

ENERGY POVERTY IN BUILDINGS IN ROMANIA

NATIONAL REPORT

AUTHORS
ANCA SINEA
ANDREEA VORNICU
GEORGE JIGLĂU



All rights reserved. The content of the work created by Center for the Study of Democracy and the work itself are subject to Romanian copyright law. Third party contributions are marked as such. Duplication, revision, distribution and any kind of use beyond the limits of copyright require the written consent of Anca Sinea, Center for the Study of Democracy. The duplication of parts of the work is only permitted if the source is mentioned.

Imprint Publisher: Center for the Study of Democracy
Strada Minerilor, nr. 85, Sala 302 400132 Cluj-Napoca, jud. Cluj, România
+40 264 431 505
jiglau@fspac.ro
<https://www.democracycenter.ro/>

Authors: Anca Sinea (Center for the Study of Democracy), Andreea Vornicu-Chira (Center for the Study of Democracy) and George Jiglău (Center for the Study of Democracy)

Photo credits: Delia Bîrla

© 2021 Center for the Study of Democracy

Contents

Energy Poverty in Buildings in Romania.....	4
A case for energy poverty in buildings	4
A conceptual framework: drivers and impact of energy poverty in buildings	4
Energy Poverty – a legal perspective:	5
Energy Poverty in European Legislation	5
Member States buildings-related obligations and implications for energy poverty	9
Energy poverty in Romanian Legislation	11
Expert survey on policies and priorities for Romania	25
Political positioning of energy poverty.....	30
Awareness raising campaigns	32
Energy poverty in the rural context	34
Low-quality single-family households in the rural area	34
Access to diversified and sustainable sources of energy.....	37
Energy poverty in the urban context	39
Socialism-dated prefabricated multifamily buildings	39
Heat source: District heating	43
Refurbishment projects: lack of trust and effectiveness at the level of tenants’ associations	46
The owners’ dilemma: energy poverty and the high property ratio	49
Energy poverty in the urban pockets: the Roma outskirts of the rapidly developing cities	50
Energy poverty on the housing and renting market	53
The housing market (selling and buying properties)	53
The renting market.....	57
References	59

Energy Poverty in Buildings in Romania

National Report

A case for energy poverty in buildings

A large part of our energy is used in order to cover our daily needs. Some of these involve mobility (7% according to [EPA](#) (Environmental Protection Agency)), but most of them are connected to some kind of venue, be that our domicile, our workplace or schools, or some other transitory building destination that is related to our regular shopping routine, our interaction with our public administrations or other more occasional activities in the public space. Based on some studies we spend 90% of our time indoors (World Health Organization, 2013). Our indoor spaces, irrespective of their kind are responsible for 40% of our energy consumption and quite the same amount of climate emissions. Despite the fact that all of this energy consumption and all the related effects is generated around our more general lifestyle, none has an as high and direct impact on our life as our own household consumption. Irrespective of our socio-economic situation, this feature poses a number of health-related challenges, which are associated with the state of the building: indoor/outdoor air pollution, hazard risks, humidity, mold, inadequate temperature or high temperature differences, lack of hygiene, etc. This can impact vulnerable households to a much larger extent.

A conceptual framework: drivers and impact of energy poverty in buildings

Academic definitions of energy poverty bind the issue indirectly to the housing concept and the related living conditions in a very broad sense. Along these lines, it has been identified to be the inability of a households to secure the energy necessary for cooking, heating, cooling, or lighting, at a level that meets basic needs. It is widely agreed that energy poverty is a complex condition experienced by millions of households around the globe, including in the developed world. Within the European Union, domestic energy poverty is mainly identified as a result of two predominant factors, such as low income and poor housing isolation, (Bouzarovski, Petrova, & Sarlamanov, 2012). Access to energy networks is mainly discussed in relation to the global South (Bonatz, Guo, Wu, & Liu , 2019). These two perspectives describe a broad energy divide across geographic landscapes. The growing literature takes a more critical approach pointing to the diverse forces driving energy poverty in an integrated manner, the geographic variations within Europe among national, regional and particular demographic groups. A recent publication on energy poverty in CEE has pointed out the complexity of issues that feed into energy poverty in the region and which are both of structural and economic nature. The work “Perspectives on Energy Poverty in Post-Communist Europe” points to the difficulties of transition from socialist to market economies and the numerous associated and inherited inefficiencies that have an important impact on energy poverty. Consumption inefficiencies including high-consumption buildings stem from a heavily subsidized energy consumption and inefficient building projects performed mainly to meet the pace of the rapid planned industrialization, whereas access to energy may be problematic in some regions due to low investment in network development after the fall of communism in some of the countries in the region (Jigla, Sinea, Dubois, & Biermann, Perspectives on Energy Poverty in Post-Communist Europe, 2020). Therefore, also a third dimension

associated with the living space can be identified, though more difficult to measure - the behavioral component or the habits related to energy consumption. These three dimensions, namely access, accessibility and efficiency overlap in reality in a very complex manner, resulting in complex coping situation for the most vulnerable and for the society at large. This is the main reason why simple answers are not always handy. The diversity of drivers, manifestations and outcomes, but also of policy responses will be pointed out below.

Energy poverty is generally associated with a number of health outcomes such as mortality (WHO, 2011) (Holmes, Rudge, & Perron, 2012) ; (Vilchesa, Barrios, Marta, & Huelvab, 2017); (Shan, Wang, Li, Yue, & Yang, 2015), mental and physical health (Robić, 2018), socio-economic outcomes such as gender and education disparities (Sovacool, 2012), general well-being (Grey, Schmieder-Gaite, Jiang, Nascimento, & Poortinga, 2018) and the wider concerns regarding social inequalities and injustice (Jenkins, McCauley, Heffron, Stephan, & Rehner, 2016), (Reames, 2016). Apart from the specificities of each country, there are certain groups of people, who are more likely to fall in a state of energy poverty and they are individuals that already experience a set of vulnerabilities: People with low incomes or who are unemployed; the elderly; widowers; young families/with small children, single parented families; people with disabilities or people who are chronically ill; single-member households; the low-educated; ethnic minorities; people who live in energy inefficient housing (Schweizer-Ries, 2009). More recent literature on CEE has also identified a general urban-rural divide. Whereas energy poverty in the urban and suburban areas can entail their very specific challenges, rural households are more vulnerable due to low incomes and improper living conditions and reduced access to infrastructure (Jiglaui, Sinea, Dubois, & Biermann, Perspectives on Energy Poverty in Post-Communist Europe, 2020)

Based on these general assumptions identified in literature, the present report will describe more closely the situation of energy poverty in Romania as it is related to the built environment. What is more, it aims to confront the realities on the ground with the existing European and national legal framework, identify existing opportunities and limitations and put forth potential solutions.

Energy Poverty – a legal perspective:

Energy Poverty in European Legislation

In European legislation the concept of energy poverty has evolved from the area of geopolitical security (European Commission, 2010) (European Commission, 2014) through the market lens (European Commission, 2015) into the human dimension and individual welfare (which lay the backdrop for the concept “just transition”); from a more marginal need for intervention in times of crises, to a sustained effort for the Member States individually and in cooperation with one another and with the support of EU institutions; from a set of solutions with a large focus on market integration to micro-interventions through financial and non-financial measures and energy efficiency. It is worth saying that even if energy efficiency was intimately linked to energy poverty from the outset, it has established as the mainstream in terms of

solutions in the two benchmark packages: the 2017 'Clean Energy for all Europeans' package and the European Green Deal and the associated documents. **These two instances anchor the European perspective on energy poverty in the context of long-term sustainability, transition to a clean economy and a related broad understanding of citizens' welfare.**

Although there is no European regulatory framework and unitary assessment of energy poverty, and we lack a common definition of the concept; despite the fact that its recognition on the ground, as well as the intervention tools, remain at the discretion of the Member States (as per the Third Energy Package in 2009), political and inter-institutional dialogue, have produced a somewhat common conceptual framework. The conceptual link between energy poverty and human dignity has already been established in various European documents since 2013 (European Parliament, 2013). Subsequently, in the autumn of 2017, the European Commission, the European Parliament and the Council established a new European Pillar of Social Rights that identified energy as an essential human right (European Commission, 2020). At the same time, vulnerable consumers were identified at the confluence of several individual factors (education, social and financial situation, degree of access to technology and market practices, etc.) and external conditions (such as energy market performance, issues of a structural nature, the quality of the legislation, the capacity of the administrative apparatus to provide access to solutions, etc.). Given the variation of these characteristics, it is recognized that even within the category of people at risk there may be important diversity of situations. Any household may be at some point in a situation assimilated to energy vulnerability, particularly if there are no safeguards in place (European Parliament, 2012). In the context of energy market liberalization, energy poverty is recognized as a priority, recommending integrated intervention measures, including financial support, non-financial measures, protection funds, educational programs with an impact on consumer behavior, legislation and long-term financial instruments to increase energy efficiency in housing. In other words, there is a shift in focus from an exclusively cost-based intervention to a broader, more integrated quality-of-life perspective – sustainable behavior, individual comfort and broad social benefits (European Parliament, 2013). In this regard, the Economic and Social Council of the European Union has recommended a cross-cutting approach to energy poverty at the policy level, prioritizing energy poverty objectives in strategies, actions and programs and corresponding evaluation criteria (European Economic and Social Committee, 2013). Despite many limitations in terms of delivery, this approach has been practiced in European policy-making ever since.

Perhaps the most comprehensive approach on energy poverty is Commission Recommendation on Energy Poverty published in 2020 as part of the work conducive to implementing the European Green Deal (European Commission, 2020). The document refers to energy as an essential social right to which everybody is entitled, with reference to the European Pillar of Social Rights of 2017 (European Commission, 2017). At the same time, the document gives the concept of energy poverty the most comprehensive understanding so far, referring to necessary areas of intervention such as: the need for heat (referring to the absence of thermal comfort indoor), summer cooling (to include the concept of summer energy poverty), lighting and electricity (to refer to the basic need of a household for optimal day-to-day activities), access to safe and quality resources with reference to the existence of a universal service (in order to identify diverse sources, which are accessible and as clean as possible for all households), free market and non-discriminatory prices with the possibility of special tariffs for poor households (to draw attention to equity in relation to energy consumption). It also

identifies a wide range of benefits for the vulnerable consumers related to these interventions: social integration, health, improved air quality, comfort and well-being, but also improved public spending.

Among the factors that may lead to a state of energy poverty the document is also comprehensive by identifying besides just the triad of low income-high expenditure-low energy efficiency other aggravating factors such as the volatile market and various socio-economic conditions, such as general poverty and housing tenure. It also recognizes the potential of the COVID-19 crisis to intensify these factors and aggravate the outcomes. While establishing the number of energy poor households in the EU around 7% and galloping, it points out the need to keep green transition objectives high while making sure that those affected by energy poverty are kept in the focal point of policies, programmes and European funding opportunities. To this end, it underlines the complexity of indicators that may be used to identify various dimensions of energy poverty and the need for closer cooperation between Member States to compensate for their individual limited sight. In terms of implementation of policies it also urges Member States to make efforts to address the associated barriers that might prevent interventions to be put in place properly. (European Commission, 2020)

Most recently, energy poverty was formalized in the 2017 'Clean Energy for all Europeans' package (*Directive (EU) 2019/944 on common rules for the internal market for electricity, Article 29*). The package placed the discussion in the context of climate commitments. With other words, successful energy transition was only possible if the most vulnerable households were taken into account, attaching to these objective measures destined to secure a clean transition at fair costs. It recognized the impact of low-quality housing on household budgets and of low incomes on the quality of households. According to the document, in 2014 the poorest households spent around 9% of their income on energy, which was described as a galloping phenomenon. Given the evidence, Member States were bound to report on the occurrence of energy poverty and to take measures to limit it. The instrument created by the European Commission with this purpose is the Integrated National Plan in the field of energy and climate change (NECP), together with the corresponding monitoring instruments. The NECPs should enable the European Commission, through the Energy Poverty Observatory, to monitor the evolution of the phenomenon in comparison between Member States and to identify good practices and appropriate measures (European Commission, 12 2017).

The 'Clean Energy for all Europeans' package aims to comprehensively address energy poverty through revisions to four major energy directives and regulations which target two of the root drivers of energy poverty: High energy prices and low energy efficiency in residential buildings. Low incomes remain an unaddressed concern, beside Energy poverty being decoupled from general poverty with an impact on policy options. The distinction made it clear that it is not enough to address energy poverty through social policies but rather through a holistic approach that combines energy, housing, social and health policies (I. Kyprianoua, 2019); (Bouzarovski & Thomson, 2019).

The European Green Deal (EGD) of December 2019, became the political cornerstone of the European Commission under Ursula von der Layen as a strategy for sustainable economic growth, which prioritizes the issue of climate change (Charlemagne | Strasbourg, 2019) (Harvey & Rankin, 2020)). Under its objectives of building a sustainable economy and achieving carbon neutrality in a socially just way, it targets energy poverty, which it defines in a broad sense as "households that cannot afford key energy services to ensure a basic

standard of living” (European Commission, 2019). The document is centered on solutions regarding energy efficiency interventions and recognizes their positive impact on household budgets and the environment. It is noteworthy to point out that the environment component and the related just transition process are affirmed in a powerful way at this point given the proposal of an European Climate Pact (European Commission) aimed at generating a strong social allegiance to sustainable measures and binding climate legislation for the Member States with the view of 2050 (European Commission). It becomes apparent that besides assuming a powerful role in guiding Member States specifically on energy poverty issues, Commission is also set to make sure there is progress in the larger sense by assuming to combat in Member States the erroneous enforcement of building regulations and other barriers to investment, and to address the lack of funding to perform renovations (under the Sustainable Europe Investment Plan and the Just Transition Mechanism) (European Commission, 2019).

The document identifies specific categories of households that are more vulnerable than others in terms of energy consumption, such as families in rented facilities, multi-ownership buildings and social housing, and proposes to reform the most important legislative tools to target them: to assess the long-term renovation strategies of the Member States, include building emissions in European carbon trading, review the European construction regulations and launch a renovation wave with appropriate funding instruments and target priorities in order to boost the pace and depth of refurbishments across the EU. The final goal is to secure a more sustainable and affordable living. The Commission proposes interventions in block in order to profit from economies of scale. In the context of just transition, the strategy also places in a vulnerability category household, which are highly dependent on fossil fuels and pleads for just transition with measures that are not one-size-fits-all but are rather adapted to the social and geographic circumstances, which is an important statement given the multitude of challenges to be found across Member States. Given the presumed general impact of the COVID-19, Member States agreed in June 2020 to pursue post-coronavirus economic recovery based on the EGD principles (Council of the European Union, 2020). There are various calls that align with this perspective and which point to the potential of the COVID-19 crisis to exacerbate the common occurrence of energy poverty across the continent, but also give birth to new situations of energy poverty (Engager, 2020)

In the context of the EGD, The Renovation Wave Initiative (RWI) of November 2020 elaborates on possible building-related interventions. Energy poor households are shifted to the top of the priorities of renovations (with a special focus on social and multi-apartment housing) due to their recognized broad impact on individual wellbeing (social marginalization, health issues, general welfare, to name a few). Rural areas are also earmarked as landscapes of energy poverty. Energy poverty is associated with a number of factors, which need to be addressed: reliance on fossil fuels for heating and cooling, the use of old technologies and wasteful appliances, need for healthy housing for all households, especially for the more vulnerable categories (low income, ill-impaired and the elderly). Solutions such as the deployment of energy communities, minimum energy performance standards, financing solutions with low or no upfront costs, regulations on the renting market, the establishment of one-stop shops and the activation of those branches of public administration which are closest to the grassroots, the employment of social enterprises and innovative solutions, the decarbonization of heating and cooling etc. are in view. Commission is expecting Member States to deliver on these components in their NECPs and Long-Term Renovation Plans to target the populations at risk (European Commission, 2020)

Member States buildings-related obligations and implications for energy poverty

Beyond these dedicated measures which become evident in the last European legislative developments, we can refer to earlier buildings-related recommendations or obligations that may bring about improvements in terms of energy poverty, if complied with.

The first piece of EU legislation to introduce the concept of energy poverty as an obligation in relation to buildings interventions, was amendment 31/2010 to Directive 91/2002 on the **energy performance of buildings**. The Directive initially required Member States to impose energy efficiency rules on major renovations of large buildings. Its reiteration of 2010 referred, albeit just in marginal terms, to the positive impact of the effective implementation of efficiency standards in new and existing buildings in terms of energy poverty reduction (European Parliament, European Council, 2010).

Directive 2012/27 on **Energy Efficiency** was the first to introduce legally binding targets on energy efficiency improvements in buildings (European Parliament, European Council, 2012). Governments were encouraged to target their interventions by pursuing “a social aim” and by identifying vulnerable consumers as beneficiaries of policies on energy efficiency; to add energy poverty to the list of accomplishment indicators by requiring a share of energy efficiency measures to be performed on vulnerable households, social housing or to the renting market to improve the living conditions of tenants; and to measure progress (European Commission, 2013). Financing was allocated for the entire programming period 2014-2020 (European Commission, 2014)

In 2015, an assessment found that many Member States had not accomplished the transposition of Directive 2012/27 into national legislation. The EC initiated infringement procedures against several Member States, Romania included, (Cătălina Mihai, 2015) and as a result, chose to change the focus of the European Structural and Investment Funds (ESIFs) - the primary EU financing instrument for energy efficiency and renovation at the time - to target funding gaps and social issues such as energy poverty more specifically (European Commission, 2015),

In 2017, the “Winter Package” established measures to be implemented in multi-apartment buildings such as metering, rules for a fair allocation of consumption costs between households, simple and transparent communication of energy consumption in the bills. Member States were also recommended to use compensatory subventions for those at risk of energy poverty (Simon Robinson, 2016). The following year, through amendments to previous building directives (Energy Efficiency of Buildings Directive (2018/844) and the corresponding Regulation 2018/1999 on the Governance of the Energy Union and Climate Action), EC created a legal obligation for Member States to assess the number of households in energy poverty on their territory in the NECPS and intervene. (European Parliament, European Council, 2018), (European Parliament, European Council, 2018)

Energy poverty was prioritized in 2019, when Recommendation 2019/1658 on the implementation of the 2012/27 Energy Efficiency Directive advised Member States to prioritize energy poverty when designing related policies (European Commission, 2019). On the same token, Commission Recommendation 2019/786 on building renovation, endorsed interventions on the worst performing buildings in a process to secure access to affordable and sustainable living spaces for citizens while reducing GHG emissions over-all. The Recommendation advocated for the exchange of good practices to address a diversity of challenges on the ground: households with financial (households with a high proportion of their disposable income spent on energy with arrears on utility bills, low-income households, social housing), structural (households with inadequate living conditions, heating and cooling, buildings in the lowest energy classes) or ownership issues (rented houses) and offers examples of roots of intervention (European Commission, 2019). The renovation Wave Initiative supports in addition to that the provision of minimal energy performance standards (European Commission, 2020) in a revised Energy Performance of Buildings Directive (EPBD), by the end of 2021.

Beyond tackling energy poverty through energy efficient buildings, it should be noted that the larger energy framework also includes requirements for Member States to address the issue at the level of electricity and gas distribution. Both the 2019/944 Electricity Directive (European Parliament, European Council, 2019) and the 2009/73 Directive (European Parliament, European Council, 2009) dealing with the internal natural gas market rules require Member States to take measures to address energy poverty when they identify it on the respective markets. The document refers to vulnerable consumers and Member States are free to have their own definition of it that may refer to aspects such as low income, high expenditure of disposable income, energy efficiency or lack of access. Solutions may include a prohibition of disconnection in “critical” situations such health issues or even income under certain threshold. Once again, these measures remain at the discretion of each Member State.

In sum, in European legislation the energy poverty is recognized and addressed very broadly. However, the issue is intimately related to the quality of the building facilities referring to the quality of the construction but also to that of the appliances and heating systems and the behavior of the household members as they interact with energy inside their homes. Access to safe and secure energy by means of a competitive and indiscriminate market, while enjoying significant protection, is also a part of the large understanding of the concept. Part of the solution and the problem at the same time is the fact that the recognition of the issue and the choice and implementation of solutions remain in the responsibility of the Member States. This allows for a better targeting of the issue based on national specificities provided that there is broad political will to do so. EU legislation provides for a long list of solutions, yet no lens is applied to differentiate between the diverse instances of energy poverty that are being experienced in different parts of the EU and no difference in terms of the effort needed is being perceived. Be it energy market liberalization, price caps, prohibition from disconnection, metering and billing transparency and clarity of information, the quality of data available, financial interventions, or renovation, etc. they have all different meanings in different places and the burden involved needs to be weighted appropriately. The Romanian case study will account for one of these specific situations and the need to provide for more sophisticated policy instruments at the level of the European institutions. The European Commission plans to have a more active role in providing solutions, and leadership is well needed on this topic

given its amplitude and complexity and, especially, the absence of political will. But as complex issues cannot be addressed with simplistic instruments, there is need for leadership in terms of sophistication of instruments that would target energy poverty effectively while minimizing externalities.

Energy poverty in Romanian Legislation

Energy poverty in numbers

There are different indicators quantifying energy poverty in Romania. EU Statistical data points to arrears on utility bills in 2019, 13,7% of the Romanian population had arrears on utility bills (Eurostat, 2021); whereas the percentage of the population that was unable to keep their house adequately warm was 9.3 in 2019 (Eurostat, 2020). Based on the numbers of beneficiaries of heating benefits, in 2015 4,6% of households were included in the system (Sinea, Murafa, & Jigla, Energy Poverty and the Vulnerable Consumer in Romania and Europe, 2018). However, this percentage diminished significantly over the following years due to the progressive rise in the minimum income threshold, which has disqualified many from receiving heating allocations, whereas social tariffs, despite having been just a marginal instruments all the way (handed out to just under 1% of households in 2018) (Jigla, Sinea, & Murafa, 2018), have been removed altogether in the process of market liberalization (Economica.Net, 2017).

From a more analytical perspective, based on various conventional cost indicators, the percentage of the energy poor in 2018 was evaluated at the following level (see table 1 below): Approximately 10% of households at the national level spend more on energy than most families; 13% of families fall under the poverty line after paying excessively high bills; 11,7% practice underconsumption because they cannot afford to sustain their energy needs; for 45,3% of the population energy bills are too heavy a burden in their own household budget.

Table 1. Data on energy poverty in Romania

Indicator	Value	Explanation
2M	10%	The household spends more than double the national median on energy.
M/2	11,7%	Household spends less than half of national median on energy ("hidden energy poverty")
LIHC	13%	The household falls below the poverty line after paying for energy AND spends more than the national median on energy
10%	45,3%	The household spends more than 10% of its income on energy

All of these indicators display only aspects of energy poverty manifestations in Romania. The households that receive some kind of non-financial protection are not quantified. Other manifestations of energy poverty, such as limited access, inefficiency of the building stock, inefficient consumption patterns, indoor and outdoor pollution, extreme energy poverty and disconnections etc.) are not accounted for and for that matter remain unaddressed. A more comprehensive score was put forward in 2018 in a report issued by the Center for the

Democracy: approx. 23% of the households at the national level (i.e. over 1.7 mil. households) to encompass all beneficiaries of some kind of aid, households who lacked connection and households with informal access (Jigla, Sinea, & Murafa, Oportunitatea gazelor naturale în sectorul rezidențial din România, 2018). Still the score is limited considering the variety of the manifestations of energy poverty. Data to inform a more complex indicator that would match structural, income-, expenses-related, demographic and behavioral data is difficult to assemble due to its inconsistency, ownership under different institutions that claim limited access or nonexistent altogether.

