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D4.1

Energy Poverty Alleviation Plans

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ABOUT

Energy transition plans may challenge the social ecosystem of the regions where coal is still king: if energy transition plans don't consider local factors, they may cause higher unemployment rates, aggravated energy poverty, and economic migration. Energy poverty is already a big challenge today in the EU, with coal-dependent regions generally being more affected by the issue.

In the spirit of the EU principle to "leave no one behind" in the transition, JUSTEM addresses the energy transition planning through a double-sided approach: (1) it helps regional authorities to develop 'just' energy transition plans that are sensitive to regional impacts such as job losses and energy poverty; and (2) it helps citizens build their capacity and find their place in a greener economy.

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ABBREVIATIONS

EPAP	Energy Poverty Alleviation Plan
EU	European Union
GHG	Greenhouse Gases
KPI	Key Performance Indicator
NGO	Non-Governmental Organisation
RAG	Red, Amber, Green
S.M.A.R.T	Specific, Measurable, Achievable, Relevant, Time-bound
SME	Small and Medium-Sized Enterprises

EXECUTIVE SUMMARY

This document provides an overview of the Energy Poverty Alleviation Plans developed for the six regions part of the JUSTEM project, namely Asturias (Spain), Istria (Croatia), Jiu Valley, (Romania), Silesia (Poland), Stara Zagora (Bulgaria), and Western Macedonia (Greece). The Plans aim to support regional and local authorities in alleviating energy poverty through the formulation of targeted measures based on a local needs assessment, including desktop analysis and engagement undertaken with key local stakeholders, coupled with a comprehensive review of national and regional policies for each region. The Energy Poverty Alleviation Plans offer regional and local authorities a robust tool to help them mitigate the risk of energy poverty in their communities through a set of structured interventions with proposed timelines and budget estimates aligned with existing and anticipated European, national and regional legislation supporting the just transition for optimal synergies. The Plans also highlight key benefits and potential barriers to the successful implementation of the proposed measures along with proposed strategies to address the identified challenges.

The core interventions and their impacts identified in the Energy Poverty Alleviation Plans fall under three broad categories considered most pertinent to tackling energy poverty – energy efficiency programmes, renewable energy deployment, and community empowerment initiatives. The Plans have identified a total of six strategic interventions to mitigate the risk of energy poverty. All regional Energy Poverty Alleviation Plans have recognised three of these measures as the cornerstone of all initiatives, namely energy renovation of multi-family residential buildings and single-family houses, renewable energy projects and empowerment of citizens through energy efficiency education, advice and awareness raising.

Effective monitoring of the Energy Poverty Alleviation Plans is critical to ensure their successful adoption *in situ*. The Plans have provided a uniform model for monitoring and evaluation to help local authorities with the timely identification of issues and areas for improvement. It is proposed that the execution of the Energy Poverty Alleviation Plans should be led by local authorities with support from experts, specialised Non-Governmental Organisations and other service providers as required. Ongoing engagement with key stakeholders including analysing feedback from the beneficiaries of the relevant measures is a key prerequisite for the successful delivery of the Plans' overarching objectives.

1. INTRODUCTION

The transition to a net-zero world, including a shift away from fossil fuels, is firmly embedded in the European Green Deal, which is premised on decoupling the continent's economic growth from resource use whilst ensuring that no person and no place are left behind. Europe is facing two significant challenges – the transition to a low-carbon economy and rising social inequality. Neither can be solved without addressing the other. It is vital to ensure that ambitious climate and environmental objectives are pursued with proper consideration of potential inadvertent impacts on communities, particularly vulnerable and marginalised groups. Coal regions tend to be particularly prone to energy poverty in the context of the just energy transition, as regional economies are typically inextricably intertwined with the coal generation and related industries. Therefore, developing a thorough understanding of the risk of energy poverty and its multiple dimensions at local and regional level, followed by targeted mitigation strategies, is of paramount importance to ensure a sustainable and just transition away from coal.



Figure 1: JUSTEM coal regions

JUSTEM has set out to provide an analysis of energy poverty at regional level, which is currently an under-researched area due to the lack of readily available systematised regional energy poverty data in most European regions. A bespoke assessment methodology was designed to enable the analysis of the energy poverty *status quo* in the six regions. This includes a review of key socio-economic factors coupled with

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existing policies to mitigate energy poverty. These socio-economic factors are evaluated through a multidimensional set of indicators comprising socio-economic vulnerability of the population, housing and energy performance and energy market criteria. Regional performance against these indicators has been used to appraise holistically the ability of a region to resist unfavourable conditions relevant to energy poverty.

