



**SOCIAL GREEN - REGIONAL POLICIES TOWARDS GREENING THE SOCIAL HOUSING SECTOR**

## **POLICY RECOMMENDATIONS ON GREENING THE SOCIAL HOUSING SECTOR**

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# CONTENT

The Social Green project in brief .....	1
Introduction .....	2
Methodology .....	3
1 DEVELOPING A COORDINATED STRATEGY ON GREENING SOCIAL HOUSING .....	4
2 ESTABLISHING AND STRENGTHENING PARTNERSHIPS AND CITIZEN OUTREACH FOR GREENING SOCIAL HOUSING.....	6
3 ESTABLISHING CONSISTENT AND FAVOURABLE CONDITIONS FOR INVESTMENT IN ENERGY EFFICIENCY .....	8
4 ADAPTING ENERGY EFFICIENCY STANDARDS TO LOCAL REALITY .....	12
5 PROVIDING EVIDENCE ON THE RESULTS OF GREENING SOCIAL HOUSING .....	14
Concluding remarks .....	15

## The Social Green project in brief

Social Green is funded by INTERREG Europe and is scheduled to run between April 2016 and September 2020. It has received funding of 1.01m 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 (Sweden), 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.

## Introduction

This report presents a joint analysis of three outputs produced by Social Green partners during phase 1 of the project – the integrated self-assessment, good practices and vision and objectives for the development of the action plans. It aims at putting the knowledge of the partner regions in a wider territorial context and providing the possibility for mutual learning and pinpointing common challenges and potentials.

Crossing the conclusions obtained in the integrated self-assessment with new challenges (identified by partners and local stakeholders after the integrated self-assessment was complete), good practices and actions with potential to integrate the Action Plans, identified by the partnership, a set of recommendations on greening the social housing sector were established. These recommendations are targeted towards regional and local authorities that have a role in fostering the greening of the social housing sector, both in terms of new construction and the retrofit of existing buildings.

Social Green partners represent a set of organisational forms at different geographical levels and different territorial contexts. Moreover, partner regions differ considerably in terms of the function and regulation of social housing and the state of social housing and green building. The analysis that has been carried out on the variety of local challenges and opportunities generated in these different contexts makes this report representative of the situation in Europe and strengthens the replicability of the established recommendations.

This report is structured in five sections. Each section presents a recommendation on greening the social housing sector based on the challenges and solutions identified as significant issues by partners in the project. The five recommendations are:

- Developing a coordinated strategy on greening social housing;
- Establishing and strengthening partnerships and citizen outreach for greening social housing;
- Establishing consistent and favourable conditions for investment in energy efficiency;
- Adapting energy efficiency standards to local reality;
- Providing evidence on the results of greening social housing.

In each section, in addition to the recommendations themselves, the challenges that justify a specific improvement are described, including concrete examples from each partner region, as well as examples of good practices already implemented, or to be integrated in the Social Green Action Plans.

## Methodology

The Social Green project has gathered institutional and practitioner insight on the opportunities and challenges for building and renovating energy-efficient social housing across Europe. The self-assessment reports reflect input from regional authorities and input from an array of stakeholders within each partner region. The good practices demonstrate the leading steps that each partner is taking to improve energy-efficiency within their respective social housing stocks and motivate all partners to continue enhancing their efforts. The action plans signalled the findings from the first two outputs and transformed them into a roadmap for continual improvement.

Self-assessment reports have been made by each partner in close cooperation with local stakeholders, making it possible for Social Green partners to get access to important data through their stakeholders while increasing the stakeholders' awareness of the state of the social housing in the area. The integrated self-assessment report ([Nordregio, 2018](#)) added a comparative dimension to these individual assessments on the state of the social housing sector and green building in each partner municipality and/or region.

Through this cooperation with local stakeholders, Social Green partners also collected a set of good practices<sup>1</sup> implemented in their regions on greening social housing, according to nine principles compiled by Nordregio, based on a review of a series of catalogues, across a range of fields.

Based on the knowledge acquired with the elaboration of the self-assessments and the collection of good practices, Social Green partners established the vision and objectives for the development of the action plans for policies and projects with potential to green their social housing sector.

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<sup>1</sup>For more information about the good practices, please visit [www.interregeurope.eu/socialgreen/good-practice/](http://www.interregeurope.eu/socialgreen/good-practice/)

# 1 DEVELOPING A COORDINATED STRATEGY ON GREENING SOCIAL HOUSING

Considering that several specific issues should be taken into account when targeting vulnerable groups, energy-efficient social housing would benefit from the development of a two-pronged approach. This would involve a general framework (funding and guidance) at European and/or national levels and a regional and local coordination for policy implementation that responds to specific local challenges and characteristics.

