Regional Roadmaps for sustainable energy future

Synthesis report on CEE countries

English version

PANEL 2050 – Partnership for New Energy Leadership 2050

Deliverable D3.6

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CENTRAL EASTERN EUROPEAN SUSTAINABLE ENERGY NETWORK

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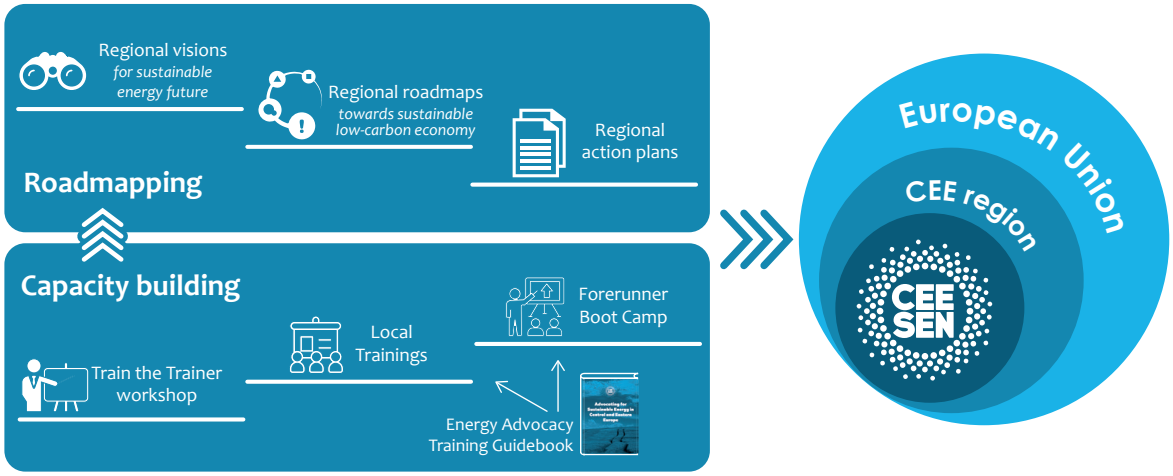
About PANEL 2050 project and CEESEN

The PANEL 2050 project has the aim to create durable and replicable sustainable energy networks at local (municipality/community) level, where relevant local stakeholders collaborate for the creation of a local energy visions, strategies and action plans. The aim of these networks is to contribute to and actively work for the transition towards low carbon communities in 2050.

The PANEL 2050 partnership provided support for the creation of first successful local energy networks in the CEE countries. In the course of the project, organisations from 10 CEE countries collaborated on creating regional energy strategies and action plans.

PANEL model is a comprehensive approach for implementing local long-term energy management, supported by the community. PANEL model consists of seven main elements: **Stakeholder Engagement, Training Program, Guidebook, Long-term Energy Visions/Roadmaps/Action Plans and Central and Eastern European Sustainable Energy Network CEESEN.**

PANEL2050 model for Central and Eastern Europe Sustainable Energy Network CEESEN



These elements were developed by PANEL 2050 project to support the CEE communities on achieving their sustainability goals. After initial implementation, PANEL model could used by the forerunners in other regions inside and outside of EU.

