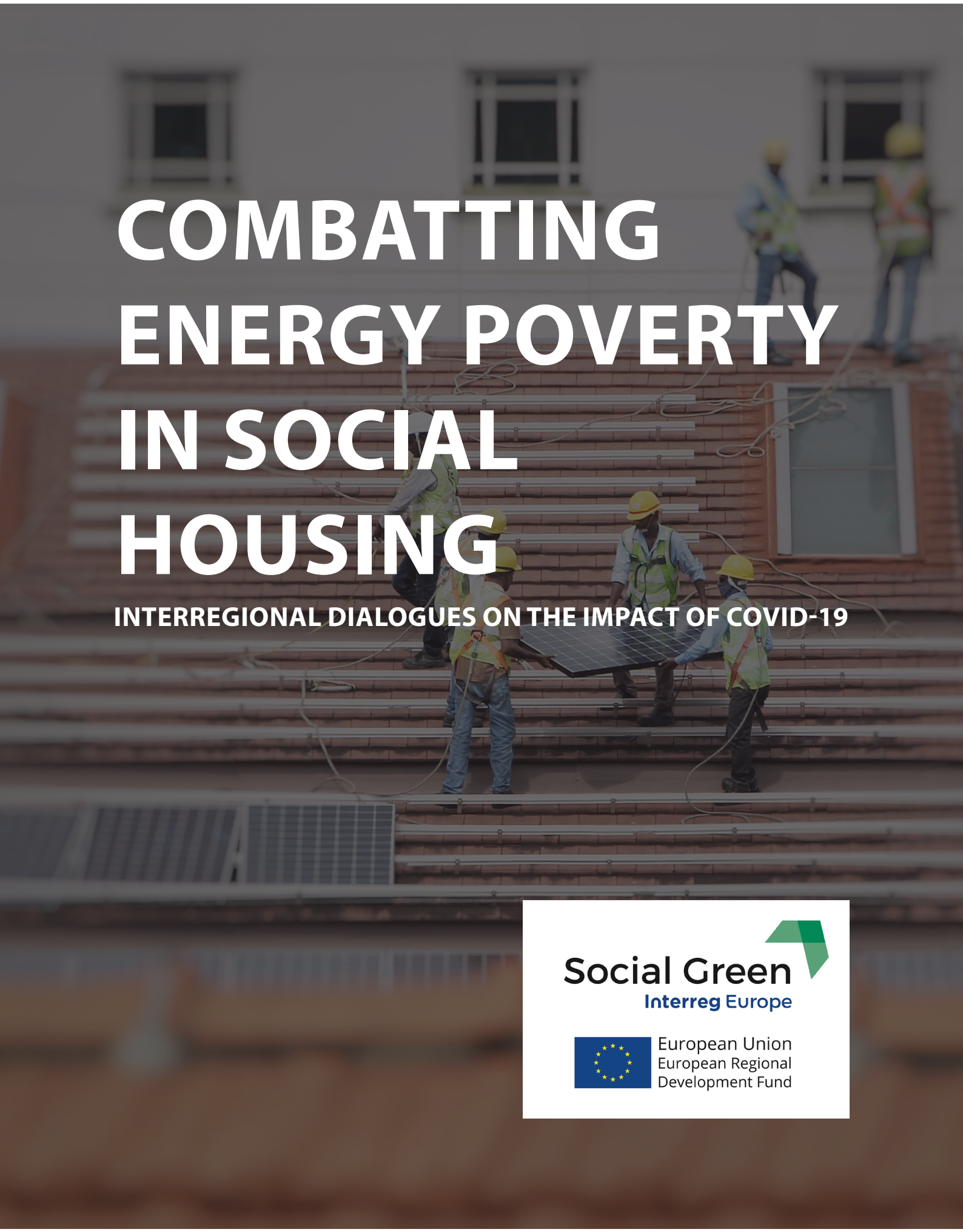

COMBATTING ENERGY POVERTY IN SOCIAL HOUSING

INTERREGIONAL DIALOGUES ON THE IMPACT OF COVID-19

Social Green
Interreg Europe

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Development Fund

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INTERREGIONAL DIALOGUES ON THE IMPACT OF COVID-19

Social Green - Regional policies towards greening the housing sector
Fifth-call activities final report

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SOCIAL GREEN IN RESPONSE TO NEW CRISES

Social Green[1] is an Interreg Europe project tackling the topic of housing deprivation and energy efficiency in the scope of the social housing sector with the goal of developing a lower carbon economy. From 2016–2021, Social Green helped seven regional and local authorities and energy agencies in five countries to develop and implement action plans for greening the social housing sector in their contexts. With the support of one advisory partner, several key learnings were identified, including the importance of long-term, collaborative approaches with local and regional stakeholders, building long-term trust with social housing tenants, and persisting with the work despite challenges (such as the sheer volume of energy inefficient housing).

In 2020, inhabitants around Europe faced a range of economic and social challenges due to the COVID-19 pandemic. Vulnerable groups, such as those facing energy poverty, became newly visible. In particular, the status of 'vulnerable' began to apply to a much larger group of the public than ever before. Leaders for regional development policies were appointed with new responsibilities to combat growing challenges faced by communities. In the spring of 2021, the Interreg Europe Programme opened a fifth call, enabling the first and second-call projects such as Social Green to extend their work in response to these emerging problems and their effects on regional policy.

During this fifth-call period, the Social Green project provided regional partners in Extremadura (Spain), Alba Iulia (Romania), Northern Croatia, and Sud Muntenia (Romania) and an advisory partner (Sweden) with the opportunity to exchange experiences about the COVID-19 crisis and its impact on green social housing retrofits (Figure 1). Together the partners identified direct and indirect challenges posed by the crisis and considered possible measures to face and recover from it. Additionally, the project period enabled the partners to improve their defined policy instrument (see Table 1) so that they could recover from the existing circumstances and build resilience for future crises.

This report is a culmination of the work that took place during the fifth-call extension, from October 2021 through September 2022. It considers the existing status of energy poverty and social housing in the European Union (EU), reviews the activities of the Social Green project, and provides several major findings that emerged from the interregional workshops with the Social Green partners tackling energy poverty in their regions.

[1]For more information about Social Green, visit www.interregeurope.eu/socialgreen.