However, in order to provide a broader perspective on the extent of vulnerability associated with energy (but not necessarily through energy deprivation or overconsumption), we used a variation of the LIHC indicator, obtained by eliminating the condition related to higher than median energy expenditures; this adapted indicator shows, based on data retrieved from the household budget survey, that 32% of households fall below the poverty line after paying energy expenditures (the value of LIHC on the same data was 13%). It must be stated, however, that these data refer to annual monthly averages, so the percentage increases significantly during the cold season and especially among the 70% of households located in rural areas without gas connection.

Policies and Schemes to Protect Vulnerable Consumers

In Romania energy poverty is approached mainly from a vulnerability point of view and the measures and interventions instruments available are almost exclusively social.

The so-called **Energy law 123/2012** with subsequent additions and amendments defines the "vulnerable consumer", and targets three categories of consumers at risk of social exclusion: the elderly, the ill-impaired and the poor. The document provides for financial (mainly heating benefits and the social tariff) and non-financial (mainly prohibition from disconnecting certain life-threatened individuals) measures of redress and foresees Government obligation to elaborate a national action plan in order to pursue their application, while vaguely allocating the task between ministries. Despite a clearer iteration of this task in the Integrated National Energy and Climate Plans 2021-2030, it has yet to be issued.

Secondary legislation establishes the eligibility criteria for the financial and non-financial measures:

- **GEO 70/2011** is regarded to be an application guideline for law 123/2012 as it provides for the implementation of heating benefits for gas. Based on this provision, heating benefits are managed by the social affairs authorities of the local administrations. The regulation proposes a larger definition of energy vulnerability in the direction of heating needs, targeting "single person[s]/family[ies] unable to maintain an adequate temperature, i.e. 21°C" and with an income within thresholds stipulated by the law, which can be updated annually by governmental decree. Despite a clear provision that income levels would be regularly updated to be in line with national income standards, in reality, they have only been recalculated once through a highly contested Government Decree in 2018 (OUG 114/2018). According to the decree, the omission of income updates has led to large numbers of beneficiaries being ousted

from the system into a grey zone (more than 54% from one season to the next - from 236355 to 129104 beneficiaries), which rendered them more vulnerable than before. What is more, and maybe one of the most contested measures enacted, was a slow-down of the process of energy market liberalization through a provision that allowed for a continuation of the regulated price system for the entire population, supposedly in order to prevent price hypes on the market (Guvernul României, 2018).

- **GD no. 920/2011** introduced additional details on the implementation of heating benefits. It provided the condition that applicants must submit a list of owned goods that would be valued monetarily and added to their income to determine qualification for heating benefits. These criteria have been implemented by local authorities with high inconsistency and highly discriminatorily, leading to many being ousted from the system. The document also provides for the right of local administrations to supplement Government-allocated funds from the local budget based on yearly decisions. The application of this measure depends on the availability of local funds, some localities being more able than others to award sums for additional funding. Usually rural and semi urban localities, which display the highest needs are also at a disadvantage. Moreover, yearly decision-making can provide for a high degree of uncertainty and variability in the number of individuals covered. Field research has identified many additional faults imbedded in the system bearing a potentially high impact on energy poor households: applicants are burdened with a complex procedure, as too many documents and approvals are needed in order to be admitted into the system. And the fact that application must be pursued on yearly basis, raises individual costs even more; many household lack much of the information needed if not accompanied by social assistants; there is great room for stigma; these arguments discourage many to apply; the pressure on the social assistants is high, as the personnel is limited, and the application process quite complex; its implementation is uneven and biased (Teschner, Sinea, Vornicu, Abu-Hamedc, & Negevd, Extreme energy poverty in the urban peripheries of Romania and Israel: Policy, planning and infrastructure, 2020)

- **GEO 27/2013** provides for the establishment of heating benefits for electricity, which are only handed out to those for which electricity is the only fuel used. Generally speaking, heating benefits are allocated as a proportional compensation of heating expenses depending on the income per family member. The rates differ from one fuel to another. This latter provision is particularly discriminating, given the fact that the highest amounts are provided for gas and district heating, whereas the vast majority of low-income households are on solid fuel or electricity (for the extreme poor). More than 80% of the rural households in Romania heat on wood. An updated situation of the cases of energy poverty subsidized broken down by fuel and on the total sums allocated from the national budget is presented in the following two tables.

Table 2. Number of heating aid cases 2017-2020

Type of fuel for which the heating aid is granted	Number of heating aid cases per annum			
	2017	2018	2019	2020
District heating	71012	45837	39281	26919

Natural gas	90782	53897	40822	30785
Electricity	6774	4360	3003	2394
Wood (and other solid fuels)	288274	159885	157238	158600

Table 3. Amounts granted for heating aid 2017-2019

	Amounts granted per type of fuel per annum (Lei)		
Fuel type	2017	2018	2019
District heating	22942,9	13309,1	9275,2
Natural gas	42651,9	27907,6	20403,3
Electricity	3175,2	2233,7	1486,5
Wood (and other solid fuels)	52807,8	33412,2	29824,9

- Access to the grid is also an important topic around energy poverty in Romania. **NRA Order 59/2013** lists the documents needed for connection. The ID and a list of property documents are the minimum obligatory requirements. The absence of such documents, which is very typical of extreme poor and vulnerable households, renders them unable to connect, which forces many either into illegal consumption or the usage of solid fuels (including waste), or both. Moreover, the cost of connection, which is much higher than an average monthly salary, leaves many without access to cheaper and more efficient alternatives (Jigla, Sinea, & Murafa, Oportunitatea gazelor naturale în sectorul rezidențial din România, 2018). According to national statistics, 66% of the population (approx. 14.7 million people) have access to gas, but EPG reports (EPG, 2018), show that merely 44.2% are effectively connected to gas. This reveals excessive connection costs and potentially energy poverty issues in the wider sense of this concept (Jigla, Sinea, & Murafa, Oportunitatea gazelor naturale în sectorul rezidențial din România, 2018).

- **NRA Order no.64/2014** (ANRE, 2014) on the vulnerable consumers of electricity defines the vulnerable consumers of electricity as the low income or elderly person with health issues, who requires continuity of supply and only provides for safeguards, namely non-financial support, for the second category ("with health issues"). This instrument is well implemented at the level of energy distributors with departments and procedures dedicated to maintaining the evidence of the cases on the ground, but they only implement the provisions in part as a large category of the population, as stipulated by the law, is not integrated. This partial definition of the concept of vulnerability on electricity is well embedded in the understanding of company employees and procedures.

- **NRA Order no. 176/2015** (ANRE, 2015) regulates the social tariffs for low-income households. They are provided upon a formal request for households that can prove their

average income per capita is below the national minimum wage. Consumption is also limited to certain amounts. Social tariffs have been an important source of energy poverty: consumption limits for electricity had not been updated, many consumed over the limit and ended up on rates higher than for regular consumers, as heating on electricity is particularly intensive; companies did not warn vulnerable consumers that they are about to go over consumption limit. Consumer interest in social contracts decreased progressively (Sinea et al, 2018). With market liberalization, the option was abandoned altogether being replaced with the so-called general safety-net contract on universal service, which is guaranteed, but at a comparatively higher cost than the liberalized market contracts (Economica.Net, 2017).

- **NRA Order no. 29/2016** (ANRE, 2016) on the vulnerable consumers of gas is similar as for electricity. The regulation provides for heating benefits through the social system and some non-financial measures (monthly billing based on actual consumption, the appointment of a third party to intermediate between consumer and provider, measures to facilitate physical access and suitable information for various vulnerable categories)

- **Law 196/2016** (Romanian Parliament, 2016) on the minimum inclusion income, lumps together all social benefits, in order to better cover the needs of vulnerable persons. The legislation also proposed a new definition for the vulnerable consumer, laying an accent on the ability to keep warm and not on the various vulnerable categories recognized. This perspective is closer to the energy poverty concept, but still, it remains restrictive as it only relates to heating, not to cooling. The law was expected to enter into force in 2018, but its enforcement was postponed due to the absence of a centralized data collecting system. The legislation was proposed to be nullified in the event a new dedicated legislation would be adopted in 2021. The provision remained in place but is not yet implemented as is the case of the energy poverty legislation which is currently under Parliamentary debate.

Currently there is a debate over a new vulnerable consumer bill (Romanian Parliament) to converge with the European agenda and national policy engagements, mainly in the NECP and LTRS in the context of complete energy market liberalization for household consumers as of the 1st of January 2021. A draft was launched in public debate over the Winter Holidays of 2020 given the tight agenda requested by the European Commission to converge with the European energy market principles of which a definition of energy poverty is one. A number of opportunities to make amendment proposals and engage with policy makers followed. The new document, mainly a proposal of the Ministry of Labor, is an inter-ministerial initiative and is currently in the public debate after having received a negative vote from the consultative Economic and Social Committee, which precedes discussions in Parliament commissions. The negative vote was due to the lack of any real change in the instruments made available to vulnerable consumers and the limited access to heating aid, granted on the basis of low income. Essentially, beyond the vulnerability concept, which was taken over from the previous bill, with an addition to also include some isolated households, and clarifications on the previous three categories (age, income, health situations), the proposal includes a definition on energy poverty, which refers to the absence of the minimal basic energy needs to households, in terms of accessibility, access to stable supply, energy efficient buildings, and an indirect reference to summer energy poverty. Despite making significant steps forward in the definition of energy poverty, the document fails to provide the matching intervention that would make the definition operational. It remains essentially socially focused, with no major operational improvements compared to previous legislation. The benefits allocated over the

warm season are rather a supplement to low-income families than a targeted safeguard due to increased consumption generated by high summer temperature. Implementation will also be guided by the Labor Ministry, which is a social-affairs entity and therefore may lack important energy poverty technicalities. Some mentions are made to financial instruments for the purchase of efficient home appliances or for the improvement of the energy efficiency in buildings. Yet, no further instruments are provided to support these provisions. Given the enlarged definition, it might be reasonable to think that sufficient conceptual ground has been set for a variety of other tools to be produced beyond the competences of the Labor Ministries and in upcoming and adjacent policies and concrete actions that would be elaborated by other entities based on this law. Two examples would be the long-term renovation plan or the resilience strategy. Also, many of the questions and uncertainties raised by this legislation could be clarified in the application norms, which, provided the needed expertise is available, can be elaborated with a high degree of sophistication and clarity.

Other policies with an impact on energy poverty

National strategies

The National Strategy on Social Inclusion and Poverty Reduction 2015-2020 (Guvernul României, 2014) and the related **Strategic Action Plan 2015-2020** (Guvernul României, 2014) aim at reducing poverty, including energy poverty, and increasing social inclusion through at least two types of exclusively social measures: the improvement of social assistance programs including by setting up a national electronic database to keep a better evidence of needs and allocations, and the introduction of installment payment schemes for energy poor households as a non-financial measure. So far, these measures have not been operationalized.

The Ministry of Public Works, Development and Administration presents at least three national programmes targeting blocks of flats or residential houses. Most of them had as a target to reduce GHG emissions and improve the building efficiency, including amenities. However, energy poverty was not identified as a specific goal. Despite some having targeted the lower performing buildings, they have essentially been blanket measures. According to some experts energy poor communities are hardly ever included in these programmes due to the complexity of their situation that might render the implementation of programmes difficult: legal ownership issues and the absence of guarantees regarding how investment will be maintained after rehabilitation, low financing or co-financing capacity, or even low liquidity for programs based on bank loans. As of now, there are no impact studies on these measures, whatsoever. The topic will be discussed into detail at a later stage when describing the situation of single and multi- family buildings.

Romania's Draft Energy Strategy 2019-2030 (Guvernul României, 2019), with an outlook to 2050, elaborated by the Romanian Government is an analytical and programmatic document that envisions the strategies to develop the Romanian energy sector. Though Draft Energy Strategies have never entered into force due to political sensitivities, they have been regarded as guiding documents by the public administration. Alongside objectives related to access to clean energy, improvement of the infrastructure, increased economic competitiveness and better governance of the energy system, the document talks about the protection of the

vulnerable consumer and the reduction of energy poverty. It acknowledges the importance of the topic, recommending a better definition and operationalization of the concept of energy vulnerability. It also puts forwards a number of solutions: (i) thermal insulation and overall energy efficiency programmes for the buildings located in communities affected by energy poverty - a cornerstone solution to reduce energy poverty and reduce GHG emissions; (ii) a reform of the social benefits system, to better cover the needs of the vulnerable consumer. With reference to energy efficiency, the strategy also mentions the rehabilitation of district power plants alongside the investments in smart meters and smart energy infrastructure in order to improve efficient consumption in a larger sense.

Currently, the state implements two other major energy efficiency programs in different sectors of activity:

The National Energy Efficiency Action Plan 2017-2020 (Guvernul României, 2017) for energy supply aims to reduce GHG emissions of energy producers based on fossil fuels, respectively to modernize the electricity industry based on European Union regulations.

The National Energy Efficiency Action Plan 2017-2020 (Guvernul României, 2017) on energy consumption targets different types of beneficiaries (industrial, construction, public and private services, transport, agriculture) among which the residential sector plays an important role. In the residential sector, the program aims to reduce energy consumption based on renovations in single-family and multi-family buildings, replacements of old equipment and by conducting energy audits in households. The implementation report reveals energy savings of over 570,000 MWh in 2011-2017 and over 4,300,000 kWh in 2018 alone due to actions taken at the level of residential buildings, while in terms of replacement of old equipment, it describes various efficient approaches based on market mechanisms or on the issuance of vouchers.

The Integrated National Plan in the field of Energy and Climate Change 2021-2030 (PNIESC) (Guvernul României, 2020) includes five major objectives - Decarbonization, Energy Efficiency, Energy Security, Internal Energy Market and Research Innovation and Competitiveness - which set the national objectives and actions that Romania must implement by 2030, in order to become neutral in terms of carbon emissions by 2050. Romania intends to rehabilitate thermally at an annual rate of 3-4% of the building stock by 2030 (while maintaining a steady pace thereafter with a perspective until 2050), which is considered ambitious and in line with the European targets included in the Renovation Wave (European Commission, 2020) With regard to the specific obligation of Member States with regard to energy poverty in the PNIESC, namely (i) a clear legal framework to protect vulnerable consumers and establish dedicated social budgets; (ii) financial guarantees; (iii) non-financial guarantees and (iv) a national social assistance information system. Commission evaluates Romania's inclusion of clear directions on the definition and methodology for measuring energy poverty in the PNIESC as positive but criticizes the lack of a clear agenda and the lack of evaluation criteria (European Commission, 2020).

The National Long-Term Renovation Strategy (LTRS) (Guvernul României, 2020), adopted by the Government in November 2020, is part of European obligations as the most relevant document setting out the address of the challenges of a low-efficiency building fund, with an impact on energy consumption and greenhouse gas emissions. GHGs and other manifestations of energy poverty, organized in three agendas: 2030, 2040, 2050. The

document presents an overview of the Romanian housing capacity, which is dependent on a combination of factors: the communist heritage in terms of buildings and construction standards, legal ownership patterns, more recent market trends and European quality standards imposed in national law. According to the document, there are approximately 5.6 million buildings in Romania, of which 90% are residential. About 85% of dwellings were built before 2000, the vast majority (60%) before 1977. Most of the population lives in multifamily blocks or small single-family units. Over 63% of these homes have less than 50 m² of usable area, which indicates a lower standard of living and an overcrowding of spaces. In addition, in Romania there is a high ratio of owner-occupied dwellings (approximately 94%), which leads to difficulties in the thermal rehabilitation of buildings, because the financing programs for these interventions can be accessed by consensus between the owners. With respect to consumption patterns, the construction sector (residential, commercial and public) is responsible for the use of 42% of total final energy (ANRE, 2018), the residential sector, placed on a decreasing curve of 8.4% over recent years. While the total number indicates a positive trend, the data broken down by the types of fuels used to heat the house show a different picture: most of the energy used in the residential sector is based on biomass (mainly wood burned in old heating stoves and mainly in rural areas). Wood consumption is followed by gas consumption (ANRE, 2018). The building sector is qualified as the one in which the biggest reductions in consumption can be achieved. Even if the existing data provide a good overview of the overall situation, building fund quality data remains a critical issue both for the creation of an integrated national database and for the purpose of possible reporting to the European Digital Buildings' Logbook, a integrated European database provided in the Renovation Wave and under development. The national targets set are the renovation of 6% of buildings by 2030, noting that 79% of buildings require renovation or complete reconstruction by 2050. Most of the buildings (approximately 91%) that need renovation are in the residential sector. Based on these elements, for the period 2021-2030 a significant reduction in energy consumption, GHG emissions and energy poverty can only be achieved if multi-apartment buildings and single-family units, primarily followed by public buildings, will be included in rehabilitation programs. When displaying the content of these programs, the document makes reference to three scenarios of intervention and three packages of intervention.

Scenario1, considers a gradual increase of the renovation rate (from 0.53 to 1.56%) and focuses on planification and a strategic distribution of tasks between the central and local decision-making levels. Scenario 2 is more ambitious (0.69 to 3.39% initially and settling around 4% afterwards) and focuses mainly on the renovation of multi-family building blocks (around 40% of them). Scenario 3 is the most ambitious and least feasible due to the need for a sustained effort around above 3% over the entire period.

Package 1 (minimum) - involves interventions mainly in the rural and peri-urban area. Single-family houses, which have so far not been included in any refurbishment programme are shortlisted for renovations based on a cost-effectiveness criterion to a minimum of C standard. Additionally, a variety of options are offered for the improvement of the heating systems based on a case-by-case evaluation: from an improvement/change of the wood burning stoves to the possibility of installing gas-fired (GHP) or air-water heat pump (HP) and solar panels for domestic hot water (DHW) and photovoltaic panels (PV) to be implemented either at the same time with renovation or in the post-renovation stage. Large amounts of data are necessary to identify and shortlist buildings, and local authorities are charged with a high responsibility regarding data collection, planification and funding.

Package 2 (medium) - is mainly focused on multi-family buildings and the implementation of Nearly Zero Energy Buildings (NZEB) principles to reach an A-level standard of energy performance in the sector: Thermal insulation is the most important intervention, whereas solar panels for domestic hot water and PV are to be progressively rolled-out. Local authorities are again central both regarding funding and the relation with homeowner associations and other stakeholders.

Package 3 (maximum) - involves the renovation of buildings based on NZEB standards (A-level) through the extensive use of energy efficiency technologies and renewables. Social buildings, educational and medical facilities, office buildings and other commercial buildings are targeted here. Public authorities, both local and national should be in charge with the inventory of these buildings and the design of special financing instruments for intervention.

In the current resilience plan, as it has been developed so far, a second scenario with a slight variation of packages two and three have been employed.

LTRS is quite specific with regards to energy poverty, which is considered to be a pervasive phenomenon. Its existence is mentioned both in relation to single-family housing and apartment units. More importantly, a specific section (LTRS) is dedicated to energy poverty in buildings and potential solutions. Energy poverty is broadly defined as “the result of a mix of various factors, such as low incomes, high energy expenditure, limited access to less expensive energy services (e.g. district heating) and the poor energy performance of buildings”. It makes reference to the 10% indicator to point out the weight of energy bills in household budgets. The preferred interventions are both in the field of energy efficiency and heating aid. In this regard, LTRS suggests that a better national legal framework is needed in terms of energy poverty. The implementation of LTRS requires sound government programs, attracting EU funds and other financial schemes to be accessed on the private market. While the role of EU funding mentioned in the Renovation Wave could be an important source, the role of local governments in accessing these grants is considered to be of great importance. It is important for local governments to integrate energy poverty into local renovation programs. Private market solutions are considered effective at a later stage, provided that the confidence between lending entities and the population is increased, as well as financial opportunities among the population.

The National Recovery and Resilience Plan (PNRR, 2021). Two Chapters of the Green Transition Pillar of the document are relevant to our discussion: Pillar 1.5 on the Renovation Wave and Pillar 1.6 on Energy. The first allocates 2.2 bil. EUR to bring building facilities in line with the European consumption and climate standards, whereas the second awards EUR 1.623.500.000 to cause similar change on the energy market. As a general remark, it should be noted that throughout the plan energy poverty is just marginally discussed, with one mention of the concept and very few tangential remarks. Throughout the social topics vulnerability and decent housing are rather discussed from a general poverty perspective with no reference to energy poverty.

The Renovation-Wave related measures aim at a moderate to deep renovation of the residential building facilities of up to 77% before 2050. That relies, in the first phase almost exclusively on interventions on multifamily buildings, which are planned to be renovated

entirely by 2026. A number of reforms are proposed: The updating of the legal framework to facilitate interventions, the realization of a suitable strategic implementation plan, better data collection on the buildings, and an increased institutional capacity to deal with renovation related issues through expertise. All these are mainly oriented towards the effort to update multifamily buildings (MFB). Single-family houses remain under the consecrated national programs, which will depend highly on the availability funding and institutional capacity. So far, these have been the main realization barrier. An additional instrument may facilitate the incorporation of single-family houses (SFH/SFB): the provisions on seismic intervention. Otherwise, they are mainly targeted through plans to install renewable technology. Even so, fuel switching instruments are only created for private enterprises, who will receive support to transition to green resources or MFB that will be aided to switch to district heating where available. However, the root causes of district heating disconnections are not sufficiently addressed, neither is the absence of public confidence in the system. It should be mentioned that the rural sector is highly dependent on biomass (mainly wood) and that important capital infusion and the implementation of innovative market models are needed in order support the transition of a sector that has a low investment potential due to increased poverty. The prioritization of the worst performing buildings would reasonably bring SFB to the foreground of this strategy, as they have the highest consumption and lowest-quality technology installed. The important extension of the list of interventions that would qualify for financing (to include also air quality, hating, inside-outside renovation works) will only be performed on MFB.

More data is needed on the quality of the buildings stock and this need should be covered by the plans to develop a consistent database that would enable the systematic aggregation of structural information, currently under various sources, and would enable it to be matched with socio-economic data. This would not only be an important step forward in terms of evidence on the buildings in general and related policymaking and prioritization, but it would also enable decision-makers to better identify energy poverty in its complexity, while going beyond an income-expense perspective, into its structural and behavioral features. However, the difficulty of the task given the multiplicity of data-possessing actors, give rise to doubts in terms of its realization within the time span proposed.

Construction expertise has long been a problematic topic given the low degree of implementation and monitoring of construction standards. The rural sector is affected to a much higher degree. The reality is recognized in the plan and initiatives to improve the situation by preparing experts and consolidation the capacity of local administrations are being put forward. But an important part of the problem is the private-property mentality of the population that reduces effective implementation, and this remains practically unaddressed.