The Energy Poverty Alleviation Plans (EPAPs) for JUSTEM regions have been structured to:

- Assess the *status quo* of energy poverty at regional level within the context of just transition challenges;
- Identify key national and regional policies and frameworks to address energy poverty in order to ensure overall alignment of the plans with relevant legislation and ambitions;
- Define a set of essential measures with indicative timelines for implementation and related investment requirements to alleviate energy poverty;
- Analyse expected benefits associated with the implemented measures as well as the related challenges and barriers;
- Provide advice for the plan refinement, implementation and ongoing monitoring.

2. STATUS QUO OF ENERGY POVERTY ACROSS JUSTEM COAL REGIONS

The assessment of energy poverty propensity provides an in-depth study of the energy poverty situation in the six JUSTEM coal regions. The approach is based on the analysis of energy poverty at regional level, which in itself presents a significant research challenge due to the lack of a regional observatory for energy poverty and systematised regional energy poverty data in most cases (exceptions are Silesia and Asturias regions). The assessment methodology designed as part of the project includes a review of key socio-economic factors coupled with existing policy frameworks to mitigate energy poverty at regional level. These socio-economic factors are evaluated through a multidimensional set of indicators comprising socio-economic vulnerability of the population, housing and energy performance and energy market criteria that determine holistically the ability of a region to resist unfavourable conditions, specifically to counteract energy poverty.

The project methodology is location-agnostic as it is founded on guiding principles developed during the project on the basis of a review of policy frameworks, quantitative indicators and other data points available at EU, national or regional level. In the absence of comprehensive regional statistics for energy poverty in most regions, this methodology aims to translate EU and national datasets for energy poverty to regional level to build on and enhance the insights gathered through the available incomplete regional datasets. This approach has also enabled the evaluation of the energy poverty

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situation in the relevant regions vis-à-vis national performance utilising a blended quantitative/qualitative analysis.

Building on the original assessment, the EPAPs provide an up-to-date snapshot of the current status of energy poverty across JUSTEM coal regions. As described below, the findings from the EPAPs align with the initial conclusions, delve into the vulnerability factors heightening the risk of energy poverty, and identify the areas where intervention is necessary to mitigate the risk of energy poverty as a significant negative externality of the energy transition towards a low-carbon economy.

Energy poverty poses a tangible risk for all JUSTEM coal regions in the context of the transition away from fossil fuels. Dependence on coal is naturally a common theme both in terms of economic reliance and as an energy source for households across most regions. Historically readily available and relatively inexpensive energy has created little incentive for investment in housing improvements and energy efficiency upgrades.

In this context, a key driver of energy poverty in all JUSTEM coal regions relates to the generally inadequate insulation, outdated heating systems and resulting low energy efficiency of a significant proportion of the housing stock comprising both dwellings in multifamily residential buildings and individual houses. This expectedly leads to poor thermal comfort and high energy expenditure for occupiers.

The Asturias, Istria, Stara Zagora and Western Macedonia regions are characterised by the prevalence of owner-occupied dwellings in unison with the general trends for the four countries (although the national average in Greece has decreased slightly in recent years). The high levels of home ownership indicate that while households are shielded from rent increases, the responsibility for undertaking building maintenance and renovation activities sits with private citizens who often find themselves in the role of “poor homeowners”. Conversely, Silesia and Jiu Valley (part of the Hunedoara County) exhibit a higher share of rental housing where the key risk for occupiers stems from the additional expense imposed by rents.

In terms of income, all regions except Jiu Valley are characterised by disposable household income levels similar to or higher than the national average. Likewise, most regions except Asturias and Jiu Valley display lower unemployment levels compared to the national averages, which can be linked, at least in part, to employment in the coal industry and related services. This means that the phase-out of coal can be expected to have an adverse impact on the local employment landscape and disposable income of households, thereby heightening their risk of energy poverty at least in the short term until local economies can re-focus and replace lost jobs.

Energy prices and their affordability for households is another key factor, which influences the vulnerability of households to energy poverty. The prices of energy for European households have undergone a sharp increase amidst the ongoing war in Ukraine and the resulting energy crisis. The war has compounded the effects of the

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liberalisation of the national energy markets for domestic customers on energy prices. While Bulgaria is the only country out of the six which still operates a regulated household energy market, full liberalisation of the electricity market including domestic customers is expected by 2025. High energy prices reduce the disposable income of households and often limit their ability to heat their homes adequately. The anticipated loss of jobs linked to the coal industry will further exacerbate this problem.