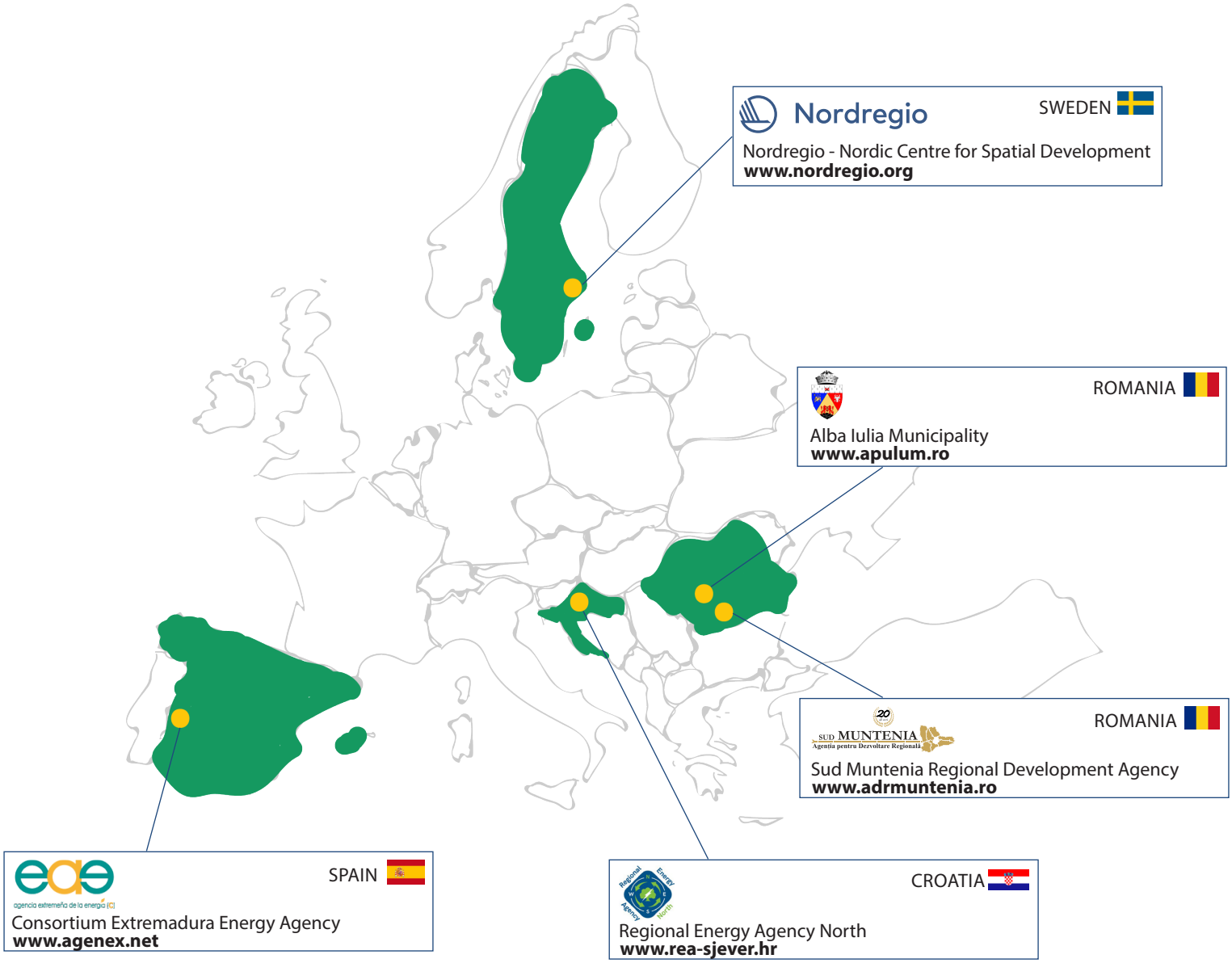

Figure 1. Social Green partners for the fifth-call activities, 2021–2022

Table 1. Social Green partner organisations and their respective Policy Instrument under review in the fifth-call period

PARTNER ORGANISATION	NUTS-2 REGION	COUNTRY	POLICY INSTRUMENT
Agenex (Consortium Extremadura Energy Agency)	Extremadura	Spain	Operational Programme for ERDF of Extremadura 2014–2020
AIM (Alba Iulia Municipality)	Centre Region	Romania	Regional Operational Programme–Centre Region 2021–2027, Axis 3 'A region with environmentally friendly communities
REAN (Regional Energy Agency North)	Kontinentalna Hrvatska	Croatia	Energy renovation of family houses owned by citizens at risk of energy poverty (National Policy Instrument in Croatia)
SMRDA (Sud Muntenia Regional Development Agency)	Sud Muntenia	Romania	Regional Development Plan 2021–2027 (Regional Policy Instrument in Sud Muntenia)

GREENING THE SOCIAL HOUSING SECTOR

According to the European Commission's Energy Poverty Advisory Hub, over 50 million people in the EU experience energy poverty (Gangale & Mengolini, 2019; see Box 1). This means that around 10% of the EU population suffers, to some degree, from the high cost of energy bills to the extent that it interferes with their physical and mental well-being. Countries in Southern and Eastern Europe tend to have higher rates of energy-impoverished residents (Chlechowitz & Reuter, 2021). In addition to the social impact of energy poverty, household energy consumption contributes to an estimated 60% of total greenhouse gas (GHG) emissions across the globe (Liu et al., 2020). Buildings in the EU are estimated to contribute widely to this figure, making up 40% of total energy consumption in the EU and contributing to 36% of GHG emissions (primarily from energy used for construction and renovation as well as household usage; European Commission, 2020). Furthermore, the current energy crisis and the war in Ukraine have contributed dramatically to the increase in electricity and gas prices which has affected millions of European citizens.

Since its global spread in early 2020, the COVID-19 pandemic has exacerbated existing conditions of energy poverty in social housing. For countries enforcing lockdowns, residents assumedly spent more time at home, placing pressure on their energy use and, at times, exposing residents to the vulnerabilities of energy poverty. Recent research has shown that the COVID-19 pandemic has increased the levels of energy poverty in Europe by affecting levels of disposable income whilst increasing expenditures for energy needs (Siksnelyte-Butkiene, 2022). Considering the energy-income nexus, the European Commission proposed a Recovery Plan for Europe in 2020 to finance a so-called Renovation Wave to update infrastructure, including energy infrastructure, in EU buildings. Other national and regional policies also responded to the crisis by, for example, placing bans on energy disconnection or providing subsidies and discounts for vulnerable households (Bouzarovski et al., 2020).

The European Green Deal seeks to reduce net emissions of GHG and decouple economic growth from resource use, while ensuring no one is left behind (including those who may not be able to afford a sustainable lifestyle that contributes to such environmental goals; European Commission, n.d.-a). Additionally, the recently revised 'Fit for 55' initiative has set new, ambitious targets for cutting GHG emissions in the EU while boosting renewable energy sources (European Council, 2022-a). One area targeted in this work is building renovations, where the public sector is expected to improve energy efficiency in order to make an annual reduction of 1.7% of en-

ergy consumption within the public sector (European Council, 2022-b). In tandem with this are global environmental goals. Providing access to "affordable, reliable, and sustainable energy" is part of the vision for Agenda 2030. Sustainable Development Goal 7 pinpoints three targets in relation to this vision, aiming for universal access to modern energy services, increasing the share of renewable energy, and improving energy efficiency by 2030 (United Nations, n.d.). These initiatives all require investments to be made in energy research, technology, infrastructure, and renovation work.

The European Commission provides funding for energy retrofit projects through several avenues including the European Regional Development Fund (ERDF) and Cohesion Funds. As part of the European Structural and Investment (ESI) funds, the financial resources go towards establishing "sustainable and healthy European economies and environments" (European Commission, n.d.-b). The activities within the Social Green project, including the fifth-call activities, are funded through the 2014–2020 ERDF, with the goal of improving the performance of regional development policies and programmes. The new ERDF 2021–2027 concentrates on developing a competitive and smart European territory and establishing a greener, low-carbon transition towards net zero carbon economy for a more resilient Europe. Practically speaking, this means that 30% of funding through the ERDF, and 37% of funding through the Cohesion Fund, is expected to be invested in climate objectives, including tackling energy poverty, developing energy savings schemes, and transitioning to energy efficient systems (EU, 2021).

Those living in energy poverty often suffer from a two-fold problem: firstly, they suffer from insufficient heating/cooling or electrical systems that burn energy at an inefficient rate, and secondly, they bear the weight of extreme costs associated with energy consumption. This means that those already living in vulnerable circumstances must face additional burdens. Residents in these conditions may overconsume energy and face bills they cannot afford, or they may under-consume in an effort to conserve finances, resulting in insufficient heating in the winter/cooling in the summer or lack of energy for daily needs (see, e.g., Thomson et al., 2019). Such measures take a mental and emotional toll on residents. Often the predicament of energy poverty is due to the conditions of older (pre-1970/80s) housing stock throughout Europe, leading to high percentages of energy inefficient residences, particularly in the social housing sector. According to the European Commission, 75% of EU buildings are considered "energy inefficient" (European Commission, 2020).

WHAT IS ENERGY POVERTY?

Energy poverty can be described as "when a household is unable to secure a level and quality of domestic energy services—space cooling and heating, cooking, appliances, information technology—sufficient for its social and material needs" (Bouzarovksi, 2018, 1). Importantly, energy poverty has vast social, economic, and environmental implications. It takes as its foundation the assumption of a certain standard of energy accessibility, security, and sustainability; however, indicators can be difficult to measure and may vary from region to region. Therefore, the number of inhabitants affected by energy poverty is an estimate, and it is likely that the actual number of people affected, to some degree, by the phenomenon is much greater. Bouzarovski's definition has been used as a popular, unofficial definition among a wide array of reports on the issue in recent years.

Without sustainable housing, all other aspects of life suffer. Several recent studies show that vulnerable households have been most affected by the pandemic when it comes to the burden of energy poverty, which is why improving energy efficiency is a climate issue as well as a social justice issue (see, e.g., Siksnelyte-Butkiene, 2022). The work of green retrofits in social housing responds to social, environmental, and economic issues that emerge from this energy emergency in Europe by considering the vulnerable beneficiaries of such projects, financial obligations of the city and its inhabitants, and the long-term environmental impact of energy supply and consumption. Green retrofitting of social housing is a way to tackle some of the root issues of energy poverty rather than merely subsidising costs to pay for existing energy systems or conducting other surface-level solutions that may alleviate temporary burdens, but do not negate the problem in the long-term (Vurro et al., 2022). Therefore, the Social Green project is, indeed, a project for people and for the planet in that

it seeks to improve tenants' quality of life while decreasing household energy contribution to GHG emissions. By doing so, the project participates in slowly changing the narrative of social housing and energy poverty circumstances in Europe.

