

# Climate Innovators Mapping in Romania





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## FOREWORD

Over the last four decades, Ashoka has been working to build an Everyone a Changemaker world, a world that responds quickly and effectively to social challenges and where each individual has the freedom, confidence and societal support to address social problems and drive change. Of the many global challenges we face today, few are as wide-reaching as climate change. While humans have enjoyed the convenience and comfort brought about by the Industrial Revolution, many of us have also lost touch with nature and as a result, directly and indirectly contributed to global warming and climate change. As a result, for the first time in its 40-year history, in 2019 Ashoka has decided to galvanize the strength of its community on climate action, through a new global initiative – Next Now: Planet & Climate. Within this flagship initiative, we aim to change the course of history by uniting leading changemakers around audacious goals that bring people and planet to a new equilibrium. Together, this ecosystem of visionary changemakers will build a brighter future. A future that addresses and anticipates the world's most urgent climate challenges. A future in which no one gets left behind. Because the world is changing fast and the time to act is Now.

For all these reasons, the partnership with EIT Climate-KIC has brought us great joy. We view the ecosystem mapping of climate innovators in nine countries in Central and Eastern Europe, which constitutes the object of this report, as a major first step in our global work on climate innovation. When it comes to global climate action, the scale and depth of the challenge we face as humanity is so severe, that we need moonshot goals and cathedral thinking. Yet, we first need to know who are the extraordinary women and men that can join hands, shoot for the moon and restore our planetary equilibrium. The fact we were able to do this ecosystem mapping in Central and Eastern Europe has been an honour and a privilege. The massive transformation this region went through, after half a century of oppression, is largely due to changemakers that stepped up to the mission of bringing a new vision for the region to life. A vision based on active citizenship, participation and inclusion. In this landscape, have the concerns for our planet fallen through the cracks? Statistics point out climate skepticism is wider and more far-reaching in Eastern Europe than in the West. But is it really so? If not, who are the regional champions that are driving a new wind of age? What are their obstacles and which are the opportunities they see in their work?

Our qualitative deep-dives, authored by regional experts from Poland, Czech Republic, Slovakia, Hungary, Romania, Bulgaria, Estonia, Lithuania and Latvia complemented a thorough quantitative network analysis in all these countries, performed with specialized teams of market analysis consultants, based on a carefully planned and tested methodology. 502 phone interviews helped us surface 827 innovators, changemakers and leading players in several fields which we saw as paramount for climate action in our region: energy efficiency in buildings, climate-smart agriculture, socio-economic transformation in post-coal regions and air pollution.

We hope you will enjoy this reading, which condenses months of scrutiny and search. The first chapter of this country report details the rationale and aim of the study. The second one presents briefly introduces the methodology we used. If you have little time for reading, do not miss Chapter 3 – it looks at all the field areas we examined and describes in great detail the general context of each of them, main policies in the region, main innovations, as well as socio-demographic characteristics of the changemakers that work in each of them. Chapter 4 sums up the main findings and insights into our whole analysis and presents country-specific general conclusions. Chapter 5 comprises of qualitative findings provided by the experts we consulted in your country. This is a country-specific condensed version of our full report, which you can find here. (link with url to where we will upload the entire report - TBD) The full report includes more details on our methodology, the other countries under scrutiny, as well as the results of the network and ecosystem mappings from the quantitative research.

For us, the journey begins now. We now know who can turn our region into a global frontrunner in climate and sustainability. It is our responsibility, as well as an invitation we would like to address to all institutional actors in the region – from governments to corporations, from funders and business leaders to leading foundations – to nurture this ecosystem, to support its visionary spirit and courageous thinking. The time to act is Now.

**Corina Murafa** Ashoka Romania Director, Field Leader Next Now: Planet & Climate  
**Marie Ringler** Ashoka Europe and Ashoka CEE Director, **Agata Stafiej-Bartosik** Ashoka Poland Director,  
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## Chapter 1

# Rationale and Aim of the Study

In 2019 EIT Climate-KIC and Ashoka joined hands to conduct a study in 9 countries (Romania, Poland, Czech Republic, Hungary, Slovakia, Bulgaria, Latvia, Lithuania and Estonia) with the purpose of identifying the most important players and changemakers in the climate innovation area.

### About EIT Climate-KIC

EIT Climate-KIC is a Knowledge and Innovation Community (KIC) working to accelerate the transition to a zero-carbon economy. Supported by the European Institute of Innovation and Technology, EIT Climate-KIC identifies and supports changemakers and their innovations that help society mitigate and adapt to climate change.

### About Ashoka

Ashoka is the largest global organization promoting and supporting social entrepreneurship and social innovation, ranked by NGO Advisor in the top 5 NGOs in the world. Ashoka identifies and supports the world's leading social entrepreneurs,

learns from the patterns in their innovations and mobilizes a global community to embrace these new frameworks and build an “everyone a changemaker” world.

Both organisations did this inquiry because such changemakers who generate positive change are quite a few, and even fewer in the climate innovation sector. The purpose of the project has been to create a network that will act on maximizing the potential of all members. If you feel we have missed important actors in any of the countries we examined, or if you think we misaddressed one of the prominent trends in any of the countries under scrutiny, please reach out to us. At the same time, the purpose of our endeavour is to design future programmes and strategies that would support these vibrant communities of changemakers and innovators. If you or people you know would like to be part of this ecosystem building movement, please contact us at: [romania@ashoka.org](mailto:romania@ashoka.org).

We looked at **changemakers** in the fields of:

- Energy efficiency in buildings,
- Climate-smart agriculture,
- Socio-economic transformation in post-coal regions
- Air quality / air pollution

Our efforts resulted in nine Climate Changemakers Maps: one for each of the countries we have examined in Central and Eastern Europe (CEE): Romania, Bulgaria, Hungary, Czech Republic, Slovakia, Poland, Lithuania, Latvia, and Estonia. Ashoka's Network Mapping is a process that uses snowball mapping analysis to identify key innovators, influencers and decision makers in a given sector, to visualize patterns and trends, and to identify the potential for subsequent network connections. Our snowball research always involves close collaborations with leading sociological and marketing research companies to ensure the scientific accuracy of the methodology

deployed. The most important output is observing the relationships with those willing to co-create, nominations for future opportunities, and insights about the field that will guide upcoming activities. The collected data in this study has been used by EIT Climate-KIC, Ashoka and their partners, with the purpose of creating the Climate Changemakers Maps and to potentially further engage with the nominators and the nominees on these topics. This data was published with the interviewees' consents, but the raw data, including contact information, was only used by the beneficiaries, and will not be publically released.





# Chapter 2

# Methodology for the Study

## 1. INTRODUCTION – GOAL OF THE RESEARCH/STUDY

The new EIT Climate-KIC strategy for the CEE Geography for 2019–2021 focuses on expanding thematically and geographically. In 2019, EIT Climate-KIC CEE encompassed not only Hungary and Poland, but also the Czech Republic and Slovakia. The next step was to also include some of the RIS countries from the CEE region, such as Lithuania, Latvia, Estonia, Bulgaria and Romania. The absolute best way to quickly understand a new business environment of the EIT Climate-KIC CEE is the ecosystem map, as it shows all the high-level value exchanges between the client and the groups with which it's interacting.

The CEE climate innovation ecosystem mapping gives EIT Climate-KIC and Ashoka CEE a stronger

license to operate in the area of innovation in climate change in the region. The process of calling-up the innovators, supporters and opinion leaders while conducting the survey was also a process of brand awareness building which allowed for a faster entry point for potential future collaboration. The mapping allows to build better and more effective networks through matching planned activities with the right audience. In the area of policy and system change, the mapping will help to convene and match the right partners to achieve the effect of synergy and collective impact. Finally, it will help to better navigate the dense ecosystems and interdependencies between various actors in the field of climate change social innovation, as it gives the audience an in-depth knowledge about the sector.

Thorough **climate innovation ecosystem map** is the exercise that will allow to kick off all the consecutive activities in the EIT Climate-KIC CEE impact goals:

- 1: Promote retrofit and decentralized energy, incl. air pollution,
- 4: Make agriculture climate-smart,
- 9: Reboot regional economies, while co-creating and experimenting with the right stakeholders, who are crucial for achieving systemic and transformational change in the region.

Starting with 2019, for the first time in its 40 year long institutional history, Ashoka – the world's largest network of social entrepreneurs, comprising 3600 leading systems-changing innovators from over 90 countries, is galvanizing the strength of its community on climate action, through a new global initiative – Next Now: Planet & Climate. Of the many global challenges we face today, Ashoka believes few are as wide-reaching as climate change. While humans have enjoyed the convenience and comfort brought about by the Industrial Revolution, many of us have also lost touch with nature, and, as a result, our generation directly and indirectly contributes to global warming and climate change.

Consequently, Next Now: Planet & Climate is working to rebuild our relationship with the planet towards systemically changing the current patterns of disconnection between humans and nature, recalibrate the social and environmental value chain, and reshape societal processes for environmental sustainability and planetary safety. By 2030, Next Now: Planet & Climate will significantly accelerate the processes through which Ashoka searches, identifies, supports and connects innovators (Ashoka Fellows, young changemakers, social entrepreneurs), by tearing down the siloes within and outside our organization, and by engaging key business partners as a force of planetary good. We will nurture collective impact moonshots and enhance

our role as ecosystem builder, convener and trust broker, bringing together changemakers, visionary corporate actors and business entrepreneurs, young people and their educators, as well as policy makers to make a significant dent on global climate action. We will practice bravery, cathedral thinking and open architecture of change.

As Ashoka recently adopted these global sectoral ambitions, we embraced the partnership with EIT Climate-KIC as highly strategic, as it allowed to pilot our global efforts to test novel ways of identifying changemakers and innovators in the field of climate action, with the ultimate goal of supporting their ambitions and the scale-up of their effective solutions to what we view as humanity's greatest problem today.

## 2. METHODOLOGY - ECOSYSTEM AND NETWORK MAPPING APPROACH BASED ON A SNOWBALL SAMPLING METHOD

At global level, Ashoka has a vast experience in running network analyses. Depending on the specific scope of the mapping, interviewees are also asked questions about their professional experience in the sector and insights on the topic. As a result, we identify trends which help us better understand social innovations in the field.

Snowball mapping is a variation of snowball sampling or chain-referral sampling. It is defined as a non-probability sampling technique in which the samples have traits that are rare to find. This is a sampling technique in which existing subjects provide referrals to recruit samples required for a research study.



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## Chapter 3

# Main Findings in the Four Sub-Areas Under Consideration

## 1. Energy efficiency in buildings

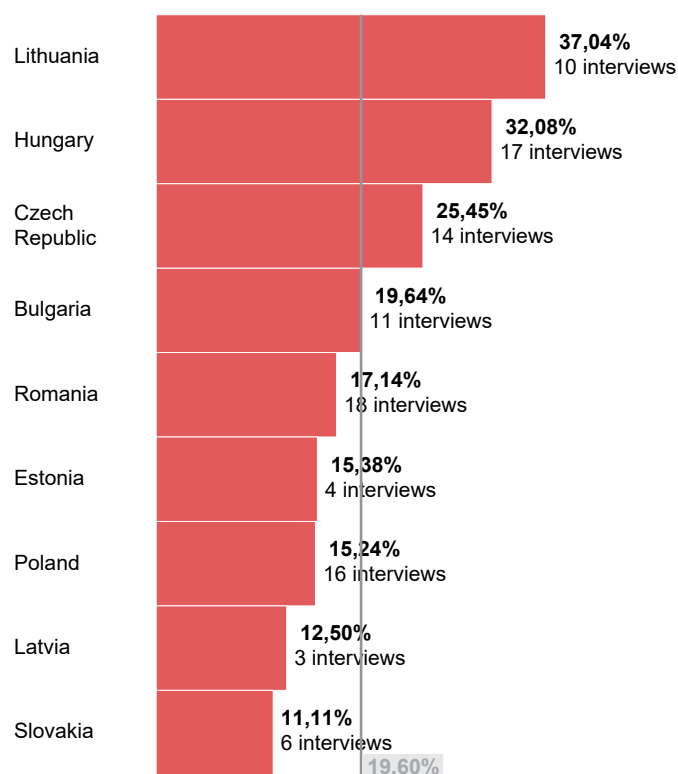
### GENERAL CONTEXT

Most CEE countries lag behind the EU average in terms of residential energy efficiency, with the notable exception of some Baltic States. The residential sector accounts for a large part of each country's energy consumption, approximately a third of it. While all the countries have national strategies for energy efficiency, they are generally not properly implemented and monitored, despite the fact that various funding bodies such as European institutions or other international organizations support CEE countries with numerous funding and innovation schemes to achieve higher efficiency in buildings.