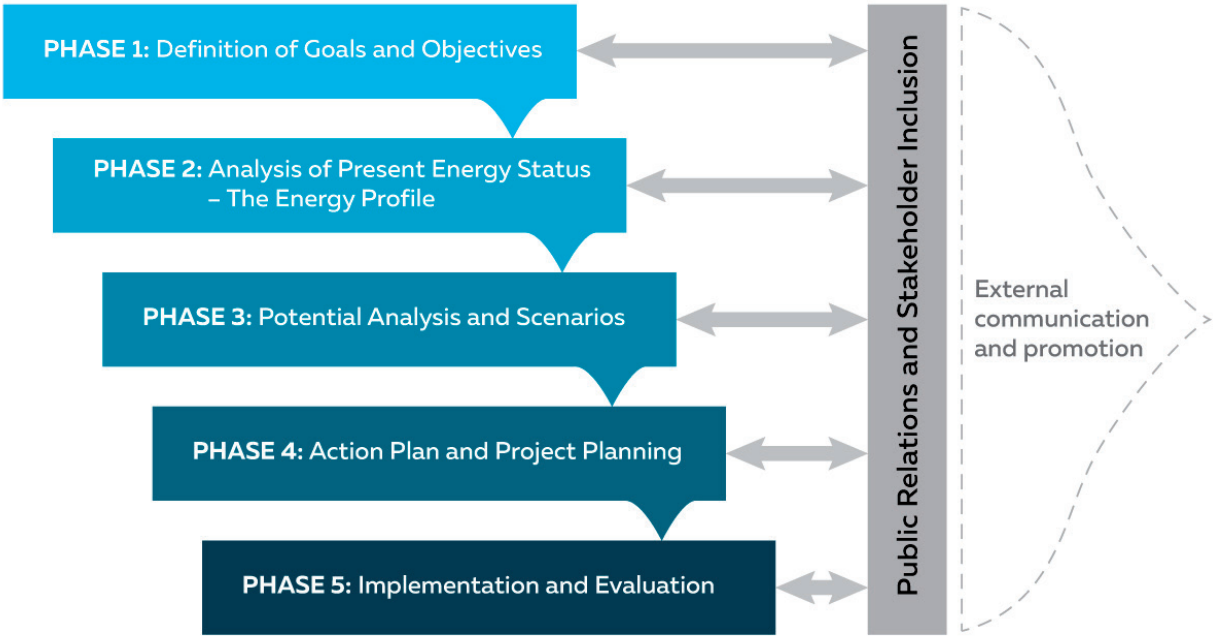
PANEL 2050 project is taking multidisciplinary approach for combining the political theory with the technical discipline of energy planning. As an outcome, a set of tools - PANEL model - were created for supporting energy transition in local communities. Ten CEE regions implemented PANEL model during the project and developed Roadmaps supporting the local transition to low-carbon economy.

Stakeholder Engagement is taking a strategic approach for engaging the community to the local energy management. Stakeholders were invited to participate in the long-term energy planning, bringing their knowledge and validation into the process. They were supported by engagement experts and capacity building activities.

Energy Advocacy Training Program developed the skills of the stakeholders on active participation in sustainable policy development in their communities. Training Program included the Curriculum in English and the training materials in 10 languages of CEE region. Local trainings were complemented by international Bootcamp for advocacy and networking.

Guidebook on Advocating Sustainable Energy in Central and Eastern Europe compiles the important topics of energy advocacy and complements the training program. Guidebook is available in English and 10 languages of CEE region.

Energy Visions, Roadmaps and Action Plans are the outputs of the long-term energy planning process with the aim of plotting the regional transition towards a low-carbon community. These components of a regional energy strategy were developed with the organized support of stakeholders and forerunners that will take the initiative of implementing the plans in the future.



Forerunners are organized themselves as the members of Central and Eastern European Sustainable Energy Network (CEESEN) using the online platform ceesen.org, that will remain the basis for the future cooperation. The members of CEESEN can participate in international conferences and training, organized by the network.

For more information and support visit ceesen.org or contact us by info@ceesen.org.

Roadmapping in PANEL model

CEESEN is promoting and supporting the transition towards a low-carbon community in Europe by 2050. This broad vision of a low-carbon economy needs to be broken down and connected with activities on local level. This transition needs to be individualised on regional or local level in the countries of Central and Eastern Europe. In order to shape the process CEESEN supported 10 regions in CEE in developing roadmaps for a sustainable energy future.

The overarching vision was to get to a regional low-carbon economy by 2050, as pointed out by EU policy documents and climate agreements.

For reaching this vision it is not productive to forecast current trends and behaviour into estimates of the future. Forecasting is a predictive tool but mostly it doesn't provide you with a connection to your vision and delivers no new perspective for points of leverage.

Back casting on the contrary starts from a vision statement and then looks back to assess what would be required to get there. This method leaves space for innovative ideas and radical actions opening up the dialogue what different actors (policy- makers, industry, NGOs, consumers) can or have to contribute. The Roadmap is the guideline describing the pathway towards the vision with stating and planning concrete future actions.

The CEESEN roadmaps on energy future 2050 are designed in comprehensive process encompassing the process of generating a baseline, setting a regional vision, drawing up the roadmap itself including several action plans.

The roadmapping model, which all partners were asked to follow is divided into different steps building on each other from the first initial data collection to a complete implementation plan.

This 4 stages-model helped to structure the process for the roadmapping teams and ensure that the sequence of tasks was followed before proceeded to the next stage.

For these 4 connected stages of the roadmapping process external input is needed either to generate data, encompass differ viewpoints or engage possible implementers and multiplicators as well as supporting activities, which were implemented by the project partners.

The model was used by all partners to document the highlights of their roadmap on one page as well as show how stakeholder input was processed, and other project activities contributed to the roadmap documents. For this purpose, WP3 provided an "empty" template of the above infographic to the partners and supported them in visualizing their individual roadmapping process.