Most partners do not experience a lack of availability or access to suitable technological solutions. Many simply don't have the resources or organisational capabilities to plan and execute a proposal to get European funds. The result is that in many regions, there's a pool of resources available for investment in energy efficiency, but very little of it, if any, is used. A coordinated European approach should be developed not only to allow, but also to promote the implementation of European funds for investing in social housing, regardless of the ownership structure.

Moreover, universal adoption of a broad, inclusive and clear definition of social housing would clarify for "whom" to retrofit, maintain a focus on equity and facilitate the renovation of dwellings in very poor condition, which could help to reduce the need for new affordable housing. This is an essential factor in structuring the framework conditions for how public (European and national) finances are allocated to "social housing" improvement, through local and regional initiatives.

To this end, the Social Green project deploys a broad and inclusive working definition of social housing:

*Housing and associated housing policy serving the needs of low-income and vulnerable residents. Social housing is often built, owned, and/or managed by the public sector, but it also includes privately-owned rental housing or different forms of housing cooperatives.*

This definition acknowledges the different forms of housing provision that exist in Social Green partner regions. This view of social housing includes any form of housing or associated policy subsidies that provide affordable housing to low-income, vulnerable, or disadvantaged people, irrespective of ownership. Hence, including housing owned by private citizens that face a burdensome cost of housing, energy poverty or, in any other way, face limitations in their ability to maintain housing conditions to an appropriate standard based on their local context.

For example, in Portugal, the concept of social housing is limited to housing built and bought with the financial support of the State. This excludes several types of housing from the support of Structural Funds, such as the so called "social islands", Urban Areas of Illegal Construction (AUGI), precarious housing, and clandestine neighbourhoods.

## **Specialized institution for social housing - Croatia**

In Croatia, social housing is managed by an array of entities that use different definitions of social housing. To build institutional capacity to access EU funding that can be applied consistently across the country, the Energy Agency of the Northern Region of Croatia (REAN) proposes the implementation of a national body and five regional offices specialized in social housing as part of its Social Green Action Plan. Specifically, these offices would focus on policy development, regulation of retrofitting and construction projects, advice and support.

In the Social Green partner jurisdiction, municipalities own at least a portion of their social housing stock (i.e. public social housing). There is also one case of regional ownership of social housing, in Extremadura. Local or regional political support is essential to secure the funding and implementation of retrofitting processes in social housing. In Tartu, strong political support is identified as a strength, while in Romania an overall low level of engagement by local authorities is confirmed by the low level of involvement in attending local meetings of the Social Green project. In Zagreb, the challenge is that city leaders do not prioritise social housing retrofitting or other social issues. This reiterates the crucial importance of getting the policy and funding schemes right at all four levels of public administration – local, regional, national and European – the so called “multilevel governance”.

## 2 ESTABLISHING AND STRENGTHENING PARTNERSHIPS AND CITIZEN OUTREACH FOR GREENING SOCIAL HOUSING

Considering the regional and local government responsibility for coordinating a policy implementation that responds local challenges, including housing provision, it is important that local and regional players in the sector are highly competent in addressing issues related to retrofitting social housing. Here, regional or national green building councils or regional energy agencies can have an important role in distributing knowledge, but cooperation between public and private players is an important means to improve capacity, experience and competence.

There is a valuable opportunity to extend the chain of learning to civil society. Local and regional players have the potential to provide direct awareness-raising on energy efficiency to social housing residents and receive important post-occupancy evaluation, allowing them to act in accordance with proved needs.

In Tartu, partnerships and the wide involvement of key stakeholders are identified as strengths. In Extremadura, some challenges relate to the limited involvement of private players. Other Social Green partners do not mention private sector involvement.

### Local Stakeholder Groups

The work of the Social Green partners directly improves the network of stakeholder interaction. Each partner established a local/regional stakeholder group, involving a wide range of local players, from the public and private sectors and from the demand and supply sides, as well as policy-makers. Through the participation on regional as well as interregional meetings, stakeholders gain relevant knowledge and experience and partners incorporate the expertise and needs of relevant stakeholders.

Furthermore, most local partners referred the lack of knowledge among social housing tenants about environmental and energy issues. This lack of knowledge leads to low interest regarding energy retrofitting, which was observed in the homeowners' associations in Alba Iulia and Tartu.