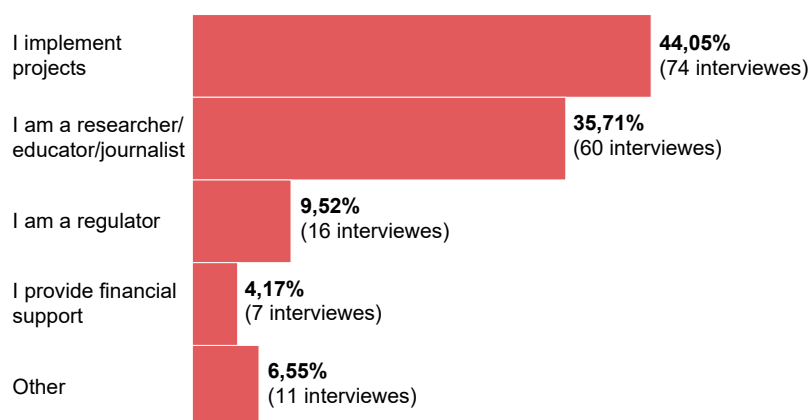
When analyzing the overall picture in the sector of Energy Efficiency in Buildings in CEE we observe that most countries have a very old infrastructure which leads to significant energy losses and high greenhouse gas emissions. We can observe that most of the buildings are between 30–40 years old in all countries (in Poland the situation is even more dire than the regional average, with over half of the building stock exceeding 50 years of age). Even though in all countries there are initiatives to insulate and make the buildings more energy efficient, the pace is quite slow, and it would take more than 30 years to fully refurbish all buildings. Statistics might be skewed, in some countries, by the high percentage of uninhabited building stock (e.g.: up to 20% of houses in Bulgaria). Demographic decline and the resulting decline in the heated living space in some countries in the region (e.g.: Bulgaria, Romania) have been responsible for the reduction of greenhouse gas emissions, and not good policy making or good governance.

The outlier in terms of the percentage of building retrofits achieved is Latvia, with almost a quarter of the residential building stock refurbished. In addition to focusing on existing buildings, in all countries there is a focus on the necessity to limit the energy consumption in newly constructed buildings, especially thermal energy, primarily through building norms and regulations. The Czech Republic also displays good scores when it comes to the percentage of the building stock that underwent renovations (a quarter of single-family houses and 55% of apartment buildings). In contrast, contrary to the general progressive state of the Baltic region, very few residential buildings have been renovated to date in Lithuania. Buildings with low energy demands are becoming cheaper (but statistics might be skewed due to the fact that, in some countries, the zero emissions building movement has been subsidized in recent years – e.g.: Slovakia) while providing high living comfort and contributing not only to the implementation of environmental policy, but also to reducing low emissions. Unfortunately, everywhere in the region there is a shortage of specialists who can design and construct buildings to such standards. The construction of nearly zero-energy buildings requires improved awareness and the development of skills of both customers, project designers, consultants and everyone else participating in the construction process.

The mapping exercise revealed that the highest share of specialists working in energy efficiency in buildings can be found in Lithuania, followed by Hungary and the Czech Republic. Also, in this field, the majority of changemakers works in project implementation, followed by researchers and journalists (Figure 5 & 6).



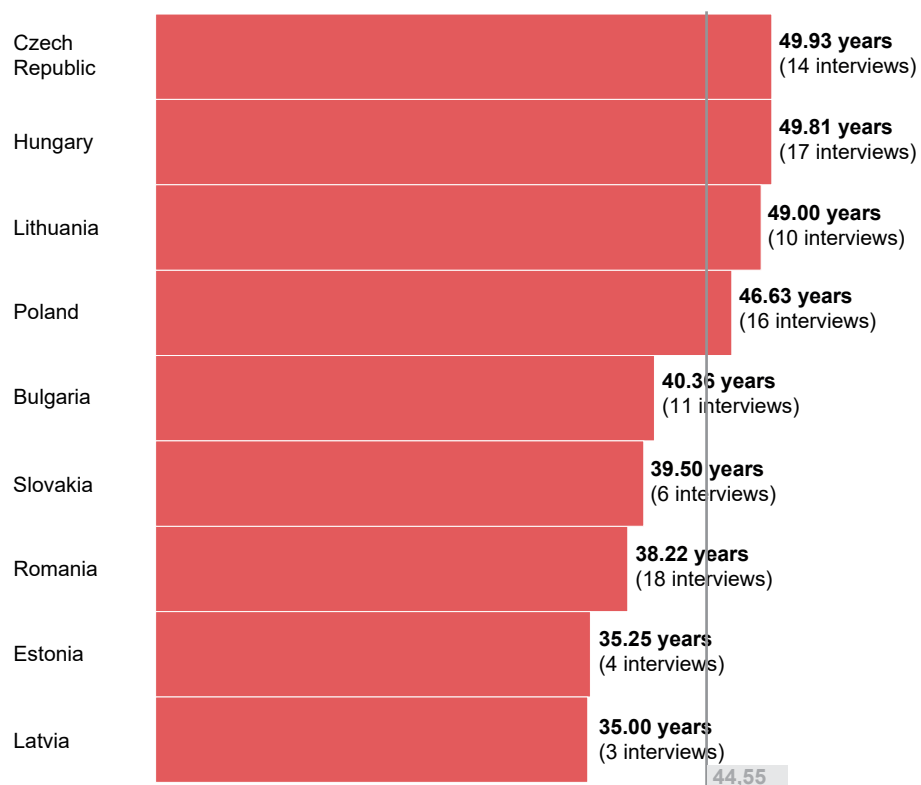
**Figure 5**  
Energy efficiency in buildings: Distribution by country



**Figure 6**  
Energy efficiency in buildings: Distribution by role of actors in the ecosystem

This sector is the most male-dominated – close to 70% of changemakers in the region are men, while only 30% are women. The highest male domination is in the Czech Republic, where 92% of the changemakers in this field are men and only 8% are women, while the most gender balanced pictures can be encountered in Romania (50% men, 50% women) and in Latvia (67% women, 33% men – with the caveat of Latvia's small sample size in this particular field).

The sector is also among the more senior ones in terms of demographics: the average age of all the changemakers we interviewed is 44,5 years old, while the average for all the fields we examined, including the transversal one, is 41,5 years old. The “youngest” countries in terms of the changemakers active in this field are Latvia, Estonia and Romania, while the “most senior” ones are Czech Republic and Hungary (Figure 7).



**Figure 7**  
Energy efficiency in buildings: Distribution by age



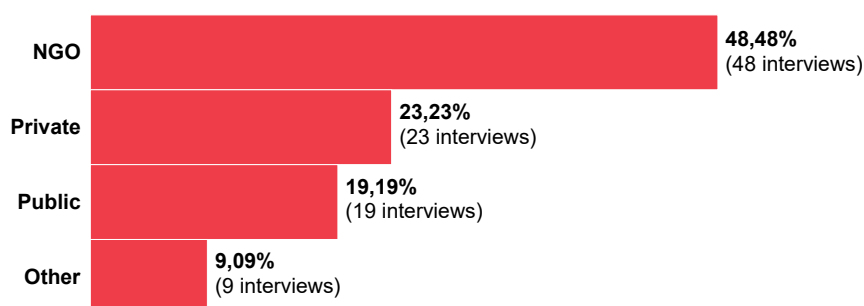
The relative seniority of the sector is confirmed by the average number of years of work experience in the field - 13 across the region, with higher averages in Czech Republic (19 years) and in

Hungary (18,5 years), while Romania and Latvia have changemakers with lower numbers of years of work experience in the field – 6 in Latvia and 8 in Romania.

## INNOVATION

Considering the high energy consumption, low energy efficiency, and the energy losses due to old infrastructure, the residential sector has a high potential for energy savings and greenhouse gas emissions reduction in all countries. In general, as with the other fields scrutinized, the private sector plays a central role in implementing environment related innovations in the buildings retrofitting

sector as well. In most of the countries from the region, the private sector is driving the public agenda when it comes to more ambition in the field of energy efficiency in buildings (promoting standards, financing schemes, organizing awareness raising events, etc.). This qualitative assessment drawn by the experts we consulted for this study has been confirmed by the network mapping we did in the region, as can be seen in Figure 8 below.

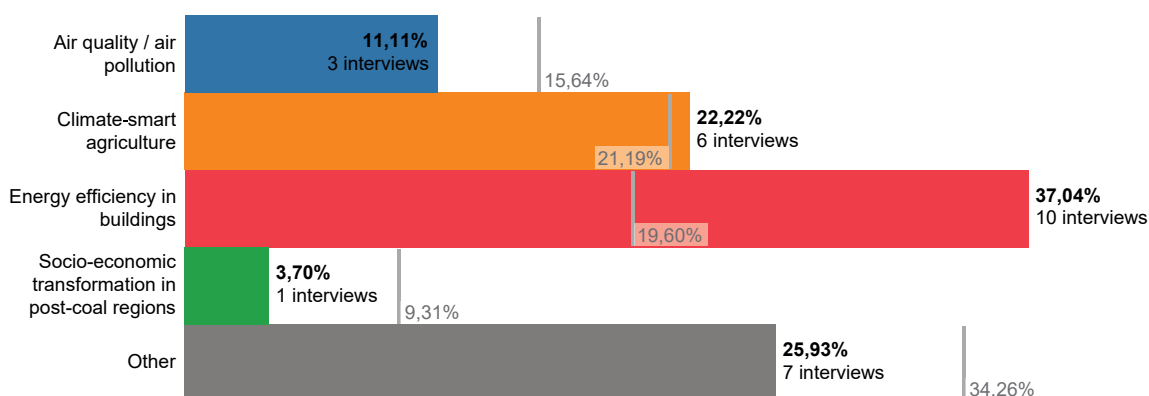


**Figure 8**

Energy efficiency in buildings: Distribution by type of institution the changemakers are active in

When it comes to innovation, Bulgaria, Romania and Poland rank their overall performance in terms of innovation and R&D being well below the EU average. In comparison, we can see a lot of green initiatives in Lithuania and Latvia, where energy efficiency in buildings can be regarded as the most prominent area of attention. New products are being developed in areas such as building materials and technologies for isolation of existing buildings. In order to tackle the issue of energy loss in buildings older than 30 years, Lithuania stands out with an initiative named

the Public House Energy Saving Agency. The program's main mission is to assist all those involved in the apartment renovation process: program administrators by developing technical tools and providing methodological materials; as well as residents by providing guidance and advisory services. Lithuania's general frontrunner position when it comes to energy efficiency in buildings has been confirmed by the network mapping analysis, which showed the field as having the highest number of changemakers in the country (see Figure 9 below).



**Figure 9**

Lithuania - Distribution of interviewees by primary activity sector



Accounting for the sample examined (a larger one in more populous countries and a smaller one in countries with less inhabitants), Lithuania is quite remarkable, with close to 40% of the climate innovation changemakers in the country contributing towards energy efficiency in buildings. The laggards, on the other hand, are Slovakia and Latvia, where less than 15% of the changemakers interviewed work in this sector – see Figure 5 above.

Two other innovative initiatives worth mentioning are from Slovakia and Estonia. The national project of the Slovak Innovation and Energy Agency (SIEA), called Green to Households, enables single-family and multi-dwelling buildings to apply for support in the forms of vouchers for the installation of small systems for the use of renewable energy sources. This program has also led to interesting horizontal economic effects; now, there are over 1000 authorized contractors for performing such energy savings/ renewable energy works, which is notable for a small country like Slovakia. The Interreg Project EFFECT4buildings from Estonia is currently developing, in collaboration with public building managers, a comprehensive decision-making support toolbox with a set of financial instruments to unlock investments and lower the risks of implementing energy efficiency measures (retrofitting, upgrading and deep renovation) in buildings owned by public stakeholders.

Other examples of private innovations can be found all throughout the region, from passive houses (e.g.: in Zielonki-Wies, Stare Babice municipality in Poland; Green Mogo – Energy Training and Advice Center in Romania; EFdeN in Romania – the two Romanian cases being complemented by a learning approach to energy efficiency) to agritourism facilities equipped at the highest technical standards globally when it comes to energy efficiency and renewable energy (e.g.: “Dom nad Wierzbami” in Poland), to applied research private institutions and start-ups (e.g.: Center of Energy Efficient Buildings, the micro-power plant Wave, the startup OIG Power, LIKO-S (the first “living hall” in the region) – all of these in the Czech Republic; Teacher’s Home, Seaplane Harbor, and several other demonstrative projects in Estonia). The hospitality industry, however, despite the positive agritourism example flagged above, is not raising up to its true potential when it comes to energy savings, innovation being generally driven by large hotel chains by group policy (e.g.: the Radisson group).

An interesting social innovation in the business sector is “The Green Office”, constructed by Eika in Lithuania, which encourages the rational use of energy in companies. Companies are invited to join the initiative and compete on a voluntary basis to save electricity each month and consume least on a yearly basis (accounting for office size and headcount). In Bulgaria, “green office” initiatives and certifications are also gaining popularity.

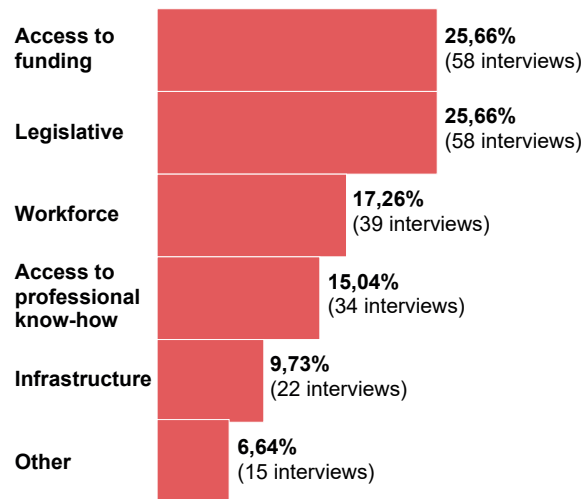
Overall, in terms of numbers of changemakers in the region, out of the four fields we examined, energy efficiency in buildings is the second most represented sector, with 99 interviewees identifying themselves as changemakers in the energy efficiency field. Presumably, many of the largest category – the so-called “transversal” one – also touch on energy efficiency, but also on other fields.