Ageing population is another common denominator and vulnerability factor affecting all regions. Households consisting of elderly residents are particularly vulnerable to energy market fluctuations and rising energy costs.

3. HIGHLIGHTS FROM NATIONAL AND REGIONAL POLICY AND REGULATORY LANDSCAPE

The selection and prioritisation of interventions in the EPAPs for JUSTEM coal regions has been informed by a comprehensive review of strategic national and regional policies and regulations. The National Energy and Climate Plans of the involved countries seek to transition energy systems to more sustainable models with emphasis on improving energy efficiency, increasing the share of renewables in the energy mix and reducing greenhouse gas (GHG) emissions, which are critical for addressing the root causes of energy poverty. In addition, the National Recovery and Resilience Plans allocate significant funds to building renovation and energy efficiency upgrades in existing housing, prioritising vulnerable households and thus addressing energy poverty. Poland has also introduced a Thermomodernisation and Renovation Fund, which offers financial incentives for improving the energy efficiency of buildings, particularly multi-family housing.

The introduction of a formal definition of energy poverty at the national level in Bulgaria (2023), Poland (2022), Spain (2019) and Romania (2021) provides the cornerstone for efforts to effectively alleviate energy poverty by clarifying the scope of the phenomenon and identifying those most affected. This understanding enables the creation of targeted policies and measures to address the factors that cause energy poverty. Spain has adopted a National Strategy against Energy Poverty (2023-2030), which incorporates specific targets for reducing energy poverty by improving energy efficiency in residential buildings, providing financial assistance to vulnerable populations, and promoting the use of renewable energy. For Greece, the National Action Plan to Mitigate Energy Poverty sets up monitoring indicators but falls short of defining energy poverty. Croatia plans to adopt a Programme for Energy Poverty Alleviation with an energy poverty definition and monitoring system.

The EPAPs for the Asturias and Silesia regions benefit from and can explore synergies with the most comprehensive set of national and regional policy frameworks and programmes covering areas such as the enhancement of energy efficiency in the

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housing sector, transition of inefficient carbon-intensive residential heating systems to cleaner more efficient alternatives, and the promotion of renewable energy projects.

In addition to national policies, a number of JUSTEM coal regions can also rely on a region-level policy instrument, which is designed to address energy poverty. The Asturias Regional Energy Strategy prioritises key measures to mitigate energy poverty, particularly in communities most affected by the issue in support of the social and economic transition in coal-dependent areas. In terms of other policies addressing regional issues, the Territorial Just Transition Plan of all JUSTEM coal regions except Istria identify energy poverty as a potential impact of the energy transition and highlight energy poverty alleviation as a strategic goal. They introduce specific measures targeting energy poverty with particular emphasis on supporting energy efficiency and RES measures in residential buildings with a focus on energy-poor and vulnerable consumers.

4. STRATEGIC LEVERS IDENTIFIED TO ALLEVIATE ENERGY POVERTY

From the outset, three broad categories considered most pertinent to tackling energy poverty based on the energy poverty status analysis and reinforced by relevant national and regional policy and regulatory frameworks were defined to ensure strategic alignment in the nature of the interventions proposed by each plan. The policy areas include: energy efficiency programmes, renewable energy deployment, and community empowerment initiatives.

A range of tailored interventions to help address the risk of energy poverty in each region has been identified as part of the six regional EPAPs utilising the findings from the local needs assessment including desktop analysis and engagement with key local stakeholders. The selection and prioritisation of the measures was also informed by a comprehensive policy review at national and regional level as described in section 3.

Key responsible entities, target group(s), indicative timelines for implementation and budget estimates have been provided for each measure prescribed by an EPAP. They are based on a combination of existing policies, funding sources, expert estimations and feedback from stakeholder engagement.

There are **three measures** which have been identified by the EPAPs for all JUSTEM coal regions as critical interventions required to help mitigate and effectively manage the risk of energy poverty.