Regional and local authorities and energy agencies are key actors in making a clean transition to a low-carbon economy, combatting the climate crisis (in the midst of building resilience after the COVID-19 crisis), and achieving European environmental goals. The practical shift from vision to action occurs through policy instruments and the interregional exchange of information among leading actors. At an interregional meeting during the fifth-call period, partners provided some initial insights into the current social housing situation (Figure 2). The results indicate that the situation is challenging, that current measures are insufficient, and that there is still more to do.

WHAT WORDS WOULD YOU USE TO DESCRIBE THE CURRENT SOCIAL HOUSING SITUATION IN YOUR REGION?

Figure 2. Word cloud generated by responses from Social Green partners regarding the current social housing situation.

With this context in mind, the four Social Green regional partners, accompanied by lead and advisory partner Nordregio, spent the past year evaluating their policy instruments, analysing the strengths and challenges of the COVID-19 era, and assessing the functionality and resilience of such policy instruments to tackle emerging concerns.

In the midst of evaluating the impact of one variable—the pandemic—additional factors have also exacerbated the energy poverty situation and created new challenges in the process. During the Social Green project, energy prices in the EU have shot upwards at a remarkable clip, with major repercussions on energy poverty. This adverse effect of pandemic recovery is mainly credited to increased global energy demand as countries emerge from lockdowns. Between August 2021 and August 2022, electricity bills in EU capital cities increased by 56% and gas bills increased by 110% (Household Energy Price Index, 2022).

Additionally, the war in Ukraine[2] has accelerated the energy crisis. The conflict has resulted in increased household utility costs and rising gas and electricity prices due to EU reliance on Russian fossil fuels (Figure 3). In 2020, for example, the EU relied on Russia as its main supplier for solid fossil fuels, crude oil, and natural gas (Eurostat, n.d.). Specifically, around 54% of coal, 43% of natural gas, and 29% of oil imported to the EU comes from Russia (European Council, 2022). In response to Russian aggression within Europe, the EU is in the process of phasing out this dependency on Russian energy supplies. In May 2022, the European Commission released its REPowerEU plan aiming to diversify energy supplies, provide cost savings to citizens, and accelerate renewable/clean energy availability (European Commission, n.d.-c).

[2]The Russian invasion of Ukraine began in February 2022.

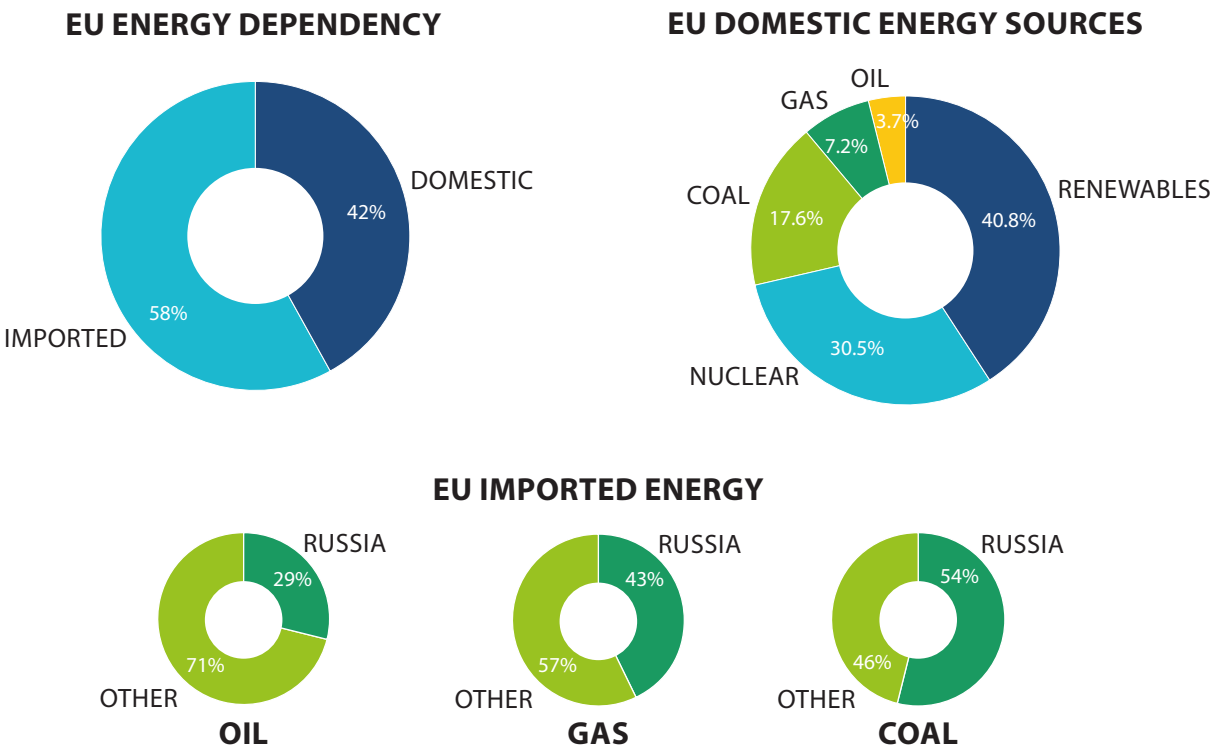

Figure 3. EU energy make-up in 2020. (Source: Eurostat; European Council, 2022-c).

YEAR IN REVIEW

ACTIVITIES 2021–2022

The primary activities conducted during this fifth-call extension included meetings with the Social Green regional partners' respective Local Stakeholder Groups (LSGs) and three interregional meetings among the project partners to host a dialogue and exchange knowledge about the social housing and energy poverty situation in each region. These interregional meetings involved presentations of policy instruments, presentations on pilot actions (REAN and AIM), workshops for self-assessment, and sharing of good practices among the partners (Figure 4).

Figure 4. Social Green partners and members of local stakeholder groups gather in Extremadura for a two-day interregional conference (May 2022).

During the first semester, each partner met with their LSGs to reintroduce stakeholders to the project and identify one good practice from within their regional contexts. They also began conducting a SWOT analysis as part of a two-part self-assessment tool. Together, the project partners met online in December to discuss good practices and consider how to apply the innovative ideas in their respective regions. They

met online again in February to workshop their strengths, weaknesses, opportunities, and threats, through which many overlapping ideas emerged.

During the second semester, the partners met again with their LSGs to work through the second part of the self-assessment tool, involving a more thorough review of the specific policy instrument with which each partner seeks to influence. The framework invited them to identify the context in which the instrument is working, consider the positive and negative impacts it may create or perpetuate, and analyse additional policies, frameworks, or instruments that may ensure the policy instrument's future influence and resilience. The final interregional meeting, which was held in May 2022 in Extremadura, Spain, involved workshopping of steps 1 and 2 of the self-assessment, presentations of pilot actions from REAN and AIM, and study visits to two social housing sites in Spain (Zafra and Merida) for which improving energy efficiency has been the key priority. Partners were also afforded the opportunity to hear more details about the REHABITA project, identified as a Good Practice from Agenex.