## PUBLIC OPINION

Public discussions on energy efficiency are still rarely connected with climate (despite the fact that, on average, buildings in the region account for a third of the countries’ carbon emissions, with worst averages for countries that still use significant amounts of coal for heating – e.g.: Poland, Czech Republic, Bulgaria, etc.) and mainly driven by presumed financial benefits for households, in all countries surveyed. In most of the countries in the region there is a clear lack of knowledge when it comes to energy efficiency improvements after retrofitting. Inhabitants are not aware of the energy they’ve saved after retrofits, neither on the cost-benefit balance of retrofits. In general, the public opinion in the majority of countries lacks confidence in the specialized stakeholders involved in building retrofits – builders, quality of reconstruction, funders, etc. People do not realize that a house is a single engineering unit, the information how much energy can be saved by installing one or another energy saving device is not accessible to the end user. In the case of savings, no clear information is provided as to what savings have been made through the implementation of one or another measure. Distrust, according to experts, is more prevalent in Poland, Latvia, and Lithuania, while in Slovakia, for instance, the overall feeling is that EU funds dedicated to building retrofits have had very good results both in terms of savings and emissions reductions (i.e. in Slovakia estimates show that all residential buildings will

be retrofitted by 2043, assuming the current rate of renovation is upkept, hence the reported “enthusiasm” of the population when it comes to building retrofits). A key question for the entire region, and in particular for the Baltic States and for Visegrad countries is whether local public authorities or financing institutions will find the effective channels to compensate for the gradual reduction of available EU funds in this area, given

the region’s overall economic progress. This finding, which was pointed out by the experts we consulted for this study, has been confirmed by the network mapping analysis we performed. A quarter of the changemakers we interviewed pointed out access to financing as a significant barrier to advancing the field of energy efficiency in buildings, as can be seen in Figure 10.



**Figure 10**  
Barriers – Energy Efficiency in Buildings

When it comes to opportunities for greater action in the field of energy efficiency in buildings, the changemakers we mapped point out primarily the sense of urgency over climate action (close to 20%), but also the untapped future potential of the sector (19%).

There is a high contrast between Poland and the Czech Republic. In Poland, the population is to some extent in climate denial, although declaratively they support the diversification of energy sources and the reduction of energy consumption, while in the Czech Republic the population is more aware in regard to the impact of their daily actions. A poll by the Public Opinion Research Center (2017) from the Czech Republic states that 55% of the population conserves energy and water for environmental reasons at all times or often. The general population in Hungary is also rather skeptical when it comes to energy efficiency measures and 90% of them believe such investments are the state’s responsibility and not the responsibility of private owners. However, over 15 innovative initiatives, all of them private, are active in the market (see Annex 3 on Hungary).

Also, in Estonia the topic is of great interest to entrepreneurs through conferences and information days, and the movement has reached new heights recently as several illustrative buildings (Teacher’s Home, Seaplane Harbour and more) have been built. There is quite a significant difference between public opinion in Estonia – much more progressive – and the one in Latvia, which is reportedly more climate skeptical and quite unsupportive of new technologies (e.g.: wind farms).

### PUBLIC POLICIES

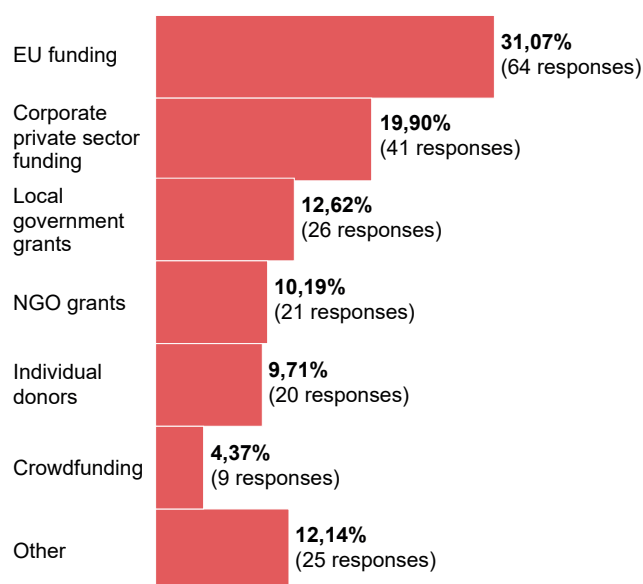
Energy efficiency is not a significant issue for state policy in none of the studied countries, especially in terms of real implementation of measures and going beyond “strategy and planning.” This happens despite the significant EU support for this topic (over 30% of the changemakers we interviewed in the network analysis identified EU funding as the biggest opportunity they know of in the field of energy efficiency in buildings – see Figure 11 below) and despite the fact that residential buildings have the highest potential



for energy savings all across the region. Corporate funding, not seen in general as an important source of funding for any of the other fields, comes second to EU funding when it comes to energy efficiency in buildings. However, some countries have very ambitious targets when it comes to near-zero energy buildings: for instance, the Czech Republic has imposed that, as of 2020, all new buildings will have to meet the target of heating consumption in the range of 30-70 kWh/m<sup>2</sup>/ year.

Policymaking, in addition to not being effective is also sluggish – experts point out to energy efficiency laws being adopted in over two years, with “endless conversations” surrounding the process. There are undergoing initiatives in all countries involved in the report, but unfortunately none of the countries surveyed will reach the committed savings on time, despite the fact they

all committed to reducing consumptions under the existing EU policy framework. In general, public authorities in Central and Eastern Europe (with the exception of the Baltics) are not ambitious enough when it comes to energy efficiency policies, experts believe. Among the important initiatives, it is worth mentioning a large scale government initiative recently implemented in Romania: the Green House for PVs is a subsidy program for prosumers who can get funding for installing photovoltaic panels on their homes and can connect to the grid. Until now, almost 30.000 prosumers were approved for funding, but the program is unfolding with major issues on the way: further legislative impediments and even criminal investigations into fraud accusations. Similar subsidy programs, such as New Green Savings from the Czech Republic resulted in even more impressive results: the construction of 1,800 new buildings in a passive energy standard.



**Figure 11**  
What do changemakers in the energy efficiency in buildings see as funding opportunity

The dire state of energy efficiency in buildings is ultimately responsible for high energy poverty levels in the region (especially in Romania, Bulgaria and the Czech Republic). Public opinion regards energy poverty as important and households report thermal discomfort and high expenditures on heating and cooling, in both rural and urban areas, yet public policy has not kept up with citizens’ concern, and energy poverty is addressed primarily with short-term financial remedies and less with structural, building-related measures.

In the Baltics, in contrast to the rest of the region, where private initiatives dominate the discourse and the agenda on energy efficiency in buildings, public authorities are frontrunners in this area. Academic institutions in the region (e.g.: Riga University, Tallin Technical University) in the Baltics are also more intensively involved in this area. Funding is also better organized in the Baltics, with dedicated financial institutions handling the money disbursement for energy efficiency in buildings (e.g.: Altum, in Latvia).

An interesting funding stumbling block is encountered in Lithuania, where, despite effectiveness and cost-benefit balance of partial renovations, the state only supports full renovation works; in other countries, government funding also supports partial renovations (e.g.: Hungary, Romania), but experts maintain that, on the contrary, full renovations should actually receive more support.

An important challenge going forward, in addition to the continuation of financing/ financial mechanism question described above, is whether policies are elaborated and implemented top-down, or bottom-up, and thus owned by local communities and local governments. While such an approach is desirable, it has been rarely put in practice in the region until now, bringing even more frustration to the stakeholders involved in this field.

## 2. Climate-smart agriculture



### GENERAL CONTEXT

There is little mainstreaming of climate aspects in agricultural policy; it is by far the least approached field from a climate perspective, despite the sector's contribution to GHG emissions of up to 10% of the countries' overall emissions. In general, the contribution of agriculture to GDP is decreasing in the entire region (even though in some countries, like Lithuania, it still plays a major role), which may explain why it's not at the forefront of innovation. In the entire area, we can clearly spot a division among two types of agriculture. The greatest part of the sector (more than 50% in all countries, with much higher percentages in Romania and Poland) is dominated by large-scale monocultures, mostly for export,

while the remaining, a smaller part, is more focused on smallholding farms, unfortunately lacking competitiveness. The presence of smallholding farms is more visible in countries like Bulgaria and Romania (in Romania, despite the fact the overall share of small farms in the farming sector is minuscule, there are several thousands of such farms), while in the rest of the countries surveyed backyard cultivation has strongly declined and almost vanished, with Slovakia being, for example, completely dependent on imports. Nowadays alternatives are springing up in the field, partly driven by climate and sustainability and with the support of targeted EU funding. However, the term „climate-smart agriculture” is very seldomly used in the region (in many countries, even a proper translation of



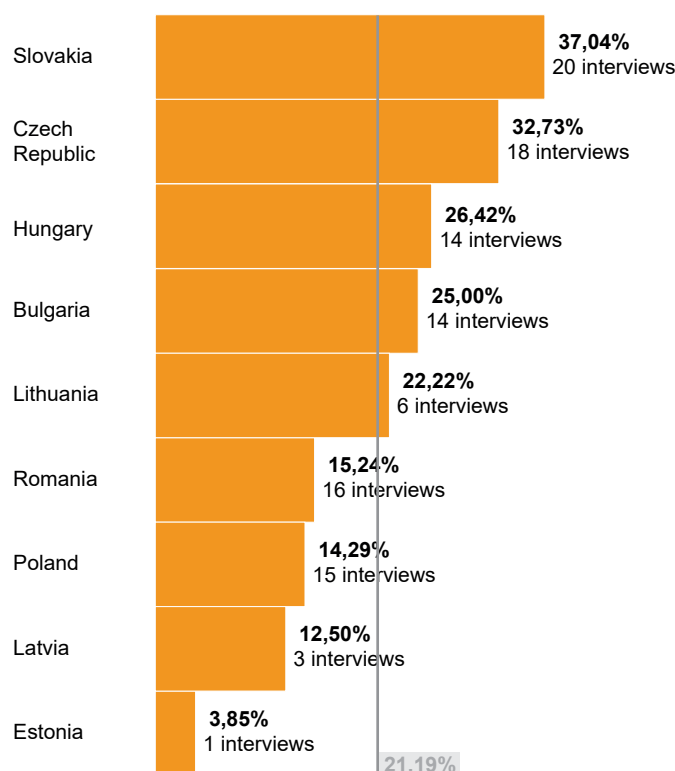
it is missing). Paradoxically, until now EU funding has contributed negatively to nurturing smaller, climate-friendly initiatives, experts believing that the Common Agricultural Policy (CAP) led to the concentration of farms in a small number of hands, large landowners not being very climate-preoccupied. The recent greening of this policy could have potentially mainstream climate-friendly practices even among large actors, but since it was implemented since around 2013, the current results are not too optimistic.

The Lithuanian agriculture sector seems to be the most affected by climate change in Europe. Lithuanian farmers suffered over €90 million in damages due to extreme weather in 2018 and the country's forestry services were, in 2019, on the highest fire hazard alert recorded in history. Unusual droughts, nonetheless, have significantly affected agriculture in the entire region. The Slovak Republic has been recently successful in organic farming with an average area of 9.6%, compared to the EU28 average of 7.03%, while in the Czech Republic, more than 4,200 farmers farm in organic way, accounting for 12% of the total agricultural land. These percentages are much lower, although steadily growing, in Bulgaria and Romania.

There is a high level of pesticide use and other chemical compounds in all the investigated countries. The use of chemicals is affecting the groundwater and the soil quality, reducing its capacity for organic farming.

Climate-smart agriculture is the field that is best represented according to network analysis we performed, with a total of 21,19% of the changemakers we interviewed, followed by energy efficiency in buildings (19,6%) and air pollution (15,64%).

On a country by country basis, Slovakia has most of its climate changemakers in the field of climate-smart agriculture (37%) and Czech Republic (33%), these countries being followed by Hungary, Bulgaria and Lithuania – all showing shares above the regional average (21%). Climate-smart agriculture is the least represented in Estonia and Latvia. Surprisingly, both Romania and Poland are under-represented with only 15% of the total of the interviews, despite the fact that the rural area it's predominant in both countries. See Figure 12 below.