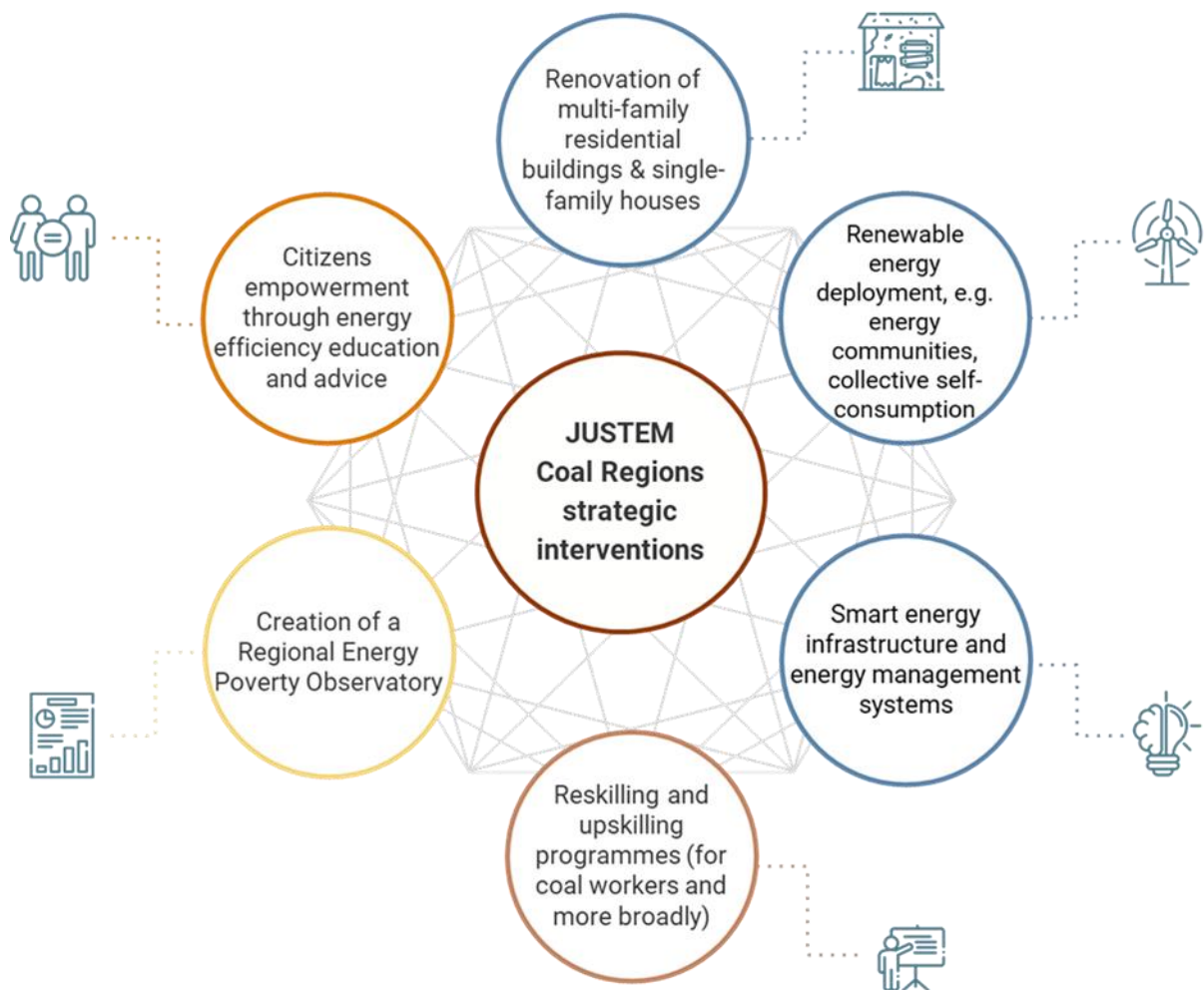


Figure 2: Strategic interventions to mitigate the risk of energy poverty identified for JUSTEM coal regions

The first relates to energy renovation of multi-family residential buildings and single-family houses. This measure entails a thorough upgrade of the building envelope in order to reduce energy consumption by minimising heating losses whilst also lowering energy bills and improving living conditions. **The replacement of inefficient heating systems, eliminating carbon-intensive heat sources**, is an intrinsic element of a holistic building retrofit programme for optimal energy efficiency. This measure is also included as a stand-alone intervention in the EPAPs for Asturias, Jiu Valley, Silesia and Stara Zagora regions.

The responsible entities for the execution of energy renovation projects specified by the plans include local and regional authorities alongside relevant ministries and ministerial departments in charge of environment and energy, regional development and finance. Key target groups for the measure comprise homeowners’ associations in multi-family residential buildings and single-family house owners with emphasis on vulnerable communities and low-income households at higher risk of energy poverty. In the same vein, priority is also given to energy-poor residents in the case of heating systems replacement.