Table 2. Objectives for the Social Green partners during the fifth-call period

PARTNER	OBJECTIVES
Agenex	Agenex will influence the distribution of the remaining funds in the Operational Programme (OP) from the European Regional Development Fund (ERDF) of Extremadura 2014–2020. The investment priority of the OP is to increase the energy efficiency and reduce CO_2 emissions in buildings, infrastructure, and public services. Taking into account the arrival of the recovery funds, Agenex is also addressing the Recovery, Transformation and Resilience Plan, which is managed at the regional level. Key to this instrument is the specific grants for energy renovation of housing that could decrease energy poverty. Due to the short period to execute the funds, the low interest of homeowners on the renovation process, and the long administrative procedure, Agenex will put its efforts towards mobilising citizens by providing technical, financial, and administrative assistance through a One-Stop Shop (OSS).
AIM	AIM will further improve the future policy instrument—Regional Operational Programme-Centre Region 2021–2027—by including concrete provisions and calls for funding that address energy efficiency in social housing. Moreover, through the pilot action, AIM intends to implement an action which will demonstrate the need for improving the policy instrument in the area of energy efficiency at the level of social housing, while involving the Managing Authority of the Regional Operational Programme in all stages as a stakeholder.
REAN	REAN plans to use its position as a member of the national working group in charge of drafting the National Programme for energy renovation of family houses 2021–2030 to propose the inclusion of rooftop solar PV in the national policy instrument related to energy renovation of buildings. Through the interregional learning and pilot action implementation in this project, REAN will directly support the development of solar PV installations into the national policy instrument as a measure to achieve direct energy and cost savings in energy poor households.
SMRDA	SMRDA aims to improve the Regional Operational Programme (ROP) with measures addressing energy poverty and considering the social impact of COVID-19. The interregional learning process and development of Good Practice examples within Social Green will be used as a basis to first develop guidelines in the Regional Development Programme (RDP) for proposed actions to be funded through the forthcoming ROP.

METHODOLOGIES FOR SELF-ASSESSMENT

Assessment tools are necessary in regional development policy to reflect on existing circumstances, engage stakeholders, identify problems, prioritise resources, and develop pathways for solutions. The call for this Inter-

reg Europe extension period invited consortiums to 1) further exchange experiences on the way the COVID-19 crisis impacts the issues they address and on possible measures to face and recover from the crisis, and 2) to further improve their regional development policies to better face and recover from this unprecedented situation. In order to adequately respond to this call, Social Green partners conducted a two-part self-assessment that would provide opportunities for knowledge exchange about the crisis and its effects on energy retrofits in social housing. The assessment also invited partners to conduct an internal audit of their specific policy instruments to determine the its strengths and limitations for responding to the pandemic's effects on the situation of energy poverty.

A SWOT analysis is one such tool that is often employed in strategic planning. The framework challenges authorities and stakeholders to identify strengths, weaknesses, opportunities, and threats of the energy poverty situation in their region, thereby providing a baseline from which to discuss vulnerabilities, priorities, and possibilities. A SWOT analysis also enables different groups to compare notes and exchange ideas—for example, if one regional authority identifies a weakness that, for another regional authority, is a strength. The initial SWOT analysis plotting activity was followed up by an additional two-by-two mapping activity (Figure 5) where partners evaluated their strengths, weaknesses, opportunities, and threats according to several categories:

- Well-established strengths with resilience against barriers (Quadrant I). These require continued resilience-building.
- Strengths, opportunities, weaknesses, or threats that have potential to become a resilient strength but currently lack necessary resources or are at immediate risk of constraints (Quadrant II and IV). These require prioritisation and deployment of resources.
- Lagging weaknesses or threats, at risk of growing weaker due to emerging threats (Quadrant III). These expose the greatest needs and concerns but may also reveal problems that are outside the scope of the regional authorities or agencies.

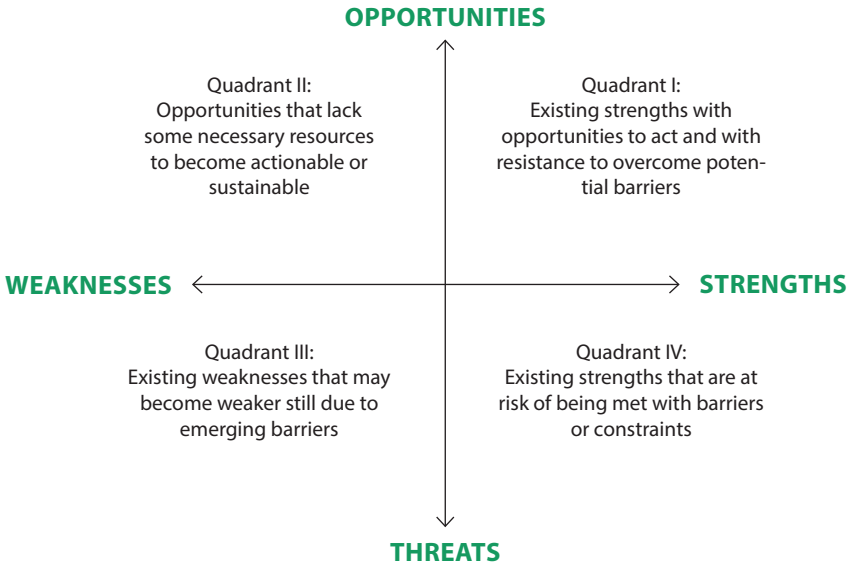

Figure 5. SWOT two-by-two mapping activity template conducted by the partners at the third interregional meeting to determine priorities, vulnerabilities, and limitations.

In addition to the SWOT analysis, partners and stakeholders completed a secondary assessment. This was achieved through an exercise measuring impacts and assurances of the policy instrument directly related to the COVID-19 pandemic. After providing a context of the current policy conditions in which the instrument had been developed, the partners responded to questions, including:

» How has the COVID-19 pandemic impacted the development of this policy instrument, politically, financially, and socially/culturally?
» What are the positive impacts the instrument seeks to create/continue, and what are the negative impacts the instrument may create/perpetuate?
» What policies, frameworks, or other instruments are in place to ensure that this instrument will make an impact that aligns with the overall goals of the region?
» What steps are being taken through this policy instrument to ensure resilience in the future?

Ultimately, these assessment methods provided points of discussion for interregional learning about transforming threats/weaknesses into opportunities, proactively identifying how existing strengths might become vulnerable, and determining how policy instruments can build resilience to respond to future crises.

INTERREGIONAL LEARNING

SUMMARY OF GOOD PRACTICES

During the first semester of the project, partners identified Good Practices within their region (Table 3). According to Interreg Europe, the identification Good Practices can provide inspiring and tested policy solutions that have the potential for knowledge transfer in other contexts or applications. The conditions for identifying Good Practices during this project period included solutions that improved energy efficiency and also responded to concerns emerging from the pandemic.

In a follow-up discussion to Good Practice presentations, several partners indicated that the REHABITA Good Practice in Extremadura provided some relevant take-aways that could be applied in other contexts. For example, one partner identified that, because they have a lot of abandoned houses, implementing a similar pilot action that focuses on retrofitting such buildings in the future could be a good way to put them to better use while granting people improved living conditions.

Citizen/tenant support was the number one complication identified by the partners for implementing these Good Practices into their own contexts. Partners in Romania and Spain all indicated that building trust in the community around the retrofitting work is difficult; the public is sceptical of such projects and is unwilling to accept the renovations because they assume that it will require them to pay for the work, or that it will cost them time and energy to be part of such projects. It is a challenge for the partners to present their case and encourage tenants that the work will provide more sustainable financial and environmental housing conditions in the long-term. Additional barriers for transferring the Good Practices learnings included (in order of most challenging to least challenging) funding, barriers due to COVID-19, existing policies, governance, and legal barriers.

Table 3. Good practice identification[3]

PARTNER	TITLE	SUMMARY	KEY LEARNING TRANSFER
Agenex	REHABITA programme for the rehabilitation of rental housing, *Extremadura*	REHABITA is a pilot launched by Extremadura Government for the temporary trans-	REHABITA is a good example of how to face the COVID-19 crisis in several ways: 1. Fixing the population in the territory ("re-inhabit"). Increasing the offer of affordable rental houses in small municipalities, enabling the decongestion

[3] To see all Good Practices identified within the Social Green Project, visit: https://projects2014-2020.interregeurope.eu/socialgreen/good-practice/