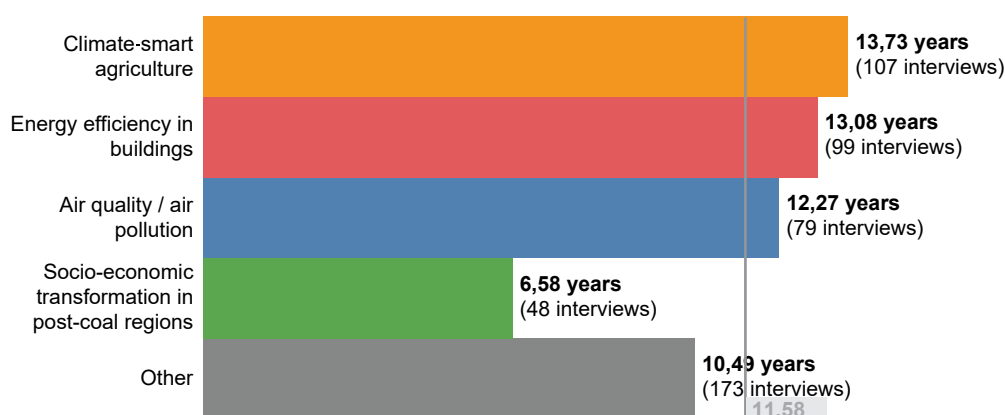


**Figure 12**  
Distribution of changemakers in the climate-smart agriculture sector by country

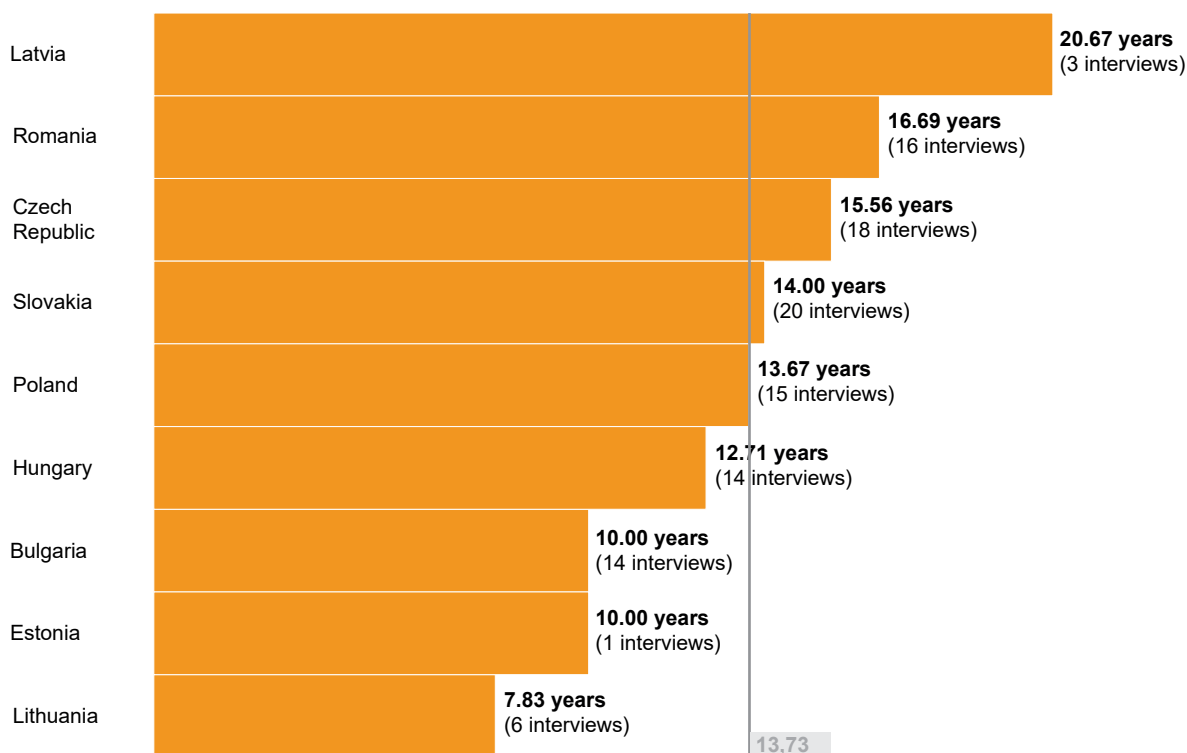
Also, in the climate-smart agriculture field, we can see the longest work experience in the region, followed by energy efficiency in buildings – see Figure 13 below. Obviously, this correlates with the average age of changemakers in this sector, which is highest from all the sectors (an average of 45 years, compared to a general average all of 41,6 for all the sectors we examined). The two outliers are Poland (with an average age of 52 in the climate-smart agriculture sector) and Lithuania (with an average age of 36).

In the sector, the changemakers with the highest number of work experience are to be found in Latvia, Romania and the Czech Republic, while the ones with the lowest in Lithuania and Estonia (see Figure 14 below).

From a gender-demographic perspective, the field is dominated by men (65,42% of the changemakers identified), while women account for only 34,58%. In Hungary and Poland, in contrast to all other countries in the region, women outnumber men in the field of climate-smart agriculture.



**Figure 13**  
Average number of years of experience by sector



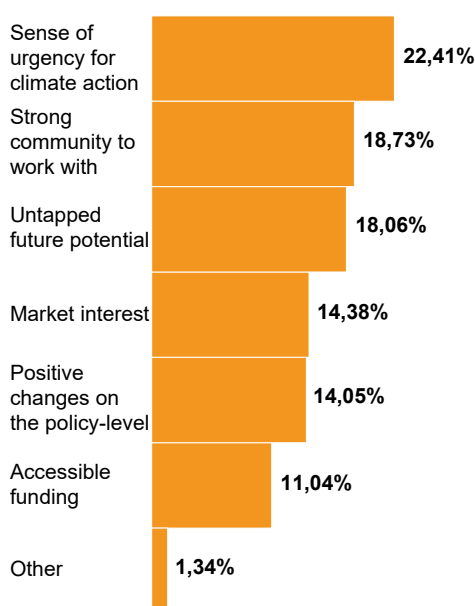
**Figure 14**  
Average number of work experience in the climate-smart agriculture sector

## INNOVATION

The impact of climate change is acknowledged by both small farm holders and large commercial farms. In terms of innovation, there are 2 directions: technological innovations (e.g.: drop irrigation, precision agriculture – particularly researched in Lithuania, no-till agriculture, use of effective microorganisms, biochar, aerated compost-tea, agroforestry) and social innovations (community supported agriculture, consumer groups, farmers coops, eco-communities, festivals, incubation farms, etc). Nevertheless, innovation in climate-smart agriculture remains underutilized – for example, Latvia has a small

number of institutions working in the innovation field, and research activity is still slow also due to low investment in R&D.

The relatively diverse and high number of social innovations in this sector make for an interesting opportunity for the field's future development. In contrast to the other sectors we examined and identified changemakers in, in the sector of climate-smart agriculture, the reliance on a strong community is seen as the second greatest potential opportunity, after the sense of urgency over climate action which is seen as the number one driver in all the sectors we looked at – see Figure 15 below.



**Figure 15**  
Opportunities Identified by Changemakers in Climate-smart Agriculture

The private sector plays an important role in producing smart agriculture solutions. In Romania there are some worthy initiatives from big players like Bayer, Corteva, KWS that invest in research and development of hybrid seeds tolerant to adverse weather conditions, while in Lithuania scientific work focused on precision fertilization technologies that allow to save fertilizers and to only fertilize the proper amount of substances on the right types of plants. There is a very notable social innovation initiative in Hungary, where a collaboration emerged between national parks stewards and herders in order to maintain biodiversity and eco system balance (e.g.: in the Hortobágy and the Tisza river basins). In Poland, the Stanislaw Karlowski Foundation's Rural Project implements biodynamic practices in

agriculture on an impressive size of over 1,900 hectares.

On the other hands, in Czech Republic, Brno's start-up World from Space analyzes current satellite data that can be used to continuously monitor the state of the fields. The results are processed into regular information on vegetation, drought, infrastructure or economic activities, for example, to farmers or cities.

Business start-ups in the field (particularly focusing on IT and agriculture) are more prevalent in the Baltics (e.g.: E-Agronom in Estonia, Agricloud in Latvia), fueled by a dynamic academic environment which focused in this area. In general, across the whole area, academics and

researchers are better represented in the climate-smart agriculture field than in others (37% of all changemakers identified in the sector).

A big question is whether, and to what extent, technological innovations will be made available and affordable to small(er) landowners. Big players are investing already in piloting such technologies and are using specialized consultancies and start-ups to support them, but from a stakeholder constellation and public policy perspectives it will be important to figure out the means for technical innovations to breed even bigger polarization in the field.

## PUBLIC OPINION

In general, in the entire region, there is a considerable lack of education on environmental topics - agriculture included. Farmers are even less aware on these issues. Agriculture in general has been on the fringe of public opinion preoccupations for many years, but the trend is general changing starting from young(er) consumers' concern over climate and health. The younger population is in general more inclined to adopt climate-smart solution in any field, including in the agriculture one, while traditional agricultural professionals are excessively targeted by ads and representatives of companies selling agricultural supplies, such as fertilizers, pesticides and machines. Unfortunately, these marketing initiatives do not draw farmers' attention to the negative environmental effects of the improper use of their products. As a result, many farmers do not understand that there is a need to reduce the impact of agricultural production on nature. The public opinion generally believes that the agriculture sector must move towards sustainable environmental management, but the trend is not homogenous in the region and many countries report big polarization (e.g.: Romania, Latvia). This movement generated a higher demand for food products with different levels of added value, such as organic food, regional and local food, food obtained through direct sales (yard sales, farmers' markets) or higher quality food and non-traditional food (quality meat products, steaks, quality cheeses, including goat and sheep, etc.). Bottom up initiatives focusing on food sovereignty, permaculture and general climate awareness are steadily developing in the region. At the same time, in some countries the general public, but also politicians, believe that climate policies will

negatively affect the agriculture sector from (e.g.: Latvia). Latvia is nonetheless an outlier; even in more conservative and poor countries in the region (e.g.: Romania, Bulgaria, Hungary) all stakeholders recognize the negative climate-related effects over agriculture.

## PUBLIC POLICIES

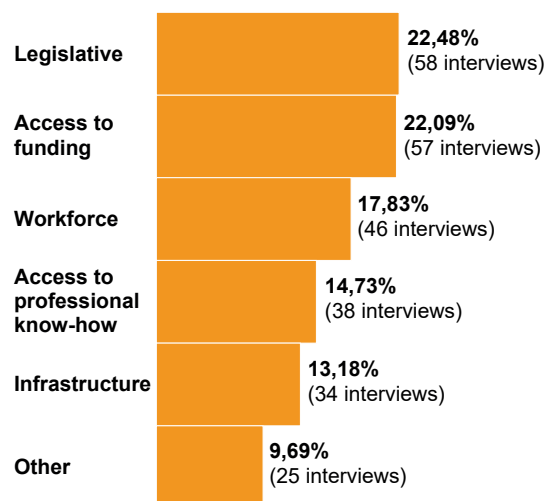
In Hungary, compared to the rest of the countries there is an expressed willingness to promote progressive climate mitigating practices through EU funded national subsidies, both in terms of technological and social innovations. However, access to these funds is reported to be burdened by bureaucratic and non-transparent procedures applicants face. Unfortunately, this is a common practice which also affects other countries from the region.

Interesting and diverse private actors (consulting companies, NGOs) are mainstreaming climate-smart agriculture in Bulgaria (e.g.: Greenpeace Bulgaria, Ecological Farming Unit, AgroHub.BG, Cleantech Bulgaria), in contrast to other countries, where the number of actors and the amplitude of their intervention is much lower. In Bulgaria, experts maintain that national agencies also play a role at the level of awareness raising on climate-friendly agriculture – e.g.: the National Agricultural Advisory Service (NAAS).

The Czech Republic has created a set of clear policies in order to achieve its climate targets in the agriculture sector in due time: Drought Protection Concept for the Czech Republic, National Drought Coalition, Strategy of the Ministry of Agriculture of the Czech Republic for 2030, Research and Development and Innovation Concept of the Ministry of Agriculture 2016-2022. Unfortunately, on the practical level, however, the fulfillment of these basic strategic documents encounters opposition from large agrarian enterprises. Still, the Czech government is moving ahead, apparently, planning to regulate monocultures heavily – it's planned that the cultivation of an area with one crop will be limited to 30 hectares only from 2021.

Our network analysis showed, very interestingly, that climate-smart agriculture is the field for which, unlike the others, the main obstacle changemakers in the field identify is not access to funding, but a legislative one. (Figure 16)





**Figure 16**  
Barriers identified by changemakers from the climate-smart agriculture sector

### 3. Socio-economic transformation in post-coal regions



#### GENERAL CONTEXT

Romania and Bulgaria are still coal dependent regions, and the corresponding socio-economic transformation in post-coal regions is something current decision-makers try to neglect or at least to postpone as much as possible, despite the increasingly more clear economic disadvantages of coal. In contrast, in Poland's Lower Silesia the transformation already took place, but new mines are even now being planned. The situation is not too different in other countries of the region. In Hungary, for example, Northern Hungary (NUTS2), is currently considered an industrial crisis region; any coal-adverse discourse is hampered by the climate denial strategy of the national government. Lithuania, on the other hand, is becoming more dependent on energy imports (many based on coal), as the Ignalina nuclear

power plant is being decommissioned. Despite this current situation, Lithuania is among the leaders in the development of renewable energy in the EU: together with Denmark, Estonia, Spain and Portugal, it is among the five most ambitious countries in the EU when it comes to renewable energy targets for 2030.