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The second relates to renewable energy projects seeking to accelerate deployment through various channels, including establishment of energy communities for renewable energy production, collective actions for renewable hot water supply in multi-family residential buildings, and collective self-consumption projects in electricity generation facilities using solar and wind energy (with storage) where applicable.

The responsible entities for the delivery of renewable energy projects include local and regional authorities, utility providers alongside relevant ministries and ministerial departments in charge of environment and energy. Key target groups for the measure consist of homeowners in multi-family residential buildings and single-family house owners with priority given to energy poor citizens.

The third relates to the empowerment of citizens through energy efficiency education, advice and awareness raising. The different plans offer slightly different mechanisms to achieve this including:

- Creation of an energy poverty advisory office / service provided by regional and/or local authorities (Asturias, Istria, Stara Zagora, Western Macedonia regions),
- Support offered to energy-poor citizens during the process of thermo-modernisation of buildings to reduce fuel and energy consumption, along with training provided to employees of social service centres (Silesia region), and
- Education campaign, including workshops, information brochures, and digital platforms, to raise awareness about energy-saving behaviours, available subsidies, and renewable energy options targeting low-income households, students, and elderly residents (Jiu Valley region).

The responsible entities include local and regional authorities with assistance from social service centres, specialised Non-Governmental Organisation (NGOs), community leaders and energy advisors. Key target groups for the measure comprise low-income households and households at risk of energy poverty, students and elderly residents.

Additional measures shared by two or more regions include:

- **Deployment of smart energy infrastructure and energy management systems with priority given to energy-poor households** – contained in the EPAPs for Jiu Valley, Stara Zagora and Western Macedonia regions,
- **Targeted reskilling and upskilling programmes and financial aid to help workers directly or indirectly employed in the mining sector transition into new job markets** – formulated in the EPAPs for Stara Zagora and Silesia region – as well as **new and innovative educational and retraining programmes for green, technological occupations aligned with the needs of the labour market** – defined in the EPAP for Istria region, and
- **Creation of a Regional Energy Poverty Observatory** – stipulated in the EPAPs for Asturias and Western Macedonia regions.

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The EPAPs also reveal a number of **region-specific measures** reflecting the local idiosyncrasies of the relevant regions. These include increase in female labour force participation, designed to reach out to non-working women part of families in which the sole breadwinner is the man working in mining (Silesia region); thermal social vouchers relating to a direct grant programme regarding energy used for heating, domestic hot water or cooking aimed at guaranteeing basic comfort and health outcomes for eligible residents with priority given to disadvantaged groups, including the elderly, children, and those with health conditions (Asturias region); support for small and medium-sized enterprises (SMEs) through production innovations (Istria region); and introduction of a new educational curriculum, mainly in secondary schools, to enhance the employment prospects of younger generations in new, greener technologies (Istria region) – deemed to be an intervention with largely indirect impacts on the risk of energy poverty.

The EPAPs also identify key sources of funding for the implementation of the plans, including EU funding, government grants, local and regional funds, private investments (e.g. public-private partnerships), development credit lines in national banks, philanthropic support, and international development assistance (e.g. European Investment Bank and World Bank funding) as appropriate. Key EU funding lines include the National Recovery and Resilience Plans, as well as the Just Transition Fund with relevant national mechanisms, which manage and distribute funds in accordance with the Territorial Just Transition Plans approved by the European Commission.

Timelines for implementation have been provided as part of all EPAPs. An indicative range has been specified in each plan, with the 2025-2029 period being the longest interval. The goal is to ensure that the plans focus on critical interventions, which should be implemented in the short term for optimal impact. This timescale also helps to provide greater transparency and accountability in the proposed measures as it prompts responsible entities to assess and report progress in a relatively condensed timeframe whilst encouraging local and regional authorities to review and evolve the planned interventions in order to ensure they remain relevant and impactful.

5. BENEFITS AND CHALLENGES ASSOCIATED WITH THE KEY PROPOSED INTERVENTIONS

The EPAPs outline the expected benefits associated with the prescribed measures, as well as related challenges, pointing out possible bottlenecks, for example, in engaging with stakeholders and securing funding. They also propose ways to address these challenges and identify means to overcome the barriers to successfully implement the measures taking into account the specific conditions in each region.

JUSTEM strategic interventions: key benefits and challenges

Table 1 below summarises the expected primary benefits and challenges relating to the six key measures prescribed by the EPAPs for most JUSTEM coal regions.