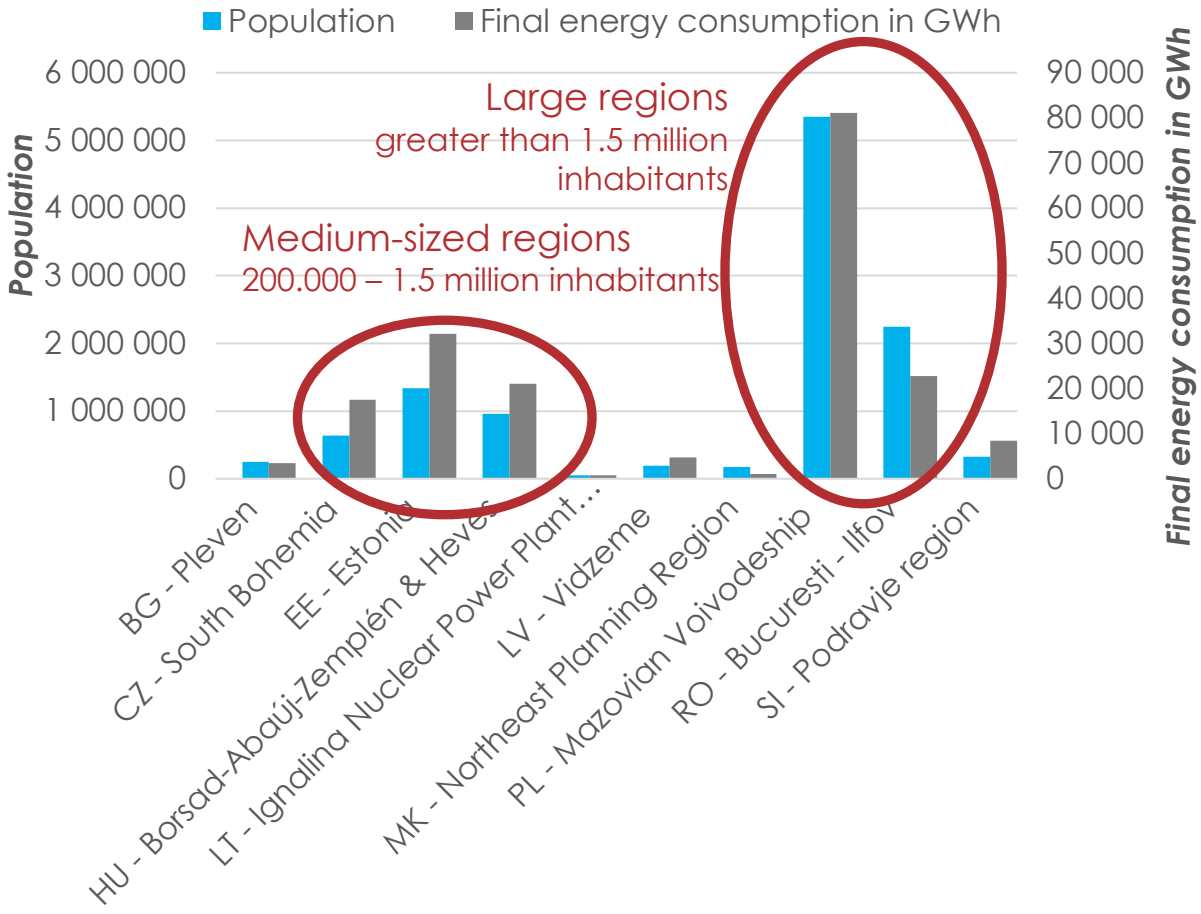
The roadmaps and related documents were made available both in the local language and English. This provided on the one hand a basis for local actors involved in the implementation and on the other hand act as case study of forerunner activities in CEE for international dissemination.

Regional Energy Profiles - Establishing a baseline for roadmapping (D3.1)