The Czech Republic is the third largest user of coal in the electricity sector in the EU; its 48% share of electricity produced from coal equates to more than double the EU average (20%). The three coal regions of the Czech Republic have historically specialized in traditional industries with an important role for heavy industry, mining and energy. For these reasons, the economic transformation of these regions was more demanding, difficult and only partially successful. In contrast to Slovakia, where unemployment

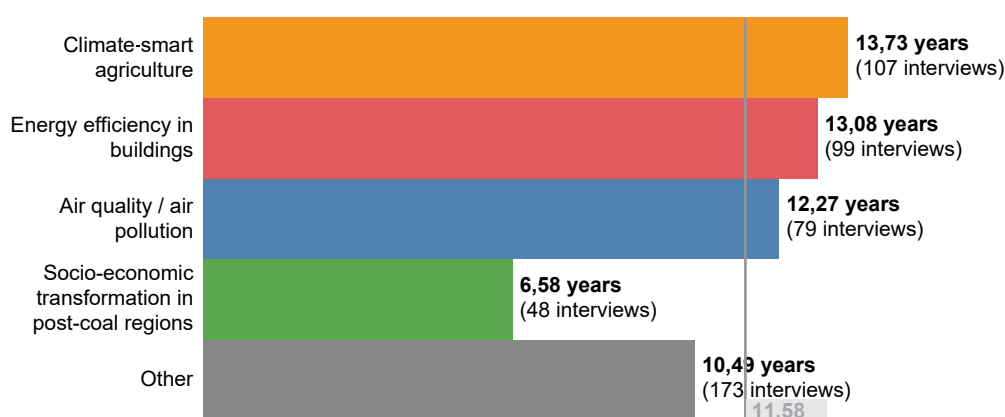
figures in coal regions are lower than the national average, in Czech Republic (but also in Romania) poverty in these regions is higher than the national average.

In Estonia, over 90% of CO<sub>2</sub> emissions come from burning oil shale for electricity. The Estonian electricity grid is well connected with the country's neighbors, and large amounts of oil shale energy are for export, but unfortunately, the oil shale industry seems to provide very little economic benefit compared to the massive pollution toll as the costs of wasted resources, damage to health and environmental destruction stay in Estonia. In addition, oil shale is able to maintain its competitiveness due to subsidies. Most likely, a market-based transformation will take place, with the steady, but intense rise of coal.

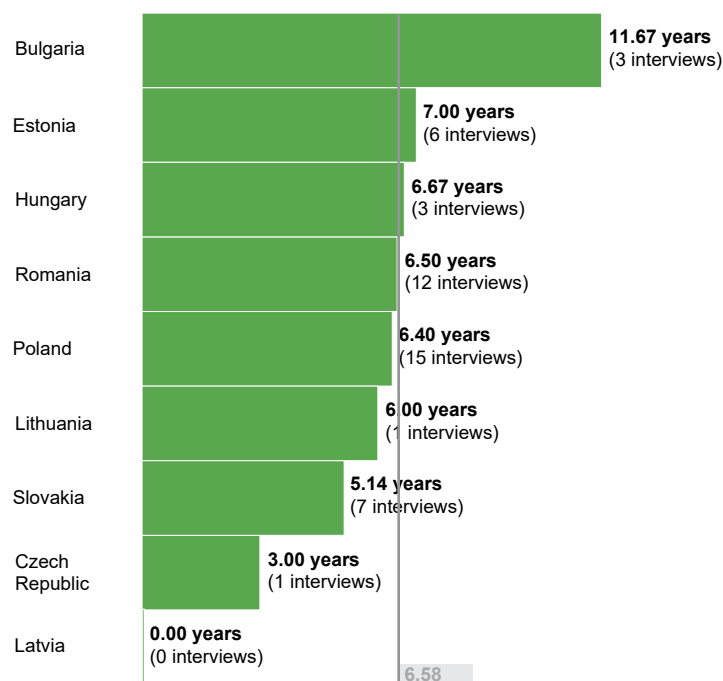
Overall, there is obviously a very contrasting state of play between countries in the region with local coal production and countries without; in the later, renewable energy development picked up a lot faster.

Our network analysis showed that this sector exhibits the lowest average number of years of work experience from all the sectors we looked at, with an average that's twice lower than the one encountered in the field of climate-smart agriculture – see Figure 14 below.

Bulgaria has more experienced changemakers, while Slovakia and the Czech Republic have the least experienced ones – see Figure 17 below.



**Figure 13**  
Average number of years of experience by sector



**Figure 17**  
Average number of work experience by country in the post-coal transformation sector

## INNOVATION

The lack of open discussion and limited recognizing from the public on the importance of the issue keeps innovation away from coal dependent regions both in terms of industrial transformation and vocational training of people concerned.

Renewable and alternative energy research and development is concentrated in the hands of big corporations, while innovations aiming at a post-coal future have been achieved at a rather small-scale, initiated by small developers/researcher groups, being seemingly very difficult to implement. A point in case is the difficult process MTVSZ as experienced by Hungary when it implemented the recommendations for post-coal regions.

The Lithuanian “Ignitis,” one of the largest energy groups in the Baltic States, has established the Centre for Energy Innovation with the purpose to analyse and utilize data which is expected to lead to new energy innovations and services. Meanwhile, in Estonia, solar energy is booming and is expected to intensify after 2020 due to the requirements for near zero-energy buildings. These transformations have been obviously easier to implement in these countries, where coal plays almost no role in the local economy.

In the Slovak Republic there is a big transition to successful closure of the mines through a gradual process. Even though the regional position of the mining industry has been steadily declining, it is still the economic backbone of the region. The project “Action Plan for Transformation of Coal Mining Region Upper Nitra” consisting of a strategic document guiding the whole coal transition process, is currently under discussion by stakeholders, and it has been supported by activities of NGOs Friends of the Earth and CEPA. These initiatives are positive examples of how to mobilise the local community and key actors (e.g.: SMEs), through presentations and discussions which can lead to achieving systemic change.

Energy cooperatives, prevalent in some countries (e.g.: Czech Republic, Poland) are gradually spreading to other countries in the region (e.g.: Romania, where the first renewable energy cooperative has opened in 2019). Unfortunately, very few of these innovations are located in coal

regions proper, one reason being the general low education of the population living in these areas.

## PUBLIC OPINION

In countries like Romania, Hungary, Bulgaria and Poland, the local public opinion in regards to the transformation towards renewable energy is not very positive, as people are afraid that they might lose their jobs. In comparison, in Slovakia the qualitative evaluation of the public discourse indicates a positive image among the general population in regards with the closure of coal mines. However, Poland seems to be the only country where the public opinion on post-coal transition has been polled, including with a direct sampling of people in coal-affected regions. Very interestingly, 59% of sector employees in Silesia believe that their skills will continue to allow them to be employed even under coal shutdown conditions. Public opinion at local level contrasts heavily with experts’ estimates: for example, the World Bank concluded that, in Poland, the coal regions will not suffer at all as heavily in terms of employment should the transition be finalized, as it’s been previously thought.

Everywhere in the region, with the notable exception of Slovakia, people living in coal dependent regions strongly oppose the phasing out of coal-related energy and see energy transition as a threat to the way they earn their living. In contrast, in Lithuania and Latvia (which do not have coal mines) the transition is witnessed positively. In Czech Republic there is hardly any discussion about managing the transition to climate-friendly energy or about the real social, economic and environmental costs of continuing in the current direction.

Public opinion in capital cities, away from coal-dependent regions, is often much more favourable of the transition, which is why experts believe that in the absence of proper management of the transition process will lead to dangerous social polarization. Bottom-up approaches are needed everywhere in the region.

## PUBLIC POLICY

With increasingly ambitious EU climate targets, the transition to a low carbon economy is likely to accelerate over the coming decades. The EU already offers various sources of funding which coal regions can use to facilitate this energy

transition and mitigate the consequences of the affected workers. Between 2021 and 2027, several sources of funding will continue to be available, ranging from social funding for market reiteration and job search, investment opportunities in the energy and climate adaptation sector, and research into new clean technologies. However, only a small minority of actors on the ground seems to be interested – and capable of accessing them.

Despite the availability of such funding, there is a lack of real projects that aim to facilitate the energy transition in countries like Romania, Bulgaria, Hungary and Poland, where politicians utilize the existing – and considerably strong – “coal-nostalgia” for political gains. This legitimizes the opening of new (lignite) mines, like in Poland, even though no other new openings are foreseen elsewhere. Experts argue that new openings are only beneficial on the short run for the investors, while deteriorating air and water quality in local communities.

Mainstream political parties and decision-makers seems to be on maintaining the dominant position of coal in the power and heat generation, and not on carrying out a just transition. Politicians do not realistically plan any coal phaseout in Romania, yet they are timidly trying to make steps in the right direction, without talking about them too directly – e.g.: the current (yet stalled) plan to retrain 5000 coal workers for jobs in the renewable energy sector. Politicians’ discourse is also slowly, slowly changing in Bulgaria, too, in face of coal’s imminent decline. The politicians’ and actors’ perspectives in Romania, Bulgaria, Hungary and Poland contrasts with the approaches in Slovakia, where no relevant political actor is currently questioning the decision to discontinue the coal mining subsidies. As can be seen in Figure 18 below, the overwhelming majority of changemakers active in the field of socio-economic transformations in the post-coal areas are from the NGO sector.



**Figure 18**  
Distribution of interviewees by the legal status of the organization they work for, in the field of socio-economic transformation of post-coal regions





## 4. Air pollution

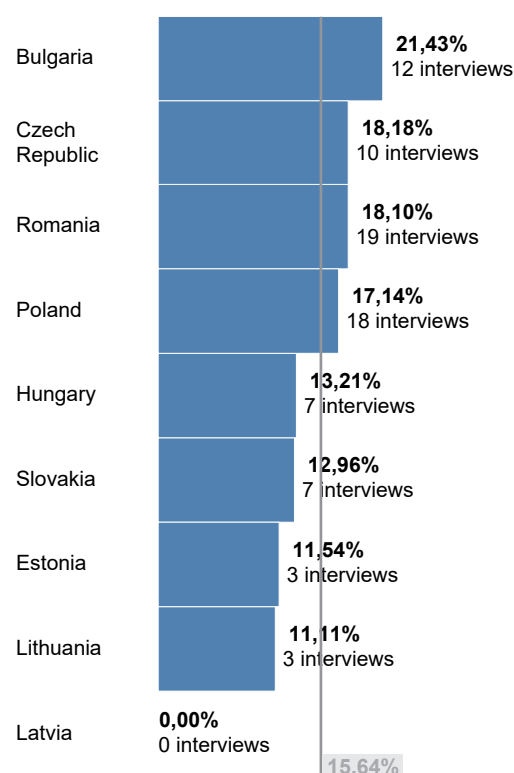


### GENERAL CONTEXT

The most important sub-area in terms of public traction, related to the wider dimension of climate and environment, seems to be air pollution, in all countries sampled. Bulgaria and Poland are most innovative when it comes to citizen participation in air quality monitoring. In Bulgaria, citizens adopt their own monitoring station via Airbg.info, while in Poland schools are actively involved in this movement. At the same time, while in Bulgaria citizens' interest on this topic is increasing and expecting to shape the political arena, in Poland, despite the fact the country is worst hit by air pollution (with detrimental consequences for healthcare), one out of three Poles does not see the issue as relevant. In Bulgaria, where both citizens and local authorities have been more involved, there is also high awareness on the consequences of air pollution: close to 15,000 premature deaths attributable to air pollution are reported each year. In Poland, the figure is staggering: 45,000 premature deaths per year. In smaller countries (e.g: Slovakia) less deaths are attributable to air pollution (around 3,000), but figures are still worrisome.

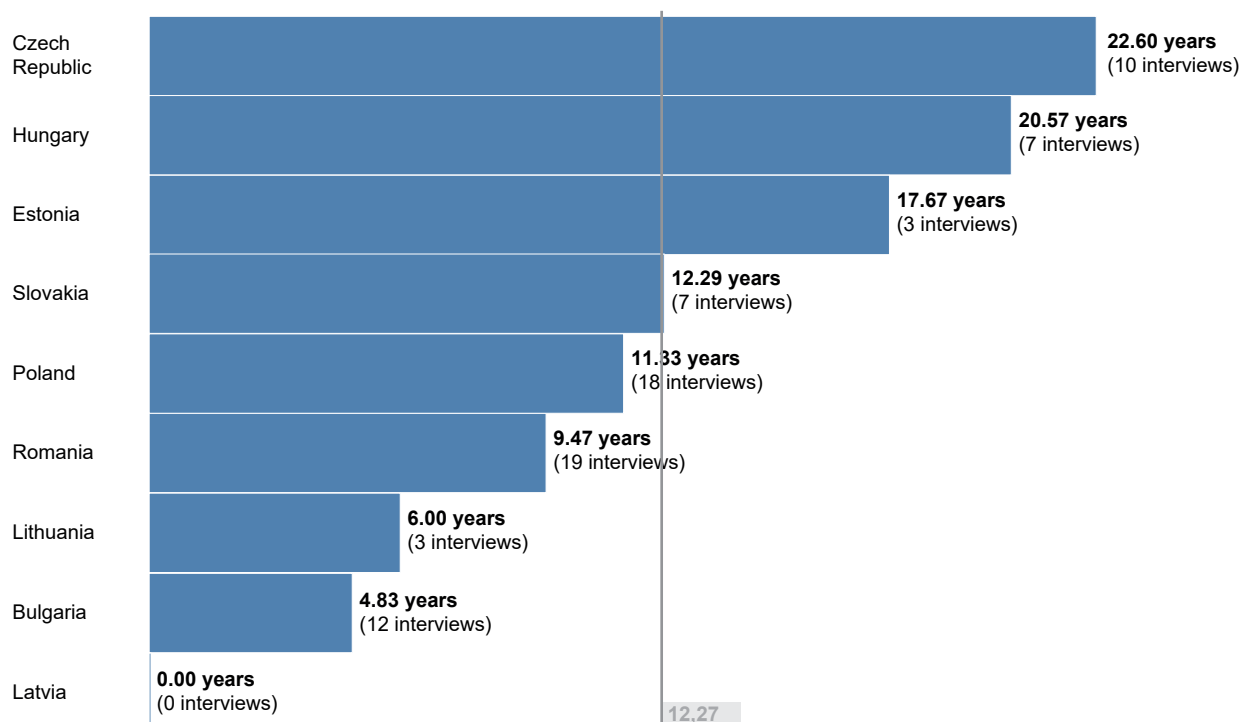
In Bulgaria we can also find most specialists in the field even though this field has only 4.8 years of experience in the country. Bulgaria is followed by

Czech Republic (18%), Romania (18%) and Poland (17% regional average).