The energy section recognizes, inter alia, the low access to diversified, sustainable and accessible fuels and proposes the extension of the gas distribution system with another 4000 km of multi-purpose pipelines that would be able to transport renewable fuels in the future. However, the initiative has a pilot rationale meant to transport fuel to three counties that are marginal to the existing gas distribution system and see how they improve access and the wellbeing of the households involved.

National Buildings Legislation

Energy Performance of Buildings - Law 372/2005 (Romanian Parliament, 2005) and Law 101/2020 (Romanian Parliament, 2020)

The Romanian legislation on energy performance of buildings transposes the most important European directives on energy efficiency: 2010/31/UE, 2012/27/UE and 2018/844/UE and includes the objectives stated in the LTRS. While energy poverty is not specifically referred to among the priorities in Law 101/2020 that amends landmark Law 372/2005, it is mentioned in the articles that transpose the LTRS objectives. Therefore, alongside the need for a coherent building database and the design of efficient policies and financial solutions that will support the renovation process, energy poverty should be addressed by targeting the lowest energy performance households that usually overlap with the lowest levels of income. Despite important limitations with regard to energy poverty, these documents are relevant for creating a general framework that could bare a potential indirect impact on energy poverty. The set of measures aimed at increasing the energy performance of buildings are based on a number of expectations: improvement of air quality, indoor comfort, energy performance standards and cost opportunities. The goal for 2050 is to have localities with an improved urban appearance and better planning, new NZEB buildings and thermally rehabilitated older constructions, accompanied by energy performance certificates as well as tenants' associations that are correctly informed about new developments in terms of energy efficiency.

In terms of flagship modifications brought by 101/2020 law, starting with 1st of January 2021 all new constructions need to be NZEB or have the lowest energy consumption level possible. At the same time, it will be mandatory for all new and refurbished buildings to integrate alternative energy systems from renewable sources. The role given to energy auditors is high in the process as they will be in charge with both overseeing implementation and with issuing energy performance certificates, which they will be integrating in the national database on the performance of buildings. To that end, the legislation provides for efficiency standards and constructors will have to take into account factors related to a comfortable and healthy indoor environment, indoor air quality and the impact on the environment. They are required to make use of building materials that are in accordance with efficiency standards. While the existing legislation (372/2005 law amended by 101/2020 law) transposes the European norms, it still lacks norms of application causing widespread confusion with regard to implementation. More specifically, while the European Commission has included the retrofitting of energy poor households as one of its priorities in various documents (EU Green Deal and Renovation Wave, directives and recommendations), national legislation on buildings refers to the concept vaguely, without any clear measures or obligations imposed on various parties (national and local authorities, constructors, non-governmental actors), while overall construction requirements, as described, remain highly inaccessible to vulnerable households. Whereas the expected outcomes of retrofitting are generally beneficial for society at large and the most vulnerable households specifically, the absence of targeted support schemes for these families might put them at a high disadvantage and limit their access to these facilities compared to families who are better off. Despite highly necessary ambitions, it would be unrealistic to think that low-income households have the means to implement these standards.

Law on informal buildings (Law 151/2019 that amends the Law 350/2001 on Landscape and Urbanism) (Romanian Parliament, 2019)

People living in informal settlements face extreme manifestations of energy poverty. They have very poor access to the grid and other basic utilities (water, sewage, electricity) and basic services like health and education. Often, communities living in these conditions consume electricity illegally or improvise devices for access to electricity or heating (Teschner, Sinea, Vornicu, Abu-Hamedc, & Negevd, Extreme energy poverty in the urban peripheries of Romania and Israel: Policy, planning and infrastructure, 2020). In Romania, there are around 50.000 households and 200.000 people living in informal settlements. The high degree of informality (lack of identity or property documents) is the most wide-spread condition. The lack of documents prevents them from accessing their basic utilities: people living in these communities need legal documents (ownership or renting) to legally connect to the grid and claim basic services or benefits (MKDP, 2019).

Law 151/2019 created the legal set-up to recognize informal settlements, giving the local authorities and informal communities the necessary framework to connect to the grid. As such, the law defines informal settlements as grouping of at least 3 housing units intended for living and occupied by persons or families who are part of vulnerable groups, and who have no rights over the buildings they occupy. Informal settlements are usually located at the outskirts of urban or rural localities and are usually made out of conventional or reclaimed construction materials. By location and socio-demographic characteristics, these housing units generate exclusion, segregation and social marginalization. Moreover, being located in areas of natural (landslides), biological (landfills, landfills) or anthropogenic risk (safety zones or protection zones), some informal settlements endanger the safety and health of their inhabitants to a very high degree. In terms of actions needed to be taken for these communities, the national authorities (especially the Ministry of Development and Public Administration) overview the application of the legislation and creates the set up for the local authorities to act. At county and local level, the County Councils are responsible for setting up commissions composed of representatives from family and child protection authorities, urbanism and spatial planning, public health and civil society specialists that will assess and coordinate all the needed measures in order to improve the living conditions of people living in informal communities. In addressing the problem of informal settlements, the mayor plays one of the most important roles, by identifying the lands within the administrative territory occupied by the informal communities, creating the database with the people living there and the typology of their buildings and communicating constantly with the commission designed by the City Council. In terms of solutions, the mayor and the local authorities with the communities' active participation should identify alternative spatial relocations, including social houses or the development of new houses on urban land with access to all the utilities. Despite the very clear legal framework created, which is an important step forward given the precedent, much of its implementation depends on the local political will and dialogue with these communities, as well as the financial solutions identified to implement these solutions long-term.

Local norms (local council decisions)

Proportional compensation for heating benefits is granted from both the national and the local budget. There is no methodology on how these contributions are being established. Apart from the fact that national legislation imposes the principle of equity between applicants, it is rather up to every local council to decide how much of the local budget goes into heating aid. Research shows that some authorities allocate financial aid, whereas other go for investment in building materials. However, some authorities are more effective or creative in offering

solutions than others. But there are significant limits to these initiatives coming from other policy areas, such as national acquisition laws or financial restrictions for the local authorities, which only allow certain types of measures to be implemented by local authorities (Sinea, Murafa, & Jigla, Energy Poverty and the Vulnerable Consumer in Romania and Europe, 2018).

Electrification Programmes

Lack of access to energy is a form of energy poverty. In Romania there are up to 100.000 households without electricity (according to a Government decree proposal launched in public debate in 2012, by the Ministry of Economy). The last National Electrification Program was approved in 2007 by Government Decree (GD no. 328/200). The solution proposed to overcome the situation was their connection to the distribution network, with the exception of isolated localities, where the decree mentioned as a possible solution the use of independent generators. Off-grid solutions from renewable sources were under the proposed options, if investment was justified. The wide majority of these localities were located in rural or partially electrified areas. Various sources of funds were to be employed (local budgets, state budget, distributor funds, sources derived from bank loans and European loans), whereas local councils were responsible for leading the investments in coordination with the DSOs covering the areas on the basis of reports on the state of electrification in these areas, including the needed works and investments. It remains uncertain to what extent this programme has been operationalized

ANRE regulations regarding the connection of individual dwellings to the power distribution network (Order 59/2013) (ANRE, 2013) states that, if there is an electric distribution network at less than 100 meters distance from any property, the distributor is obliged to carry out an electrical connection to the network. Connections are to be paid by the beneficiary, whereas any additional works needed to extend the network capacity to the new number of users are made at the expense of the distributor. If the distance is greater than 100 meters, the distributor has an obligation to communicate to the consumer all proceedings necessary for the expansion of the distribution network, including the schedule of the necessary works. Project financing in this case is to be assumed by both the distributor and the local authorities. Art. 51 of the law 123/2012 describes the processes involved in the electrification of localities or the expansion of electrical distribution networks. Network extension is performed based on technical and economic feasibility.

In April 2019 Government launched a financing project to install PVs that would enable remote households to have access to electricity. The basic program assumption was that the 7136 households across Romania, that are not connected to electricity, and therefore in a distance longer than 2 km from any distribution network, can apply for a 100% financing of investment costs up to a limit of approx. EUR 5000 to install the technology. Most of the households identified in the program are situated in areas that are hard to reach, in mountain regions. The applications were to be submitted by county authorities in a one-time call. Up to the due date, no application was submitted, and the deadline needed to be extended due to the lack of capacity of local authorities to collect in time all requests from their respective constituencies. Another program that subsidized 90% of investments up to a maximum of RON 20.000 for any kind of private applicant, has been in a situation of deadlock for a long time (Vasalca,

2019). More examples of programmes on renewable installation will be discussed below in the rural/urban energy poverty analyses.

Gasification Programmes

There have not been national gasification programs similar to that for electricity, nor has there been a count of the dwellings, which are not connected to gas. However, various estimations can be made based on official statistical data. According to data collected by the National Statistics Institute (INS) on all the administrative units (AU) and the National Energy Regulator, 96 of the 103 municipalities are currently connected to the gas network, covering 99% of the population residing in municipalities. 148 town (68%) - smaller AU - are connected to gas, covering 75% of their population. The situation changes significantly in case of communes and villages, where 2228 (78% of the total) are not connected to gas, that is 71% of the rural population. Localities connected to gas networks are clustered mainly in the center of the country, along an axis, which connects the Northwestern development region with the Transylvania plateau (the eastern parts of Cluj and Alba counties, Mureș county and mostly all of Sibiu and Brașov counties), down to Dâmbovița, Prahova, Ilfov and Bucharest. The Timiș and Arad counties also stand out as better covered by the gas network, whereas least-covered areas are the ones located in the outer-Carpathians. Also, the unconnected AUs are generally the ones with a lower population density with some exceptions: 20 localities with a low density (from 10 to 20 people/sq. km) are connected, and other 29 with a high density (more than 200 people/sq. km) are not connected (Sinea, Murafa, & Jigla, Energy Poverty and the Vulnerable Consumer in Romania and Europe, 2018). However, the largest share of unconnected AUs is located at short distances from the network (i.e., 874 AUs lie at a distance of 10 km or less from the network). There is another nuance to be mentioned: 66% of the population (approx. 14.7 million people) has access to gas, i.e., has a distribution pipe in proximity, but only 44.2% are connected, according to EPG (XXX), which may reveal a problem related to the excessively high connection fees and complex bureaucracy which may prevent many to apply for connections. The energy law provides for similar conditions for the network extension as for electricity. NRRP (PNRR, 2021) identifies the unitary costs of such projects at 110 EUR/m in the case of distribution network extension and 1000EUR per individual connection, in the event of an extension of the gas network with intelligent facilities that might accommodate green gases in the future. The plan aims at extending the network another 4000 km in a pilot initiative to connect households in the southern Mehedinți, Dolj and Olt (counties with little access to gas) counties with multiple-purpose pipes that might be able to transport biogases in the future. The ambition was criticized by the Commission as being too little.

Assuming that the expansion of the gas network would contribute to reducing the climate impact of households through energy consumption and increase access to diversified energy sources, in September 2020, ANRE presented a proposal for a regulation based on the amended energy law, 155/2020, which established the obligation of gas distributors to connect all requesting households free of charge to the gas network within a maximum of 90 days from the receipt of the building permit. The procedure is considerably simplified for the applicant, because the complete bureaucratic process must be assumed by the operator in cooperation with the local administration (Nicut, 2020). This simplification at the level of the consumer who demands access to the gas network does not simplify the process as a whole, requiring no less than 19 administrative steps before the new connection can be put into operation, whereas for the first 13 steps no time limit is imposed. The 90 days refer only to the maximum period between the issuance of the construction permit and the commissioning. It should be

noted that, the consumer who wishes to access this programme remains, after submitting the application and in the event of its approval, outside a process that will remain entirely an exchange between the local authorities and the company. Also, the request can be rejected by the company if it is not economically justified. Based on this, in the hypothetical event in which a household in a village, which is not connected to the gas network, submits a connection request, this does not automatically mean that it will be admitted to the network. Therefore, the extension of the network is possible just as before in one of the following situations: 1) at the initiative of a group of households in a locality, so that the expansion project can be deemed economically viable for the distribution company, and the administrative effort is justified, 2) either at the initiative of the local authority, assumed on behalf of the whole community, 3) or at the initiative of the company itself.

Despite the opportunities created by the initiative, it was heavily criticized from the outset. At the time of the introduction of these new provisions, there was a fear they would lead to an increase in consumer bills, as the costs borne by the distributor would be recovered through distribution tariffs. But so far, six months after the introduction of this regulation, there has been no estimate of the impact of this measure on households in general or with regard to energy poverty in particular, neither has there been a centralization of requests and works performed. Companies, on the other hand, criticize the negative impact of this provision on their own functionality. They claim to have reached an administrative blockage due to the increase in connection requests (C.Pirvoiu , 2021). This led to the ultimate annulation of the provision with no perspective on the topic. Another dimension publicly debated at European and national level concerns the sustainability of the expansion of natural gas networks from the perspective of the efficiency of this fuel in the energy mix and its impact on the environment. Given the GHG targets adopted at European level, the expansion of gas networks has been the subject of positions by European officials, who consider it inappropriate to invest in what was considered to be short-term solution, but which in the medium and long term would generate taxes and duties that would generate new burdens for local government and citizens alike. The alternative of smart and multi-purpose networks offered in the NRRP was, however, deemed more acceptable.

The situation reflects, on the one hand, the need to expand existing energy services in society and their importance for the population in terms of diversity and accessibility of resources. On the other hand, the situation reflects the need of the companies to increase their capacity to manage the process on the market and thirdly, the need for alternative and viable solutions to improve access that might be identified in a concerted action between the Government, the distributing companies and the consumers. To unblock the situation, energy companies should identify themselves as a key player in solving the problem of diversified access to the population and find together with other relevant actors solutions to expand the natural gas market, for which there is a great opportunity.

Expert survey on policies and priorities for Romania

For an evaluation of these elements of public policies, we called on a panel of experts to evaluate their advantages and disadvantages in relation to the phenomenon of energy poverty, as well as specific causes, symptoms and solutions for Romania.

Methodology

Fifteen experts in the field of energy, buildings and development in Romania were identified by a "snowball" type sampling. Respondents have diverse expertise and come from different sectors: academia, the economic sector, NGOs or other think tanks, public administration, media. The questionnaire was applied online in the fall of 2020. The experts were asked to identify the most important pieces of legislation in their fields with an impact on energy poverty and to assess the possible opportunities and limitations that the legal framework has in practice. A secondary objective was to validate some statements and premises that underlie research in the field of energy poverty and to verify the extent to which there is coherence between the perspectives developed in the theoretical literature and those derived from practice.

Perspectives on the definition, causes and manifestations of energy poverty in Romania

The interviewed experts define energy poverty as a multidimensional phenomenon that includes various causes or dimensions, such as low incomes, high utility bills, low energy efficiency buildings and, in general, low living standards, which brings them in the conventional area of the concept as defined in literature or between researchers and practitioners. Despite these common characteristics, the respondents brought in the discussion about energy poverty additional dimensions of the phenomenon specific to the Romanian context:

Financial limitations. Existing heating aid and social tariffs are not designed to cover real energy needs for households and are even insufficient to cover monthly energy bills, because they are generally dissociated from real energy needs. Some of these tools may even push households deeper into energy poverty through the admissions criteria and the bureaucratic procedures applied. These may be considered too complex by many households, as their implementation depends on a complex interaction with the local social and administrative assistance apparatus.

Structural limitations. Limited access to gas infrastructure in many geographical areas of the country is mentioned as a major dimension of energy poverty. Households use solid fuel (mainly wood) for heating to a large extent, especially in rural and peri-urban areas. Therefore, for many households the choice of fuel is not possible.

Limitations related to urban planning. Energy poverty is becoming extreme for households in informal settlements, as they cannot legally connect to the grid and rather improvise their connections or use alternative and polluting heating and cooking materials and cannot access heating aids to reduce the financial burden. Based on the legal changes made in 2020, which allow informal settlements and people living informally to request access to basic infrastructure, the most important effort must be made by local authorities.

Some respondents considered the role of education/information in understanding energy consumption and the immediate impact on climate change to be equally important. In addition, some experts have highlighted the impact on human health and well-being of energy-

inefficient buildings and energy poverty, pointing to respiratory and heart diseases among the elderly as the most common problems associated with living in suboptimal homes.

The East-West cleavage

Experts have identified specific factors that favor energy poverty in Romania, as a representative country of the post-communist context, compared to other regions in the EU. While energy poverty is a widespread phenomenon in all European countries, former communist countries, including Romania, are more affected by its manifestations. Interviewees explain the gap between Western and CEE countries based on at least two categories of criteria.

Income gap. Citizens in the former socialist Member States have less purchasing power when it comes to energy, and the impact of energy costs on household budgets is relatively higher. The experts also point out the persistent economic, social and educational gaps between Romania and Western European Member States, which create the context for the absence of an informed public discourse and debate on this issue: there are limited debates in public about poverty itself, and even less about energy poverty, and how it can be addressed.

Poor policymaking. In general, experts believe that national and local authorities have failed to provide quality services and implement sound systemic policies to address inequalities and address poverty issues more generally in the last three decades. Some point to the lack of systematic action to improve the energy efficiency of the communist-era housing stock - including the poor quality of appliances and other heating devices, investment and expansion of gas and electricity infrastructure - especially in rural areas. Others point out that heating aid and other financial instruments offered to low-income households have been insufficient and inadequately designed to address energy poverty. Another category of respondents emphasizes the importance of addressing energy poverty in social housing and the need to recognize informal settlements. Another problem that arises is non-compliance by local authorities with legal procedures or inefficient enforcement of construction law and unclear rules for the application of legislation, especially by offices that grant building permits.

Energy market (electricity and gas) liberalization and energy poverty

Experts have expressed their views on the impact of energy market liberalization on households. Theoretically, increased competition should lead to lower consumer prices and better contractual conditions, which means that low-income households would have increased access to cheaper and better energy services. Some experts believe that, in order to conclude a better energy contract, consumers should have access to better information and tools to explore competing offers. Some have even noted that there are persistent information asymmetries between vulnerable and non-vulnerable households and that energy-poor households most likely do not have the means to seek better energy supply, which sometimes makes this segment of the population particularly vulnerable to unfair market practices. Some experts pointed out that most energy-poor households will not change suppliers or renegotiate existing contracts due to limited access to information and an inability to understand contractual clauses. Moreover, even households that are not affected by energy poverty may find the process of choosing between different energy providers difficult, because information is not readily available and clearly explained. Beyond the need for more information and clear

protection mechanisms from the national regulator, the experts did not recommend other measures that should be identified and prioritized for the protection of vulnerable consumers in the context of market liberalization.

EU financial schemes

Discussions on the energy efficiency of buildings have been on the European agenda for the past two decades. Romania, as a member state, had access to the Regional Operational Program (ROP) 2014-2020, measure 3.1.A., which included a financing line for the thermal rehabilitation of multifamily buildings, with the possibility for local authorities to co-finance the execution of thermal insulation works. While the operational program had a clear target, experts point out that the bureaucratic procedures involved in accessing these funds and implementing the programs were excessive, involved long-term procurement procedures and put small communities with limited institutional capacity at a disadvantage with regard to access funding and program management. As some respondents pointed out, not all local governments have an energy performance expert in their organizational chart. Others stressed that local authorities, including mayors, do not have the best partnerships with regional development authorities, while the rehabilitation of collective buildings is a complex task, including what regards unanimous agreement from the owners. In addition, as some experts point out, the 2014-2020 ROP did not include an energy consumption monitoring component, which led to poor implementation of otherwise properly designed projects. Some experts also point out that the modernization process did not meet existing standards, the builders used poor quality materials, which could have led to suboptimal results. In line with this remark, experts think that the new financial programs address these issues, update quality standards, integrate strict compliance and monitoring processes, reduce bureaucratic burdens and give more voice to local governments.

Areas of intervention

In terms of areas of intervention, respondents tend to prioritize the thermal rehabilitation of the energy-efficient building stock and the reform of the benefits system.

The experts recommend, first of all, the elaboration of a specific national action plan on energy poverty, with the participation and coordination of the main stakeholders in the field, such as the Ministry of Economy, Ministry of Energy, Ministry of Labor, Ministry of European Funds, Ministry of Development and Public Administration, the National Energy Regulator, local authorities, but also the civil society. This national action plan should set clear objectives and innovative financial schemes, including through state procurement of energy performance services (EPC - ESCO). The action plan should be able to assess the existing situation in relation to energy poverty by using integrated databases of both residential and non-residential buildings (including technical details and energy efficiency characteristics). Based on information from such databases, local authorities with financial support from the government should give priority to low-income and high-energy households. Furthermore, experts believe that European funds should be the main source of funding, while local authorities should have the capacity to directly manage EU funds and to develop and implement local solutions for vulnerable households. The national plan should include effective social schemes aimed at making life easier for people living in energy poverty, including more substantial heating aid,

which can be complemented by energy efficiency financial schemes. In this respect, better coordination between national and local authorities is desirable.

Respondents also believe that special emphasis should be placed on projects in local and small-scale communities as a source of basic initiatives and solutions. For example, it is easier for local communities to integrate renewable sources and implement concepts such as energy communities or to improve existing systems, such as district heating, that may run, for example, on biomass.

Equally important, experts stress the need for a more general and integrated approach to combating energy poverty through existing building legislation. According to this reasoning, the national plan should include clear recommendations on at least a minimum energy efficiency standard for new buildings. In Romania, the legislation on existing buildings (Law 101/2020) has transposed the European standards for NZEB buildings, but there are no clear implementing rules. An important role in implementation is also played by energy auditors who should verify the compliance of all new constructions and rehabilitation projects. Energy auditors, in partnership with municipalities, can play an important role in creating and updating building databases.

Another relevant discussion in Romania refers to the existing gas infrastructure and the expansion of the network, especially for areas where the pipelines are close to small urban and rural areas and where the expansion is justified, to reduce GHG emissions and inefficiency of consumption patterns. derived from the exclusive dependence on polluting solid fuels. The process should be accompanied by extensive thermal insulation of non-performing buildings in those areas where renovation projects have been minimal.

Experts unanimously believe that the recommended policies and actions should be accompanied by awareness-raising campaigns on energy poverty and efficiency, through the media, in order to target the general population (educating the population in understanding energy poverty and the means to address it - efficient appliances, consumer behavior, building insulation, financial and non-financial schemes).

Integrating energy poverty in thermal rehabilitation programs

Experts agree that energy poverty has never been a component of discussions and strategies related to energy efficiency in buildings. Some experts recommend the design of dedicated financial instruments for the thermal rehabilitation of households in energy poverty. Funds should be consistent and set clear performance indicators, including the possibility of combining them with other existing instruments (guarantees, consolidation programs, use of renewable sources in buildings). Experts also found that local governments play an important role in identifying energy-poor households, are more aware of the needs of the community and are able to prioritize energy-poor households without excessive administrative effort. Some experts mention the Renovation Wave, which provides opportunities and tools in the hands of national and local governments to tackle energy poverty. As such, for the first time, local governments will have the opportunity to become key players, able to directly access significant funds for the thermal modernization of buildings.

