conditions or low energy efficiency of their homes. Households where a member is a recipient of cash social assistance, care allowance, or energy allowance. Households receiving child benefits in the first three income brackets and living in energy-inefficient buildings or inadequate living conditions.
Key activities	Establishment and operationalization of a scheme to reduce energy poverty. Allocation of non-repayable financial incentives through the Eco Fund of the Republic of Slovenia for the energy renovation of buildings for socially vulnerable citizens. Implementation of public calls (consulting, support) aimed at helping energy-poor households obtain funds for energy renovation. Establishment of indicators for monitoring the implementation of measures and evaluating their effectiveness. Education and raising public awareness about ways to reduce energy poverty and the importance of energy-efficient behavior.

Justice aspects	Targeting the most vulnerable groups, including households receiving social assistance or living in energy-inefficient buildings. All eligible households will have equal access to financial incentives and support for energy renovation, regardless of their geographical location or other factors. The allocation of non-repayable financial incentives ensures that households are not burdened with additional debt, which is crucial for preventing the deepening of poverty.
INSTITUTIONS/ORGANIZATIONS INVOLVED AND THEIR ROLE IN THE PROJECT	
Jožef Stefan Institute, Center for Energy Efficiency (IJS-CEU)	The Research Institute - Center for Energy Efficiency focuses on research, development, and consulting in the field of energy efficiency. The Center collaborates with industry, government institutions, and international organizations on projects related to sustainable energy, renewable energy, and emission reduction.
Institute for Economic Research (IER)	An independent research institution in Slovenia, specializing in macroeconomic analysis, development policies, and economic strategies. It conducts research in areas such as economic growth, the labor market, public finance, and environmental policies, and collaborates with state institutions and international organizations.
Focus, Society for Sustainable Development	Focus, the Society for Sustainable Development, is a Slovenian non-governmental organization that focuses on sustainable development, environmental policies, and climate change. It works in areas such as energy efficiency, sustainable mobility, fair trade, and environmental justice, while promoting socially responsible behavior.
AVAILABLE DOCUMENTATION & COMMUNICATION CAMPAIGN	
Available documentation	https://www.energetika-portal.si/podrocja/energetika/energetska-revscina/preucitev-in-strokovne-podlage-za-razvoj-ukrepov-za-boj-proti-energetski-revscini/
Communication campaign	https://ceu.ijs.si/ https://www.ier.si/projekti/energetska-revscina/ https://focus.si/
CHALLENGES AND BENEFITS IN DEVELOPMENT AND/OR IMPLEMENTATION	
Challenges	Ensuring sufficient financial resources for the implementation of planned measures remains a key challenge, particularly in relation to their fair distribution and efficient use. High energy prices and their fluctuations complicate the planning and execution of measures aimed at reducing energy poverty. The aging housing infrastructure and its energy inefficiency require significant investments for renovation and rehabilitation. Effective coordination between institutions and coherent resource management are essential for successful implementation.
Benefits	The plan aims to improve living conditions for energy-poor households by providing warmer, more comfortable homes and reducing energy costs.

	It ensures that the most vulnerable households receive support, helping to reduce social inequality and improve their social status. Aligned with national and European climate neutrality goals and energy policies, the plan facilitates access to additional funding and support.
KEY LESSONS LEARNED	
Successfully reducing energy poverty—and poverty in general—requires ensuring that policy measures are aligned with efforts to alleviate rather than exacerbate the issue. Inconsistent policies (e.g., tax, wage, economic, or housing policies) could unintentionally increase poverty levels. Achieving effective solutions demands coordinated action among government institutions, local communities, and non-governmental organizations.	
RESULTS (IF AVAILABLE)	
The project is currently in the implementation phase, with concrete results still in development. However, these measures are expected to bring significant improvements in reducing energy poverty in Slovenia. A total of €34 million has been allocated for the 2024–2026 period to support these efforts, aligning with the goal of halving the share of energy-poor households by 2030.	
OTHER RELEVANT INFORMATION (IF ANY)	
The scheme for reducing energy poverty builds on existing initiatives such as the ZERO500 programme and the ZERO project. It is designed as a comprehensive set of interconnected measures, ensuring a systemic and long-term approach to tackling energy poverty. A key objective of the scheme is to support a fair transition to a low-carbon society, making energy efficiency accessible to all. Additionally, it enables the allocation of larger financial resources, including those from the Climate Change Fund and, in the future, the EU Social Climate Fund.	

Title	Analytical Report on Energy Poverty in the Settlements of the Local Action Group Goričko (PHASE 1) Prepared as part of the COEXISTENCE (SOŽITJE) project—an intersectoral, intercultural, and intergenerational initiative for the Local Action Group Goričko 2020.
Time frame	2020 - 2022
Country	Slovenia
PURPOSE AND IMPLEMENTATION	
Objectives	LAS Goričko 2020 through sustainable development projects and European funds, supports measures to improve energy efficiency, raise awareness among residents, and increase access to renewable energy sources, thereby working to reduce energy poverty in the region. The cooperation operation “SOŽITJE” focuses on improving the long-term position of socially vulnerable groups in the settlements of LAS Goričko, ensuring a fair and inclusive transition to sustainable energy solutions.

Beneficiaries/ Targets	Households from the settlements of Cankova, Gornji Petrovci, Grad, Hodoš, Kuzma, Moravske Toplice, Puconci, Sveti Jurij, Šalovci, Tišina, Bakovci, Krog, and Rakičan are included. Special emphasis is placed on vulnerable groups that are at a higher risk of falling into energy poverty, such as the elderly, the unemployed, and the Roma.
Key activities	Inventory of approaches, routes, and channels for identifying suitable households. Implementation of 50 energy audits in households to prevent energy poverty. Procurement of materials such as energy-saving aerators, thermostatic valves, energy-saving showerheads, insulating foil behind radiators, and energy-saving LED bulbs for assembling emergency packages to prevent and alleviate energy poverty. Distribution of 50 material packages to households for the prevention of energy poverty. Presentation brochures on the state of energy poverty in the settlements within the Goričko Local Administrative Organization.
Justice aspects	Ensuring access to reliable energy sources for all residents by assessing the infrastructure for electricity, gas, and other energy sources at affordable prices, regardless of income. Evaluation of energy standards in housing and buildings, as low-energy-efficiency buildings contribute to energy poverty by requiring more energy for heating and cooling. Review of support programs and subsidies for vulnerable population groups, including energy cost reduction programs, subsidies for home energy renovations, and other forms of financial assistance. Engaging local communities in decision-making and planning processes to address energy issues fairly.
INSTITUTIONS/ORGANIZATIONS INVOLVED AND THEIR ROLE IN THE PROJECT	
Municipality of Kuzma	A border municipality in the Pomurje region, located in the far northeast of Slovenia, on the border with Austria and Hungary.
Rakičan Manor Research and Education Center	A public institution engaged in research, education, culture, and tourism. It offers various educational programs, conducts scientific projects, and organizes international conferences and workshops, contributing to local and regional development.
Local Energy Agency Pomurje (LEA Pomurje)	A regional organization that promotes sustainable energy use, renewable energy sources, and energy efficiency. It collaborates with municipalities, businesses, and residents to develop energy strategies, implement projects, and raise awareness about sustainable energy solutions. Its efforts contribute to reducing energy poverty and facilitating the transition to a low-carbon society.
AVAILABLE DOCUMENTATION & COMMUNICATION CAMPAIGN	
Available documentation	https://leag.si/wp-content/uploads/2021/12/Bojan-Vogrincic-LEA-Pomurje_Sozitje_compressed.pdf

Communication campaign	https://2020.las-goricko.si/ https://2020.las-goricko.si/go/978/ESRR
CHALLENGES AND BENEFITS IN DEVELOPMENT AND/OR IMPLEMENTATION	
Challenges	Energy poverty in the LAS Goričko 2020 area is a pressing issue, as it is a rural region with dispersed settlements, older buildings, and an above-average elderly population. This area is one of the most socially disadvantaged regions in Slovenia. Many households have low incomes and live in energy-inefficient homes, leading to high heating costs and limited access to modern energy solutions. An additional factor exacerbating the situation is the high cost of energy. Ultimately, all of this negatively impacts public health. Furthermore, there is a lack of proper knowledge transfer between generations. Young people often show little interest, and the region also struggles with the inadequate social inclusion of Roma community members. The issue of socially vulnerable groups in the LAS Goričko area has been addressed multiple times in the past, but rarely through a holistic approach that also considers energy poverty. It is crucial to recognize that out of a total of 18.212 households in the LAS Goričko area, 1.670 households are already experiencing energy poverty.
Benefits	The report serves as a foundation for educational programs that inform residents about opportunities for more efficient energy use and cost reduction. The analysis results can support the development of local, regional, or even national policies and strategies to combat energy poverty.

KEY LESSONS LEARNED

Energy poverty impacts low-income households the most, particularly pensioners, the unemployed, and households receiving social assistance. Their economic situation is often linked to poor energy efficiency in their homes (e.g., inadequate insulation, old and inefficient heating systems, and expensive energy), which is frequently associated with poorer health, especially among the elderly.

Identifying areas with high levels of energy poverty, planning effective measures tailored to residents' needs, and conducting detailed analyses to secure funding for projects are essential steps in reducing energy poverty.

RESULTS (IF AVAILABLE)

The operation aimed to improve the quality of life and promote sustainable development in the Goričko region.

The implementation of educational programs and awareness-raising campaigns empowered residents by highlighting the importance of sustainable development and the efficient use of resources.

Several initiatives emerged to promote sustainable development, including projects focused on energy efficiency, the use of renewable energy sources, and environmental protection.

These efforts contributed to strengthening social cohesion and cooperation among residents, leading to a better quality of life and reduced social inequalities.

OTHER RELEVANT INFORMATION (IF ANY)
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Title	Report: RES in Belchatow. New prospects for the region
Time frame	publication: February 2025
Country	Poland
PURPOSE AND IMPLEMENTATION	
Objectives	A report prepared by the Energy Forum Foundation analyzes the potential of the Belchatow region in the context of energy transition. We present an analysis of local conditions and challenges, we evaluate the potential for the development of wind and solar energy, and propose specific actions that can be taken by local and regional authorities to effectively take advantage of the transformation opportunity and preserve the important energy role of the Belchatow region on the map of Poland after abandoning brown coal mining.
Beneficiaries/ Targets	Local government units, residents, private investors, energy companies.
Key activities	The analysis provided an estimate of the RES potential in the transformation area in Lodz province. This is an illustrative estimation made using planning tools (GIS.box) and spatial data. Consideration was given to: ● areas of existing and planned residential and other development, ● road infrastructure, ● protected areas, ● highest voltage power grids, ● the area of the Belchatow mine and power plant, ● existing generation sources.
Justice aspects	The report indicates that in the transition area already, thanks to the establishment of areas of accelerated RES development, nearly 1 GW of wind power plants can be built, while the potential for photovoltaics is 5 GW. This can significantly reduce the need to generate energy from fossil fuels - in our case, lignite.
INSTITUTIONS/ORGANIZATIONS INVOLVED AND THEIR ROLE IN THE PROJECT	
The Energy Forum Foundation	report co-authors
The Reform Institute Foundation	
AVAILABLE DOCUMENTATION & COMMUNICATION CAMPAIGN	
Available documentation	https://www.forum-energii.eu/energetyczna-przyszlosc-belchatowa

Communication campaign	
CHALLENGES AND BENEFITS IN DEVELOPMENT AND/OR IMPLEMENTATION	
Challenges	Designing the development of space in the areas currently used by the lignite mine and power plant so that it can accommodate the infrastructure needed to produce energy from renewable energy sources as efficiently as possible.
Benefits	A report that is a basis for planning by stakeholders of the RES investment process, to help shape local policies, primarily land use plans.
KEY LESSONS LEARNED	
The report indicates that by accelerating the development of RES, nearly 1 GW of wind power plants could be built, and the potential for photovoltaics would be 5 GW of capacity. At first look, the Lodzkie Region, due to its scattered buildings or fragmented forest areas and average wind conditions, does not appear to be the most attractive area for locating RES. However, other assets of the region play a key role here, such as: - Central location - Existing network infrastructure - Large post-mining areas	
RESULTS (IF AVAILABLE)	
The result of the report is its conclusions: The development of RES in Belchatow can attract new industry seeking access to zero-carbon energy, allowing the region to grow economically. Access to green energy is increasingly a key location criterion for companies, and the Belchatow region has the potential to become a leader in this area. Manufacturing companies urgently need access to clean, low-cost energy, and attracting them to the region will create new, stable jobs for the region's residents, who until now have been employed in the energy complex.	
OTHER RELEVANT INFORMATION (IF ANY)	
-	

Title	Energy poverty between welfare and environment: a research in four council houses' districts of Trieste
Time frame	May 2021-July 2022
Country	Italy
PURPOSE AND IMPLEMENTATION	
Objectives	Collect information on the energy consumption of families in four contexts of public residential buildings managed by ATER Trieste, focusing in particular on the neighbourhoods where situations of marginalization, socio-economic and socio-health fragility are concentrated
Beneficiaries/ Targets	Residents of public housing in four neighborhoods in Trieste (Gretta, Melara, Valmaura, and Borgo San Sergio). These areas, characterized by socio-economic and infrastructural vulnerabilities, include a high percentage of elderly individuals and households facing energy poverty.
Key activities	Administering detailed surveys across four public housing neighborhoods in Trieste to explore socio-economic and energy consumption patterns. The

	team conducted qualitative and quantitative analyses, combining on-site data collection with resident engagement. The work integrated input from local social welfare services ("Microareas" and "Social gate-keeping"), to ensure comprehensive data on living conditions, energy vulnerabilities, and potential areas for intervention
Justice aspects	Energy poverty is one of the main targets of JET policies
INSTITUTIONS/ORGANIZATIONS INVOLVED AND THEIR ROLE IN THE PROJECT	
UNITS	University of Trieste, Department of Political and Social Sciences. Research group on Ecowelfare. Implementer of the research
ATER	Regional company for public residential construction. Facilitator in reaching the sample of interviewees (tenants of ATER public housing)
Municipality of Trieste	Implementer of "Programma Microaree," which focuses on community welfare and territorial healthcare services
ASUGI	Health and Medicine University public company Giuliano Isontina. Co-implementer of "Programma Microaree"
AVAILABLE DOCUMENTATION & COMMUNICATION CAMPAIGN	
Available documentation	https://www.openstarts.units.it/server/api/core/bitstreams/f82d409f-1e9c-401f-92d2-ff246ba73626/content
Communication campaign	-
CHALLENGES AND BENEFITS IN DEVELOPMENT AND/OR IMPLEMENTATION	
Challenges	Outdated housing infrastructure, high energy costs, limited financial resources, health vulnerabilities, and insufficient integration of welfare and energy efficiency policies
Benefits	Understanding the existing problems could improve local living conditions (through energy-efficient housing, reduced health risks, lower energy costs, and enhanced community well-being) due to targeted financial and policy interventions
KEY LESSONS LEARNED	
Energy poverty arises from economic constraints, inefficient housing, high energy costs, and health vulnerabilities, disproportionately affecting the elderly and socio-economically fragile populations. Localized factors like extreme climates and outdated infrastructure worsen the issue, linking inadequate heating or cooling to health risks. Solutions require integrating social welfare and environmental policies, improving energy efficiency, and providing targeted financial support. Community engagement, as seen in Trieste, is crucial for identifying needs and tailoring interventions to address this multifaceted challenge.	
RESULTS (IF AVAILABLE)	
The study reveals the multifaceted nature of energy poverty in public housing contexts in Trieste, shaped by economic, structural, and social factors. Vulnerability to energy poverty arises from inadequate housing efficiency, socio-economic constraints, and limited access to energy-saving interventions or financial aids. Localized challenges, such as structural obsolescence and low community engagement, compound the issue. The research highlights the interplay of individual, structural, and contextual elements, emphasizing the need for integrated policies addressing energy efficiency, financial support, and community cohesion.	
OTHER RELEVANT INFORMATION (IF ANY)	

The study focuses on identifying the needs of these communities to develop targeted interventions addressing energy efficiency, financial support, and community engagement.

Title	EAGER-Easing AGrophotovoltaic for EuRope
Time frame	2024-2028
Country	9 countries - focus on Nuovo Circondario Imolese, province of Bologna (Italy)
PURPOSE AND IMPLEMENTATION	
Objectives	Improving 9 policy instruments to ease agriphotovoltaics in Europe by 2027
Beneficiaries/ Targets	14 partners
Key activities	Generating a common understanding of suitable APV settings and contexts; identifying, analysing and transferring good practices; changing behaviour among policy actors of the participating regions
Justice aspects	Consideration of the conflict between agriculture and the energetic transition
INSTITUTIONS/ORGANIZATIONS INVOLVED AND THEIR ROLE IN THE PROJECT	
European Union (Interreg programme)	Co-funder
Partners	Municipalities, provinces, regions of the countries involved
AVAILABLE DOCUMENTATION & COMMUNICATION CAMPAIGN	
Available documentation	https://www.interregeurope.eu/eager/library
Communication campaign	https://www.interregeurope.eu/eager/news-and-events
CHALLENGES AND BENEFITS IN DEVELOPMENT AND/OR IMPLEMENTATION	
Challenges	Different challenges depending on the country
Benefits	Mitigation of conflicting interests between agriculture and open space photovoltaic systems for viable land
KEY LESSONS LEARNED	
RESULTS (IF AVAILABLE)	
Project started in April 2024 and will end in June 2028.	
OTHER RELEVANT INFORMATION (IF ANY)	

Title	Die deutsche Energiewende: Synergien, Zielkonflikte und politische Triebkräfte / The German energy transition: Synergies, conflicting goals and political drivers

Time frame	2023
Country	Germany
PURPOSE AND IMPLEMENTATION	
Objectives	Determine methods to make the energy transition in Germany more just and efficient, specifically in the context of the Russian invasion of Ukraine. Focused on end of coal mining and need to increase wind energy generation.
Beneficiaries/ Targets	Civil society at large
Key activities	List of recommendations was elaborated by academic analysis of policy documents and 28 expert interviews
Justice aspects	Recommendations focus almost exclusively on justice aspects as civil acceptance of changes associated with energy transition is seen as critical by authors
INSTITUTIONS/ORGANIZATIONS INVOLVED AND THEIR ROLE IN THE PROJECT	
Institution no. 1	Leibniz Information Centre for Economics
Institution no. 2	German Institute of Development and Sustainability (IDOS)
AVAILABLE DOCUMENTATION & COMMUNICATION CAMPAIGN	
Available documentation	https://www.econstor.eu/bitstream/10419/283119/1/PB-23.2023.pdf
Communication campaign	N/A
CHALLENGES AND BENEFITS IN DEVELOPMENT AND/OR IMPLEMENTATION	
Challenges	This paper is a meta-analysis of existing research on the topic as well as expert opinions, no major challenges were described in the context of its creation.
Benefits	Very useful overview of existing research on the topic.
KEY LESSONS LEARNED	
• Dismantling the ideological, institutional and vested interests barriers to ambitious climate policy through policy coherence. In North-Rhine Westphalia, keeping the recent promises of a coal phase-out by 2030 and of repealing the 1000-meter "rule" (i.e. 1km between residential buildings and wind turbines) is key. These voluntary commitments should be enshrined in legislation. • Promote greater political equality in all decision-making processes related to the energy transition at all levels of government (federal, state, and local) towards a stronger energy democracy through consultation and participation mechanisms. Reducing political inequalities (e.g., by establishing cooperatives) is essential to increasing public acceptance of renewable energy projects. • Integrating ideas of social and climate justice into energy transition policy to ensure that the German energy transition is just for all people, not just for German coal miners. Ideas of procedural, distributive, and recognition justice should be considered.	
RESULTS (IF AVAILABLE)	

OTHER RELEVANT INFORMATION (IF ANY)

Title	Finanzielle Beteiligung als ein Schritt hin zu einer gerechten Energiewende – Was wir aus dem Bürger- und Gemeindenbeteiligungsgesetz aus Mecklenburg-Vorpommern lernen können / Financial participation as a step towards a fair energy transition – What we can learn from the Citizens' and Municipalities Participation Act in Mecklenburg-Western Pomerania
Time frame	2022
Country	Germany
PURPOSE AND IMPLEMENTATION	
Objectives	Analysis and description of lessons learned of 2016 Citizens' and Municipalities Participation Act in the German state of Mecklenburg-Western Pomerania.
Beneficiaries/ Targets	Creators of public policy on the state-level or above.
Key activities	Passive research
Justice aspects	Article focuses specifically on how to increase acceptance of new energy technologies – details in key lessons learned section
INSTITUTIONS/ORGANIZATIONS INVOLVED AND THEIR ROLE IN THE PROJECT	
Institution no. 1	Brandenburgisch-Technische Universität Cottbus-Senftenberg
AVAILABLE DOCUMENTATION & COMMUNICATION CAMPAIGN	
Available documentation	https://stadtlandplus.auf.uni-rostock.de/docs/pub/Tagungsband_SLP-Tagung_15-09-2022_Rostock.pdf (p. 101 ff.)
Communication campaign	N/A
CHALLENGES AND BENEFITS IN DEVELOPMENT AND/OR IMPLEMENTATION	
Challenges	N/A
Benefits	List of pertinent recommendations to be considered.
KEY LESSONS LEARNED	

1. A uniform national solution – local legal certainty: A uniform national solution offers legal certainty and the same conditions for project sponsors throughout the country. At the same time, it is possible to set nationwide minimum standards for local value creation, from which communities throughout the country can benefit.
2. Simple rules – easy implementation: A law that regulates financial participation must be designed with practical application in mind. It should be easy for project developers to implement in a transparent manner and as easy as possible to communicate in the local municipalities.
3. Clear expectations – short time horizons: In order to be relevant at all for the resolution of local wind power conflicts, it must be clear to residents and municipalities what they can expect, e.g. through fixed or legally stipulated payments. Timely, reliable information

about the individual or municipal benefits can help to constructively bridge the period until actual application.

4. Scope for municipalities – setting minimum standards: While keeping things simple is important, municipalities should be guaranteed a minimum level of decision-making power. The law must prevent municipalities from "coming away empty-handed" because they are unwilling or unable to invest themselves.
5. Create space for individual solutions: Good cooperation between project developers and municipalities should be encouraged. To this end, leeway must be created that allows agreements to be made that go beyond the legal requirements.
6. Advice and support for municipalities: The energy transition presents many challenges for municipalities. At the same time, however, it also offers great opportunities. It is important to have advice that is seen as neutral, that informs municipalities about the implementation of legal requirements and that accompanies decision-making processes.
7. Strengthening municipal networks: Municipalities need to be able to exchange ideas. In peer-to-peer consultations, municipalities can share their experiences of local energy transition projects with each other, and seek or offer help. Communication with like-minded people often helps to resolve problems and uncertainties more quickly.
8. Energy agencies at regional or state level: Providing advice and support to municipalities, developing and maintaining municipal networks and other supportive services requires resources. Whether it is a state energy agency, a regional energy management or an authority responsible for regional planning, responsibilities must be created and the relevant organizations must be provided with the necessary human and financial resources.
9. Taking diversity into account and reducing structural disadvantages: Existing structural disadvantages of individual communities (e.g. due to a lack of land ownership, poor funding or small administrations) with regard to a lack of creative possibilities must not be reinforced. Anyone who wants to increase local value creation must therefore empower municipalities to bring their specific interests into the process.
10. Promoting spatial justice in the energy transition: An equal spatial distribution of wind turbines is neither desirable nor feasible. Spatial justice in the energy transition should rather be achieved through a unified framework that ensures procedural and financial distributive justice as well as a fair burden sharing. The legal anchoring of the strengthening of local value creation and the creation of good framework conditions for communities can be important steps in this direction.

RESULTS (IF AVAILABLE)
OTHER RELEVANT INFORMATION (IF ANY)

Title	Integrated spatial and energy planning in Styria – A role model for local and regional energy transition and climate protection policies
Time frame	January 2022 – May 2022
Country	Austria, Vienna
PURPOSE AND IMPLEMENTATION	

Objectives	Integrate energy transition and spatial planning to develop energy-efficient settlement structures supporting climate protection and sustainability.
Beneficiaries/ Targets	Municipalities, planners, policymakers, and local communities aiming for sustainable urban and regional development.
Key activities	Developing strategic planning methodologies, creating spatial databases and maps, conducting education programs, and implementing integrated spatial and energy planning (ISEP) in municipalities.
Justice aspects	Ensuring inclusive participation, equitable access to energy resources, and minimizing spatial inequalities in energy transition policies.
INSTITUTIONS/ORGANIZATIONS INVOLVED AND THEIR ROLE IN THE PROJECT	
Institute of Spatial Planning, Environmental Planning and Land Rearrangement	Co-Author: L. Abart-Heriszt
University of Natural Resources and Life Sciences	Author: G. Stoeglehner
AVAILABLE DOCUMENTATION & COMMUNICATION CAMPAIGN	
Available documentation	Integrated spatial and energy planning in Styria – A role model for local and regional energy transition and climate protection policies - ScienceDirect
Communication campaign	
CHALLENGES AND BENEFITS IN DEVELOPMENT AND/OR IMPLEMENTATION	
Challenges	Lack of integration across sectors, difficulty in implementing theoretical concepts into real-life planning, resistance to change at municipal levels
Benefits	Enhanced energy efficiency, increased use of renewable energy, improved quality of life, and reduced environmental impacts.
KEY LESSONS LEARNED	
Holistic and integrated planning approaches are essential for effective energy transition, requiring strategic alignment across policies and sectors.	
RESULTS (IF AVAILABLE)	
Implementation of ISEP in Austria, demonstrating how spatial planning can effectively support the energy transition through energy-efficient urban and regional structures.	
OTHER RELEVANT INFORMATION (IF ANY)	
Renewable and Sustainable Energy Reviews, Volume 165, September 2022, 112587	

Case histories

Title	Building and strengthening capacities for future competencies (Mate Blažine Labin High school)
Time frame	Integrated Territorial Programme 2021-2027 call planned for June 2025 – May 2026 period
Country	Croatia (Istrian County, Labin City)
PURPOSE AND IMPLEMENTATION	
Objectives	Ensuring excellence in vocational education in the function of a green economy through infrastructural and programmatic investment in secondary education institutions and their human capacities, i.e. through programs oriented towards future-oriented competencies
Beneficiaries/ Targets	City of Labin high school students and staff
Key activities	Establishment of the Center of Excellence in Electrical Engineering at the Mate Blažina High School in Labin. The project plans to reconstruct the workshop building, equip 11 specialized classrooms and 3 general purpose spaces; modernize and implement the vocational program, and establish and implement an adult education program.
Justice aspects	Future re-skilling options to enable job diversity and new career possibilities
INSTITUTIONS/ORGANIZATIONS INVOLVED AND THEIR ROLE IN THE PROJECT	
Ministry of Regional Development and EU funds	Coordinator
Istrian County	Coordinator
AURORA – Regional Coordinator of Istrian County for EU programmes and funds	Operating coordinator
Mate Blažine Labin High school	Operating coordinator
AVAILABLE DOCUMENTATION & COMMUNICATION CAMPAIGN	
Available documentation	https://eufondovi.gov.hr/indikativni-godisnji-plan-objave-poziva/
Communication campaign	https://www.rk-aurora.hr/objavljen-dopunjeni-plan-objave-natjecaja-za-2024-godinu-za-pkk-2021-2027-i-itp-2021-2027/
CHALLENGES AND BENEFITS IN DEVELOPMENT AND/OR IMPLEMENTATION	
Challenges	Lack of funding, delays linked to administrative and legislative barriers, lack of available staff for project implemenation
Benefits	Enabling infrastructure for future re-skilling possibilities of high school students and adult population in City of Labin and wider region
KEY LESSONS LEARNED	

-
RESULTS (IF AVAILABLE)
-
OTHER RELEVANT INFORMATION (IF ANY)
9.161.253,04 EUR total grant amount for the call (85% co-financing)

Title	Development of entrepreneurial infrastructure in Labin City area
Time frame	Integrated Territorial Programme 2021-2027 call planned for April 2025 – December 2025 period
Country	Croatia (Istrian County, Labin City)
PURPOSE AND IMPLEMENTATION	
Objectives	Creating conditions for diversification of economy and increasing productive investments in SMEs, which will lead to the strengthening of a favorable environment for the development of entrepreneurship, and the entrepreneurial climate in an area that will be negatively affected by the transition.
Beneficiaries/ Targets	SMEs in Istrian Region
Key activities	Investments in entrepreneurial support institutions (coworking spaces, technological and innovation incubators, centers (HUB) of knowledge, creativity and innovation). Development of agricultural and food entrepreneurial infrastructure in Istrian County through establishment of an agribusiness center.
Justice aspects	Establishing a growing entrepreneurial climate aimed at creating new jobs and job diversification.
INSTITUTIONS/ORGANIZATIONS INVOLVED AND THEIR ROLE IN THE PROJECT	
The City of Labin	Coordinator
AVAILABLE DOCUMENTATION & COMMUNICATION CAMPAIGN	
Available documentation	https://eufondovi.gov.hr/indikativni-godisnji-plan-objave-poziva/
Communication campaign	https://www.rk-aurora.hr/objavljen-dopunjeni-plan-objave-natjecaja-za-2024-godinu-za-pkk-2021-2027-i-itp-2021-2027/
CHALLENGES AND BENEFITS IN DEVELOPMENT AND/OR IMPLEMENTATION	
Challenges	Lack of funding, delays linked to administrative and legislative barriers, lack of available staff for project implemenation
Benefits	Enabling infrastructure for creation of new job opportunities and future re-skilling possibilities in City of Labin and wider region
KEY LESSONS LEARNED	
-	
RESULTS (IF AVAILABLE)	
-	

OTHER RELEVANT INFORMATION (IF ANY)
29.987.384,40 EUR total grant amount for the call (85% co-financing)

Title	Renewable Energy for All: The Just Energy Transition Initiative in the Ústecký Region
Time frame	2019-2023
Country	Czech Republic
PURPOSE AND IMPLEMENTATION	
Objectives	• To transition away from coal-dependent energy sources to renewable energy, particularly in the Ústecký region, which has a high concentration of coal mines and power plants. • To reduce energy poverty by providing low-income households with access to renewable energy solutions. • To create job opportunities for workers transitioning from the coal industry, ensuring a just transition for affected communities.
Beneficiaries/ Targets	• Low-income households in the Ústecký region, particularly those affected by high energy costs and the closure of coal mines. • Local workers transitioning from coal-related industries to renewable energy sectors. • Regional authorities and local businesses involved in the energy transition. • Communities vulnerable to the environmental and economic impacts of coal dependency.
Key activities	• Installation of solar panels and small-scale wind turbines on public and private buildings in the Ústecký region. • Training programs for former coal workers, providing them with the skills needed for jobs in the renewable energy sector. • Launch of a financial aid program to help low-income households switch to energy-efficient technologies and renewable energy sources. • Creation of community energy cooperatives, allowing local residents to collectively own and manage renewable energy projects. • Collaboration with local governments and energy companies to ensure fair and inclusive energy transition policies.
Justice aspects	• Ensuring equitable access to the benefits of the energy transition, particularly for economically disadvantaged households. • Providing financial support to help vulnerable communities pay for energy-efficient solutions and renewable energy. • Promoting local ownership and control of renewable energy projects, empowering communities to manage their energy needs. • Providing retraining and employment opportunities for workers in the coal industry to transition into the renewable energy sector.

INSTITUTIONS/ORGANIZATIONS INVOLVED AND THEIR ROLE IN THE PROJECT	
Ministry of Environment (Czech Republic)	Coordinating national efforts to transition away from coal and towards renewable energy. The ministry oversees the Just Transition Fund and allocates financial support to regions like Ústecký.
Local Municipalities (Ústí nad Labem, Teplice)	Play a key role in local project implementation, including facilitating the installation of renewable energy systems and engaging communities in the transition process.
Non-Governmental Organizations (NGOs)	Work directly with vulnerable households, providing support in accessing financial aid for energy efficiency improvements and promoting awareness of available renewable energy options.
AVAILABLE DOCUMENTATION & COMMUNICATION CAMPAIGN	
Available documentation	**Czech Energy and Climate Action Plans** outlining national goals for reducing coal dependency and increasing the share of renewables in the energy mix. https://www.mzp.cz/en/national_energy_and_climate_plan_2021_2030
Communication campaign	**Community outreach programs** in the Ústecký region to inform local residents about renewable energy solutions and available financial support.
CHALLENGES AND BENEFITS IN DEVELOPMENT AND/OR IMPLEMENTATION	
Challenges	• **Resistance to change:** Some communities in the Ústecký region remain skeptical of the energy transition, particularly those who have long depended on the coal industry for employment. • **Financial barriers:** Despite available funding, some low-income households face challenges in accessing financial support for renewable energy technologies due to bureaucratic hurdles or lack of awareness. • **Skills gap:** While there is demand for workers in the renewable energy sector, former coal workers need retraining, which can be a lengthy and resource-intensive process.
Benefits	• **Increased energy security** through local renewable energy projects, reducing dependence on fossil fuels and imported energy. • **Economic diversification** in the Ústecký region, with the creation of new jobs in renewable energy installation, maintenance, and management. • **Reduction in energy costs** for low-income households that have switched to energy-efficient solutions or renewable energy sources. • **Environmental benefits** such as reduced carbon emissions and improved air quality from the decrease in coal power generation.
KEY LESSONS LEARNED	

• **Community engagement is essential:** Actively involving local communities in decision-making processes helps ensure that the energy transition is both fair and effective. • **Financial support mechanisms must be accessible:** Simplifying the process of accessing financial aid for energy efficiency and renewable energy projects is crucial for helping vulnerable households. • **Collaboration is key:** Effective partnerships between local governments, NGOs, and renewable energy companies are necessary for successful project implementation and long-term sustainability. • **Ongoing education and retraining are crucial:** Providing continuous support and training for workers transitioning from the coal industry ensures that they can access new employment opportunities in the green energy sector.
RESULTS (IF AVAILABLE)
• **Energy savings:** Over 500 households in Ústecký received financial aid to install solar panels, resulting in a significant reduction in energy costs. • **Job creation:** More than 200 former coal workers were retrained and found employment in the renewable energy sector, including roles in installation and maintenance of solar and wind energy systems. • **Renewable energy capacity:** The project successfully installed over 1 MW of solar power in public and private buildings in the region. • **Positive community feedback:** Surveys showed that 85% of participants in the renewable energy programs reported increased satisfaction with their energy costs and a greater sense of energy independence.
OTHER RELEVANT INFORMATION (IF ANY)

Title	The **Obnov dom mini** (in English "Renew your house mini") is a programme focused on the partial renovation of family homes, which helps households at risk of energy poverty achieve permanent energy savings.
Time frame	2023 - ongoing
Country	Slovakia
PURPOSE AND IMPLEMENTATION	
Objectives	Main objective of the programme is to ensure the access of **vulnerable households** to financial support for making their homes more energy-efficient.
Beneficiaries/ Targets	Vulnerable groups of citizens in all municipalities located throughout whole territory of Slovakia.
Key activities	Provision of a financial contribution for the partial renovation of family houses for households at risk of energy poverty. Eligible activities under this call include: • Insulation of the external envelope: Improving the thermal insulation properties of the walls of the house.

	• Replacement or modification of the roof: Insulating the roof envelope or replacing the roof covering. • Replacement of opening structures: Replacing old windows and doors with new ones with better insulation properties. • Modernization of the heating system: Replacing inefficient boilers with new, more environmentally friendly variants. • Installation of renewable energy sources: Installing solar panels to produce electricity or hot water. These measures are aimed at increasing the energy efficiency of family houses and reducing energy costs for households.
Justice aspects	
INSTITUTIONS/ORGANIZATIONS INVOLVED AND THEIR ROLE IN THE PROJECT	
Institution no. 1	**Slovak Environment Agency (SAŽP)** – The main implementing body responsible for managing applications, evaluating projects, and distributing financial support.
Institution no. 2	**Ministry of Environment of the Slovak Republic** – Oversees and sets policies related to the program's objectives, ensuring alignment with national environmental and energy efficiency goals.
Institution no. 3	**State Housing Development Fund (ŠFRB)** – May provide additional financial support or collaborate on housing-related subsidies.
Institution no. 4	**Municipal and Regional Authorities** – Assist in outreach, awareness, and support for eligible households in applying for the program.
AVAILABLE DOCUMENTATION & COMMUNICATION CAMPAIGN	
Available documentation	https://obnovdom.sk/dokumenty/obnov-dom-mini
Communication campaign	https://www.youtube.com/watch?v=33J2zvfunu4
CHALLENGES AND BENEFITS IN DEVELOPMENT AND/OR IMPLEMENTATION	
Challenges	The total amount allocated from REPowerEU, the green chapter of the Recovery and Resilience Plan of the Slovak Republic for the renovation of houses within the call is EUR 36.9 million.
Benefits	The Obnov dom mini challenge will help households at risk of energy poverty in locations with the most polluted air in the Banská Bystrica and Košice regions to renovate their family homes and thus save considerable financial expenses.
KEY LESSONS LEARNED	
Targeted support for energy-poor households: The program focused on low-income households in areas with the most polluted air, which allowed for effective targeting of financial assistance where it was most needed. Flexibility in the use of funds: The provided contribution of up to 10,000 euros allowed households to implement various measures, such as insulating the house, replacing	

windows, boilers, or installing solar panels, which contributed to increasing energy efficiency. Simplification of administrative processes: The abolition of the obligation to submit an energy certificate when submitting an application reduced the administrative burden for applicants and accelerated the approval process. Provision of advance payments: The possibility of obtaining an advance payment of up to 5,000 euros after signing the contract allowed households to start renovation without the need for their own initial investments, which was crucial for households with limited financial resources.
RESULTS (IF AVAILABLE)
By March 2025, 149,241,820 euros had already been paid out for the renovation of family houses. The aim of the programme is to partially renovate at least 3,060 homes by the end of the third quarter of 2025.
OTHER RELEVANT INFORMATION (IF ANY)

Title	Bábolna – the first fully operational renewable energy community in Hungary
Time frame	2022-2025
Country	Hungary
PURPOSE AND IMPLEMENTATION	
Objectives	Bábolna has launched a unique initiative, unique in Hungary but also rare worldwide, to consume locally produced electricity locally.
Beneficiaries/ Targets	Residents can sell their surplus at a higher price than the official price, while businesses can buy it at a lower price.
Key activities	The Bábolna project brings together a group of new and existing photovoltaic and conventional generators, battery storage, residential and industrial consumers into an energy community. The design and operation of the system requires a complex IT and telecommunications solution supporting technical and commercial (accounting) functions. These can be used to ensure that the separate devices, systems and consumers can operate in an automatic unified energy community and smart grid operation. The development of the energy community in Bábolna is a forward-looking project of far-reaching local significance, which could serve as a model for other energy communities to be established in the future.

Justice aspects	The municipality would like to expand the energy community in the near future, and in the second round they are looking for those who have a solar panel system or any alternative energy source to join. Once their planned new solar farm and the associated electricity storage facility are operational, they could also provide energy at a discounted price to the socially deprived.
INSTITUTIONS/ORGANIZATIONS INVOLVED AND THEIR ROLE IN THE PROJECT	
Town Municipality of Bábolna	Project leader, initiator of the development of the first local renewable energy community in Hungary
AVAILABLE DOCUMENTATION & COMMUNICATION CAMPAIGN	
Available documentation	https://www.babolna.hu/onkormanyzat/nem-europai-unios-palyazatok/74112/
Communication campaign	https://greendex.hu/babolna-elso-energiakozosseg/
CHALLENGES AND BENEFITS IN DEVELOPMENT AND/OR IMPLEMENTATION	
Challenges	Fully operational renewable energy communities are still rare in Europe, and in Hungary, there was no previous example on how to successfully build a local energy community. Lack of legal background. Convincing the right actors to join their forces.
Benefits	As the community has its own energy sources, it can reduce dependence on central energy suppliers and external markets. Last but not least, energy communities strengthen local communities as members work together towards a common goal, which increases social cohesion and trust. In the local community-based energy supply, members can share investment costs and energy costs can be reduced for households. Energy communities use mainly renewable energy, reducing carbon emissions and helping to reduce environmental pressures.
KEY LESSONS LEARNED	
In community-based energy supply, members can share investment costs and energy costs can be reduced for households. Energy communities use mainly renewable energy, reducing carbon emissions and helping to reduce environmental pressures. Locally generated electricity is also used locally, which strengthens energy sovereignty. The Mayor is therefore planning further improvements and intends to expand the community.	
RESULTS (IF AVAILABLE)	
Currently, the municipality is the largest player in the partnership with its gas-fired small-scale power plant and solar power. Soon to become a member will be IKR Agrár Ltd. with a 340 KW solar power plant, OSI Food Solutions Ltd. as a large consumer, and three private individuals with solar panels and electricity storage. The system will be complemented by a 200 KW battery electricity storage unit and a V2G bus charger capable of smoothing out load imbalances.	
OTHER RELEVANT INFORMATION (IF ANY)	
They will install solar panels on all their facilities, and we are also planning a new 36-hectare solar farm, which would also be part of the energy community. By the end of next year, but by 2026 at the latest, we want to achieve zero overheads in municipal institutions.	