**Figure 19**  
Distribution of interviewees by country in the  
Air Quality/ Air Pollution field





**Figure 20**  
Distribution of interviewees by number of years of work experience in the Air Quality/ Air Pollution field

Low air quality is tightly connected to energy poverty and to the way people heat themselves in wintertime: using coal and wood, or even burning waste (e.g.: Romania, Bulgaria, Poland, Czech Republic, etc.). In Hungary, very worryingly, researchers point out to a big gap in education: Hungarians burn waste for heating irrespective of educational or financial background (only a handful of educational and awareness raising activities over this issue are reported). The second main cause of air pollution is diesel usage outside cities and heavy traffic inside cities.

All countries from the region have very poor air quality with Poland leading the way - the worst air quality in Europe, while Hungary has been estimated, according to some sources, as second worst in terms of air quality in the world after China.

The two least polluted countries are Lithuania and Latvia, but even in these two countries, the air quality is low in big cities. An important reason for this situation is the lack of public awareness of the health effects of waste incineration, low quality fuel or old and broken cars use, as well as the scale of energy poverty in the region. A further important reason is pollution flowing cross border

from neighbouring countries, namely Poland; Polish air pollution accounts for half of the air pollution in Czech Republic, too.

## INNOVATION

As a result of a growing interest for data on air quality, there have been recent developments on the innovation side. In Romania, for example, URADMonitor develops air monitoring sensors for the general public while in Bulgaria, Airbg.info enables citizens to build or adopt their own sensor station and to connect it to the platform, which provides a real-time data on air quality in Bulgaria and other countries. In Latvia, for example, several CO2 monitoring devices have been developed by at least three independent businesses. One of them had been facilitated by business incubator in Valmiera, others are without identified state support. In Estonia, an abundance of government-owned and privately-owned sensors are monitoring air quality both in urban and in rural areas. See Annex 9 on Estonia for a detailed enumeration of startups and innovative, cleantech actors in the country.

A very interesting initiative is happening in Poland - The Educational Anti-Smog Network project.

Schools participating in the project are equipped with air quality meters, and the measurement results are made available online and presented on school displays. This enables students, teachers and the local community to monitor air quality live and plan activities accordingly.

Also, in Czech Republic we can mention a couple of innovative projects that aim to improve air quality: CLAIRO in Ostrava, which has been planting trees in urban spaces, Dustee, which has developed a device that measures dust levels in the air by Using IoT (it processes sensor data and can recommend where to place air purifiers) and World from Space, which also analyzes the air quality, according to satellite images and has completed a project in the city of Pilsen.

Traditional environmental NGOs in the countries surveyed are significantly shifting their focus towards air pollution, after many years of lack of activism and solutions-driven approached over this topic. While this may pave the way for more activism, a solutions-based approach has originated in the business sector and in business associations, many technical innovations being „imported” from Western Europe. The interventions of the Hungarian Masonry Heater Builders’ Association (MACSOI) and of the Environmental Wood Heating are notable and could, hopefully, permeate other countries in the region as well (mainly Romania and Bulgaria).

## PUBLIC OPINION

Public authorities have long been blamed for lack of action on this topic and for failing to develop and implement proper strategies to reduce air pollution in all countries. Existing public policy documents are criticized both by experts and the general public for their limited ambitions. In Romania, two NGOs, Optar and 2Celsius, initiated a legal lawsuit against the City Hall of Bucharest for failing to guarantee the right to a clean environment for people living in Bucharest. In Bulgaria, 52% of people consider air quality the most important environmental issue in the country, placing Bulgaria second after Malta in the EU28. On the contrary, in Lithuania and Latvia, where there is a good monitoring of air pollution, a large part of the public is simply not interested in it, while the Czech public has reduced its emissions over the last two years mainly by frequent use of public transport, bicycles or

walking instead of cars, and by replacing old energy-intensive equipment with newer ones. Estonians are, very interestingly, the most positive from the entire region when it comes to air quality and are not interesting in tightening air purity standards, according to a Eurobarometer survey (very interestingly, the connection between shale of land air pollution has not penetrated public perception). On the other hand, hard data is showing that indeed air quality is relatively good in Estonia and, in contrast to Poland and Romania for instance, is improving.

Activities of the national government aimed at reducing air pollution in Poland are getting very low marks from almost half of respondents, and in the case of local governments, such opinion is shared by almost 40%.

Yet, as many air pollution measures requests citizens to directly change their behaviour (e.g.: change heating sources, stop using cars, etc.) ultimately they are met with resistance. A point in case is the Oxygen tax in Bucharest, which the city hall intended to introduce for polluting cars, with obvious regressive side-effects.

## PUBLIC POLICY

In almost all of the countries surveyed, national authorities have been referred to the European Court of Justice by the European Commission, over failing to address air quality issues. In some (e.g.: Hungary) infringement cases have epical durations – i.e. over 10 years. Even in the most “diligent” countries with respect to air pollution (e.g.: Latvia) it’s still the EU push that is shaping local authorities’ reaction (e.g.: in Riga, where the Commission is requesting increased control over fine particles). Sofia Municipality seems to be the most involved from all local public authorities on issues related to air quality, incentivizing public transportation and free parking in public parking lots (to avoid traffic in the city center), while also widely informing the public about the benefits of public transportation and the risks of irresponsible waste disposal. Rising public discontent over this issue, particularly in Bulgaria, Romania and Poland is expected by experts to significantly shape public policy in the future. Various barriers to car traffic have been imposed or will be soon imposed in all the countries in the region, while some authorities are also thinking of alternative investments (e.g.: roadside tree planting in Lithuania).



## Chapter 4

# Insights of the Network Mapping Analysis

## How Does the Network of Climate Innovators in Central and Eastern Europe Look Like? General Trends and Patterns at Regional Level

### GENERAL STATE OF PLAY IN THE REGION

Climate and environment occupy lower positions as priorities on the citizens' agenda in Central and Eastern Europe than in Western Europe; however, they are gradually gaining more saliency. Even in coal-dependent countries, for instance, citizens say the share of renewables must be increased (e.g.: Poland, with 94% of the citizens holding this belief). In general, there are few publics in the region that are climate change deniers, with the notable exception of Hungary, where a climate change denial current is currently being nurtured by mainstream politicians.

Research and non-profit groups play the most important role in influencing the public opinion in regards to climate matters. In all the thematic areas we looked at, there is ample climate and sustainability-focused EU funding, despite the general ecosystems' assessment that access to funding is the most important barrier they face when it comes to accelerating climate innovation.

The region is not homogenous when it comes to innovation. Romania and Bulgaria occupy notoriously low places in the European Innovation Scoreboard, followed by the cluster of Visegrad countries (Czech Republic, Poland, Slovakia, Hungary). On the other hand, the Baltics are frontrunners when it comes to overall innovation capacity and R&D spending. This trend, while not filed-specific, obviously permeates the state of play in climate innovation.

According to the hundreds of phone interviews we conducted for this study, the sense of

emergency for climate action is felt and seen as an opportunity in the entire region, which leads to a lot of diverse initiatives in the 4 fields analysed in the study. While we tried to identify and scout for changemakers, innovators and leaders in only four fields of action that touch on climate – energy efficiency in buildings, climate-smart agriculture, socio-economic transformation in post-coal regions, and air pollution – one key finding of the Ecosystem and Network Mappings was that a very large portion of changemakers in the region (34,26% of all changemakers identified) work transversally on several of these topics and on other cross-cutting ones (e.g: education, activism, energy business, generalist think-tanks etc.). This presents a great opportunity for identifying synergies and breaking the siloes between different fields in the climate area. On the other hand, this means that many regional changemakers, innovators and leaders do not have precise specializations, but are rather generalists, which could be an obstacle when it comes to rolling out innovations that can serve the key areas we investigated.

Most of the changemakers we identified are work on climate-smart agriculture, with a total of 21,19% of changemakers from the whole regional network being active in this field, followed by energy efficiency in buildings (19,6%) and air quality / air pollution (15,64%). Unfortunately, the least represented subdomain is socio-economic transformation in post-coal regions (9,31%). We identified very few technical or social innovations in post-coal regions throughout CEE.



# DEMOGRAPHIC CHARACTERISTICS OF CHANGEMAKERS IN THE REGION

Climate-smart agriculture is also the field where changemakers display, on average, the highest number of years of work experience across the whole region (13,73 years on average of specific work experience), followed by energy efficiency in buildings (13,08 years on average of specific work experience). The “least experienced” field is the one with the least identified changemakers: socio-economic transformation in post-coal regions, with an average of 6,58 years of work experience. The countries with an experience above average are: Czech Republic (16 years), Hungary (15 years)

and Slovakia (13 years), while Bulgaria is the least experienced (8 years), followed by the Baltics with only 10 years of experience. Romania and Poland showcase about 11 years of experience in climate innovation. On average, the male changemakers in the region are 43 years old, while women changemakers are about 40. This difference stays the same in all countries, except of Estonia, where men are the younger (34 years old on average).

Regarding the age split by sub-domains, the lowest age average is in socio-economic transformation in post-coal regions (38 years old) and the highest average is in climate-smart agriculture (45 years old). For a breakdown of the average age by the primary activity sector, see Figure 1 below:

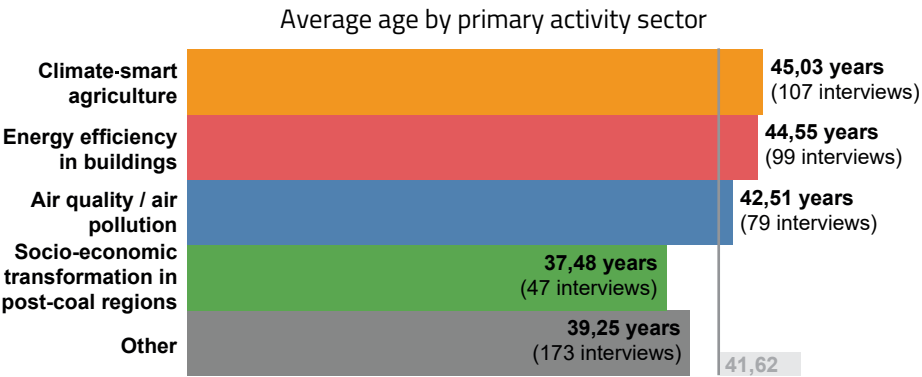


Figure 1



On average, men are better represented in all the sub-fields and countries we examined, with 58% of the total number of changemakers we interviewed being men. The only country where women have a larger share is Latvia, with 62,5% women. Hungary has the most balanced gender distribution (51% men and 49% women), followed closely by Romania (52% men and 48% women). The country with the most unequal gender distribution is Czech Republic, with 75% of the changemakers active in the field of climate action being men and only 26% women. The research showed that men are better represented in the specialized fields (agriculture, air pollution, energy efficiency) – with over 60% of the total number of interviews, compared with the non-specialized fields (coded with “other”) – which were better represented by women (57%). In the socio-economic transformation in post-coal regions, the gender balance is higher than in the other fields (57% vs. 43%). See Figure 2 below:



## Gender distribution



## Gender distribution by primary activity sector

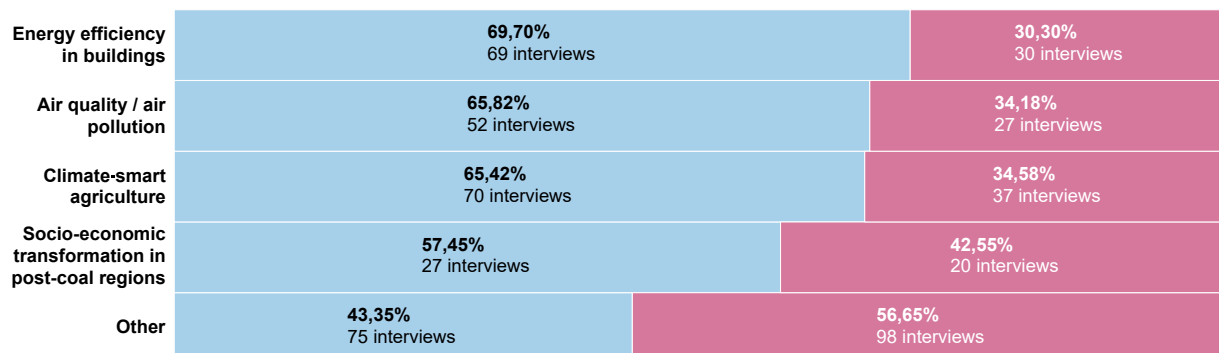


Figure 2

## Institutional characteristics of the Changemakers' Networks in the region

As expected, most actors are implementing projects (42%), followed by a share of 34% who are activating in fields related to public education and awareness (such as journalists, educators, researchers).