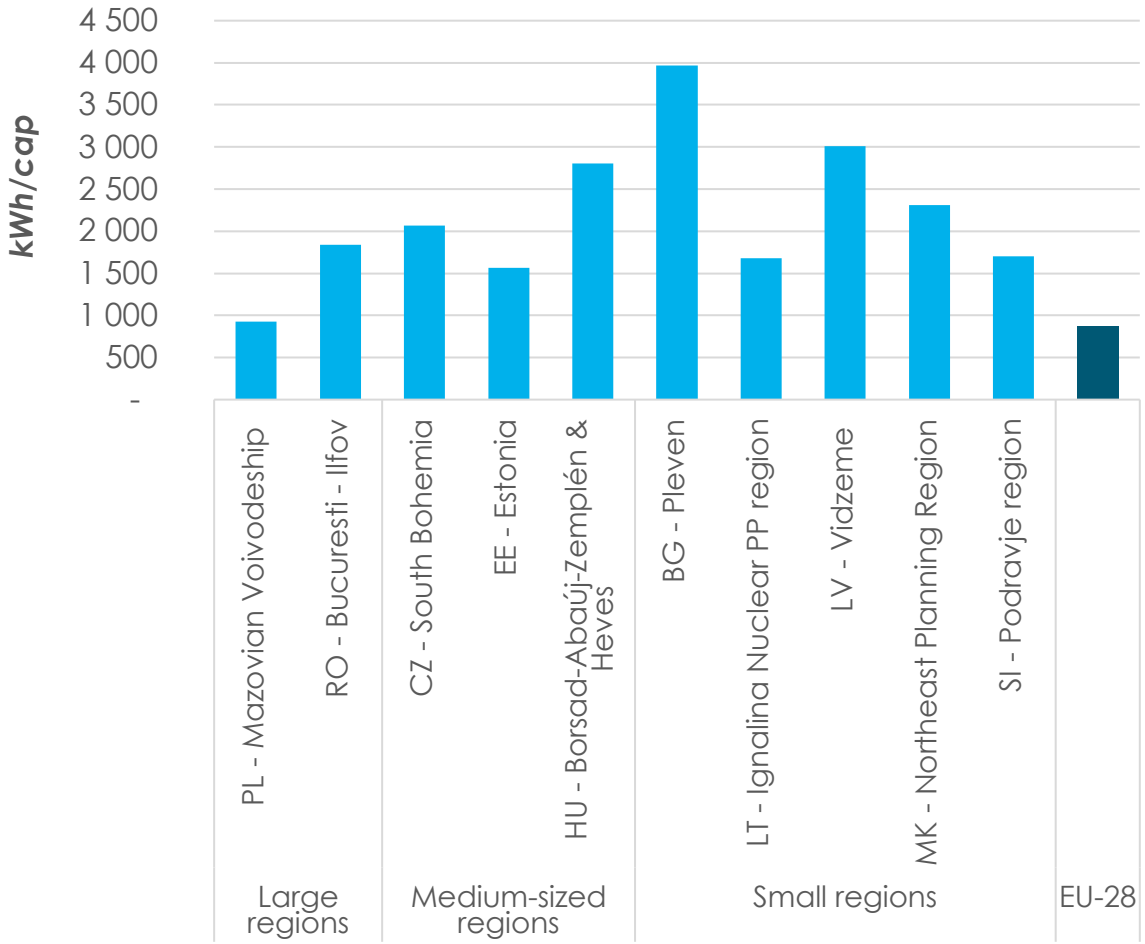
For the roadmapping process it is essential to establish a solid baseline before the actual roadmapping, designing of scenarios and planning of actions can start. While identifying the 10 focus regions partners reported back that energy data on regional level is mostly not systematically collected by regional authorities and therefore not easily available. The data collection has therefore been done by the PANEL2050 partnership.

In order to get a better understanding of the energy-related status quo of the focus regions the partners will prepare Regional Energy Profiles (REP). The REPs gave a comprehensive analysis of local energy production, imports, exports and energy consuming sectors as well as analyze strengths and challenges with regard to the transition towards a low carbon community. Here are the main findings of the Regional Energy Profiles.