Lack of knowledge can lead to higher levels of energy consumption. In the Northern Region of Portugal, there is strong resistance from residents of social neighbourhoods towards adopting efficient consumption patterns of energy. The education/employment rate among residents is low and they spend a large part of the day in the neighbourhood, which results in large energy expenditures in common areas, due in part to the frequent use of lifts. The common areas expenses are borne by the local administration, meaning that residents do not bear the full costs of their energy consumption or the related carbon emissions.

The lack of knowledge also influences residents' quality of life. Internal temperature measurements were performed on identical dwellings with results differing by up to 3 °C. This underlines the behavioural component of energy efficiency and indicates that technical solutions cannot be implemented without comprehensive resident engagement.

Through communication and collaboration, public and private players, as well as citizens, have the potential to create a series of mutually reinforcing positive feedback loops. These efforts can strengthen competencies in the development and application of policy relating energy-efficient social housing. Subsequently, these feedback loops can inform the use, maintenance and further development of energy efficient social housing. As a result, the impact of these efforts is greater than the individual actions.

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### **Energy advisory for social housing residents – Croatia**

In Koprivnica-Križevci County and Sisak-Moslavina County (HR), energy advisors visit families with lower socioeconomic status to provide an energy assessment of the dwelling (energy class, isolation, etc.). Following the assessment, they provide residents with low-cost energy efficiency measures (light bulbs, draught proofing for windows and doors, etc.) and advice on energy savings.

The Regional Energy Agency of North proposes the replication of this project in other counties in Croatia as part of its Social Green Action Plan.

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### 3 ESTABLISHING CONSISTENT AND FAVOURABLE CONDITIONS FOR INVESTMENT IN ENERGY EFFICIENCY

Financing energy efficiency measures and social housing is a common challenge in many European countries. Despite the existing programmes and policy instruments, the main problem is the shortage of funds allocated to these tasks, due to the current general economic situation, not only at local, regional and national levels, but also at European level. These issues are compounded by the fact that improving energy efficiency in social housing requires substantial up-front investments.

Lack of funding options creates the risk of the retrofit burden being passed on to social housing residents through increased rents or energy cost recoupment. This means that, not only retrofitting does not necessarily lead to a decrease in energy poverty, as it can also result in gentrification, with social housing tenants being economically pushed to move to even poorer parts of a city.

Keeping the cost for social housing residents at a minimum is a key priority among partners in the Social Green project. Schemes should be developed, allowing people to retrofit their buildings, ideally at zero cost, i.e. where the energy savings offset most of the cost to retrofit. This creates retrofit opportunities for people that cannot afford any extra expenditure.

In Estonia, around 70% of the housing stock was built between 1960-1990, when energy efficiency in construction was not a priority and the modernist "super-block" apartment building typology was widespread. Around 98% of housing stock is in private ownership and family income levels do not allow self-financing of energy retrofitting projects. Real-estate value and demand for housing in smaller cities and rural areas is limited, making the cost of retrofits, which have increased 30% to 40% in recent years, difficult to manage.

#### **KredEx support scheme – Estonia**

One of the best practice examples highlighted in the Social Green project is an Estonian support scheme, managed by national financing institute KredEx, which provides grants and technical consultancy services for energy renovation. The scheme is open to homeowner associations in multi-apartment buildings as well as to local authorities, if they own more than half of the apartments in the building.

There are three levels of support, depending on the energy efficiency measures. The KredEx grants cover between 15 and 40% of the total cost of renovation. To receive the largest grants, the energy consumption must be reduced to 150 kWh/m<sup>2</sup> per year or less.

The renovation of Sõpruse 202, a large apartment complex in Tallinn, was partly funded through KredEx. The refurbishment included better insulation of the roofs and outer walls as well as new ventilation and heating systems. Energy consumption for heating was reduced by an impressive 60% to 61 kWh/m<sup>2</sup>. In addition, the air quality and indoor climate improved considerably. The total cost of the Sõpruse 202 renovation was around Euro 2 million, but the project only resulted in a rent increase of 2%.

Despite KredEx's positive results, Tartu Regional Energy Agency highlights that the next programme needs to be more flexible, considering territorial differences. Likewise, more funding is needed for new social housing construction.

In Extremadura, social housing represents less than 3% from the total building stock, which is far from the actual requirements in the region. Furthermore, most social buildings are more than 25 years old, which means that Extremadura has an urgent demand for constructing new social housing and for retrofitting the existing ones. Funding is generally available for energy efficiency and renewable energy purposes, but social housing is not targeted. Extremadura Energy Agency highlights that a guaranteed fund allowing banks to give loans to low income families is missing.