People working in managing the climate field have a share of 11% of all the changemakers we identified through the interviewing and mapping process. The institutional distribution of the

roles of the climate actors remain the same in all subdomains. Most changemakers that act in the financial sector/ funding sector have been identified in the Baltics, while most regulators are based in Slovakia (23%), Poland (18%) and Latvia (16%). Hungary, Bulgaria and Romania are the countries where network members identified the fewest policymakers as part of the network. Not surprisingly, the qualitative experts' assessment also believe policy-making is weakest in these countries. See Figure 3 for a distribution of the changemakers by their type of role in the ecosystem.

## Distribution of interviewees by the type of role

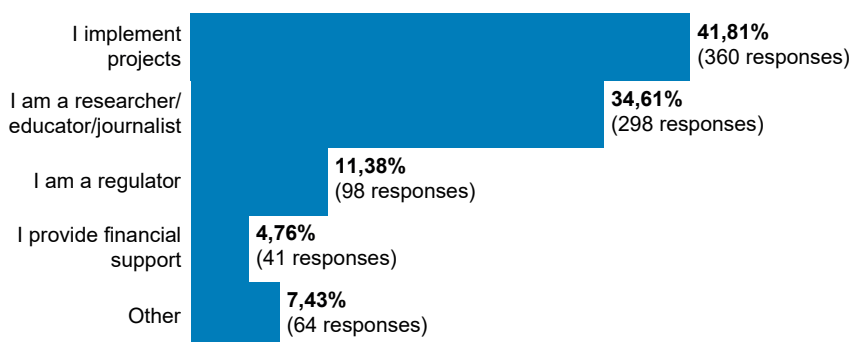


Figure 3

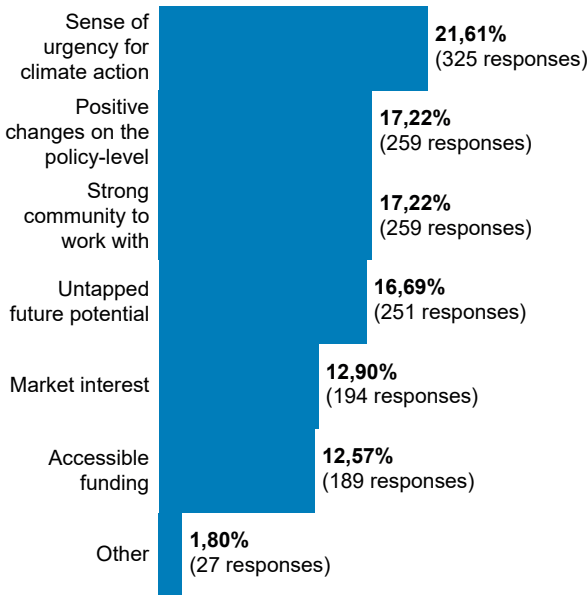
The NGO sector is the most represented as an institutional spaceholder for climate innovators in the region, with 47% of all changemakers in the region activating in NGOs, followed by public sector representatives (21%) and private sector representatives (19%). NGOs dominate the legal status in all sub-domains, while the private sector comes second in all sub-domains except for air pollution – where the public sector is better represented.

The public sector (with a regional average of 21%) is better represented in Baltic countries and least represented in Bulgaria (14%). NGOs are the least represented in Lithuania, with only 30% compared with the regional average of 47%;

Access to funding and legislation are seen as the most important barriers to further scaling social

and environmental impact in the region. Access to funding is mentioned on average by 25% of the respondents, while 24% of the respondents mentioning legislation. Workforce and access to professional know-how are seen as a barrier by 15% of the respondents, while infrastructure by only 10% of them. The top 2 barriers stay the same in all sub-domains.

The most important opportunity identified by the respondents is the sense of urgency on climate action (22%), followed by positive changes on policy-level (also mentioned as an important barrier) and strong communities to work with (both with 17%). The least mentioned opportunity is access to funding – mentioned by only 13% of the respondents (also seen as the most important barrier). For further details see Figure 4 below.



**Figure 4**  
Distribution of interviewees by the opportunities for climate innovation they see in the region

We talked with the changemakers we mapped about the funding opportunities they see for their work. The most mentioned funding opportunity is funding from EU (26%), especially in the Baltics (40%/37%/36%). Corporate private sector funding is seen as an opportunity by 15% of the respondents, close to the funding from local government grants (14%). Individual donors are mentioned on average by 13% of the respondents. On regional average, NGO grants are mentioned by 13% of the respondents. In

Bulgaria local government grants are the least mentioned funding opportunity (4%) – similar with crowdfunding (4%); the individual donors stands out in Bulgaria with 24% of the mentions – the same as EU funding (24%). In Poland, NGO grants seem to be seen by more respondents as a funding opportunity (19%), followed by EU funding with 18% and individual donors with 17%.

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You may see all maps we built, in each of the countries analyzed, in the Final Annexes of this report. Below, we present some general descriptions of all the 9 networks:

**Average degree:** Connectivity of the network is the average degree: number of nominations / numbers of unique contacts (1.21);

**Slovakia (1.483) and Romania (1.33) have the most interconnected people on the map;**

**Latvia (1) and Czech Republic have the least interconnected people on the map;**

**Weighted degree:** The power of the connections between people is the average weighted degree. The weights were allocated as follows: 4 points for working together, 3 points for interacting regularly, 2 points for interacting occasionally and 1 point for "I heard of him" (the regional average is 3.865)

**Romania has the strongest relationships between the people on the map (4.761) followed by**

**Slovakia (4.719);**

**The least powerful connections are in Latvia (2.68);**

**Diameter:** the distance between the two furthest points on the map; calculated the greatest number of steps between the furthest points on the map (regional average it's 10.2)

**Poland has the widest network with a diameter of 20, followed by Romania with a diameter of 15;**

**The Baltics are the smallest networks in terms of diameter (4-6 steps between furthest points on the map);**

.....

An overview comparison between those countries taking into account the average number of nominations provided by each individual shows that Slovakia nominated the highest number of people (2.44) followed by Estonia and Bulgaria (2.37). The bottom top is Latvia and Lithuania with 1.25 and 1.64. Overall, medium-sized countries have the greatest number of nominations / interviews, while the small countries tend to have the least number of nominations / interviews. Another way to examine the networks we analyzed is the average weighted degree: the power of the relationship (strongest being "working together," interacting constantly, interacting occasionally and the weakest being

"I've heard of him/her"). The research showed that the most powerful relationships are in Romania and Slovakia, followed by Poland, Bulgaria and Estonia. The least powerful relationships are in Latvia and Lithuania, where it seems that people have weaker work connections. We also looked at the so-called "average degree": how connected is the network, how often the members of the network repeat when counting nominations (total number of nominations / unique nominations). The most connected network is Slovakia, followed by Romania and Estonia (the members of the network repeat more often). The least connected network is Latvia, followed by the Czech Republic.

The study shows that Romania is similar to Bulgaria when it comes to the distribution of changemakers: most changemakers are distributed equally among the four fields, but a high percentage of the interviewees activates in the 5th transversal field, which integrates education, climate activism, policies and so on.

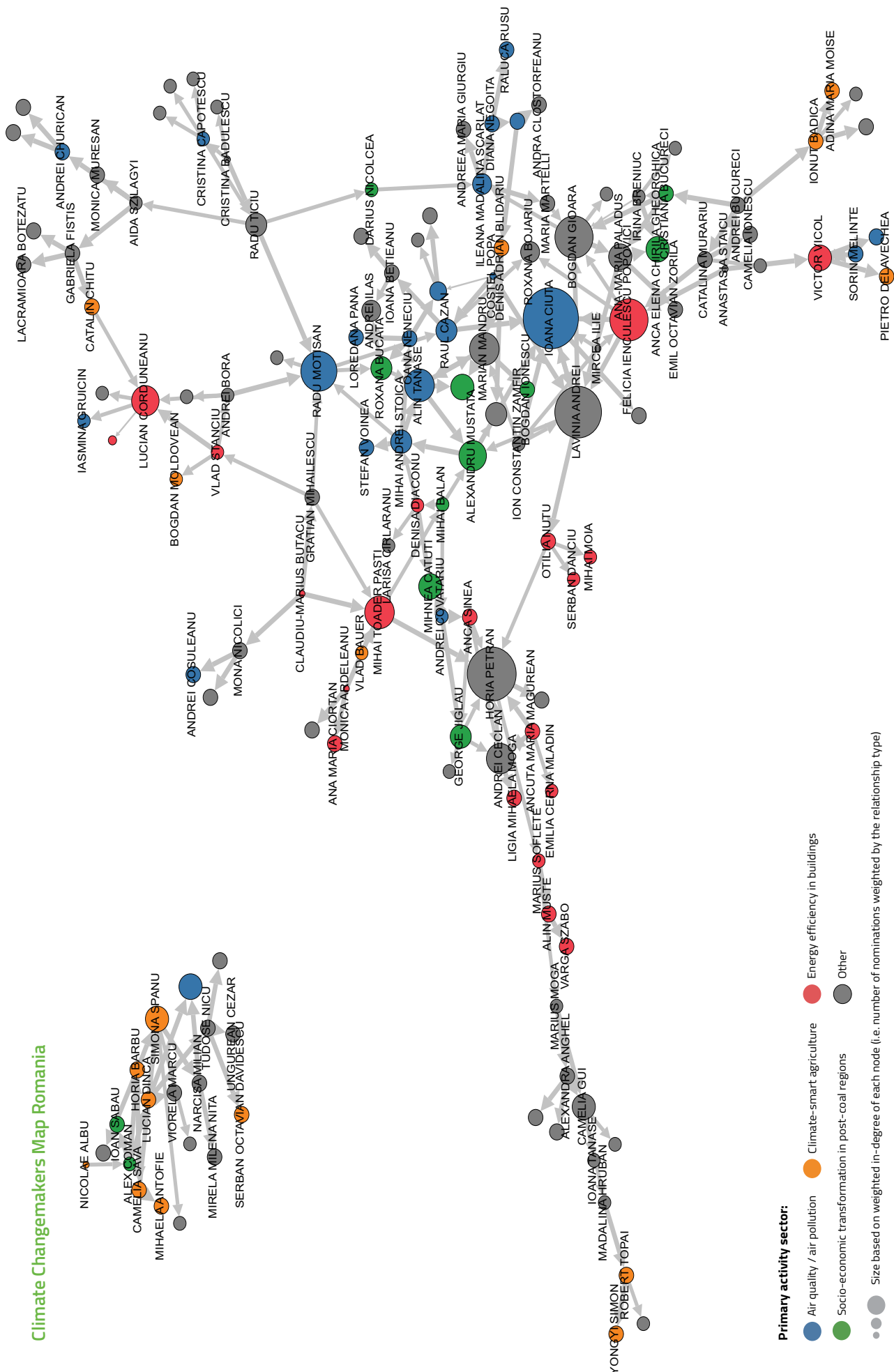
The work experience in climate innovation is still lower than the regional average. The field which displays the highest level of experience is Climate-smart agriculture (17y), which is a lot higher than the regional average (13.73y). Most experienced changemakers activate in the public field with almost 22y experience (compared to 16.49y in the region). Even if the most experienced changemakers are from the public field, the current legislation & access to funding are seen as the highest barriers.

## General description of the network in Romania

In Romania, 105 telephone interviews were made, which led to 147 unique nominations and 189 total nominations (mentioned names);

- Average number of nominations provided by each individual: 1.8 nominations on average (on the fifth place, while on top is Slovakia with 2,44 and at the bottom is Latvia with 1.25);
- Average degree and diameter: Compared with Poland, where we had the same number of interviews (105), Romania is a more “closed” / congested network, meaning people know each other better and the network diameter is shorter than in Poland (distance between the furthest points on the map); however, Romania has a smaller network compared with Poland, with a total number of 147 nominations vs. 172 members in Poland;
- Average weighted degree: Romania has the strongest type of relationships between the members of the network, with 4.761 (compared with Poland that has 4.175 - and the weakest which is Latvia at 2.679); this indicator shows healthy and strong work relations, and that members frequently work together and interact with each other;
- Subdomains interconnectivity: in Romania, the subdomains are over the average interconnected, meaning people are recommending other actors from different domains. Except for air pollution – slightly under the regional average;
- Subgroups: In Romania, one small sub-network (18 individuals) can be noted, meaning there is no connection between the main network and this subnetwork, except Ashoka Romania (who made the initial nominations)

## Climate Changemakers Map Romania









## Chapter 5

# Qualitative Analysis Romania

Authors: **Roxana Bucată, Ștefan Voicu**  
For Ashoka

## Energy efficiency in buildings

### General context

The building sector in Romania is characterized by a high share of residential buildings (99,08%) and a small proportion of non-residential buildings (0,2%), according to the 2011 National Population and Housing Census. Most of the residential buildings in Romania were constructed before 1970, without any energy efficiency requirements. Old infrastructure is responsible for significant energy loss. As a result, the residential sector accounts for 1/3 of the final energy consumption in Romania. The 8% decline in greenhouse gas emissions from buildings in 2016 compared to 1990 was not the result of good governance, but the consequence of demographic decline and reduction of heated living space.<sup>1</sup> However, nowadays it is mandatory for every new or existing building to have an energy performance certificate in order to be the object of a property sale.