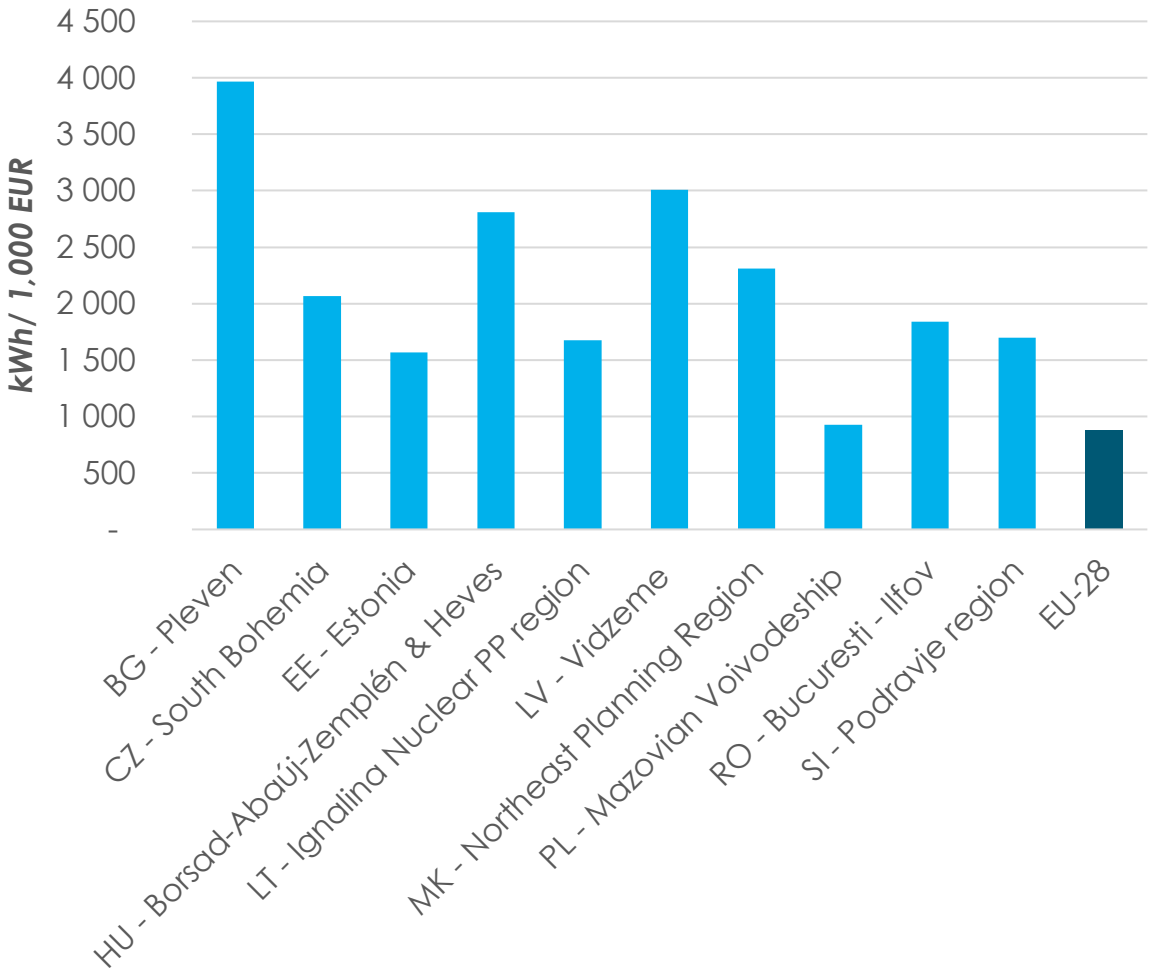
The 10 presented regions can be categorized according their population size and final energy consumption.



The larger regions Mazovian Voivodeship (PL) and Bucuresti–Ilfov (RO) show a lower final energy consumption per capita than the other regions – which is not surprising as the energy consumed by general infrastructure and economic activities are communally shared by a larger size of population. But this trend cannot be observed comparing the other size groups. The reason is that these regions are quite different in economic activity, which proves to be a larger influencing factor than population. Most of the regions are in the area of the EU-28 average (25,000 kWh/cap).



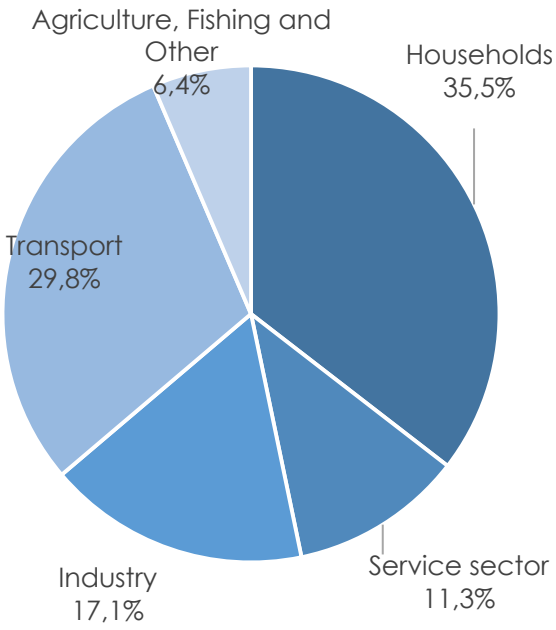
Looking at energy intensity of the regional economy using the indicator kWh per 1,000 EUR GDP. Again, the regions covered here are quite different and can't be divided into specific categories. The EU-28 average considering only final energy consumption lies below all of the presented Central and Eastern European regions (880 kWh/ 1,000 EUR).