Another important aspect discussed is related to thermal rehabilitation. To date, national and local thermal rehabilitation projects have not focused on energy poverty. Rather, households that could demonstrate the ability to contribute financially to isolation projects have been prioritized, whereas vulnerable households have been integrated only by chance. Moreover, experts point out that most of these programs targeted blocks of flats, while single-family homes and social houses were generally unable to access funds. In connection with rehabilitation projects, experts also pointed out the lack of administrative capacity of many local governments, especially in rural areas, to design rehabilitation projects and apply for funding. This has a disproportionate impact on vulnerable households, given the welfare asymmetries between rural and urban areas.

The interviewees also emphasize the need for dedicated programs for different types of buildings: public, residential and industrial. For each category, experts suggest that priority should be given to buildings of lower energy classes (E and D). Some experts stress the need for sustainable interventions. They recommend that builders be encouraged to use environmentally friendly materials, such as polyurethane foam made from vegetable materials, bales of straw or wool, for example. This creates the context for professional specialization, where technical universities and professional associations, construction companies, public authorities, as well as national and European construction regulators play an important role.

Some of the experts identify district heating at the locality level as an important source of accessible energy for the population, emphasizing the fact that in Romania there is a great need for investments in the systems inherited from the communist era. Local authorities have been identified as having the most important role, as investments from local budgets can be directed towards the renovation and transformation of existing district heating plants in accordance with current environmental and energy performance standards and objectives. However, only 62 localities have central heating systems in operation, and 15 county seat municipalities completely lack such systems.

Energy poverty should also be integrated in the discussion on renewable energy sources. While in recent years renewable energy sources have been integrated into the national energy system, allowing prosumers to be part of the market and take advantage of significant subsidies, similar projects have not been designed for multifamily buildings to allow tenants' associations to install renewable energy, technologies that produce and consume cleaner and cheaper energy, which is a major unintended effect and requires correction, according to some respondents.

For all these measures to be effective, most respondents stressed the importance of involving all relevant stakeholders, such as the media, NGOs, business associations, ministries and relevant local and government agencies.

Political positioning of energy poverty

Given the importance of political will and the role of political decision-making in addressing energy poverty, we have performed a research on political programs and electoral discourses to identify the importance allocated by politicians to energy poverty and related topics and to identify possible entry ways into the topic. This might enable us to acknowledge the level of

political literacy on the subject, key individuals that might be approached to advance this agenda and subjects deemed important by them and that might be used as an opportunity to advance an energy poverty-related discussion. A number of components have been scrutinized: Two national elections (Presidency and Parliament), one general election (local administrations) and party programmes, more generally.

Analysis of electoral programs

The 2020 local and parliamentary elections and the abundance of electoral documents prepared by candidates and parties for both the local and national levels provided the right context to identify politicians' perspectives on energy policies in general, following mainly the extent to which attention is paid to the phenomenon of energy poverty. We structured the analysis according to several elements. We included in the analysis all 41 counties, plus Bucharest. We have included all the listed parties with chances to cross the electoral threshold (PSD, PNL, USRPLUS, UDMR, ProRomania, ALDE, PMP), including some relevant local formations (FDGR for Sibiu, for example). We have included accessible official documents ("election programs") at both party and candidate level (in the case of local), as well as Facebook posts or media appearances, where available. We have scrutinized these documents based on a list of 30 terms, starting from "energy poverty", "energy vulnerability" and going to terms associated to these topics (for example "gas", "wood", "thermal", etc). For the analysis we used the ATLAS.ti software, which allowed us to make frequent associations between the concepts initially identified.

For objectivity, we will aggregate the conclusions presented below for all parties and for the whole territory of the country, in order not to make specific assessments regarding the parties or candidates. As a general remark, the reasoning, narratives or solutions proposed by parties and candidates in electoral contexts are not significantly different. We have not distinguished any party that has a significantly different vision from others. In general, based on the frequency with which these topics appear in documents, the smaller parties (ProRomania, PMP, ALDE, which did not even cross the electoral threshold in parliament) tend to give less importance to these issues than the larger parties (PSD, PNL, USR/PLUS).

Local elections

Political programs for local elections address the issue of energy in the residential environment, especially from the perspective of energy efficiency of buildings. Most of the campaign documents analyzed emphasized the importance of accessing European funds to cover financially projects for this purpose, with particular reference to the thermal rehabilitation of blocks of flats and the thermal insulation of facades. An important element that parties refer to in election documents in association with the need to increase the energy efficiency of residential buildings is the European Green Deal (EGD). It is mentioned as a framework for action that creates the context through which more citizens can benefit from thermal rehabilitation projects. Many electoral programs designed for the urban environment have assumed the introduction of EGD objectives in local projects. Also, in the context of EGD ambitious objectives related to combating pollution or introducing selective waste collection are mentioned. Mostly candidates in large and medium-sized municipalities stress these issues. Selective waste collection is mentioned as a potential source for the creation of new thermal energy networks.

On the other hand, electoral programs at the commune level rarely refer to the EGD. The most common element in these programs is the connection to utilities (gas, electricity, water, sewerage). Thus, we can observe the discrepancy between urban and rural also in terms of issues addressed in political discourses.

Parliamentary elections

In the case of the parliamentary elections, in which the parties came up with relevant programs at the level of the entire county, as an electoral constituency, there is an increased inclination of the parties towards investments for the expansion of gas networks. The favorable context created by the EGD, plus the need to develop the National Recovery and Resilience Plan, is mentioned even more strongly than in the local elections. The main parties approach the energy-related objectives in the residential sector from an environment perspective and the associated obligations, this perspective includes the messages related to the extension of the natural gas networks. Gas is seen as a transition fuel and the main means by which both the energy needs of the population could be covered, and the targets related to the reduction of climate effects, by replacing coal with natural gas in energy production and solid fuels with gas for heating households, can be met. However, alternative energy sources are not neglected, which are seen as at least a complementary solution to access to gas for single-family homes, especially in rural areas. The phenomenon of energy poverty - mentioned either explicitly or in associated terms, such as “energy vulnerability” or “vulnerable consumer” - is approached in the same register which stresses necessity to expand the gas network, especially in rural areas, and to a lesser extent from the perspective of growth. Energy efficiency in residential buildings (either through more precise assessment through energy audits or through investments in thermal rehabilitation) and access to information or financial aid schemes with less bureaucratic burden are also identified as part of the solution to energy poverty.

Awareness raising campaigns

Information and awareness raising measures are particularly important in the transition process to a free energy market but also for its functioning. Studies performed so far show that most public information mechanisms can be identified on the more liberalized markets. Transparency depends on a certain political culture and the way in which a state's civil society understands to become involved on the market as an equitable stakeholder. Results of such mechanisms are the awareness of one's own rights and obligations, the recognition of the other market stakeholders, of their rights and obligations, and a certain degree of trust in the market and its players.

While energy poverty and all the risks and opportunities associated a rather new topics in Romania, there are various aspects with respect to awareness that can be apprehended. The conclusions below are based on a field research done in various municipalities around Romania, where local decision makers, social workers and aid beneficiaries have been interviewed about the quality of information with respect to consumption, access to benefits, the role played by different actors in alleviating energy poverty. Municipalities involved in the field research were selected to represent all varieties of energy poverty in Romania (Jigla, Sinea, & Murafa, Oportunitatea gazelor naturale în sectorul rezidențial din România, 2018).

The relationship between the institutions involved in the process of granting benefits is usually a good one. All local authorities claim to have a good communication with other state institutions with which they are in direct contact for granting the benefits, in particular with social services at the county level, or directly with the Ministry of Labor. With some exceptions, the communication with utility providers is also assessed as positive and easy (Jigla, Sinea, & Murafa, *Oportunitatea gazelor naturale în sectorul rezidențial din România*, 2018) . This being the case, a better information system to document households on a constant basis would be an optimal source of support. Through digitalization the pressure for additional human resources would be smaller, at least because the need to constantly perform investigations in the field would be reduced.

The relationship between beneficiaries and authorities is also perceived to be a good one. In 2021, surveys display an unusually high trust from the population towards their local administrations, close to 60% at the national level (CURS, 2021), whereas the percentage confirms in a survey performed at the level of Cluj-Napoca (Babeş-Bolyai University, 2021). Specifically, with regard to energy benefits handed out to beneficiaries, city halls generally maintain that the population is efficiently informed with regard to the periods when aid applications can be submitted, the required documents, the conditions under which social investigations are conducted. A good relationship is also maintained through the local press, but also horizontally between people. Social assistants are considered to be a support and a source of information for potential beneficiaries, which confirms the assumption that the large number of benefits from a county does not necessarily indicate that the problems are greater there, but that the process of communication with the authorities is presumably better. Another overall conclusion drawn from interviews with local authorities is the tendency to stigmatize recipients and to associate heating benefits with social benefits. Thus, often negative remarks appear in reference to the recipients, however, such attitudes do not prevail in practice. Even if there are many biases associated with the application procedure, from the interviews performed, there is no indication that the procedures would be applied selectively, and on personal prejudice.

The relationship between recipients and utility companies is perceived as a good one as long as communication channels made available by utility companies are efficient. Communication between beneficiaries and providers can prevent disconnections, as alternative solutions such as individually negotiated pricing plans in relation to vulnerable clients, or even counselling, are being sought. Most of those interviewed, who receive benefits for gas and electricity, understand how subsidies can be identified on the invoice, and problems of understanding the invoice, where they exist, are not placed in the supplier's fault. In other words, it is important for providers to constantly communicate to vulnerable clients and to those who may encounter difficulties in paying the bill, in order to generate understanding of their situation and in order for the relationship between the two parties to operate on a presumption of good faith. In the process of complete market liberalization for household consumers the NRA has required energy companies to inform consumers on their contract options over several months.

Apart from traditional methods of communication with the clients (call center, information desks), proactive measures to establish relationships with vulnerable consumers are welcome. One such case is known in Bucharest, where the provider hired a community mediator in order to establish a better relationship with the inhabitants of several ghettos. It should be said, however, that none of the respondents who do not receive benefits for

electricity (who would not be eligible) has indicated that it was actively guided by the provider in the choice of the social tariff. Interventions at the level of education and customer behavior are also important. The majority of respondents have difficulties in assessing their current income, the necessary income, the household expenses, the specific expenses on energy or the consumption. On the other hand, there is a willingness to accept counseling. Therefore, the question of education can be approached either by school programmes or various other training facilities offered by the authorities or by suppliers to their staff (Jigla, Sinea, & Murafa, Oportunitatea gazelor naturale în sectorul rezidențial din România, 2018).

Energy poverty in the rural context

Romania is characterized by a variety of instances of energy poverty. Whereas national analyses display important regional differences in these manifestations and in the availability of programmes of redress (Jigla, Sinea, & Murafa, Sărăcia energetică și consumatorul vulnerabil. Evidențe din România și Europa, 2017), there are important contrasts in the residential sector between the urban and the rural localities, each displaying specific challenges. This policy brief is aimed at displaying a number of energy poverty challenges characteristic of the rural context in Romania.

Low-quality single-family households in the rural area

In Romania there are 8 mil. residential spaces corresponding to 7,2 households. Residential buildings amount to 90% of the total national building capacity. 31% of total are multifamily buildings, whereas 50% are single family houses (PNRR, 2021). Romania is rural to a large extent. 47,5% of the residential spaces (71% of the single-family households) are located in the rural area. The highest structural challenge in the rural area consists of single-family households (European Commission, 2021). 95% of the buildings are individual houses. The rest consists of administrative buildings and multifamily buildings, which are highly uncommon and are mostly former workers colonies situated in the proximity of industrial sites or mines. The rate of vacancy at the level of residential buildings in Romania is 16% of the total and the rural area is particularly affected by this phenomenon (Ministry of Energy, 2018). This is considered to be an important factor of space degradation. One of the most important reasons behind space vacancy is migration. In the rural space there are two types of migration at work: the external exodus and a rural-urban migration, especially at the level of the young population. Besides vacancy, another general phenomenon present in the residential sector is overcrowding. The majority of households live in small living spaces compared to the majority of EU member states. 63% of living spaces are smaller than 50sqm. Despite larger living area for individual houses - 73sqm (Guvernul României, 2020) - up to 1/4th of them is under 50sqm.

From a structural perspective, 50% of the houses are made of building bricks, whereas the remaining half are made of wood and plaster – approx. 20%. This latter feature is disproportionately present in rural housing facilities as they have very specific renovation needs. Soil-based materials conserve humidity and heighten the risk of an unhealthy living space.

Generally speaking, structural characteristics, their location and the fuel employed may determine a variety of energy needs and a corresponding climate footprint. Using data retrieved from the national buildings' census, CSD has classified 80% of the national building stock in 23 different categories based on a number of structural features. The heating needs of these of these households have been established and their effort to reach a steady inside temperature of 21 degrees Celsius. This temperature is provided for in the national regulations on building standards. The model computed enabled the identification of those households who may be rendered most vulnerable in the process. While furnishing us a list of useful information, the model does not account for behavioral practices inside the building – actual technology employed, the quality of the resource used (the quality of wood) and consumption manners, which may result in features such as under- or overconsumption. In Romania partial and temporary room heating is common practice in more than 50% of the households (Ministry of Energy, 2016). Heating below standards at times, or over-heating are much employed coping practices, whereas hidden energy poverty (resulting from underconsumption) is as high as 11,7% (Center of the Study of Democracy, 2021). Furthermore, the model only captures heating needs. Cooling needs during the hot season are not included.

Despite the shortcomings, the model allowed us to formulate a number of conclusions with regard to single family houses: Generally, private houses have been recorded to face the highest potential energy effort to reach a steady 21 degrees, as anywhere between 255 and 900 kWh/sqm/year are needed in order to secure acceptable living conditions. This effort lies much above the European real average sqm consumption in the residential area, which is 180kWh/sqm and the national average of 300 kWh/sqm, as shown in European Commission data (European Commission). Other reports point out the difference in inefficiency between single family houses and multifamily buildings referring to the fact that single family houses build before 1994 are 83% less efficient as compared to multi-apartment buildings, Whereas the difference goes down to 12% for houses built after 2014. Romania has an aging building stock with only 6% of its residential buildings built after 2000, whereas half of it is older than 1970 with little investment afterwards (Fiocompass, ERDF, 2020). Whereas national strategies aim at reducing the annual consumption of refurbished multifamily buildings to 100 kWh/sqm (ANRE, 2018), there are no plans yet with regard to single family houses and no evaluation of the effective refurbishment effort needed. However, in order to cause real change, these interventions need to take into account heating needs.

From a standard heating need perspective, the highest energy consumption effort potential is associated with single family brick buildings built in the 1960s, 50 sqm, with 2 rooms using wood to heat as they may have to consume anywhere between 520 and 900 kWh/sqm/year to reach an acceptable indoor temperature. Given the volatility of the wood market, these households may be exposed to outrageous prices especially during the high season and may have to reduce their consumption drastically in order to stick to budgets. An earlier CSD report showed that wood heating may surpass electricity costs for some families during the high season (Jigla, Sinea, & Murafa, Sărăcia energetică și consumatorul vulnerabil. Evidențe din România și Europa, 2017). These very specific group of vulnerable buildings identified above represent over 5% of the total households population considered in the study. More generally speaking, brick houses seem to be an important problematic category, irrespective of their primary energy source being gas or wood. Their needed consumption seems to potentially surpass 700 kWh/sqm/year easily in order to secure a decent living environment, which may indicate a high need for investment in refurbishment and finding alternative heating solution.

With regard to pollution, brick houses using gas boilers are particularly problematic as their annual carbon footprint, provided the heating effort needed to reach 21 degrees would be deployed, would be anywhere between 53 and 160 kgCo2/sqm/year, with 56 sqm houses with 2 rooms being particularly problematic (91-160 kgCo2/sqm/year). This category represents 1.19 % of the housing population considered in the simulation.

Two discussions need take place at this point: one concerns structural regulations and investment measures and programs, whereas the other refers to the need to change energy consumption behaviors and heating technologies.

First, Romania is paramount for its high degree of private property with 94,7% degree of private ownership (PNRR, 2021). This feature has a number of implications in terms of the quality of the building stock, and energy poverty more specifically. Private property tenure involves a higher maintenance burden on the owner, and therefore higher investment liability, either in own funds, bank loans or capacity to access public grants with or without individual contribution. It should be noted that in 2019 Romania classified as the country with the lowest median equivalized disposable income in the EU, despite increases, and the Member State with the fourth highest income inequality (with a Gini coefficient of 34.8% (Eurostat, 2022)). Moreover, rural-urban disparities in terms of income are high with earnings 35% lower in the countryside as compared to towns (INS, 2020). This does not only mean that the investment capacity of rural households is low but also that bank solvability is (especially compared to urban households) reduced and the ability to access green mortgages or other private financial instruments is limited. Bank loans are more accessible to higher income groups who are able to provide better guarantees in terms of income and property. Rural property values are generally lower than those in the cities, which decreases the capacity of rural families to access bank loans.

In terms of building refurbishments, it should be noted that despite a higher concentration of single-family households in the countryside, and more structural and socio-demographic challenges associated, renovations have been performed disproportionately in the urban sector (8% as opposed to 3% in the country side). It is unclear whether these interventions have been performed on private or public sums, or a combination of the two. However, most of them have run on financing schemes that involved 60% national sources and 40% individual or local administration sources either separately or in a combination of the two. With respect to these mechanisms, one of the conclusions of previous field studies should be noted here, namely the limited capacity of local administration to attract funding and administer renovation programs or implement innovative solutions that would help households improve their energy efficiency (Jigla, Sinea, & Murafa, Sărăcia energetică și consumatorul vulnerabil. Evidențe din România și Europa, 2017). Based on a national legislation from 2011 (Ivanov, Legea care prevede ca proprietarii sa-si repare cladirile darapanate pana in 2013, impotmolita la primarii, 2011), some urban administrations have launched façade reconditioning programs which have had different degrees of success (Sfârlea V. , Cum reabilităm fațadele Clujului: 10 idei din Oradea (Infografic), 2018). In the rural context these have been generally absent. National programs targeting single family houses have been marginal and mainly dedicated to higher income families, and even so, they have been slow to deliver. Programs like Casa Verde Clasic (The classic green house programme), only aimed to install PVs on individual houses. 30.000 individual houses have been targeted, but no structural intervention was involved. [Casa Verde Plus](#) (The green house plus) (Ziare.Com, 2018) was designed to be an upgrade for the previous program and also include efficiency works by financing building insulations. Casa eficienta energetic (The energy efficient house) was aimed exclusively at financing energy efficiency works on private houses. 60% of investment (up to 15.000 EUR) involving insulation, heating system improvement, and window and door improvement would be supported from the grant. These programs have faltered out of various reasons, such as the lack of funds (Casa Verde Plus), slow bureaucracy ([Casa verde](#)) (Digi24, 2020) or low institutional capacity despite high public interest in the program ([Casa eficienta energetic](#)) (Alba24, 2021). Green mortgages, another financial instrument well promoted by authorities and administered by private banks, have been accessible solely to real-estate investors and solvable families (Romania Green Buildings Council). The national resilience plan will implement a scenario where multifamily buildings will be mainly targeted and completely refurbished by 2026, whereas for individual houses the two latter programs will be activated to be accessed by beneficiaries (PNRR, 2021)

Another challenge that results from the high degree of private property combined with low institutional capacity at the level of local public administrations is the low implementation rate of national

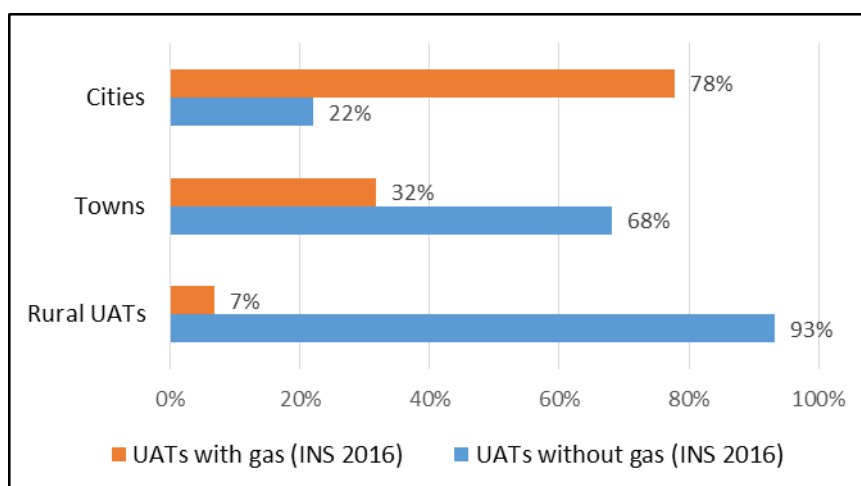
construction regulations and for that matter the low capacity of local administrations to produce and enforce local construction norms. This weakness has been regarded by many experts interviewed as an explanation for the low implementation of EU standards on the ground and can be found at the intersection of the low institutional adaptability, the reluctance coming from real estate developers to reduce profit margins by investing more in quality, and the objections coming from the population at large due to low investment capacity. Moreover, the low institutional capacity at the local level and the high private property mentality can also be associated with a high degree of free-riding and construction work performed without authorization. There is not statistics of the percentage of unauthorized construction work performed on private houses, however the practice is highly recognized and media accounts of hazards resulting from such behavior are at the ordinary. The newly issued NRRP (European Commission, 2021) points out the need to develop construction related expertise at the local level and especially in the rural area in order to provide for better implementation and construction overview.

Access to diversified and sustainable sources of energy

Nearly 80% of the rural population use wood for heating, in obsolete and inefficient stoves with low heating power and energy efficiency, with highly air polluting emissions and toxic effects on human health and the environment. Besides environmental and health effects, wood burning gives rise also to accessibility issues. Generally speaking, in terms of price, wood is the cheapest heating fuel available but at only a short distance from gas. Moreover, there is high illicit consumption associated with wood heating. This may produce contrasting effects: the lower costs effect possible on one hand, can be compensated by the uncertain costs effect on the other. The wood market is highly volatile and with large price variations from one region to another and between seasons. This may lead, at times, to prices that are considerably higher than those of gas (George Jigla, 2018). With regard to price compensations available for these households, despite the fact that by far the largest part of heating aid available is allocated for wood, (Jigla, Sinea, & Murafa, 2017) individual payments can be up to five times lower than for gas or electricity. They do not cover by any standard the wood needs of a household during the cold season. Recent legal changes have ceased this disparity between fuels. Despite a better satisfaction of the equitability standard, heating payments can only be a transitional measure and can by no means sustain the sustainability ambitions in place.