Title	Agrovoltaic Deržič – Solar Power Plant / Sheep Farming
Time frame	2011
Country	Slovenia
PURPOSE AND IMPLEMENTATION	
Objectives	Ensure the optimal utilization of solar energy with minimal impact on agricultural production by transitioning to renewable energy sources. Create conditions for a secure, affordable, and sustainable energy future for all. Enable an effective energy transition through dual land use.
Beneficiaries/ Targets	Investor, farmers, local community
Key activities	Combined use of land for electricity production from solar panels while simultaneously supporting agricultural activities. Utilization of agricultural land for sheep farming.
Justice aspects	Farmers can generate additional income by producing and selling electricity, enhancing their financial stability. Local energy production significantly lowers energy costs, contributing to greater economic stability. Using renewable energy instead of fossil fuels reduces greenhouse gas emissions, supporting the fight against climate change—a global concern that affects everyone. Dual land use optimizes resource utilization in areas where land is limited
INSTITUTIONS/ORGANIZATIONS INVOLVED AND THEIR ROLE IN THE PROJECT	
Ministry of Environment, Climate and Energy (MOPE)	An institution responsible for policy formulation and action in the fields of environment, climate, and energy, including the promotion of renewable energy sources and the reduction of environmental pollution
Vrata Deržič s.p.	Investor, company, owner, user
AVAILABLE DOCUMENTATION & COMMUNICATION CAMPAIGN	
Available documentation	/
Communication campaign	https://www.vrata-derzic.si/dvoosni-sledilnik-sonca.html
CHALLENGES AND BENEFITS IN DEVELOPMENT AND/OR IMPLEMENTATION	
Challenges	The introduction of agrovoltaics requires a new land categorization. Crop production under agrovoltaics is limited. High initial investment costs. Integrating agrovoltaics technology requires specialized expertise.
Benefits	Supporting and promoting agricultural activities.

	Simultaneous production of electricity and food. Agrovoltaics does not require additional land, as it is integrated with agricultural activities, increasing land use efficiency. It enables dual land use by combining farming with solar energy production. Agrovoltaics supports electricity generation from renewable sources, aligning with EU guidelines. Its integration provides protection from heat and rain, reducing extreme weather impacts and creating a more favorable environment.

KEY LESSONS LEARNED

Agrovoltaics represents an innovative approach to optimizing resource use and enhancing sustainability. The synergy between agriculture and electricity production from photovoltaic systems not only maximizes arable land utilization but also provides economic benefits and supports the goals of the European Green Transition. Experience shows that agrovoltaics can increase yields per hectare and reduce irrigation needs by up to 20%.

RESULTS (IF AVAILABLE)

A photovoltaic power plant with an installed capacity of 0.4 MWh.

Preserved area for sheep grazing.

OTHER RELEVANT INFORMATION (IF ANY)
The special feature of the Deržič photovoltaic device is that it is a two-axis tracking system mounted on concrete bases. The tracker enables *IDEAL SUN TRACKING*, as solar radiation is always perpendicular to the surface of the module. A two-axis sun tracker is a device that allows for both horizontal and vertical tracking of the sun, which increases electricity production by up to 35% compared to static solar power plant installations.

Title	Self-sufficient Energy Community Luče – Savinjska dolina
Time frame	2018 - 2021
Country	Slovenia
PURPOSE AND IMPLEMENTATION	
Objectives	Ensure the reliability and security of the energy supply in the local energy system, which includes residential and commercial buildings with a high share of renewable energy sources (RES). Increase community engagement in energy and environmental protection while fostering trust in the local energy community and RES production. Advance the decarbonization of the local energy system.
Beneficiaries/ Targets	Engage all stakeholders in the energy system and promote the creation of additional energy communities. Involve the residents of Luče.
Key activities	Organize workshops for energy community members and local residents. Install solar power plants, system batteries, and battery storage units. Set up a public electric vehicle charging station and upgrade the transformer station.

Justice aspects	In addition to establishing a stable energy community and ensuring a reliable electricity supply, the project strengthened neighborly relations and improved the local economy. Fostered greater community interest in energy, environmental protection, and the adoption of renewable energy sources (RES). Facilitated the exchange of experience and best practices among partners.
INSTITUTIONS/ORGANIZATIONS INVOLVED AND THEIR ROLE IN THE PROJECT	
Elektro Celje d.d.	Electricity distributor. Testing cutting-edge technologies to enhance self-sufficiency and improve the reliability of electricity supply.
Faculty of Electrical Engineering, University of Ljubljana	Energy Strategies Laboratory at the Faculty of Electrical Engineering, University of Ljubljana. Coordinator of the COMPILE project.
Petrol d.d.	Contractor for the installation of photovoltaic systems, storage tanks, and chargers.
AVAILABLE DOCUMENTATION & COMMUNICATION CAMPAIGN	
Available documentation	https://main.compile-project.eu/sites/pilot-site-luce/ https://www.compile-project.eu/
Communication campaign	https://www.ekodezela.si/eko-energetika/luce-so-postale-prva-slovenska-samooskrbna-energetska-skupnost/?fbclid=IwAR3fiYHuuz9JjFYvxsly59o3OupKpnq3ONaRP9qrXJ8hvEyirOGLMi7LiVk https://www.petrol.si/znanje-in-podpora/2019/clanki/prva-lokalna-energetska-skupnost-v-lucah-z-obnovljivimi-viri-energije-do-proznega-in-konkurencnega-energetskega-sistema.html https://main.compile-project.eu/sites/pilot-site-luce/
CHALLENGES AND BENEFITS IN DEVELOPMENT AND/OR IMPLEMENTATION	
Challenges	The biggest challenge was the weak electricity grid in the town. Due to the varied natural landscape, the electricity supply was often interrupted during weather events. The local grid had its own technical limitations, causing frequent disruptions in electricity production and supply. This is precisely why the existing energy system had to be changed. The rapid and dynamic development of technology continuously introduces a multitude of new devices, posing a significant challenge to distribution network operators, such as Elektro Celje. New technologies, often designed for the optimal use of existing infrastructure, can present a considerable unknown in terms of their impact on the current system.
Benefits	In addition to reducing greenhouse gas emissions, the community offers numerous benefits to the involved stakeholders, including local economic development, job creation, new opportunities for collaboration across the value chain to enhance social benefits, lower energy costs, self-sufficiency, and a more reliable energy supply.

	Passive electricity consumers have also transformed into active producers.

KEY LESSONS LEARNED

The exchange of experience and best practices among partners in solving complex challenges is invaluable to the system.

As electricity is a fundamental pillar of modern society and technological progress, demand will only continue to grow. Therefore, renewable energy sources are becoming essential for meeting the energy needs of contemporary society while ensuring long-term decarbonization.

This shift is particularly beneficial for isolated settlements and villages lacking adequate electricity distribution infrastructure.

The case in question holds great potential for further replication of the developed solutions and concepts across the Slovenian countryside.

RESULTS (IF AVAILABLE)

The energy community supplies electricity to 54 residents in private households, utilizing solar installations across nine different rooftops.

Each building is equipped with approximately 11 kW of solar panels, contributing to a total installed capacity of 102 kW within the community. Additionally, a system battery (150 kW / 333 kWh) is connected to a section of the grid supplying 35 metering points, which include residential houses, farms, office buildings, a small business, a biomass boiler house, a fire station, a cultural center, and a post office.

To enhance system performance, five additional battery storage units were installed (2 x 10 kW / 23,2 kWh; 10 kW / 11,6 kWh; 5 kW / 9,8 kWh and 3,5 kW / 7 kWh). These units enable independent operation of individual buildings, improve voltage conditions, and maximize solar power production that would otherwise be limited.

The project also included the installation of a public electric vehicle charging station and the renovation of a transformer station to facilitate the system battery connection. Additionally, the community was integrated with the Tango technical information system, enabling advanced management, analysis, and optimization. A 'Home Energy Management System' (HEMS) was developed to process measurement data from connected devices. By managing both individual facilities and the energy community as a whole, the project achieved five times higher solar power production for community members than was initially possible with the existing grid.

6,4 million EUR Compile project, which lasted 42 months, successfully increased self-sufficiency, reliability, and security of supply by integrating innovative solutions into the network.

Community members contributed to the installation costs, with partial funding provided by the EU Horizon 2020 program and additional subsidies for solar power installations from the Eco Fund of the Republic of Slovenia.

The energy community in Luče generates approximately 200 megawatt-hours of electricity annually while consuming around 185 MWh.

OTHER RELEVANT INFORMATION (IF ANY)

The Compile project, part of the EU Horizon 2020 program, facilitated the transition from a centralized energy system to a flexible yet stable decentralized grid. This new system integrates and supports renewable energy sources (RES), enables optimal management of all energy components, incorporates energy storage solutions, and promotes electromobility to accelerate decarbonization and energy efficiency.

The self-sufficient energy community in Luče stands as a model of collaboration between community members, the broader local community, leading Slovenian companies, and the

University of Ljubljana. It serves as an exemplary case of best practices on both a European and international scale. https://www.youtube.com/watch?v=eS7nl1Eiy5I

Title	Project: construction of a composting site for green waste and other bio-waste from selective collection in Różanna, Opoczno commune
Time frame	04.2022 – 11.2022
Country	Poland (Lodzkie Region)
PURPOSE AND IMPLEMENTATION	
Objectives	The aim of the project is to improve the municipal waste management system in the municipality of Opoczno in Lodzkie Region. The project includes the expansion of the composting plant in order to increase its capacity for municipal waste biodegradable waste. The construction works include the construction of a composting yard with a concrete surface and an area of approximately 4,396.8 m2.
Beneficiaries/ Targets	The target groups of the project are all users of the municipal waste management system from the project area, especially from the Opoczynski district.
Key activities	Results of project implementation: - reconstructed waste management facilities - waste processing installations - modernized composting plants - capacity of waste management plant- 1575 Mg/year; - additional waste recycling capacity- 1130 Mg/year; - increase in employment.
Justice aspects	Increasing waste recycling and investing in a “circular economy” reduces pollution levels and therefore contributes to the European Green Deal.
INSTITUTIONS/ORGANIZATIONS INVOLVED AND THEIR ROLE IN THE PROJECT	
Board of the Lodzkie Region	Managing Authority for the program (Lodzkie Regional Operational Program 2014-2020)
Municipal Utility Company in Opoczno	beneficiary
AVAILABLE DOCUMENTATION & COMMUNICATION CAMPAIGN	
Available documentation	-
Communication campaign	https://www.opoczno.pl/inwestycje/inwestycje-2022/n,263294,zakonczono-budowe-placu-do-kompostowania-odpadow-zielonych.html

CHALLENGES AND BENEFITS IN DEVELOPMENT AND/OR IMPLEMENTATION	
Challenges	Unsatisfactory level of effective waste management in the region; overflow of waste and partial littering of the environment.
Benefits	The expansion of the composting facility will increase the capacity to accept and process biodegradable waste, which will enable an increase in the scale of collection of this waste from the project area. Thus, it will improve waste management in the Lodz province.
KEY LESSONS LEARNED	
-	
RESULTS (IF AVAILABLE)	
additional waste processing capacity – 1 130,00 tons/year	
OTHER RELEVANT INFORMATION (IF ANY)	
-	

Title	Renewable Energy Community (REC) Valsamoggia
Time frame	2022-ongoing
Country	Italy
PURPOSE AND IMPLEMENTATION	
Objectives	Producing energy from renewable sources (PV) to abate CO_2 at the local level, increase the percentage of value added generated locally that remains in the same territory, and use the economic revenues for the benefit of the community.
Beneficiaries/ Targets	Citizens and firms within the Municipality of Valsamoggia (Bologna)
Key activities	Installing PV plants in suitable sites to produce energy from Renewable energy, self-consuming a part and selling another part at an agreed price (including a grant), generating an income to be made shared among the members that supports the REC or invested in common good projects.
Justice aspects	Bottom-up and place-based production of energy, RECs as a possible support to address energy poverty.
INSTITUTIONS/ORGANIZATIONS INVOLVED AND THEIR ROLE IN THE PROJECT	
Emilia-Romagna Region	Funder of two steps for the creation of the CER (a first one to provide for coverage of up to 80% of the costs incurred for the start-up of the REC, a second one to provide for a non-repayable contribution equal to 30% of the construction cost of the plants)
CER Valsamoggia Cooperative	Collective institution created to manage and lead the REC
AVAILABLE DOCUMENTATION & COMMUNICATION CAMPAIGN	
Available documentation	https://cervalsamoggia.it/documentazione/

Communication campaign	https://cervalsamoggia.it/
CHALLENGES AND BENEFITS IN DEVELOPMENT AND/OR IMPLEMENTATION	
Challenges	Convincing private (individuals and firms) to join the REC; Initial investments to be funded; Feasibility plan based on the non-guaranteed assumption of a non-decreasing price of energy; Complex bureaucracy (new and still not codified tool)
Benefits	Reduced CO_2 emissions; (partial) energy self-sufficiency; generation of economic resources to address cases of energy poverty and to support activities aimed at community well-being
KEY LESSONS LEARNED	
Relevance of public financing in the constitution phase and in the construction of the first plants. Difficulty in convincing private individuals to join when concrete experience on the functioning and success of a REC are still missing.	
RESULTS (IF AVAILABLE)	
5 installed plants (600 KWP), estimated annual production of 700,000 KW/H; 61 partners of the REC (19 Small Medium Enterprises) consuming 2.5 million KW/H per year	
OTHER RELEVANT INFORMATION (IF ANY)	
-	

Title	Agricultural photovoltaic within the province of Bologna, Emilia-Romagna 1) Il Regno del Marrone (Castel del Rio, BO) 2) Azienda agricola Valle Torretta (Crevalcore, BO)
Time frame	1) 2010 - ongoing 2) 2024 – ongoing
Country	Italy
PURPOSE AND IMPLEMENTATION	
Objectives	1) Produce solar energy to use throughout the chestnut processing cycle and for the farmer's domestic use 2) Integrating agriculture with renewable energy production through an agriphotovoltaic system (20 MW)
Beneficiaries/ Targets	Farm owners
Key activities	1) Chestnut farm located in the Tuscan-Emilian Apennines; the photovoltaic plant allows the farm to be energetically self-sufficient 2) Multipurpose farm (cereals cultivation, vegetable garden, agritourism)
Justice aspects	Bottom-up and place-based production of energy
INSTITUTIONS/ORGANIZATIONS INVOLVED AND THEIR ROLE IN THE PROJECT	

Institution no. 1	
Institution no. 2	
AVAILABLE DOCUMENTATION & COMMUNICATION CAMPAIGN	
Available documentation	
Communication campaign	https://valletorretta.it/azienda-agricola/
CHALLENGES AND BENEFITS IN DEVELOPMENT AND/OR IMPLEMENTATION	
Challenges	
Benefits	1) CO_2 emissions avoided and energy self-sufficiency 2) Renewable energy production without giving up agricultural land
KEY LESSONS LEARNED	
RESULTS (IF AVAILABLE)	
1) Significant contribution to climate change mitigation (over 2000 tons of CO_2 avoided). Total power of the plants: 247,67 Kwp 2) The project was supposed to be realized during the years 2023-24, no evidence yet	
OTHER RELEVANT INFORMATION (IF ANY)	

Title	Energieautarkes Dorf Feldheim
Time frame	~2015-ongoing
Country	Germany
PURPOSE AND IMPLEMENTATION	
Objectives	The individually connected households in the village of Feldheim are supplied directly with electricity and heat from renewable energy plants located “on their doorstep” via separate distribution networks.
Beneficiaries/ Targets	Inhabitants of Feldheim (directly) and civil society at large (indirectly) through communication efforts / visitor centre etc. that seek to make the Feldheim method more popular and lead to its implementation in other sites.
Key activities	The nearby wind farm forms the backbone of the local power supply, while heat is supplied by the local biogas plant. Since 2015, the control power plant has ensured grid stability in Feldheim and at the transmission system operator 50 Hertz. A modern woodchip heating plant is available to meet additional heating needs on particularly cold days. What makes the Feldheim concept special is the separate local heating and electricity supply network, which is used to transport

	the heat and electricity generated on site directly to the consumers. This reduces costs and dependence on energy imports.
Justice aspects	The Feldheim project promotes energy justice by ensuring affordable, locally produced renewable power, reducing dependence on external providers. It fosters community participation, giving residents control over energy resources. Additionally, it supports climate justice by reducing carbon emissions and setting a model for fair, sustainable energy transitions in rural areas.
INSTITUTIONS/ORGANIZATIONS INVOLVED AND THEIR ROLE IN THE PROJECT	
Institution no. 1	Energiequelle GmbH
Institution no. 2	Municipality of Treuenbrietzen
Institution no. 3	Public actors involved in providing funding support (EU, state of Brandenburg)
AVAILABLE DOCUMENTATION & COMMUNICATION CAMPAIGN	
Available documentation	https://nef-feldheim.info/the-energy-self-sufficient-village/?lang=en
Communication campaign	Feldheim actively promotes public communication through its visitor center, which offers guided tours, exhibitions, and educational programs on renewable energy. The center provides insights into the village's energy self-sufficiency, fostering awareness and knowledge sharing. It serves as a hub for policymakers, researchers, and the public, thereby demonstrating the feasibility of community-led energy transitions.
CHALLENGES AND BENEFITS IN DEVELOPMENT AND/OR IMPLEMENTATION	
Challenges	- Financial Hurdles – Securing investment and funding for infrastructure, such as the local grid, required innovative financing models, public-funding support, and community buy-in. - Regulatory Barriers – Navigating complex energy laws and gaining approvals to disconnect from the national grid posed legal and bureaucratic challenges. - Community Engagement – Convincing all residents to support and invest in the project required extensive dialogue and trust-building. - Technical Implementation – Developing a fully self-sufficient energy system integrating wind, solar, and biogas demanded advanced engineering solutions.
Benefits	Preparing for the future - Switching to renewable energies means creating long-term safeguards of existential importance for future generations. This is the only way to reduce CO2 emissions effectively and protect the climate. Positive image building

	- Many awards show that investments in renewable energies are honoured by society and result in a positive image factor for municipalities and local communities. When the latter can demonstrate that they have solved global energy problems at local level, they awaken public interest. Long-term energy security - Wind, solar and bioenergy will always be available, whereas fossil fuel resources are becoming increasingly scarce, and thus expensive. The technologies already exist for meeting present and future needs with renewable energies. Maximum independence - An appropriate overall energy concept and an essentially autarchic supply grid puts the regional end-users connected to it in a position where they can free themselves from spiralling prices for fossil fuels and from over-powerful energy suppliers. This shows that renewable energies allow the creation of totally new value cycles at regional level. Secure jobs - Every renewable energy project brings inward investment to the region. The planning, construction and maintenance of renewable energy systems secures existing and creates new jobs in local enterprises. Financial benefits - Producers of power from renewable energies receive a price that is defined by law, thus safeguarding revenues for plant operators on a long-term basis. Even when the local community is not the operator of the wind or solar farm, it still derives benefits in the form of municipal trade tax and perhaps also leasehold payments from the plant operator.
KEY LESSONS LEARNED	
- Community Participation is Crucial – Engaging residents early and ensuring local ownership fosters trust and long-term success. - Energy Independence is Feasible – A decentralized, renewable-based grid can provide reliable, affordable energy. - Policy and Regulatory Flexibility Matters – Supportive legal frameworks are essential for innovative energy projects. - Education and Transparency Drive Replication – Public communication, like Feldheim's visitor center, helps spread knowledge and inspire similar initiatives. - Economic and Environmental Benefits Align – Renewable energy can reduce costs while promoting sustainability and local job creation.	
RESULTS (IF AVAILABLE)	
Feldheim became Germany's first energy-independent village, producing 100% renewable electricity and heat. Residents enjoy lower energy costs, reduced carbon emissions, and local economic benefits. The project serves as a model for community-	

led energy transitions, demonstrating the feasibility of decentralized, sustainable power systems.
OTHER RELEVANT INFORMATION (IF ANY)

Title	Neue Energien Ostsachsen eG - egNEOS
Time frame	2013-ongoing
Country	Germany
PURPOSE AND IMPLEMENTATION	
Objectives	egNEOS aims to involve citizens in the regional energy transition by enabling them to invest in renewable energy projects such as wind and solar power. Their main objectives include promoting decentralized energy production, promoting local ownership and participation in sustainable energy solutions, and contributing to the regional economy through citizen-led initiatives. They also focus on creating financial benefits for participants while advancing the use of clean energy in the region.
Beneficiaries/ Targets	- Local citizens who invest in renewable energy projects, allowing them to benefit from financial returns and actively participate in the energy transition. - The local community as a whole, through decentralized energy production that strengthens regional economic development and reduces reliance on external energy sources. - The environment, benefiting from increased use of clean, renewable energy that reduces carbon emissions and supports sustainable energy practices.
Key activities	- Developing and operating renewable energy projects, such as wind farms and solar installations, often in collaboration with local communities. - Facilitating citizen investments in these projects, allowing individuals to participate financially and benefit from the energy produced. - Promoting education and awareness about renewable energy and the energy transition through informational events and community engagement. - Supporting decentralized energy production to reduce dependence on external energy sources and contribute to local sustainability. - Strengthening regional economic value by involving local communities in energy projects, creating jobs, and retaining profits within the region.
Justice aspects	egNEOS promotes a just energy transition by ensuring local participation in renewable energy projects, giving citizens a stake in clean energy production and financial benefits. Their focus on decentralized energy reduces reliance on large, centralized energy

	providers, while community involvement fosters equity and sustainability, ensuring that the benefits of the energy transition are shared locally and fairly.
INSTITUTIONS/ORGANIZATIONS INVOLVED AND THEIR ROLE IN THE PROJECT	
Institution no. 1	Neue Energien Ostsachsen eG - egNEOS
AVAILABLE DOCUMENTATION & COMMUNICATION CAMPAIGN	
Available documentation	https://egneos.de/
Communication campaign	
CHALLENGES AND BENEFITS IN DEVELOPMENT AND/OR IMPLEMENTATION	
Challenges	Securing adequate funding for large-scale renewable projects while keeping investment opportunities accessible to local residents is a significant challenge. Obtaining the necessary permits for renewable energy projects often slows progress. Engaging the community and overcoming reluctance to participate or invest in such initiatives can also be difficult, as not all citizens are immediately convinced of the benefits. Furthermore, larger energy providers pose competition, creating pressure on long-term financial sustainability.
Benefits	By enabling citizens to invest in renewable energy projects, egNEOES creates financial opportunities for local residents and offers a share in the returns from sustainable energy production. This empowers the community and ensures that profits remain in the region. The projects also help reduce carbon emissions and contribute to a cleaner, more sustainable energy system. Decentralized energy production enhances energy security, reduces reliance on external energy sources and fostering greater energy independence for the region.
KEY LESSONS LEARNED	
- Early and active community involvement is crucial for securing support and investment in renewable energy projects. - Transparent communication about the benefits and risks of participation helps build trust and overcome skepticism. - Balancing financial viability with affordable investment options is essential for the success of large-scale renewable projects. - Careful planning and long-term strategy are key to ensuring the sustainability and success of energy initiatives.	
RESULTS (IF AVAILABLE)	
https://egneos.de/portfoli/projekte/	
OTHER RELEVANT INFORMATION (IF ANY)	

Title	Renewable Energy Community Energiewerk Weiz
Time frame	2022 – 2025

Country	Austria, Styria, Weiz
PURPOSE AND IMPLEMENTATION	
Objectives	Make better prices for electricity available for all people and companies which have their metering point at the transformer station with the number 3
Beneficiaries/ Targets	Private households and companies
Key activities	Foundation of an association and establishing the energy community with an appropriate number of members
Justice aspects	Low-income households can profit from the lower electricity prices without having an own PV-system installed
INSTITUTIONS/ORGANIZATIONS INVOLVED AND THEIR ROLE IN THE PROJECT	
Innovation Center Weiz	Member and founder of the association
Economic area Weiz-St.Ruprecht	Member and founder of the association
Reallabor Weiz+	Member and founder of the association
AVAILABLE DOCUMENTATION & COMMUNICATION CAMPAIGN	
Available documentation	EnErGie Werk Weiz - Erneuerbare-Energie-Gemeinschaft Gewerbepark Energiestraße und Werksweg Weiz - Stadt der Zukunft
Communication campaign	
CHALLENGES AND BENEFITS IN DEVELOPMENT AND/OR IMPLEMENTATION	
Challenges	Overcome technical issues with implementing an innovative storage system within the energy community
Benefits	The members can save up to 350 €
KEY LESSONS LEARNED	
Its important to know about the legal boundaries and stay up to date	
RESULTS (IF AVAILABLE)	
There are more than 20 members and more than 40 metering points in the energy community	
OTHER RELEVANT INFORMATION (IF ANY)	

Annex 2 - Financial Analysis for Just Energy Transition

The transition towards climate neutrality and a low-carbon energy system requires substantial and sustained investment at local and regional level. Local Action Plans (LAPs) prepared within the framework of JETforCE set out coherent packages of measures for decarbonisation, energy efficiency, renewable energy deployment, and social support. However, the extent to which these LAPs can be implemented does not depend solely on their technical soundness or strategic alignment. It depends, to a significant degree, on the availability of appropriate financing instruments and on the economic sustainability of the proposed interventions over time.

In a just transition perspective, questions of financing are intrinsically linked to questions of distribution. The choice of funding sources and instruments influences who bears upfront costs, how risks are allocated between public and private actors, how benefits are shared among different groups, and whether more vulnerable territories and populations can participate on equal terms. Financing arrangements that rely exclusively on short-term grants may not be replicable or scalable. Conversely, approaches based primarily on commercial finance may exclude smaller municipalities, low-income households or higher-risk areas. Ensuring economic sustainability thus requires financing solutions that are robust from a budgetary and market perspective, and at the same time consistent with social-justice and territorial-cohesion objectives.

Local and regional authorities operate within a complex multi-level funding environment. European Union programmes (such as cohesion policy funds, the Common Agricultural Policy and the Recovery and Resilience Facility), national schemes, regional instruments, local budgets and private capital each follow distinct objectives, rules and timeframes. LAPs typically combine investment in physical infrastructure (e.g. buildings, networks, generation assets), support services and capacity-building, as well as governance and coordination structures. These components exhibit different cost profiles, revenue potentials and risk characteristics. For many territories, particularly smaller municipalities or peripheral regions, constraints on fiscal space, administrative capacity and access to credit further restrict the range of feasible options.

Against this background, the chapter adopts the concept of **multi-layered financing architectures** for Just Energy Transition Action Plans. Rather than associating each measure with a single source of funding, it considers how different categories of instruments can perform complementary roles:

- **Grants and incentives**, used in a targeted manner to support non-bankable components, social and territorial cohesion measures, innovation and governance functions, and to reduce barriers to entry for vulnerable groups and smaller authorities.
- **Loans and guarantees**, provided by public promotional institutions and commercial intermediaries, to finance the bankable portion of investments where stable cash flows or cost savings can be demonstrated.

- **Equity and citizen or community participation**, including cooperative and municipal ownership structures, to strengthen local buy-in, align interests and retain value within the territory.
- **Technical assistance and advisory support**, to develop and structure project pipelines, aggregate small-scale operations, prepare funding applications, and ensure adequate monitoring and reporting.

The appropriate combination and sequencing of these layers depends on the characteristics of each LAP, the maturity and revenue model of specific measures, and the institutional environment in which they are embedded. Some actions lend themselves to a higher degree of financial engineering, while others will remain predominantly grant-funded. A central challenge is to distinguish clearly between these categories and to design financing arrangements accordingly.

The chapter has three main objectives:

1. **To clarify the economic and financial implications of the LAPs.** For each partner territory, the analysis identifies the main types of expenditures and investments implied by the LAP (infrastructure, services, governance, social measures) and the associated cost and revenue trajectories.
2. **To propose territory-specific financing architectures.** Building on the existing portfolio of European, national, regional and local instruments, the chapter outlines, for each LAP, a feasible configuration of grants, loans, guarantees, equity and technical assistance that is compatible with just-transition objectives and local implementation capacities.
3. **To derive cross-cutting lessons and design principles.** By comparing the partner cases, the chapter extracts recurring patterns, constraints and enabling factors that can inform future programming and replication in other territories.

By consolidating these analyses, the chapter seeks to support dialogue between local and regional authorities, managing authorities, financial intermediaries and other stakeholders involved in just transition processes. Its overall intention is to facilitate the evolution of Local Action Plans from planning documents into economically viable, socially balanced and implementable investment pathways.

In the following sections, we take deal of the main financial opportunities in each partner country and territory.

A2.1 Hungary

1. Financial objective

Build a simple, blended financing structure that secures grants for social and public-interest components, mobilises modest repayable finance where needed, and enables local ownership through the REC.

2. Financing Architecture

2.1 Overview

The financing strategy integrates three practical layers tailored to the LAP's scope:

1. **Grant Layer**: EU and national grants for REC set-up, small-scale RES+storage, the EV purchase, and public-building renovations (e.g., KEHOP Plusz, JTF window under *KEHOP Plusz Priority 5 – Just Transition*, RRF, LIFE where relevant).
2. **Loan Layer**: concessional or standard loans for the repayable share of investments (e.g., MFB – Magyar Fejlesztési Bank lines; EIB for scale if needed).
3. **Technical Assistance (TA) Layer**: advisory and preparation support (e.g., ELENA – European Local Energy Assistance; programme TA; targeted LIFE actions).

2.2 EU-Level Instruments

Instrument	Type	Application for LAP Actions	Managing Authority/ Channel	Notes
KEHOP Plusz 2021–2027 (Environment and Energy Operational Programme Plus)	Grant/Financial instrument	RES+storage for municipal sites, energy-efficiency in public buildings, grid-friendly solutions supporting the REC	National MA (HU))	Main cohesion channel for energy and efficiency actions
JTF – KEHOP Plusz Priority 5 (Just Transition)	Grant / TA	Actions aligned with the Territorial Just Transition Plan for B-A-Z County; governance, skills, and community-energy pilots	National MA (HU)	The TJTP for B-A-Z is implemented as Priority/Chapter 5 within KEHOP Plusz (JTF)
RRF / REPowerEU	Grant	Complementary support for building renovation, digitalisation, and small-scale RES	National coordination (RRF)	Subject to available windows/calls
LIFE (incl. LIFE Clean Energy Transition)	Grant (market uptake / TA)	Capacity-building for REC governance, communication, replication	CINEA (direct management)	Non-investment support; pairs well with KEHOP Plusz
ELENA (EIB)	TA Grant	Project preparation for a pipeline of REC investments and public-building renovations	European Investment Bank	Useful if the Association aggregates multi-site projects
Horizon Europe (Cluster 5)	Grant (R&I)	Digital monitoring, tools for REC operations and demand management	European Commission	Optional complement for innovation

2.3 National-Level Instruments

Instrument / Body	Type	Function	Managing Entity	Comment
Competitive Districts Program (Versenyképes Járások Program – VJP)	Grant	EV purchase for social meal delivery and related local-service improvements	National programme (HU)	Subject to eligibility under the specific VJP call for the district and year
MFB – Magyar Fejlesztési Bank	Loan/Guarantee	Concessional finance for municipal/REC investments not fully grant-funded	MFB	Blending with KEHOP Plusz / RRF where eligible
Commercial banks (municipal lending)	Loan	Standard loans for co-financing gaps	Commercial intermediaries	Use prudently with clear repayment sources
Programme Technical Assistance	TA	Management, communication, monitoring, and reporting	Relevant programme MAs	Eases admin burden for small municipalities

2.4 Regional and Local Mechanisms

Mechanism	Function	Implementing Entity	Status/Feasibility
Közösségi Energiabank Egyesület (Community Energy Bank Association)	Legal/operational backbone for the municipal REC; aggregation of sites; pipeline building; funding applications (incl. ELENA)	Association of municipalities	Established; 70+ municipal members and growing
Municipal Co-financing	Local budget contributions; hosting sites (roofs, buildings, land)	Municipalities (e.g., Bükkábrány, Bükkaranyos)	Standard practice; size tailored to fiscal capacity
County Self-Government (B-A-Z)	Project owner for building renovations; procurement and asset management	County Self-Government / BORA 94	Ready for investment design and tendering

3. Financing Flow and Governance

Fund chain:

- EU: KEHOP Plusz (including JTF Priority 5), RRF/REPowerEU, LIFE, ELENA.
- National: Competitive Districts Program (VJP); MFB financing lines; programme TA.
- Regional/Local implementers: BORA 94 Nonprofit LLC; B-A-Z County Self-Government; municipalities; Community Energy Bank Association.
- Beneficiaries: Municipalities and their entities, county institutions, citizens (through services), and members of the REC.

Flow logic:

1. Grants (KEHOP Plusz / JTF / RRF / VJP / LIFE): cover non-bankable and public-interest components (REC governance; EV for social services; deep renovations).
2. Loans (MFB / EIB / commercial): finance the repayable CAPEX share for bundled REC sites or renovation elements not fully grant-funded.
3. TA (ELENA / programme TA / LIFE CET): fund preparation, audits, procurement templates, aggregation, and citizen-engagement.
4. Equity/Participation (within REC): optional municipal/member contributions to reinforce ownership and reinvestment capacity.

4. Risk Management and Mitigation

Risk Category	Description	Likely Impact	Mitigation
Institutional	Multi-actor coordination (county, municipalities, association)	Delays, admin burden	Use the Association as a single coordination hub; standardise templates and calendars
Financial	Over-reliance on grants; co-financing gaps	Scaling limits	Blend KEHOP Plusz / JTF with modest MFB loans; phase investments; prioritise highest-impact sites
Regulatory	Evolving REC and self-consumption rules	Project phasing risk	Align designs with current national transposition of EU directives; allow modular roll-out
Operational	Limited capacity for procurement and M&V	Slower delivery	Use ELENA / programme TA for preparation, owner's engineer, and monitoring systems
Social	Ensuring inclusion of smaller/rural municipalities	Uneven benefits	Simple membership and contribution rules; targeted support and communication
Market/Technical	Equipment lead times; grid constraints	Cost/schedule impacts	Early grid checks; storage-ready designs; framework contracts for PV and HVAC

5. Recommendations

1. **Anchor the REC in KEHOP Plusz / JTF** calls and use **ELENA** to prepare a multi-site pipeline (PV + storage + controls) across member municipalities.
2. **Use the Competitive Districts Program (VJP)** to deliver the **EV for social meal delivery** quickly, creating visible social benefit and early momentum.
3. **Bundle the three public-building renovations** into one procurement with clear performance specs; combine KEHOP Plusz (grants) with modest **MFB** co-financing if needed.
4. **Keep administration lean:** create a small central team (within the Association/BORA 94) for funding applications, procurement templates, and reporting across all actions.
5. **Design for inclusion:** simple membership fees/tiers for small municipalities; offer technical support and shared services through the Association.
6. **Monitor:** grant absorption, kWh generated/saved, CO_2 avoided, REC membership growth, EV service coverage (meals/day), user satisfaction; publish results annually.

A2.2 Italy

1. Financial objective

Build a blended, scalable financing structure that maximises grants and incentives, mobilises cooperative/farmer capital, and uses repayable finance only where needed to ensure long-term affordability and local value creation.

2. Financing Architecture

2.1 Overview

A four-layer model tailored to the actions:

1. **Grant/Incentive Layer** – ERDF/ESF+ regional programmes; PNRR incentive schemes (e.g., REC and agrivoltaics); CAP rural instruments for APV-compatible measures.
2. **Loan Layer** – concessional/standard debt for the repayable share (e.g., CDP/commercial banks; possible EIB lines for bundled portfolios).
3. **Equity/Ownership Layer** – citizen/SME/farmer participation in RECs and APV SPVs; municipal participation where appropriate.
4. **Technical Assistance (TA) Layer** – project preparation and coordination via MCBO/Region; potential LIFE CET and, if the investment pipeline is large enough (≈€30m+), ELENA TA for project development; programme TA under ERDF/ESF+

2.2 EU-Level Instruments

Instrument	Type	Application for LAP actions	Managing Authority / Channel	Notes
ERDF / ESF+ 2021–2027 – Regione Emilia-Romagna (PR FESR / PR FSE+)	Grant/TA	RECs (infrastructure, enabling measures); STAMI public-building efficiency; skills and inclusion linked to LAP	Regione Emilia-Romagna (MA)	Regional cohesion policy backbone; ITI modalities where applicable
LIFE – Clean Energy Transition	Grant (TA/ market up-take)	One-stop services, engagement, replication for RECs and APV	CINEA	Non-investment support; complements regional actions
ELENA (EIB)	TA Grant	Preparation, bundling, procurement for REC portfolios and STAMI retrofits	EIB	Suitable if MCBO aggregates a metropolitan pipeline
Horizon Europe – Cluster 5	Grant (R&I)	Agrivoltaic demonstrators, monitoring, digital tools for REC operation	European Commission	Optional innovation complement
InvestEU – Sustainable Infrastructure	Loan/Guarantee	Risk-sharing for larger aggregated portfolios (REC/APV)	EIB/EIF via intermediaries	Use only if scale justifies it

2.3 National-Level Instruments

Instrument / Body	Type	Function	Managing Entity	Comment
PNRR – Incentivi per Comunità Energetiche Rinnovabili (CER)	Incentive/ Grant+tariff	Support to REC CAPEX and remuneration of shared energy	GSE	Core scheme for RECs referenced in LAP
PNRR – Decreto Agrivoltaico Sperimentale (DM 436/2023)	Grant + tariff	CAPEX support and premium tariff for agrivoltaics	GSE	For APV plants meeting agricultural integration criteria
CAP 2023–2027 (PSP/CSR)	Grant	Rural measures complementing APV (e.g., farm investments, resilience)	Regione Emilia-Romagna / AGEA	Alignment with dual-use requirements
Conto Termico / other national calls (where applicable)	Incentive	Small-scale efficiency/RES measures	GSE / MiTE	Complementary where eligible
CDP / Commercial banks	Loan	Debt for the repayable share of CAPEX (REC/APV/STAMI)	CDP / banks	Use with clear repayment sources

2.4 Regional and Local Mechanisms

Mechanism	Function	Implementing Entity	Status / Feasibility
Integrated Territorial Investments (ITI) – STAMI	Channel ERDF/ESF+ to inner/mountain municipalities for public-building efficiency	Regione Emilia-Romagna / MCBO	LAP indicates ~88% public co-financing with ~12% municipal match
Metropolitan facilitation & one-stop	TA, templates, pipeline prep for REC/APV; support for small municipalities	MCBO with regional agencies	Feasible; builds on LAP/JETA experience
REC legal entities / cooperative SPVs	Citizen/SME participation and asset ownership	Municipalities, cooperatives, SMEs	Enabled under national CER framework
Farmer associations & APV SPVs	APV development, revenue sharing, compliance with agricultural criteria	Farmers, cooperatives, SMEs	Align w/DM 436/2023 technical rules

3. Financing Flow and Governance

Fund chain:

- EU/Regional: ERDF/ESF+ via Regione Emilia-Romagna (incl. ITI for STAMI).
- National incentives: GSE for REC and APV (PNRR measures); CAP via regional bodies/AGEA.
- Financial intermediaries: CDP/banks; optional EIB/InvestEU for aggregation.
- Metropolitan implementer: MCBO (coordination, TA, aggregation, monitoring).
- Beneficiaries: Municipalities, REC entities, farmers/APV SPVs, social partners, citizens/SMEs.

Flow logic:

1. Grants/incentives: ERDF/ESF+ (STAMI, enabling actions), PNRR REC/APV schemes via GSE, CAP rural measures for APV-compatible costs.
2. Loans: CDP/commercial banks (and EIB where relevant) for the repayable share of bankable CAPEX.
3. Equity/Participation: citizen/SME shares in RECs; farmer equity in APV SPVs; municipal stakes where appropriate to anchor public interest.
4. TA: metropolitan one-stop (MCBO), regional agencies; optional LIFE/ELENA for pipeline preparation and replication.