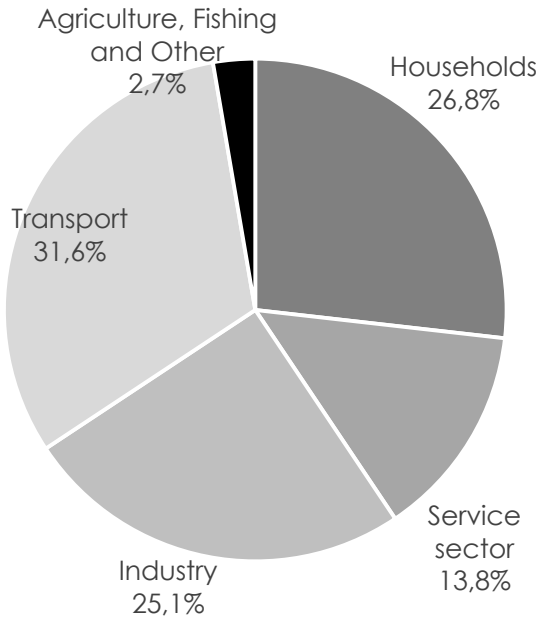
For most of the analyzed regions the households present the largest energy consuming sector with 30-50 % of the regions final energy consumption. The transport sector makes a close second place with 15-40 %.

The energy consumption of the service and industry sector highly depends on the characteristics of the region. E.g. energy consumption of the industry sector ranges from more than 40 % in Hungarian regions Borsad-Abaúj-Zemplén & Heves to only a view percentage point in the Macedonia Northeast Planning Region.