In Croatia, more than 90% of the population owns their own home. Many of these houses were built in the 1990s and have energy class F, making it difficult for pensioners and others on a fixed income to keep their houses adequately warm. The Croatian cities of Krizevci, Zagreb, Varaždin and Virovitica identified a lack of funding at local, regional and state levels as key issues. This could also increase demand and reliance on EU funding.

### **Selling social housing - Croatia**

To counteract the lack of affordable housing and funding in Croatia, the Regional Energy Agency of the North (REAN) proposes selling social apartments in multi-storey buildings and using this money to build new social apartments as part of its Social Green Action Plan. To ensure an array of housing options that meet a diversity of resident needs, REAN is exploring opportunities to implement the shared housing concept.

Another challenge identified by REAN is the lack of a comprehensive system for monitoring and regulating social housing tenants. In many cases, the result is that the retrofitted social housing exceeds the quality of non-social housing, which in turn leads to tenants taking advantage of the system to ensure that they can continue living in social housing even if their socio-economic situation no longer justifies it. To address this, REAN proposes the renting of social apartments for 5-year periods, followed by a review.

Finance schemes with EU participation can be created to provide financing on a complementary basis from EU funding to address key policy objectives, such as greening the social housing sector. However, these objectives are often achieved with risky investments that require public participation to de-risk financing. In social housing, the risk stems from the fact that significant savings in energy consumption and hence financial savings are not always guaranteed, as described in the next chapter.

One effective way to counteract the shortage of funds allocated for energy efficiency and further distribute risks is the creation of Financial Instruments. Financial Instruments combine EU funding with funding coming from the private sector and other public financial sources. Thus, private investment leverages public funds. Such instruments may take the form of loans or guarantees and other risk-sharing instruments (equities and quasi-equities) and may, where appropriate, be combined with grants.

## IFRRU 2020 - Financial Instrument for Urban Rehabilitation and Revitalization - Portugal

In the Northern Region of Portugal, the municipalities own a significant number of social housing dwellings, but these can be either entire apartment blocks or portions of apartment blocks that include private dwellings. Residents of the private dwellings often face the risk of financial burdens as a result of municipal rehabilitation strategies. This has created a barrier to overcome in terms of public funding for implementing green retrofit strategies. In some cases, residents of private dwellings opposed local strategies to improve energy efficiency because they could not afford the costs of rehabilitation.

The solution was the activation of a financial instrument – IFRRU 2020 – that, in addition to financing the complete rehabilitation of buildings aged 30 years or more, abandoned spaces and industrial units, also finances the rehabilitation of private dwellings inserted in social housing buildings.

Available since October 2017, the Financial Instrument for Urban Rehabilitation and Revitalization provides Euro 1.4 billion for these interventions. Euro 700 million are public and community funds from the Portugal 2020 Regional Operational Programmes, the European Investment Bank and the Council of Europe Development Bank. The remaining Euro 700 million are made available by four banks, leveraging public funds.

The new financial instrument provides loans under exceptionally advantageous conditions, compared to those existing in the market. For projects that do not have sufficient guarantee, the IFRRU 2020 also provides a guarantee through the Portuguese Mutual Guarantee System, accessible to companies.

The formalization of the applications for IFRRU 2020 takes place in three steps:

1. Each municipality has an IFRRU 2020 interlocutor, who issues the project guidelines and supports the licensing process;
2. To ensure the selection of the best solutions to increase energy efficiency in the property to be rehabilitated, a qualified expert carries out the energy certification process;
3. The loan application is carried out at a branch of any of the four banks selected to operate under IFRRU 2020.

Applications for financing are presented when the investor considers most appropriate, with no pre-determined phases each year for submission or limits on the number of applications.

In 10 months of activity, IFRRU 2020 completed 30 financing contracts, corresponding to an investment of Euro 135 million, received 129 applications for funding, corresponding to a Euro 398 million investment, and has 739 projects in pipeline, corresponding to Euro 1,997 million of investment intentions.

This Portuguese good practice could be a solution for the challenges identified by the energy agencies of Extremadura and Northern Croatia. These regions reveal difficulties in the renovation of social apartments, since these are not in one multi-story building (dispersed social apartments) and there are no financing options for mixed private/public buildings.