	Regional Government/ URVIPEXSA	fer of housing for its rehabilitation and subsequent affordable rental	of the main cities, and occupying rural areas which is possible due to teleworking opportunities. 2. Renovating the empty residential park, reducing CO_2 emissions, and fighting energy poverty with affordable rental prices. 3. Contributing to the economic recovery and generating employment.
AIM	Expansion, rehabilitation, modernisation of the social infrastructure: Daily Centre for the Elderly, *Alba Iulia Municipality*	This project aims to increase the energy efficiency of a social infrastructure while promoting volunteering and active ageing in the municipality.	This intervention sought to improve the hygiene and comfort of the centre by providing thermal insulation, modern equipment, electrical installations, and furniture adapted to elderly needs. Improvements include replacing existing radiators and multilayer pipes and installing solar panels, LED lighting, and an intelligent water and temperature management system. The effects of such a project include increased energy independence, reduced maintenance costs for heating and hot water consumption, and reduced GHG emissions through RES. Such measures are transferable to other projects in Romania or abroad, especially considering the increases in energy costs in the EU. The building will rely more on RES and the services provided to beneficiaries represent added value which can be transferred to other cities.
REAN	Energy retrofitting of family houses owned by citizens at risk of energy poverty, *Environmental Protection and Energy Efficiency Fund (EPEEF)*	The first national project that aims to significantly improve energy and living conditions of single-family houses owned by citizens at risk of energy poverty.	Financially, almost all new EU member state countries could explore options of using ETS credit revenue to mitigate energy poverty. As energy prices increase, resources for such policy instruments can improve, leading to more energy retrofitting projects. The call emphasises greater flexibility for retrofitting. Financing individual retrofit measures instead of extensive retrofitting is attractive due to less investment burden and better results. Additionally, the decentralisation of funds and operations leads to greater reliance on local/regional stakeholders. Regarding COVID-19, the level of digitalisation in many segments such as energy retrofitting is low (especially with less affluent populations). This prevents/hinders action. From the pilot call, we learn that a more personal approach is needed to engage with the population.
SMRDA	Retrofitting multi-apartment buildings in Mizil, *Mizil City Hall*	Forty percent of the final energy consumption takes place in buildings. Retrofitting of the building will decrease energy consumption with economic and social impact.	The good practice can be transferred to other public authorities implementing the project both to private and public buildings, from European, governmental, or local funds. Public authorities play a key role as the public buildings represent about 12% by area of the EU building stock. Thus, retrofitting public buildings would result in an important saving of energy and public funds allocated for energy consumption. In addition, the investments can lead to savings in heating which can be invested in other type of works for rehabilitating social housing.

INTEGRATED SWOT ANALYSIS

Improving the conditions for energy efficiency in social housing is a complex task involving multiple stakeholders and resources and requiring conscientious political conditions. Throughout the course of this year, we found that there were many commonalities as well as opportunities for interregional knowledge exchange among the energy agencies and regional and municipal authorities. After conducting SWOT analyses among their LSGs, Agenex, AIM, REAN, and SMRDA partners discussed their results during multiple digital workshops. During these workshops, six key take-aways emerged, revealing that the work of greening the social housing sector has been highly affected by the COVID-19 pandemic.[4] As one representative from AIM stated, "energy efficiency projects have become all the more relevant in the aftermath of this global health and economic crisis."

1. Many existing conditions necessary for energy retrofit work are in place for the partner organisations. Agenex, AIM, REAN, and SMRDA all indicated that existing structures are significant to the work of energy retrofits, and the presence of many of these existing structures—such as integrated strategies for sustainable development at various governmental levels and ongoing use of energy efficient technologies in some municipalities–are a great strength. In Călărași, a city in the Sud Muntenia region of Romania, the municipality is already using solar panels and heat pumps for social housing, providing a precedent for rehabilitations in other cities. In Extremadura, Agenex also indicated that energy technology has already been developed. Alba Iulia, Agenex, and Sud Muntenia already have strong administrative capacities that help the authorities to access appropriate funding sources for the retrofit work ahead. REAN also indicated that the pre-existing focus of the national programme towards energy retrofitting of family homes and multi-apartment buildings in specific areas helps set the tone for future renovations.

All four of the regions/localities in view in the Social Green project have a high degree of need for energy rehabilitation projects. More than half of the buildings in Croatia require renovations. In Extremadura, around 80% of all housing stock is considered in need of energy renovations, while in Sud Muntenia, the percentage is close to 90%. This high degree of need is due to the old housing stock built using inefficient materials and equipped with unsustainable energy systems, and it applies to both public and private buildings. These weak existing conditions, shared among the partners, reveal the need for adequate financial and human resources to conduct renovations. They also reveal the importance of establishing sustainable building practices with resilience in mind so as to mitigate the high levels of energy poverty in the future.

2. Lack of human resources and private sector involvement hinders energy rehabilitation projects. Despite the existence of some structures, the practical application of transforming the social housing sector to become more energy efficient requires specific competencies that are not always readily available. Regional and local authorities indicated that knowledge and skills are lacking. The regional government in Extremadura has more than 30 years of experience coordinating social housing efforts, but it lacks the capabilities in the construction sector and is experiencing a general shortage in manpower to conduct the proper retrofitting. Alba Iulia also has long experience in the field of energy efficiency and project management, but the chronic lack of specialised labour for building renovations or renewable resource installation results in a gap between planning and implementation (especially due to a large exodus of specialized workers towards Western European countries). Many private companies also lack experience in energy efficiency retrofitting projects. Representatives from REAN and SMRDA also indicated the lack of certified installers and experts for energy rehabilitation as a major concern.

The pandemic has exacerbated this issue by forcing businesses to close and labourers to be dismissed in the midst of the health crisis. Agenex, REAN, and AIM all indicated that the lack of involvement, interest, or skills from the private sector in energy renewable work leaves the issue to be addressed by the public sector alone. In addition to reinvigorating the labour market and coordinating efforts through public-private partnerships, governments will need to focus on providing skills training for the green transition in order to implement sus-

[4] A detailed integrated SWOT analysis and a summary table are available in the Appendix of this final report.

tainable development strategies in the near future.

3. Participation of tenants is a necessary but complicated step for improving energy poverty.

The partners share the common challenge of tenant scepticism when it comes to addressing energy inefficiency in social housing. Citizens' lack of knowledge regarding the benefits of energy efficiency (such as financial savings, comfort, and air quality) means that beneficiaries of the rehabilitation work often lack confidence in, or express direct scepticism towards, public administration. Representatives from Alba Iulia noted that, in private housing, completing energy retrofits is near impossible due to the inability to gain citizen approval for renovation, even when the programme covers most of the costs to conduct the renovation.[5]

Whether the authorities provide funding or not, providing solar panels, installing new water pumps, or renovating homes with sustainable insulation all require tenant or home-owner support. But Agenex and REAN also note other concerns working with social tenants. These concerns include the misuse of housing facilities and facing difficulties with paying for rent or for high energy bills.

4. The COVID-19 pandemic has had material, financial, and social consequences on the process of improving energy efficiency in social housing.

Delays

For many of the engaged regions, the pandemic has caused major delays in retrofit work, with the postponement of some projects and prolongation of documentation or administrative procedures. Such issues create clogs in an already complex system. Despite the benefits of the pandemic recovery funds, some regions, such as Extremadura, are experiencing complications with the short period of time allotted for executing projects supported by such funds. For most regions, the isolation and social distancing requirements led to slowed or halted project work.

Increased energy and construction prices exacerbated vulnerabilities and revealed energy retrofit needs

Increased electricity and gas prices are having tremendous effects on citizens in Europe—in some regions, so much so that it is hard to identify who is *not* considered vulnerable. In Sud Muntenia, the worsening economic and health crisis poses a threat to those in the region already in sensitive situationns. This includes, for example, the Roma population, a group who is experiencing lack of housing and problems with property deeds. All Social Green regions have experienced a high increase in construction material prices in addition to gas and electricity prices. Partners from Extremadura also indicated that the reduction of purchasing power of low-income families due to the economic crisis means more families need government assistance for basic needs such as housing.

Despite the disheartening consequences of price hikes, the pandemic has also revealed the vulnerabilities in many systems and provided a new wave of interest in energy retrofit projects. The high prices reveal the necessity for green retrofit projects and provide clear opportunities to fight against existing tenant scepticism and gain citizen support for renovations that pay off in the long run, even if it requires short-term inconveniences.

Increased support for addressing energy inefficiency

The pandemic has fuelled additional support from various outlets. Recovery plans help to finance new projects tackling energy poverty. For example, the arrival of EU Funds from the Recovery, Transformation, and Resilience Plan are allocated for the construction of energy efficient social housing in Extremadura, where 100% grants are provided for families in vulnerable situations. Further, the new requirements within the Recovery Plan allows users to more easily apply for energy retrofits in Extremadura. Another effect from the pandemic is renewed motivation from local companies in Alba Iulia offering energy efficiency solutions and renewable sources. During the pandemic, Sud Muntenia celebrated the success of energy rehabilitations for several public school buildings in the region, which were possible thanks to the vacancy of the school as educational

[5] For retrofitting an apartment building, Alba Iulia Municipality covered 75% of the costs through an EU project and local funding, while 25% of costs were covered by the tenants through their own means (or a lower share if the tenants were considered vulnerable groups). Even so, only after several negotiations with the tenants' associations were the retrofitting projects commenced.

courses moved to digital platforms. The region also benefits from greater allocation of resources to overcome the pandemic situation.