Benefits and challenges associated with JUSTEM strategic interventions

Strategic interventions	Renovation of multi-family residential buildings & single-family houses	Renewable energy deployment	Smart energy infrastructure and energy management systems	Reskilling and upskilling programmes	Creation of a Regional Energy Poverty Observatory	Citizens empowerment through energy efficiency education and advice
Expected benefits	<ul style="list-style-type: none"> Improved energy efficiency resulting in lower energy consumption and energy costs, reduced GHG emissions and better thermal comfort. Enhanced indoor air quality where retrofit projects include the replacement of polluting heating systems with cleaner alternatives in addition to upgrades to the building envelope. 	<ul style="list-style-type: none"> Increased self-consumption offering clean and affordable energy to households, especially energy-poor ones. Improved energy security enabling energy-poor households to reduce their energy costs, GHG emissions and achieve greater energy independence. More equitable access to essential energy services for vulnerable households. 	<ul style="list-style-type: none"> More accurate billing and greater transparency for consumers supporting a proactive attitude towards energy usage and encouraging the implementation of energy-saving practices. Promotion of advanced energy management practices such as load shifting to maintain grid stability and optimise energy costs. 	<ul style="list-style-type: none"> Enabling citizens directly affected by the green transition to retrain and obtain new skills required for employment in other areas including green industries. Helping workers to move into new job markets following the closure of coal plants and disruptions to related industries and service providers. 	<ul style="list-style-type: none"> Improved understanding of local and regional authorities of the energy poverty situation in their region. Contributing to the identification of priority households in need of additional support to help reduce social and economic inequalities. 	<ul style="list-style-type: none"> Increased citizens' energy literacy and awareness of funding sources for energy upgrades also offering a 'guiding hand' during retrofit projects. Effective engagement with energy-poor residents. More rational energy use, lower energy bills and the adoption of efficient, low-carbon energy technologies.
Expected challenges	<ul style="list-style-type: none"> Low awareness among citizens of the benefits of energy renovation projects. Difficulty in engaging hard-to-reach vulnerable households. Limited ability to cover upfront investments where self-funding is required in the absence of grants. 	<ul style="list-style-type: none"> Limited ability to meet investment requirements, both upfront and during the exploitation phase. Grid saturation can hinder the integration of renewable energy and thus discourage new installations. Outdated energy infrastructure can impede the upscaling of renewables. 	<ul style="list-style-type: none"> Behavioural resistance due to lack of information. Limited ability of households to engage due to upfront investment requirements. Technological complexities and maintenance challenges. 	<ul style="list-style-type: none"> Resistance to change exhibited by coal industry workers and reluctance to participate in reskilling programmes. Insufficient preparation including lack of capacity building of relevant local and regional authority employees and funding required for the successful delivery of reskilling and upskilling programmes. 	<ul style="list-style-type: none"> Lack of funding for the creation and operation of the observatory. Lack of coordination among the various levels of government. 	<ul style="list-style-type: none"> Lack of citizen engagement. Insufficient outreach efforts targeting energy-poor households. Inadequate funding hindering the effective operation of energy poverty advisory offices or equivalent services. Failure to provide relevant training to local and regional authority employees.

Table 1: Benefits and challenges associated with strategic interventions recommended by JUSTEM to alleviate regional energy poverty

The EPAPs also examine the benefits and challenges relevant to the identified region-specific measures. Key benefits associated with the increase in female labour force participation proposed by the EPAP for Silesia region include increase in the labour force participation of all household members of working age, which will raise household incomes and promote gender equality whilst also leading to higher productivity levels in the region. The main barrier relates to the lack of previous work experience of women who have not had to work professionally up to date given their family circumstances (i.e. well-earning husbands working in mining), which might make it difficult for them to find employment.

The key benefit associated with the thermal social vouchers proposed by the EPAP for Asturias region relates to reduced financial pressure on vulnerable energy users who receive direct grants regarding energy used for heating, domestic hot water and cooking in the form of a single annual payment. There are no specific barriers confronting this intervention except potential lack of awareness among low-income families of their entitlement.

The EPAP for Istria region recommends the provision of support for SMEs through production innovations and the introduction of a new educational curriculum (in secondary schools). Key benefits highlighted in relation to the former include the expansion of the job market, ensuring new jobs and reskilling options for vulnerable groups in the region. Improving the employment prospects of younger generations in new, greener technologies is considered the most significant benefit of the second measure. Lack of SME interest and lack of funding are identified as the main barriers to the successful implementation of the measure relating to SMEs. Barriers relating to the modernisation of the educational curriculum include lack of interest from local and regional authorities or educational institutions, as well as potential legal barriers.