An interesting characteristic of the Portuguese financial instrument is the fact that bureaucracy in the application process was reduced. It is worth noting that Alba Iulia municipality and South Muntenia Regional Development Agency identified the increased number of documents that need to be prepared when applying for funding as a disincentive to investment in energy efficiency.

Another weakness identified by the Social Green partnership is the fact that financial support for energy retrofitting is focused on technological and constructive components. There is a need to promote a more comprehensive/integrated approach in terms of eligibility, considering that improving buildings energy

efficiency depends on constructive and physical procedures that go beyond the “strict” scope of energy efficiency measures.

Alba Iulia municipality and South Muntenia Regional Development Agency note that their Regional Operational Programmes do not include hiring a consultant, cadastral, staff (including trainings and payrolls) and supplies as eligible costs, and do not make it possible to update the costs to meet changes in the project.

Moreover, excluding certain procedures from the financing of thermal insulation systems, such as the preparation of support walls, which are vital to guarantee the success of the entire system, risks limiting the uptake of financial tools. Another example is the application of window frames with thermal cutback that often require adaptations to the interior carpentry. In many cases, the interior carpentry, which is essential for the new windows, is not eligible for financing. One procedure cannot be done without the others.

Likewise, energy retrofitting of social housing is often part of a larger renovation effort, where kitchens and entryways are also updated. Social Green partners find that they are more successful in applying for support for this type of urban revitalisation projects, than for energy efficiency-specific ones.

Even within the scope of energy efficiency measures there are restrictions. In Portugal, there are limitations concerning the support of alternative building materials to External Thermal Insulation Composite Systems (ETICS) solutions. Consequently, standard costs are exclusively defined for ETICS, making it difficult to apply alternative solutions, such as the use of materials and building systems appropriate to specific situations in which ETICS solutions do not work correctly. This approach hinders the adoption of more technically adequate and efficient solutions, in a medium and long-term basis.

As an aggravating factor, financing does not consider the life cycle of building materials and energy-efficient equipment, such as solar and photovoltaic panels, heating systems and storage of water with thermal insulation, increasing the cost burden for municipalities.

There is a need to adjust the conditions for receiving EU funding to better suit the needs of those seeking the funds. More tailored support at the EU-level should be provided. There is a strong need to (re)launch a set of housing policies, tackling dimensions that are considered ineligible within the scope of current financing instruments.

## 4 ADAPTING ENERGY EFFICIENCY STANDARDS TO LOCAL REALITY

The development of the indicator of building permits is rather close to the development of actual work. According to the data published by [Eurostat](#), for the EU-28 the building permit indices peaked in late 2006/early 2007 and then began a continuous and rapid downturn which lasted for 2 years. During the years 2010 and 2011 the index level remained relatively stable but it has since further decreased although not as dramatically as before. During the years 2015 to 2017 the index levels increased slightly.

Therefore, building new green buildings alone will not be enough to achieve resource efficiency in the housing stock. Energy consumption in buildings needs to be significantly reduced, especially in urban areas, and that can only be done by picking up the pace with which existing buildings are retrofitted.

On the other hand, more sustainable urban development models can reduce the sprawl of new construction and, consequently, of commuting movements. The retrofit of existing buildings and the improvement of their energy performance can create appealing residential options within existing urban regions.

It is essential to adapt energy retrofitting standards to regional/local reality. An innovative perspective of action presupposes the ability to cross two central debates on public policies: the debate around energy efficiency and low carbon societies and the debate on energy poverty and residents' living and comfort conditions.

In Portugal, GDP is lower than the European average, while the price of electricity and natural gas is higher. In Northern European countries, the use of energy for heating is substantial. However, in Portugal, with a Mediterranean climate, passive energy efficiency measures (thermal control, insulation and ventilation) are more relevant than active measures.

Moreover, the average heating expenditure in Portugal is around Euro 70 per month. In social housing this figure is much lower. Due to their socioeconomic conditions, social housing residents have almost null energy costs, as they do not spend money on heating or cooling and energy consumption for domestic hot water is very low. In Extremadura, a similar situation exists. Energy retrofitting actions in these buildings result in theoretical consumption reductions, but not in actual reductions. In fact, studies demonstrate that the incorporation of active energy efficiency equipment in social housing do not have a direct impact in reducing energy consumption. With the installation of photovoltaic or thermal solar panels, consumption can even increase in less sunny seasons. Conversely, the implementation of passive solutions might have a significant result in terms of thermal comfort conditions.