4. Risk Management and Mitigation

Risk Category	Description	Likely Impact	Mitigation
Regulatory	Evolution of REC/APV implementing rules and grid-sharing procedures	Phasing/connection delays	Early engagement with GSE/DSO; standard legal templates; staged commissioning
Permitting/ Land use APV	Planning constraints; agricultural compatibility	Project redesign / delay	Apply DM 436/2023 criteria; early agronomic studies; stakeholder dialogue
Grid capacity	Limited hosting capacity in rural feeders	Curtailment / delays	Pre-feasibility with DSO; storage/demand-response; portfolio staging
Financial	Co-financing gaps; tariff sensitivity	Reduced bankability	Blend ERDF/PNRR/CAP with CDP/EIB debt; robust cash-flow models; conservative assumptions
Social	Distribution of benefits across inner/mountain areas	Lower participation	Clear participation rules; inclusion targets; share options for vulnerable users
Operational	Limited municipal capacity for procurement/M&V	Slippage	MCBO one-stop TA; shared procurement templates; training
Environmental	APV design impacts on biodiversity/soil	Non-compliance	Adopt agronomic/biodiversity safeguards; monitoring protocols

5. Recommendations

1. **Use GSE incentives as backbones:** apply PNRR CER for RECs and DM 436/2023 for APV; complement with ERDF/ESF+ (incl. ITI) and CAP where eligible.
2. **Set up a metropolitan one-stop facility** (within MCBO) to standardise REC/APV templates, procurement, and financial modelling; consider ELENA if the pipeline is sizable.
3. **Blend finance prudently:** combine grants/incentives with CDP/EIB loans; reserve municipal resources for inclusion measures (e.g., subsidised REC shares).
4. **Phase projects by readiness:** start with quick-win REC clusters and APV sites with strong agronomic feasibility and grid capacity; scale iteratively.
5. **Safeguard inclusiveness:** define REC participation tiers and community-benefit funds; link STAMI retrofits to energy-poverty relief in inner/mountain areas.
6. **Strengthen monitoring:** track leverage, CAPEX absorption, REC/APV membership, energy output, CO_2 savings, and reinvestment into local services; publish annual summaries.
7. **De-risk permitting and grid:** adopt early DSO engagement and biodiversity-positive APV designs; maintain a compliance checklist (state aid, procurement, no double funding).

A2.3 Germany

1. Financial objective

Establish a blended, community-centric financing model that keeps tariffs affordable, mobilises cooperative capital, and ensures long-term viability of village-scale heat networks and the local energy community.

2. Financing Architecture

2.1 Overview

Radibor's financing strategy integrates four complementary layers:

1. **Grant Layer:** Federal and EU programmes supporting planning and capital investment (BEW, NKI, ERDF/JTF).
2. **Loan Layer**: Concessional loans from KfW and Sächsische Aufbaubank (SAB Sachsen) to finance the repayable share of investments.
3. **Equity/Ownership Layer**: Citizen and SME participation through cooperative shares in the local Energiegemeinschaft, supported by the municipality.
4. **Technical Assistance (TA) Layer**: Funding for project preparation and coordination through the Nationale Klimaschutzinitiative (NKI) and EU TA instruments.

This approach balances social affordability, bankability, and citizen ownership while maintaining compliance with EU and national aid rules.

2.2 EU-Level Instruments

Instrument	Type	Application for LAP Actions	Managing Authority / Channel	Notes
ERDF/JTF Programme – Free State of Saxony (2021–2027)	Grant / TA	Feasibility studies, municipal energy infrastructure, and skills/innovation measures linked to the REC	Managing Authority: Saxony; Implemented by SAB Sachsen	Includes a JTF priority for coal regions in Upper Lusatia
LIFE – Clean Energy Transition	Grant (TA)	Community governance, citizen engagement, and communication	CINEA (European Commission)	Complements non-investment measures
Horizon Europe – Cluster 5 (Climate, Energy, Mobility)	Grant (R&I)	Development of digital tools for heat planning and monitoring	European Commission	Optional complement for innovation and data tools
InvestEU – Sustainable Infrastructure Window	Loan / Guarantee	Risk-sharing and leverage for municipal or cooperative investments	European Investment Bank / EIF	Applicable for larger-scale or multi-village energy networks
ELENA (EIB Technical Assistance Facility)	Grant (TA)	Project-preparation and procurement support for energy/heating projects	European Investment Bank	Suitable for a pipeline of local or regional heating projects

2.3 National-Level Instruments

Instrument / Programme	Type	Function	Managing Entity	Comment
Bundesförderung für effiziente Wärmenetze (BEW)	Grant	Core CAPEX support for new renewable or decarbonised heating networks (generation, network, and integration)	BAFA	Main federal grant line for district and village-scale heating
Nationale Klimaschutzinitiative (NKI) – Klimaschutzmanagement	Grant (TA)	Funding for climate manager, feasibility studies, and coordination	ZUG (for BMUV)	Already supports Radibor's planning phase
KfW – Kommunale / Wärmewende Loans	Loan	Long-term, low-interest loans for municipal energy and heat infrastructure	KfW	Can blend with BEW or EU grants
SAB Sachsen – Sachsenkredit "Energie und Speicher"	Loan / Grant element	Regional financing for energy and storage components; complements federal programmes	SAB Sachsen	Useful for smaller local components or bridging finance
Kommunale Wärmeplanung Support (State/Federal)	Grant / TA	Planning and governance assistance for municipal heat plans	Saxon authorities / NKI	Standard support instrument for Saxon municipalities

2.3 Regional and Local Mechanisms

Mechanism	Function	Implementing Entity	Status / Feasibility
Energy cooperative / municipal company	Collective ownership, citizen equity, tariff co-design	Municipality of Radibor and cooperative members	Fully compatible with German community-energy models
Inter-municipal cooperation	Joint planning and funding applications with neighbouring municipalities (Großdubrau, Malschwitz)	Participating municipalities	Enhances efficiency and project scale
Municipal budget co-financing	Covers non-eligible costs and provides credit backing	Municipality of Radibor	Standard procedure in German municipal projects

3. Financing Flow and Governance

Fund chain:

- EU: ERDF/JTF (SAB Sachsen as intermediary).
- Federal: BEW (BAFA) and NKI (ZUG for BMUV).
- Loans: KfW and SAB Sachsen.
- Regional implementers: Municipalities and planning partners.
- Beneficiaries: Municipality of Radibor, the future cooperative/municipal utility, and local citizens.

Flow logic:

1. Planning and TA: NKI (climate manager, feasibility), ERDF/JTF TA, and optional LIFE or ELENA support for participation and preparation.
2. Capital grants: BEW for renewable heating networks; ERDF/JTF where eligible and complementary.
3. Loans: KfW and SAB Sachsen for the repayable share of investments; InvestEU guarantees possible for scale-up.
4. Equity: Citizen and SME contributions via the energy community; municipal participation as

anchor investor.

5. Operations: Tariffs cover running costs and loan repayment; surpluses reinvested locally.

4. Risk Management and Mitigation

Risk Category	Description	Likely Impact	Mitigation
Regulatory / Planning	Implementation aligned with the Wärmeplanungsgesetz; coordination with grid operators and permits	Delays or rework	Early heat-planning coordination; use NKI funding for administrative capacity
Financial	Dependence on grants and rising construction costs	Affordability risk	Blend BEW grants with KfW/SAB loans; prudent tariff design and municipal guarantee
Social	Limited citizen participation or equity barriers	Reduced legitimacy	Use flexible cooperative shares and targeted outreach through LIFE or NKI
Market / Supply chain	Equipment and contractor shortages	Cost and schedule impact	Phased implementation; early tenders; flexible technology mix within BEW criteria
Administrative	Complex multi-source reporting (BEW, EU, loans)	Coordination burden	Centralised project accounting and standard templates managed by the climate manager

5. Recommendations

1. **Use BEW as the main grant instrument** for renewable heating networks and coordinate with ERDF/JTF where applicable.
2. **Combine grants with KfW and SAB loans** to finance the repayable share while maintaining affordable tariffs.
3. **Establish the energy cooperative early** to secure citizen participation and local ownership.
4. **Continue using NKI, LIFE, and ELENA** for planning, communication, and capacity building to support implementation.
5. **Phase development by village**, starting with technically mature and socially accepted sites.
6. **Maintain strict financial separation** between EU and federal funding sources to ensure compliance and audit readiness.
7. **Track key indicators** such as CO_2 reductions, membership growth, and tariff stability to monitor financial and social performance.

A2.4 Slovenia

1. Financial objective

Create a participatory financing model that combines EU and national grants, cooperative equity, and accessible credit to ensure long-term sustainability, affordability, and replicability.

2. Financing Architecture

2.1 Overview

The financing strategy integrates four complementary layers:

1. **Grant Layer:** EU and national grants for RES investments and cooperative start-up (Cohesion Policy, Climate Change Fund, RRF).
2. **Loan Layer:** Concessional loans for the repayable share of CAPEX, primarily via Eko sklad (Slovenian Environmental Public Fund).
3. **Equity Layer:** Cooperative-member contributions from citizens, SMEs, and the municipality as founding partner.
4. **Technical Assistance (TA) Layer:** Support from LEA Spodnje Podravje for project preparation, governance, and community engagement.

This structure ensures social accessibility while maintaining financial viability and compliance with Slovenian and EU funding frameworks.

2.2 EU-Level Instruments

Instrument	Type	Application for LAP Actions	Managing Authority / Channel	Notes
Operational Programme for the Implementation of EU Cohesion Policy 2021–2027 (SI)	Grant	Solar plant investment, energy efficiency, and cooperative start-up	Ministry of Cohesion and Regional Development (SI)	Primary EU-level framework for regional and energy actions
RRF – Recovery and Resilience Facility (REPowerEU)	Grant	Complementary support for renewable generation and storage	Government Office for Development and European Cohesion Policy (SVRK)	Use where calls cover small-scale PV / community models
LIFE – Clean Energy Transition Subprogramme	Grant (TA/ market up-take)	Community engagement, awareness, capacity building, and replication	CINEA (European Commission)	Non-investment component; complements LEASP work
ELENA (EIB)	Grant (TA)	Preparation and design of renewable energy community pipelines	European Investment Bank	Applicable if LEA Spodnje Podravje coordinates several sites
Horizon Europe – Cluster 5	Grant (R&I)	Digital tools and innovation for REC monitoring	European Commission	Optional; small-scale R&I complement

2.3 National-Level Instruments

Instrument / Programme	Type	Function	Managing Entity	Comment

Eko sklad – Slovenski okoljski javni sklad (Slovenian Eco Fund)	Loan/Grant	Concessional finance for PV, energy efficiency, and storage	Eko sklad	Key national financial instrument for RES and EE
Climate Change Fund (Sklad za podnebne spremembe)	Grant	Investment support for RES and efficiency in public and cooperative projects	Ministry of the Environment, Climate and Energy	Suitable for partial co-financing
Borzen RES Support Scheme	Feed-in/Premium Tariff	Guaranteed purchase or premium for renewable generation	Borzen d.o.o. (national energy market operator)	Provides predictable revenue for cooperative
Municipal budget contribution	Grant/Equity	Founding capital and co-financing of cooperative start-up	Municipality of Dornava	Limited in size; symbolic and catalytic role
Private co-financing (banks / citizens)	Equity/Loan	Additional resources through member shares or small bank credit	Cooperative members / local banks	Enhances ownership and resilience

2.4 Regional and Local Mechanisms

Mechanism	Function	Implementing Entity	Status / Feasibility
Energy Cooperative (REC)	Collective ownership and operation of solar power plant	Municipality of Dornava and citizens	Founding planned for 2025; legally supported under ZSROVE
LEA Spodnje Podravje (LEASP)	Technical and financial coordination, project aggregation, awareness	LEASP	Active regional energy agency; experienced in EU projects
JETA Dornava (Alliance for a Just Energy Transition)	Social inclusion and citizen participation	Civil-society alliance	Provides outreach and monitoring of inclusiveness
Municipal support structures	Provision of public roof, legal backing, and co-financing	Municipality of Dornava	Confirmed site and participation

3. Financing Flow and Governance

Fund chain:

- EU level: Cohesion Policy OP, RRF, LIFE, ELENA.
- National level: Eko sklad loans/grants, Climate Change Fund, Borzen feed-in premiums.
- Regional/local: Municipality of Dornava, LEA Spodnje Podravje, and cooperative members.
- Beneficiaries: Renewable Energy Community (cooperative), citizens, and municipality.

Flow logic:

1. Grants (EU + national): cover up to 50% of CAPEX (PV system, grid connection, cooperative setup).
2. Loans (Eko sklad): finance the repayable portion on favourable terms (interest subsidy or partial guarantee).
3. Equity (citizens/SMEs/municipality): provides 20–30% as shares ensuring local ownership.
4. Revenue stream: electricity self-consumption and surplus sales under Borzen premium scheme; potential small municipal service contracts (public lighting, facility power).

4. Risk Management and Mitigation

Risk Category	Description	Likely Impact	Mitigation
Financial	Delayed grant approval or higher CAPEX	Liquidity gap	Stage procurement; use bridging Eko sklad loan

Regulatory	Energy-sharing framework still evolving	Legal/operational delays	Follow ZSROVE and EZ-1 updates; seek LEASP legal guidance
Social	Limited citizen participation or affordability	Lower ownership, weaker legitimacy	Flexible share sizes, communication via JETA Dornava
Market / Technical	PV equipment price fluctuation, grid bottlenecks	Cost increase, delay	Early procurement and DSO coordination
Institutional	Limited municipal capacity for administration	Slower implementation	LEASP technical support, standardised templates
Strategic	Funding beyond 2027 uncertain	Sustainability risk	Build revolving element from cooperative revenues

5. Recommendations

1. **Use EU Cohesion and national Climate Change Fund** grants for CAPEX and cooperative establishment.
2. **Apply to Eko sklad** for concessional financing to close funding gaps.
3. **Maintain cooperative ownership**: at least 51% citizen/municipal shares to comply with REC requirements.
4. **Engage early with Borzen** to secure access to premium tariff or self-consumption contract.
5. **Employ LEA Spodnje Podravje** as technical assistance partner for feasibility, procurement, and legal setup.
6. **Ensure inclusiveness:** subsidised shares or vouchers for vulnerable households.
7. **Monitor performance:** kWh produced, CO_2 saved, number of cooperative members, and share of vulnerable households.

A2.5 Croatia

1. Financial objective

Establish a multi-layered, self-reinforcing financing structure that guarantees social accessibility, economic sustainability, and long-term local value creation.

2. Financing Architecture

2.1 Overview

The financing strategy integrates four complementary layers:

1. **Grant Layer:** ERDF and ESF+ for infrastructure, training, and inclusion measures.
2. **Loan Layer:** HBOR and EIB credit lines for the repayable portion of bankable investments.
3. **Equity Layer:** (where applicable) cooperative and citizen participation in RECs.
4. **Technical Assistance (TA) Layer:** funding for project preparation, governance, and capacity building through EU and EIB facilities.

This architecture balances social inclusiveness with financial autonomy while remaining compliant with EU and national programming rules.

2.2 EU-Level Instruments

Instrument	Type	Application for LAP actions	Managing Authority /Channel	Notes
ERDF – Programme for Competitiveness and Cohesion 2021–2027	Grant / Financial instrument	Capital investments in renewable energy, energy efficiency, storage, and training facilities	Managing Authority (MA): Ministry of Regional Development and EU Funds (MRRFEU)	Aligned with Policy Objective 2 "A Greener Europe"
ESF+ – "Efficient Human Resources 2021–2027"	Grant	Reskilling, upskilling, and social inclusion under the Green Skills component	MA: Ministry of Labour, Pension System, Family and Social Policy	Supports RECs through workforce reskilling and local employment
InvestEU – Sustainable Infrastructure Window	Loan / Guarantee	Risk-sharing for municipal and cooperative investments; enables blending with ERDF/national co-financing	Channel: European Investment Fund / HBOR	De-risking and leverage of private capital
LIFE – Clean Energy Transition	Grant	Capacity building, awareness, One-Stop Shops, and preparation of community-energy projects	Channel: CINEA (EU executive agency)	Non-investment market-uptake support
Horizon Europe (Cluster 5)	Grant (R&I)	Digitalisation tools and pilots for transition monitoring and replication	Channel: European Commission (direct management)	R&I complement to LAP actions
EIB Loans and ELENA Advisory	Loan / TA	Project-preparation grants and long-term finance for local energy infrastructure	Channel: European Investment Bank	Supports pipelines led by IRENA/municipalities

Just Transition Fund (JTF)	Grant / TA	Strategic and territorial alignment; potential access for TA or future complementary operations	MA: MRRFEU	Ensures coherence with national TJTP/JTF objectives

2.3 National-Level Instruments

Instrument	Type	Function	Managing Entity	Comment
HBOR – Green Credit Lines	Loan	Concessional finance for renewable and efficiency projects led by municipalities, SMEs, or cooperatives	Croatian Bank for Reconstruction and Development (HBOR)	Compatible with ERDF grants; EIB/InvestEU can provide de-risking
FZOEU – Environmental Protection and Energy Efficiency Fund	Grant / Incentive	Household and SME incentives for renewables and clean heating	FZOEU (national agency)	Enables participation of vulnerable users in RECs
NRRP Measures	Grant / Loan	Large-scale renewables, grid modernisation, and storage infrastructure	MRRFEU / sectoral ministries	Complements LAP investments where applicable

2.4 Regional and Local Mechanisms

Mechanism	Function	Implementing Entity	Status / Feasibility
Regional Revolving Fund for Just Energy Transition (RRF-JET)	Pool ERDF/HBOR/municipal resources to finance projects and reinvest repayments	IRENA (Istrian Regional Energy Agency)	Legally feasible under CPR financial-instrument rules; subject to MA approval
Municipal Green Bonds	Mobilise community investment for renewable infrastructure	Municipalities / County	Legally possible; suitable for creditworthy issuers
Energy Cooperatives (Citizen Shares)	Collective ownership for renewable generation	Cooperatives / local associations	Enabled by Croatian/EU community-energy framework
ESCO / PPP Models	Performance-based retrofitting and facility operations	Municipalities / Private partners	Tested in the Croatian public sector

3. Financing Flow and Governance

Fund chain:

- Managing Authorities: MRRFEU (ERDF/JTF) and Ministry of Labour (ESF+).
- Financial intermediary: HBOR (loan/guarantee instruments; potential InvestEU channel).
- Regional implementer: IRENA (coordination, aggregation, potential revolving-fund management).
- Beneficiaries: municipalities, cooperatives, SMEs, training institutions, households.

Flow logic:

1. Grants (ERDF/ESF+): cover non-bankable or social components;
2. Loans (HBOR/EIB): finance the repayable CAPEX share;
3. Incentives (FZOEU): enable low-income/vulnerable participation;
4. Equity (citizen shares): reinforce ownership and legitimacy;
5. Revolving fund: recycles repayments and energy revenues into new projects;
6. Technical Assistance (TA): project preparation and governance support can be financed

through LIFE, EIB's ELENA facility, or EU TA allocations under the Common Provisions Regulation.

4. Risk Management and Mitigation

Risk Category	Description	Likely Impact	Mitigation
Institutional	Fragmented coordination between regional and national bodies	Delays and overlaps	Establish a regional coordination desk under IRENA and formal agreements with MRRFEU
Financial	Excess reliance on grant funding	Reduced scalability and continuity	Implement blended finance and revolving mechanisms
Operational	Limited project-preparation capacity in smaller municipalities	Lower absorption rates	Provide Technical Assistance (LIFE/ELENA) for feasibility and design
Market	Low private-sector participation	Limited leverage	Use InvestEU guarantees and HBOR de-risking facilities
Social	Exclusion of low-income groups from RECs	Inequitable outcomes	Introduce sub-grant schemes via FZOEU and local social programmes
Regulatory	Grid and permitting bottlenecks	Project delays	Early coordination with DSO (HEP ODS) and regulators
Strategic	Funding gap after 2027	Disruption of project pipeline	Institutionalise the revolving fund and explore local bond issuance

5. Recommendations

1. **Preserve strategic coherence with JTF** while implementing actions through ERDF, ESF+, and national programmes.
2. **Establish the Regional Revolving Fund (RRF-JET)** to manage reinvestment and financial continuity.
3. **Adopt blended finance structures** combining grants, loans, and citizen equity, ensuring compliance with EU financial-instrument regulations.
4. **Enhance project-preparation capacity** using available Technical Assistance facilities.
5. **Ensure inclusiveness** by integrating dedicated mechanisms for vulnerable households and underrepresented groups.
6. **Implement performance-based monitoring** covering leverage, reinvestment, and social impact indicators.

A2.6 Czech Republic

1. Financial objective

Establish a multi-layered, self-reinforcing financing structure that promotes financial viability, social accessibility, and local ownership while complying with EU and Czech programming rules.

2. Financing Architecture

2.1 Overview

The LAP financing model combines the following complementary layers:

1. **Grant Layer:** ERDF and CF programmes for physical investments in infrastructure and renewable energy.
2. **Loan Layer:** EIB/InvestEU instruments for the repayable share of bankable CAPEX.
3. **Equity/Ownership Layer:** cooperative or citizen participation in the REC.
4. **Technical Assistance (TA) Layer:** project preparation, audits, and governance financed via LIFE, ELENA, or national TA allocations.

2.2 EU-Level Instruments

Instrument	Type	Application for LAP Actions	Managing Authority / Channel	Notes
Operational Programme Environment (OPŽP) 2021–2027	Grant (ERDF/CF)	PV installations, energy efficiency, storage and grid upgrades in municipal buildings	Ministry of the Environment; State Environmental Fund (SFŽP)	Core programme for clean-energy infrastructure
Modernisation Fund (EU ETS revenues)	Grant	Renewable generation, efficiency and storage projects (public and enterprise windows)	SFŽP	Main large-scale decarbonisation source
OP TAK – Technology & Application for Competitiveness (ERDF)	Grant	SME energy-saving measures, innovation and supply-chain upgrades supporting the local transition	Ministry of Industry and Trade	Complements municipal investments
InvestEU – Sustainable Infrastructure Window	Loan / Guarantee	De-risking and blending for municipal or cooperative investments	EIF/EIB via national intermediaries	Enables leverage of private capital
LIFE – Clean Energy Transition Subprogramme	Grant (market uptake / TA)	Project preparation, REC governance, capacity building and replication	CINEA (direct management)	Supports non-investment actions
EIB Loans & ELENA Advisory Facility	Loan / TA	Long-term loans for PV/retrofits and ELENA grants for project development, procurement and monitoring	European Investment Bank	Suitable for bundled municipal pipelines
Horizon Europe – Cluster 5 (Climate, Energy, Mobility)	Grant (R&I)	Digital tools for energy-management optimisation, monitoring systems and pilot innovations	European Commission	Research and innovation complement

2.3 National-Level Instruments

Instrument / Body	Type	Function	Managing Entity	Comment

State Environmental Fund (SFŽP)	Grants / Incentives	Operates OPŽP and Modernisation Fund; national programmes such as *Nová zelená úsporám* (New Green Savings) for households	SFŽP	Key national operator of RES/EE schemes
NRRP Measures (Recovery and Resilience Plan)	Grant / Loan	Grid modernisation, digitalisation, and storage investments complementing local RES projects	Ministry of Industry and Trade	Complements OPŽP and MF projects
National Energy-Efficiency Programmes	Incentives	Support for audits, smart metering, and EE technologies in public buildings	Ministry of Industry and Trade	Applies to municipal pilot projects

2.4 Regional and Local Mechanisms

Mechanism	Function	Implementing Entity	Status / Feasibility
Pilot REC (cooperative/municipal model)	Shared ownership and governance of PV generation and electricity sharing	City of Jihlava / cooperative partners	Enabled by evolving Czech energy-sharing law; phase according to regulatory milestones
Energy Performance Contracting (EPC)	Performance-based retrofits of public buildings; repayments from verified savings	Municipality / ESCOs	Common EU model; compatible with ERDF grants for additional-cost elements
Power Purchase Agreements (PPAs)	Long-term off-take for larger PV capacity	Municipality / utilities / private developers	Transfers generation risk; attractive for scale

3. Financing Flow and Governance

Fund chain:

- Managing Authorities: Ministry of the Environment (OPŽP), Ministry of Industry and Trade (OP TAK).
- Programme Operator: SFŽP for Modernisation Fund and national incentive schemes.
- Financial Channels: EIB/InvestEU for loans and guarantees; blending with ERDF/Modernisation Fund where eligible.
- Regional Implementer: EAV (technical preparation, aggregation, procurement, monitoring and REC support).
- Beneficiaries: Municipality of Jihlava, municipal organisations, cooperatives, SMEs, and households (for participation schemes).

Flow logic:

1. Grants (OPŽP / Modernisation Fund / OP TAK): cover non-bankable or high-impact CAPEX.
2. Loans/Guarantees (EIB/InvestEU): scale bankable components with repayment potential.
3. Equity (citizen or SME shares): provide local ownership and reinvestment capacity.
4. TA (LIFE / ELENA): finance feasibility, audits, governance design, and digital integration.

4. Risk Management and Mitigation

Risk Category	Description	Likely Impact	Mitigation
Regulatory	Energy-sharing rules under phased implementation (until 2026)	Project sequencing and REC onboarding delays	Align project phasing to legislative milestones; early coordination with DSO and Energy Regulatory Office
Institutional	Coordination among multiple programmes (OPŽP, MF, OP TAK)	Administrative delays; low absorption	City-level coordination with EAV; pre-award funding matrix and standard templates
Operational	Limited capacity for complex procurement and ICT integration	Delays; underperformance	Establish TA facility via ELENA/LIFE; standardise audits, procurement and M&V
Financial	Over-reliance on grants	Limited scalability	Blend with EIB/InvestEU; apply EPC for retrofits; use PPAs for larger PV capacity
Market	SME participation in REC supply chains uncertain	Lower local economic benefit	Use OP TAK incentives to stimulate SME innovation and participation
Social	Barriers for household inclusion in RECs	Unequal access	Link municipal REC with *Nová zelená úsporám* incentives and targeted outreach
Grid / Technical	Connection-capacity or permitting constraints	PV curtailment; project delays	Conduct early capacity studies; stage commissioning; integrate smart-control and storage measures

5. Recommendations

1. **Use OPŽP and Modernisation Fund** for PV, storage and efficiency CAPEX; **OP TAK** for SME and innovation actions linked to the regional supply chain.
2. **Adopt blended-finance structures:** combine grants with **EIB/InvestEU** loans and EPC models; apply PPAs for scalable PV projects.
3. **Deploy a dedicated TA facility** with **EAV** (through LIFE or ELENA) for feasibility, design, procurement and governance preparation.
4. **Ensure inclusiveness** by connecting REC participation to national incentives (*New Green Savings*) and targeted citizen engagement.
5. **Monitor outcomes** through KPIs for fund absorption, leverage, cost savings, REC participation, and reinvestment into new sites.

A2.7 Slovakia

1. Financial objective

Ensure that JTF resources are used efficiently to create a coherent, sequenced investment pipeline, in which energy audits guide renovation priorities and renewable-energy deployment, while national and regional co-financing and future EU/national programmes can support the scale-up and replication of successful measures.

2. Financing Architecture

2.1 Overview

The financing architecture for BBSK can be summarized as follow:

1. **Grant Layer**: JTF grants under Programme Slovakia 2021–2027 (Priority 8P1), complemented by state and regional co-financing for school renovations, the energy-audit project and the Prievidza PV plant.
2. **Loan Layer**: Not used in the current LAP actions; standard municipal or regional borrowing could be considered in later phases to complement grants for follow-up renovations where energy-savings streams provide repayment capacity.
3. **Equity / Ownership Layer**: Predominantly public ownership (state, BBSK, municipalities) of buildings and infrastructure, with private partners involved in the development and operation of the Prievidza PV project.
4. **Technical Assistance (TA) Layer**: Support embedded in the national energy-audit project implemented by SIEA and in programme-level TA under Programme Slovakia; additional EU advisory facilities may be considered in the future if a larger investment pipeline is assembled.

2.2 EU-Level Instruments

Instrument	Type	Application for LAP Actions	Managing Authority / Channel	Notes
Programme Slovakia 2021–2027 – Priority 8P1 (Just Transition Fund – Slovakia)	Grant / TA	Core financing for SVS renovations, 80 energy audits, and the 4.95 MW PV plant near Prievidza	MIRRI SR – Ministry of Investments, Regional Development and Informatization (Managing Auth.)	Main EU structural instrument for the LAP; provides investment grants and programme-level TA
Other EU funds under Programme Slovakia (ERDF/ESF+ relevant priorities)	Grant	Potential follow-up financing for additional building renovations or complementary measures identified by audits	Relevant line ministries / Managing Authorities	To be used for scaling up measures beyond current JTF-funded projects, depending on future calls

LIFE – Clean Energy Transition (optional)	Grant (TA/uptake)	Capacity building, awareness, and replication for energy-efficiency and community-energy models linked to LAP actions	CINEA (European Commission)	Optional non-investment support; could complement JTF-funded investments in later phases
ELENA (EIB)	TA Grant	Preparation and bundling of a larger pipeline of renovations or RES projects building on the 80 audits	European Investment Bank	Only relevant if BBSK/SIEA later aggregate a sizeable, multi-site investment pipeline beyond the LAP

2.3 National-Level Instruments

Instrument / Body	Type	Function	Managing Entity	Comment
State Budget Co-financing	Grant / Co-finance	National co-financing for JTF-funded projects, notably SVS renovation and the energy-audit project	Ministry of Finance / line ministries in coordination with MIRRI SR	Ensures mandatory national contribution to JTF operations
Regional Budget – BBSK	Grant / Co-finance	Co-financing and operation of renovated secondary vocational schools and related measures	BBSK Office	Strengthens regional ownership and long-term maintenance of upgraded infrastructure
Recovery and Resilience Plan (RRP – Slovakia) (potential)	Grant	Possible follow-up funding for implementation of measures identified through energy audits	National coordination authority for RRF	Mechanisms for future implementation of audit-based measures
Modernisation Fund (Slovakia) (potential)	Grant	Support for further RES and efficiency investments derived from audit recommendations	National climate/energy authorities	Potential funding source for future phases beyond initial JTF-funded projects

2.4 Regional and Local Mechanisms

Mechanism	Function	Implementing Entity	Status / Feasibility
BBSK Office – energy strategy and asset management	Designs and manages renovation projects in secondary vocational schools; coordinates LAP actions	BBSK Office	Active; central regional actor responsible for schools and energy-management strategy
SIEA – National energy-audit project	Implements 80 energy audits; builds regional energy-performance database and prioritisation	Slovak Innovation and Energy Agency (SIEA)	Ongoing national project defined in the LAP; provides technical basis for future investments
City of Prievidza and private firms (PV project)	Host municipality and project partners for the 4.95 MW PV plant; repurposing brownfield site	City of Prievidza, private developers	Project under development within JTF framework; designed to support future energy-sharing concepts and regional energy communities
Emerging energy communities / sharing models (future)	Potential use of PV output to support local/ regional consumers and energy communities	Municipalities, citizens, companies (Upper Nitra & BBSK)	Not yet formalised in the LAP; envisaged as a future pathway building on JTF-supported infrastructure and legislative developments

3. Financing Flow and Governance

Fund chain:

- Managing Authority: MIRRI SR (Ministry of Investments, Regional Development and Informatization) for Programme Slovakia 2021–2027, Priority 8P1 – Just Transition Fund.

- Implementing Body: SIEA (Slovak Innovation and Energy Agency) for the national project delivering 80 energy audits.
- Regional Implementer: BBSK Office as project owner and coordinator for secondary vocational school renovations and regional energy management.
- Local Implementer: City of Prievidza and private partners for implementation and operation of the 4.95 MW PV plant on the brownfield site.
- Funding Sources: JTF grants under Programme Slovakia 2021–2027 (Priority 8P1), complemented by state-budget and BBSK regional-budget co-financing; in later phases, potential use of other EU/national instruments (e.g. relevant Programme Slovakia priorities, Recovery and Resilience Plan, Modernisation Fund).
- Beneficiaries: Secondary vocational schools and other public buildings under BBSK; the City of Prievidza; local citizens and enterprises in Upper Nitra and neighbouring BBSK territory.

Flow logic:

1. JTF grants (Programme Slovakia Priority 8P1) finance the core investments: energy-efficient renovation of secondary vocational schools, the national project with 80 energy audits, and construction of the 4.95 MW PV plant.
2. State and regional budgets provide the mandatory co-financing shares and contribute to operating and maintenance costs of renovated buildings, ensuring long-term functionality of the upgraded infrastructure.
3. Further EU and national instruments (other Programme Slovakia priorities, Recovery and Resilience Plan, Modernisation Fund) can subsequently be used to implement measures identified by the audits and to replicate successful renovation and RES projects.
4. Governance of financial flows is ensured through coordination between MIRRI SR (strategic management and JTF calls), SIEA (technical implementation and monitoring of the audit project), BBSK Office (regional coordination and asset management) and the City of Prievidza with private partners (PV project implementation and operation)

4. Risk Management and Mitigation

Risk Category	Description	Likely Impact	Mitigation
Regulatory / Programme	Adjustments in JTF rules, Programme Slovakia calls, or national energy regulations	Timing shifts; need to adapt project design	Maintain close coordination with MIRRI SR; ensure flexibility in project phasing and compliance with evolving requirements
Implementation capacity	Limited administrative and technical capacity at regional/local level for managing multiple projects	Delays in procurement and implementation	Use SIEA's technical support and national project structures; standardise documents and procedures across SVS and audit projects
Financial / Co-financing	Pressure on state/regional budgets to provide co-financing and follow-up investment resources	Risk of underfunded follow-up measures	Plan multi-annual co-financing in state and BBSK budgets; leverage future calls under Programme Slovakia, RRP, Modernisation Fund

Technical (PV / grid)	Grid-connection capacity and technical uncertainties for the 4.95 MW PV plant on brownfield site	Connection delays; partial curtailment	Early and continuous coordination with the DSO; adapt design if needed; staged commissioning of PV output
Social / Just transition	Ensuring that benefits (renovated schools, audit-based renovations, cheaper renewable electricity) reach communities most affected by deindustrialisation	Perception of unequal benefits; lower support	Prioritise disadvantaged districts in audit and renovation pipelines; monitor distribution of benefits; engage local stakeholders systematically
Strategic / Post-2027	Uncertainty about funding availability after the current programming period	Gap between first and subsequent investment waves	Use audits and first SVS retrofits as a demonstrator portfolio; prepare pipeline for future EU/national calls

5. Recommendations

1. **Consolidate JTF Priority 8P1 as the backbone of the LAP**, ensuring full and timely implementation of the three key actions (school renovations, energy audits, PV plant) through close coordination between MIRRI SR, SIEA, BBSK Office and the City of Prievidza.
2. **Use the 80 energy audits as a structured investment pipeline for the region**, systematically linking recommended measures to specific funding sources (future Programme Slovakia calls, Recovery and Resilience Plan, Modernisation Fund) and prioritising projects with the highest energy-saving and just-transition impacts.
3. **Maximise long-term value from school renovations** by tracking energy and cost savings and, where feasible, earmarking part of these savings for further efficiency and renewable-energy investments in BBSK facilities, reinforcing a virtuous reinvestment cycle.
4. **Leverage the Prievidza PV project as a demonstrator** for brownfield-to-renewable conversion and for future energy-sharing communities, documenting economic, environmental and social outcomes and exploring replication in other post-coal industrial parks.
5. **Strengthen monitoring and communication of just-transition outcomes**, using existing indicators and adding simple social and territorial metrics (e.g. coverage of disadvantaged districts, evolution of energy costs for public institutions) to support evidence-based adjustment of funding priorities.

A2.8 Poland

1. Financial objective

Develop a sustainable financing framework that ensures the long-term viability of the five observatories, supporting evidence-based policymaking, stakeholder engagement, and knowledge exchange within available regional and EU resources.

2. Financing Architecture

2.1 Overview

The financing approach relies mainly on grants and technical assistance. Three complementary layers are proposed:

1. **Grant Layer:** JTF ESF+ for governance, capacity building, and digital systems.
2. **Technical Assistance (TA) Layer:** support for project preparation, coordination, and monitoring through EU TA facilities.
3. **Regional and Local Co-financing:** contributions from the Marshal's Office and participating municipalities to ensure continuity after project funding ends.

This structure balances administrative simplicity with long-term sustainability.

2.2 EU-Level Instruments

Instrument	Type	Application for LAP Actions	Managing Authority / Channel	Notes
Just Transition Fund (JTF)	Grant / TA	Core funding for the creation and operation of the five observatories; supports governance and participation in transition regions	Marshal's Office of the Łódzkie Voivodeship (Regional Managing Auth.)	Primary funding source aligned with TJTP priorities
ERDF / ESF+ – Regional Programme "Fundusze Europejskie dla Łódzkiego 2021–2027 (FEŁ 2027)"	Grant / TA	Institutional capacity, digital tools, data systems, skills development, social inclusion, and communication	Marshal's Office of the Łódzkie Voivodeship	Complements JTF for governance and engagement measures
FEnIKS – European Funds for Infrastructure, Climate and Environment 2021–2027	Grant	Complementary funding for digitalisation and data-sharing platforms supporting the Observatory	Ministry of Funds and Regional Policy (MFiPR)	Used for broader governance and digitalisation priorities
LIFE – Clean Energy Transition Subprogramme	Grant (TA)	Capacity building, networking, communication, and knowledge exchange	CINEA (European Commission)	Supports Observatory outreach and replication activities
Horizon Europe – Cluster 5 (Climate, Energy, Mobility)	Grant (R&I)	Development of digital tools, data analysis, and policy-evaluation methods	European Commission	Optional complement for innovation and monitoring tools

2.3 National-Level Instruments

Instrument / Body	Type	Function	Managing Entity	Comment

NFOŚiGW – National Fund for Environmental Protection and Water Management	Grant	Co-funding for environmental data systems, communication, and education	NFOŚiGW	Possible support for the "New Energy" thematic area
WFOŚiGW (Łódzkie Regional Fund)	Grant / Loan	Support for regional environmental initiatives and awareness campaigns	WFOŚiGW Łódzkie	Potential local co-financing partner
NRRP (KPO) Measures	Grant	Funding for digitalisation and monitoring tools aligned with national transition priorities	Government of Poland / Line ministries	Complementary alignment opportunity

2.4 Regional and Local Mechanisms

Mechanism	Function	Implementing Entity	Status / Feasibility
Just Transition Observatory	Coordination, research, monitoring, and stakeholder engagement	Marshal's Office of the Łódzkie Voivodeship	Core LAP action under preparation
Municipal Partnerships	Provide data, participate in Observatory activities, and co-finance local elements	Municipalities	Feasible through inter-municipal cooperation agreements
Academic and NGO Collaboration	Analytical work, youth programmes, and public outreach	Universities, research institutions, NGOs	Active partnerships from JETforCE pilot stage

3. Financing Flow and Governance

Fund chain:

- Managing Authorities: Marshal's Office (regional MA for FEŁ 2027 and JTF); MFiPR (national MA for FEnIKS).
- Financial Intermediaries NFOŚiGW and WFOŚiGW for co-financing
- Regional Implementer: Just Transition Observatory Secretariat within the Marshal's Office
- Beneficiaries: Regional administration, municipalities, academic partners, and NGOs.

Flow logic:

1. Grants (JTF, ERDF, ESF+): cover staff, analytical work, digital tools, communication, and coordination.
2. Technical Assistance (LIFE, Horizon Europe, Programme TA): support capacity building, data integration, and outreach.
3. Regional/Local Co-financing: ensure continuity and ownership within the regional budget.

4. Risk Management and Mitigation

Risk Category	Description	Likely Impact	Mitigation
Institutional	Limited administrative capacity for multi-programme management	Delays or coordination issues	Assign a small coordination unit within the Marshal's Office; use standardised reporting tools

Financial	Reliance on a single EU funding source	Potential funding gap after project end	Combine JTF with FEŁ 2027 institutional-capacity measures
Operational	Insufficient staff for Observatory management	Slower implementation	Use ESF+ for training and additional staffing support
Engagement	Low participation by municipalities or citizens	Reduced effectiveness	Strengthen outreach through LIFE and regional communication actions
Strategic	Uncertainty of post-2027 funding	Continuity risk	Plan gradual integration of Observatory functions into the regional budget

5. Recommendations

1. **Use JTF as the main funding source** for establishing and operating the Observatory network, ensuring alignment with the regional TJTP.
2. **Combine JTF with FEŁ 2027 resources** to finance digital tools, analytical activities, and engagement programmes.
3. **Apply LIFE or Horizon Europe** for capacity building and replication at EU level, supporting knowledge exchange and innovation.
4. **Create a dedicated coordination team** within the Marshal's Office to manage financing, reporting, and stakeholder cooperation.
5. **Plan a transition to regional budget financing** by 2028 to maintain Observatory operations beyond EU project cycles.
6. **Monitor results** using clear indicators on stakeholder participation, data quality, and social inclusion.