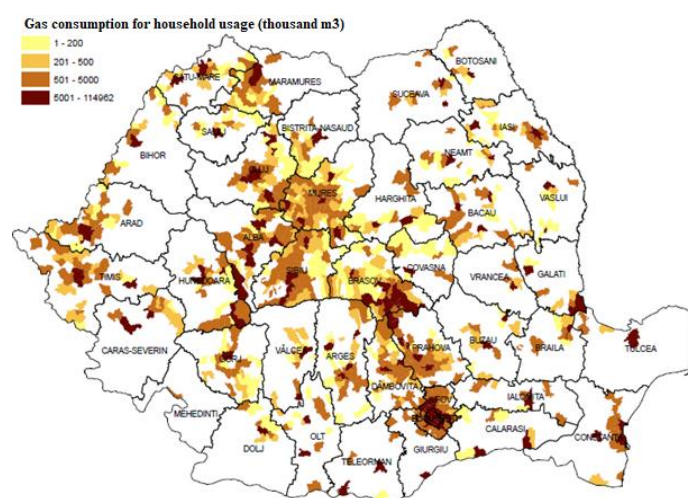
It should be noted that for most wood-consuming households this is the only heating resource available. No alternatives are in sight (Jigla, Sinea, & Murafa, 2017). Access to the gas network, for instance, is particularly limitative for rural localities. As displayed below gas usually reaches high density urban and suburban areas, whereas rural administrative unites can access this alternative to a low degree.

Figure 1. Percentage of UATs connected to gas



Source: (INS)

The map displayed below presents visually the areas which are uncovered by gas alternatives and households are bound to wood-based heating. Legislative initiatives aimed at the facilitating the spread of gas connection to households have faltered due to limited capacity on the side of the distribution companies.



Source: (George Jigla, 2018)

Heating on electricity is limited. Nation-wide only 1% of the population heats on electricity due to its high intensity for heating and the limitative technology prices. It is usually either extreme poor households that revert to electric heaters or richer households that can afford heat pumps or similar technology. The spread of renewable technology is also particularly limited at this level with very minor initiatives supported either through public grants or through the activity of NGOs.

Based on national analysis, wood will continue to be part of the residential heating mix until 2030, thus having a major role in the energy transition process (European Commission, 2016).

According to the same data, a growing number of wood-burning dwellings are expected to shift to natural gas. More than certainly, this phenomenon will be particularly prevalent in urban areas due to infrastructural limitations. It will be considerably slower in rural areas, where it will need additional support schemes. Despite the fact that NRRP enlarges the efficiency measures that can qualify for financial support, including, inter alia, also the change of heating systems, they are mainly dedicated to multifamily buildings, whereas allocations for technology switches are only made for private enterprises. Single family households remain in the sphere of the national programs in places, their implementation depending on funding, institutional capacity, individual contribution, etc., elements which have so far faltered their success (PNRR, 2021) (European Commission, 2021).

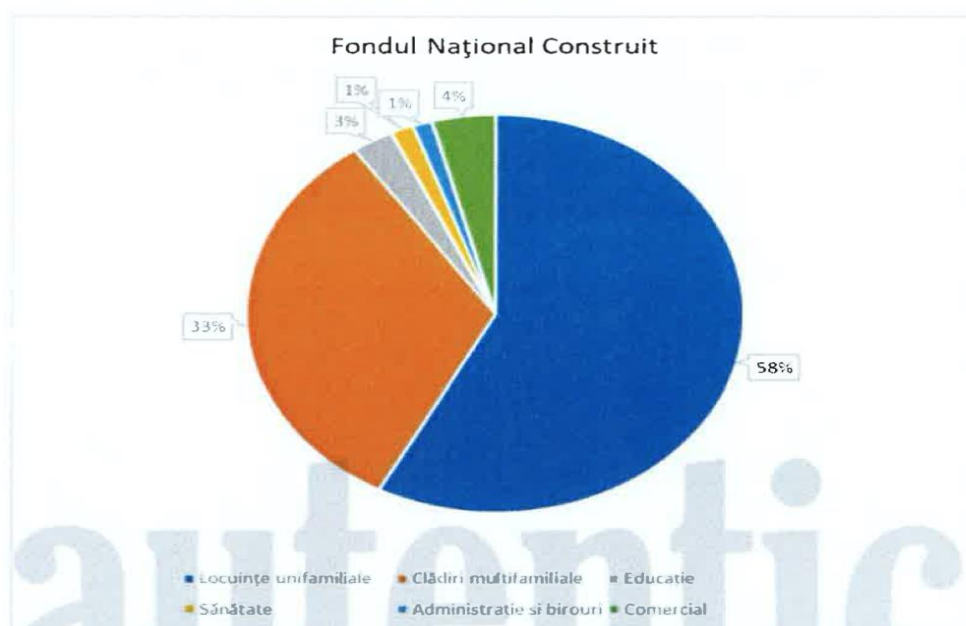
Energy poverty in the urban context

Romania is characterized by a variety of instances of energy poverty. Whereas national analyses display important regional differences in these manifestations and in the availability of programmes of redress (Jigla, Sinea, & Murafa, Sărăcia energetică și consumatorul vulnerabil. Evidențe din România și Europa, 2017) there are important contrasts to be established in the residential sector between the urban and the rural localities, each displaying very specific challenges. This policy brief is aimed at displaying a number of energy poverty challenges characteristic of the urban context in Romania.

Socialism-dated prefabricated multifamily buildings

In Romania there are 8 mil. residential spaces corresponding to 7,2 mil. households. Residential buildings amount to 90% of the total national building capacity. 31% of total are multifamily buildings, whereas 50% are single family houses (PNRR, 2021) The rate of vacancy at the level of residential buildings is 16%. This is due to various factors. The rate of migration is an important factor that has affected some urban localities and more generally the rural area. Besides vacancy, another general phenomenon present in the residential sector is overcrowding. The majority of households live in small living spaces compared to the majority of EU member states. 63% of living spaces are smaller than 50sqm and these are to a large extent multifamily buildings. Multifamily apartments have an average living space of 48sqm compared to individual houses with 73sqm (Guvernul României, 2020). Multifamily buildings are mostly present in the urban context, where they make up to 72% of the housing facilities, that is approx. 85.000 facilities (ANRE, 2018). Multifamily buildings are a quite uncommon feature of the rural area, where they make up only about 5% of the residential capacity.

Figura 5: Fondul de clădiri - ponderea clădirilor pe categorii



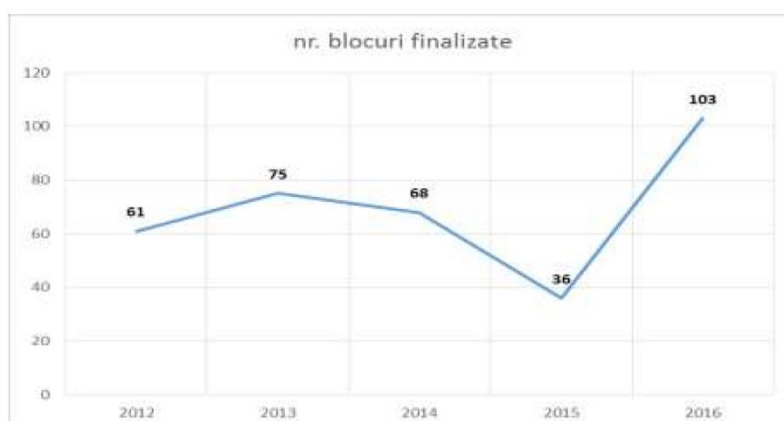
Sursa: Analiza Băncii Mondiale, 2019.

Source: (Guvernul României, 2020)

In Romania 87% of the buildings have been built before 1990, and only 6% after 2000. Multifamily panel buildings, have been built during communism, generally in waves, between the 1960s and 1980s, to uphold the massive planned industrialization and urbanization process. The effort was pursued under a specific type of systematization and economic logic that included the development of single massive supply systems, including for district heating and gas that became unsustainable with the high urban growth that rendered households dependent on one single and increasingly vulnerable source. These low efficiency, fast-to-assemble panel buildings relied on heavily subsidized energy and housed thousands of formally rural families with little capacity to invest in maintenance. With the fall of communism, the landscape witnessed the challenges of transition both with respect to public and private investment capacities. This left apartment blocks and their energy supply systems unrestored, resulting in a deteriorating building stock and general servicing infrastructure. The ever-degrading state of the district heating systems resulted in increasing numbers and duration of heat and hot water cuts for households.

After the fall of communism some of these highly inefficient buildings have been isolated either individually or through programmes that requested important individual contributions. This resulted in a high degree of patchwork with many households refusing to invest due to limited financial capacity (Sinea, George, Ute, & Philipp, 2020). With the use of pre- and post-adhesion funds this trend has been slowly curved with the inclusion of entire facilities in the programmes. Still the renovation pace remains low compared to needs, whereas prioritization takes vulnerability into account marginally. Based on European statistics, under a quarter of the planned energy performance works in houses having been accomplished between 2014-2020 in Romania (European Union, 2020). Another, national source, reports that between 2012-2018, a renovation rate of up to 5% was achieved over the entire period, i.e. only 343 (aprox.12.300 apartments) out of 85.000 apartment buildings have been included in

interventions programs of various types, with the process reaching a higher rate towards the end of the period. That corresponds to an annual renovation rate of 0,5, much below the current 1% European goal or the up to 3% objective of the Renovation Wave Initiative. The status quo led to an improvement of 8,5% in final energy consumption in housing (from 8,10 Mtep-7,42 Mtep), which is evaluated as being a minor improvement (PNRR, 2021). The objective was to reduce the annual consumption to 100 kWh/sqm (Guvernul Romaniei, 2020). However, achievements are difficult to establish due to inconsistent impact assessment (PNRR, 2021) (Jiglau, Sinea, & Murafa, Sărăcia energetică și consumatorul vulnerabil. Evidențe din România și Europa, 2017). The trend is illustrated in the graph below. So far, renovations have been performed on financial schemes that have been financed up to 60% out of national financial sources and 40% of variations of sources coming from own tenant funds or local budgets, or a combination of the two (PNRR, 2021). Much of the difficulty of implementing renovation programs has come individually or from a combination of the design of these projects and their bureaucratic requirements and complexity, the difficult process of association between tenants, the difficulty of mobilizing own funding and the limited capacity of local administrations to implement (Jiglau, Sinea, & Murafa, Sărăcia energetică și consumatorul vulnerabil. Evidențe din România și Europa, 2017). National experts maintain that improvement targets have usually not been set around energy poverty nor have the improvements completed been measured for savings (Center for the Study of Democracy, 2021).



Source: (ANRE, 2018)

Based on new refurbishment plans elaborated in the National Long Term Renovation Strategy and National Resilience Plans by 2050, 77% of the national residential buildings should be renovated. Multifamily buildings are at the core of this strategy as they are deemed a priority of the first intervention track. Through NRRP will be renovated the building blocks constructed before 2000, with a final energy consumption higher than 300 kWh/m² year and a final energy consumption for heating higher than 200 kWh/m² year. By 2026 all multifamily buildings are planned to have been renovated with a documented reduction of consumption of at least 30%. The plan also aims for a higher degree of in-depth renovations and a higher degree of integration in efficiency measures. To that aim it increases the list of works that can be done to improve the quality of the buildings to also include works such as window replacement,

replacement of interior heating and electricity installation, smart systems, indoor ventilation, internal structural works, connection to district heating, etc., which have previously not been part of the refurbishing schemes. The program also aims to lessen the bureaucratic burden involved and to target programs better towards the lowest-performing housing facilities. 20% of the funding allocated will be destined to vulnerable families (in general and not specifically to the energy poor) (PNRR, 2021).

Despite ambitions, there is a high complexity of the situation on the ground. A study performed on efficiency certificates issued on refurbished apartment blocks in the city of Cluj-Napoca has established that over 45% (94 from 2016) of apartment buildings refurbished in Cluj-Napoca between 2011-2018 could not be brought to the standard recommended based on the type of building due to the unsatisfyingly high costs involved. Most on these situations involved a target label of C, whereas accomplishments have been around a D standard or lower (EnPowerR, 2021).

The buildings population in Cluj-Napoca cannot be considered to be representative for the situation at the national level. However, it showcases many of the challenges of multifamily panel buildings around the country. The refurbishing needs are complex and the absence or dissipation of data between authorities the activities of which lack integration are high. This is exemplified by a renovation needs modeling tool elaborate by CSD. Using data retrieved from the national buildings' census, we classified 80% of the national building stock in 23 different categories based on a number of construction features. This allowed us to compute the heating needs of these housing types in order to reach inside temperature standard of 21 degrees Celsius provided for in the national regulations. We associated the heating needs with the type of fuels used for various purposes in that household (space heating, hot water and lighting) and established their standard effective consumption. Standardized as it is, the instrument is purely indicative and does not capture real behavior, such as for instance under or overconsumption. In Romania partial and temporary room heating is common practice in more than 50% of the households (Ministry of Energy, 2016). Heating below standards at times, or over-heating are much employed coping practices. Furthermore, it only captures heating needs. Cooling needs during the hot season are not included.

Despite the shortcomings, the model allowed us to formulate a number of conclusions with regard to the situation of multifamily buildings, such as consumption potential, or more precisely, based on structural characteristics, to identify those buildings that have the highest potential to fall in energy poverty.

Generally speaking, panel buildings in Romania (approx. 30% of the building sample at the national level) have a heating need of anywhere between 257-655 kWh/sqm/year. This lies above the European average sqm consumption in the residential area, which is 180kWh/sqm, based on European Commission data (European Commission). As mentioned before, national strategies aim at reducing the annual consumption of refurbished multifamily buildings to 100 kWh/sqm (ANRE, 2018), which lied beyond the aims of profound renovation (60% efficiency and emissions improvements). In the category of multifamily buildings made of concrete paneling, the most vulnerable are the 30sqm 1-room apartments using gas boilers. They consume anywhere between 390 and 655 kWh/sqm/year energy depending on the heating zone and they account for 1,3% of the sample. These types of buildings remain the highest consumers even in the event of substituting the heating fuel for district heating, for instance. This means that just switching the heating fuel is insufficient. Targeted refurbishment

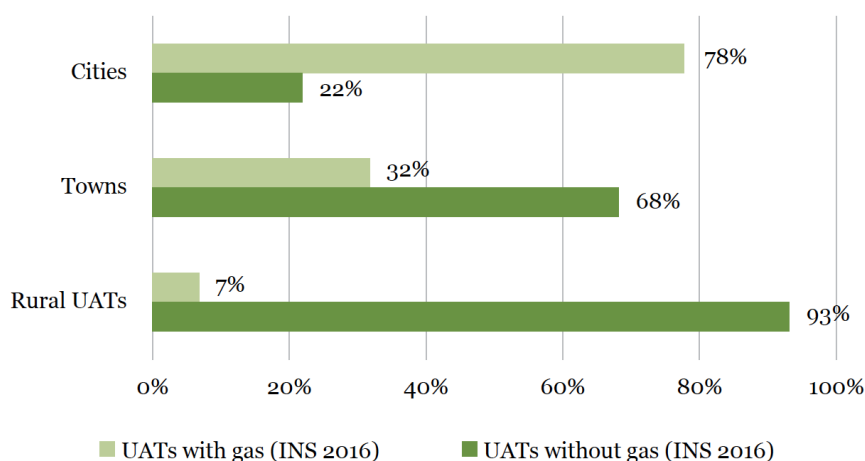
measures are needed. These types of apartments are also associated with comparatively high emissions for they should let out between 77-131 kgCo₂/sqm/year depending on the climate zone to reach an acceptable comfort standard (Center for the Study of Democracy, 2019). Provided that this statistical situation of structural data is corroborate with socio-economic data on the ground, these types of buildings should be prioritized for interventions.

Heat source: District heating

District heating is an important component of the urban energy landscape in Romania as it is closely related to the development of multifamily building districts in many of the industrialized cities in the country. At the national level 1.3 million households in 60 localities across the country are supplied with heat generated by district heating (Ministry of Energy, 2020).

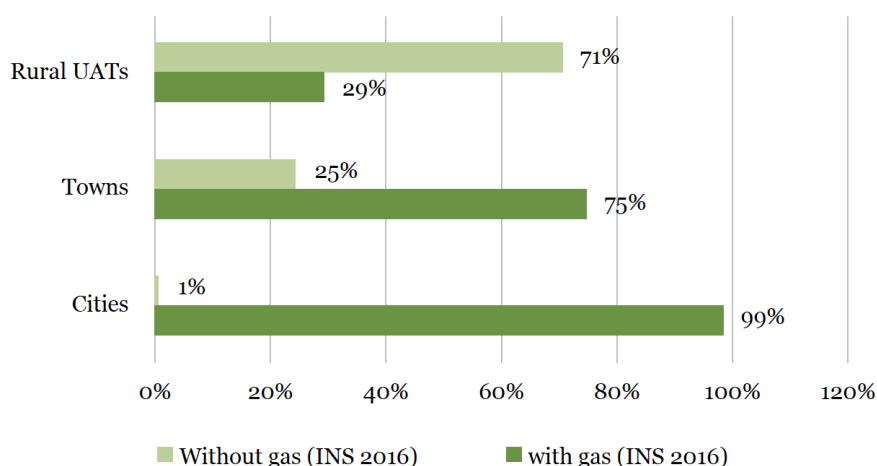
With little investment in the sector, it remains associated with inefficiency, high costs, souring losses, unreliability, which causes a steady percentage of disconnections. The situation of Bucharest, for instance, is by far the most critical in the country in the entire CEE region, with losses of over 1400 tons of water/per hour in 2020 (Nicuț, 2019), repeated heating and hot water supply service failures during high season (Sinea, George, Ute, & Philipp, 2020), and high pressure on production due to excessive consumption and losses. It is a crucial topic that has majorly contributed to voting administrations out of office. Today, there is increasing confidence that the complete failure of the system, at the expense of the 1,21 million consumers, is inevitable. A few initiatives around the country resulted in the technologization and modernization of some of these systems, which are being upheld as good practices. Oradea or Cluj-Napoca are two such examples (Pacuraru, 2020). Despite that, these projects, as in Cluj-Napoca for instance, fail to be convincing enough to halt disconnections by the population and to attract new consumers or to generate public agreement on future strategies. In Cluj-Napoca discussions have been heavy. These system function on high subsidies, which are burdensome for the local public administrations, but the absence of which would render thermal energy uncompetitive pricewise. Based on this argument, some short-sighted administrations continue to encourage disconnection and the installation of individual boilers (such as in the city of Galati – which are highly inefficient and polluting practices, but which may reduce public expenditure immediately. In other cities, as is the example of Cluj-Napoca, the local administration intends to prohibit the installation of new individual boilers. However, there is no obligation in place yet and no real alternatives to follow (Scarlat, 2021). In Bucharest interventions have been piecemeal, either through installing individual meters or through replacing damaged pipes. More often than not situations are similar to the one in Bucharest. Important cities such as Timisoara or Constanta replicate the challenges in the capital city. With little alternative, consumers here are forced to employ various coping solutions. In Bucharest households use electric boilers as a backup to serve their hot water needs throughout the year. This is an expensive method, but the only one available. Grant enquiries have been developed for a massive system upgrade, but the financial and administrative complexity of the matter have so far blocked solutions (Sinea, George, Ute, & Philipp, 2020).

Graph 2: Percentage of administrative units connected to gas



Source: (Sinea, 2018b)

Graph 3: Percentage of residents in the administrative units connected to gas



Source: (Sinea, 2018b)

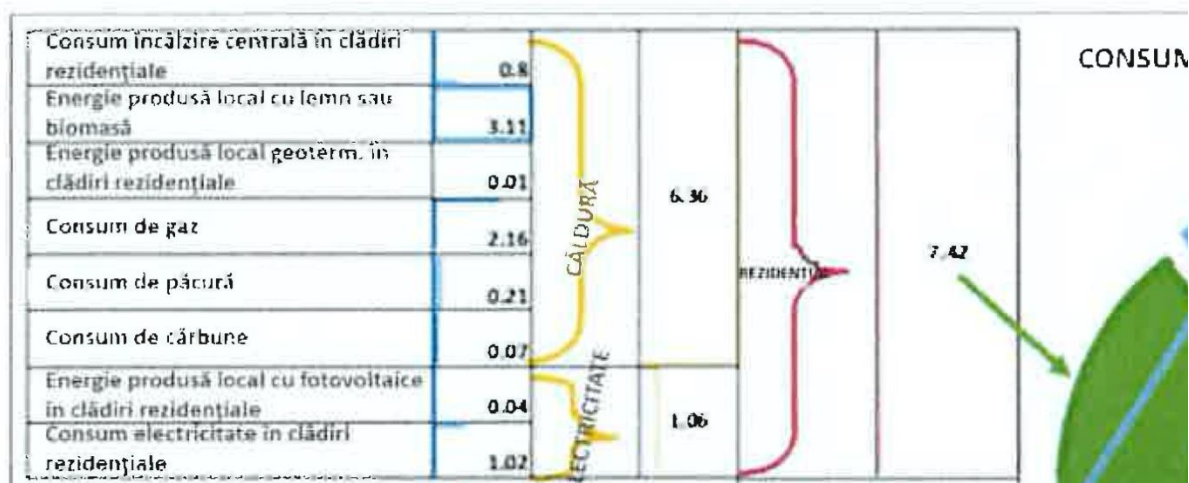
If access to a diversity of energy resources for household use is generally considered to be a problem in Romania, urban and suburban localities are better supplied compared to rural ones. Electricity is almost generally available (Jigla, Sinea, & Murafa, Sărăcia energetică și consumatorul vulnerabil. Evidențe din România și Europa, 2017). Gas mainly covers high-density urban or suburban areas, areas that are close to gas extraction sites and geographically more accessible. 28% of Romanian use gas for heating. 96 of the 103 municipalities are currently connected to the gas network, covering 99% of the population residing in municipalities. The 7 municipalities not yet connected are the following: Beiuș (Bihor county), Orșova (Mehedinți county), Brad (Hunedoara county), Calafat and Băilești (Dolj county), Vatra Dornei (Suceava county) and Toplița (Harghita county). 148 town (suburban) (68%) are connected to gas, covering 75% of their population. The largest five (by number of residents) of the 69 unconnected towns are: Borșa (Maramureș county), Cernavodă (Constanța county), Vișeu de Sus (Maramureș county), Vicovu de Sus (Suceava county) and Moldova Nouă (Caraș-Severin county). With respect to all localities, 72% of Romania's administrative unities are not connected to gas. But the largest share of unconnected

administrative units are located at short distances from the network. For instance, 874 administrative units lie at less than 10 km from the network. 66% of the population (approx. 14.7 million people) have access to gas, (but only 44.2% are connected according to EPG, which may reveal a problem with excessively high connection fees for a part of the population). While a recent initiative waved gas connection fees to all consumers, companies reversed the provision due to excessive bureaucratic burden on their behalf (Pirvoiu, 2021). No preferential treatment was made available to vulnerable consumers at any stage of this initiative. The national resilience plan envisions the extension of the gas distribution network by 400 km, particularly to Mehedinti and Dolj counties in a pilot initiative to build multifunctional pipes that might be able to transport alternative fuels in the future. This initiative should deliver heating fuel to areas that have the lowest access to resources, high degree of vulnerability in the population, and high consumption on wood fuel. However, the ambition is deemed too low even at the level of the European Commission, who is demanding additional efforts. A solution would be to evaluate the effort needed to pursue this type of solution for localities that are much closer to the network and, thus, much faster to connect.