5. Financial resources emerge in all four areas of the SWOT diagram.

Financial investment in energy retrofit work is a clear need. Its provision enables rehabilitation work to continue, while its absence poses major threats to making progress. Furthermore, the accessibility of these funds to provide for those most in need can be a challenge. Agenex benefits from new grants through streams such as the NextGenerationEU funds, a recovery plan focusing on the emergence of European societies as green, digital, healthy, strong, and equal after the pandemic. One of the main funding lines of this plan focusses on the energy renovation of dwellings, including the access of 100% grants to vulnerable families. The reimbursement of the grants can be requested in advance, meaning that owners are not required to provide upfront payments to overcome the renovation. One strength for AIM has also been that clear targets and priorities exist which make it possible for grants to be appropriately accessed.

REAN identified finances as a key weakness in their work, however, due to the lack of sufficient funding intended for energy-poor citizens. The agency's work is threatened by the existing funding programme because many vulnerable citizens are not eligible for funding according to the framework. SMRDA also noted that the processes for applying for funding and collecting the appropriate documentation from tenant associations makes funding a cumbersome ordeal.

The economic situation has also changed over the course of the year. As the market fluctuates, so too does the affordability of electricity and the costs of rehabilitation. All of the partners indicated growing concerns due to the economic crisis, either directly related to or exacerbated by COVID-19. For example, electricity and gas prices have dramatically increased in the past year, as well as prices for raw materials for the construction work of energy rehabilitation projects. In Spain, low-income families experienced a reduction of purchasing power due to the economic crisis, which worsened during the pandemic. The financial circumstances also lead to concerns for tenants who struggle to pay utility bills and for the authorities who are left to manage the situation.

Simultaneously, REAN has experienced an opportunity in Croatia related to the financial situation. Though energy companies are not yet directly included in the financing, the energy efficiency law encourages their investment in energy savings in households that are affected by energy poverty in such a way that the achieved savings are increased by 10 to 30% (depending on the conditions). Some suppliers give energy-poor citizens vouchers for energy products as well which helps citizens to pay their bills. However, in the long term, this does not solve the problem that energy retrofits and the use of Renewable Energy Systems (RES) could achieve, and recently suppliers have prioritised the concerns of the anticipated recession over solving energy poverty.

6. Some legislation poses a threat to retrofit work. However, new regulations that support decarbonisation and retrofitting are on the horizon.

Legislation can act as a barrier when policies are not comprehensive or involve complex systems for achieving their goals. For example, REAN indicated a concern regarding the language of the programme for energy retrofits of family houses owned by citizens at risk of energy poverty. Currently, the programme specifically targets homes that are owned, not rented. Therefore, the programme intrinsically excludes some of the most vulnerable citizens from participating. SMRDA also encountered issues with the way the legislation was written, requiring that the projects fall under the category of modernisation rather than rehabilitation, which ultimately led to deadline extensions or, in more severe instances, project cancellations. AIM also indicated the threat of a fluctuating national legislative environment which creates low predictability and makes planning difficult at the municipal level. National political instability in Romania has provoked high turnover rates among decision-makers in institutions and public energy regulators, which makes it difficult to build momentum and develop consistency. Furthermore, national funds are allocated according to non-competitive criteria which means that sometimes political criteria or the 'first-come first-serve' principle applies. Agenex also noted that

new requirements within the Recovery Plan make the application process difficult for those in need to access the grants.

Programmes with high bureaucratic barriers make rehabilitation work slow or difficult to accomplish in these regions. Still, some legislation has improved in recent years thanks to EU Directives, and there is evidence of more political momentum in this direction. There is also some optimism with regards to the improvement of regulations regarding retrofitting in Spain. For example, tighter regulations on air quality provide Agenex a clear indicator by which to justify the rehabilitation needs in social housing. Meanwhile, EU and national regulations and policies in Romania support and require decarbonisation, which gives credence to the work of energy retrofits at the local level in Alba Iulia.

POLICY INSTRUMENTS: HOW TO BUILD RESILIENCE, ADDRESS EXISTING CHALLENGES, AND UNDERSTAND FUTURE NEEDS

During the third interregional workshop hosted in Extremadura, the regional authorities and agencies conducted an internal audit of their policy instruments in relation to their formerly identified strengths, weaknesses, opportunities, and threats. Using the aforementionned two-by-two framework (see Figure 5), the partners then indicated whether their policy instruments had the capacity to address these items, build resilience, and resist emerging threats. The exercise revealed several key learnings that were then shared among the groups including the capacities and limitations of the current policy instrument and potential areas that future initiatives can address. By discussing these findings together, the partners learned how policy instruments from other regions were able to tackle common concerns.

Agenex: Assessing regional government and encouraging citizens to optimize the use of available funds for energy renovation of dwellings

Agenex has been working closely with the regional government, giving technical assistance to reallocate the remaining funds of the Operational Programme 2014–2020 from the ERDP. Technical studies have been elaborated highlighting the most cost-effective actions for the public social housing stock.

In parallel, due to the arrival of the recovery funds, Agenex has also focused on the the Recovery, Transformation and Resilience Plan which is managed at the regional level. Extremadura has been the first region in Spain to publish the regional decree regulating the funding lines for energy renovation of buildings. This grant programme provides up to 80% of the investment for renovation actions that achieve 65% energy savings. This could be increased to 100% for vulnerable families. Another key aspect is the possibility to request an advanced payment of the grant to ensure that owners with less resources are not encumbered by upfront payments. Although this context seems favourable to boost the renovation process and reduce energy poverty, the demand side is not yet activated, and there are administrative barriers that paralyse the process for homeowners of multi-family households. Therefore, Agenex has put its efforts into giving technical, financial, and administrative assistance to citizens through the creation of an OSS to optimize the use of the recovery funds as there is a short period of time to execute them.

Finally, it is important to note that the instrument is unable to address threats such as lack of involvement from the private financing sector, tenant issues related to housing misuse or difficulties paying rent, or human resource shortages for energy rehabilitation projects.

AIM: Working across multiple policy instruments to improve energy efficiency

Alba Iulia Municipality has focused on Axis 3—a region with environmentally friendly communities—of their ROP for the Centre Region 2021–2027. The workshop exercise revealed the high level of competency of the policy instrument to address many of the existing opportunities, threats, and weaknesses, while also resisting potential vulnerabilities of the strengths. The ROP (with the help of the European Social Fund) can address the

issues of the chronic lack of labour specialised in building renovations and installations of renewable energy sources, the fluctuating national legislative framework, the high number of buildings (both public and private) in need of retrofitting, and the involvement of the local community in energy transition projects initiated by the municipality. This can be achieved through the coordinated involvement of numerous stakeholders starting with the Managing Authority, the local authorities at the regional level, universities, the private sector, and civil society.

However, the ROP is still limited in how it can address issues with private companies and their lack of experience with energy efficiency retrofits, which could be something to address in a future initiative. AIM raised a concern regarding the non-competitive criteria for the allocation of national government funds, but this has also been deemed outside the scope of the ROP. Strengths regarding integrated strategies for sustainable development at local/regional levels, strong administrative capacities, and experience from public officials in the field of energy efficiency are all important elements with which the ROP has the capacity to continue.

In addition to the ROP, several other policy instruments are at work to address the needs and concerns of the municipality regarding energy retrofits such as the Integrated Urban Development Strategy 2021–2027 (adopted Spring 2022), the Smart City Strategy for Alba Iulia Municipality (adopted Spring 2022), the Urban Mobility Plan (updated February 2022), and the Alba Iulia Municipality Sustainable Energy and Climate Action Plan. These initiatives work in tandem with the ROP to address energy poverty in the municipality.