A2.9 Austria

1. Financial objective

Use a blended model that keeps household costs affordable, secures long-term operation of district heating, and enables citizen-owned power sharing through the energy community.

2. Financing Architecture

2.1 Overview

A four-layer structure tailored to the two actions:

1. **Grant Layer**: National/regional programmes co-financed by the EU (KPC – Umweltförderung, Sauber Heizen, Sanierungsförderung) and municipal subsidies for connection support and affordability.
2. **Loan Layer**: Commercial bank loans or municipal/utility financing to cover the repayable share of DH network extensions or PV sub-systems if needed.
3. **Equity/Participation Layer**: Member contributions in the energy community association;
4. **Technical Assistance (TA) Layer**: Advisory and coordination by Innovation Centre W.E.I.Z**.** and the regional energy agency; use of JETforCE digital tools (GloCha, technology evaluation) and the So**Strom** administration/monitoring platform.

2.2 EU-Level Instruments

Instrument	Type	Application for LAP Actions	Managing Authority / Channel	Notes
LIFE – Clean Energy Transition	Grant (TA / market uptake)	Citizen engagement, energy-community governance, replication	CINEA	Complements non-investment components
Horizon Europe – Cluster 5	Grant (R&I)	Digital tools/innovation for energy-community operations and monitoring	European Commission	Optional complement where research pilots fit
(Optional) ELENA	TA Grant	If Weiz aggregates a larger pipeline (DH extensions / PV), support for preparation and procurement	European Investment Bank	Only if scale justifies TA

2.3 National and Regional-Level Instruments

Instrument / Programme	Type	Function	Managing Entity	Comment
KPC – Umweltförderung des Bundes	Grant	Core public support for district heating expansion/renewable integration	KPC (Kommunalkredit Public Consulting)	Cited in LAP as a key funding line
Sauber Heizen	Grant	Household support for clean-heat switch/connection	Federal/Regional scheme	Reduces entry costs for vulnerable groups
Sanierungsförderung	Grant	Building-side upgrades/retrofits linked to DH	Federal/Regional scheme	Complements DH connections

Municipal subsidies	Grant	Additional support for low-income/elderly households	City of Weiz / Thannhausen	Targeted affordability tool
Commercial bank / utility finance	Loan	Repayable share for DH works or PV sub-systems	Local banks / operator	Use prudently alongside grants

2.4 Regional and Local Mechanisms

Mechanism	Function	Implementing Entity	Status / Feasibility
District Heating Operator (Weizberg)	Invest, operate, and maintain DH extensions; tariff setting	DH Operator + municipalities	Active; upgrades coordinated with other utilities
Energy Community (association)	Collective ownership/operation; member onboarding; billing	Innovation Centre W.E.I.Z. + members	Established model; monitored via SoStrom
Innovation Centre W.E.I.Z.	Project management, counselling, funding access	WEIZ	Weekly low-threshold advice; JETA/Digital Ambassadors support

3. Financing Flow and Governance

Fund chain:

- Grants: KPC – Umweltförderung, Sauber Heizen, Sanierungsförderung; municipal subsidies.
- Loans (if required): commercial banks / operator financing for the repayable share.
- TA & Advisory: Innovation Centre W.E.I.Z., regional energy agency; JETforCE tools; SoStrom platform for EC monitoring.
- Beneficiaries: Households (connection support, lower energy bills), the district heating operator (stable customer base), and energy-community members (reduced electricity costs).

Flow logic:

1. District heating (DH): public grants reduce CAPEX; households pay connection fees and heat tariffs; optional loan covers residual CAPEX.
2. Energy community (EC): initial setup supported by national research funding (per LAP); ongoing operations funded by an internal margin between member tariffs: feed-in €0.090/kWh vs. consumption €0.115/kWh, yielding €0.025/kWh to cover O&M and administration; expansion financed by member contributions and small grants as available.

4. Risk Management and Mitigation

Risk Category	Description	Likely Impact	Mitigation
Affordability / Social	Upfront costs for DH connections; equity barriers to EC membership	Lower uptake among vulnerable groups	Maintain municipal top-ups; flexible EC share sizes; targeted outreach (elderly women, low-income)
Financial	Grant variability; cost inflation for DH works	Funding gap; tariff pressure	Stage investments; secure KPC early; use loans only for residual CAPEX; transparent tariff design
Operational	Coordination across utilities / contractors	Delays and rework	Integrated planning (as in LAP); owner's engineer role via WEIZ
Regulatory	Evolving details for EC billing/data	Admin burden	Use SoStrom platform; standardised contracts and privacy-compliant data handling
Market / Technical	Equipment lead times; PV output variance	Schedule/cash-flow volatility	Early procurement, conservative yield assumptions, reserve funds from EC margin

5. Recommendations

1. **Keep KPC as the grant backbone** for DH extensions; combine with Sauber Heizen/Sanierungsförderung and municipal top-ups to protect vulnerable households.
2. **Use loans sparingly** for DH residual CAPEX; prioritise sections with high connection density to stabilise tariffs.
3. **Stabilise the EC business model** around the €0.025/kWh margin; review annually against O&M costs and membership growth.
4. **Scale via cohorts:** onboard EC members in waves (households → SMEs → public sites), using WEIZ counselling to reduce admin friction.
5. **Standardise templates** (membership, billing, data, consent) and keep SoStrom as the single monitoring source of truth.
6. **Track inclusion KPIs** (share of low-income/elderly households connected to DH; EC members by category; average annual savings).
7. **Plan a replication bundle** for additional DH micro-extensions and EC PV additions; consider EU LIFE (engagement/replication) if scale grows.

Annex 3 - Catalogue of Local Action Plans

The present document collects, organizes, and analyses the Local Action Plans (LAPs) developed by the JETforCE partners, providing a comprehensive overview of how the principles of the Just Energy Transition (JET) are being interpreted and operationalized across different territorial contexts. Its aim is to systematize the diversity of approaches, priorities, and instruments adopted at the local level, while highlighting the convergences that underpin a shared vision of fair, inclusive, and sustainable decarbonization in Central Europe.

Each LAP translates the overarching framework of JETforCE into the specific socio-economic and institutional realities of its territory. As such, the collection functions not merely as a descriptive compendium of initiatives, but as an analytical device for understanding how technical innovation, governance reform, and community participation interact to shape place-based models of energy justice. Through their combination, the LAPs illustrate how environmental objectives can be pursued in conjunction with social equity and territorial cohesion.

Across the partnership, a clear convergence emerges around Renewable Energy Communities (RECs) as the preferred operational model for enabling local empowerment, democratic ownership, and equitable benefit sharing. These are complemented by large-scale retrofitting programmes, energy-efficiency upgrades, and renewable infrastructures that together provide the physical backbone of decarbonization. Such initiatives confirm that technical modernization, when rooted in participation, can become a vector of social inclusion and territorial resilience.

Education and skills development constitute another common axis. Some LAPs introduce vocational training, school programmes, and public awareness actions aimed at building the human capital necessary for the transition. These activities strengthen local capacities, link energy transformation to educational renewal, and foster long-term behavioural change, thus extending the scope of the transition beyond technology towards culture and citizenship.

At the same time, the LAPs demonstrate how energy transition policies can act as levers for broader territorial regeneration. In post-industrial, inner, or rural regions, energy actions are intertwined with strategies for economic diversification, social innovation, and environmental rehabilitation. This integrative perspective situates the transition within the wider agenda of sustainable regional development, aligning climate goals with cohesion and inclusion objectives.

Taken together, the LAPs portray a living laboratory of just transition. They show partners' capacity to integrate wide area strategies with bottom-up experimentation, to align technological innovation with social participation, and to embed the principles of justice, transparency, and solidarity into energy policy. Beyond the diversity of contexts, a shared narrative emerges—one in which the energy transition becomes a collective enterprise grounded in democratic governance, community empowerment, and enduring territorial benefit.

A3.1 The process

The development of the Local Action Plans (LAPs) and the present report followed a structured, iterative, and participatory process guided by Metropolitan City of Bologna and designed to translate the principles of the Just Energy Transition into territorially grounded, operational strategies. Much like the LAPs themselves, the process was not linear but reflective, combining collective intelligence, methodological rigor, and progressive refinement. It unfolded across multiple phases, each contributing to a shared understanding of priorities, instruments, and governance mechanisms capable of sustaining a just, inclusive, and place-sensitive transition.

The starting point was the transnational workshop held in Telč (28 May 2025), where partners engaged in a World-Café–style exercise to explore future actions, governance responsibilities, business-model requirements, and the integration of justice principles into local policy design. By rotating across thematic tables and consolidating diverse territorial perspectives, participants co-constructed a preliminary conceptual architecture for the LAPs. This collective moment served as a foundational reference frame, shaping not only the substantive content of the plans but also the methodological path that followed.

Building on these shared insights, the coordinating team initiated a progressive drafting process aimed at ensuring coherence across territories while respecting local specificities. A common LAP template was designed during June–July 2025, balancing analytical depth with operational clarity. The template provided a harmonized structure for situating local challenges within the broader JETforCE strategy, defining key actions, articulating governance models, and identifying justice-related impacts. Its circulation to partners on 17 July 2025 marked the beginning of a shared drafting phase in which local expertise and project-level guidance converged.

Partners submitted a first complete version of their LAPs by 30 September 2025, enabling the launch of a structured peer-review process. This step was crucial for ensuring transnational consistency: LAPs were examined comparatively, and feedback focused on strengthening the logic of intervention, clarifying expected outcomes, and reinforcing the integration of procedural, distributive, and recognitional justice. Consolidated comments were returned to partners in a dedicated meeting on 7 November 2025, followed on 12 November by detailed requests for refinement to guarantee that each LAP met both methodological and strategic requirements.

The iterative cycle culminated with the submission of the second, finalised versions on 30 November 2025, which form the basis of the present report.

Date	Step	Activity
28 May 2025	Telč workshop	Conceptualisation of LAPs through thematic group work
June–July 2025	LAP template preparation	Drafting and harmonization according to the results of Telč workshop by MCBO
17 July 2025	Template delivery	Template shared with partners by MCBO
30 September 2025	LAPs return	Submission of first LAP versions by partners
October 2025	LAPs analysis	Peer review on first LAP versions by MCBO
7 November 2025	LAPs workshop	Consolidated feedback to partners on LAPs by MCBO
12 November 2025	Review delivery	Detailed revision suggestions sent to partners (one individual sheet per partner)
30 November 2025	LAPs return	Submission of final LAP versions by partners

Tab. 1.1 The stepladder of the process for the definition of JETforCE LAPs

Together, the steps above demonstrate a process that is both analytical and dialogic, anchored in shared frameworks yet attentive to local trajectories. The resulting LAPs thus embody a collective effort to align territorial action with the wider vision of a just energy transition, transforming methodological coordination into a space of mutual learning and strategic convergence.

Finally, it should be emphasized that, in the months following the finalization of the project, the present **Catalogue of LAPs will be formally endorsed** by each institutional project partner, together with the JETforCE Strategy.

A3.2 The Local Action Plans

A3.2.1 Borsod-Abaúj-Zemplén County - Hungary

Purpose and Strategic Alignment

The Local Action Plan (LAP) of BORA 94 Borsod-Abaúj-Zemplén County Development Agency aims to support a just, inclusive, and sustainable energy transition, primarily in small rural settlements deeply affected by energy poverty and the coal phase-out. Through creating enabling conditions, strengthening community participation, and using digital tools for evidence-based decision-making, the LAP contributes to a fair transition that benefits all citizens, especially the most vulnerable.

The LAP aligns with the priorities of the JETforCE strategy and with the EU and Hungarian frameworks guiding decarbonization, including:

- **Just transition Mechanism** based on the **Territorial Just Transition Plan** (TJTP) for Borsod-Abaúj-Zemplén county
- **Just Transition Fund** is intended to be allocated based on the **Environment and Energy Operational Programme (KEHOP+) priority 5 (Just Transition)**
- **Recovery and Resilience Plan**, which was approved by the European Council in 2022, but was updated in 2023 also to introduce REPowerEU chapter
- **LIFE-IP North-HU-Trans programme** (www.igazsagosatmenet.hu/en/home/)**:** roadmap for the safe, efficient and low-carbon transformation of Hungary's last coal region (Mátra Power Plant and connected lignite mine in Bükkábrány)
- Law on climate protection
- National Energy Strategy 2030
- National Energy Efficiency Action Plan
- National Clean Development Strategy 2020-2050
- National Energy and Climate Plan (NECP 2030, with an outlook up to 2040)
- Hydrogen Strategy (May 2021)

During the elaboration of the TJTPs, 6 main types of activities have been identified as follows:

- Investment in training and retraining of the workforce;
- Green economic diversification, technological change, promotion of research and development and innovation;
- Encouraging the development of renewable energy infrastructure;
- Encourage environmentally friendly household energy production and energy usage;
- Green public transport development;
- Sustainable repurposing of mining sites in the affected counties (Heves and Borsod-Abaúj-Zemplén)

Hungary targets a low-carbon electricity mix of 90% by 2030, with new nuclear power and renewables (solar photovoltaic, geothermal, hydrogen) to play a major role.

The LAP intends to respond to systemic challenges, such as energy poverty by focusing on social inclusion, local community involvement and awareness raising in the energy transition process.

Key Actions

BORA 94, being an umbrella organization with a broad network of various types of partners on local, national and international levels and by obtaining all necessary information and means for economic development is in the position to positively influence with the right tools and by connecting the relevant actors the sustainable development environment and efforts. The LAP consists of the following 3 key interventions with the active involvement and support of our Digital Ambassadors, Mayors of Bükkábrány and Bükkaranyos as well as with the most active JETA member from B-A-Z County Self-Government:

- **Renewable Energy Communities:** Creation of Hungary's largest municipal energy community, including Bükkábrány and Bükkaranyos settlements (the members are only local municipalities)
- **Green mobility:** electric vehicle purchase in Bükkábrány for food delivery (lunch) for the local community (delivered from the central kitchen to the nursery, kindergarten, and home delivery of social meals (elderly))
- **Energy renovations of public buildings:** energy efficiency renovation of the B-A-Z County Self-Government headquarters (including BORA 94 offices) and other two public buildings owned by the self-government

All these interventions are leading to the same direction: to improve the life quality of the local communities (including vulnerable groups, such as the elderly), as well as the staff of the self-government and citizens of B-A-Z County, who will use the renovated public buildings for governmental services.

These are complemented by the following horizontal elements:

- Citizen participation and education measures
- Cross-sector connections (energy–mobility–social services)
- Institutionalization of digital tools (TET, Challenge Mapping)
- Reinforced multi-level governance links

Key action #1: Renewable Energy Communities (REC)

PURPOSE AND IMPLEMENTATION	
Objectives	The aim is to democratize local energy production and consumption through a municipal REC that enhances local resilience, reduces grid load, and empowers communities.
Beneficiaries/ Targets	Municipalities (over 70 members, expanding) Vulnerable households indirectly through lower municipal costs and new services
Key activities	• Joint installation of decentralized RES and storage assets • Smart grid and smart metering solutions • REC governance capacity-building for municipal staff • Citizen and school-level energy education programmes • Cross-sectoral cooperation: REC savings partially reinvested in social programmes (e.g. elderly care, energy poverty relief, community education) • Peer-learning scheme with other Hungarian/European RECs
Justice aspects	• A fairness-based tariff model for small and disadvantaged municipalities • Introduction of low-income participation schemes • Transparent, participatory decision-making through the Challenge Mapping Tool
INSTITUTIONS/ORGANIZATIONS INVOLVED AND ROLE IN THE PROJECT	

Közösségi Energiabank Egyesület (Community Energy Bank Association, Leader)	This organization is the legal representative of the local energy community, which currently counts over 70 municipalities from two major LEADER ACTION GROUP areas (Bükk-Area and South-Borsod) and more are expected to join until the end of the year. It deals with all relevant aspects and daily tasks of the energy community. Roles: coordination, management of existing and joining members, financial monitoring, searching for relevant national and EU funding possibilities to further develop the energy community. Preparing and implementing application (e.g. ELENA – European Local Energy Assistance).
Municipalities (members)	Municipalities play a central role in the Renewable Energy Community (REC) by participating in strategic planning, identifying suitable municipal buildings and land for renewable energy installations, and aligning REC activities with local climate strategies. They co-develop and co-invest in decentralized renewable energy projects—such as solar PV, hybrid systems, heating modernization, and storage—and support implementation through permitting, data provision, and cooperation with technology providers. Municipalities also enable digitalization by allowing the installation of smart meters and using tools such as the Challenge Mapping Tool, Technology Evaluation Tool, and KPI dashboards. Their involvement extends to REC governance through transparent decision-making, capacity-building trainings, and participation in a fairness-based tariff model, while engaging citizens and schools in energy education and supporting social programmes such as elderly care and energy-poverty reduction. Additionally, municipalities help ensure equity by identifying vulnerable groups for low-income participation schemes and by contributing to monitoring and reporting through smart-meter data collection. In return, they gain reduced energy costs, improved energy resilience, digital and administrative capacity, local economic benefits, and strengthened regional cooperation in the transition toward a clean and decentralized energy system.
BORA 94 (coordination and capacity building)	BORA 94 will be involved in the REC by providing coordination and capacity-building support to municipalities, helping them plan, implement, and manage REC-related activities more effectively. Its role includes facilitating communication among member municipalities, aligning local needs with REC objectives, and organizing trainings and technical assistance to strengthen municipal knowledge in areas such as renewable energy planning, smart-grid solutions, governance processes, and funding opportunities. BORA 94 also assists in harmonizing procedures, guiding municipalities through regulatory and administrative requirements, and ensuring consistent project development standards, ultimately enhancing the overall operational capacity and cohesion of the REC.
Energy service/ technology providers	Energy service and technology providers will be involved in the REC by delivering the technical expertise, infrastructure, and operational support needed to design, install, and maintain renewable energy systems such as solar PV, hybrid solutions, battery storage, and smart metering technologies. Their role includes conducting site assessments, preparing technical designs, ensuring regulatory compliance, integrating systems into smart-grid architectures, and providing ongoing maintenance and performance monitoring. These providers also support digitalization by enabling data collection, system optimization, and KPI tracking through advanced monitoring platforms. By collaborating closely with municipalities and the REC's coordinating bodies, they help ensure that

	installations are efficient, cost-effective, scalable, and aligned with the community's long-term energy, resilience, and climate objectives.
NORMS, LEGAL PROVISIONS	
EU framework	**Directive (EU) 2018/2001 (RED II):** Establishes the legal framework for renewable energy communities, empowering citizens to produce, consume, store, and sell renewable energy. **Directive (EU) 2019/944 (IEMD):** Sets rules for citizen energy communities and collective self-consumption. **RED III (Proposed):** Future directive expanding support for renewable energy communities.
National framework	**Act LXXXVI of 2007 on Electricity:** Governs energy production and consumption, allowing for decentralized renewable energy production. **Government Decree No. 100/2005:** Provides regulations on renewable energy usage. **Act LXXXVIII of 2013 on the Energy Market:** Legal framework for energy production and market participation by citizens. **National Energy and Climate Plan:** Outlines Hungary's goals for renewable energy and community involvement. **Hungarian Green Deal:** Encourages renewable energy communities as part of Hungary's climate goals.
Regional framework	The formation of renewable energy communities in Hungary is primarily regulated **by EU directives such as RED II and the Internal Electricity Market Directive, with Hungary's national laws** (Energy Act, Renewable Energy Decree) providing the domestic legal framework. These regulations facilitate citizen participation in energy production, consumption, and trading, aiming to promote decentralized and sustainable energy systems that contribute to Hungary's climate and energy transition goals. However, **local municipalities** in Hungary can also play an important role in enabling **renewable energy communities** by **allocating land** or **creating incentives** for the establishment of local energy cooperatives. Some municipalities may offer **local financial incentives** for installing **solar panels** or creating **community-owned wind farms** or **solar parks**. However, such initiatives are typically part of larger **regional** or **national** programs, often in collaboration with EU funding.
POTENTIALITY OF THE DIGITAL TOOLS	
• Challenge Mapping Tool to identify operational, social, and technical barriers • Technology Evaluation Tool (TET) for assessing PV/storage configurations and ELENA applications • Dashboard for monitoring KPIs (to be established)	
EXPECTED OUTPUTS	
• Heating modernization of 150 municipal buildings with a total installed heating capacity of 3,418 kW(th) • Installation of a new hybrid solar panel system with battery storage capacity in 62 municipal buildings with a total capacity of 637 kW • Expansion of the existing solar panel system at 30 municipal buildings with a new hybrid solar panel system supplemented with battery storage capacity with a total capacity of 230 kW;	

• Installation of a battery energy storage system with a total capacity of 490 kWh to supplement the existing solar panel system in 90 municipal buildings • Commissioning of 1 control and accounting system
EXPECTED OUTCOMES
User-level economic and technical benefits. Thanks to decentralized storage, less electricity is fed back into the central grid during peak hours, thereby reducing the load on the grid. Local production, storage, and consumption increase energy efficiency and reduce grid losses. Moreover forming an operable energy community can result in the following outcomes in each of these categories: **Energy:** Increased local generation and storage capacity, reduced grid dependency and improved resilience, **Environment:** Emissions reduction, contribution to climate goals, cleaner local environment; **Economy:** Job creation, cost savings, local investment retention; **Society:** Community empowerment, participation, energy equity, enhanced citizen awareness and participation, new skills and improved digital maturity of local actors; **Technology:** Smart energy systems, efficiency improvements; **Policy & Governance:** Grassroots influence on energy transition policies, stronger municipal cooperation and co-financing ability; **Broader Integration:** Links to e-mobility, agriculture, circular economy.
MONITORING SYSTEM
The outputs and outcomes will be monitored according to the funding criteria/indicators achieved that are provided by the funding programme, based on the installed smart metering systems.

Key action #2: EV for Social Meal Delivery (Green mobility)

PURPOSE AND IMPLEMENTATION	
Objectives	To ensure inclusive local mobility while contributing to decarbonization through the purchase and operation of an electric vehicle serving schools, kindergartens, and elderly residents.
Beneficiaries/ Targets	Local organizations of Bükkábrány (e.g. primary school, kindergarten) and the elderly, who needs social meal delivery service
Key activities	• Purchase of the green vehicle for social meal delivery service purpose • Organizing the distribution of meals for the local relevant organizations • Integration of EV usage data into the LAP monitoring dashboard • Training for municipal staff on energy-efficient driving and vehicle management • Exploration of synergies such as EV use for elderly visits, medicine delivery, or community transport
Justice aspects	• Enhancing mobility for elderly and low-income households • Prioritizing clean mobility in a region affected by poor air quality • Demonstrating low-carbon services at municipal level
INSTITUTIONS/ORGANIZATIONS INVOLVED AND ROLE IN THE PROJECT	
Local Municipality of Bükkábrány	The Municipality of Bükkábrány will be the owner of the purchased electric vehicle for social meal delivery. Also it will organize and coordinate the schedule for the delivery service from the central municipal kitchen.

Arany János Primary School, Bükkábrány	Beneficiary of the social meal delivery service
Napsugár Kindergarten Bükkábrány	Beneficiary of the social meal delivery service
NORMS, LEGAL PROVISIONS	
EU framework	**EU Regulation 2019/631 - CO_2 Emission Standards for Cars and Vans:** This regulation sets binding CO_2 emission standards for new passenger cars and light commercial vehicles. **EU Directive 2006/38/EC - The Directive on Alternative Fuels Infrastructure:** This directive aims to establish a common framework for the deployment of alternative fuels infrastructure, including electric vehicle charging stations. **EU Directive 2014/94/EU - Alternative Fuels Infrastructure Directive:** This directive obliges EU countries to develop a trans-European infrastructure for alternative fuels (including electric vehicles) and to establish national policy frameworks for this development. **EU Regulation 168/2013 - Type-approval of Motor Vehicles and their Trailer:** The regulation includes technical standards for the approval of vehicles and their components, including electric vehicles, ensuring their safety, environmental performance, and roadworthiness across the EU. **EU 2020/1429 – European Green Deal and Zero-Emission Mobility Strategy:** This broader strategy aims to make Europe the first climate-neutral continent by 2050, with a major focus on reducing transport emissions, including incentivizing the use of electric vehicles.
National framework	**Act I of 1988 on Road Traffic:** This is the main piece of Hungarian legislation governing road traffic, including rules for the registration, use, and safety standards for all types of vehicles, including electric vehicles (EVs). **Act LXXVI of 2004 on Environmental Protection:** This law addresses environmental protection in Hungary and includes provisions relevant to electric vehicles, such as regulations concerning emissions, waste management (batteries), and sustainable transport solutions. **Act LIII of 1995 on the General Rules of Environmental Protection** – This Hungarian law establishes the fundamental principles, rights, and obligations related to the protection of the environment, aiming to ensure sustainable development and the harmonious relationship between humans and nature. **Act CLXXXV of 2012 on Waste** – This Hungarian law regulates the prevention, management, and proper disposal or recycling of waste to protect the environment and human health. **Government Decree No. 243/2019 (22 October)** on Certain Issues of Electromobility Services - this government decree regulates the licensing, operation, technical, and data-reporting requirements for public electric vehicle charging infrastructure and services in Hungary.

	Hungarian Vehicle Tax Act (Act LXXXII of 1991): This law regulates vehicle taxation, and it includes tax incentives for electric vehicle owners in Hungary. EVs enjoy reduced or even zero vehicle tax, encouraging their adoption. **Government Decree No. 284/2021 on the Deployment of Electric Vehicle Charging Infrastructure:** The decree ensures that Hungary meets its obligations under the EU's alternative fuels infrastructure directive. **Green Public Procurement Regulations:** Hungary encourages the purchase of electric vehicles in both the private and public sectors through green procurement policies. These regulations incentivize the adoption of environmentally friendly vehicles, including electric cars, in public administration and services. **Hungarian Incentive Programs for EV Purchases:** Hungary also offers financial incentives for purchasing electric vehicles. These incentives may include direct subsidies, tax credits, or reduced registration fees for EV buyers.
Regional framework	While **Borsod-Abaúj-Zemplén County**, or the **Local Municipality of Bükkábrány does not have specific municipal laws for electric vehicles,** the national Hungarian laws (such as those mentioned above) and EU directives on the environment and electric vehicles would apply throughout Hungary, including Bükkábrány. These laws generally cover **incentives for EVs, registration procedures, and infrastructure development.** Furthermore, if the Bükkábrány local government will install EV charging stations, it will adhere to national laws regarding the permitting and safety regulations for such infrastructure.
POTENTIALITY OF THE DIGITAL TOOLS	
• TET used to analyse procurement options • Challenge Mapping Tool to gather citizen feedback on mobility needs	
EXPECTED OUTPUTS	
1 Electric vehicle, serving the local community with social meal delivery.	
EXPECTED OUTCOMES	
Using electric vehicles for social meal delivery offers a broad range of advantages for both the environment and the community: • **Environmental:** Cleaner air, reduced emissions, less noise pollution • **Economic:** Cost savings/reduced municipal operational costs, incentives, and long-term financial benefits for the community • **Social:** Improved access to food for vulnerable populations, job creation, and community pride, improved services for vulnerable groups • **Health:** A healthier delivery environment and safer streets • **Sustainability:** Alignment with global and local sustainability goals Ultimately, using EVs for services like meal delivery promotes green mobility, supports local inclusion, and fosters a more sustainable and resilient community. It's an excellent example of how local initiatives can combine social good with environmental responsibility, benefiting everyone involved.	
MONITORING SYSTEM	

The outputs and outcomes will be monitored according to the funding criteria/indicators achieved that are provided by the funding programme, called “Competitive Districts Program”.

Key action #3: Energy renovations of public buildings

PURPOSE AND IMPLEMENTATION	
Objectives	The aim of the intervention is to increase energy savings and energy efficiency in 3 public buildings owned by the B-A-Z County Self-Government, to improve energy performance, comfort, accessibility, and sustainability in these public buildings. Modern technical and energy systems contribute to the more environmentally conscious and sustainable operation of buildings, while the planned modernization investments ensure a reduction in the operating costs of the properties through their energy-efficient operation. In the long term, this will tip the balance in favor of the municipality's budget and contribute to the achievement of the strategic goal of sustainable development. The implementation of the project may indirectly contribute to reducing the country's dependence on energy imports.
Beneficiaries/ Targets	Direct beneficiaries: B-A-Z County Self-Government, BORA 94 Nonprofit LLC; Indirect beneficiaries: partners of these organizations as well as citizens, who visit these facilities for public service purposes.
Key activities	• Deep renovation including insulation, HVAC modernization, RES installation, and accessibility improvements • Incorporation of indoor environmental quality indicators in monitoring • Full digital monitoring of energy performance, made public through the LAP dashboard • Linking renovations to community outreach events (open days, awareness sessions)
Justice aspects	• Full accessibility for people with disabilities • Lower public budget pressure allowing more social investment • Better indoor environments in public service buildings
INSTITUTIONS/ORGANIZATIONS INVOLVED AND ROLE IN THE PROJECT	
B-A-Z County Self-Government	Project owner/Beneficiary of the energy renovations for 3 of their public buildings
BORA 94 Nonprofit LLC	Beneficiary of the energy renovations for its offices
Renovating company	Performs the renovation tasks
NORMS, LEGAL PROVISIONS	
EU framework	**Energy Efficiency Directive (EED) (2012/27/EU, 2018/2002):** 3% annual renovation, public sector leadership **Energy Performance of Buildings Directive (EPBD):** Building energy standards, EPCs, nZEB goals

	Renovation Wave / Fit for 55 / Green Deal: Strategy to accelerate deep building renovation
National framework	**Act LVII of 2015 on Energy Efficiency**: Implements EED, national renovation rules **Gov. Decree 122/2015 (V. 26.):** Public building renovation targets and obligations **Act LXXVIII of 1997:** Building codes and renovation standards **Decree 9/2023 (V.25.) of the Ministry of Construction and Transport** on the determination of the energy characteristics of buildings **NECP 2020-2030:** Energy and climate planning, public building renovation targets **Recovery and Resilience Plan:** RRF-financed deep renovation of public institutions
Regional framework	Although **Borsod-Abaúj-Zemplén County does not have specific regional laws** regulating the energy renovation of public buildings, there are several regional and local initiatives and projects aimed at improving energy efficiency, as follows: **Energy Renovation of County Government Buildings:** The county government has carried out energy renovations on three of its properties, which included insulating external walls, modernizing heating systems, installing solar panels and heat pumps, and upgrading lighting. The goal of these projects was to improve energy efficiency and reduce operational costs. **Sustainable Energy and Climate Action Plans (SECAP):** Sustainable Energy and Climate Action Plans have been developed for eight Local Action Groups (LEADER HACS) in the region, aiming to reduce CO_2 emissions and support climate adaptation. These plans include measures to improve energy efficiency, including renovations of public buildings. **Energy Efficiency Developments of Public Buildings:** Under the KEHOP (Environment and Energy Efficiency Operational) Programme, an energy renovation project was implemented for a building located in Mindszent Square, Miskolc. The planned renovations included insulating facade walls, replacing windows, and insulating the roof. The energy classification of the building was improved from "EE" to "A++". **Energy Renovation of the Miskolc Building of the Borsod-Abaúj-Zemplén County Disaster Management Directorate:** This project aims to reduce energy consumption by increasing energy efficiency. It includes utilizing renewable energy sources and planning for economical operation. The project contributes to reducing environmental impact and supports sustainable operation "A++".
POTENTIALITY OF THE DIGITAL TOOLS	

• TET used during feasibility and design • Public-facing visualization of energy savings via dashboard
EXPECTED OUTPUTS
3 energy efficient public (government) buildings, with minimum "DD" rating. **Key expected outputs:** **Technical:** Insulation, HVAC upgrades, solar panels, lighting modernization, building renovation, accessibility improvements **Environmental:** Reduced energy use and emissions, more renewable energy use, better indoor climate **Social:** Greater accessibility, comfort, awareness, possible local employment **Institutional:** Better public infrastructure, enhanced reputation, regulatory compliance
EXPECTED OUTCOMES
There are several positive expected outcomes can be identified in many different fields as follows: **Energy Savings:** Lower energy use, reduced costs **Emission Reductions:** Decreased CO_2 and other greenhouse gases, increased use of renewable energy **Improved Comfort:** Better indoor climate for occupants **Deepened social aspects:** accessibility, support for vulnerable visitors **Reduced Operating Costs:** Less frequent repairs and efficient operation **Economic Benefits:** Local job creation and business support **Leadership and Awareness:** Sets example for community and other public bodies **Regulatory Compliance:** Meets EU/Hungarian energy renovation obligations **Increased Property Value:** Improved asset durability and worth
MONITORING SYSTEM
The outputs and outcomes will be monitored according to the funding criteria/indicators achieved that are provided by the funding programme.

Governance and Participation

The LAP adopts a strengthened cross-sector, multi-level governance model involving:

- Municipalities
- BORA 94 and B-A-Z County Self-Government
- Community Energy Bank Association
- NGOs and social service partners
- Citizens through JETA and digital tools

The participatory planning and engagement strategy of the LAP is fully integrated with JETforCE Work Package 1 (WP1), which inter alia focuses on engaging local stakeholders in e.g. the development of the JETforCE handbook, as well as the joint strategy and local action plan-building process, mainly involving the local JETA members and the Digital Ambassadors, to ensure transparency and alignment of expectations.

The LAP embeds long-term coordination within the broader JETforCE governance architecture through horizontal governance links between energy, mobility, and social care services.

Governance tools:

- REC Steering Committee with Digital Ambassadors

- Peer-learning programmes between municipalities
- Youth and school participation in energy education
- Project Management Office (PMO) for each of the planned key actions for day-to-day coordination and communication
- Specific monitoring & reporting tools for transparency and continuous improvement
- JETforCE Capacity Building Toolkit for skills development and stakeholder engagement
- Community Engagement with the support of the Challenge Mapping Tool for maintaining public support and participation
- Periodic Plan Review for adaptation and strategic updates

Participatory methods:

- Challenge Mapping Tool used as a continuous stakeholder feedback and problem-reporting tool
- Technology Evaluation Tool (TET) mandatory for every investment decision and feasibility assessment
- Annual Just Transition Community Forum upgraded with thematic workshops
- Co-design workshops for REC development and renovation plans
- Youth Energy Ambassadors programme added

Financing and Business Models

The LAP adopts a diversified funding strategy to match the specific needs of its three key project types.

Funding Mix for the planned actions:

- ELENA Programme (technical assistance for REC pipelines)
- Competitive Districts Program (EV)
- National programmes for building renovation

New Financial Innovation Measures

- Introduction of a “Revolving Local Energy Fund” reinvesting REC savings into new community energy projects
- Development of cooperative and citizen-ownership schemes (e.g., community shares, citizen bonds)
- Hybrid cooperative–municipal REC business model combining public ownership with social enterprise functions
- Blended finance combining grants, loans, and private contributions

Risk Mitigation

- Diversified funding sources
- Phased implementation
- De-risking instruments under InvestEU

Integrated Implementation Roadmap

The LAP of BORA 94 follows a phased timeline, balancing short-term readiness with long-term transformation.

A stylized Gantt chart visualize the timelines according to each key action planned schedule, showing parallel tracks for each key action as follows:

The LAP aligns closely with existing municipal and regional planning frameworks, ensuring institutional coherence and strategic integration.

All three key actions are in line with the local/regional development plans of the affected organizations.

Justice, Policy Coherence and Future Pathways

Distributive justice concerns the fair allocation of resources, benefits, and burdens within society. In the context of renewable energy projects, EV purchases, and energy renovations, this means ensuring that the benefits of these initiatives are equitably shared among all groups, particularly those who are historically marginalized or underserved.

Procedural justice focuses on fairness in the processes that lead to decisions. It emphasizes transparency, inclusiveness, accountability, and equal participation in decision-making. For renewable energy, EV, and energy renovation projects, procedural justice ensures that all stakeholders—especially marginalized communities—are meaningfully involved in the design, implementation, and governance of these initiatives.

Recognitional justice focuses on the acknowledgment and respect for the identities, experiences, and contributions of different groups, especially those who have been historically marginalized. In the context of sustainable energy transitions, it ensures that the needs and rights of disadvantaged groups are recognized and respected in the development and implementation of these initiatives.

In summary, the three planned key actions serve these 3 justice principles in the following ways:

Distributive Justice:

- Fair distribution of energy savings and benefits
- Reduced energy poverty through municipal cost savings

Procedural Justice:

- Citizen participation through digital tools and workshops
- Transparent governance structures

Recognitional Justice:

- Prioritization of coal-transition communities
- Inclusion of elderly, disabled, and energy-poor populations

The LAP of BORA 94 directly addresses local inequalities by prioritizing actions that all serve mainly public interest. RECs allow residents, small businesses and other local institutions, organizations to access affordable clean energy. The current LAP is prepared to expand its range of action in many directions:

Broader REC membership

- Additional EVs for social or community transport
- Replication of renovation model to more buildings

The following clear measurable indicators can be applied for distributive, procedural and recognitional justice:

- Number of vulnerable households benefiting indirectly from REC
- Accessibility improvements in renovated buildings
- Participation levels in citizen workshops and Challenge Mapping
- Number of youth/students involved in energy education

The LAP has a strong focus on energy poverty, because it takes into consideration the following aspects:

- REC savings are earmarked for reducing municipal energy poverty
- Targeted participation schemes will be made available for low-income municipalities
- Social service providers will be involved in LAP steering structures

The LAP strengthens social innovation and community participation, deepens integration of digital tools for monitoring and decision-making, enhances cross-sector cooperation between energy, mobility, and social services, improves financial sustainability through revolving funds and cooperative ownership and it includes measurable justice indicators ensuring that the energy transition remains fair and inclusive. By this, the LAP is fully in line with the just energy transition process of B-A-Z County and the aims of the JETforCE project.

A3.2.2 Metropolitan City of Bologna - Italy

Purpose and Strategic Alignment

The LAP of the Metropolitan City of Bologna (MCBO) aims to ensure a fair, inclusive, and sustainable energy transition by integrating environmental innovation with social equity and territorial cohesion. Its objectives focus on empowering local communities through Renewable Energy Communities (REC), on enhancing energy efficiency in public infrastructure within inner areas municipalities (STAMI), and on agrivoltaic (APV) models for farmers' income integration.

More specifically, the LAP is devoted on one hand to frame the conditions for the three chosen pilots to be effectively applied in the MCBO area, to depict the multi-level institutional scenario capable to endorse them, and to explain how they can help the Strategy in its paramount objective of achieving a just energy transition.

On the other hand, the LAP serves as a mechanism for the optimal integration and utilization of the two project instruments, the GloCha Challenge Mapping Platform and the Technology Evaluation Tool, within the implementation of the pilots, ensuring alignment with the JETforCE strategy.

As a matter of fact, The LAP supports ecological and digital transitions while addressing energy poverty and demographic decline, and aligns clean energy generation with agricultural preservation and rural development. By leveraging bottom-up, place-based solutions, the LAP promotes energy self-sufficiency, environmental resilience, and social inclusion.

Embedded within a broader regional and EU framework and from the perspective of a facilitating institution, which can develop and spread the issue of just energy transition through public opinion campaigns, dissemination tools and participation to EU cooperation projects, MCBO's strategy seeks to turn the energy transition into an opportunity for regeneration, equity, and innovation at the local level.

The LAP of the MCBO aligns closely with the priorities of the JETforCE strategy and broader EU and national decarbonization frameworks translating the principles of a just energy transition into concrete, locally tailored actions. Anchored in the European Green Deal's call for fairness, participation, and territorial equity, the LAP operationalizes EU directives - such as RED III, the Energy Efficiency Directive, and the cohesion-oriented Policy Objective 5 - through three mutually reinforcing pilot initiatives.

Promoting RECs, the LAP advances energy democracy, tackling energy poverty, and embedding cooperation among citizens, SMEs, and public institutions. This approach echoes EU legislation (RED III, free access to the grid) and regional strategies, and is backed by structured governance. Second, the LAP fosters agrivoltaics as a dual-use model for clean power and agricultural resilience, combining renewable energy deployment with farm productivity in line with the Farm to Fork Strategy, CAP 2023–27, and national APV incentives, while safeguarding rural identity and creating equitable economic returns. Third, targeted energy-efficiency upgrades in mountain and inner areas integrate climate action with social cohesion, in line with the EU Cohesion Policy's territorial approach, improving public services and resilience for underserved communities.