Graph 4: Administrative units connected to gas and average annual consumption

Source: (Sinea, 2018b)

Figura 4: Consumul de energie în clădiri în România, 2013-2016 (Mtep)



Source: (Guvernul României, 2020)

Refurbishment projects: lack of trust and effectiveness at the level of tenants' associations

National statistics illustrate an annual 0,5 renovation rate over the period 2012-2018, with up to 5% households being upgraded over the entire period. Most of these refurbishments have run on financing schemes that involved 60% national sources and 40% individual or local administration sources either separately or in a combination of the two. There are at least three issues related to refurbishment programs in residential buildings:

Multifamily buildings only: Experts unanimously agree that most financial programs have been dedicated to multifamily buildings despite single family households making up a much larger part of the national buildings' capacity (50%), with a higher consumption and climate impact. In Romania the largest part of refurbishing projects have addressed multifamily buildings almost exclusively, whereas single family houses have been systematically excluded from refurbishing support programmes. The table below illustrates the number of buildings renovated. It is unclear if the numbers also include new buildings and only initiatives financed by public resources or also own funds – more likely at the level of single-family buildings. Based on a national legislation from 2011 (Ivanov, Legea care prevede ca proprietarii sa-si repare cladirile darapanate pana in 2013, impotmolita la primarii, 2011), some local initiatives aimed at changing the face of the urban setting have conditioned lower property taxes (or have imposed fines for non-compliance) on the refurbishment of facades, such as was the case in Cluj-Napoca, Oradea or Arad (Sfârlea V. , Cum reabilităm fațadele Clujului: 10 idei din Oradea (Infografic), 2018) . Despite important progress, the provision did not involve structural changes and was financed by a variation of solutions that involved household budgets almost exclusively or to a high extent. Private owners criticized the high costs involved and the complicated bureaucracy to receive intervention permits. Other programs targeting single family houses have been marginal and mainly dedicated to higher income families, and even so, they have been slow to deliver. Programs like Casa Verde Clasic (The classic green house programme), only aimed to install PVs on individual houses. 30.000 individual houses have

been targeted, but no structural intervention was involved. Casa Verde Plus (The green house plus) (Ziare.com, 2018) was designed to be an upgrade for the previous program and also include efficiency works by financing building insulations. Casa eficienta energetic (The energy efficient house) was aimed exclusively at financing energy efficiency works on private houses. 60% of investment (up to 15.000 EUR) involving insulation, heating system improvement, and window and door improvement would be supported from the grant. These programs have faltered out of various reasons, such as the lack of funds (Casa Verde Plus), slow bureaucracy (Casa verde (Digi24, 2020)) or low institutional capacity despite high public interest in the program (Casa eficienta energetic (Alba24.ro, 2021)). Green mortgages, another financial instrument well promoted by authorities and administered by private banks, have been accessible solely to real-estate investors and solvable families (RoGBC). The national resilience plan will implement a scenario where multifamily buildings will be mainly targeted and completely refurbished by 2026, whereas for individual houses the two latter programs will be activated to be accessed by beneficiaries (PNRR, 2021).

Renovations in the residential sector

Type of building	Category	Number of building	Total heated area (th M2)	Renovated until 2020
Single family hh	Rural	3,810,737 (71.6%)	247.80	3%
	Urban	1,354,263 (25.46%)	124.46	8%
Multifamily hh (30%)	P+ >= 4 floors	92332 (1.7%)	94.51	7%
	P + < 4 floors	61554 (1.1%)	115.51	7%
Totals		5,318,886 buildings	582.27	5%

Source: World Bank 2019 based on URBAN INCERC INCD

Low targeting and impact assessment: There is widespread judgement at the level of expertise that the mechanisms currently in place provide for little targeting at the level of refurbishment programs and little impact measurement. In fact, there is no centralized data on the impact of refurbishment measures performed so far (Guvernul României, 2020). The national resilience plan points out the fact that more effort is needed in targeting the lowest performing buildings which have so far not been the focal point of intervention programs, and in establishing mechanisms that would record the types of intervention performed and their impact on consumption and welfare. To this aim the document proposes a much needed detailed and centralized data system, which not only succeeds to collect a diversity of building related data but is also able to integrate data bases from different authorities and relate to socio-economic evidence. Currently, data is not only collected unsystematically and at times inaccurately but is in the property of a diverse set of actors, public and private, who have inconsistent data collecting practices, have divergent GDPR application rules and do not

communicate data between them. Moreover, it is not clear what institution should take initiative to centralize all existing data basis and data collection initiatives. Despite the difficulties involved in reconciling these concerns, there is need for targeted measures that would secure tailored solutions based on evidence. PNRR plans to target the lowest performing buildings mainly, but this is dependent upon access to data and the challenges previously mentioned (PNRR, 2021).

Own contribution: In the decision-making circles there is a strong support for own contribution in refurbishment projects, which is generally associated with a higher degree of responsibility on maintenance. Albeit justified, depending on size, it may slow down refurbishment programs. Vulnerable families may not dispose of these sums and consequently they may opt out, leading to partially renovated buildings or delays in the realization of the projects altogether.

Low trust in community projects: One of the fundamental components of refurbishment projects in multifamily buildings is the contribution of the tenants' association either by securing a part of the investment or through agreement on the performance of refurbishment works and its details, or both in most cases. This involves a high degree of cooperation between neighbours, which has oftentimes been stranded by the low degree of trust among citizens. In 2020, 56% of Romanians denied trust in fellow-citizens (Fundăția Viață și Lumină, 2020). A recent household survey performed in Cluj-Napoca with the aim of identifying behaviour and attitudes associated with various manifestations of energy poverty, revealed that 25% of citizens have no trust in neighbours, whereas 55% acknowledged to trust some. Only 8% of tenants cooperate with their neighbours on regular basis, whereas 57% rarely or never do. It is not clear what entity should take the lead in trust-building among neighbours. Whereas generally trust in governmental institutions or local public administrations rarely exceeds 30% at the national level, cities such as Cluj-Napoca may be rather exceptions, data placing trust in the municipality at 60% with higher potential to cause change in this respect. It may just come down to local circumstances and local solutions (Babeș-Bolyai University, 2021).

Trust is an important aspect to consider given that Romania has a 94,7% private property ratio (Guvernul României, 2020) leading to a high stake for the owner in deciding on measures to be taken on the owned space, a comparatively low capacity for the local administration to impose measures in this respect, and a low propensity of the household to invest in refurbishment and property preservation due to generally low incomes. This defines a general private property dilemma in Romania.

The residential buildings consumption instrument computed by CSD singles out single family houses as the highest consumers in the residential sector based on their energy needs. Private houses have been recorded to have a potential consumption between 255 and 900 kWh/sqm/year to secure acceptable living conditions depending on the building material, climate zone and fuel used. The highest demand is associated with 1960s brick buildings, 50 sqm, with 2 rooms using wood to heat as they may have to consume anywhere between 520 and 900 kWh/sqm/year to reach an acceptable indoor temperature. Given the volatility of the wood market, these households may be exposed to outrageous prices especially during the high season and may have to reduce their consumption drastically in order to stick to budgets (Jigla, Sinea, & Murafa, Sărăcia energetică și consumatorul vulnerabil. Evidențe din România și Europa, 2017). These are all single-family houses, and they represent over 5% of the households population considered in the study. Brick houses seem to be an important

problematic category, irrespective of their primary energy source being gas or wood. Their needed consumption seems to surpass 700 kWh/sqm/year easily, which may indicate a high need for investment in refurbishment and the quite limited control exercised by building authorities in imposing standards and sanctioning their disregard so far. From the perspective of pollution, brick houses using gas boilers are particularly problematic as their annual carbon footprint can be anywhere between 53 and 160 with 56 sqm with 2 room-houses being particularly problematic (91-160 kgCo₂/sqm/year). This particular category is 1.19 % of the housing population considered in the simulation. Generally speaking, approximately 17% of the households need important intervention at the level of the heating systems. The individual boilers are a very wide-spread solution in Romania (33% of households, that is 2,2 Mil., own individual apartment boilers on gas to heat their homes and water. 0,3 Mil. households burn gas in traditional stoves). This solution was justified in the context of high private property tenure, due to the high degree of independence it offered to households. But their efficiency, pollution and security are topics of important debate. Most of the households using individual apartment boilers are situated in the urban or sub-urban areas (Jigla, Sinea, & Murafa, Sărăcia energetică și consumatorul vulnerabil. Evidențe din România și Europa, 2017).

With regard to wood or plaster houses burning wood, which make up approx. 50% of the individual residential capacity (affecting the rural context disproportionately), the model developed offers a comparatively favorable score on emissions, even if the needed consumption is only moderately lower. What the model does not consider are the heating sources employed – mostly wood – and the quality of the stoves employed, which according to national data remain quite low. Much of the wood is still being purchased from unauthorized sources and is not properly prepared for burning (Ministry of Energy, 2018). In the residential area, the highest final consumption is mainly due to the consumption of biomass (mainly wood burnt in inefficient stoves) (3.11 Mtep) and followed by gas (2.16 Mtep) (Guvernul României, 2020). Another aspect to be pointed out in this type of housing is their low market value, which makes investment in high value heating or electricity technology disproportionate, and their high susceptibility to develop mold, contain moisture, develop mold and develop improper living conditions.

The owners' dilemma: energy poverty and the high property ratio

Former communist Member States have a much higher property ownership ratio than Western European Member States. At the beginning of the 1990s most housing units were inhabited by tenants who benefited from “giveaway” privatization programmes, in which sitting tenants were preferred and encouraged to purchase the properties they have lived in through various forms of programmes and payment schemes (European Housing Partnership, 2017). In addition, former private landlords and their successors received in-kind compensations or other forms of material benefits to substitute their loss. Romania leads the private property ratio with 96% (Csiba, Bajomi, & Gosztonyi, 2016)

This situation leads to a number of energy poverty-related challenges. Owners have low capacity to preserve and improve the quality of their buildings from own funds given the low efficiency of the housing facilities and the low household income shares available for investments. Limited investment capacity has also led to a common situation where several generations live under the same roof, causing increased wear of the property and an

overcrowding of the living space. According to Eurostat (Eurostat, 2018, p. 56) Romania has the highest share at the EU level of overcrowded households (48.8%) lives in overcrowded households. The situation in the region is comparable (more than 40% of the population from Hungary, Poland, Slovakia, Croatia, Bulgaria, Latvia are in a similar situation). Furthermore, high property ownership has also translated into low associative culture and low capacity of local administrations to initiate refurbishment programs and legislation. It is common practice for owners to manage their living space, including construction-related decisions, on their own with little interference from authorities (Sinea, George, Ute, & Philipp, 2020). This is rarely a topic of public debate despite effects of such behavior coming up oftentimes in the media as hazards with or without casualties. Despite legislation having been updated repeatedly (2018, 2019, 2020) and sanctions progressively increased, the implementation capacity on behalf of the authorities remains reduced and tenants can easily evade obligations, whereas court decisions remain feeble and lack leverage.

The excessive and well-spread private ownership culture may also prevent authorities from identifying situations of energy poverty. There is little data on the behavior of people with respect to energy consumption in their own households, other than what is reflected in expenses and consumptions (which is also limited and little accessible due to GDPR provisions that entitle private companies to protect client data while also failing to perform individual studies on potential own vulnerable consumers). A survey conducted in Cluj-Napoca in fall 2020 shows that over half of households prefer to keep a temperature above 21C, despite this generating expenses, which may bring more than 40% of households in a state of vulnerability. This is a matter of choice, since these are households which to a very high degree hold temperature regulation equipment ("thermostat"). 76% of the households use individual gas boilers and only 20% are connected to district heating. Studies show that a decrease of temperature by 1 degree Celsius reduces the energy bill by 7%.

The private ownership mentality also generates effects in the rental market. This topic will be developed at length in a different policy brief. As a general remark, the rental market comparatively much smaller in size. Despite efforts over the years to regulate it given the dynamics of a more vibrant real estate market, it has remained largely unregulated with little leverage on the landlords to improve the efficiency of their let apartments. Landlords and renters alike, commonly prefer a cheaper arrangement based on an informal contract in order to avoid taxes and other bureaucratic matters, and do not find the benefits of a legal contract particularly attractive.

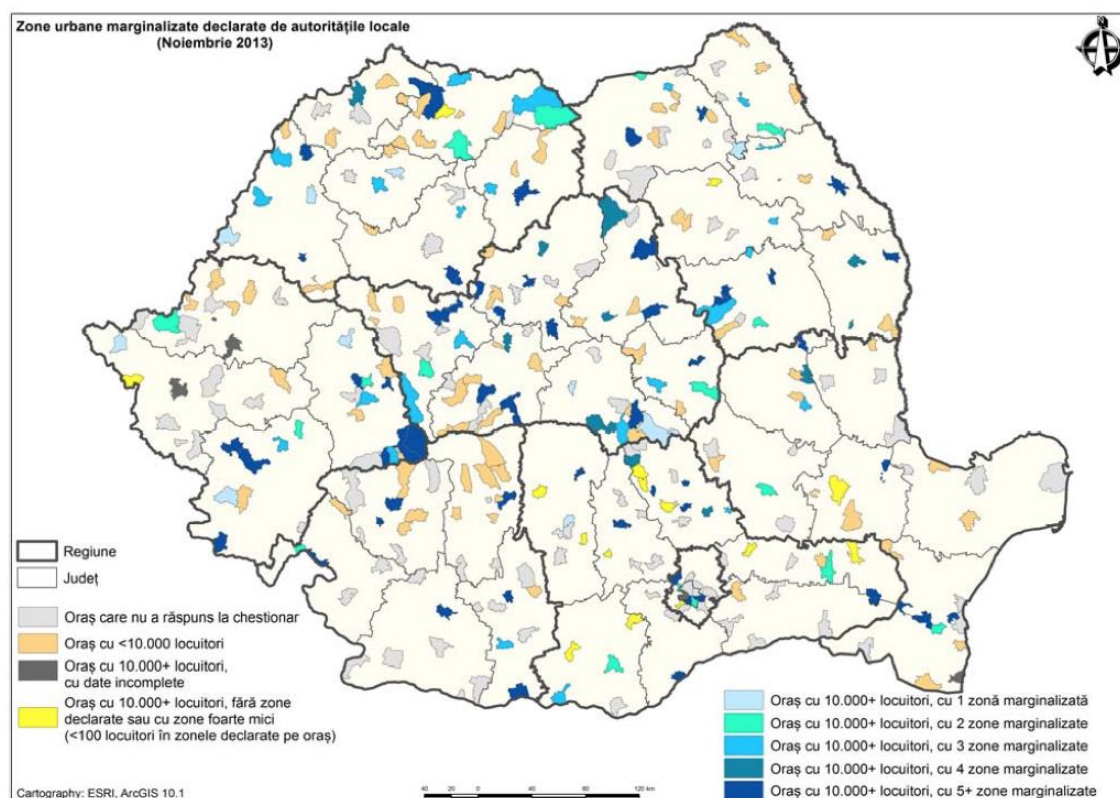
Energy poverty in the urban pockets: the Roma outskirts of the rapidly developing cities

Around 6 million Roma live in the European Union, representing the largest and the most marginalized minority in the region (World Bank, 2015), and one with the highest risk of falling into a state of extreme poverty. Romania hosts the highest population of Roma citizens at anywhere between 1 to 2 million people (World Bank, 2015). In Bulgaria, Hungary, and Romania, Roma poverty rates are between 4 to 10 times higher than that of their non-Roma fellow citizens. If they fall in extreme poverty, there are fewer opportunities available for social

mobility (Ringold, 2002) (World Bank, 2015). In the former communist countries, Roma vulnerabilities have been exacerbated by the transition to democracy, involved their economic and social disempowerment along with limited political and administrative engagement. Due to their lower level of education and social skills, the Roma were the first to lose their jobs after the fall of communism. In addition, the succeeding economic crises only deepened their previous situation of precarity. Moreover, the housing crisis, which resulted either in their evacuation or in the reduced ability to improve their living conditions, led to new types of energy poverty, many of which can be described as extreme (Teschner, Sinea, Vornicu, Abu-Hamed, & Negev, Extreme energy poverty in the urban peripheries of Romania and Israel: Policy, planning and infrastructure, 2020) given the low-efficiency and, at times, improvised dwellings, isolated in deep poverty pockets of otherwise thriving cities, further restricted by an impossibility to connect to the grid, use or pay for public utilities (World Bank, 2015).

Around 100 000 people, most of them Roma, live in the Ferentari district of Bucharest, mostly in highly degraded, concrete panel apartment buildings, usually overcrowded. While some residents own their apartments, others live in illegal properties or shacks. A few of these buildings have been refurbished. The provision of public services is scarce and unreliable. Between 30% and 70% of the households in the Ferentari district cannot keep their homes adequately warm during winter and 50% of them cannot afford to pay the utility bills (Teschner, Sinea, Vornicu, Abu-Hamed, & Negev, Extreme energy poverty in the urban peripheries of Romania and Israel: Policy, planning and infrastructure, 2020). The landfill at the outskirts of Cluj-Napoca hosts up to 2 000 people with low economic opportunity (Bădiță & Vincze, 2019). Some of them have been evicted from social houses in the city center to living facilities of very low standards, while others have erected unauthorized huts with complete lack of access to water, sewage and electricity. In most cases they have developed informal electricity consumption practices. For heating, people mainly use wood and waste burned in suboptimal heating facilities (Teschner, Sinea, Vornicu, Abu-Hamed, & Negev, Extreme energy poverty in the urban peripheries of Romania and Israel: Policy, planning and infrastructure, 2020)

Harta 3. Distribuția orașelor și municipiilor după numărul de zone marginalizate raportate de autoritățile locale



Date: AM POR, Sondaj privind zonele urbane marginalizate la nivelul orașelor din România, Noiembrie 2013. Notă: Orașele cu mai puțin de 10.000 locuitori nu sunt eligibile pentru intervenții de tip DLRC, dar ca parteneri ai unor Grupuri de Acțiune Locală alături de comunele învecinate pot deveni eligibile pentru programul LEADER.

Source: (Regio)

Similar situations replicate around the country in locations identified in a study coordinated under the World Bank (see the map above) (Regio). This study identifies a high development gap between these marginalized areas and the main urban localities to which they are attached, and they are multidimensional as they translate into low human capital, high unemployment rate, improper living conditions (i.e. no energy connection, over-crowded spaces, low housing security). These areas variate in size (from a handful of inhabitants for some 9000 persons) and typology (various types of ghettos and slums with houses or improvised shacks, at the margins or in the center of cities). The study identifies at least 20% of the inhabitants are being Roma. However, the numbers are difficult to evaluate as many refrain from declaring their ethnic identity.

A number of drivers are at work. One of the most important is the state of informality as many pursue their daily lives without valid documentation. Access to energy or heating benefits is conditioned upon the possession of property and identification documents. Forced evictions have contributed to deepening of this problem as political engagement in these communities is low. As a result, individuals feel disenfranchised, abandoned, and distanced from bureaucratic processes, of which they lack understanding. Most often, the energy relationship with suppliers and authorities is one of conflict resulting in repeated forced disconnections and lawsuits, only rarely with serious engagement and solution-finding approaches (Teschner, Sinea, Vornicu, Abu-Hamed, & Negev, Extreme energy poverty in the urban peripheries of Romania and Israel: Policy, planning and infrastructure, 2020).

Besides immediate effects on the welfare of these communities and their individual members, the situation may also lead to informal market practices, such as informal electricity trade (Jiglau, Sinea, Dubois, & Biermann, Perspectives on Energy Poverty in Post-Communist Europe, 2021) which may expose these households to further risks (community disputes, harassment, increased indebtedness, etc.) and hazards. Authorities may be unaware of these practices or turn a blind eye on them hoping that they are the best solutions at hand for the time being (Teschner, Sinea, Vornicu, Abu-Hamed, & Negev, Extreme energy poverty in the urban peripheries of Romania and Israel: Policy, planning and infrastructure, 2020). Some good practices have been identified: the involvement of humanitarian NGOs who, taking advantage of the lack of administrative observance, connect these households in compliance with technical safety requirements, and deliver electricity at a fair price (Pata Rat, Cluj-Napoca); the involvement of community mediators is another good practice employed by some companies who are interested to know the issues in the communities and possible solutions (Ferentari, Bucharest) (Jiglau, Sinea, & Murafa, Sărăcia energetică și consumatorul vulnerabil. Evidențe din România și Europa, 2017). However, despite their potential to improve the situation on the ground, these examples remain rather the exception

Energy poverty on the housing and renting market

The housing market (selling and buying properties)

According to the World Bank (The World Bank, 2015), Romania's housing stock consists of around 8.5 million units located across 5.3 million buildings. Having the highest rate of unoccupied houses (16%) in the European Union, would in principle translate into higher mobility and a more stable housing market. However, most of the unoccupied houses are located either in areas where the real-estate market is practically idle and properties are low-value and low-quality, or in holiday areas and are thus occasionally occupied (Lăzărescu & Diacon, 2020).

Romania also has one of the highest home ownership rates in Europe with a 94,7% private property ratio (Guvernul României, 2020). Three factors contribute the most to an entrenched culture of home ownership: a dysfunctional rental market, the post-communist housing legacy given the house-access policy practiced by the socialist regime and the unfavorable banking terms in place. In Romania nine out of ten homeowners live in dwellings for which they have to pay loans, while in the EU only 26.5 % of the properties are encumbered by loans.

While the ownership rate is one of the highest from the European Union, the living standard is one of the lowest (small living spaces that are overcrowded, poor building materials, energy inefficient housing units). Based on several indicators related to the living standards, such as the provision of housing with utilities and the share of housing agglomeration, Eurostat (Eurostat, 2021) has developed a composite indicator (the rate of housing deprivation) to measure the population ratio living in substandard housing units (i.e. with damaged and leaking roofs, walls and floors, broken windows, lack of bath/shower, toilet inside the house, housing rated as too dark). Based in this indicator, Romania (Eurostat, 2021) has the highest rate of people living in severe housing deprivation (14.2%) in comparison to the European mean of 3.8%. Moreover, people living rural areas in Romania are by far the most deprived

(26.1%), as most of the dwellings located here lack access to utilities (sewage, running water, bathroom inside the house) and are in poor condition (Lăzărescu & Diacon, 2020).

While the ownership ratio is very high in Romania, it is usually one family member that owns the household where all the other members are registered. The same data (Housing Right Watch, 2020) indicates that the problem of housing affordability is present all across Romania, including in the big cities like Bucharest and Cluj-Napoca, where the average income is around 700 euro/month. Even with this income people barely afford to pay a market rent (at around 400 euro/month for a two-room apartment) from one salary and provide for the other household needs on top. Housing costs indicate a high financial burden on the Romanian households, one of the highest at the European level. Under these conditions, people either resort to various forms of informal renting, or take second jobs and a bank loan to acquire their own property. If the existing housing market puts pressure on households with average incomes, the situation is even more problematic for those with low incomes. Marginalized communities, much of which are of Roma (Housing Right Watch, 2020) ethnic background experience extreme forms of living conditions (see policy brief on urban living). The lack of an adequate social housing policy, doubled by other social and economic incentives push these communities of people at the margin of society, most frequently living in informal settlements.