REAN: Meeting citizens' energy needs while recognising limitations

REAN has sought to influence the national policy instrument for family homes owned by citizens at risk of experiencing energy poverty. The workshop revealed that the existing policy instrument addresses several opportunities that otherwise lack resources and strengths otherwise at risk of meeting barriers. For example, the instrument has the capacity to meet some of the high need for renovations, provide funding for energy poor citizens, include energy companies in financing, and respond to the vulnerabilities indicated by the pandemic. It can also respond to the problems with documentation required to apply for the retrofit, bring more vulnerable citizens into the programme, and assist citizens who face barriers with paying energy bills.

However, the national instrument has its limitations. REAN suggests that the funds need to be further diversified, which could be addressed in the future by combining local and national instruments. Furthermore, the guidelines for applying for funding need to be less rigid so that a greater extent of vulnerable families can apply for necessary renovations. The agency also noted several weaknesses or threats that were beyond the scope of the instrument, including the challenges posed by rising energy and material prices (making retrofits less profitable and more expensive to perform), the lack of private interest outside the framework of the programme, the reality of the ageing population of Croatia, and the lack of certified experts to conduct the retrofit work. Thus far, the installation of solar power plants has not been financed for citizens living in energy poverty, which is why REAN carried out an analysis comparing solar potential of citizens living in energy and those out of poverty as part of the Social Green project.

SMRDA: Improving present and future policy instruments

SMRDA seeks to improve the 2021–2027 Sud Muntenia Regional Operational Programme (SMROP) with measures addressing energy poverty and considering the social impact of COVID-19. To improve the ROP, the agency seeks to influence the Regional Development Programme (RDP). In their internal review process, they determined that the ROP has the capacity to address financing and some of the concerns from the pandemic due to business closures and unemployment. Thus, in the RDP 2021–2027, the indicative action will support the investments for thermal rehabilitation of public housing, social housing, and buildings, especially in communities affected by energy poverty.

Sud Muntenia authorities and stakeholders suggested that they could be more effective in the area of human

resources since this is an area that lacks expertise and training for conducting energy rehabilitation work in the housing sector, which could be addressed in the policy instrument. The ROP also provides opportunities to overcome the pandemic situation through the financial resources and can build off earlier successes such as the rehabilitation of schools during the pandemic period. The National Recovery and Resilience Plan is a national policy instrument that also supports some of this work.

The new RDP addresses several of the remaining issues described by SMRDA such as documentation delays and legislative changes that delayed or even cancelled some rehabilitation projects. However, many concerns remain outside the range of the instrument, including the reality of the ageing population in the region, the worsening health and economic crisis, and the increasing electricity and gas prices alongside rising construction prices.

In order to tackle the aforementioned challenges, the SMROP 2021–2027 will provide support to potential beneficiaries in the region to improve the energy efficiency of public buildings in urban and rural environments. With the help of the European Local Energy Assistance (ELENA) facility, applications for non-competitive projects will open, targeting public or residential buildings.

Additionally, support for training of the specialists in the rehabilitation sector will be provided by another Interreg Europe project with which SMRDA participates, namely Shifting towards Renewable Energy for Transition to Low Carbon Energy (SHREC). SMRDA aims to implement the action plan with one activity related directly to training specialists in this area. Social Green stakeholders will be invited to attend the training courses and learn the newest concepts in this area such as Nearly Zero Energy Buildings (nZEB), Renewable Energy Systems, and passive houses, thereby developing synergies with another project addressing energy for a low carbon economy.

PROJECT CONCLUSIONS

PARTNER SUCCESS IN SOCIAL GREEN

At the beginning of the project period, partners identified several expected outcomes. The identification, investigation, and exchange of Good Practices, as well as the discussions around the two-part self-assessment were developed to ensure that all partners had opportunities for mutual learning and that fruitful discussion about regional interventions for the inclusion of green retrofits for reducing energy poverty took place in light of the social and economic impacts of COVID-19.

In addition to benefitting from interregional learning experiences through the three workshops, Agenex expected to gain a better understanding for how to allocate the remaining funds from their current ROP 2014–2020. They hoped to define the most impactful and cost-effective interventions to be carried out in the buildings. By the end of this project period, they have elaborated several energy studies that define a variety of energy renovation actions, their potential of energy savings, and the investment needed, all of which are being taking into account by the regional government while defining the priority projects in the process. Additionally, they have initiated the mobilisation of the demand side and provided technical, financial, and administrative advice to homeowners with the creation of an one-stop shop (OSS). This will improve the execution of the recovery funds, optimising the use of public funding and boosting the renovation process to reduce energy poverty.

AIM expected to utilise the interregional learning findings from the Social Green project to demonstrate the need to include smart, modern, and innovative energy efficiency measures for social housing, which was previously lacking. The conclusions of their first pilot action[6] were included in a final report sent to the Managing Authority of the ROP to take the suggestions into account for the future ROP calls for energy efficiency of buildings (including social housing). They also expected their second pilot action[7] to contribute to this by testing the ability to increase RES and reduce energy poverty through solar installations, with the Managing Authority for the ROP as a stakeholder.

REAN sought to identify and develop solar PV solutions for energy poor homes during the project period, which involved developing a tool to lobby key policy stakeholders to dedicate funding to solar PV on social housing and energy poor homes. They expected their tool to be used as an example to other cities who are interested in increasing production of renewable energy sources and lowering energy costs in social housing. As of June 2022, they have successfully launched their solar potential mapping tool[8] which received many inquiries from citizens interested in PV installation and encouraged the Mayor of the City of Varaždin to announce a new co-financing measure for the project documentation for PV installation. By inputting a building address and inputting monthly electricity costs, the tool enables users to gain the recommended power of PV the plant to install on the roof of the house or building, the investment size (which is updated according to latest pricing data), subsidy options, payback period time, and information about the potential for reducing the carbon footprint. Citizens who are at risk of energy poverty have the potential to save energy, especially thermal energy, if their houses are energy renovated, but their potential for utilising renewable energy sources should not be ignored. Through REAN's analysis and comparison of data for citizens who do not live in energy poverty, it was concluded that the solar potential is significant for both groups and should be considered as a measure to mitigate the problems caused by the energy crisis.

Sud Muntenia planned to improve their RDP by using the interregional learning activities and Good Practice identification methods in order to update the content of the PI with measures that addressed reducing energy poverty and responded to the social impacts of COVID-19. By the end of the project, SMRDA has improved the policy instrument with measures that support the increase of the energy efficiency, especially in communities affected by energy poverty. Thus, in terms of the efficiency of energy consumption, the new RDP is addressing this issue by supporting the renovations carried out with priority to social housing. Further, the new ROP 2021–2027 for the Sud Muntenia Region will contain an indicative action aiming to support investments in residential buildings (including individual and social housing) in order to ensure/improve energy efficiency, including consolidation of activities according to identified risks and for the use of alternative energy sources.

FUTURE EFFORTS TO COMBAT ENERGY POVERTY

The work of Social Green has been motivated by several key factors: the desire to limit CO_2 emissions stemming from outdated energy systems that rely on non-renewable sources, the wish to learn and inform others about energy consumption and social housing renovations in order to reduce widespread energy poverty in Europe, and, ultimately, the longing to care for vulnerable communities by improving living conditions for generations to come.

Future crises may impact energy in general, but their effects on energy poor citizens in particular need greater attention. The Social Green fifth-call activities showed that the pandemic revealed large-scale vulnerability, while the energy crisis in Europe evolved and exacerbated the situation. This past year, the Social Green partners have identified several hindrances to energy retrofitting of social housing, but the knowledge exchange fostered a dialogue on existing solutions. Furthermore, such interregional discussions have supported the identification of future efforts that are still needed (Table 4).