In each domain, the LAP leverages the use of JETforCE's digital tools, i.e. the GloCha Challenge Mapping and Technology Evaluation Tool, to ensure interventions are participatory, evidence-based, and justice-oriented. Far from isolated experiments, these pilots are embedded in a multi-level governance framework that channels EU and national mandates into locally owned, impactful projects. This integration not only accelerates decarbonization but also reinforces social inclusion, demonstrating how regional strategies can pragmatically deliver European climate policy in diverse territorial contexts.

The LAP addresses systemic challenges by coupling decarbonization with social equity and local economic revitalization. In inner and mountain areas, STAMI projects improve public infrastructure efficiency, reduce energy costs, and enhance community services, directly countering energy poverty and demographic decline. RECs democratize energy production, enabling households, SMEs, and institutions to co-own renewable generation and reinvest benefits locally, thus fostering participation and resilience. Agrivoltaic initiatives integrate clean power generation with agricultural productivity, protecting rural incomes and territorial identity while easing land-use conflicts. Across these key-actions, accessible technologies, targeted training, and participatory governance, reinforced by JETforCE's digital tools, ensure interventions are evidence-based, inclusive, and tailored to local contexts. By aligning climate action with economic opportunity and community empowerment, the LAP ensures the energy transition strengthens, rather than destabilizes, livelihoods, making it sustainable, socially fair, and economically robust.

Key Actions and Pilot Initiatives

While being a leading place for innovation and sustainability in Italy and Europe, the MCBO area displays internal disparities that challenge the fairness of its energy transition. Its mountain municipalities, particularly in the Apennine area, remain structurally disadvantaged in terms of per-capita income, business vitality, and population renewal. These territories are more rural, more fragile, and less integrated into the green and digital transformation processes that define Bologna's urban core. The LAP thus prioritizes three key actions (RECs, agrivoltaics, and energy efficiency in the Apennines) not only for their environmental value but for their transformative social and economic potential in these lagging areas.

RECs represent a bottom-up solution to democratize energy production and consumption. By allowing citizens, SMEs, and public actors to co-produce and share renewable electricity, RECs build local energy sovereignty, reinvest savings into community projects, and mitigate energy poverty. Their cooperative model fosters inclusion and participation, both key principles of a just transition.

Agrivoltaic, align energy generation with agricultural productivity, providing rural communities with additional income streams and reducing land-use conflicts. This dual-use innovation supports the Apennine area's traditional agricultural identity while integrating it into the green economy.

Energy efficiency in mountain municipalities, target public infrastructure like schools, sport facilities, and public lighting. These actions reduce energy bills for local governments, lower emissions, and enhance living standards. In remote, ageing, and sparsely populated villages, such improvements are crucial to reversing marginalization and attracting new residents or businesses.

Together, these three actions articulate a coherent response to the dual imperative of decarbonization and territorial equity. They combine environmental sustainability with economic regeneration and community empowerment, placing justice at the heart of the Metropolitan City of Bologna's territory transition pathway.

Key action #1: Renewable Energy Communities

PURPOSE AND IMPLEMENTATION	
Objectives	Renewable Energy Communities seek to democratize and green energy production and consumption, empowering citizens, businesses, and public entities to become active players in the energy transition. By fostering local solidarity and cooperation, they reduce dependence on external energy sources, promote environmental sustainability, and generate shared economic and social value. Through collective ownership and management of renewable resources, they strengthen resilience, innovation, and community well-being
Beneficiaries/ Targets	Households and individuals, SMEs, local bodies, parishes, local associations
Key activities	Developing, owning, and managing renewable energy installations; producing, storing, and sharing clean energy; promoting energy efficiency; providing training and awareness; facilitating collective investments; fostering local partnerships; and reinvesting benefits into social, environmental, and economic initiatives for the community
Justice aspects	Democratizing energy production and consumption; mitigating energy poverty by ensuring fair access to clean energy; fostering cooperation and sharing among citizens, businesses, and institutions; empowering local actors to participate in decision-making; promoting social inclusion and equitable benefits within the local community
INSTITUTIONS/ORGANIZATIONS INVOLVED AND ROLE IN THE PROJECT	
Emilia-Romagna Regional Gov.	Fostering RECs with laws, grants, EU funds (ERDF, ESF), technical support, training, awareness actions, mapping of public assets, and permanent coordination bodies to accelerate a just and sustainable energy transition. More precisely: • financing start-up and implementation via Public tender for the support to RECs development (2024) and ERDF funds • supporting training and capacity-building via ESF • providing technical assistance, information, and REC registry management • operating a permanent technical working group for policy, best practice, and grid issues

	By Dec 2024, Emilia-Romagna counted 129 RECs: 69 in design, 56 constituted, 4 operational (six month later they reached 19), with 52.5 MW planned to power 52,700 homes. Since 2022, €3.5 M funded 71 creation and 27 plant projects, plus loans up to €2 M at 70% of eligible costs for cooperative RECs.
Metropolitan City of Bologna	Promoting RECs as a facilitator, offering information, training, and networking, integrating REC themes into strategic plans, and fostering collaboration among local actors, with no direct financing. More precisely: • supporting the organization of REC-focused webinars, labs, and events for SMEs • promoting REC concepts in the Metropolitan Sustainable Development Agenda • facilitating networking between institutions, businesses, and stakeholders • encouraging integration of CERs in local energy and climate strategies Currently, one REC is established in the MCBO territory and other ten are at different levels of designing
NORMS, LEGAL PROVISIONS	
EU framework	• Directive EU 2018/2001 on the promotion of the use of energy from renewable sources (RED II) • Directive EU 2019/944 on common rules for the internal market for electricity and fair access to the grid • Directive EU 2023/2413, amending Directive 2018/2001, (RED III)
National framework	• D.Lgs. 199/2021 Articulates REC definitions and governance implementing Dir. EU RED III • ARERA Resolution 727/2022 and Resolution 15/2024 setting operational rules through the Integrated Law on Decentralized Self-Consumption (TIAD) • NRP funds up to 40% grants for RECs investments, open to municipalities <50,000 pop • D.M. 127/2025 simplifying the access and broadening beneficiary eligibility forRECs
Regional framework	• Regional Law No. 5/2022: defining RECs, objectives, and measures for promotion and support. • Financing from set-up to plant construction and storage, with €12 M from ERDF; training strengthened via ESF+ • Annual reporting of energy performance for each REC (Regional REC Registry) • Permanent Technical Table (Advisory body including Region, local authorities, associations, ENEA, ER clusters) • Regional Energy Plan (PER): updated integrating REC development
POTENTIALITY OF THE DIGITAL TOOLS	
JETFORCE's GloCha challenge mapping platform can support the Metropolitan City of Bologna in promoting RECs by systematically identifying local energy transition challenges, such as regulatory gaps, stakeholder coordination needs, or technology adoption barriers. It can map these against potential solutions, partners, and funding sources, creating a clear action roadmap. The Technology Evaluation Tool can then assess candidate REC technologies—such as PV generation, storage systems, and digital energy-sharing platforms—on technical, economic, and environmental performance. Combined, these tools enable evidence-based planning, prioritize the most impactful REC initiatives, align them with EU	

and regional policies, and strengthen stakeholder engagement, ensuring RECs are deployed efficiently and deliver on just energy transition goals
EXPECTED OUTPUTS
15-20 RECs operational within 2035 in the MCBO territory (55 municipalities)
EXPECTED OUTCOMES
10 MW installed for a production of 13.5 GWh per year, for a total revenue of €1.7 million/year (from shared energy incentive and energy surplus sales) to be used to reduce energy costs for low-income members and to finance environmental and social projects. Participation of 400-500 members of different kinds
MONITORING SYSTEM
Receiving information from the official monitoring systems of Region Emilia-Romagna 8for instance the Regional REC Registry once activated)

Key action #2: Agrivoltaic

PURPOSE AND IMPLEMENTATION	
Objectives	Delivering reliable rural income and ease land-use conflicts by combining solar generation with productive farming. Agrivoltaics (APV) preserves and upgrades agricultural activity through elevated or spaced modules, precision-agriculture tools, and mandated monitoring of yields, water use, soil fertility and microclimate, while ensuring at least 70% of land remains farmed. The result is local clean energy, resilient crops, and stronger rural economies
Beneficiaries/ Targets	Farmers and agricultural companies, temporary business association with at least one agricultural operator
Key activities	Designing and implementing agrivoltaic systems involves installing elevated or adjustable photovoltaic structures over cultivated land, conducting experimental crop trials, and applying precision monitoring for yields, water use, and soil health. Activities also include farmer training, awareness campaigns, policy engagement, financing and infrastructure development, and fostering partnerships among agricultural, research, and energy stakeholders to scale adoption
Justice aspects	Agrivoltaics advances a JET by coupling clean power generation with the preservation of agricultural livelihoods, ensuring rural communities share in economic gains. By integrating food and energy production, it fosters equitable access to benefits, supports local identity, and mitigates land-use conflicts, aligning decarbonization goals with social inclusion, territorial cohesion, and environmental stewardship
INSTITUTIONS/ORGANIZATIONS INVOLVED AND ROLE IN THE PROJECT	
Emilia-Romagna Regional Gov.	The Region frames agrivoltaics as a pillar of its energy transition, coupling renewables with agricultural competitiveness. It acts through

	regional laws, funding, research partnerships, and pilot projects to scale high-quality, farmer-centred APV. Namely: • PR ERDF (2021-27): funds R&D and pilots (e.g., AGRIVOLT-ER) integrating cultivation, IoT monitoring and energy communities within the Region's decarbonisation agenda • PR EAFRD/CAP 2023-27 (CoPSR) supports farm innovation, climate adaptation and sustainability pathways into which APV projects can align • Research pact 2025 among the Regional Administration, University of Bologna, Catholic University of Milan (established in Piacenza) and the Italian Sustainable Agrivoltaics Association to co-develop evidence, agronomic trials and design guidance
Metropolitan City of Bologna	MCBO advances agrivoltaics by convening actors and spreading practical know-how. More specifically: • stakeholder convening & capacity-building (public meetings gathering municipalities, farmers, businesses and citizens to discuss just transition, agrivoltaics and community financing) • mobilizing advisors to spread information on potential energy-community pathways and the opportunity to host agrivoltaic pilots • patronizing pilots & knowledge transfer (e.g., AGRIVOLT-ER; ERRE) to inform farms on dual-use designs • hosting and supporting University of Bologna/CNR's trials on APV technologies in MCBO's territory
NORMS, LEGAL PROVISIONS	
EU framework	• European Green Deal and Farm to Fork strategies both orient agriculture-energy integration • Directives EU 2018/2001 (RED II) and EU 2023/2413 (RED III) guide national transposition for RES in agriculture, underpinning APV authorisations and support • RRF/NextGenerationEU incentives APV through NRP • CAP 2023-27/EAFRD supports farm innovation, climate adaptation and rural investments aligned with APV • ERDF/Interreg Europe supports transnational cooperation and pilot funding for APV policy learning
National framework	• National Integrated Plan for Energy and Climate (PNIEC) 2030 frames renewable expansion including APV • D.Lgs. 199/2021 receiving and transposing RED II • Decree-Law 77/2021 introduces a regulatory definition of APV plants, recognising their dual-use specificities • Ministry of Environment and Energy Safety's Decree 436/2023 ("DM Agrivoltaico") establishes the incentive scheme and identifies GSE as manager of related procedures • NRP (Mission 2, Component 2, Investment 1.1) sets the APV target (≥1.04 GW by June 2026) and financing (up to 40% capex + tariff for APV) • National guidelines by RSE/CREA/ENEA, defining "advanced/ innovative" APV

Regional framework	• Regional Energy Plan (PER, last update 2022) and Jobs & Climate Pact (2020), guiding renewables deployment • Legislative Assembly Resolution n. 125/2023 sets localisation criteria to expand PV while protecting farmland and landscape, referencing advanced APV solutions • PR ERDF 2021-27 and PR EAFRD/CAP 2023-27 to address and direct EU financing in the regional territory (see *supra*)
POTENTIALITY OF THE DIGITAL TOOLS	
The GloCha Challenge Mapping could gather reports from farmers, workers and residents on concrete APV issues (grazing access, crop shading, tenancy conflicts, grid bottlenecks, heat-stress) while the data model highlights impacts on vulnerable groups. These inputs become a citizen brief to steer siting and design. The Technology Evaluation Tool can be used to test candidate APV layouts with weighted questions on socio-procedural justice, energy and costs, producing a kind of cost-benefit/impact report. MCBO can suggest to prioritise projects that cut farm energy burdens, embed local ownership, protect soils and create decent jobs, and use the same tool for procurement and ex-post checks	
EXPECTED OUTPUTS	
Implementation of 10 new APV plants for 50 MW installed within 2035 in the MCBO territory (55 municipalities)	
EXPECTED OUTCOMES	
Production of 62.5 GWh per year and 5.5 million Euros per year, which increases agricultural income for farmers of at least 30%	
MONITORING SYSTEM	
Information extracted from GSE on the evolution of APV plants in MCBO territory	

Key action #3: Energy efficiency in the inner and mountain areas

PURPOSE AND IMPLEMENTATION	
Objectives	Improving the quality of life in small and remote communities through the enhancement, regeneration and creation of recreational, cultural and leisure infrastructures; advancing the ecological transition via energy-efficiency, renewable energy and environmental improvement projects; fostering inclusion, strengthening local economies, and promoting the digital transition to ensure resilient, attractive and sustainable mountain and inner areas
Beneficiaries/ Targets	Three municipalities of the Bologna Apennines and their communities
Key activities	Within the Strategy designed by and involving 15 municipalities of the Metropolitan City of Bologna Apennines, three projects deal directly with the issue of energy transition: one aimed to increase the energy self-sufficiency of schools in Monghidoro, and two related to energy efficiency of public lighting in the municipalities of Vergato and Marzabotto. Together with other projects supporting indirectly the reduction in GHG emissions through the support to slow-tourism and sustainable mobility, the strategy pursue social inclusion and the regeneration of mountain communities

Justice aspects	Targeted, community-driven interventions ensuring that the shift to sustainable energy benefits all, addressing specific local needs, reducing inequalities, and providing fair access to efficiency improvements, renewable energy, and public services across the Bologna Apennines' mountain communities
INSTITUTIONS/ORGANIZATIONS INVOLVED AND ROLE IN THE PROJECT	
Emilia-Romagna Region	Managing body and responsible for monitoring. Funder of 88% of the total costs of intervention, through the ERDF and the ESF+ funds
15 Municipalities of the province of Bologna	Planners of the common strategy, funders of 12% of the total costs of intervention through municipal budget financing, proposer and implementer of the actions
Metropolitan City of Bologna	Facilitator and technical assistance provider, networking
NORMS, LEGAL PROVISIONS	
EU framework	The STAMI strategy is deeply rooted in the EU's Cohesion policy, channelling European resources into local transformation. More specifically: • Key EU Priorities. Actions align with the European Green Deal (energy efficiency, renewables, ecological transition), the Digital Decade (digital infrastructures, skills), and the Social Pillar (inclusion, education, community services), and adopt a targeted territorial approach, in line with EU objectives of territorial cohesion and reduction of disparities • Framework & Funding Sources. STAMI is implemented under the EU Cohesion Policy, particularly Policy Objective 5 ("Europe closer to citizens"), targeting sustainable, integrated territorial development, and it operates through the Integrated Territorial Investments (ITI), a EU ruling device enabling multi-fund interventions combining ERDF and ESF+ allocations with local co-financing
National framework	The STAMI strategy in Emilia-Romagna is rationally embedded in the national Inner areas strategy (SNAI). As a matter of facts, the territory is officially recognized as on of the nine Inner Area of Emilia-Romagna, albeit not funded by the National strategy, which funds directly just six of them. • It operates within SNAI, Italy's long-term policy for strengthening remote and marginal territories • STAMI combines national SNAI guidelines and objectives with EU Cohesion Policy, under PR FESR, PR FSE+, National Development and Cohesion Fund 2021–2027, ensuring coordinated action between local municipalities, the Region, national institutions, and European bodies
Regional framework	STAMI originates from Emilia-Romagna's regional planning, translating long-term development visions into targeted actions for mountain and inner areas. • Conceived within the Regional Strategic Document 2021–2027, STAMI responds to the Jobs & Climate Pact 2020 (sustainability, inclusion, and innovation as pillars of territorial development) • Established by DGR n. 1635/2021 (and subsequent DGR n. 2100/2022), which approved the overall STAMI program under the 2021–2027 EU Cohesion Policy framework. • The specific strategy and action plan for the Bologna Apennines were adopted through DGR n. 1015/2024, defining interventions, eligible municipalities, and resource allocation

POTENTIALITY OF THE DIGITAL TOOLS
Integrating JETforCE's GloCha Challenge Mapping platform and Technology Evaluation Tool into the Bologna Apennine STAMI can make its energy measures a driver of *just* transition. The Challenge Mapping tool can empower residents, especially vulnerable groups, to report local energy issues, ensuring that the strategy's actions - such as energy retrofitting, public lighting upgrades, and renewable deployment - are aligned with community needs and avoid negative impacts. The Technology Evaluation Tool can then be used to assess the proposed solutions against socio-economic fairness criteria, emphasising the interventions that maximize benefits for the STAMI area while optimizing costs and energy gains. Together, these instruments would embed inclusiveness, transparency, and evidence-based decision-making into STAMI, transforming it into a participatory and equitable energy transition model for the Apennines
EXPECTED OUTPUTS
Final implementation of the three energy related projects within June 2027
EXPECTED OUTCOMES
The three project should allow energy savings for 114 MWh per year, generating savings for 35,000 euros per year and a reduction in CO2 emissions of 105 kg eq. per year
MONITORING SYSTEM
STAMI provides for the monitoring of impacts through indicators by individual implementers with the coordination of the technical assistance body, which in Bologna Apennine is the MCBO

Governance and Participation

The present LAP is grounded in a collaborative, multi-level governance model in which stakeholders assume complementary and reinforcing functions. The MCBO facilitates stakeholder networks and integrates LAP actions into broader climate and development strategies. Local municipalities, particularly in the Apennine area, identify community needs, co-design place-based interventions, and co-finance projects alongside regional and national funds. Civil society organizations, cooperatives, and associations lead citizen engagement for RECs, fostering participation, capacity-building, and fair benefit-sharing. Agricultural stakeholders, including farmers' associations and individual farm owners, are pivotal to agrivoltaic actions, aligning clean energy production with agricultural productivity. The Emilia-Romagna Region ensures regulatory coherence, channels EU funded resources, and provides information and assistance. Private actors, notably SMEs, farms and technology providers, contribute through innovation, infrastructure development, and service delivery, ensuring that local projects meet both technical and social objectives.

The participatory planning and engagement strategy of the LAP is fully integrated with JETforCE Work Package 1 (WP1), which focuses on building transnational tools and capacities for a just energy transition. Central to this approach is the Just Energy Transition Alliance (JETA) model, the local and transnational stakeholder networks co-developed to co-design, test, and evaluate solutions. JETforCE projects is committed to promote inclusive governance through structured engagement with local authorities, civil society, SMEs, and especially youth via Digital Ambassadors. These ambassadors act as mediators between digital tools and communities, ensuring accessibility for all, including vulnerable groups. The participatory process includes workshops, online forums, and hybrid events, fostering co-creation and trust. T-JETA platform, coordinated by the MCBO, amplifies this by linking regional action with transnational dialogue. Together, these mechanisms ensure that energy transition measures reflect real local needs, strengthen digital and democratic engagement, and

translate into socially embedded policies. This inclusive and iterative engagement structure is both a response to and a driver of systemic change.

The LAP embeds long-term coordination within the broader JETforCE governance architecture by leveraging both local alliances and transnational networks. At the heart of this is the Just Energy Transition Alliance (JETA), which ensures continued stakeholder involvement through structured engagement processes, regular updates, and capacity-building activities. The Transnational JETA (T-JETA), coordinated by MCBO itself, serves as a platform for cross-regional learning and policy alignment, sustaining collaboration beyond project cycles. Digital Ambassadors act as permanent liaisons, anchoring community voices in planning and monitoring. Tools like the Challenge Mapping platform, designed for continuous citizen input, further institutionalize participatory feedback loops. Moreover, the integration of WP1 findings into WP2 and WP3 activities strengthens multi-level coherence and ensures that local implementation remains aligned with evolving European and national strategies. This layered, adaptive governance model provides continuity, responsiveness, and legitimacy—key ingredients for embedding justice and inclusivity in the long-term transition process.

Financing and Business Models

The LAP adopts a diversified funding strategy to match the specific needs of its three key project types (RECs, agrivoltaic systems, and energy efficiency in mountain municipalities). Public grants, especially from EU cohesion funds like ERDF, are crucial to support energy retrofitting and infrastructure upgrades in the Apennines, where local fiscal capacity is limited. RECs, benefit from a blended model: initial public support for technical assistance and plant installation is paired with citizen and SME investments, incentivized through cooperative models and shared returns. Agrivoltaic projects, typically involving entrepreneurial farms, leverage private capital and bank loans, but are supported by regional schemes and national green incentives to reduce risk and enable scalability. The plan promotes alignment with JETforCE's cost-benefit tools to ensure efficient use of resources and attract mission-oriented finance. It also encourages dialogue with financial institutions to design tailored instruments for just transition goals. By matching project types with appropriate financial tools, the strategy ensures viability, equity, and long-term impact.

The long-term economic sustainability of the LAP's core actions is ensured by aligning environmental goals with durable value creation. RECs are designed to reinvest revenues from energy production into local welfare and infrastructure, fostering a circular economic model based on collective benefit. Agrivoltaic systems, already piloted in farms across the Bologna province, offer farmers a steady income diversification stream while preserving agricultural productivity, reducing land-use conflict, and improving energy autonomy. Energy efficiency projects in the Apennines, though heavily reliant on public funding at the outset, generate long-term savings for small municipalities by lowering operational costs and reducing vulnerability to energy price volatility. The integration of digital monitoring tools, promoted by JETforCE, helps optimize performance and identify areas for reinvestment. Overall, the economic model underlying these actions prioritizes low operating costs, community resilience, and reinvestment of benefits, ensuring that initial investments lead to lasting, self-reinforcing returns. This approach enhances both financial viability and territorial cohesion over time.

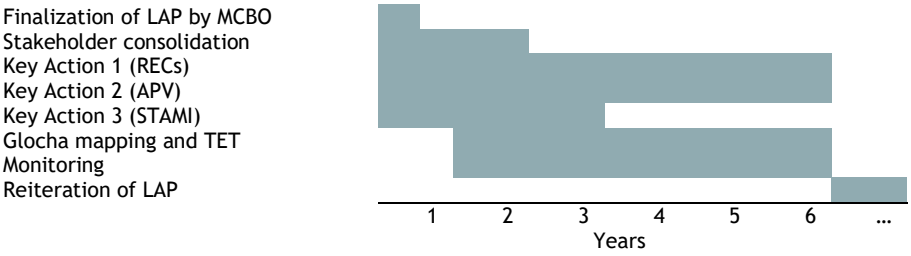
Integrated Implementation Roadmap

The LAP of the MCBO follows a phased timeline, balancing short-term readiness with long-term transformation. In the short term (Year 1–2), the focus is on finalizing feasibility studies, stakeholder consolidation, launching key-actions on RECs and APV.

In the medium term (Year 2–4), agrivoltaic systems will be scaled up, supported by private co-financing and regional incentives. Simultaneously, the STAMI-led energy efficiency upgrades in the Apennines will be completed, generating the expected results in terms of energy savings and CO2 reduction.

In the long term (Year 4–6+), efforts shift toward replication and mainstreaming: expanding RECs to new municipalities, integrating APV into rural policy, and embedding efficiency standards into local planning. Cross-cutting actions like digital monitoring, citizen engagement, and fund alignment will continue throughout.

For clarity, a stylized Gantt chart can visualize this sequence, showing parallel tracks for each key action, anchored by milestones such as Key action completion, investment rounds, and policy integration. This phased approach ensures steady impact while allowing for adaptive learning and scale-up.



The LAP associates closely with existing municipal and regional planning frameworks, ensuring institutional coherence and strategic integration.

At the regional level, the LAP aligns with a wide set of strategic and planning instruments that shape the region's sustainable development agenda. These include the Regional Energy Plan (PER) and the Jobs & Climate Pact, which frame decarbonisation, innovation, and social inclusion as pillars of territorial growth; Regional Law No. 5/2022 on RECs' promotion and support, funded through the PR ERDF 2021-2027, and the PR EAFRD/CAP 2023–2027, supporting climate adaptation in agriculture and sustainable rural development. The LAP also reflects the orientations set by the Regional Strategic Document 2021–2027 and the legislative resolutions guiding the localisation of agrivoltaic plants, ensuring landscape protection and farmland preservation. By embedding these complementary strategies, the LAP ensures coherence across energy transition goals, territorial cohesion policies, and socio-economic development priorities in Emilia-Romagna.

All key actions mirror goals set in municipal Sustainable Energy and Climate Action Plans (SECAPs), signed by 54 out of 55 municipalities of the MCBO. Agrivoltaic projects are consistent with rural development strategies and land-use planning, promoting multi-functional land management.

Moreover, the LAP leverages the STAMI framework, actually the application of the National Strategy for Inner Areas in the MCBO territory, thus ensuring that energy interventions support broader social inclusion and demographic renewal goals.

This alignment allows for complementarity in funding, reduces policy fragmentation, and enhances the long-term effectiveness of just transition efforts.

The LAP is formalized by the MCBO, which will assume a coordinating role in its implementation. As institutional leader, the MCBO ensures strategic oversight, alignment with regional and EU frameworks, and interdepartmental coordination across environment, energy, and territorial planning sectors. The MCBO assumes a central role in the STAMI, serving as technical and institutional assistance for the partnership of the implementing municipalities, while contributing in REC and APV activities through the provision of information,

the organization of public consultations, and the hosting of workshops and webinars aimed at enabling stakeholders and potential participants.

Local municipalities, especially those in the Apennine area, are responsible for implementing energy efficiency interventions, with technical and financial support from the region and EU funds, and participate in the establishment of RECs playing the dual role of facilitators of relationships for the creation of partnerships and of effective member of the partnership itself.

The Emilia-Romagna Region acts as a key co-financer and policy enabler, particularly for agrivoltaic and territorial cohesion initiatives, but plays a leading role in management and monitoring of the key actions, as well.

Stakeholder engagement will be maintained through the existing JETA structure, ensuring continuity, transparency, and bottom-up participation.

The endorsement by the Metropolitan City gives the LAP formal legitimacy and lays the foundation for durable governance, cross-sector collaboration, and future funding access.

Justice, Policy Coherence and Future Pathways

The LAP embeds distributive, procedural, and recognitional justice by ensuring that energy benefits reach historically disadvantaged rural and mountain communities. Resources are allocated to reduce disparities in infrastructure and access, especially through energy retrofits and inclusive REC models.

Participation is institutionalized via local JETAs and Digital Ambassadors, enabling communities to shape decisions that affect them. Recognitional justice is addressed by tailoring interventions—like agrivoltaics—to local identities, acknowledging the cultural and economic distinctiveness of farming and inner areas. These principles are not abstract goals but operational criteria guiding project design, implementation, and monitoring across the LAP's full lifecycle.

The LAP of the MCBO directly addresses local inequalities by prioritizing actions in the Apennine municipalities, where socio-economic indicators such as income levels, business density, and demographic vitality lag behind urban areas. Vulnerable groups—including elderly populations, low-income households, and isolated rural communities—are at the core of targeted interventions. Energy efficiency upgrades in public buildings lower utility costs and improve comfort for users of essential services. RECs allow residents and small businesses to access affordable clean energy and share its economic benefits. Agrivoltaic projects offer farmers new income opportunities while preserving traditional land uses. Engagement tools such as the Challenge Mapping platform and the Digital Ambassadors program ensure that these groups are not only beneficiaries but active participants in shaping the transition. By combining infrastructural investment with social empowerment, the LAP works to reduce disparities and ensure that no one is left behind.

The current LAP is prepared to expand its range of action in many direction:

1. Deepen social targeting. LAP could integrate more granular data on energy poverty and demographic vulnerability to fine-tune interventions, particularly in inner areas. Tools like social mapping and needs-based indices can support more tailored responses.

2. Expand Cross-sector interaction. Strengthen collaboration between energy, mobility, housing, and digital agendas. For example, coupling energy efficiency with digital connectivity or low-carbon mobility can amplify impact, especially in underserved areas.

3. Strengthen monitoring & adaptive learning. Introduce a structured monitoring framework with justice-related indicators (e.g., participation rates, distribution of benefits) and create periodic review mechanisms to adapt strategies based on outcomes and community feedback.

4. Foster replicability. Encourage the institutionalisation of RECs and agrivoltaic models by creating replication toolkits, peer-to-peer networks among municipalities, and incentives for civic entrepreneurship.

5. Integrate climate adaptation. Combine mitigation actions with climate resilience planning—especially relevant for mountainous and forested areas at risk from extreme weather events.

A3.2.3 Radibor - Germany

Purpose and Strategic Alignment

The actions pursued by the municipality of Radibor (developing village-scale heating networks and, in this same context, founding an energy community) are highly coherent with the strategic architecture of the JETforCE project. The strategy frames the energy transition as both a technological shift and as a multidimensional challenge of distributive and procedural justice. Radibor's initiatives reflect this framing by combining decarbonization goals with mechanisms to guarantee citizen participation and local benefit-sharing.

The heating network project directly addresses distributive justice by offering collective-level solutions that spread costs and risks across households. It thereby protects vulnerable residents from being excluded due to high upfront investments. This corresponds closely to JETforCE's recommendation to treat energy poverty as a structural challenge and to prioritize universal accessibility to affordable clean energy. Moreover, Radibor's approach of tailoring solutions to each of its constituent villages echoes the strategy's emphasis on territorial equity: Energy systems must be place-sensitive and responsive to local socio-economic conditions rather than be imposed through top-down, one-size-fits-all models.

The founding of an energy community aligns strongly with JETforCE's focus on procedural justice and participatory governance. The strategy highlights Renewable Energy Communities (RECs) as key vehicles for democratizing energy production and embedding ownership at the local level. Radibor's plan to establish cooperative or municipal-company models mirrors the best practices identified in other European regions and converts citizens from passive consumers into active stakeholders. This inclusive governance structure also improves recognitional justice, as it acknowledges the specific needs and capacities of rural populations by granting them a voice and stake in transition projects.

Another dimension of coherence lies in financing. The JETforCE Strategy underscores the importance of equitable financing mechanisms and community-level ownership to prevent the transition from reproducing inequalities. Radibor's intention to combine national and European funding streams with cooperative investment is consistent with this principle.

Finally, Radibor's emphasis on cooperation with neighboring municipalities reflects the JETforCE call for multi-level governance and collective action. The strategy warns against governance fragmentation and advocates for participatory, decentralized structures to secure legitimacy and trust. By coordinating heat planning regionally and embedding citizen consultations, Radibor demonstrates an institutional design that fits these recommendations very well.

Key Actions and Pilot Initiatives

The municipality of Radibor is already an active driver of the energy transition in Upper Lusatia on the municipal level. Building on its recently adopted climate protection concept and supported by a dedicated climate manager, the municipality has established a clear roadmap to reduce greenhouse gas emissions and modernize its energy systems. Central to this roadmap is the recognition that the transition must be both technically and financially viable and fair, transparent, and inclusive for all residents.

A priority field of action is local heat supply, where Radibor is undertaking detailed municipal heat planning for each of the smaller villages it consists of. This planning process compares options ranging from individual heat pumps to biomass boilers and micro-district heating networks. By considering the costs and social impacts of these solutions, Radibor seeks to ensure that households are not left behind because of high upfront costs or technical barriers. This approach reflects a commitment to justice, as shared infrastructures can prevent individual households from bearing disproportionate burdens and can create community benefits.

To strengthen local ownership and trust, Radibor is exploring cooperative models for energy projects. Such structures allow residents to participate directly, both as users and as co-investors, ensuring that the value generated by renewable energy stays within the community. The municipality is also running regular public information events and open "energy consultations" to give residents clear, accessible pathways to participate, ask questions, and benefit from available subsidies.

Radibor is also building partnerships with neighboring communities such as Großdubrau and Malschwitz to jointly plan projects and coordinate funding applications. This approach increases efficiency while also guaranteeing that residents have equal opportunities to benefit from modern, climate-friendly energy systems.

Key action #1: Municipal heating network

PURPOSE AND IMPLEMENTATION	
Objectives	Establish village-scale or micro-district heating networks to provide reliable, renewable, and affordable heat while reducing greenhouse gas emissions and dependence on fossil fuels
Beneficiaries/ Targets	All residents of Radibor, both private owners and businesses
Key activities	Conduct detailed heat planning for each village; compare technical options (biomass, large-scale heat pumps, hybrid systems); assess full-cost scenarios; secure funding; pilot the implementation of local heating networks in suitable villages; and explore cooperative or municipal ownership models
Justice aspects	Ensure fair cost distribution by spreading investments across households; offer transparent information and consultation opportunities; create pathways for citizen participation and co-ownership to keep value within the community; and design collective solutions that prevent vulnerable households from being disproportionately burdened by the energy transition
INSTITUTIONS/ORGANIZATIONS INVOLVED AND ROLE IN THE PROJECT	
Municipality of Radibor	Political lead and initiator of the climate protection concept; responsible for adopting the plan, coordinating implementation, and making final decisions on possible municipal or cooperative ownership models for heating networks

SachsenEnergie (planning agency and consultancy)	Commissioned by the municipality to conduct the heat demand analyses, evaluate technology options, and calculate full-cost scenarios for local heating networks
National Climate Protection Initiative	Provides funding for the climate manager position and the initial concept phase, lowering the entry barrier for small municipalities
Citizen Groups	Target group and key stakeholders: their acceptance, participation, and potential investment are critically important for the financial and social viability of heating networks
POTENTIALITY OF THE DIGITAL TOOLS	
The Technology Evaluation Tool was already used at an earlier stage of the project to provide another data point on the viability of the project; it may be used again in the future on a case-by-case basis to evaluate smaller sub-measures (such as the mentioned micro-district heating networks which may need to be employed to provide for some particularly small and/or remote parts of the municipality). While such an automated solution of course cannot replace actual human experts, it can provide a valuable starting point for more in-depth analyses. The Challenge Mapping Tool may in the future be used as another way in which citizens can communicate their issues and concerns to the local authorities.	
EXPECTED OUTPUTS	
Completed village-level heat plans, feasibility studies for local heating networks, public information events, and a governance model (e.g. cooperative or municipal utility) prepared for (pilot) implementation	
EXPECTED OUTCOMES	
Reduced dependence on fossil fuels, lower greenhouse gas emissions, stable and affordable heating for households, and stronger community ownership of local energy infrastructure	
MONITORING SYSTEM	
Regular reporting by the climate manager to the municipal council, energy consumption and emissions tracking at municipal and village level, and ongoing citizen feedback mechanisms through public consultations and digital means such as the Challenge Mapping Tool.	

Key action #2: Renewable Energy Communities

PURPOSE AND IMPLEMENTATION	
Objectives	Establish a local energy community to enable collective ownership and management of renewable energy projects, which will make sure that financial benefits and decision-making power remain within the municipality
Beneficiaries/ Targets	All residents of Radibor, both private owners and businesses (actual benefits will depend on level of engagement with community)
Key activities	Develop a community charter; engage citizens through consultations and information sessions; define membership structures and financing mechanisms; link the community to specific projects such as solar PV on public buildings or future heating networks

Justice aspects	Guarantee broad, non-discriminatory access to membership; design fair contribution levels to include low-income households; ensure transparent governance and decision-making; and reinvest revenues locally to support equitable community development
INSTITUTIONS/ORGANIZATIONS INVOLVED AND ROLE IN THE PROJECT	
Municipality of Radibor	Political sponsor and facilitator; provides initial coordination, legal framework support, and possible use of municipal assets (e.g. roofs, land) for community projects, all mainly through climate manager
Members of the Energy Community	Core stakeholders; provide equity contributions, participate in governance, and benefit from affordable energy and dividends from projects
Regional Partners	Potential cooperation partners in scaling projects, synergies with joint heat planning and shared renewable installations
POTENTIALITY OF THE DIGITAL TOOLS	
Similarly to Key action 1, both the Technology Evaluation Tool and the Challenge Mapping Tool can be used for producing initial evaluations and for communication between various groups.	
EXPECTED OUTPUTS	
Formal establishment of the energy community, initial renewable energy projects launched, and a financing model in place for future expansion	
EXPECTED OUTCOMES	
Increased local renewable energy generation, fairer distribution of economic benefits within the community, stronger citizen participation in the energy transition, and improved local energy security	
MONITORING SYSTEM	
Annual reporting on membership growth, project performance (energy generated, CO_2 savings), and financial returns; member assemblies to review progress and ensure transparent, democratic oversight	

Governance and Participation

Radibor's engagement strategy is grounded in transparency, participation, and fairness. For the heating network, the municipality organizes public information events and ongoing energy consultations to explain technical options, costs, and funding schemes in accessible terms. In this way, it makes sure that households understand both benefits and obligations and can shape decisions on network design. For the energy community, early involvement of citizens is of particularly high importance: Open assemblies and workshops are planned to co-design cooperative models, define membership rules, and establish equitable contribution levels. In both actions, communication emphasizes to build trust and prevent resistance. Collaboration with neighbouring municipalities (Großdubrau, Malschwitz) further supports regional consistency and shared learning.

In this context, the most productive role both JETA and Digital Ambassador can take is not to actively impose themselves on an already complex process. Instead, they will focus on spreading knowledge of the approach and any lessons learned to other stakeholders in the region, which is helped by representatives of Radibor, most notably the climate protection manager, being members of the JETA. The role of the two JETforCE pilots

will be as described in the Key action tables: As a resource to be used by any local stakeholders whenever they do have a use for it.

Financing and Business Models

The financing of Radibor's heating network will rely on a blended model that combines public subsidies, cooperative capital, and external loans. Initial planning and feasibility studies are already supported by the Nationale Klimaschutzinitiative, which funds the climate manager position and the preparation of the climate concept. For the investment phase, the municipality intends to draw on European, federal and state-level grant programs dedicated to local heating networks, covering a substantial share of the upfront costs. To embed community ownership, residents will be invited to contribute capital through a cooperative structure or cost-participation agreements, thereby ensuring that citizens are not only users but also stakeholders. Where necessary, low-interest public loans, for instance from KfW, will complement grants and community capital to secure full financing. This diversified scheme reduces the financial risks for individual households and ensures that the burden of investment is shared fairly across actors.

In the long run, financial sustainability will be ensured by establishing a cooperative or municipal utility as the operator of the heating network. This entity would be responsible for producing and supplying heat from renewable sources such as biomass or large-scale heat pumps, with technologies adapted to the needs of each village. Users would pay fees that reflect real consumption, covering operational costs and servicing loans, while remaining stable and shielded from fluctuations in the larger energy market. Any surplus revenues would be reinvested locally, either in network maintenance, in upgrading efficiency, or in expanding renewable capacity. A cooperative structure would also guarantee democratic governance, giving both citizens and the municipality a say in major decisions and ensuring that value creation remains within the community. Over time, coordination with neighboring municipalities could provide further economies of scale. In this way, the business model is designed both to ensure economic viability and to embed principles of fairness, participation, and local benefit-sharing at the heart of Radibor's energy transition.

Integrated Implementation Roadmap

The heating network is currently in the planning and feasibility phase, with village-level heat planning and cost assessments already prepared. Over the next one to two years, Radibor aims to finalize technical designs, secure funding commitments from federal and state programs, and establish a cooperative or municipal utility to act as operator. Pilot implementation in one or two villages could begin shortly thereafter, with construction and commissioning roughly expected within a three- to five-year horizon. Long-term expansion to other villages will then follow based on feasibility results and community demand, in a gradual scaling across the municipality.

The founding of the energy community will proceed in parallel but on a much shorter timeline. Preparatory work, including citizen consultations and legal design of the cooperative or municipal company, is expected within the first year of LAP implementation. Initial projects, such as expanding photovoltaic systems on municipal roofs, could be launched within two years, generating early financial and social benefits. In the medium term (three to five years), the energy community will expand its portfolio to include participation in the heating network and possibly other renewable or efficiency projects.