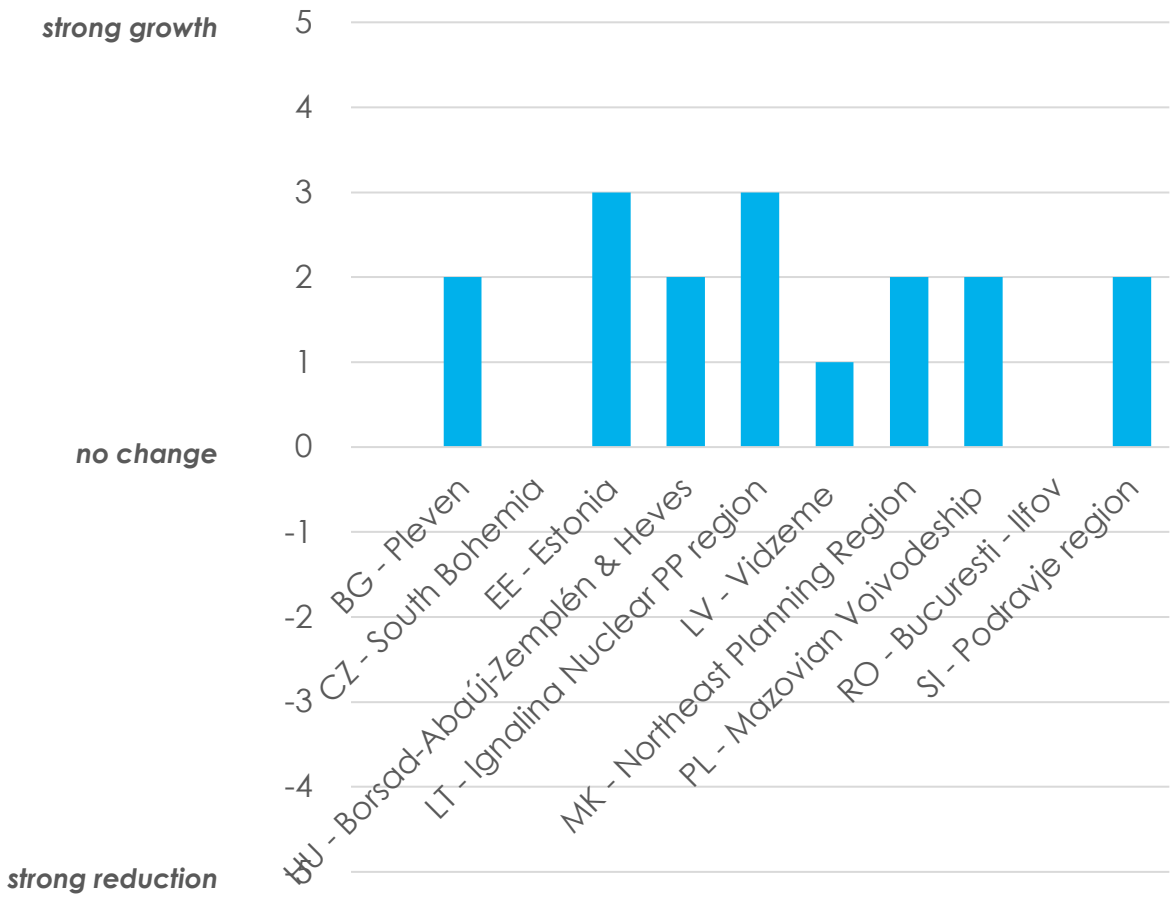
Partner regions average



EU-28

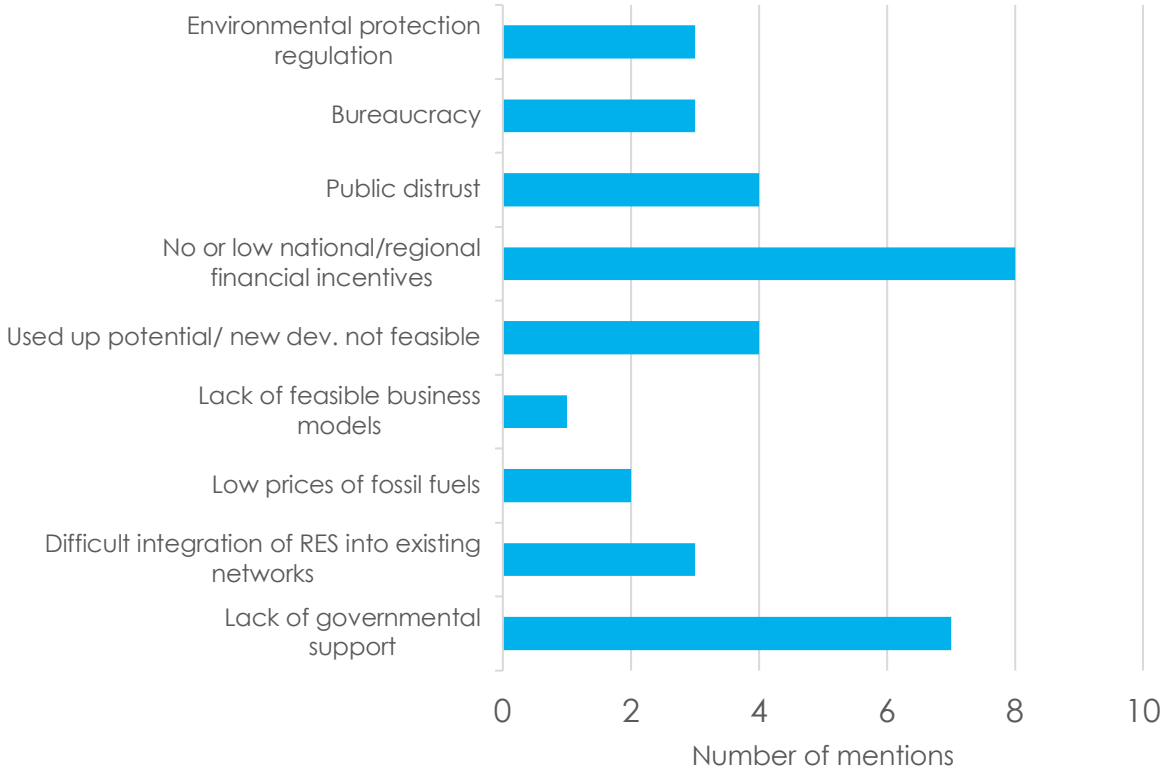


Different from the observed trends in energy consumption, the regions show a clear trend when it comes to renewable energy production. Almost all regions expect a slight to medium growth of renewable energy capacities in the coming years.



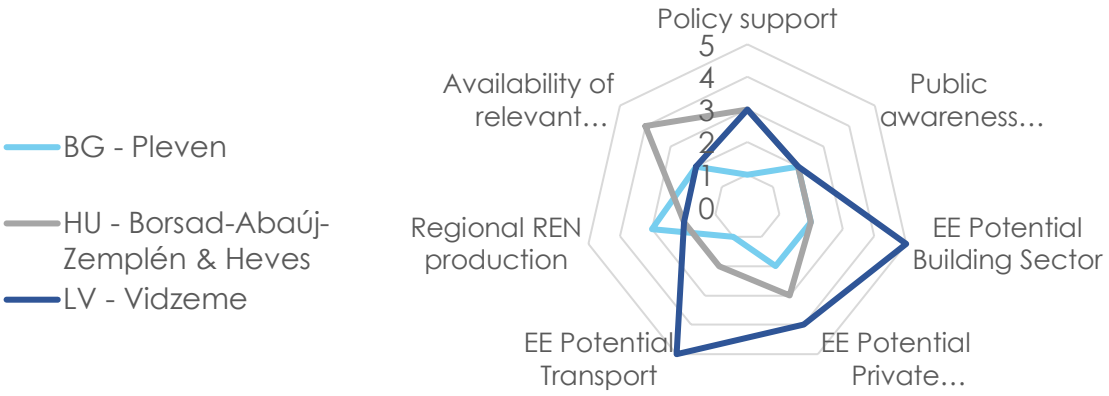
Barriers for Renewable Energy Development