Evidence on the ground accounts for high disparities in terms of real-estate market in Romania. Generally, following the global financial crisis of 2008, the housing market experienced a severe downward evolution (World Bank (2015)). Some areas of the country managed to stabilize quickly and even experience an upturn in housing supply in the last two to three years. In Cluj-Napoca (DELMENDO, 2021), for instance, Romania's fourth most populous city, saw the biggest y-o-y increase in apartment prices of 7.48% (6.13% inflation-adjusted) to an average of €1,840 (US\$2,230) per sq. m. Though it is still lower than 2019's increase of 10.1%.

The impact of the COVID-19 pandemic on the market was quite obvious and split effects could be observed: the renting market was particularly affected as rents decreased with 15% since March 2020. In contrast, property sales increased due to the number of houses sold as prices generally remained relatively constant in 2020 and 2021, with minor rises in some big cities and their metropolitan areas. This may be explained by means of a double tendency: In addition to internal migration (into and from the cities to the countryside), due to the pandemic-related evolution on the markets of Western EU Member States, many Romanians living abroad decided to return home and buy properties, which led to a sustained real-estate demand in the most developed localities in Romania (Cristea, 2021).

Overall, the Romanian housing market is still dynamic, and people prefer to buy the properties instead of renting them. When selling a property, there are certain obligations that constructors or vendors need to respect. First and foremost, no housing facility can be sold or rented in the absence of a valid energy performance certificate. The Romanian energy performance certificate system (iBroad, 2020) was first developed in 2001 as a voluntary system. After the transposition of the Energy Performance Building Directive in the national legislation in 2005 (law 372/2005, amended in 2020), energy certificates became mandatory. However, despite it being a legal obligation, it is rarely respected (iBroad, 2020). Real estate agencies active on the market manage to bypass them successfully, especially for the renting situations, whereas authorities fail to overview implementation.

Energy performance certificates are normally issued by energy auditors who are responsible for applying the official methodology (Ministerial Order 1057/2007 and the Energy Performance Building Directive, EN 13790) when assessing a building. However, as provisions with respect to the methodology are quite vague and, in certain cases, give room to interpretation, there is much room for bias and inconsistency. Furthermore, energy auditors must keep a certificates registry with all the assessments performed. An electronic version of this registry should be transmitted to the Ministry of Public Administration and Development, which is responsible for collecting the data on buildings in Romania. However, since there was no standardized format for the certificates, auditors collected and transmitted the data in a large diversity of forms, which made it difficult to generate a uniform national database. This situation was signaled by the European Commission and Romanian authorities are under an obligation to amend the legislation and offer a standardized template for certificates.

An energy performance certificate (iBroad, 2020) contains data about energy consumption related to space heating, domestic hot water installations, lighting, mechanical ventilation and space cooling. Despite many limitations (including those regarding the category definitions¹), the information offered by this document, if centralized, could have a high potential to offer a clear image of the general state of the national buildings' capacity, which coupled with socio-economic information, would offer a fair image of energy poverty across the country. An improved assessment methodology, with a clear reporting procedure, may offer a good representation of the situation on the ground and the real structural need attached to energy poverty and otherwise. Moreover, some experts say that energy auditors can play an important role the process of identifying and addressing situations of energy poverty by offering council to vulnerable consumers on methods tailored for their needs. But quite adversely, certificates are used on the market rather as a formality, with little function in the process. Given the situation, there is also low trust attached to it and a very low value of relevance.

Besides the information component on the building stock, intervention programmes are and additional topic of importance in the process as they have the capacity to improve the quality of the buildings stock and to improve their market value. Experts unanimously agree that most financial programs have been dedicated to multifamily buildings despite single family households making up a much larger part of the national buildings' stock (50%), with a higher consumption and climate impact. In Romania the largest part of refurbishing projects have addressed multifamily buildings almost exclusively, whereas single family houses have been systematically excluded from refurbishing support programmes. The table below illustrates the number of buildings renovated. It is unclear if the numbers also include new buildings and only initiatives financed by public resources or also own funds – more likely at the level of single-family buildings. Based on a national legislation from 2011 (Ivanov, Legea care prevede ca proprietarii sa-si repare cladirile darapanate pana in 2013, impotmolita la primarii, 2011), some local initiatives aimed at changing the face of the urban setting have conditioned lower

¹ Currently, an energy performant housing unit labelled “A” would range from a consumption of 125 kWh/m²/year (for all energy uses) to 150 kWh/m²/year. These labels are currently under revision, as some experts consider them to be insufficiently ambitious. Moreover, many experts request the inclusion of deem the technical details included in the Annex as rather insufficient or incomplete for an appropriate assessment of a unit.

property taxes (or have imposed fines for non-compliance) on the refurbishment of facades, such as was the case in Cluj-Napoca, Oradea or Arad (Sfârlea V. , 2018). Despite important progress, the provision did not involve structural changes and was financed by a variation of solutions that involved household budgets almost exclusively or to a high extent. Private owners criticized the high costs involved and the complicated bureaucracy to receive intervention permits. Other programs targeting single family houses have been marginal and mainly dedicated to higher income families, and even so, they have been slow to deliver. Programs like Casa Verde Clasic (The classic green house programme), only aimed to install PVs on individual houses. 30.000 individual houses have been targeted, but no structural intervention was involved. Casa Verde Plus (The green house plus) (Ziare.com, 2018) was designed to be an upgrade for the previous program and also include efficiency works by financing building insulations. Casa eficienta energetic (The energy efficient house) was aimed exclusively at financing energy efficiency works on private houses. 60% of investment (up to 15.000 EUR) involving insulation, heating system improvement, and window and door improvement would be supported from the grant. These programs have faltered out of various reasons, such as the lack of funds (Casa Verde Plus), slow bureaucracy (Casa verde) (Digi24, 2020) or low institutional capacity despite high public interest in the program (Casa eficienta energetic) (Alba24.ro, 2021).

With some variations, funds are allocated in a 60-40% share national-local administration, whereas the national share had to be firstly accessed by local authorities. Homeowners contribute with another (approx. 20%, but some categories of vulnerable citizens may be excepted).

Besides their general focus on multifamily buildings, these programs have additional limits to effective implementation. Firstly, families with very low incomes who cannot afford to pay their shares or find it difficult to navigate through the bureaucratic process find themselves at a disadvantage. The existing national programmes for the residential single-unit buildings from the urban and rural area (Casa Verde and Casa Verde Plus), have a very slow reimbursement pace, they are designed for households with at least a medium income and are not suited to deal with situations of energy poverty. Secondly, the capacity of local authorities to attract and manage these funds is another important factor that renders energy poverty intervention ineffective. Evidence on the ground displays many limits in this regard especially at the level of semi-urban and rural local administrations (Jigla, Sinea, & Murafa, Sărăcia energetică și consumatorul vulnerabil. Evidențe din România și Europa (raport), 2017). Besides capacity to act, political will and action at the level of decision-making is also important. Local authorities can be pro-active in addressing the phenomenon of energy poverty, or rather choose to avoid it. An example of good practice was displayed by the municipality of Zalău, which accessed both Governmental and European Funds (Regional Operational Programmes) to thermally rehabilitate residential buildings. Households that could not afford to contribute to the rehabilitation process, were shortlisted for a grant. High homeownership is third factor that may impede intervention. Reaching consensus between tenants to renovate an entire building block has proved to be a difficult task (Jigla, Sinea, & Murafa, Sărăcia energetică și consumatorul vulnerabil. Evidențe din România și Europa (raport), 2017).

Green mortgages, another financial instrument well promoted by authorities and administered by private banks, have been accessible solely to real-estate investors and solvable families (RoGBC). The

national resilience plan will implement a scenario where multifamily buildings will be mainly targeted and completely refurbished by 2026, whereas for individual houses the two latter programs will be activated to be accessed by beneficiaries. Energy poverty is not an express target (PNRR, 2021).

The renting market

Unofficial estimates consider that anywhere between 7 to 15% of the national housing stock is rented, with numbers going higher for cities like Bucharest and Cluj-Napoca (up to 20%). The high variance between official numbers and estimates are due to the high degree of informality on the market and the lack of reporting to fiscal authorities. Moreover, even for registered rental contracts, the reported rent value is usually lower than in reality. A potential explanation to this is that Romanians tend to avoid interacting with authorities, including the fiscal ones, as the bureaucratic process of declaring additional incomes can be rather difficult and time consuming. Moreover, the low levels of trust in authorities and the perceived high levels of taxation discourage people from signing enforceable contracts (The World Bank, 2015).

The precarious rental market increases, as an end effect, the demand to purchase new houses, instead of renting them, which limits labour mobility, increases the vulnerability of the tenants and keeps the market prices high, especially in the big cities. Moreover, there is a social and urban pressure on the rural areas around the big cities that transform into peri-urban localities which reach the need of substantial investments in infrastructure and public transportation and which have hardly met (see the village of Floresti, Cluj county). Here and elsewhere the high demand for houses has sustained a dynamic construction industry that delivers fast and below standards. Corruption with regard to access to buildings permits, low access to public facilities, low quality urban planning and structural buildings issues are topics at the ordinary in the local and social media. Research on energy poverty in peri-urban settings is an important topic of interest.

During the Covid-19 pandemic, the renting market was the first to decline, especially in the big cities, as there was a reduced demand for properties. But even in this context, the cost of renting remains high especially for the low-income households.

Apart from these challenges, social housing is yet another topic of interest. There is very limited social housing in Romania, which renders the low-income renter extremely vulnerable to the fluctuations on the market fluctuations, forcing entire groups of people into the outskirts of the cities, where living costs are lower, but the living conditions are extremely precarious. As an alternative, poor households cannot afford a formal rent. This pushes them into additional forms of vulnerability with regard to housing: an informal renting contract does not give them the right to apply for heating subsidies. While not enough for covering the heating costs, these subsidies can still be an important income for the vulnerable citizens. Around a quarter (Georghe, 2020) of Romanian employees (out of 5.6 million employees) earn the minimum wage (1364 lei - around 280 Euros), whereas the value of the monthly consumption basket for a decent living is evaluated at around 2700 lei (around 540 Euros), which leads to an increased vulnerability for the low-income population, who can barely afford a decent living.

The Romanian housing market, selling or renting, is mainly dictated by private investors, developers and owners and is driven by the logic of profit-making, increasing the inequalities between social groups. The state is a minor player through very limited social housing and little involvement in regulation and capacity to enforce, for that matter (Housing Right Watch , 2020). What is more, renting is very often itself captive to a subsistence logic, as renters and landlords may mutually lack investment capacity while seeking to evade taxation for an additional source of indispensable income. No programs to address the improvement of renting facilities has yet to be available on the market, neither nationally or locally.

In terms of state interventions to correct the effects of an unregulated renting market, beginning with 2001, the National Housing Agency (ANL) has built more than 17.000 social dwellings dedicated to young people up to 35 years old, all across the country. After 2004, the number of new social dwellings built has decreased constantly. While this programme was designed to help especially young families with low or medium incomes, based on income criteria, the number of dwellings proved to be considerably below, whereas the vulnerable categories were rarely admitted to housing (Amann & Mundt, 2010). Another governmental programme with national coverage is "Prima Casa", a programme that offers guaranteed state loans, with preferential interest rates for the acquisition of the first property. This programme is also destined mainly to young families, to improve their access to better living conditions. The programme was highly criticized for causing more gain to real-estate developers than to low- and middle-income households. What is more, low-income households can rarely afford to access a private mortgage, even under the circumstances of a state guarantee, as they are not able to meet even the minimal solvability criteria demanded. As a result, their need for access to decent living conditions remains largely unmet.

Some rather exceptional programs that feed into the lack of national initiative can be found at the local level. In Cluj-Napoca, vulnerable families (these are families with low incomes or other social vulnerabilities) can benefit from a subsidized rent of up to 1400 lei (approx. 280 EUR). However, programme is available for a maximum of 36 months, it requires official renting contracts and does not succeed to solve the problem of a limited social housing stock (DASM, 2021).

In conclusion, the Romanian housing market is dominated by a high degree of informality with official numbers that do not reflect the realities on the ground and construction standards that are difficult to enforce, whereas market regulations are highly insufficient, very limitative and bureaucratically complex. Being highly unregulated, developers and other constructors have a high leverage in dictating prices. This situation affects vulnerable households disproportionately. There is insufficient housing available for the vulnerable categories. Moreover, without a proper legal framework, there are no clear rules on who bears the responsibility of managing the property and which should be the basic facilities included in the renting offer. Energy performance certificates, which have a certain degree of correcting this flaw are rarely used up to their potential in property sales. On the renting market, its employment is rather an exception. Energy poverty remains completely unaddressed on the housing market, being only marginally discussed in the case of subsidies for heating or other social benefits or in rather exception local retrofitting programmes.

References

- World Health Organization. (2013). *Combined or multiple exposure to health stressors in indoor built environments*. Retrieved from https://www.euro.who.int/__data/assets/pdf_file/0020/248600/Combined-or-multiple-exposure-to-health-stressors-in-indoor-built-environments.pdf
- Environmental Protection Agency. (n.d.). *Indoor Air Quality*. Retrieved from Report on the Environment: <https://www.epa.gov/report-environment/indoor-air-quality#main-content>
- Robić, S. . (2018). Exploring health impacts of living in energy poverty: Case study Sisak-Moslavina County, Croatia. *Energy and buildings (0378-7788)* 169 (2018), 379-387.

- Sovacool, B. (2012). The political economy of energy poverty: A review of key challenges. *Energy for Sustainable Development* 16(3), 272–282.
- Reames, T. G. (2016). Targeting energy justice: Exploring spatial, racial/ethnic and socioeconomic disparities in urban residential heating energy efficiency. *Energy Policy, Volume 97*, 549-558.
- Schweizer-Ries, P. (2009). Energy Poverty: Impact and Public Recognition in the United Kingdom, France, Germany, Italy and Poland. *FinSH Project no. EIE/07/146/SI2.466277*.
- European Parliament. (2013). *Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions - "A Clean Air Programme for Europe", COM(2013) 918 final*. Retrieved from <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52013DC0918&from=EN>
- European Commission. (2020). *COMMISSION RECOMMENDATION of 14.10.2020 on energy poverty*. Retrieved from https://ec.europa.eu/energy/sites/ener/files/recommendation_on_energy_poverty_c2020_9600.pdf
- European Parliament . (2012). *Resolution 'strengthening the rights of vulnerable consumers'*. Retrieved from <http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//NONSGML+TA+P7-TA-2012-0209+0+DOC+PDF+V0//EN>
- European Parliament . (2013). *Social housing in the European Union*. Retrieved from <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52013IP0246&rid=2>
- European Economic and Social Committee. (2013). *For coordinated European measures to prevent and combat energy poverty*. Retrieved from <https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2013:341:0021:0026:EN:PDF>
- European Commission. (2020). *Commission Recommendation (EU) 2020/1563 of 14 October 2020 on energy poverty*. Retrieved from <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32020H1563>
- European Commission. (2017). *The European Pillar of Social Rights*. Retrieved from https://ec.europa.eu/info/strategy/priorities-2019-2024/economy-works-people/jobs-growth-and-investment/european-pillar-social-rights/european-pillar-social-rights-20-principles_en
- I. Kyprianou, D. S. (2019). Energy poverty policies and measures in 5 EU countries: A comparative study. *Energy & Buildings* (196), 46-60.
- Charlemagne | Strasbourg. (2019). *Ursula von der Leyen is elected European Commission president*. Retrieved from The Economist: <https://www.economist.com/charlemagnes-notebook/2019/07/16/ursula-von-der-leyen-is-elected-european-commission-president>
- European Commission. (2019). *The European Green Deal*. Retrieved from https://eur-lex.europa.eu/resource.html?uri=cellar:b828d165-1c22-11ea-8c1f-01aa75ed71a1.0002.02/DOC_1&format=PDF
- European Commission. (n.d.). *European Climate Pact*. Retrieved from https://ec.europa.eu/clima/policies/eu-climate-action/pact_en
- Council of the European Union. (2020). *Video conference of environment ministers*. Retrieved from <https://www.consilium.europa.eu/en/meetings/env/2020/06/23/>
- Engager. (2020). *European Energy Poverty: Agenda Co-Creation and Knowledge Innovation*. Retrieved from http://www.engager-energy.net/wp-content/uploads/2020/05/ENGAGER-Call_for_Action_COVID_19_R2E.pdf

- European Commission. (2020). *A Renovation Wave for Europe - greening our buildings, creating jobs, improving lives*. Retrieved from https://eur-lex.europa.eu/resource.html?uri=cellar:0638aa1d-0f02-11eb-bc07-01aa75ed71a1.0003.02/DOC_1&format=PDF
- European Parliament, European Council. (2010). *Directive 2010/31/EU of the European Parliament and of the Council of 19 May 2010 on the energy performance of buildings*. Retrieved from https://eur-lex.europa.eu/legal-content/EN/ALL;ELX_SESSIONID=FZMjThLLzfxmmMCQGp2Y1s2d3Tjwtd8QS3pqdkhXZbwqGwlgY9KN!2064651424?uri=CELEX:32010L0031
- European Parliament, European Council. (2012). *Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC Text with EEA relevance*. Retrieved from <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32012L0027>
- European Commission. (2013). *Guidance for National Energy Efficiency Action Plans*. Retrieved from <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52013SC0180&from=EN>
- European Commission. (2014). *Financing the energy renovation of buildings with cohesion policy funding*. Retrieved from https://ec.europa.eu/energy/studies/financing-energy-renovation-buildings-cohesion-policy-funding_en?redir=1
- Cătălina Mihai. (2015). *Comisia Europeană lansează un infringement împotriva României în domeniul eficienței energetice*. Retrieved from <https://www.mediafax.ro/economic/comisia-europeana-lanseaza-un-infringement-impotriva-romaniei-in-domeniul-eficientei-energetice-14176319>
- European Commission. (2015). *Assessment of the progress made by Member States towards the national energy efficiency targets for 2020 and towards the implementation of the Energy Efficiency Directive 2012/27/EU as required by Article 24 (3) of Energy Efficiency Directive 2012/27/EU*. Retrieved from <https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1452162772536&uri=CELEX:52015DC0574>
- Simon Robinson, G. V. (2016). *Guidelines on good practice in cost-effective cost allocation and billing of individual consumption of heating, cooling and domestic hot water in multi apartment and multi-purpose buildings*. Retrieved from https://ec.europa.eu/energy/sites/ener/files/documents/mbic_guidelines20170123_en.pdf
- European Parliament, European Council. (2018). *REGULATION (EU) 2018/1999*. Retrieved from <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018R1999&from=EN>
- European Parliament, European Council. (2018). *DIRECTIVE (EU) 2018/844*. Retrieved from <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018L0844&from=EN>
- European Commission. (2019). *COMMISSION RECOMMENDATION (EU) 2019/1658*. Retrieved from <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019H1658&qid=1613898012936&from=en>
- European Commission. (2019). *COMMISSION RECOMMENDATION (EU) 2019/786*. Retrieved from <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019H0786&from=GA>

European Commission. (2020). *Support from the EU budget to unlock investment into building renovation under the Renovation Wave*. Retrieved from <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020SC0550&from=EN>

European Parliament, European Council. (2019). *DIRECTIVE (EU) 2019/944*. Retrieved from <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019L0944&from=EN>

European Parliament, European Council. (2009). *DIRECTIVE 2009/73/EC*. Retrieved from <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32009L0073&from=EN>

Eurostat. (2021). *Arrears on utility bills - EU-SILC survey*. Retrieved from http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=ilc_mdes07&lang=en

Eurostat. (2020). *Population unable to keep home adequately warm by poverty status*. Retrieved from https://ec.europa.eu/eurostat/databrowser/view/sdg_07_60/default/table?lang=en

Economica.Net. (2017). *Românii renunță treptat la tariful social la curent*. Retrieved from https://www.economica.net/romanii-renunta-treptat-la-tariful-social-la-curent_134798.html

Jigla, G., Sinea, A., & Murafa, C. (2018). Oportunitatea gazelor naturale în sectorul rezidențial din România. Retrieved from <https://www.democracycenter.ro/romana/publicatii/rapoarte-de-cercetare/oportunitatea-gazelor-naturale-sectorul-rezidential-din-romania>

Guvernul României. (2018). *ORDONANȚĂ DE URGENȚĂ nr. 114 din 28 decembrie 2018*. Retrieved from <http://legislatie.just.ro/Public/DetaliiDocument/209465>

Teschner, N., Sinea, A., Vornicu, A., Abu-Hamed, T., & Negevd, M. (2020). Extreme energy poverty in the urban peripheries of Romania and Israel: Policy, planning and infrastructure. *Energy Research & Social Science*.