The LAP as a whole follows a phased approach. The first stage (years one to two) focuses on planning, governance design, and pilot projects. The second stage (years three to five) emphasizes implementation of the heating network and scaling up of the energy community, alongside complementary measures such as municipal energy efficiency upgrades. Beyond year five, the LAP enters a consolidation phase, with monitoring,

optimization, and expansion of successful models to additional villages or sectors. This long-term horizon reflects the municipality's commitment to decarbonization and to embedding justice, participation, and financial sustainability in the local energy transition.

The Municipality of Radibor is the central endorsing body. Its council has the political authority to approve investment decisions and provide municipal assets (such as public land or building roofs) for project use. Endorsement by the council signals binding commitment and ensures that the projects are integrated into local planning and budgeting frameworks. The municipality will also safeguard fairness and inclusiveness in implementation, especially in setting tariff structures and governance models.

The Municipal Climate Manager, although not a political body, plays a crucial coordinating role once the LAP is endorsed. Acting under municipal authority, this position ensures continuity between planning and execution, monitors progress, and mediates between citizens, external consultants, and funding agencies.

At the regional and national level, funding and regulatory institutions such as the Saxon government and the Federal Ministry for Economic Affairs and Climate Action (BMWK) are essential. Their endorsement takes the form of approving grant applications, auditing compliance with national climate and energy legislation, and providing financial support through instruments such as the Nationale Klimaschutzinitiative.

Finally, for the energy community and heating network, endorsement will also need to come from the cooperative which will be established. This entity, once formally created and registered, will act as the legal and financial vehicle for operation, carrying forward the community's decisions in a democratic structure.

Justice, Policy Coherence and Future Pathways

The initiative put forth by the municipal government of Radibor as described in this Local Action Plan makes an explicit contribution to distributive, procedural, and recognitional justice in the energy transition. Distributive justice is advanced through both the heating network and the energy community, as these measures are aimed at a fair sharing of costs, risks, and benefits. The heating network addresses energy poverty by spreading investment across households and securing subsidies to keep tariffs affordable, while the energy community creates direct financial returns for members and reinvests revenues locally. Together, these mechanisms reduce the risk that low-income households or small villages bear disproportionate burdens, and they guarantee that the economic value of the transition remains within the municipality.

Procedural justice is supported by a strong emphasis on participation and transparency. The LAP builds on ongoing public consultations, information events, and energy consultations that give citizens the opportunity to shape project design and governance. The cooperative or municipal-company model planned for the energy community ensures democratic oversight, while the heating network planning process incorporates citizen feedback on costs and technology choices. These practices create legitimacy, strengthen trust in institutions, and ensure that decisions are not made in a top-down manner but through inclusive and accountable processes.

Recognitional justice is embedded in the LAP through sensitivity to Radibor's rural character and the socio-economic realities of its residents. Tailoring heating solutions to each individual village acknowledges the diversity of local needs, while cooperative structures explicitly recognize residents not only as consumers but as active stakeholders and co-owners. By involving neighboring municipalities, the LAP also reflects a recognition that small rural communities face structural disadvantages and can only achieve a fair transition by pooling resources and acting collectively. In this way, the Radibor initiative acknowledges and values the perspectives, identities, and constraints of those most affected by the transition.

A3.2.4 Dornava - Slovenia

Purpose and Strategic Alignment

The Local Action Plan of the Municipality of Dornava is designed as a practical tool for advancing a just energy transition at the local level. It serves as both a strategic and implementation oriented document, developed within the framework of the European project JETforCE.

The purpose of the plan is to enable a fair energy transition grounded in an inclusive, transparent and socially just approach. The rural municipality of Dornava, located in the Lower Podravje region, faces challenges such as high dependence on fossil fuels, dispersed settlement patterns, and the energy vulnerability of certain groups.

The vision is to create an energy self-sufficient, equitable and sustainable community that reduces energy poverty, strengthens local resilience and contributes to achieving national and European decarbonization goals. To realize this vision, the primary objective is to establish a feasible and financially sustainable framework that will support the gradual reduction of fossil fuel dependence and the increase in the share of renewable energy sources within the local energy balance.

The specific objectives of the plan are:

- Establish a fair, inclusive and sustainable local energy system that reduces the community's energy dependence and strengthens resilience to energy and climate challenges, in the form of an energy community through the development of a community solar power plant.
- Promote active participation of residents, particularly vulnerable groups, as well as local stakeholders in the co-management of energy measures, ensuring their empowerment in energy related decision making while simultaneously reducing energy poverty.
- Enable a long term sustainable business model based on contractual cooperation, lower energy costs and circular ownership.

The Plan is fully aligned with the objectives and priorities of the JETforCE project, which promotes a just transition towards a low carbon society by engaging local communities and strengthening their energy independence. With this document, Dornava contributes to the implementation of the European Green Deal and responds to the medium term challenges of the energy crisis triggered by the war in Ukraine, particularly by reducing imports of fossil fuels from Russia.

This alignment is reflected in the orientation of European directives that support the development of energy communities and accelerate the deployment of renewable energy sources. At the national level, the Plan contributes to the comprehensive National Energy and Climate Plan by fostering local investments in renewable energy with the support of energy communities, encouraging the sustainable use of energy in both the public and private sectors, and ensuring fair access to energy resources for all residents.

The Local Action Plan directly addresses the multifaceted systemic challenges faced by the Municipality of Dornava and the wider Lower Podravje region.

On the social dimension, it responds to energy poverty and the low level of citizen involvement in energy planning by engaging vulnerable groups, thereby strengthening social cohesion through the creation of a participatory model that includes residents, municipality and other stakeholders.

From an economic perspective, the plan encourages local investment and enhances resilience by reducing energy costs through the community power plant. The energy community also introduces an innovative business

model that enables the reinvestment of savings into further development projects, while also providing access to grants that ease the initial financial burden.

On the environmental level, the plan contributes to reducing greenhouse gas emissions, increases the share of locally produced renewable energy and strengthens the resilience of the local energy system. Local energy production decreases dependency on external sources, while at the same time promoting more sustainable land and resource use.

In this way, the Local Action Plan positions itself as a strategic document that integrates the environmental, social and economic dimensions of development, while providing long term guidance towards a just, inclusive and sustainable energy transition. By fostering decentralised production, energy efficiency and awareness raising, it simultaneously contributes to the Paris Agreement and to the Slovenia Development Strategy 2030.

Key Actions and Pilot Initiatives

The implementation of the Local Action Plan is based on targeted measures that integrate the social, economic and environmental dimensions of a just energy transition. The central focus is on designing solutions that not only reduce dependence on fossil fuels but also ensure equal participation of residents, alleviate energy poverty and strengthen local capacities.

In the Municipality of Dornava, the measures follow two key directions: establishing the organisational and legal framework for an energy community and setting up the first community solar power plant, which will serve as a flagship demonstration project. The establishment of the energy community represents the core strategic measure of the Local Action Plan for a just energy transition in Dornava. It is conceived as an innovative, sustainability-oriented approach to local energy production, consumption and management from renewable sources, going beyond traditional energy models. The energy community is grounded in the principles of cooperation, solidarity and local self-governance and enables residents to play an active role in the transition to a low carbon society. The energy community in Dornava is not merely a technical solution but also a tool to strengthen local cohesion, reduce energy poverty, increase energy security and improve quality of life. Its establishment requires an inclusive approach, careful planning and the development of organisational, legal and financial mechanisms to ensure long term operation.

These two measures represent concrete steps towards achieving a just energy transition, based on the principles of inclusiveness, transparency and social justice in line with the JETforCE project. The pilot initiatives enable decentralised production of renewable energy, reduce energy poverty and enhance local resilience. They directly put into practice the principles of a just energy transition by fostering active participation of residents, including vulnerable groups, who are able to engage without additional financial burdens, while also promoting a fair distribution of benefits such as lower energy costs and local ownership.

Support for the implementation of these measures comes from a digital tool developed within the JETforCE project. This tool allows for the assessment of investments by taking into account not only financial, but also social, economic and environmental aspects. It serves as a decision making aid, optimises the implementation of measures and ensures that the transition does not deepen inequalities but rather contributes to a sustainable and inclusive energy future.

Key action #1: Establishment of a cooperative as the main entity of the energy community

PURPOSE AND IMPLEMENTATION	
Objectives	Establish a legal and organizational framework for the operation of an energy community in the form of a cooperative, enabling the participation of the municipality, residents and other stakeholders. Democratization of the energy system, joint decision making on the energy future and the reduction of energy poverty
Beneficiaries/ Targets	Households – residents of the Municipality of Dornava The Municipality of Dornava as a co-founder Public institutions and other interested stakeholders
Key activities	Formation of an initiative group – partnership for the establishment of the cooperative. Preparation of founding documentation (deed of establishment, statutes). Formation of the cooperative's governing bodies (management board, supervisory board, cooperative president) Registration of the cooperative. Information and awareness raising among citizens and public institutions to attract membership. Preparation of a business plan and membership inclusion rules. Establishment of communication channels within the community.
Justice aspects	Equal participation of all members based on the principle of "one member – one vote," ensuring democratic governance. Development of mechanisms for the inclusion of vulnerable groups with lower financial contributions and socially adjusted membership conditions. Fair distribution of benefits (lower electricity costs) among community members.
INSTITUTIONS/ORGANIZATIONS INVOLVED AND ROLE IN THE PROJECT	
Municipality of Dornava	Main initiator and co-founder, providing initial institutional support. Ensures strategic orientation, legal framework and administrative assistance in obtaining permits. Actively contributes to citizen awareness raising through the use of local communication channels.
Citizens	Households engaged as cooperative members, contributing founding shares, which enable their participation in co-decision making and co- management at general assemblies, as well as their involvement in investments
JETA Dornava	The Alliance for a Just Energy Transition coordinates cooperation between the municipality, citizens and external advisors. It organizes information events and workshops, through digital ambassadors, ensures wider awareness raising and the inclusion of vulnerable groups.
LEA Spodnje Podravje	Professional partner acting as a coordinating body: • for establishing local partnerships and networking, • for conducting training and capacity-building,

	• for providing support in the preparation of documentation (applications, investment documentation, etc.), • for preparing studies and analyses necessary for the effective and timely implementation of the strategy and related programs or measures.
NORMS, LEGAL PROVISIONS	
EU framework	**Directive (EU) 2018/2001 (RED II)** Article 22: Renewable Energy Communities Defines the energy community as a legal entity, providing the legal framework for their recognition. **Directive (EU) 2018/2001 (RED III) (2023, pending transposition)** Strengthens energy communities through enhanced legal clarity and support for their integration into the energy system. **Directive (EU) 2019/944** Articles 2 and 16: Citizen Energy Communities Establishes common rules for the internal electricity market, setting conditions for the development of energy communities.
National framework	**Cooperatives Act (Zzad)** Defines the legal conditions for the establishment and operation of a cooperative as a democratic organization based on voluntary association for common economic, social and environmental objectives. **Renewable Energy Sources Promotion Act (ZSROVE)** Regulates the promotion of renewable energy sources and sets out the conditions for the establishment of energy communities, including their rights and obligations. **Electricity Supply Act (ZOEE)** Complements ZSROVE with more detailed provisions on consumer rights, self-supply and grid access. It represents the operational dimension of the energy community (network, tariff system, dynamics between members and the system). **National Energy and Climate Plan (NECP) – 2020 / Draft 2023** Foresees measures to support the establishment of energy communities, including financing, education and legal assistance.
Regional framework	/
POTENTIALITY OF THE DIGITAL TOOLS	
The primary objective is the digital inclusion of citizens in shaping energy policies and investments, aimed at reducing social inequalities and increasing trust in the transition. GloCha maps challenges, while the JETforCE technology/investment assessment tool evaluates solutions. **The GloCha challenge mapping platform** functions as a digital citizen engagement tool that enables reporting and analysis of challenges in the energy transition, thereby directly contributing to the easier establishment and implementation of energy communities. It focuses on citizen participation, challenge mapping and social engagement, which are crucial for cooperative formation and overcoming barriers such as energy poverty or lack of trust.	

It enables the mapping of participation through transparent data collection and the evaluation of climate transition initiatives that identify the needs of vulnerable groups, with the aim of preventing negative impacts on these groups. The energy cooperative targets inequality reduction, while GloCha explicitly assesses the impacts of the transition on these groups, leading to better policies (e.g., tailored subsidies for energy poverty).

The platform allows citizens to report specific challenges such as energy poverty (high costs for vulnerable groups) or lack of inclusion (marginalized groups without access to information). This can help in the early identification of barriers to cooperative establishment, such as unequal access to subsidies or insufficient media awareness, thereby facilitating the adaptation of policies and investments.

The JETforCE technology/investment evaluation tool also evaluates impacts on vulnerable groups, ensuring that the cooperative as the community driver includes all stakeholders (including marginalized households). This strengthens trust and legitimacy.

The tool compares scenarios and supports decision making on technologies that are both energy efficient and socially acceptable, thereby reducing risks in the establishment process.

EXPECTED OUTPUTS

The direct output of the first measure is the establishment of a cooperative as the legal and organizational framework of the energy community, which includes the preparation of the founding act, statutes, registration with the competent court and the formation of the cooperative's basic governing bodies.

The results also include the preparation of a business plan, defining financial flows, procedures for the inclusion of new members, as well as rules on responsibilities and benefits.

The expected outcome in terms of communication pathways is the establishment of regular information sharing and participation of all members (annual reporting at the general assembly).

EXPECTED OUTCOMES

Enhanced social cohesion and strengthened trust within the local community.

Positive impacts on reducing energy poverty, as vulnerable groups will be able to participate with lower financial contributions while still benefiting from reduced energy costs.

Strengthening residents' competences, as the cooperative will provide educational activities, knowledge transfer and support in energy literacy.

Indirectly, the measure will also contribute to environmental sustainability through a higher share of renewable energy sources and to the economic resilience of the local community.

A stable organizational structure of the cooperative, prepared for further investments in terms of expanding production capacities, with clearly defined rules and protocols.

MONITORING SYSTEM

The cooperative management board prepares quarterly and annual reports, which include an overview of the number of members, financial contributions and the level of participation and submits them to the general assembly for review and approval. The general assembly conducts an annual assessment of progress, including an analysis achieved objectives and proposals for strategic adjustments, thereby ensuring long term orientation. The supervisory board carries out periodic reviews of compliance with legislation and internal rules, ensuring the legal and financial stability of the cooperative. These activities constitute an internal mechanism for safeguarding proper functioning, compliance and organizational effectiveness.

The cooperative's governing bodies also follow the legislation and by laws that define reporting obligations. These activities represent an external mechanism to ensure accountability, transparency and the strengthening of trust among members and within the local community as a whole.

Key action #2: Construction of a community solar power plant

PURPOSE AND IMPLEMENTATION	
Objectives	Installation of a community solar power plant on the roof of the municipal building – infrastructure (55 kW capacity) for renewable energy production from solar sources. Enabling energy generation for self-supply of consumers (cooperative members) under a shared-use model. Reducing electricity costs for cooperative members. Increasing local energy independence and resilience to climate challenges. Reducing CO_2 emissions as a contribution to broader national and European objectives in the field of energy efficiency and renewable energy. Strengthening energy literacy and knowledge transfer through educational activities.
Beneficiaries/ Targets	Households – residents of the Municipality of Dornava (consumers and co-managers) Municipality of Dornava (consumer and co-manager) Public institutions and other interested stakeholders Schools and the wider community, indirectly through educational benefits
Key activities	Technical and economic design and sizing (roof structure analysis, structural calculations). Preparation of project documentation, obtaining grid connection approval and other permits. Selection of contractors and procurement of the PV system with all associated equipment, in line with the technical, economic and regulatory requirements of the solar power plant installation project. Construction works, system connection to the electricity grid and initiation of trial operation. Completion of construction with a technical inspection and handover by the cooperative. Operational start-up with the activation of electricity production, including regular monitoring and distribution of electricity among cooperative members in accordance with agreed shares and rules.
Justice aspects	Ensuring the inclusion of vulnerable groups through the allocation of electricity without additional burdens. Transparent distribution of energy surpluses according to an agreed mechanism as a fair sharing of benefits. Reinvestment of surpluses with consideration of social justice, benefiting members most at risk of energy poverty. Accessibility of documents in clear language through a combination of digital and analogue channels.

INSTITUTIONS/ORGANIZATIONS INVOLVED AND ROLE IN THE PROJECT	
Municipality of Dornava	Co-founder of the cooperative and owner of the infrastructure, providing the location (roof surfaces of public buildings) and participating in the acquisition of approvals and permits.
Cooperative	The operational lead responsible for managing the investment by overseeing the investment plan, ensuring financial transparency and monitoring the dedicated use of funds. Coordinates project activities, including the selection of contractual partners for design, construction and grid connection of the power plant, as well as supervision of quality in accordance with legislation and technical standards.
Designer-Consultant	External partners responsible for preparing technical plans, project documentation and specifications, ensuring that the proposed solutions comply with the client's requirements.
Contractors	External partners responsible for carrying out construction works, equipment installation and system connection.
LEA Spodnje Podravje	Professional partner acting as a coordinating body: • providing expert support in technical analyses, • providing expert support in the preparation of project documentation and applications for public calls, • organizing training for power plant maintenance (general maintenance, thermography with unmanned aerial vehicles, cleaning), • preparing studies and analyses necessary for the effective and timely implementation of the strategy and its related programs and measures.
NORMS, LEGAL PROVISIONS	
EU framework	**Directive (EU) 2018/2001 (RED II)** The Renewable Energy Directive, establishing the framework for increasing the share of renewable energy sources in the EU. **Directive (EU) 2023/1791** The Directive sets the framework for enhancing energy efficiency in the EU, including the promotion of renewable energy use. **Regulation (EU) 2016/631** The Regulation lays down technical requirements for the connection of generating installations to the electricity grid. It includes standards for grid stability and equipment certification. **REPowerEU (2022)** The EU plans to reduce dependence on fossil fuels and accelerate the green transition. It includes measures to speed up the deployment of solar power plants, financial incentives and the simplification of permitting procedures.
National framework	**Renewable Energy Sources Promotion Act (ZSROVE)** The Act sets out measures to promote the use of renewable energy sources. It includes rules on financial incentives, conditions for self-supply and administrative procedures for system installation.

	Act on the Deployment of Renewable Energy Power Generation Facilities (ZUNPEOVE) The Act focuses on the spatial planning of solar and wind power plants. It defines priority areas for deployment and simplifies permitting procedures. **National Energy and Climate Plan (NECP) – 2020 / Draft 2023** The strategic framework of Slovenia until 2030 (with a perspective until 2040), setting targets for reducing greenhouse gas emissions, improving energy efficiency, increasing the share of renewables, ensuring energy security and fostering innovation. **Energy Act (EZ-1)** Provides the framework for community participation in the electricity market, including the regulation of surpluses and energy sales.
Regional framework	/

POTENTIALITY OF THE DIGITAL TOOLS
The primary objective is the digital inclusion of citizens in shaping energy policies and investments, in order to reduce social inequalities and strengthen trust in the transition. GloCha maps the challenges, while the JETforCE technology/investment assessment tool evaluates the solutions. **The GloCha challenge mapping platform** strengthens direct communication among stakeholders through technical analyses and workshops. It enables the identification of optimal locations for solar power plants and the distribution of benefits, thereby enhancing trust and ownership of the transition. **The JETforCE technology/investment evaluation tool** provides both technical and financial evaluation of investments, supporting (after the community is established) concrete technical steps for the deployment of a solar power plant. The tool carries out a cost benefit analysis of energy technologies, including socio economic impacts. Together, these tools assist the cooperative in selecting the optimal scenario, assessing socio economic benefits and ensuring compliance with the principles of a just transition, thereby facilitating access to subsidies or financing.
EXPECTED OUTPUTS
Deployment and commissioning of a solar power plant, that will generate energy for shared use and provide self-sufficiency for the participating consumers. Reduction of energy costs for cooperative members through economies of scale and surplus sharing, with a direct impact on lowering electricity bills. The community solar power plant will annually provide 60,500 kWh of generated electricity, which will enable the members of the energy community a combined annual financial saving of 10,890 EUR. Strengthening local energy independence based on renewable energy sources, with the aim of encouraging and transferring good practices to other rural communities.
EXPECTED OUTCOMES
Long term impacts include reducing energy dependency, which will contribute to greater stability of the local energy system, lowering CO_2 emissions, and strengthening environmental awareness. In a broader context, the project will contribute to national and European decarbonization targets and to improving the environmental performance of the municipality. The annual reduction in CO_2 emissions is estimated at 21 tons.

Long term financial sustainability, enabling the reinvestment of surpluses into upgrading the system with energy storage solutions.
MONITORING SYSTEM
To ensure long term reliability and efficiency, a system of technical monitoring of the solar power plant will be established. At the technical level, a digital monitoring system will be implemented, enabling real-time tracking of parameters such as generated energy, self-consumption, grid feed-in and outages. The system will allow for timely intervention and the reduction of production losses. In terms of maintenance, regular annual onsite inspections by authorized partners will be carried out to ensure compliance with safety standards.

Governance and Participation

The establishment of the energy community in the Municipality of Dornava is based on a participatory approach that ensures the involvement of all stakeholders in both decision making and implementation. A clear distribution of roles among stakeholders guarantees transparency, accountability and effective execution of measures. The Local Action Plan, prepared within the framework of the JETforCE project (with a special emphasis on a just energy transition) is founded on the principles of transparency, responsibility and cooperation between the municipality, the cooperative, residents and external partners.

The Municipality of Dornava acts as the initiator and provider of political support while also ensuring infrastructural conditions, whereas the cooperative serves as the formal legal and organisational framework for the functioning of the energy community. It also ensures integration of the project into local development documents, such as the Local Energy Concept.

Stakeholders are assigned roles that ensure effective implementation and long term stability of the energy community. The cooperative is the central actor, operating as a legal entity responsible for organisation, investment, management of the solar power plant and member engagement. Its governing bodies (general assembly for strategic decisions, management board for implementation and supervisory board for oversight) ensure transparency and compliance with legislation.

Members of the energy community (residents, households and local stakeholders) are active participants who contribute capital through membership fees and initial shares, participate in decision making at general assemblies and benefit from lower energy costs. Special emphasis is placed on including vulnerable groups, supported through subsidised mechanisms that reduce financial barriers to entry. These mechanisms may include partial coverage of investment costs, adjusted contributions based on socio economic status and additional support in administrative procedures, thereby ensuring equal participation of all residents and reducing the risk of deepening energy poverty.

The ownership structure within the cooperative is divided between the municipality and the participating households. As the initiator of the project, the municipality holds the predominant share, while the remaining portion is evenly distributed among the households. The municipality’s majority stake reflects its role in providing essential infrastructure, ensuring operational stability, assuming the initial risks and obligations associated with the establishment of the project. The shares within the cooperative structure and the stakeholders’ needs are presented in the table below.

Cooperative Structure	Required Capacity (kW)	Share (%)
Municipality	31	56%
Household 1	6	11%
Household 2	6	11%
Household 3	6	11%
Household 4	6	11%
TOTAL	**55**	**100%**

External experts (designers, contractors) provide technical support in the design, construction and maintenance of the photovoltaic system. The Local Energy Agency acts as a coordinating body, assisting with partnership building, training, preparation of documentation and analyses. National institutions (the Ministry of Environment, Climate and Energy, the Energy Agency, and Borzen) provide financial incentives and ensure regulatory compliance.

The role of all stakeholders is most visible within the regional structure, through the establishment of a framework for identifying, involving and managing stakeholders in a defined geographical area. The JETA Dornava (Just Energy Transition Alliance), which includes representatives of the municipality, residents and external advisors, acts as a bridge between the municipality and the local population. This advisory and coordinating group enables collective learning about the energy transition, represents diverse community voices, contributes to co-management of measures, organises information events, fosters broader understanding and acceptance of measures and monitors the implementation of the Local Action Plan.

To bridge the gap between residents and digital solutions, digital ambassadors, selected from the JETA group, use modern digital tools that enable effective responses to challenges while providing a platform for expressing views and fostering active stakeholder participation. Their role is primarily connecting, as they establish a bridge between the JETA group, the municipality and the local community. A digital ambassador thus acts as a trusted intermediary between advanced technological tools and communities facing challenges related to digital access and literacy. Within the project, a specially developed investment evaluation tool is used, allowing for the assessment of costs, benefits and broader social impacts of projects, thereby facilitating informed decision making on investment implementation.

The process of developing the Local Action Plan is based on participatory planning, in which all stakeholders are given the opportunity to contribute on an equal footing. This active involvement is reflected throughout all stages; from awareness raising through information sessions to co creation via surveys and workshops for shaping the business model. Such an approach strengthens the sense of belonging and responsibility, as residents are not merely passive recipients of benefits but also active co-creators of energy solutions.

The JETforCE project plays a dual role in this regard. On the one hand, it provides methodological support, drawing on experiences from other European regions in the fields of networking, training and inequality prevention. On the other hand, it serves as a platform for the transfer of good practices and the strengthening of local capacities, which in Dornava is manifested through JETA, where digital ambassadors promote participation by applying the challenge response tool.

The long term success of the energy community is ensured by mechanisms that enable continuous coordination among stakeholders. By combining institutional, participatory and digital mechanisms, a permanent framework is created that allows for flexible, transparent and inclusive governance of the energy community.

Performance monitoring is based on clear and measurable objectives derived from performance indicators. Alongside technical and environmental indicators, surveys and evaluations are used to monitor, among other aspects, the level of public awareness.

In terms of reporting, the cooperative's operational unit regularly prepares quarterly reports including technical indicators and financial overviews for the management board, as well as annual reports for the general assembly, assessing impacts on both the community and the environment.

For long term development, it is essential to enhance the cooperative's capacities through member training and the expansion of resources, such as the introduction of energy storage systems. Cooperation with other communities facilitates knowledge exchange and the sharing of best practices, while the cooperative's internal protocols ensure continuity in both maintenance and further development.

Special attention is devoted to financial and regulatory alignment. Financial surpluses are not consumed in the short term but are systematically reinvested into development projects, thereby strengthening the cooperative's capacity, fostering technological progress and ensuring greater energy independence for the community. Furthermore, the cooperative actively monitors national and European calls for proposals to secure additional funding for expanding production capacities, introducing new technologies, improving energy efficiency and implementing innovative pilot projects.

At the same time, full compliance with legislative requirements in the fields of energy, environment, finance and cooperative governance is ensured. Such alignment not only enables safe and transparent operations but also builds trust among cooperative members, the local community and external partners. Regulatory compliance additionally provides access to sustainable financing, as investors and financial institutions generally prioritize projects that demonstrate a clear governance structure and long term financial accountability. In this way, the cooperative establishes a solid foundation for future development while remaining flexible in adapting to new challenges and opportunities within a rapidly evolving energy landscape.

All these mechanisms contribute to resilience in the face of increasingly frequent geopolitical challenges and enhance the replicability of the model in a broader context.

Financing and Business Models

The financial framework of the Local Action Plan is based on a combination of public and private (cooperative) sources, tailored to specific measures in order to ensure a just energy transition without imposing additional burdens on vulnerable groups. The Municipality of Dornava, given its limited budgetary capacity, focuses on mobilizing funds that foster local ownership and long term sustainability.

Public funding sources include non-repayable grants from national and European programs (the Climate Change Fund, the Recovery and Resilience Plan and the European Cohesion Funds 2021–2027), earmarked for investments in renewable energy and energy efficiency. These funds will be primarily allocated to co finance the community solar power plant.

Private financing sources are derived from cooperative membership. The municipality, as a founding member, assumes a larger share of the initial financial contribution, while individual members provide proportional investments in line with their planned energy consumption. Membership fees are also considered part of private financing, covering infrastructure maintenance, community management and support services to ensure the stability of the business model. This structure ensures that members act simultaneously as investors, users and managers, thereby reinforcing the sense of shared ownership.

Financing is further supported by bank loans, both to strengthen financial stability and to complete the funding structure, notably through favourable "eco-loans" provided by the Slovenian Eco Fund.

The establishment of the cooperative requires relatively low initial costs, primarily related to the preparation of founding acts, cooperative registration, legal advisory services and initial organizational expenses. These costs are covered by cooperative capital, i.e., contributions from the founding members. The business model is membership based, with an annual membership fee providing a stable revenue stream for the cooperative's operations. This creates a sustainable framework in which the cooperative functions as a non-profit organization, reinvesting surpluses into the further development of energy projects.

For the implementation of the community solar power plant, a balanced financial model will be applied, ensuring diversified funding sources and long term project sustainability. The investment, covering design, construction and grid connection, will be financed through a combination of the following sources:

- Non-repayable public funding.
- Private initial contributions from community members.
- Loan financing to cover the remaining share.

The business model is based on the generation of electricity for the self-consumption of members, thereby ensuring lower electricity costs. Savings and surpluses are reinvested into the further development of the energy community, creating a circular model of sustainable financing.

The total investment in the project amounts to 38,500 EUR, of which non-refundable funds represent 39% or 14,850 EUR. The decision to implement the community solar power plant in a cooperative model further reinforces the project's justification, as such investments are subsidised at a higher rate compared to individual solar power installations. The remaining own contribution of 23,650 EUR will be secured through the founding contribution and a bank loan, in a ratio of 20% to 80%. Accordingly, the founding contribution amounts to 4,730 EUR, while the bank loan covers 18,920 EUR. The loan is taken out for a period of seven years, with an estimated return on investment (ROI) of three years. The monthly loan instalment represents a financial obligation for the five members of the community (the municipality and four households), with each obligation proportionally allocated according to the cooperative's ownership structure: 56% for the municipality and 11% for each household.

The annual savings of 10,890 EUR ensure the long-term stability and scalability of the energy model. In this context, the model provides the foundation for a future investment cycle through a renewable fund mechanism, enabling the "self-financing" of system upgrades. The share and structure of the savings are presented in the table below[1].

Savings category	Share (%)
Regular maintenance	8%
Cooperative operation	10%
Household 1	8%
Household 2	8%

[1] The 8% share allocated to each household includes funds for covering the monthly loan instalment and savings resulting from a reduced electricity bill (30 EUR per month for the loan instalment and 50 EUR due to lower grid consumption). The 24% share allocated to the municipality includes funds for covering the monthly loan instalment and savings in electricity costs (140 EUR per month for the loan instalment and 90 EUR due to lower grid consumption). The 26% share intended for the future sustainability cycle represents an annual contribution of 2,900 EUR to the reserve fund. By the end of the seven-year loan repayment period, approximately 20,000 EUR will be accumulated and allocated to upgrading the solar power plant with a battery energy storage system.

Household 3	8%
Household 4	8%
Municipality	24%
A new sustainable cycle	26%
TOTAL (Savings value 10,890 EUR)	**100%**

The long term economic sustainability of the measures rests on a business model that goes beyond the initial investment and ensures the self-sufficiency of the energy community. The model is built on circular ownership, where benefits are reinvested back into the community, strengthening resilience and enabling upgrades. The cooperative's surpluses are not intended for profit generation but are purposefully directed toward fulfilling the principles of a just transition, as the benefits obtained are reinvested directly into the community. Both measures are designed to complement one another: the cooperative, as the organizational framework, provides stability and transparency, while the community solar power plant generates direct financial benefits for members. Additional value lies in the potential for expanding the community and its production capacities, as well as in establishing connections with other forms of renewable energy sources, without imposing any additional financial burden on the members or the municipal budget. In this way, a sustainable system is created economically stable, socially inclusive and environmentally oriented.

Integrated Implementation Roadmap

The comprehensive implementation plan of the Local Action Plan for the Municipality of Dornava is both a strategic and operational document that enables the transition from planning to execution. Its central purpose is to establish a clear framework within which the proposed measures will be implemented transparently, effectively and in line with the principles of a just energy transition. It goes beyond technical and financial aspects, representing a holistic process that connects the local community, municipal administration, regional development institutions and national stakeholders in a shared goal: the creation of a sustainable and fair energy community. The plan encompasses:

- A time dimension of implementation, ensuring a logical sequence of measures with an emphasis on short term and medium term activities that support national and European decarbonisation objectives.
- A broader institutional framework, ensuring consistency with existing planning instruments and development policies across different levels.
- A clear division of responsibilities among stakeholders.

The timeline is structured to enable gradual yet sufficiently swift implementation of measures, with clearly defined phases, milestones and interdependencies for continuous evaluation and adjustment. In this way, trust among stakeholders is strengthened, financial stability is ensured and the conditions for expanding the energy community are established. The process is divided into an implementation phase (establishment of the cooperative, construction of the community solar plant) and an operational phase (management and monitoring). Key milestones include the registration of the cooperative, the commissioning of the solar plant and the cooperative's first annual report.

Short term period (Years 1 and 2) is dedicated to establishing the institutional and legal foundations. The first step is Measure No. 1, namely the establishment of a cooperative that will assume the role of the legal and organizational entity of the energy community. During this period, the cooperative's statute will be adopted, its internal governance structure defined, the initial membership registered and the basic administrative

capacities established. In parallel, activities forming the basis for the implementation of Measure No. 2 will already be underway; namely the preparation of project documentation for the community solar power plant, including the development of energy studies, the acquisition of permits and approvals and the preparation of tender documentation for grant funding. Particular attention will be devoted to structuring the financial framework, as it is crucial at this stage to ensure sufficient member participation as well as timely submission of applications for funding.

Medium term period (Years 2 and 3) represents the investment phase, specifically Measure No. 2, the construction of the community solar power plant located on the roof of the municipal building. The project will require coordinated cooperation among contractors, the cooperative and the municipality, since the works will include site preparation, installation of photovoltaic modules, execution of electrical works and integration with the distribution grid. In addition to technical activities, this phase will also establish the internal system for allocating the generated electricity among cooperative members. To ensure fairness, a benefit-sharing mechanism will be introduced, based on proportional contributions and the needs of members. In parallel, digital monitoring and reporting systems will be developed, enabling transparent tracking of impacts and providing members with insight into production and their individual consumption.

The timeline of measures is embedded within a broader development framework. The long term orientation is defined as a development perspective that goes beyond current implementation capacities and outlines a vision for future growth. The establishment of the cooperative is planned for the short term period, while the long term ambition is to strengthen and gradually expand its membership. The construction of the solar power plant begins with preparatory activities in the second year, with the investment phase taking place in the medium term. In the long term perspective, the plant becomes a key infrastructural foundation for upgrading and expanding the system, including the addition of new capacities and the deployment of electricity storage solutions.

The Gantt chart provides a clear overview of the sequence of activities, parallel and interlinked pathways, as well as the key milestones of the project timeline.

The plan is aligned with and linked to existing municipal and regional planning tools and strategic documents that guide the development of the municipality, region, and country. Effective project implementation is based on a clear allocation of roles and responsibilities, ensuring that tasks are not left undefined and that each actor assumes their respective share of responsibilities and obligations.

A significant contribution is also provided by digital tools developed within the framework of the JETforCE project, which enable the mapping of challenges, evaluation of technologies and monitoring of the impacts of measures. In this way, they support smoother alignment with national policies and promote evidence-based decision making.

At the local level, alignment is ensured through the integration of the action plan into the local energy concept. This connection directly supports the increase of renewable energy shares and the reduction of greenhouse gas

emissions, in accordance with the provisions of the Renewable Energy Promotion Act. Energy communities play a special role in this context, as they are embedded in the municipality's strategic documents. The project is also aligned with municipal spatial plans, since the installation of photovoltaic systems requires compliance with urban planning guidelines. The municipality will consider the energy community as an integral part of its development policies, particularly in the areas of sustainable mobility and energy renovation of public buildings. In the future, the Municipality of Dornava will bear responsibility for the long term integration of energy communities into local development policies and spatial plans. By regularly updating its strategies, it will enable the expansion of projects to additional areas.

The cooperative will, in the future, assume the role of implementing new investments in renewable energy and energy efficiency, allowing for the expansion of the community beyond the initial pilot project. The Municipality of Dornava holds political and development responsibility. Its role includes providing infrastructure, co-financing the project according to the agreed model and coordinating with other local policies. The municipality, or indirectly the municipal council, provides legitimacy to the project, as their approval grants the local action plan official status and a political commitment to its implementation. The cooperative, as the legal and organizational framework of the energy community, is responsible for operational management, organization of investments, management of financial contributions and long term operation of the power plant. Its uniqueness lies in its participatory nature, as members are not only investors but also co-managers and users, ensuring social equity and stronger cohesion among community members.

At the regional level, the plan is integrated into the Podravje Regional Development Program 2021–2027, which identifies as key development priorities the transition to a low carbon society, the increase of renewable energy shares and the strengthening of local energy self-sufficiency. The project also facilitates connections with other municipalities in the region, which in the long term enhances the potential for forming regional energy communities. At this level, the institutional role focuses on supporting the long term integration of energy communities into regional development plans through replication in other municipalities, thereby building synergies and increasing the region's overall energy independence.

At the national level, measures are aligned with the National Energy and Climate Plan, which recognizes local energy communities as a key instrument for the transition to a low carbon society. At this level, the project directly contributes to the objectives of Slovenia's Long-Term Climate Strategy up to 2050, which envisions full decarbonization. The role of national institutions is regulatory and financial, through subsidies, loans and other support mechanisms, as well as the establishment of rules for the operation of local energy communities. Future implementation will focus on ensuring a stable support environment for energy community operations.

At the European level, the project is situated within the framework of the European Green Deal, thereby ensuring linkage to European financial instruments while adhering to the principles of energy democracy, which strengthen the role of local communities in the transition to clean energy. At this level, future institutional roles will be directed toward ensuring the long term alignment of local projects with the commitments of the European Green Deal and decarbonization objectives by 2050.

Justice, Policy Coherence and Future Pathways

The establishment and operation of a community solar power plant in the Municipality of Dornava goes beyond technical and organizational aspects, as it is closely intertwined with issues of social equity, policy compliance, and long term sustainability. The project represents an opportunity to strengthen local cohesion, enhance social justice and implement the principle of equal opportunities for all residents.

For the project to truly contribute to a just energy transition, it must consider the diversity of the local community in terms of socio economic, technical and spatial conditions, as well as differing capacities for

participation. The cooperative provides a model that enables broad involvement of local stakeholders and a fair distribution of benefits arising from the project. Various segments of the local community will be included, with each cooperative member participating on an equal basis according to the principle of “one member – one vote.” This model strengthens democratic decision making and reduces the risk of unequal benefit allocation. Project benefits will therefore not be limited to individuals with greater capital but will rely on mechanisms that allow the inclusion of more vulnerable groups. For these groups, the cooperative will design specific engagement models, such as symbolic membership without an initial contribution or gradual financing through savings on energy bills. The project will enable equitable distribution of benefits, such as lower electricity costs or participation in surplus revenue from energy sales. Residents of Dornava will receive direct benefits from the community model, with advantages that are clear, measurable and accessible to all members.

In addition to the economic impact, an equitable effect will also be ensured, as all members will be regularly informed about project operations, decisions and financial outcomes, while also having the opportunity to provide input and vote on the direction of the community’s development. At the same time, the Local Action Plan is fully aligned with existing national, regional and European strategic and legal frameworks in the areas of energy, sustainable development and just transition. The project directly supports the fundamental principles and objectives outlined in documents that define the framework for energy transformation in Slovenia and the EU.

At the national level, the project is aligned with the National Energy and Climate Plan of the Republic of Slovenia, particularly in aspects promoting the development of renewable energy sources at the local level, community involvement in energy projects and the enhancement of self-sufficiency. In doing so, the project directly addresses the objectives of Slovenia’s Long Term Climate Strategy up to 2050, which emphasizes the importance of decentralized energy production and the engagement of local populations in the energy transition. An important legal foundation for the governance model is also provided by the Act on the Promotion of the Use of Renewable Energy Sources (ZSROVE), which defines the conditions for the establishment, operation and rights of energy communities and enables the inclusion of individuals, local communities and small enterprises in energy production and management.

At the regional level, the project follows the development objectives of the Spodnje Podravje region, with a focus on reducing energy dependency, increasing resilience to energy disruptions and improving quality of life through decarbonization of the local environment. In this context, the project contributes to the priorities of mechanisms supporting a just transition.

At the EU level, the action plan is aligned with the principles and guidelines of the directives on promoting the use of energy from renewable sources.

The development of the project on the legal and strategic foundations represents a best practice example of translating strategic orientations into concrete local solutions. This alignment ensures the project’s legitimacy, the potential to secure co financing, and a stable environment for the long term operation of the cooperative as the driving entity of the energy community.

The establishment of the energy community based on the local action plan constitutes one of the steps toward greater energy independence, social cohesion and a just transition in the Municipality of Dornava. The continuation of these steps must be reflected in replicability, requiring a long term vision and gradual enhancement of future capacities, challenges and opportunities. Future activ ities will focus on:

- Strengthening the cooperative capacity as the implementing body of the community project, including the development of internal knowledge and tools for the technical, administrative and financial management of the energy community.