In this type of housing, energy certification does not translate into energy consumption and GHG emissions. Certification would only make sense if the government had the capacity to subsidize social housing. This scenario raises the question of whether the priority should be an increase in energy efficiency or the minimization of discomfort, improving living conditions and the residents' quality of life. Achieving a high-energy class entails requirements in terms of equipment to be installed with associated maintenance costs for municipalities.

### **New generation of housing policies – Portugal**

On October 4, 2017, the Portuguese Council of Ministers approved a resolution that establishes the strategic vision, objectives and instruments of action for a *New Generation of Housing Policies*, an integrated approach in sector policies, territory and players, which represents a change in the traditional way of designing and implementing housing policy.

The *New Generation of Housing Policies* has the objective of creating the conditions for building rehabilitation to become the rule. The policies require a joint action on the legal and regulatory framework (adapting it to the specificities of the rehabilitation), and on financing interventions, guaranteeing the existence of favourable conditions for the investment in rehabilitation.

In this context, the “Projeto Reabilitar como Regra” (Rehabilitation as a Rule Project) was created. It aims at preparing proposals to adapt technical standards of construction to the requirements and specificities of building rehabilitation. A network of stakeholders was created to develop the project. It is made up of a coordinator of the project, designated by the Government member responsible for housing, and representatives of entities with recognized technical competence, with attributions in the fields of building construction and rehabilitation.

## 5 PROVIDING EVIDENCE ON THE RESULTS OF GREENING SOCIAL HOUSING

A key challenge that has emerged through Social Green partner discussion is the lack of monitoring or impact evaluation of greening interventions in social housing. The few existing data, in most cases, refer to a reduced range of indicators not specific to social housing, not updated, and rarely translated to the local scale.

Even more challenging, indicators are defined in a way that is often of limited relevance in the local or regional context. In some cases, these measures risk being counterproductive. Under the conditions identified in the previous chapter, the Operational Programme for Northern Portugal "NORTE 2020" result indicator "Households with improved energy consumption" does not adapt to social housing dwelling interior and the result indicator "Social housing dwellings with improved energy class" loses relevance.

Monitoring can help address many challenges identified by the Social Green project partners. Better monitoring and evaluation could be beneficial by providing evidence on the results of retrofitting to decision-makers. By demonstrating the success of current initiatives, monitoring could contribute to securing political support and access to funding for similar actions. Pre- and post- energy performance monitoring schemes should be an integral part of the retrofit process.

Furthermore, the data obtained through monitoring can be used in capacity building and awareness-raising strategies. Monitoring would enable data gathering on the building properties and residents' habits. It would also support strategy definition in line with local efforts, such as the specific cases of the Northern Region of Portugal and Extremadura, with special emphasis on the adaptation of the energy retrofitting standards to local reality.

The use of smart technologies, such as energy metering and intelligent energy systems, allows the collection, integration and analysis of real-time information (big data) to support decision and policy-making processes. Energy observatories (such as the case of the ANERGO Energy Observatory, Romania) are relevant instruments to monitor and evaluate both individual interventions and the energy efficiency of the building stock of the entire city.

### **ANERGO Energy Observatory - Romania**

ANERGO is an internal structure of the Alba Iulia Local Energy Agency, specialized on energy data processing. The Energy Observatory is an online tool where monthly energy consumption data for the residential sector is introduced (manually, for now) and aggregated at city level.

Data is collected from public and municipal buildings using different methodologies:

- Common energy meters at building level or section (for residential blocks);
- Individual energy meters;
- 1% smart electricity meters GSM/GPRS (installed and certified by an electricity distributor);
- Invoices issued by the energy provider, based on energy meters reading in the field, at certain time intervals.

## Concluding remarks

The analysis developed in this report illustrates that each partner region has both challenges and solutions related to improving energy efficiency within the social housing sector. For every challenge identified, there was at least one existing solution, implemented or planned by one of the partner regions. This reinforces the importance of communication by, for instance, establishing and strengthening partnerships for knowledge transfer.

Success in greening the social housing sector requires collaboration from an array of players and often involves numerous steps within a funding, design and building process. No step should be neglected, or the success of the whole can be compromised.

Communication is key for knowledge transfer, but knowledge comes from monitoring and evaluating. Funding is the fuel that makes it all work, but funding comes with political interest. Monitoring is an effective way to demonstrate the success of retrofitting to decision-makers, hence securing political interest. To have results to monitor there must be projects, which need favourable financing conditions.

Finally, a multilevel coordinated strategy is the glue that bonds all these stages together. A consistent strategy on greening social housing should be developed to coordinate efforts (and funding) among local, regional, national and European public administrations.