Romanian Parliament. (2016). *LEGE nr. 196 din 31 octombrie 2016*. Retrieved from <http://legislatie.just.ro/Public/DetaliiDocument/183328>

Romanian Parliament. (n.d.). *Legea privind stabilirea măsurilor de protecție socială pentru consumatorul vulnerabil de energie*. Retrieved from <https://sgg.gov.ro/new/wp-content/uploads/2021/01/LGANEXE.pdf>

Guvernul României. (2014). *Strategia națională privind incluziunea socială și reducerea sărăciei 2015-2020*. Retrieved from https://servicii-sociale.gov.ro/source/strategii/StrategyVol1RO_web.pdf

Guvernul României. (2014). *Planul strategic de acțiuni pentru perioada 2015-2020*. Retrieved from <https://www.servicii-sociale.gov.ro/ro/politici-si-strategii/planul-strategic-de-actiuni-pentru-perioada-2015-2020>

Guvernul României. (2019). *Strategia energetică a României 2019-2030, cu perspectiva anului 2050*. Retrieved from <http://energie.gov.ro/transparenta-decizionala/strategia-energetica-a-romaniei-2019-2030-cu-perspectiva-anului-2050/>

Guvernul României. (2017). *Planul National de Actiune pentru Eficienta Energetica 2017-2020*. Retrieved from https://www.google.com/search?q=planul+national+de+actiune+eficienta+energetica+2017-2020&newwindow=1&biw=1536&bih=664&sxsrf=ALeKk02611ePTD4jqQntreCTej_KIe12Ow%3A1625679826217&ei=0uflYNrkDOqSrgSe173wBw&oq=planul+national+d+e+actiune+eficienta+energetica+20

- Guvernul României. (2020). *Planul Național Integrat în domeniul Energiei și Schimbărilor Climatice 2021-2030*. Retrieved from https://ec.europa.eu/energy/sites/ener/files/documents/ro_final_necp_main_ro.pdf
- European Commission. (2020). *Assessment of the final national energy and climate plan of Romania*. Retrieved from https://ec.europa.eu/energy/sites/ener/files/documents/staff_working_document_assessment_necp_romania.pdf
- Guvernul României. (2020). *HOTĂRÂRE nr. 1.034 din 27 noiembrie 2020*. Retrieved from https://ec.europa.eu/energy/sites/default/files/documents/ro_ltrs_2020.pdf
- ANRE. (2018). *Planului Național de Acțiune în domeniul Eficienței Energetice*.
- LTRS. (n.d.). *Long-term renovation strategies*. https://ec.europa.eu/energy/topics/energy-efficiency/energy-efficient-buildings/long-term-renovation-strategies_en.
- PNRR. (2021). *Planul Național de Redresare și Reziliență*. Retrieved from <https://mfe.gov.ro/wp-content/uploads/2021/06/0c2887df42dd06420c54c1b4304c5edf.pdf>
- Romanian Parliament. (2005). *LEGEA nr. 372 din 13 decembrie 2005*. Retrieved from <http://legislatie.just.ro/Public/DetaliuDocument/66970>
- Romanian Parliament. (2020). *Legea nr. 101/2020 pentru modificarea și completarea Legii nr. 372/2005 privind performanța energetică a clădirilor*. Retrieved from <https://lege5.ro/gratuit/gm3tomjyhaza/legea-nr-101-2020-pentru-modificarea-si-completarea-legii-nr-372-2005-privind-performanta-energetica-a-cladirilor>
- Romanian Parliament. (2019). *LEGE nr. 151 din 24 iulie 2019 pentru completarea Legii nr. 350/2001 privind amenajarea teritoriului și urbanismul*. Retrieved from <http://legislatie.just.ro/Public/DetaliuDocumentAfis/216610>
- MKDP. (2019). *Așezările Informale*. Retrieved from <https://locuireinformala.ro/wp-content/uploads/2019/11/Ghid-Actiune-Autoritati.pdf>
- ANRE. (2013). *ORDIN nr. 59 din 02.08.2013*. Retrieved from https://www.enel.ro/content/dam/enel-ro/informatii-utile/fomulare-clienti/avize_contracte/Ordin%20nr.%2059%202013%20pentru%20aprobarea%20Regulamentului%20privind%20racordarea%20utilizatorilor%20la%20retelele.pdf
- C.Pirvoiu . (2021). *Racordările la energie și gaze s-au blocat / Virgil Popescu: Cererile au explodat, companiile sunt depășite fizic și financiar. Această situație trebuie rezolvată acum*. Retrieved from <https://economie.hotnews.ro/stiri-energie-24749117-racordarile-energie%20-gas-blocked-virgil-popescu-requests-exploded-companies-are-physically-financially-outdated-this-situation-must-be-solved-now.htm>
- CURS. (2021). *Sondaj de opinie februarie 2021*. Retrieved from <https://curs.ro/3030/>
- Babeș-Bolyai University. (2021). *Research report on the extent, drivers, and symptoms of energy poverty in Cluj-Napoca*. Retrieved from https://energy-poverty.eu/sites/energy-poverty.eu/files/documents/enpower_scientific_report.pdf
- Bouzarovski, S., Petrova, S., & Sarlamanov, R. (2012). *Energy poverty policies in the EU: A critical perspective*. Energy policy 49.
- Holmes, D., Rudge, T., & Perron, A. (2012). (Re)Thinking violence in health care settings: a critical approach. *Primary Health Care Research & Development*.
- Vilchesa, A., Barrios, Á., Marta, P., & Huelvab, M. (2017). Retrofitting of homes for people in fuel poverty: Approach based on household thermal comfort. *Energy Policy*, 283-291.
- Shan, M., Wang, P., Li, J., Yue, G., & Yang, X. (2015). Energy and environment in chinese. *Building and Enviroment* 91, 271-282.

- Grey, C. N., Schmieder-Gaite, T., Jiang, S., Nascimento, C., & Poortinga, W. (2018). Cold homes, fuel poverty and energy efficiency improvements: A longitudinal focus group approach. *Indoor + Built Environment: The Journal of the International Society of the Built Environment* 26(7), 902–913.
- Jenkins, K., McCauley, D., Heffron, R. J., Stephan, H., & Rehner, R. (2016). Energy Justice: A Conceptual Review. *Energy Research & Social Science* 11, 174–182.
- Jiglau, G., Sinea, A., Dubois, U., & Biermann, P. (2020). *Perspectives on Energy Poverty in Post-Communist Europe*. Routledge Explorations in Energy Studies.
- Bouzarovski, S., & Thomson, H. (2019). Confronting Energy Poverty in Europe: A Research and Policy Agenda. *Energies* 14(4):858.
- Harvey, F., & Rankin, J. (2020). *What is the European Green Deal and will it really cost €1tn?* Retrieved from The Guardian:
<https://www.theguardian.com/world/2020/mar/09/what-is-the-european-green-deal-and-will-it-really-cost-1tn>
- ANRE. (2014). *ORDIN nr. 64 din 14 iulie 2014 pentru aprobarea Regulamentului de furnizare a energiei electrice la clienții finali*. Retrieved from
<https://www.cez.ro/ckfinder/userfiles/files/cez/cezv/legislatie/regulament-furnizare-ee/ordin-64-14-07-2014.pdf>
- ANRE. (2015). *Ordinul nr. 176/2015*. Retrieved from
<https://lege5.ro/gratuit/ha4diobrha/ordinul-nr-176-2015-pentru-aprobarea-tarifelor-reglementate-de-energie-electrica-aplicate-de-furnizorii-de-ultima-instanta-clientilor-casnici-care-nu-si-au-exercitat-dreptul-de-eligibilitate-precum-si>
- ANRE. (2016). *ORDIN nr. 29 din 28 iunie 2016 pentru aprobarea Regulamentului privind furnizarea gazelor naturale la clienții finali*. Retrieved from
<http://legislatie.just.ro/Public/DetaliiDocumentAfis/179828>
- Bonatz, N., Guo, R., Wu, W., & Liu, L. (2019). A comparative study of the interlinkages between energy poverty and low carbon development in China and Germany by developing an energy poverty index. *Energy Build.*, 817–831.
- WHO. (2011). *Environmental burden of disease associated with inadequate housing: a method guide to the quantification of health effects of selected housing risks in the WHO European Region. Summary report*.
- Sinea, A., Murafa, C., & Jiglau, G. (2018). *Energy Poverty and the Vulnerable Consumer in Romania and Europe*. Cluj Napoca: Cluj University Press.
- Vasalca, T. (2019, 7 1). Nicio cerere pentru subvențiile destinate instalării de panouri fotovoltaice la gospodăriile izolate. AFM va prelungi termenul de înscriere. *News Energy*.
- Nicut, M. (2020, 9 25). Racordarea la gaze va fi gratuită pentru toate persoanele fizice, indiferent unde e locul de consum, și se face în cel mult 90 de zile. *Lege nouă. Economica.net*.
- European Commission. (n.d.).
- European Commission. (12 2017). *ANNEX. Second Report on the State of the Energy Union, COM (2017)53 final*. Brussels.
- European Commission. (2010). *the Energy 2020 strategy for sustainable, competitive and secure energy COM (2010) 639 final*. Brussels.
- European Commission. (2014). *the policy framework for climate and energy in the period from 2020 to 2030, COM (2014) 15 final*. Brussels.
- European Commission. (2015). *A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy, COM/2015/080 final*. Brussels.

- Jigla, G., Sinea, A., & Murafa, C. (2017). *Sărăcia energetică și consumatorul vulnerabil. Evidențe din România și Europa*.
- European Commission. (2021). *The National Recovery and Resilience Plan*. Retrieved from https://ec.europa.eu/info/business-economy-euro/recovery-coronavirus/recovery-and-resilience-facility_en
- Ministry of Energy. (2018). *Strategia energetică a României 2019-2030, cu perspectiva anului 2050*. Retrieved from <http://energie.gov.ro/transparenta-decizionala/strategia-energetica-a-romaniei-2019-2030-cu-perspectiva-anului-2050/>
- Guvernul României. (2020, Decembrie 17). *Monitorul Oficial al României*. Retrieved from https://ec.europa.eu/energy/sites/default/files/documents/ro_ltrs_2020.pdf
- Ministry of Energy. (2016). *Strategia Energetică a României 2016-2030*. Retrieved from http://energie.gov.ro/wp-content/uploads/2016/12/Strategia-Energetica-a-Romaniei-2016-2030_FINAL_19-decembrie-2.pdf
- Center of the Study of Democracy. (2021).
- European Commission. (n.d.). *Energy use in buildings*. Retrieved from Energy consumption: https://ec.europa.eu/energy/eu-buildings-factsheets-topics-tree/energy-use-buildings_en
- Fiocompass, ERDF. (2020).
- ANRE. (2018). *RAPORT NAȚIONAL 2018*.
- Eurostat. (2022). *Living conditions in Europe - income distribution and income inequality*. Retrieved from https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Living_conditions_in_Europe_-_income_distribution_and_income_inequality
- Ivanov, C. (2011). *Legea care prevede ca proprietarii sa-si repare cladirile darapanate pana in 2013, impotmolita la primarii*. Retrieved from <https://economie.hotnews.ro/stiri-imobiliar-10317807-legea-care-prevede-proprietarii-repare-cladirile-darapanate-pana-2013-impotmolita-primarii.htm>
- Sfârlea, V. (2018). *Cum reabilităm fațadele Clujului: 10 idei din Oradea (Infografic)*. Retrieved from <https://cluj.info/cum-reabilitam-fatadele-clujului-10-idei-din-oradea-infografic/>
- Ziare.Com. (2018). *Programele-fantoma ale Guvernului: Astazi, Casa Verde Plus*. Retrieved from <https://ziare.com/mediu/verde/programele-fantoma-ale-guvernului-astazi-casa-verde-plus-1539192>
- Digi24. (2020). *Bătăie de joc cu bani europeni: programul Casa Verde nu are niciun beneficiar. 13 milioane de euro au fost risipite*. Retrieved from <https://www.digi24.ro/stiri/actualitate/bataie-de-joc-cu-bani-europeni-programul-casa-verde-nu-are-niciun-beneficiar-13-milioane-de-euro-au-fost-risipite-1249433>
- Alba24. (2021). *ECONOMIE CASA EFICIENTĂ ENERGETIC 2021: Ce se întâmplă cu programul în care s-au înscris peste 14.000 de solicitanți. Precizări de la AFM*. Retrieved from <https://alba24.ro/casa-eficienta-energetic-2021-ce-se-intampla-cu-programul-in-care-s-au-inscris-pest-14-000-de-solicitantii-in-septembrie-2020-829819.html>
- Romania Green Buildings Council. (n.d.). *Green Homes certified by RoGBC*. Retrieved from <http://rogbc.org/en/projects/green-homes>
- George Jigla, A. S. (2018). *Oportunitatea gazelor naturale în sectorul rezidențial din România*. Retrieved from <https://www.democracycenter.ro/romana/publicatii/rapoarte-de-cercetare/oportunitatea-gazelor-naturale-sectorul-rezidential-din-romania>

- INS. (n.d.). *Percentage of UATs connected to gas*. Retrieved from <https://insse.ro/cms/>
- European Commission. (2016). *EU Reference Scenario 2016. Energy, transport and GHG emissions Trends to 2050*. Retrieved from https://ec.europa.eu/energy/sites/ener/files/documents/20160713%20draft_publication_REF2016_v13.pdf
- The World Bank. (2015). *HOUSING IN ROMANIA*. Retrieved from TOWARDS A NATIONAL HOUSING STRATEGY: <https://documents1.worldbank.org/curated/en/552171468585744221/pdf/106856REVISED-WP-RomaniaHousingRASOutputFinalHousingAssessment-PUBLIC.pdf>
- Lăzărescu, L.-M., & Diacon, L. D. (2020). A Comparative Analysis of the Housing Affordability in Romania and the European Union from the Perspective of the Housing Costs. : *The 16th Economic International Conference New Challenges and Opportunities for the Economy 4.0, May 7-8th, 2020*.
- Eurostat. (2021). *Severe housing deprivation rate by age, sex and poverty status - EU-SILC survey*. Retrieved from https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=ilc_mdho06a&lang=en
- Housing Right Watch . (2020). *Homeownership, poverty, and legislative pitfalls in Romania*. Retrieved from <https://www.housingrightswatch.org/content/homeownership-poverty-and-legislative-pitfalls-romania>
- DELMENDO, L. C. (2021). *House price rises decelerating in Romania*. Retrieved from Global Property Guide: <https://www.globalpropertyguide.com/Europe/Romania>
- Cristea, M. (2021). *Romanian real estate market exceeded all expectations in 2020*. Retrieved from <https://business-review.eu/property/romanian-real-estate-market-exceeded-all-expectations-in-2020-219795>
- iBroad. (2020). *Factsheet: Romania*. Retrieved from Current use of EPCs and potential links to iBRoad: https://bpie.eu/wp-content/uploads/2018/01/iBROAD_CountryFactsheet_ROMANIA-2018.pdf
- Ivanov, C. (2011). *Legea care prevede ca proprietarii sa-si repare cladirile darapanate pana in 2013, impotmolita la primarii*. Retrieved from <https://economie.hotnews.ro/stiri-imobiliar-10317807-legea-care-prevede-proprietarii-repare-cladirile-darapanate-pana-2013-impotmolita-primarii.htm>
- Sfârlea, V. (2018). *Cum reabilităm fațadele Clujului: 10 idei din Oradea (Infografic)*. Retrieved from <https://cluj.info/cum-reabilitam-fatadele-clujului-10-idei-din-oradea-infografic/>
- Ziare.com. (2018, Noiembrie 23). *Programele-fantoma ale Guvernului: Astazi, Casa Verde Plus*. Retrieved from Ziare.com: <https://ziare.com/mediu/verde/programele-fantoma-ale-guvernului-astazi-casa-verde-plus-1539192>
- Digi24. (2020, Ianuarie 23). *Bătăie de joc cu bani europeni: programul Casa Verde nu are niciun beneficiar. 13 milioane de euro au fost risipite*. Retrieved from Digi24: <https://www.digi24.ro/stiri/actualitate/bataie-de-joc-cu-bani-europeni-programul-casa-verde-nu-are-niciun-beneficiar-13-milioane-de-euro-au-fost-risipite-1249433>
- Alba24.ro. (2021, Februarie 26). *CASA EFICIENTĂ ENERGETIC 2021: Ce se întâmplă cu programul în care s-au înscris peste 14.000 de solicitanți. Precizări de la AFM*. Retrieved from Alba24.ro: <https://alba24.ro/casa-eficienta-energetic-2021-ce-se-intampla-cu-programul-in-care-s-au-inscris-pest-14-000-de-solicitanti-in-septembrie-2020-829819.html>
- Jiglau, G., Sinea, A., & Murafa, C. (2017). *Sărăcia energetică și consumatorul vulnerabil. Evidențe din România și Europa (raport)*. Retrieved from

- <https://democracycenter.ro/romana/publicatii/rapoarte-de-cercetare/saracia-energetica-si-consumatorul-vulnerabil-evidente-din-romania-si-europa>
- RoGBC. (n.d.). *Green Homes certified by RoGBC*. Retrieved from RoGBC: <http://rogbc.org/en/projects/green-homes>
- PNRR. (2021). *Planul Național de Redresare și Reziliență*. Retrieved from <https://mfe.gov.ro/wp-content/uploads/2021/06/0c2887df42dd06420c54c1b4304c5edf.pdf>
- Georghe, A. (2020). *Distributia salariilor in tara noastra: 1 din 4 romani castiga salariul minim, iar altii iau pana la 120.000 de lei pe luna*. Retrieved from <https://www.wall-street.ro/articol/Careers/248017/distributia-salariilor-in-tara-noastra-1-din-4-romani-castiga-salariul-minim-iar-altii-iau-pana-la-120-000-de-lei-pe-luna.html>
- Amann, W., & Mundt, A. (2010). Designing a new rental housing law for Romania. *International Journal of Law in the Built Environment* 2(2).
- DASM. (2021). *Romania Country Report on the situation of domestic violence and on work with perpetrators*. Retrieved from <http://dasmclujnapoca.ro/2021/07/2021-osspe-romania-country-report-on-the-situation-of-domestic-violence-and-on-work-with-perpetrators/>
- Jigla, G., Sinea, A., & Murafa, C. (2017). *Sărăcia energetică și consumatorul vulnerabil. Evidențe din România și Europa*. Retrieved from <https://www.democracycenter.ro/romana/publicatii/rapoarte-de-cercetare/saracia-energetica-si-consumatorul-vulnerabil-evidente-din-romania-si-europa>
- Guvernul României. (2020, Decembrie 17). *Monitorul Oficial al României*. Retrieved from https://ec.europa.eu/energy/sites/default/files/documents/ro_ltrs_2020.pdf
- ANRE. (2018). *RAPORT NAȚIONAL 2018*.
- European Union. (2020). *EUROPEAN STRUCTURAL AND INVESTMENT FUNDS*. Retrieved from <https://cohesiondata.ec.europa.eu/countries/RO?fbclid=IwAR0qlj2MTr32yLvAA5LVyN9plnSL16zYruwZoGUj3ZqSA0IT7gJt3iEonr4>
- Guvernul Romaniei. (2020). *Strategia nationala de renovare pe termen lung*. Retrieved from https://ec.europa.eu/energy/sites/default/files/documents/ro_ltrs_2020.pdf
- Center for the Study of Democracy. (2021).
- EnPowerR. (2021). *Alleviating Energy Poverty in Romania and beyond*. Retrieved from https://energy-poverty.eu/sites/energy-poverty.eu/files/documents/enpower_policy_paper_alleviating_energy_poverty_in_romania_and_beyond.pdf
- Ministry of Energy. (2016). *Strategia Energetică a României 2016-2030*. Retrieved from http://energie.gov.ro/wp-content/uploads/2016/12/Strategia-Energetica-a-Romaniei-2016-2030_FINAL_19-decembrie-2.pdf
- European Commission. (n.d.). *Energy use in buildings*. Retrieved from https://ec.europa.eu/energy/eu-buildings-factsheets-topics-tree/energy-use-buildings_en
- Center for the Study of Democracy. (2019).
- Ministry of Energy. (2020). *Strategia energetica a Romaniei 2020-2030, cu perspectiva anului 2050*. Retrieved from <http://economie.gov.ro/strategia-energetica-a-romaniei-2020-2030-cu-perspectiva-anului-2050-1>
- Nicuț, M. (2019, Decembrie 09). *Sistemul de alimentare cu apă caldă și caldură al Bucureștiului se autodistruge, încet, dar sigur. Explicații*. Retrieved from

- Economica.net: https://www.economica.net/sistemul-de-alimentare-cu-apa-calda-i-caldura-al-bucure-tiului-se-autodistruge-incet-dar-sigur-explica-ii_174867.html
- Pacurar, C. G. (2020, Iunie 25). *SACET-urile: noi le omorâm și occidentalii le (re)construiesc*. Retrieved from HotNews.ro: <https://www.hotnews.ro/stiri-opinii-24136216-sacet-urile-noi-omoram-occidentalii-construiesc.htm>
- Scarlat, R. (2021, Martie 14). *Centralele termice de apartament, interzise în Cluj-Napoca. Anunțul făcut de primarul Emil Boc*. Retrieved from Gandul.ro: <https://www.gandul.ro/actualitate/centralele-termice-de-apartament-interzise-in-cluj-napoca-anuntul-facut-de-primarul-emil-boc-19601124>
- Pirvoiu, C. (2021, Mai 11). *Racordarea la gaze și energie NU va mai fi gratuită pentru toată lumea / Facilitatea a creat mai multe probleme decât avantaje, la scurt timp după aplicare*. Retrieved from HowNews.ro: <https://economie.hotnews.ro/stiri-energie-24790864-exclusiv-racordarea-gaze-energie-nu-mai-gratuita-pentru-toata-lumea-facilitatea-creat-mai-multe-probleme-decat-avantaje-scurt-timp-dupa-aplicare.htm>
- Ivanov, C. (2011, Octombrie 4). *Legea care prevede ca proprietarii sa-si repare cladirile darapanate pana in 2013, impotmolita la primarii*. Retrieved from HotNews.ro: <https://economie.hotnews.ro/stiri-imobiliar-10317807-legea-care-prevede-proprietarii-repare-cladirile-darapanate-pana-2013-impotmolita-primarii.htm>
- Sfârlea, V. (2018, Septembrie 24). *Cum reabilităm fațadele Clujului: 10 idei din Oradea (Infografic)*. Retrieved from Cluj.Info: <https://cluj.info/cum-reabilitam-fatadele-clujului-10-idei-din-oradea-infografic/>
- Fundația Viață și Lumină. (2020, Iulie). *2020 - Alegeri în Pandemie*. Retrieved from Policy Paper: https://www.euractiv.ro/documente/ires_2020---alegeri-in-pandemie_policy-paper.pdf
- Babeș-Bolyai University. (2021). *Research report on the extent, drivers, and symptoms of energy poverty in Cluj-Napoca*. Retrieved from https://www.euractiv.ro/documente/ires_2020---alegeri-in-pandemie_policy-paper.pdf
- Ministry of Energy. (2018). *Strategia energetică a României 2019-2030, cu perspectiva anului 2050*. Retrieved from <http://energie.gov.ro/transparenta-decizionala/strategia-energetica-a-romaniei-2019-2030-cu-perspectiva-anului-2050/>
- European Housing Partnership. (2017, Noiembrie 1). *Affordable Housing in Central and Eastern Europe: Identifying and Overcoming Constrains in New Member States*. Retrieved from https://ec.europa.eu/futurium/en/system/files/ged/2018.10.22_affordable_housing_in_central_and_eastern_europe.pdf
- Csiba, K., Bajomi, A., & Gosztonyi, Á. (2016, Octombrie). *ENERGY POVERTY HANDBOOK*. Retrieved from <https://bpie.eu/wp-content/uploads/2016/11/energypovertyhandbook-online.pdf>
- Eurostat. (2018, Martie). *Living conditions in Europe*. Retrieved from <https://ec.europa.eu/eurostat/documents/3217494/9079352/KS-DZ-18-001-EN-N.pdf/884f6fec-2450-430a-b68d-f12c3012f4d0>
- World Bank. (2015). *ROMA IN AN EXPANDING EUROPE BREAKING THE POVERTY CYCLE*.
- Ringold, D. (2002, Mai 7). *POVERTY AND ROMA IN CENTRAL AND EASTERN EUROPE: A VIEW FROM THE WORLD BANK*. Retrieved from European Roma Rights Center: <http://www.errc.org/roma-rights-journal/poverty-and-roma-in-central-and-eastern-europe-a-view-from-the-world-bank>

- Teschner, N., Sinea, A., Vornicu, A., Abu-Hamed, T., & Negev, M. (2020). Extreme energy poverty in the urban peripheries of Romania and Israel: Policy, planning and infrastructure. *Energy Research & Social Science*.
- Bădiță, C., & Vincze, E. (2019). *Resituating the Local in Cohesion and Territorial Development*. Retrieved from Relocal: https://relocal.eu/wp-content/uploads/2019/05/25_RO_Case-1_Pata-Cluj_Final.pdf
- Regio. (n.d.). *Elaborarea strategiilor de integrare a comunităților urbane marginalizate*. Retrieved from Atlasul zonelor urbane marginalizate din România: <https://documents1.worldbank.org/curated/en/857001468293738087/pdf/882420WP0P1430085232B00OUO0900Atlas.pdf>
- Jigla, G., Sinea, A., Dubois, U., & Biermann, P. (2021). *Perspectives on Energy Poverty in Post-Communist Europe*. Routledge.
- Sinea, A., George, J., Ute, D., & Philipp, B. (2020). *Perspectives on Energy Poverty in Post-Communist Europe*. Routledge Explorations in Energy Studies.