- Enhancing collaboration with external partners to expand the project through additional capacities and the integration of energy storage, thereby increasing resilience to energy disruptions and climate impacts.

The selected cooperative model and its stakeholder structure result from a deliberate strategic decision, as they provide an optimal balance between the achieved savings and the minimal initial contributions required for establishing, implementing and constructing the community solar power plant in the first investment period, without increasing the risk of energy poverty.

The energy profiles of the stakeholders are complementary. The municipal building consumes the most electricity during the morning, late morning and partly afternoon hours, while households exhibit peak consumption in the afternoon and evening. During weekends, when the municipal building is not in operation, the produced electricity is fully available to the households, further contributing to a fair distribution of benefits.

The model's replicability and scalability represent important added value. Upgrading the solar power plant with a battery energy storage system in the next investment cycle will enable the storage of surplus electricity generated during the day and its use or sale during evening hours, when market electricity prices are significantly higher. This will enhance the project's economic efficiency while maintaining energy accessibility for community members.

The second investment cycle will also be carried out in cooperation with local contractors, with preparatory activities beginning as early as year five. The objective is to ensure that the battery energy storage system becomes operational by the end of year six. The contractual model with the contractor will be designed in accordance with the principles of a just transition and social responsibility, including the option to defer part of the payment based on a "half now, half in one year" arrangement. By the end of year six, the cooperative will have accumulated sufficient funds in the renewal reserve to cover the first half of the investment, with the remaining balance settled upon the completion of year seven.

The plan foresees the establishment of monitoring systems to track the impacts of the measures. These indicators will serve as the basis for the cooperative's annual reports, which members and the wider public can use for reflection, guidance of adjustments and strategic development. The alignment of the local action plan with the principles of a just transition and the objectives of the national energy and climate plan creates a foundation for participation in financing programs, the exchange of best practices, and long term partnerships.

The pre-planned funds within the renewal reserve, serving as a form of "self-financing" for the upgrade, represent a long term investment cycle intended for the implementation of the next phase of the project in the 2031–2032 period. The accumulated amount of 20,000 EUR, to be collected by the end of the current loan term, will provide the own contribution required for upgrading the solar power plant with a battery energy storage system. The remaining 14,000 EUR needed for the investment will again be secured from non-refundable public sources, covering approximately 42% of the total investment.

In this context, the local action plan does not represent a closed phase but rather serves as a starting point for further growth, networking and the development of a just and sustainable energy system.

A3.2.5 Istrian Region - Croatia

Purpose and Strategic Alignment

The Local Action Plan (LAP) of the Istrian Region supports the overarching vision of the Interreg CENTRAL EUROPE JETforCE project—to enable a just, inclusive, and participatory energy transition across Central Europe.

It focuses on transforming the regional energy system by fostering local renewable energy production, strengthening community engagement, and developing a skilled and resilient workforce capable of driving the green transition. As one of Croatia's two officially designated Just Transition Regions, the Istrian Region is committed to reshaping its energy and economic structure in line with the Territorial Plan for Just Transition (ITP) and the Just Transition Fund (JTF) framework. The LAP contributes to this effort through two complementary measures:

- Use of renewable energy sources through the establishment and support of energy communities, promoting citizen participation, local ownership, and territorial energy self-sufficiency.
- Empowering the energy transition process by ensuring a qualitative and future-ready workforce in the energy supply sector, through targeted education, training, and awareness programmes—such as the "Kids Can Do It" initiative.

Together, these measures position the Istrian Region as a leading example of how environmental sustainability, economic resilience, and social inclusion can reinforce one another within a fair transition process.

The LAP is fully aligned with the JETforCE strategy by addressing distributive, procedural, and recognitional justice. It supports reducing energy poverty, promoting access to affordable clean energy, and involving citizens in decision-making. Digital tools (Challenge Mapping Tool, Technology Evaluation Tool) will help to identify local challenges, select optimal solutions, and monitor the progress. This approach ensures that the energy transition is inclusive and leaves no one behind, while also strengthening local economy through innovation and job creation.

The Istrian Region faces distinctive challenges related to energy security, labour-market transformation, and demographic change.

These include high dependence on imported energy, limited interconnection capacity, seasonal demand fluctuations driven by tourism, and shortages of technically skilled professionals in energy and construction sectors.

In response, the LAP promotes place-based, inclusive solutions that mobilize local resources and knowledge. The creation of Renewable Energy Communities (RECs) will enhance local generation capacity, reduce energy poverty, and empower citizens to co-shape the transition.

At the same time, investments in education and skills development will ensure a qualified workforce able to install, maintain, and manage renewable technologies—anchoring new economic opportunities within the region.

By linking social innovation, environmental stewardship, and economic diversification, the Istrian Region LAP embodies the essence of the Just Energy Transition: enabling progress toward a carbon-neutral and knowledge-based regional economy, while ensuring that no individual or community is left behind.

Key Actions and Pilot Initiatives

The Local Action Plan of the Istrian Region identifies two interlinked key actions that together form the backbone of the region's just energy transition:

- Use of renewable energy sources through the energy communities – focused on democratizing energy production and improving local energy autonomy through community-based models.
- Empowering the energy transition process by ensuring a qualitative workforce in the energy supply sector – aimed at strengthening education, training, and innovation capacities to sustain the transition.

Both actions address the systemic challenges identified in the Regional Development Strategy (2022–2027) and the Territorial Just Transition Plan, ensuring social fairness, territorial cohesion, and green growth.

The actions will also use JETforCE digital tools—the Challenge Mapping Platform and Technology Evaluation Tool—for identifying local needs, evaluating technological options, and monitoring impacts.

Key action #1: Use of renewable energy sources through energy communities

This action promotes the creation and expansion of Renewable Energy Communities (RECs) across the Istrian Region as a mechanism for achieving energy self-sufficiency, reducing greenhouse gas emissions, and strengthening citizen participation in the energy transition.

PURPOSE AND IMPLEMENTATION	
Objectives	The objective is to transform consumers into prosumers—citizens, public institutions, and SMEs who jointly produce, share, and manage renewable energy. By decentralizing generation and involving local actors, energy communities contribute to: • Lowering energy costs and reducing energy poverty. • Increasing local energy security and resilience. • Retaining economic value within the region. • Building public support for renewable investments through transparency and shared ownership.
Beneficiaries/ Targets	• Municipalities and local authorities seeking to improve local energy autonomy. • Citizens and households, including those in rural or heritage-protected areas. • SMEs and public institutions willing to invest in shared renewable systems. • Vulnerable groups, who can benefit from fairer access to affordable clean energy.
Key activities	• Mapping of potential REC sites using regional energy data and Challenge Mapping Tool results (e.g. public roofs, schools, business zones). • Facilitation of local partnerships among municipalities, cooperatives, and citizens to establish pilot RECs. • Preparation of technical, legal, and financial models for REC operation (based on national REC regulations and EU Directives RED II and RED III). • Pilot implementation of community solar PV systems with battery storage and smart metering; Awareness-raising campaigns and capacity-building workshops for citizens and local authorities; Monitoring of social and environmental impacts using JETforCE's Technology Evaluation Tool.

Justice aspects		Ensures fair access to clean and affordable energy for all residents, including vulnerable groups, rural communities, and those living in heritage-protected areas where energy renovation is limited.
INSTITUTIONS/ORGANIZATIONS INVOLVED AND ROLE IN THE PROJECT		
IRENA - Istrian Re-gional Energy Agen-cy		Overall coordination, technical support, and knowledge transfer
Municipalities and public institutions		Initiators and hosts of RECs
JETAs and Digital Ambassadors		Facilitation of participation, inclusion, and digital monitoring
NORMS, LEGAL PROVISIONS		
EU framework		Directive (EU) 2023/2413 – Renewable Energy Directive (RED III).
National framework		Law on Renewable energy sources and high-efficiency cogeneration (OG 78/25); Law on the Electricity Market (OG 111/2021)
Regional framework		Regional Development Plan of the Istrian Region (2022–2027) – Objective 1.1 "Energy transition and climate change adaptation."
POTENTIALITY OF THE DIGITAL TOOLS		
Challenge Mapping Tool: identification of local challenges related to energy access, poverty, and potential community sites. Technology Evaluation Tool: evaluation of proposed renewable technologies (solar, battery systems, microgrids) across social, environmental, and economic dimensions.		
EXPECTED OUTPUTS		
• Establishment of at least one Pilot Renewable Energy Community by 2027. • Reduction of local energy costs for participating households and institutions by at least 10–15%. • Development of guidelines and toolkits for replicating the model across the region.		
EXPECTED OUTCOMES		
• Enhanced local energy independence and reduced vulnerability to external price shocks. • Increased citizen engagement and community empowerment. • Measurable reductions in GHG emissions and improved energy efficiency. • Stronger territorial cohesion, with benefits shared across urban and rural areas. • Reinforced trust in institutions and digital participation through transparent REC governance.		
MONITORING SYSTEM		
Monthly data collection, annual reporting by Energy Manager, JETA oversight.		

Key action #2: Empowering the energy transition process by ensuring a qualitative workforce in the energy supply sector

This key action aims to strengthen the human and institutional capacities required for a successful and fair energy transition in the Istrian Region.

While renewable energy technologies are advancing rapidly, the regional labour market faces a shortage of qualified technicians, engineers, and energy specialists—particularly in solar installation, energy management, and building retrofitting.

PURPOSE AND IMPLEMENTATION	
Objectives	• Build a skilled workforce capable of supporting renewable energy development, energy efficiency measures, and smart energy management. • Integrate practical training and innovation into formal education, vocational programs, and lifelong learning. • Promote youth engagement, inclusion, and awareness through participatory learning models such as "Kids Can Do It". • Strengthen cooperation between educational institutions, businesses, and public authorities to ensure alignment between skills demand and supply. • Ultimately, this measure supports the Just Transition Fund's goal of ensuring that no worker or community is left behind in the shift toward a low-carbon economy.
Beneficiaries/ Targets	Students and teachers; Professionals and SMEs in the energy, construction, and technology sectors; Educational institutions; Citizens and vulnerable groups.
Key activities	Introduction of the model into the curriculum, implementation of the "Kids can do it" model, Fostering the establishment of regional training and competence centers, Organization of internships, Awareness and capacity-building campaigns.
Justice aspects	• Promotes equal access to education, training, and employment opportunities in the growing renewable energy sector. • Reduces regional disparities by making advanced training available outside major urban centers. • Ensures that benefits of the green transition—such as new jobs, improved income stability, and enhanced quality of life—are fairly shared across the population.
INSTITUTIONS/ORGANIZATIONS INVOLVED AND ROLE IN THE PROJECT	
IRENA - Istrian Regional Energy Agency	Coordination, technical expertise, and linkage with EU projects.
Istrian Region	Policy support and integration into regional development programmes
Educational institutions	Curriculum reform and pilot implementation
Business sector and chambers	Collaboration for apprenticeships, internships, and skill-demand mapping
NORMS, LEGAL PROVISIONS	

EU framework	Directive (EU) 2023/2413 – Renewable Energy Directive (RED III).
National framework	National Energy and Climate Plan of the Republic of Croatia (NECP 2021–2030) Energy Development Strategy of the Republic of Croatia until 2030 with a Vision to 2050
Regional framework	Regional Development Plan of the Istrian Region 2022–2027
POTENTIALITY OF THE DIGITAL TOOLS	
Challenge Mapping Tool: identifies educational and skills-related challenges in the region and maps opportunities for improvement (e.g. where shortages exist, where new training is needed). Technology Evaluation Tool: used to assess pilot educational activities and training projects in terms of social impact, inclusion, and sustainability outcomes.	
EXPECTED OUTPUTS	
• At least three educational institutions piloting "Kids Can Do It" or similar hands-on energy learning models. • Updated curricula and training programs integrated into at least two vocational schools. • 100+ participants (students, teachers, professionals) trained in renewable energy technologies and energy efficiency. • Joint programmes between schools and SMEs for internships and technical training.	
EXPECTED OUTCOMES	
• Increased availability of skilled labour in renewable energy and energy efficiency sectors. • Improved cooperation between education and business, resulting in better employment opportunities. • Strengthened regional innovation ecosystem and entrepreneurship potential. • Enhanced energy literacy and environmental awareness among youth and citizens. • Greater social inclusion and gender balance in technical professions. • Reinforcement of the Istrian Region's position as a knowledge-based, future-oriented territory.	
MONITORING SYSTEM	
Monitoring will be coordinated by IRENA with the support of educational institutions. Indicators can include: • Number of institutions and participants engaged. • Number of new or updated training programmes. • Level of satisfaction and employment rates among trained participants. • Number of initiatives evaluated via digital tools. • Integration of results into the regional energy and education policies.	

Governance and Participation

The implementation of the Local Action Plan (LAP) for the Istrian Region relies on a multi-level governance model, ensuring that all relevant actors—from public authorities to citizens—contribute to a transparent, inclusive, and effective energy transition process:

- IRENA – Istrian Regional Energy Agency – lead coordinator of the LAP; ensures technical expertise, project development, monitoring, and communication among partners. Acts as a bridge between regional authorities, local communities, and JETforCE partners.

- Istrian Region – strategic steering, policy alignment with the Regional Development Plan 2022–2027 and Territorial Just Transition Plan.
- Municipalities and local self-government units– supports establishment of renewable energy communities (RECs), support citizen engagement, provide local infrastructure and communication channels.
- Educational institutions – implement educational activities, training programmes, and pilot projects related to green skills and renewable energy.
- Business sector and chambers of commerce – participate in training and apprenticeship schemes; provide practical expertise, job opportunities, and market feedback on skill needs.
- Civil Society and NGOs - promote inclusion, energy literacy, and public awareness; support vulnerable groups in participating in energy communities or training opportunities.
- Citizens and local alliances - active participants in RECs, awareness campaigns, and education programmes.

The LAP governance model builds on the participatory principles of the JETforCE Strategy and the Territorial Just Transition Plan, ensuring procedural justice—that all groups, including vulnerable and underrepresented ones, are meaningfully involved in decision-making. Key engagement approaches include co-design workshops, community events and public consultations, public forums, energy fairs, and workshops (e.g., "Energy Days") to raise awareness, gather feedback, and share best practices from pilot projects. Together, these mechanisms ensure a bottom-up process where policies and investments are informed by the real needs of communities and continuously refined through feedback and monitoring.

The LAP embeds long-term coordination within the broader JETforCE governance architecture through the following potential mechanisms:

- Setting up a Steering Committee involving the Digital Ambassadors and other relevant key actors for oversight and for strategic decision-making.
- Operating a Project Management Office (PMO) for each of the planned key actions for day-to-day coordination and communication.
- Using specific monitoring & reporting tools for transparency and continuous improvement.
- Using the JETforCE Capacity Building Toolkit for skills development and stakeholder engagement.
- Community Engagement with the support of the Challenge Mapping Tool for maintaining public support and participation.
- Drafting a Periodic Plan Review for adaptation and strategic updates.

Financing and Business Models

The implementation of the Local Action Plan (LAP) of the Istrian Region will require a diversified and flexible approach to financing, adapted to the evolving institutional, technical, and regulatory conditions. While the LAP is strategically aligned with the Territorial Plan for Just Transition (ITP), it should be noted that the two key actions identified in this document are not directly financed through the Just Transition Fund (JTF). Nevertheless, the LAP supports the same territorial objectives of a fair and inclusive energy transition and therefore seeks synergies with other available European, national, and local instruments. At this stage, several potential funding sources can be considered for future implementation. Among European instruments, the European Regional Development Fund (ERDF) could potentially support investments in renewable energy, energy efficiency, and digital infrastructure, while the European Social Fund Plus (ESF+) may provide opportunities for education, reskilling, and training actions related to the green and digital transition. Complementary financing could also be explored under REPowerEU, the National Recovery and Resilience Plan (NRRP), and innovation-oriented programmes such as Horizon Europe and LIFE, particularly for pilot projects and cross-regional cooperation. Financial instruments such as InvestEU or national green financing facilities

could be considered to provide risk-sharing mechanisms, loans, or guarantees for municipalities, SMEs, and citizen cooperatives participating in Renewable Energy Communities (RECs). Additionally, public–private partnerships, green municipal bonds, and community-based financing models (such as cooperative shares or crowdfunding schemes) represent potential pathways to mobilize local capital and citizen investment.

For Key Action 1 – Renewable Energy Communities, different business and ownership models can be evaluated in the upcoming period. Potential arrangements include citizen cooperatives, municipal-led initiatives aggregating public roofs and facilities. Each model should ensure open participation, transparent governance, and fair distribution of benefits, while maintaining flexibility for future replication across the region. Specific financial mechanisms—such as member contributions, power purchase agreements with public institutions, or third-party investment—may be tested depending on local priorities and legal feasibility.

For Key Action 2 – Workforce and Skills Development, possible funding pathways include education and training programmes supported by ERDF, ESF+, or national labour-market measures, complemented by private-sector involvement through apprenticeships, equipment donations, or co-financing. Regional competence centres for renewable energy and energy efficiency could be developed in cooperation with educational institutions, local companies, and chambers of commerce. Once established, such centres may explore fee-based or service-oriented models to ensure continuity beyond the initial project phase.

In parallel with the identification of funding sources, the long-term economic sustainability of both key actions will be an essential design criterion. The LAP envisions the creation of systems capable of maintaining financial viability after initial investments, generating local economic value and social benefits. For Renewable Energy Communities, sustainability could be achieved through diversified revenue streams such as self-consumption savings, sale of surplus electricity, and long-term power purchase agreements (PPAs) with public or commercial partners. Communities may also establish reserve funds or reinvest surpluses into maintenance, new installations, or social support measures for vulnerable members. For Workforce Development, sustainability is expected to result from the gradual integration of new training modules into the formal education system, the establishment of partnerships with private companies, and the introduction of certification or service-based training models. Over time, competence centres may become self-financed through participation fees, commissioned services, or business partnerships. Ultimately, the long-term sustainability of both measures will depend on strong regional cooperation, institutional support, and the capacity to attract diverse funding sources. By maintaining flexibility and exploring multiple financing options, the Istrian Region will ensure that its energy transition pathway remains adaptable, resilient, and capable of generating enduring environmental, social, and economic value for its communities.

Integrated Implementation Roadmap

The implementation of the Local Action Plan (LAP) of the Istrian Region will unfold gradually between 2026 and 2029, ensuring that both key actions — Renewable Energy Communities and Workforce Empowerment — evolve in a coordinated and sustainable manner. The process will be guided by principles of inclusiveness, transparency, and institutional cooperation, ensuring that the plan is not a one-time initiative but a foundation for long-term regional transformation.

Key Action 1 – Use of Renewable Energy Sources through Energy Communities

The first phase of implementation, beginning in 2026, will focus on preparatory and planning activities. During this period, the Istrian Regional Energy Agency (IRENA) will coordinate the mapping of potential Renewable Energy Community (REC) sites across the region, identifying suitable public buildings, business zones, and residential areas with favourable technical and social conditions. In late 2026, the emphasis will shift to the establishment of pilot community. Technical and legal documentation will be prepared for at least one pilot

RECs, including feasibility studies, energy-sharing models, and governance structures. Pilot project will likely focus on solar photovoltaic systems on public roofs, integrating smart metering. Capacity-building sessions will be organized for municipal officers and interested citizens to increase understanding of the REC concept, cooperative principles, and participation mechanisms. IRENA will also work with the distribution system operator (HEP ODS) to address grid access and administrative procedures, ensuring readiness for installation. By 2027, the first REC installations are expected to become operational, marking the transition from pilot testing to demonstration. During this stage, lessons learned from the pilots will be systematically documented, and a set of regional guidelines for REC replication will be developed. A digital platform will be created to provide transparent information about ongoing projects, membership options, and local impacts.

In 2028 and 2029, the focus will be on scaling up and institutionalising the REC model. Additional municipalities will be supported to establish their own communities, and partnerships with SMEs will be strengthened to explore new applications, such as community energy storage, electric vehicle charging, and local energy-sharing schemes.

Key Action 2 – Empowering the Energy Transition Process by Ensuring a Qualitative Workforce

The implementation of the second key action will begin in parallel in 2026 with preparatory activities led by IRENA in collaboration with educational institutions, such as Mate Blažina High School Labin, technical schools in Pula, etc. A regional survey will be conducted to identify skill gaps in the renewable energy, energy efficiency, and construction sectors. Based on these results, IRENA will work with schools and training providers to design an integrated skills development plan for the region.

During 2026, the focus will move to the modernization of curricula and the introduction of new modules on renewable energy technologies, energy efficiency, and sustainable construction. The “Kids Can Do It” programme will be expanded to additional schools as a participatory learning model that links education, awareness, and hands-on practice. Teacher training and the creation of didactic materials will be supported by partnerships with IRENA, universities, and local companies. Collaboration between schools and businesses will ensure that training responds to real labour-market needs. In 2028 and 2029, the focus will be on scaling up and institutionalizing these activities through continuous education programmes, certification schemes, and regional partnerships. A growing number of participants — students, teachers, and professionals — will be trained, strengthening the human capital base of the region and ensuring long-term employability in the green economy.

The LAP is conceived as a complementary and operational document that supports and extends existing planning instruments at both municipal and regional levels. It directly contributes to the implementation of the Regional Development Plan of the Istrian Region 2022–2027, particularly under Objective 1.1 “Energy Transition and Climate Change Adaptation,” Objective 2.1 “Improving Education Quality and Access,” and Objective 3.1 “Digital and Green Transformation of the Economy.” The plan also reinforces the priorities of the Territorial Just Transition Plan (2023), which emphasises renewable energy deployment, workforce adaptation, and inclusive governance.

The responsibilities of the plan are shared among the following subjects:

- IRENA – Istrian Regional Energy Agency – lead coordinator of the LAP; ensures technical expertise, project development, monitoring, and communication among partners. Acts as a bridge between regional authorities, local communities, and JETforCE partners.
- Istrian Region – strategic steering, policy alignment with the Regional Development Plan 2022–2027 and Territorial Just Transition Plan.
- Municipalities and local self-government units– supports establishment of renewable energy communities (RECs), support citizen engagement, provide local infrastructure and communication channels.

- Educational institutions – implement educational activities, training programmes, and pilot projects related to green skills and renewable energy.
- Business sector and chambers of commerce – participate in training and apprenticeship schemes; provide practical expertise, job opportunities, and market feedback on skill needs.
- Civil Society and NGOs - promote inclusion, energy literacy, and public awareness; support vulnerable groups in participating in energy communities or training opportunities.
- Citizens and local alliances - active participants in RECs, awareness campaigns, and education programmes.

Justice, Policy Coherence and Future Pathways

The Distributive justice concerns the fair allocation of resources, benefits, and opportunities. In the context of the Istrian Region's Local Action Plan, this means ensuring that the advantages of renewable energy and green-skills initiatives are shared equitably among all social groups. The plan promotes fair access to energy benefits, particularly for vulnerable households, rural communities, and those with limited capacity to invest in renewable technologies. By supporting Renewable Energy Communities (RECs) and inclusive training programmes, the LAP aims to ensure that the social and economic benefits of the energy transition—such as lower energy costs, job creation, and increased local investment—are widely distributed.

Procedural justice focuses on fairness, transparency, and inclusiveness in decision-making processes. The LAP establishes participatory mechanisms—such as Just Energy Transition Alliances (JETAs), Digital Ambassadors, and the Challenge Mapping Platform—to guarantee that citizens, municipalities, educational institutions, and civil society organizations have meaningful opportunities to shape the energy transition. These tools ensure that decision-making is transparent, open, and accountable, reflecting the perspectives of all communities across the Istrian Region.

Recognitional justice relates to acknowledging and respecting the diverse identities, experiences, and needs of different groups. In the Istrian Region, this principle underpins efforts to recognize the specific challenges faced by smaller inland municipalities, women, elderly citizens, youth, and those in energy poverty. Educational and outreach activities, including the Kids Can Do It initiative, help ensure that energy transition policies respect local culture and empower individuals as active participants, not passive beneficiaries.

The Local Action Plan directly addresses local inequalities by prioritizing actions that primarily serve the public interest and strengthen social inclusion. Renewable Energy Communities will allow households, small businesses, and institutions to jointly produce and use renewable energy, lowering costs and increasing resilience. Participation models will be designed to include those who are at risk of energy poverty or have limited investment capacity.

Education and training measures will reduce labour-market disparities by providing access to green skills and lifelong learning for all citizens. Special attention will be given to young people entering the labour force, women in technical professions, and workers affected by industrial transformation. Outreach activities and partnerships with NGOs will ensure that vulnerable and rural populations are not left behind in the regional energy transition.

Through these measures, the LAP supports the broader objectives of the Territorial Just Transition Plan for the Istrian Region—reducing territorial disparities, strengthening social equity, and promoting sustainable local development.

The current Local Action Plan represents a foundation for continuous improvement. Future updates may focus on the following directions:

- **Deepen social targeting**

Develop a comprehensive communication and engagement campaign under the common message “Just Energy Transition for All”, connecting energy communities, education, and inclusion initiatives.

- **Strengthen monitoring and adaptive learning**

Introduce a structured monitoring framework with justice-related indicators and KPIs (e.g. number of citizens engaged, MW installed, trainees certified, households supported). Use the Challenge Mapping and Technology Evaluation tools to track progress transparently.

- **Enhance financial synergies**

Explore opportunities to blend multiple funding sources—such as ERDF for energy infrastructure, ESF+ for training, LIFE for innovation, or local green bonds for citizen participation.

- **Scale and replicate**

Identify additional municipalities, schools, and business zones where successful pilot projects can be replicated or expanded, ensuring that benefits are spread across the entire Istrian Region.

- **Promote cross-border and regional learning**

Continue collaboration within the JETforCE network to exchange good practices and strengthen cooperation with neighbouring regions in Central Europe.

A3.2.6 Statutory City of Jihlava – Czech Republic

Purpose and Strategic Alignment

The LAP strengthens explicit coherence with national and EU policy and funding frameworks, notably OPŽP 2021–2027, the Modernisation Fund, and national milestones for energy sharing and Renewable Energy Communities, improving multi-level alignment.

The Local Action Plan (LAP) of the City of Jihlava aims to implement the principles of the Just Energy Transition (JET) through concrete, locally anchored actions that combine environmental innovation, digital transformation, and social inclusion. Its core objective is to ensure that Jihlava reaches its climate neutrality goal by 2050 while reducing greenhouse gas emissions by at least 30% by 2032 compared to 2022 levels. The LAP supports the city’s strategic documents such as the Sustainable Energy and Climate Action Plan (SECAP), the Climate Adaptation Strategy, and the city’s Strategic Plan, which all prioritize energy efficiency, renewable energy deployment, and resilience against climate change impacts.

The LAP is fully aligned with the JETforCE strategy by addressing distributive, procedural, and recognitional justice. It supports reducing energy poverty, promoting access to affordable clean energy, and involving citizens in decision-making. Digital tools (Challenge Mapping Tool, Technology Evaluation Tool) will help to identify local challenges, select optimal solutions, and monitor the progress. This approach ensures that the energy transition is inclusive and leaves no one behind, while also strengthening local economy through innovation and job creation.

Social challenges: Jihlava experiences rising energy poverty and a need to strengthen citizen participation in climate and energy decisions. By focusing on public buildings such as schools and kindergartens and developing community energy projects, the LAP ensures that benefits reach vulnerable groups and foster social cohesion.

Economic challenges: Energy costs represent a significant burden for the municipal budget and local SMEs. Through energy efficiency improvements, smart metering, and renewable energy production, the LAP reduces operational costs, freeing resources for other social and development priorities, while also stimulating the local green economy and creating jobs.

Energy system challenges: The city faces dependency on external energy sources and price volatility. By expanding renewable generation, enhancing energy management, and building local energy communities, the LAP increases local energy security, flexibility, and resilience to future crises.

Key Actions and Pilot Initiatives

A mid-term scaling horizon of 3–5 years is introduced, defining quantified targets for PV capacity expansion, smart-metering-driven energy savings, and REC membership growth.

The City of Jihlava, faces the dual challenge of meeting ambitious climate neutrality targets and ensuring that the energy transition is fair and inclusive. Based on the results of the Challenge Mapping process and stakeholder consultations within the Local JET Alliance, the LAP prioritizes two main interventions:

1. Smart Metering and Energy Management:

This intervention targets municipal buildings with the highest energy consumption and public relevance (schools, sport facilities, administrative offices). By installing smart meters, the city can obtain precise consumption data, identify inefficiencies, and guide cost-effective renovation measures. This is crucial for reducing operating costs, optimizing budget allocation, and setting a good example for local businesses and citizens.

2. Renewable Energy Deployment and Community Energy:

This intervention focuses on installing photovoltaic plants on municipal buildings and establishing a pilot Renewable Energy Community (REC). It allows citizens and SMEs to actively participate in local energy production, thereby lowering energy bills, increasing energy independence, and creating a sense of shared ownership over the transition.

Together, these interventions form a coherent and integrated approach to climate action, supporting emission reduction, boosting local resilience, and enhancing citizen engagement. They are designed to be scalable, so that once initial pilots are successfully implemented, the city can expand them to cover more buildings, districts, and stakeholders.

Key action #1: Renewable Energy Communities

Building on the pilot installation of smart meters in the Bystrouška Kindergarten (nZEB standard), the city will extend smart metering and digital energy management to a portfolio of municipal buildings, including schools, sport facilities, and administrative offices. The data will be used to generate detailed energy balances, identify inefficiencies, and support decision-making for energy retrofits.

PURPOSE AND IMPLEMENTATION	
Objectives	Extend smart metering to 10+ municipal buildings, generate building-level energy balances, support decision-making for retrofits.
Beneficiaries/ Targets	Municipal staff, school children, building users, city energy manager.
Key activities	Installation of meters, integration into central dashboard, monthly reporting, awareness campaigns for users.
Justice aspects	Ensures equal access to energy data, promotes behavioural change for all user groups.
INSTITUTIONS/ORGANIZATIONS INVOLVED AND ROLE IN THE PROJECT	
City of Jihlava	The City of Jihlava acts as the project owner and strategic coordinator. It provides political endorsement, defines priorities in line with municipal strategies, allocates budget resources, oversees procurement procedures, and ensures integration of smart metering and energy management into the city's overall governance and decision-making framework.
Municipal organizations of Jihlava	Municipal contributory organizations (schools, kindergartens, sport and cultural facilities, administrative buildings) act as implementation sites and operational partners. They host the smart metering installations, provide access to buildings and operational data, cooperate in data collection and reporting, and support awareness-raising and behavioural change among building users.
NORMS, LEGAL PROVISIONS	
EU framework	Directive (EU) 2018/2002 on energy efficiency (EED), promoting smart metering.
National framework	National framework: Act No. 406/2000 Coll., on Energy Management + Decree No. 264/2020 Coll., on the Energy Performance of Buildings
Regional framework	Territorial energy concept
POTENTIALITY OF THE DIGITAL TOOLS	
Use of Challenge Mapping Tool to prioritise buildings and Technology Evaluation Tool for selecting metering solutions.	
EXPECTED OUTPUTS	
Meters installed, dashboard created, number of reports produced.	
EXPECTED OUTCOMES	
10–15% energy savings, improved energy management decisions.	
MONITORING SYSTEM	
Monthly data collection, annual reporting by Energy Manager, JETA oversight.	

Key action #2: Renewable Energy Deployment and Community Energy

Following the mapping of renewable energy potential (PV rooftops, public spaces), Jihlava will prepare projects for the installation of photovoltaic plants on municipal buildings and support the creation of local energy communities (RECs). The aim is to enable citizens and SMEs to participate in local energy production, thus lowering energy bills and improving local energy resilience

PURPOSE AND IMPLEMENTATION	
Objectives	Install at least 300 kW of PV on municipal buildings, establish pilot Renewable Energy Community.
Beneficiaries/ Targets	Citizens, SMEs, public institutions, vulnerable households benefiting from cheaper energy.
Key activities	Preparation of feasibility studies, procurement and installation of PV, legal setup of REC, public engagement sessions.
Justice aspects	Distributive justice: share benefits across all citizens; Recognitional: include vulnerable groups; Procedural: participatory meetings.
INSTITUTIONS/ORGANIZATIONS INVOLVED AND ROLE IN THE PROJECT	
City of Jihlava	The City of Jihlava acts as the initiator, coordinator, and facilitator of renewable energy deployment and community energy development. It prepares and coordinates photovoltaic projects on municipal buildings, ensures compliance with national and EU legislation, supports the legal and organizational setup of Renewable Energy Communities, and facilitates citizen and SME participation.
Municipal organizations of Jihlava	Municipal contributory organizations serve as hosts of renewable energy installations and anchor members of the Renewable Energy Community. They provide rooftops or premises for PV installations, participate in local energy sharing schemes, and benefit from locally produced renewable electricity, thereby supporting the practical operation and long-term sustainability of the community energy model.
NORMS, LEGAL PROVISIONS	
EU framework	Directive (EU) 2018/2001 (RED II) on renewable energy, Directive (EU) 2019/944 on common rules for internal electricity market.
National framework	Act No. 458/2000 Coll. (Energy Act) incl. 2023 amendment enabling community energy.
Regional framework	Territorial energy concept
POTENTIALITY OF THE DIGITAL TOOLS	
Technology Evaluation Tool for PV technology selection, monitoring tools for production and consumption balance	
EXPECTED OUTPUTS	
Installed PV capacity, established REC statutes, number of members.	
EXPECTED OUTCOMES	

Annual CO_2 savings, % of local energy covered by RES, reduced energy bills.
MONITORING SYSTEM
Energy production monitoring via smart meters, annual REC performance report.

Governance and Participation

The governance of the LAP in Jihlava is based on a collaborative model involving multiple stakeholders:

- City of Jihlava – provides political endorsement through the City Council and coordinates the implementation through its Sustainability Commission and the Energy Manager.
- Municipal Contributory Organizations – schools, kindergartens, cultural and sport facilities act as key pilot sites for energy management and renewable energy projects.
- Energy Agency of Vysočina (EAV) – acts as technical partner, supports data analysis, project preparation, and monitoring.
- Local JET Alliance (JETA) – platform of local stakeholders including businesses, NGOs, academia, and citizens, ensuring inclusivity and knowledge sharing.
- Technology and ICT Department – provides digital infrastructure and ensures integration of smart metering data into the city's systems.

Citizen engagement is a key element of the LAP. Activities include public workshops, participatory budgeting for energy projects, and education programs in schools. The Digital Ambassadors trained within JETforCE WP1 support communication, raise awareness about energy transition, and encourage citizens to participate in Renewable Energy Communities.

The LAP is anchored in the city's long-term planning framework (Strategic Plan, SECAP, Climate Adaptation Strategy). The City of Jihlava commits to:

- Annual review of LAP progress by the Sustainability Commission and City Council.
- Integration of LAP targets into municipal budget planning.
- Continuous operation of the Local JET Alliance beyond the project duration, serving as a permanent consultative body for energy transition topics.
- Regular data reporting through the smart metering dashboard, available for internal use and summarized in annual public sustainability reports.

Financing and Business Models

The City of Jihlava will adopt a diversified funding approach to ensure that the two key actions can be implemented without overburdening the municipal budget. The financing mix will include:

- EU and national funding – Modernisation Fund (PV and energy efficiency), OP TAK, OPŽP, Just Transition Fund (if eligible).
- Municipal budget allocations – dedicated funds for energy management and building renovations, prioritizing projects with highest energy-saving potential.
- Innovative financing mechanisms – Energy Performance Contracting (EPC) for efficiency retrofits, Power Purchase Agreements (PPA) for PV installations.

Private sector participation – involvement of local businesses in co-owning or investing in renewable energy projects, especially within RECs.

The LAP ensures long-term financial viability through a combination of savings and revenues:

- Energy cost reduction – smart metering and digital management enable 10–15 % savings on energy bills, freeing budget resources for other social and infrastructure needs.
- Revenue generation – electricity produced by PV installations will partially cover municipal consumption, with surplus sold to the grid or shared within RECs, generating stable income.
- Replication and scaling – once pilots demonstrate positive cost-benefit results, additional investments can be funded from savings, creating a self-reinforcing financing loop.
- Risk management – phased implementation allows the city to adjust based on price developments, technology costs, and lessons learned from pilots.

Integrated Implementation Roadmap

The LAP of Jihlava follows a phased approach:

Short-term (2025): feasibility studies and audits of municipal buildings; preparation of project documentation for smart metering and PV installations; securing financing through national and EU programs.

Medium-term (2026-2027): roll-out of smart meters and central dashboard; installation of first PV systems on municipal buildings; legal and organizational setup of the pilot Renewable Energy Community; initial awareness campaigns and citizen engagement events.

Long-term (2028 and beyond): expansion of smart metering to all municipal buildings; scaling up PV capacity and integrating storage solutions if feasible; replication of REC model in additional city districts; continuous monitoring, evaluation, and refinement of energy policies.

The LAP is fully aligned with the Strategic Plan of the City of Jihlava, and the Integrated Territorial Investment Strategy (ITI) of Jihlava Agglomeration. This ensures synergy with regional development plans and maximizes access to EU funding.

Allocation of responsibilities involve:

- City Council of Jihlava – formally endorses the LAP, integrates it into official planning documents, and ensures political commitment.
- Sustainability Commission – oversees implementation progress and prepares annual reports.
- Energy Manager and Technical Departments – responsible for project preparation, procurement, and monitoring.
- Energy Agency of Vysočina (EAV) – provides technical expertise and data analysis.
- JET Alliance (JETA) – remains active as an advisory platform for stakeholder engagement and citizen participation.

Justice, Policy Coherence and Future Pathways

The LAP of Jihlava embeds distributive justice by targeting measures where they generate the highest social value – in public buildings used by children, elderly citizens, and/or vulnerable groups. Benefits from energy

savings and locally produced renewable energy are shared across the community through lower municipal operating costs and potential participation in energy communities.

Procedural justice is ensured through transparent decision-making, public consultations, participatory budgeting, and stakeholder meetings under the Local JET Alliance (JETA). Citizens and SMEs have direct opportunities to influence project design and monitor progress through digital dashboards.

Recognitional justice is addressed by considering the specific needs of low-income households and socially disadvantaged groups when designing Renewable Energy Communities, ensuring that they can participate and benefit without financial barriers. Education and awareness programs are tailored for schools and community groups to ensure broad understanding and engagement.

The LAP directly addresses local inequalities by prioritizing actions that lower energy costs for public services and by enabling vulnerable households to access affordable renewable electricity through shared production schemes. RECs provide a democratic model for citizens to become co-producers of energy, thus reducing dependence on volatile energy prices.

To further strengthen its impact, future iterations of the LAP should:

1. **Expand social targeting** – include specific subsidies or support mechanisms for low-income households joining RECs.
2. **Strengthen cross-sector integration** – link energy transition with mobility planning, social housing programs, and circular economy initiatives.
3. **Introduce justice-related indicators** – track participation rates of vulnerable groups, distribution of financial benefits, and gender representation in decision-making bodies.
4. **Foster replicability** – document best practices and share them with other municipalities in the Vysočina Region to create a regional model for just energy transition.
5. **Leverage digitalization** – expand the use of data analytics and AI for predictive energy management, enabling more targeted interventions.

A3.2.7 Banská Bystrica – Slovakia

Purpose and Strategic Alignment

In recent decades, Banská Bystrica Self-Governing Region has faced a loss of competitiveness of local industrial enterprises throughout its whole territory, especially in energy-intensive production based on energy from fossil fuels. In connection with these issues, there is an increase in unemployment and also a brain drain abroad, which leads to the gradual lagging behind of the entire region.

The aim of the action plan is to support and make visible the implementation of selected JET measures in the Banská Bystrica Self-Governing Region – an associated partner´s region of the project JETforCE in Slovakia.

The document directly reflects the challenges entered for Slovakia in the Challenges Mapping Tool application focused on two priorities:

1. Increasing the energy performance of buildings, including energy audits (in relevant cases).
2. Support for solar power generation facilities with possible benefits for establishment and running of energy communities aimed at empowering citizens and local entities to collectively participate in and benefit

from the clean energy transition by enabling local production, management, and consumption of renewable energy.

The selected actions currently represent the most significant current measures to support a just energy transition in the Banská Bystrica Self-Governing Region. These measures reflect key legislation and policies as well as relevant regional initiatives presented in the Slovak contribution to Joint JETforCE Strategy.