JUSTEM strategic interventions: proposed strategies to address common challenges

Table 2 summarises the key challenges and barriers affecting the main interventions advocated by the EPAPs for all JUSTEM coal regions and the core strategies that can be adopted across the six regions to overcome the identified challenges.

	Expected challenges and barriers	Proposed strategies to address the expected challenges and barriers
1	Lack of awareness among citizens of the benefits of energy improvement projects, leading to reluctance to participate and resistance to change.	Establishing advisory offices or equivalent service acting as a one-stop-shop for education, guidance and support to citizens, helping them to navigate the often complex technical issues around building renovations and relevant upgrades. Conducting targeted outreach

		campaigns (e.g. information brochures, workshops and digital platforms) involving trusted community leaders where possible to inform households about the long-term benefits of energy efficiency, renewable energy and smart energy infrastructure, along with available support offered by the state including existing funding schemes.
2	Need for capacity building and effective coordination among multiple levels of government, as well as between local and regional government and external partners, i.e. specialised NGOs and other service providers.	Extensive training and capacity building of local and regional authority employees to enhance their knowledge of key issues such as energy efficiency measures and deployment of on-site renewables to enable them to provide meaningful advice to interested citizens and engage effectively with external partners.
3	Financial constraints in the form of limited financial resources of residents, particularly energy-poor households, and insufficient funding provided by national and regional governments.	Developing accessible financing mechanisms such as low-interest loans and targeted grants.
4	Complexity in identifying and engaging hard-to-reach vulnerable households.	Creating a mechanism for identifying energy-poor households at regional or local level based on objective criteria linked to the definition of energy poverty (where available).

Table 2: Challenges and barriers associated with strategic interventions recommended by JUSTEM and proposed strategies to address them

6. PLAN REFINEMENT, IMPLEMENTATION AND MONITORING

In order to assess the level of success of the EPAP's implementation, each plan has defined Specific, Measurable, Achievable, Relevant, Time-bound (S.M.A.R.T) key performance indicators (KPIs) and targets to track progress against the strategic

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interventions identified for each region. As part of the project, a uniform model for the plan monitoring and evaluation has been developed to enable the timely detection of bottlenecks and/or areas for improvement. Minor adaptations to this model have been implemented by individual regions to reflect local specificities.

Crucially, the methodology treats the development and implementation of the EPAPs for JUSTEM coal regions as an iterative process, learning from experience and refining strategies and interventions as needed to achieve the desired outcomes. The model for monitoring and evaluation is premised on the principle of continuous improvement and adaptation of the plans by establishing a feedback loop to incorporate stakeholder input, emerging trends, and changing circumstances into the ongoing management and evolution of the plan over time.

The implementation and monitoring of the EPAPs should be a **two-stage process**. The overarching responsibility for the plans sits with the **regional authorities**. The responsibility for the day-to-day implementation of the measures outlined in the Plan sits with the **individual municipalities** tasked with the execution of the relevant interventions, who are expected to engage relevant experts from specialised NGOs and other partners as required.

A status report prepared by the relevant department in each municipality covering all measures and relevant KPIs should be produced annually, clearly identifying the progress against each metric using a Red / Amber / Green (RAG) evaluation system with timescales for the specific initiatives and accompanying with an explanation of key achievements and challenges where applicable. The report should be presented to the Municipal Council of the relevant municipalities for ratification.