### Innovation

Considering the high energy consumption, low energy efficiency, and the energy loss due to old infrastructure, the residential sector has a high potential of energy savings and greenhouse gas emissions reduction. Tapping this potential requires a great deal of innovation, but the overall eco-innovation performance of Romania in the construction sector is well below the EU-27 average, consequently belonging to the catching-up countries group<sup>2</sup>. According to the European Innovation Scoreboard 2017, Romania is classified as a Modest Innovator with an overall innovation and R&D expenditure performance well below the EU average. Romania has the lowest classification in the Scoreboard.

<sup>1</sup> LIFE PlanUp 2019

<sup>2</sup> Paraschiv et. al. 2011

Even if the overall innovation in the building sector is not high, there are isolated initiatives that push for a change in the way Romanians build and use buildings. One of the most successful projects is Green Mogo - Energy Training and Advice Center. Located just outside Bucharest, the Centre is a passive house which served also as a learning experience for volunteers, activists, students and general public. Green Mogo demonstrates that sustainable materials, energy efficiency technologies and clean energy sources are available in Romania and can be used to construct a 90% energy self-sufficient house.

Another relevant project in the innovation landscape is EFdeN, an interdisciplinary group of students and professionals who built a solar house for the Solar Decathlon competition in 2014. It became a centre for innovation and debate and attracted thousands of visitors who learned about green building techniques. EFdeN built a second solar house in 2018 for the same international competition. These houses produce more energy than they need and have a minimum impact on the environment. From natural light usage to photovoltaic panels on the roof, these houses optimize all clean energy sources.

### Public opinion

Public opinion is more aware of energy related issues in buildings and is in favour of public programs like building retrofitting. Romanians are motivated to support the retrofitting program because of its economic benefits from lower heating and cooling costs after the technological improvements and are less aware or concerned with the environmental benefits. Energy poverty is an important issue in public opinion because it affects a large number of individuals. In Romania, thermal discomfort and high expenditures on heating and cooling are a reality for most people in urban areas. Despite this, energy poverty is not embedded in national law and the Romanian National Energy and Climate Plan does not stipulate clear measures in this direction.

## Public policies

Public policies are focused on energy efficiency, which is one of the three pillars of Romania's European obligations in the energy sector together with reduction of greenhouse gas emissions and renewable energy usage. The existing programmes include the continuation of the National Energy Efficiency Action Plan IV, the Energy Strategy of Romania 2019- 2030 and the Strategy for mobilizing investment in the renovation of residential and commercial buildings fund, both public and private, existing at national level - Version 2/2017.

The most recent governmental initiative is the Green House for PVs project, a subsidy program for prosumers who can get funding for installing photovoltaic panels on their homes and can connect to the grid. The upgrade of the former Green House program comes after the Romanian Parliament passed a law that recognizes prosumers and allows them to sell the clean energy in the grid. Until now, almost 30.000 prosumers were approved for funding, but the program is unfolding with major issues: further legislative impediments and even criminal investigations into fraud accusations.

The greater majority of Romanian members of the Parliament voted in favour of prosumers, but the negotiations for implementing rules stalled the effects of new legislation. There is resistance to allow major incentives for prosumers.

## Climate-smart agriculture

### General context

The Romanian agricultural sector is highly polarized. There are over three million smallholding farms utilizing half of the country's agricultural land and little over 12.000 using the other half. While the latter use it as arable land to cultivate crops like wheat, maize, sunflower seeds, rapeseed or rear sheep, all of which are mostly destined for export commerce, the other half practices a more mixed type of agriculture. Smallholding farms are generally oriented towards subsistence and combine arable land, with permanent crop land, kitchen gardens and grasslands, as well as livestock rearing. The effects of climate change are also polarized. Climate change has increased drought,

desertification, flood, blizzard and hail incidence. These have a bigger impact on smallholding farms than on large commercial farms, as is acknowledged even in the National Strategy for Climate Change (2013-2020)<sup>3</sup>.

### Innovation

The impact of climate change is acknowledged by both smallholders and large commercial farms. The latter are trying to mitigate the effects of drought through irrigation systems. The state irrigation system built during socialism (1945-1989) is still in a derelict state, while recent refurbishments made by the Ministry have not concentrated on the replacement of the high energy consuming pumps. Some large farmers tried to innovate by drilling wells on their fields and pumping water. However, this is not a very widespread practice and it is not clear how this solution actually contributes to climate mitigation instead of creating further problems, like drying the underground water streams.

Seed companies, like Bayer (former De Kalb Monsanto), Corteva (former Pioneer) and KWS, invest in research and development of hybrid seeds tolerant to adverse weather events. Nevertheless, this solution would benefit only large commercial farms, as smallholders are unable to cover the costs of these seeds. Moreover, many researchers have argued that seed companies contribute to a loss of seed diversity and are causes, not solutions, to the problems farmers face.

Ecoruralis, an NGO focusing on peasant rights, is promoting smallholding agroecological practices as solution to climate change. They argue that smallholders have been in symbiosis with the surrounding environment and that their practices are not ecologically harmful. They also established a seed bank, collecting and distributing 'traditional' seed varieties to small farmers across the country in order to conserve and increase seed genetic diversity.

Various NGOs have opened up urban and community gardens experimenting with permaculture techniques. The NGO Institutul de Cercetare în Permacultură din România (ICPR) has created a network of 9 urban gardens in Bucharest under the project Grădinărescu which was

<sup>3</sup> Strategia națională a României privind schimbările climatice. 2013

financially supported by the German multinational retailer Kaufland.

Agroecological and permaculture practices are also being translated to large scale agriculture. In Romania there are several experts who are consulting large commercial farmers in the adoption of agrotechnologies like the no-till/ minimum till practice and research is being conducted to assess the efficiency of these practices. However, these practices require expensive agricultural machinery and digital equipment that most farmers, and especially the small ones, do not afford. Thus, it is likely that this kind of solutions will continue to polarize agriculture in the future.

## Public opinion

Public opinion is driven by the interests of large farmers' professional associations. The focus is placed on the rehabilitation and extension of the irrigation system as the main method of mitigating the effects of climate change and on subsidies for insurance schemes. During years with severe drought, pressure is put on the government to compensate farmers for crop failures. The eco-conditionality introduced by the EU for receiving the payment schemes have not generated great controversies, although many farmers do not necessarily understand the reasoning behind it.

## Public policy

Agriculture features in the Romanian National Climate Change Strategy (2013-2020) as a sector vulnerable to climate change, but also as a source of greenhouse gas emissions. The EU's Common Agricultural Policy (CAP) payment schemes have targeted sustainable land use practices, with 30% of the country's agricultural income supported provided through the CAP being allocated to the "greening" measure since 2013. A recent audit of the greening payment scheme argued that the environmental and climate performance of the CAP has not been enhanced<sup>4</sup>. The other major CAP income support schemes are conditional on compliance with EU standards on good agricultural and environmental practices. Its efficiency has also been questioned.

Since 2008 Romania has developed a national

<sup>4</sup> European Court of Auditors. 2017. Greening: a more complex income support scheme, not yet environmentally effective. Special report no. 21

anti-hail and rainmaking system aimed at reducing the effects of hailstorms and prolonged drought. In 2016 an investment program in the rehabilitation and extension of the national irrigation system has begun. However, the government lead by the Social Democrat Party has been ousted in November 2019 by the National Liberal Party. The continuation of the program remains uncertain. In 2019 crop insurance premium subsidies from the rural development fund have been re-introduced. As these are contingent on the national budget, the continuation of the program is uncertain.

## Socio-economic transformation in post-coal regions

### General context

Romania is a coal-dependent country with a fluctuating 25% share of coal in the energy production mix. The country has a balanced energy mix with coal, hydropower, natural gas, nuclear energy and wind power having comparable shares of capacity and power generation. However, despite the diverse mix and the availability of renewable energy, the Ministry of Energy does not have plans for a coal phase-out. Instead, it prioritizes coal, nuclear power and hydro power in its latest 2019-2030 National Energy Strategy.

Despite the state's support for fossil fuels in the form of subsidies and laws biased in favour of coal companies, there are other factors that push the coal into history: coal extraction and exploitation incur high costs, while the price of carbon continues to rise. According to an analysis of the 2019 global coal power trends<sup>5</sup>, gas replaced coal in the EU as the carbon price in the EU Emissions Trading System rose above 20 EUR per tonne of CO<sub>2</sub>. Furthermore, EU climate and energy legislation puts pressure on the Romanian coal industry and coal regions to come up with a phase-out plan. Coal regions in Romania are part of the EU Just Transition Platform that looks into ways for sustainable post-coal development. Nonetheless, climate is an essential factor in the coal phase-out process. As a signatory of the 2030 Agenda for Sustainable Development, Romania has committed itself to a number of ambitious objectives regarding the energy sector, such as 43.9% emission reductions compared to

<sup>5</sup> Myllyvirta, L., Jones, D., Buckley, T. 2019. Analysis: Global coal power set for record fall in 2019. In Carbon Brief

2005; at least 27.9% renewable energy in total energy consumption; at least 37.5% increase in energy efficiency by 2030.

## Innovation

Innovation is necessary to move away from dirty sources of power generation. One of the most recent developments in the private sector is the founding of the first Romanian Energy Cooperative that has the mission to democratize, decentralize and decarbonizing the energy market. Members of the Cooperative invest in solar and wind projects across Romania and consumers have the option to choose the Cooperative as an energy provider. The project is an innovative development on an energy market characterized by centralized energy production.

## Public opinion

Public opinion is divided on this issue. While a part of the public is aware of the environmental degradation and supports coal phase-out, another part of the population, especially local people, perceives coal phase-out as a threat to their livelihoods. The lack of a long term, comprehensive social and economic strategy from the state will only accentuate the conflict. The CEROPE study<sup>6</sup> commissioned by Bankwatch and Greenpeace shows that, if alternative development scenarios are implemented, thousands of jobs and hundreds of millions of euros can be generated in the region by 2030: 750 jobs and 88 million euros net profits can be created over the next decade in small-scale farming and animal raising; 1520 jobs and 31 million euros in renewables and energy efficiency; and 434 jobs and 38 million euros profits in tourism and other services.

## Public policies

The most recent move on the public policy front is the program launched by the Ministry of Energy which aims at re-skilling 5.000 former coal miners to work in wind farms in Romania and Europe. Coal regions in Romania have to deal with great social and environmental issues. In the “golden age” of the coal industry there were around 50.000 people employed in the sector. The state began closing coal mines in the 1990s and reduced the labour force employed in the industry to around 1.000

<sup>6</sup> Centrul Român de Politici Economice (CEROPE). 2019. Just Transition in Hunedoara. Economic diversification in a fair and sustainable manner

people. This has had dramatic consequences for the regional economies and the livelihoods of the people in coal mining regions who were left without employment alternatives. Starting in summer 2019, the Ministry reskilling program created in cooperation with the Romanian Association for Wind Energy and the University of Petroșani, is now stalled because of political and financing problems.

The Ministry of Energy has a reputation of being pro-coal. Its long-time position in favour of fossil fuels is still strong and it is visible in the National Energy Strategy. The Romanian actors that are pushing for alternatives are the Members of European Parliament, also members of EU Just Transition Platform, like Adina Vălean or Cristina Prună.

## Air pollution

### General context

Air pollution is a major problem for Romania. The European Commission (EC) decided to refer Romania to the Court of Justice of the EU for failing to meet air quality standards. According to the EC, air pollution levels with particulate matter in the region of the Romanian capital Bucharest have been persistently exceeded ever since the EU law became applicable to Romania. In 2016, this happened for 38 days. According to the Air Quality Report 2019 released by the European Environment Agency, there were 23.400 premature deaths attributed to PM 2,5, NO2 and O3 exposure in Romania just in 2016.

### Innovation

As a result of a growing interest for data on air quality, there has been recent developments on the innovation side. URADMonitor, for example, is a Romanian company that develops air monitoring sensors for the general public. The sensors are used by NGOs and citizens and provide with growing data on dangerous emissions in the air.

### Public opinion

Public authorities have long been blamed for lack of action on this topic and for failing to develop and implement proper strategies to reduce air pollution. The Romanian National Network for Monitoring Air Quality has over 100 stations, 8 of



them being based in Bucharest, the most polluted city in the country. The stations are often non-functional and cannot provide data. Also, there are no information billboards about air pollution in the most polluted cities and the population has very limited or no information about the pollutants it is exposed to. As a result, public opinion has an apathy towards this issue and didn't have major reactions regarding air pollution.

On the other side, nongovernmental organizations are more active in this area. The first report that drew attention to this topic was published by Ecopolis in 2011 and stated that the monitoring is poorly done, that air pollution has major health effects and that transport is the most important source of air pollution. At the moment, Ecopolis is close to launch a platform that integrates open source air pollution data from citizens. Other NGOs, Optar and 2Celsius, initiated a legal lawsuit against the City Hall of Bucharest for failing to guarantee the right to a clean environment for people living in Bucharest. They demand the

revocation of the Integrated Air Quality Plan which is based on an environmental assessment study that is five years old.

## Public policies

The most recent development in the air quality area is the Oxygen for Bucharest project, launched by the City Hall of Bucharest. Its main objective is to implement a toll for polluting cars in the centre of the capital. The tax was received with enthusiasm, on the one hand, but with criticism on the other hand, for the burden it puts on low income people who cannot afford a less polluting car or an extra tax.

Different groups that are working for alternative public policies lack the political will that is necessary to address environmental problems related to air pollution. The Ministry of Environment denounces lack of financing to explain the malfunctioning of the National Monitoring Network.

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