Key Actions and Pilot Initiatives

Key action #1: Increasing the energy performance of buildings

PURPOSE AND IMPLEMENTATION	
Objectives	Renovation of secondary vocational schools modernizing infrastructure and supporting vocational education and training
Beneficiaries/ Targets	Local schools and students
Key activities	Renovation of secondary vocational schools, modernizing infrastructure and supporting vocational education and training. Implementation within the Just Transition Fund (JTF) for Slovakia coordinated by BBSK Office, responsible for establishing and managing the schools and for designing calls and managing the renovation process, supported by the Slovak Innovation and Energy Agency (SIEA)
Justice aspects	The action tackles justice, inequality, and energy poverty by improving efficiency in public buildings, mainly schools (ensuring accessibility for people with disabilities - social justice, promoting energy efficiency and clean energy - environmental justice). It supports fair access to energy, reduces regional disparities in Banská Bystrica, and enhances equal learning conditions through modernized educational facilities.
INSTITUTIONS/ORGANIZATIONS INVOLVED AND ROLE IN THE PROJECT	
Ministry of Investments, Regional Development and Informatization of Slovak Rep.(MIRRI SR)	Governing body
BBSK Office	Manages schools, designs calls, and coordinates renovation implementation
DA	Development of energy strategy and energy management in buildings and facilities under the competence of BBSK Office
SIEA	Monitoring activity
12 secondary vocational schools	Object of the project
NORMS, LEGAL PROVISIONS	

EU framework	EU Just Transition Fund (JTF) under the European Structural and Investment Funds 2021–2027 EU's Low-Carbon Development and energy efficiency directives
National framework	JTF Slovakia Low-Carbon Development Strategy to 2030
Regional framework	Banská Bystrica Self-Governing Region's energy strategy
POTENTIALITY OF THE DIGITAL TOOLS	
The Technology Evaluation Tool application was evaluated a real successful project of the complete renovation of a public building, reaching 123% JET score	
EXPECTED OUTPUTS	
Renovated and modernized secondary vocational schools in the Banská Bystrica Self-Governing Region, improving the energy performance of public buildings under the BBSK Office 9 approved renovation projects **Technical outputs:** Insulation, HVAC upgrades, solar panels, lighting modernization, building renovation, accessibility improvements **Environmental outputs:** Reduced energy use and emissions, more renewable energy use, better indoor climate **Social outputs:** Greater accessibility, comfort, awareness, possible local employment **Institutional outputs:** Better public infrastructure, enhanced reputation, regulatory compliance	
EXPECTED OUTCOMES	
Reduced energy consumption in public buildings (goal of -8% in heating energy by 2025/2026 compared to 2022/2023 levels) Overall increase in comfort for approximately 4,000 students and staff using the renovated school buildings Lower operational costs for local government entities and institutions **Energy Savings:** Lower energy use, reduced costs **Emission Reductions:** Decreased CO_2 and other greenhouse gases **Improved Comfort:** Better indoor climate for occupants **Reduced Operating Costs:** Less frequent repairs and efficient operation **Economic Benefits:** Local job creation and business support **Leadership and Awareness:** Sets example for community and other public bodies **Regulatory Compliance:** Meets EU/national energy renovation obligations	
MONITORING SYSTEM	
BBSK Office monitors progress through energy consumption reduction targets The Slovak Innovation and Energy Agency (SIEA) oversees and reports on the Territorial Just Transition Plan	

Key action #2: Energy Audits for Banská Bystrica Region

PURPOSE AND IMPLEMENTATION

Objectives	Carrying out 80 energy audits in public buildings with low efficiency and high use, creating technical and financial prerequisites for targeted energy-saving investments and future renovation measures
Beneficiaries/ Targets	Public buildings managed by BBSK Office. Local governments and citizens through lower costs and energy savings
Key activities	Perform 80 detailed energy audits mainly in schools and local institutions in Brezno, Revúca, Rimavská Sobota, Zvolen, Žiar nad Hronom, Žarnovica, and Banská Štiavnica districts; identify priority sites for renovation; recommend energy efficiency and renewable energy solutions
Justice aspects	Supports fair transition by addressing energy poverty and inefficiency in disadvantaged districts of Banská Bystrica Region. Ensures public resources target areas most affected by deindustrialization and high energy costs, improving fairness in regional development. The number of beneficiaries can only be determined in cases where the measures from the energy audits will be physically implemented. Then the expected justice aspects achieved are similar as for Key action # 1: • Ensuring accessibility for people with disabilities (social justice). • Promoting energy efficiency and clean energy (environmental justice). • Reducing long-term environmental impact for future generations (intergenerational justice). • Equal access to benefits of modernization across all buildings (distributive justice).
INSTITUTIONS/ORGANIZATIONS INVOLVED AND ROLE IN THE PROJECT	
Ministry of Investments, Regional Development and Informatization of Slovak Rep.(MIRRI SR)	Governing body
BBSK Office	Coordinates audits in buildings under its jurisdiction
DA	Supports BBSK Office in energy strategy and management of audited buildings
SIEA	Implements the national project, conducts and manages 80 energy audits across the region
NORMS, LEGAL PROVISIONS	
EU framework	EU Just Transition Fund (JTF) under the European Structural and Investment Funds 2021–2027 EU's Low-Carbon Development and energy efficiency directives
National framework	JTF Slovakia Low-Carbon Development Strategy to 2030
Regional framework	Banská Bystrica Self-Governing Region's energy strategy
POTENTIALITY OF THE DIGITAL TOOLS	

A complete public building renovation was evaluated in the TET application, achieving a JET score of 123%
EXPECTED OUTPUTS
80 professional energy audits in public buildings under BBSK Office. Creation of a regional energy performance database to guide renovation priorities and identify funding eligibility for efficiency and renewable energy investments
EXPECTED OUTCOMES
Better energy planning capacity in the region and readiness for large-scale renovation. Reduced energy costs and improved management efficiency in public buildings
MONITORING SYSTEM
SIEA oversees audit delivery, reporting, and compliance with JTF funding BBSK Office tracks implementation progress and validates audit results. Indicators include number of audits completed and energy-saving potential identified

Key action #3: Support for solar power generation facilities

PURPOSE AND IMPLEMENTATION	
Objectives	Increase clean energy generation from renewable sources by building a photovoltaic power plant near Prievidza. The project supports Slovakia's green transition, boosts regional self-sufficiency, and enables future energy-sharing communities in Banská Bystrica Region
Beneficiaries/ Targets	Local citizens, municipalities, and enterprises in the Upper Nitra and neighboring Banská Bystrica regions
Key activities	Build a 4.95 MW photovoltaic plant connected to the distribution grid; Recover an abandoned industrial park with existing infrastructure; Facilitate surplus electricity transfer to Banská Bystrica Region and prepare the groundwork for regional energy communities.
Justice aspects	Transforming a former coal-mining site into a renewable energy hub, supporting a fair transition from fossil fuels. Promoting local participation, environmental recovery, and community empowerment, ensuring the benefits of the energy shift reach citizens equally
INSTITUTIONS/ORGANIZATIONS INVOLVED AND ROLE IN THE PROJECT	
Ministry of Inve-stments, Regio-nal Development and Informatiza-tion of Slovak Rep.(MIRRI SR)	Coordinating and financing institution
City of Prievidza	Represents the local municipality hosting the PV plant
Private firms	Builds and operates the 4.95 MW photovoltaic installation Advises on forming energy-sharing groups and networks to support community energy
NORMS, LEGAL PROVISIONS	

EU framework	Renewable Energy Directive (RED II) EU Just Transition Fund (JTF) under the European Structural and Investment Funds 2021–2027
National framework	JTF Slovakia Low-Carbon Development Strategy to 2030 Integrated National Climate and Energy Plan 2019
Regional framework	
POTENTIALITY OF THE DIGITAL TOOLS	
TET was used to assess and benchmark the potential and performance of renewable energy community projects, validating their contribution to the just transition goals, achieving a JET score of 232%	
EXPECTED OUTPUTS	
Construction of a 4.95 MW photovoltaic power Transformation of an abandoned industrial park into a renewable energy site Generation of about 4 907 MWh per year	
EXPECTED OUTCOMES	
Increased renewable energy share in Slovakia's power mix. Reduction of CO_2 emissions and new green jobs in a post-coal area Contribution to regional decarbonization and development of local energy-sharing communities Reduction of electricity bills for approx. 500 households benefiting from the PV power plant as well as for several local companies (these numbers are not final, as connecting to the electricity source is still an ongoing process). For the same reason it is not possible to determine the exact number of beneficiaries, also in the case of companies consuming electricity from the PV powerplant. Economic benefits: • support for local employment and economic stability, • benefits from surplus electricity production will be used in the neighboring region, • lower energy bills for participating consumers. Environmental benefits: • local production and use of renewable energy, • reduction of GHG emissions, • reduction of energy consumption. Social benefits: • active participation of citizens in energy decision-making, • ensuring access to energy, • resilience to market price fluctuations, provision of community services, alleviation of energy poverty.	
MONITORING SYSTEM	
Project beneficiary tracks progresses through annual reports on energy generation and employment	

Governance and Participation

The governance of the Local Action Plan (LAP) for the Banská Bystrica Self-Governing Region is grounded in cooperation **between** national, regional, and local institutions engaged in the Slovak Just Transition process.

The Ministry of Investments, Regional Development and Informatization of the Slovak Republic (MIRRI SR) serves as the main governing authority, responsible for strategic oversight and management of calls financed by the Just Transition Fund (JTF) under the Programme Slovakia 2021–2027.

The Slovak Innovation and Energy Agency (SIEA) acts as the implementing body, ensuring professional and technical realization of actions and monitoring results in line with EU and national energy frameworks. The Banská Bystrica Self-Governing Region (BBSK Office) plays a key coordinating role as the regional partner, linking policy objectives to local needs through its responsibilities in public infrastructure, education, and energy management. Its involvement guarantees that the LAP responds to territorial specificities, promoting local ownership and participation.

Collaboration with the City of Prievidza, KEKS Energy, and other stakeholders strengthens multi-level governance and stakeholder engagement, particularly in the formation of energy communities and in advancing renewable energy and efficiency measures. Overall, the LAP governance ensures coherence between strategic planning, implementation, and just transition goals by aligning institutional roles across scales and sectors.

Financing and Business Models

Financing and business models within the LAP for the Banská Bystrica Self-Governing Region are primarily anchored in the Just Transition Fund (JTF) for Slovakia, complemented by national and regional public resources. All three actions are financed under the Programme Slovakia 2021–2027, Priority 8P1, which provides the framework for the use of European Structural and Investment Funds during the current programming period.

The renovation of secondary vocational schools represents the largest investment component, supported by a total eligible cost of €27.38 million, including €23.27 million from the JTF and the remaining share from state and regional budgets.

The Preparation of Energy Audits is defined as a National Project implemented by the Slovak Innovation and Energy Agency (SIEA), with a total eligible cost of €1.17 million, of which 85 percent is financed from the JTF and 15 percent from the state budget. The energy audits create the technical, economic, and decision-making foundation for future investments in public building renovation and renewable energy deployment.

The third key action, the construction of a 4.95 MW photovoltaic power plant in Prievidza, is financed with €3.22 million from the JTF and designed to promote renewable energy generation and circular economic models in post-coal territories. The associated business model relies on reinvestment of savings and revenues into community energy projects, stimulating local development, job creation, and long-term sustainability of the regional energy transition.

Integrated Implementation Roadmap

The implementation roadmap of the LAP for the Banská Bystrica Self-Governing Region integrates three complementary actions financed through the Just Transition Fund within the Programme Slovakia 2021–2027.

The roadmap follows a sequenced approach: audits inform renovation priorities, while renewable deployment enhances resilience. Progress is monitored through audits completed, buildings renovated, renewable energy produced, and CO_2 savings achieved. It begins with the Preparation of Energy Audits, implemented by SIEA **between April 2025 and December 2026**, aimed at delivering 80 audits to guide energy investments.

Based on these results, the BBSK Office proceeds with **building renovation projects** in secondary vocational schools, focusing on facilities with the greatest efficiency potential and gradual execution **within 2026**, ensuring measurable reductions in energy consumption.

In parallel, the Prievidza photovoltaic project*, scheduled for **completion in 2025**, introduces renewable generation into the regional energy mix by repurposing former coal-mining areas. The Ministry of Investments, Regional Development and Informatization (MIRRI SR) provides overarching coordination, ensuring coherence, compliance, and funding continuity.

Justice, Policy Coherence and Future Pathways

The aim of this action plan is to focus on those actions that have the most significant potential in the area of just transition of the region, specifically in relation to energy.

All three proposed actions are in accordance with the priorities for spending financial resources from the JTF Fund for Slovakia. Specifically, the JTF Fund for Slovakia represents priority 8P1 within the Programme Slovakia, which is the framework programme for drawing funds for Slovakia from the European Structural and Investment Funds in the current programming period 2021 – 2027.

Specifically, Key-action no. 1, together with Key-action no. 2, represents a complex measure with the highest energy saving potential within the competence of the Slovak associated partner of the JETforCE project - BBSK Office. Action 1 contributes to fulfillment of the strategic goal of BBSK Office in the field of energy to reduce energy consumption in all institutions under its responsibility as follows:

Reduce consumption in BBSK organizations by 6% in the heating period 2023/2024 compared to the heating period 2022/2023. In the following heating periods, by implementing additional measures, reduce consumption by 1% per year with the ultimate goal of reducing by 8% in the period 2025/2026 compared to the heating period 2022/2023.

The project on Energy Audits follows on from the successfully implemented project "Expertly about Energy", within which 138 energy audits of public buildings were carried out throughout Slovakia, except for the most developed Bratislava region. Based on the implementation of the above action, we expect significant benefits of the upcoming new project in the area of just energy transition. Energy audits represent a crucial professional element, which will subsequently enable qualified implementation of energy efficiency measures in the affected buildings. The measures proposed by qualified energy experts will serve as a basis for documenting the eligibility of expenses for drawing funds for their implementation from relevant support financial mechanism will be recommended (e.g. EU funds, Recovery and Resilience Plan, Modernization Fund, ...).

Support for solar power generation facilities focuses on the use change of the area of abandoned industrial park, which was originally used for brown coal mining in the neighboring region of Upper Nitra. Proposed solution of building PV powerplant takes advantage of the fact that the area has a power line of sufficient capacity to distribute electricity generated from solar energy. In the future, the project plans to distribute generated surplus electricity also to the territory of Banská Bystrica Self-Governing Region. In addition to changing the nature of the use of the industrial park from its original use for the purpose of fossil fuel mining to the production of energy from renewable sources, it is assumed that the use of the produced energy will also lead to the development of the innovative concept of energy sharing communities. Since there are several abandoned industrial parks with similar characteristics in the regions of Slovakia affected by the energy transformation, it is expected that after the successful implementation of the projects supported in this call from the JTF Fund for Slovakia, analogical projects can also be replicated.

A3.2.8 Lodz Region– Poland

Purpose and Strategic Alignment

The Local Action Plan (LAP) aims to support the energy transition in the Lodzkie Region by continuing selected outcomes from the JETforCE project. The LAP explores possibilities for maintaining digital engagement tools and supporting community participation in the transformation process, subject to resource availability and stakeholder agreement.

The LAP builds on experiences from the JETforCE pilot phase, where initial challenges were identified through the Challenge Mapping Tool. It seeks alignment with the regional Territorial Just Transition Plan and broader EU climate objectives, while recognizing the significant constraints facing implementation. The approach remains flexible, allowing for adaptation based on available resources and local capacities.

The LAP acknowledges the complex social, economic, and environmental challenges facing the region during the transition from coal dependency. These include workforce adaptation needs, municipal revenue concerns, and climate resilience requirements. The plan proposes preliminary approaches to these issues, though specific interventions will depend on funding availability and institutional support to be determined through stakeholder consultations.

Key Actions and Pilot Initiatives

Apart from direct investments and interventions aimed at eliminating coal dependency, the Lodzkie Region's transition requires auxiliary actions. Here the emphasis is put on alleviating socio-economic repercussions and increasing citizens' participation in the process. Based on initial citizen engagement through JETforCE tools and regional strategic priorities, preliminary key action is proposed for further development. This action aims to maintain citizen participation and establish institutional capacity for comprehensive transformation management.

The Transformation Area Observatory is a flagship project initiated by the Marshal's Office of the Lodzkie Region under Action FELD.09.07. The project has secured funding from the Just Transition Fund for Lodzkie Region (FEŁ 2021-2027), with a total budget of EUR 4.9 million (including EUR 4.2 million from JTF). The implementation period is set for 1 January 2026 – 31 December 2028.

Key action #1: Just Transition Observatory

PURPOSE AND IMPLEMENTATION	
Objectives	Establish comprehensive stakeholder engagement and develop strategic framework for transformation management.
Beneficiaries/ Targets	35 municipalities of the Lodzkie Region, which will receive analytical, strategic, and participatory support through the Observatory's thematic platforms. Local citizens, youth groups, and universities benefit from inclusion in dialogue, hackathons, and research Indirect beneficiaries include regional policymakers, employers, and civil society, who gain data, coordination, and tools for planning
Key activities	• Operate 5 thematic observatories (regional development, public health, social dialogue, new energy, entrepreneurship)

	• Organize annual European Just Transition Forum • Conduct community dialogues and youth programs including MOST Observatory • Develop investment area database for 35 municipalities • Prepare regional development strategy for 2028-2034
Justice aspects	The Observatory promotes fairness by ensuring open participation, transparent data use, and recognition of diverse local voices. It reduces regional disparities by involving municipalities, youth, and vulnerable groups in decision-making and monitoring through inclusive and evidence-based processes
INSTITUTIONS/ORGANIZATIONS INVOLVED AND ROLE IN THE PROJECT	
Lodz Marshal Office	Strategy development, coordination
Bełchatów-Kleszczów Industrial Technology Park	*Partnership in project implementation*
Municipalities	Data provision, local implementation
Universities and schools	Research support, youth programs
NORMS, LEGAL PROVISIONS	
EU framework	European Green Deal Just Transition Mechanism, and EU Cohesion Policy 2021–2027
National framework	Poland's Territorial Just Transition Plan National Energy and Climate Plan
Regional framework	Lodzkie Region Development Strategy 2030 Territorial Just Transition Plan for the Lodzkie Region
POTENTIALITY OF THE DIGITAL TOOLS	
• Challenge Mapping Tool data feeds into Observatory analyses for real-time citizen input • TET supports assessment of strategic projects identified by Observatory	
EXPECTED OUTPUTS	
• Establishment of 5 Just Transition Observatories targeting regional development, new energy, strengthening entrepreneurship, social dialogue and public health • analytical reports focused on, among others, job market and human capital, the role of labor unions in transition, territorial cohesion and diversity, sustainable development, revitalization and environmental threats, etc. • Set of recommendations for municipalities based on analytical reports • Forums, study visits and workshops designed for promoting entrepreneurship, knowledge transfer and good practices through stakeholder engagement – 15 unique activities for 260 participants combined, including a main event – Just Transition Forum • Investment area database and competency mapping	
EXPECTED OUTCOMES	

• Increased stakeholders' engagement in Just Transition process – measured by the number of stakeholders with a goal set for 3 545 individuals engaged • Establishment of management model for Just Transition • Regional development strategy 2028-2034 with project pipeline
MONITORING SYSTEM
Quarterly activity reports, stakeholder engagement metrics, strategy milestones, event feedback, platform usage statistics

Governance and Participation

The Marshal's Office of the Lodzkie Region will coordinate LAP implementation, leveraging its EU funds management experience. The 35 municipalities will participate according to their capacities. The Just Transition Observatory provides coordination through thematic observatories, Local governments contribute data and participate when feasible. Academic institutions and civil society engage through Observatory activities, subject to available resources.

The engagement strategy builds on JETforCE experiences within regional constraints. The Observatory coordinates engagement through annual forums and community dialogues, if funding permits. The Challenge Mapping Tool feeds citizen input into analyses. Youth engagement through MOST (Just Transition Observatory for the Youth) and competitions offers innovation, though requires sustained funding. Digital Ambassadors may assist voluntarily, but without compensation their involvement remains uncertain. Multiple participation channels exist if infrastructure can be maintained.

The Observatory aims to integrate JETforCE tools into permanent monitoring infrastructure, contingent on securing JTF funding amid competing priorities. Its governance model and 2028-2034 strategy development provide coordination mechanisms, effectiveness depending on stakeholder commitment and resources. Progress tracking assumes adequate administrative capacity. The ambitious scope may require adjustment to match realistic resource levels.

The cooperation between the Marshal's Office of the Lodzkie Region and stakeholders such as universities, NGOs, and municipalities is voluntary and not formalized. It involves engaging them in activities and initiatives carried out by the Lodzkie Region based on proposals or mutual knowledge exchange. This is not a formal competence of the Marshal's Office, particularly regarding universities.

Financing and Business Models

Potential funding sources include EU programmes (such as the Just Transition Fund with its regional allocation), national instruments, and private sector partnerships. Specific allocations and availability are subject to confirmation.

Just Transition Observatory itself is a project initiated independently by The Marshal's Office of the Lodzkie Region and its funding will be ensured by the Just Transition Fund for Lodzkie Region. Expected outcomes of JTO align with those of JETforCE, giving an opportunity for undertaking synergic and coordinated actions.

The planned actions aim to achieve sustainability through integration into existing administrative structures. However, long-term viability beyond initial grant funding remains dependent on market conditions and securing committed partnerships.

Integrated Implementation Roadmap

Implementation is tentatively planned to begin in 2026, subject to resource availability and necessary approvals. The approach follows three flexible phases:

- **Preparatory phase (2025-2026):** Stakeholder consensus-building, resource identification, and foundational structure establishment for the Observatory
- **Implementation phase (2026-2028):** Launch of prioritized actions starting with lower-cost initiatives like digital platform elements and initial Observatory thematic groups, progressing to more complex interventions
- **Evaluation phase (2028-2029):** Progress assessment and strategy refinement, aligned with development of regional development strategy 2028-2034

Key milestones include securing appropriate endorsement, launching pilot initiatives, establishing thematic observatories, and regular review points aligned with regional planning cycles.

The LAP will align with the Territorial Just Transition Plan and Development Strategy of the Lodzkie Region 2030, leveraging existing frameworks rather than creating parallel structures. The Just Transition Observatory will provide the primary coordination mechanism, offering continuous monitoring and feedback between planning levels through its five thematic areas (regional development, public health, social dialogue, new energy, entrepreneurship).

Municipal integration will be differentiated according to local capacities—larger municipalities may adopt LAP principles comprehensively while smaller ones focus on specific relevant actions. This respects local autonomy while maintaining regional coherence.

The Marshal's Office of the Lodzkie Region will coordinate implementation within its existing mandate for regional development and EU funds management, taking primary responsibility for the Observatory. The endorsement pathway will be determined based on institutional realities—ranging from formal Regional Assembly adoption to executive approval or technical agreements.

Municipalities will engage at levels appropriate to their capacity, from formal adoption to informal participation in specific initiatives. Universities, employers, and civil society organizations will contribute according to their capabilities through existing partnerships.

Constant cooperation with stakeholders will clarify commitment levels, confirm the most appropriate endorsement pathway, and establish the structure for both key actions. The focus remains on creating functional partnerships that enable practical implementation within existing structures and available resources.

Justice, Policy Coherence and Future Pathways

The LAP integrates three dimensions of justice as core principles for energy transition, recognizing both their importance and practical implementation challenges.

Distributive justice guides resource allocation within available means. The digital participation tools and Observatory's analytical framework will systematically assess community needs across municipalities, enabling more equitable distribution based on transparent criteria and regular monitoring rather than ad-hoc approaches.

Procedural justice is addressed through multiple engagement channels combining digital and traditional methods to reach diverse populations. Ongoing participatory processes including stakeholder meetings, community dialogues, and forums ensure continued engagement beyond initial consultations, with specific efforts to include youth voices and broaden participation across communities.

Recognitional justice is embedded in the Observatory's multi-thematic structure, ensuring different stakeholder perspectives are formally acknowledged in planning processes. Evidence-based prioritization through analytical reports will help address diverse needs according to urgency and vulnerability.

The LAP addresses key inequalities affecting specific populations:

- **Displaced workers:** Support for reskilling and identifying transition opportunities through competency mapping and partnerships with employment programs
- **Gender disparities:** Tracking participation metrics and promoting women's inclusion in green job training and STEM education
- **Fiscally dependent municipalities:** Support for economic diversification through investment databases, external expertise, and advocacy for adequate transition funding

Recommendations for the iteration of the LAP in the future are the following

1. Build on monitoring infrastructure: Use data systems to refine justice goals based on evidence rather than assumptions
2. Scale proven interventions: Replicate initiatives identified as effective through evaluation
3. Ensure transparent accountability: Leverage reporting mechanisms to track progress and advocate for resources
4. Strengthen inter-municipal cooperation: Use convening platforms to help communities access collective support
5. Foster knowledge exchange: Establish connections with other transition regions for shared learning and advocacy

These recommendations recognize that systematic institutional frameworks can advance justice goals more effectively than sporadic interventions, enabling meaningful progress within resource constraints through coordinated effort and evidence-based approaches.

A3.2.9 Weiz– Austria

Purpose and Strategic Alignment

The LAP of Innovation Centre WEIZ (Weiz) serves both as a strategic framework and an implementation guide for the City of Weiz and other municipalities in the region. It is designed to support motivated actors—including district heating operators, energy community initiators, and engaged citizens—by providing a clear pathway for introducing and executing actions that contribute to a just and inclusive energy transition. The LAP aims to foster regional climate neutrality by promoting coordinated infrastructure development, citizen participation, and access to advisory and financial support mechanisms. It empowers local stakeholders to take meaningful steps toward decarbonization and energy resilience, while ensuring that no one is left behind.

The Local Action Plan (LAP) of Innovation Centre W.E.I.Z. (WEIZ) is fully aligned with regional sustainability priorities, the European Union’s climate and energy goals, and Austria’s national legislative frameworks for decarbonization and energy transition. It reflects the core principles of the Just Energy Transition for Central Europe (JETforCE) strategy by promoting inclusive, citizen-centered approaches to climate neutrality.

It demonstrate a strong commitment to:

- **EU Green Deal objectives**, including climate neutrality by 2050, energy efficiency, and renewable energy expansion.
- **National strategies**, such as Austria's Integrated National Energy and Climate Plan (NECP) and the Renewable Heat Act, which encourage the shift from fossil fuels to sustainable heating systems.
- **Regional and municipal goals**, focusing on social inclusion, infrastructure modernization, and local economic development like it is stated in the SECAP from the city of Weiz as well as in the new climate neutrality roadmap which was elaborated in 2025.

The LAP responds to key systemic challenges in the region:

- **Social:** It promotes inclusion by supporting vulnerable groups with targeted subsidies and advisory services, ensuring no one is left behind in the energy transition.
- **Economic:** The coordinated infrastructure development and energy community model stimulate local economic activity, create jobs, and reduce energy costs.
- **Energy:** The expansion of district heating and the creation of the energy community contribute to regional energy resilience, reduce greenhouse gas emissions, and promote renewable energy adoption.

Key Actions and Pilot Initiatives

In line with the objectives of the JETforCE project, the LAP identifies two key pilot actions that exemplify the principles of JET and demonstrate how local initiatives can contribute to broader EU and national decarbonization goals:

1. **Expansion of the District Heating Plant at Weizberg**
   This action focuses on the inclusive and sustainable development of local heating infrastructure. The project was implemented in coordination with other utility upgrades (e.g., fiber-optic internet, water, electricity, and LED street lighting), maximizing efficiency and minimizing disruption. It was supported by national and regional funding schemes such as *KPC*, *Sauber Heizen*, and *Sanierungsförderung*, with additional municipal subsidies to ensure affordability for vulnerable groups, including elderly women and low-income households.
2. **Establishment of a Local Energy Community**
   The second key action involves the creation of a decentralized energy community based at the Innovation Centre. This initiative empowers citizens and businesses to produce, share, and consume renewable energy locally. It promotes energy democracy, strengthens regional energy resilience, and fosters community engagement in the energy transition.

Both actions are supported by the Innovation Centre W.E.I.Z., which provides expert guidance on energy efficiency and funding access. The agency plays a crucial role in ensuring that all residents—regardless of income or technical knowledge—can participate in and benefit from the transition.

To monitor progress and evaluate outcomes, a set of indicators will be used to track environmental impact, social inclusion, and economic benefits. Additionally, digital tools developed in the JETforCE project will be employed to support implementation, data collection, and stakeholder engagement.

Key action #1: Expansion of the District Heating Plant at Weizberg

PURPOSE AND IMPLEMENTATION	
Objectives	Reduce Fossil Fuel consumption and reduce CO2 Emissions

Beneficiaries/ Targets	Households
Key activities	This action focuses on the inclusive and sustainable development of local heating infrastructure.
Justice aspects	ensure affordability for vulnerable groups, including elderly women and low-income households.
INSTITUTIONS/ORGANIZATIONS INVOLVED AND ROLE IN THE PROJECT	
Innovation Centre WEIZ	Project management
District Heating Plant Weizberg	Implementation of the Action
Municipality of Thannhausen	Additionl Fundings for households for connecting to district heating grid
NORMS, LEGAL PROVISIONS	
EU framework	***Directive (EU) 2018/2001 – RED II*** The **Renewable Energy Directive (RED II)** promotes the use of energy from renewable sources across the EU. It sets binding targets for Member States, including a minimum 32% share of renewables in the energy mix by 2030.
National framework	Renewable Heat Act National legislation promoting the phase-out of fossil-based heating systems and supporting renewable heating technologies.
Regional framework	Weiz 2040 Climate Strategy – "Weiz lebt Klimaschutz!" A master plan integrated into the SECAP and e5 process, focusing on decarbonization, energy efficiency, and renewable energy. It emphasizes participatory governance and continuous monitoring.
POTENTIALITY OF THE DIGITAL TOOLS	
GloCha Challenge Mapping Platform This tool can be used to engage citizens by providing a digital space where they can ask questions, access information, and find support related to the district heating project. It helps build trust, transparency, and community involvement—key elements of a Just Energy Transition. **Technology Evaluation Tool** This tool supports initiators and stakeholders by offering insights into the **economic viability**, **technical readiness**, and **social justice impact** of the district heating expansion. It helps assess how well the project addresses local challenges and ensures that decisions are inclusive and evidence-based.	
EXPECTED OUTPUTS	
Expected Outputs • Installation of new district heating pipelines in the Weizberg area. • Integration of district heating infrastructure with other utilities (fiber-optic internet, water, electricity, LED street lighting). • Increased number of households connected to the district heating network.	

• Distribution of subsidies to participating households through municipal, regional, and national programs. • Advisory support provided by the regional energy agency to guide citizens through funding and technical options
EXPECTED OUTCOMES
Expected Outcomes • Reduction in greenhouse gas emissions through replacement of fossil-based heating systems. • Improved energy efficiency and infrastructure modernization in the region. • Enhanced social inclusion by enabling low-income and elderly residents to access clean heating. • Strengthened local energy resilience and progress toward climate neutrality goals. • Increased public awareness and engagement in the energy transition process
MONITORING SYSTEM
A monitoring concept was made to monitor economic and ecologic aspects of the action.

Key action #2: Establishment of the Energy Community

PURPOSE AND IMPLEMENTATION	
Objectives	Reduce peak loads, be more energy efficient, produce and share regional energy
Beneficiaries/ Targets	Households, SMEs, Municipalities, NGOs
Key activities	The action focuses on establishing a renewable energy community in Weiz
Justice aspects	The energy community provides savings in energy costs for households. With a special consultation for elderly people, the access to the energy community is provided to all stakeholder groups.
INSTITUTIONS/ORGANIZATIONS INVOLVED AND ROLE IN THE PROJECT	
Innovation Centre WEIZ	Projectmanagement, consultations, Administration of the energy community
NORMS, LEGAL PROVISIONS	
EU framework	***Directive (EU) 2018/2001 – RED II*** The **Renewable Energy Directive (RED II)** promotes the use of energy from renewable sources across the EU. It sets binding targets for Member States, including a minimum 32% share of renewables in the energy mix by 2030.
National framework	NECP Austria (2021–2030) Austria's **National Energy and Climate Plan** outlines targets for greenhouse gas reduction, renewable energy expansion, and energy efficiency. It supports the transition to 100% renewable electricity by 2030.
Regional framework	SECAP Weiz (2019) The **Sustainable Energy and Climate Action Plan (SECAP)** of Weiz, developed under the Interreg CENTRAL EUROPE project CitiEnGov (CE496), outlines the city's strategy for climate neutrality by 2040. It includes emissions inventories,

	stakeholder engagement, and a structured action plan for mitigation and adaptation.
POTENTIALITY OF THE DIGITAL TOOLS	
GloCha Challenge Mapping Platform This tool can be used to engage citizens by providing a digital space where they can ask questions, access information, and find support related to the district heating project. It helps build trust, transparency, and community involvement—key elements of a Just Energy Transition. **Technology Evaluation Tool** This tool supports initiators and stakeholders by offering insights into the **economic viability**, **technical readiness**, and **social justice impact** of the district heating expansion. It helps assess how well the project addresses local challenges and ensures that decisions are inclusive and evidence-based.	
EXPECTED OUTPUTS	
• Formal establishment of a local energy community based at the Innovation Centre. • Installation and operation of renewable energy systems (e.g., solar PV) for shared use. • Participation of households, businesses, and public institutions in local energy production and consumption. • Development of governance structures and digital tools to manage energy sharing and communication. • Advisory services provided by the energy agency to support new members and optimize energy use.	
EXPECTED OUTCOMES	
• Increased share of locally produced renewable energy in the regional energy mix. • Strengthened energy autonomy and resilience for the community. • Enhanced citizen engagement and awareness of sustainable energy practices. • Reduction in energy costs for participating members. • Contribution to climate neutrality goals and alignment with EU directives (e.g., RED II) promoting energy communities.	
MONITORING SYSTEM	
The Energy Community is provided on a administration platform called SoStrom. This platform is also used for the monitoring of the energy community.	

Governance and Participation

The LAP of WEIZ is built on a strong foundation of stakeholder engagement, ensuring that the principles of a Just Energy Transition are implemented inclusively and effectively. The two key actions—expansion of the district heating plant and establishment of a local energy community—require active participation from citizens, municipalities, technical experts, and energy providers.

For the **district heating expansion**the key stakeholders encompass municipal authorities, which oversee planning, coordination, and co-financing, ensuring the alignment of the project with local development priorities. District heating operators are responsible for the technical implementation and ongoing service delivery, while citizens—particularly vulnerable groups—benefit from targeted subsidies and advisory services designed to lower energy costs and improve comfort. The regional energy agency complements these efforts by offering guidance on energy efficiency measures and available funding opportunities, helping households participate effectively in the transition.

For the **energy community**, the initiative is driven by initiators and early adopters who lead its establishment, governance, and operational framework. Local businesses and households take part in collective energy production and sharing, gaining direct financial and environmental benefits through reduced costs and increased self-sufficiency. Municipal representatives play an enabling role by integrating the community's activities into broader urban planning and infrastructure systems, ensuring that local energy generation supports long-term sustainable development.

To strengthen engagement, the LAP employs instruments developed in JETforCE WP1, particularly the JET Energy Transition Alliance (**JETA**) and **Digital Ambassadors**.

- **JETAs** act as pioneers of the energy transition. They are often members of the *Gemeinderat* (municipal council) and serve as role models by being the first to adopt new technologies or join the energy community. Their experiences help build trust and motivate others in their neighborhoods and surrounding municipalities to follow suit.
- **Digital Ambassadors** play a key role in citizen engagement. They support information events, explain technical details in an understandable way, and help address concerns or misconceptions. Their presence ensures that the transition is not only technically sound but also socially accepted.

Additionally, the Innovation Centre **W.E.I.Z.** offers weekly counseling sessions every Wednesday in its coworking space. Citizens can receive free advice on energy efficiency, funding opportunities, and registration for energy communities. This low-threshold service is a vital tool for empowering residents and ensuring broad participation.

Together, these instruments foster a participatory culture, where citizens are informed, empowered, and actively involved in shaping their energy future. This approach ensures that the LAP is not just a technical plan, but a socially inclusive strategy for climate neutrality.

Financing and Business Models

The expansion of the district heating plant (Key Action 1) follows a mixed financing model combining public and private contributions. Households connecting to the network pay a one-time connection fee, while national funding—covering around 35% of the total investment—is provided through the Austrian environmental support program (KPC). In addition, ongoing payments from households for heat consumption ensure the recovery of operational costs.

The business model is based on long-term financial sustainability through a user-based approach: connected households contribute to both the initial investment and the ongoing operation of the system. The combination of national subsidies and user payments makes this model both scalable and replicable in other municipalities.

The district heating operator manages the system, while the municipality provides institutional support. The regional energy agency assists by advising households on connection options and available funding, encouraging participation and maintaining affordability for all users.

The energy community in Weiz (Key action 2) is organized as a registered association, enabling citizens to collectively manage and benefit from local renewable energy generation. Its initial development was financed through a national research project that covered the legal framework, technical planning, and stakeholder engagement processes.

For long-term operation, the financial model relies on a cost margin between production and consumption: members receive a feed-in tariff of €0.09 per kWh and pay €0.115 per kWh for consumption, with the €0.025

per kWh difference funding operational expenses and community management. This structure keeps the community financially viable while offering members lower energy costs and enhancing local energy autonomy.

The association model guarantees democratic governance, transparency, and broad participation. Continuous support is provided by the Innovation Centre W.E.I.Z. and the regional energy agency, which organize free weekly counseling sessions to help citizens register, understand benefits, and engage actively in the community's energy initiatives.

Integrated Implementation Roadmap

The implementation of the Local Action Plan follows a coordinated, phased approach designed to integrate infrastructure development with community-based energy initiatives. The roadmap begins with a preparatory phase, during which municipal authorities, utility providers, and regional energy agencies jointly plan the expansion of the district heating network and the creation of the energy community framework. This stage includes technical studies, coordination with local infrastructure systems, and securing necessary funding through national and regional programs.

The infrastructure phase focuses on tangible implementation. For the district heating expansion, this involves the installation of new heating pipelines, integration with existing utilities, and the deployment of connection points for households and public buildings. Simultaneously, the energy community establishes its legal structure as a registered association, finalizes its governance framework, and initiates installation of renewable energy systems.

Next, the activation phase marks the start of operational activities. Households are connected to the district heating network, receiving subsidies and advisory support to ensure affordability and uptake. The energy community enters its active operation period, enabling energy sharing, billing, and transparent community management.

Finally, the consolidation and expansion phase ensures long-term sustainability. Both initiatives undergo continuous monitoring, maintenance, and potential territorial expansion. Surpluses generated by the energy community are reinvested to support new members and further renewable installations, while district heating operations are extended where economically and environmentally justified. Together, these actions create a scalable, replicable framework for a just and sustainable regional energy transition.

The LAP's implementation is supported by the following institutions:

- **Innovation Centre W.E.I.Z.**: Core coordinator of the LAP and key actions; provides infrastructure, counseling services, and stakeholder engagement.
- **City of Weiz and surrounding municipalities**: Endorse the LAP politically and administratively; support implementation through local planning and funding.
- **Regional Energy Agency**: Advises citizens and stakeholders on energy efficiency, funding, and technical solutions.
- **District Heating Operator**: Responsible for technical implementation and long-term operation of the heating network.
- **Energy Community Association:** Manages the governance, operations, and member engagement of the energy community.
- **JETAs and Digital Ambassadors**: Facilitate citizen engagement, act as role models, and support communication and education efforts.

Justice, Policy Coherence and Future Pathways

The Local Action Plan promotes justice across three key dimensions—distributive, procedural, and recognitional—ensuring that the transition toward clean energy is fair, inclusive, and community-oriented.

Distributive justice is achieved by providing equitable access to clean and affordable energy solutions. The district heating expansion guarantees reliable heating for all, with particular attention to low-income households and elderly women living on limited pensions. Financial barriers are reduced through subsidies provided by municipal, regional, and national sources. Likewise, the energy community lowers energy costs for its members through collective renewable energy production, distributing benefits among participants rather than concentrating them in private ownership.

Procedural justice is ensured through active citizen involvement and transparent governance. During the district heating expansion, residents were informed and engaged through public events and advisory services, with the regional energy agency and the Innovation Centre W.E.I.Z. offering continuous support. The energy community functions as a democratic association, allowing all members to take part in governance and decision-making. Weekly counseling sessions held at the Coworking Space provide open, low-threshold opportunities for participation and registration.

Recognitional justice is reflected in the plan's attention to diverse social and community needs. The district heating expansion directly addresses the circumstances of vulnerable groups such as elderly women and low-income families, acknowledging their financial and technical limitations. The energy community encourages participation from households, businesses, and public institutions alike, valuing local knowledge and community leadership as essential elements of a just and sustainable energy transition.