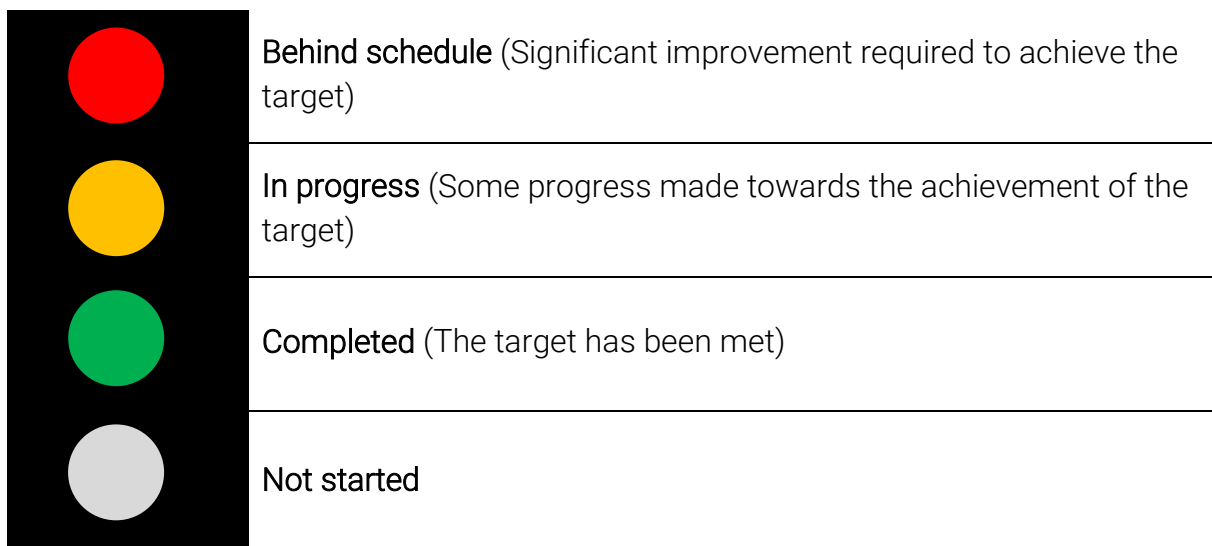


Figure 3: RAG System for Evaluating Progress against the Plan Measures

Before the Plan submission to the Municipal Council, relevant commissions in charge of spatial development, social policy, budget and finance, and environment and green

transition should be tasked with reviewing the status report and making suggestions for amendments to the Plan if necessary.

Once the status reports are ratified by the Municipal Councils of the relevant municipalities, they should be submitted to the regional authority who is then responsible for synthesizing the findings from the individual status reports of the various municipalities in order to evaluate the overall progress against the commitments specified in the EPAP for the relevant region and make recommendations to the individual municipalities if required.

A mechanism for collecting feedback from beneficiaries of the relevant measures (e.g. homeowners involved in home energy renovation projects, energy-vulnerable citizens using the services of the energy poverty advisory offices, workers in coal mines participating in reskilling programmes) should be established in relation to every measure contained in the Plan. This can include formal surveys, stakeholder meetings and informal discussions.



Figure 4: Energy Poverty Alleviation Plan Implementation & Monitoring Process

7. CONCLUSIONS

This report summarises key findings and observations from the EPAPs for the six JUSTEM coal regions, offering an in-depth understanding of key vulnerability factors of energy poverty determined on the basis of a bespoke assessment methodology developed to inform the analysis of the energy poverty *status quo* in the six regions. This analysis revealed that energy poverty poses a tangible risk for all JUSTEM coal regions in the context of the green energy transition. The risk of energy poverty has broadly similar root causes in the six regions, with poor building energy performance being a key common factor. Likewise, there is strong alignment between the core interventions proposed by the EPAPs and likely challenges, which must be overcome to ensure the successful implementation of the recommended solutions.

The EPAPs also outline clear pathways for removing or minimising the impact of the barriers in question. The major strategies revolve around the provision of education and support to citizens to help them understand the benefits of building renovation projects and relevant upgrades; extensive training and capacity building of local and regional

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authority employees to enhance their knowledge of technical matters, such as energy efficiency measures and deployment of on-site renewables, to enable them to provide meaningful advice to interested citizens and engage effectively with external partners; securing accessible financing mechanisms, such as targeted grants and low-interest loans; and the creation of a mechanism for the identification of energy-poor households at regional or local level based on objective criteria linked to the definition of energy poverty (where available).

The development of the EPAPs for JUSTEM coal regions is an iterative process, drawing on lessons learnt from practice and feedback provided by the beneficiaries of the implemented measures and other relevant stakeholders. Our recommendation to local and regional authorities is to review them regularly, in line with the evolution of market practice, technology and the regulatory landscape. Crucially, the regional EPAPs have been devised with a view to establishing a template for this type of tool targeted at local and regional authorities that can be easily transposed to other regions to amplify its positive impact in alleviating energy poverty. The “replicability” of the Plans has been achieved by following a clearly documented methodology and data collection process, structured engagement with key stakeholders, open access data sources, assessment of the economic viability of proposed solutions in the form of specific budget estimates with respect to each measure type, and advice for the plan refinement, implementation and monitoring.

The Energy Poverty Alleviation Plans of the JUSTEM regions are available in the respective local language on the project website – [Asturias](#), [Istria](#), [Jiu Valley](#), [Silesia](#), [Stara Zagora](#), and [Western Macedonia](#).