[6] The first AIM Pilot Action was implemented in the original Social Green project (2016-2021).
[7] The second AIM Pilot Action was implemented during the fifth-call period (2021-2022).
[8] To explore the solar mapping tool, visit solarnamapa.hr/grad-varazdin/

Table 4. From problem to action

PRIMARY HINDRANCES	AVAILABLE SOLUTIONS	FUTURE EFFORTS NEEDED
Lack of knowledge/expertise for renovation work	Partnerships with the private sector to complement public rehabilitation work	Increase skills training and green jobs related to energy retrofit work
Tenant scepticism	Minimise the economic burden for tenants to participate in energy rehabilitation projects; raise awareness of benefits	Use existing energy crisis and emerging vulnerabilities as opportunities to show the benefits of retrofit work
High degree of need for energy rehabilitation projects	Identify which groups and which buildings require priority for energy retrofits	Develop inclusive energy retrofit programmes with low barriers of entry to benefit vulnerable tenants/ homeowners
Finances: increased electricity and gas prices; how to fund rehabilitation programmes	Decouple smart solutions from high costs; Utilise blended financial models using EU, national, regional, and municipal initiatives	Use renewable energy sources and establish financial instruments that are less influenced by fluctuations of energy prices and can prove resilient against future crises
Bureaucracy burdens	Influence policy instruments through interregional knowledge exchange; re-evaluate existing policies	Create effective processes for identifying energy poor households using clear and measurable definitions

One way to combat energy poverty is to focus on consumption and behavioural aspects. Combatting energy poverty through a variety of energy efficiency measures as well as establishing local use of renewable energy sources can help to reduce household consumption and simultaneously reduce the economic burdens threatening energy poor households in the long-term. Refurbishing housing in these ways is a preventive measure that provides tenants with better resilience against future crises that influence energy supply and household costs. The project also revealed that performing these rehabilitions and changing energy dependency requires tenant support. This means local and regional authorities need effective processes for identifying who suffers from energy poverty (with clear and measurable definitions of the term) and must diminish the barriers of entry for tenants to participate in retrofit projects. It also involves communicating the benefits of green retrofitting in a language that resonates with tenants, promoting skills training for green jobs (such as construction and installation of energy efficient systems), collaborating with other public and private institutions to establish financial instruments that can withstand dramatic fluctuations in energy prices, and continuously evaluating the local and regional circumstances to improve upon existing policy. Progress is happening in places like Extremadura, Alba Iulia, Kontinentalna Hrvatska, and Sud Muntenia. These pathways, gleaned from the Social Green project, are important routes which governments and public agencies can prioritise to combat energy poverty for improving the welfare of their citizens.

THE SOCIAL GREEN PROJECT IN BRIEF

Social Green is funded by Interreg Europe. The first call project activities ran between April 2016 and March 2021, with a fifth-call extension period running between October 2021 and September 2022. It receives a total funding amount of 1.2 million euros from the European Regional Development Fund (ERDF), which is distributed among eight partners in six countries: Tartu Regional Energy Agency (EE), Extremadura Energy Agency (ES), Regional Energy Agency North (HR), Regional Coordination and Development Commission of Norte (CCDR-N) (PT), Centre for Excellence and Innovation in the Automotive Industry (CEiiA) (PT), Alba Iulia Municipality (RO), South Muntenia Regional Development Agency (RO), and Nordregio – Nordic Centre for Spatial Development (SE). One advisory partner, Nordregio, provides scientific and technical support to the consortium. The other partners, local authorities, energy agencies, and managing authorities work jointly in the development of the main project's activities, namely preparation, implementation, and monitoring.

Social Green promotes the greening of the social housing sector through mutual learning and the development of improved regional policies. It provides the opportunity to explore green building practices and significantly reduce greenhouse gas emissions through cost-effective means while providing much-needed housing in a healthy and sustainable manner. Through interregional cooperation, Social Green stakeholder regions identify, share, and transfer innovative methodologies, processes, and good practices in developing and implementing greener social housing sector policies, targeting new constructions, or retrofitting existing buildings. In this context, the project's sub-objectives are:

1. To understand the role of green building intervention in the social housing sector and the link with fuel poverty
2. To identify green measures for the social housing sector, specifically including energy efficiency and renewable energy development
3. To identify, share, and transfer experiences and good practices and to develop joint policy tools and instruments related to innovative solutions for greening the social housing sector in the areas of fuel poverty and energy efficiency
4. To develop strategic guidelines and policy recommendations as an integrated toolkit for regional and local authorities
5. To improve regional/local policies by introducing best practices into EU mainstream programmes in order to contribute towards fostering the competitiveness, sustainability, and social cohesion of cities, regions, and the EU as a whole.

The fifth-call extension from Interreg Europe enables one additional year of exchange of experience activities to address the COVID-19 crisis. In this context, the project's fifth-call objectives are:

1. To support regional learning, capacity building, and interventions to mitigate the impacts of COVID-19
2. To develop more resilient future policy programmes

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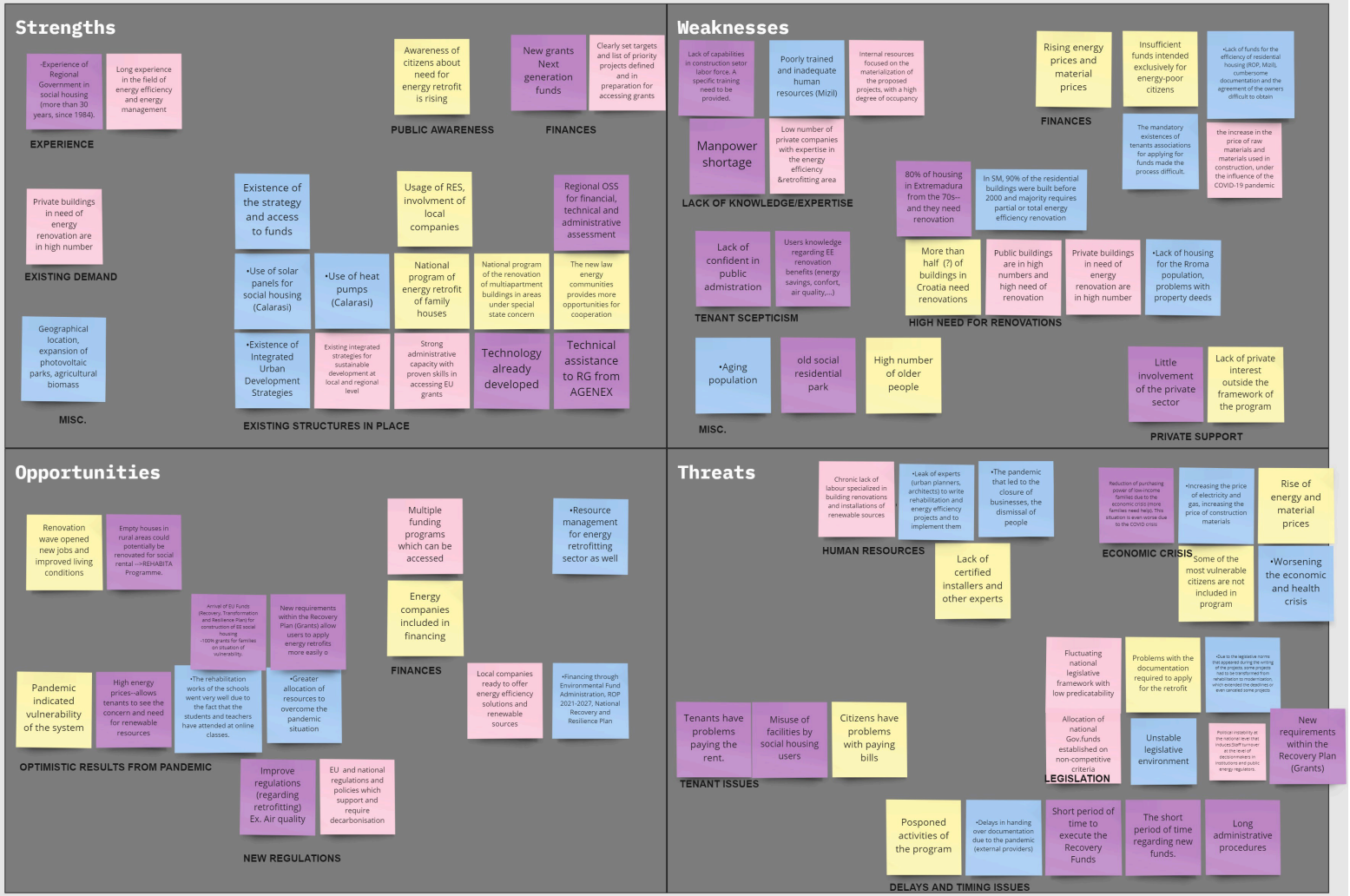
Integrated SWOT analysis, colour-coded according to partner (Agenex, purple; AIM, pink; REAN, yellow; SMRDA, blue). Conducted during the interregional events 2021–2022 using Miro.



Summary diagram evaluating strengths, weaknesses, opportunities, and threats of the current energy retrofitting conditions for regions in Croatia, Romania, and Spain.