The lack of financial incentives and other governmental support was identified as the main barrier for renewable energy development- mentioned in 8 (respectively 7) of 10 regional energy profiles. Apart from missing financial incentives, other strong barriers for CEE regions mostly concerned with framework conditions for REN applications and a relative high number (4 regions) mentioned that there is still public distrust to overcome regarding REN technologies.

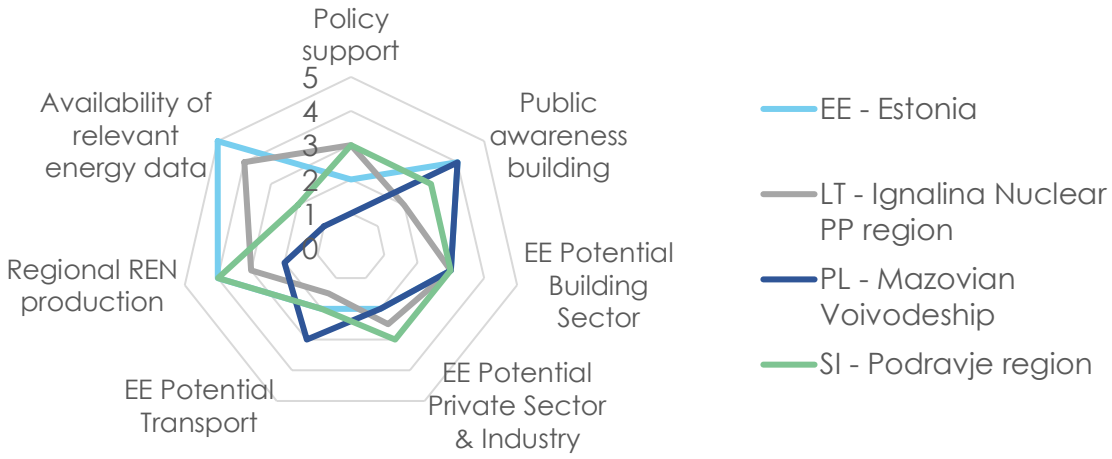


Regions with similar energy intensity were clustered in the following figures. The listed framework conditions were assessed using a scale from 1 (potential unused) to 5 (potential fully used).

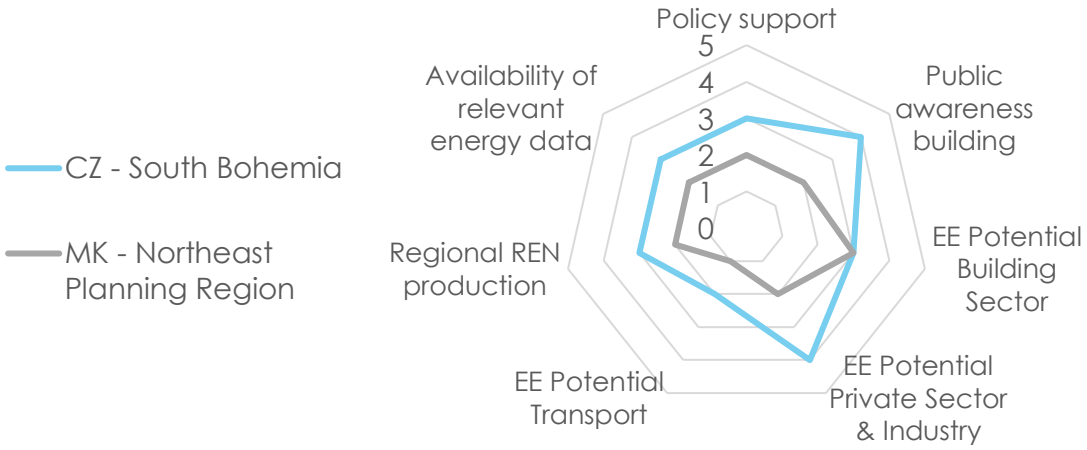
Regions with comparably high energy intensity



Regions with medium energy intensity

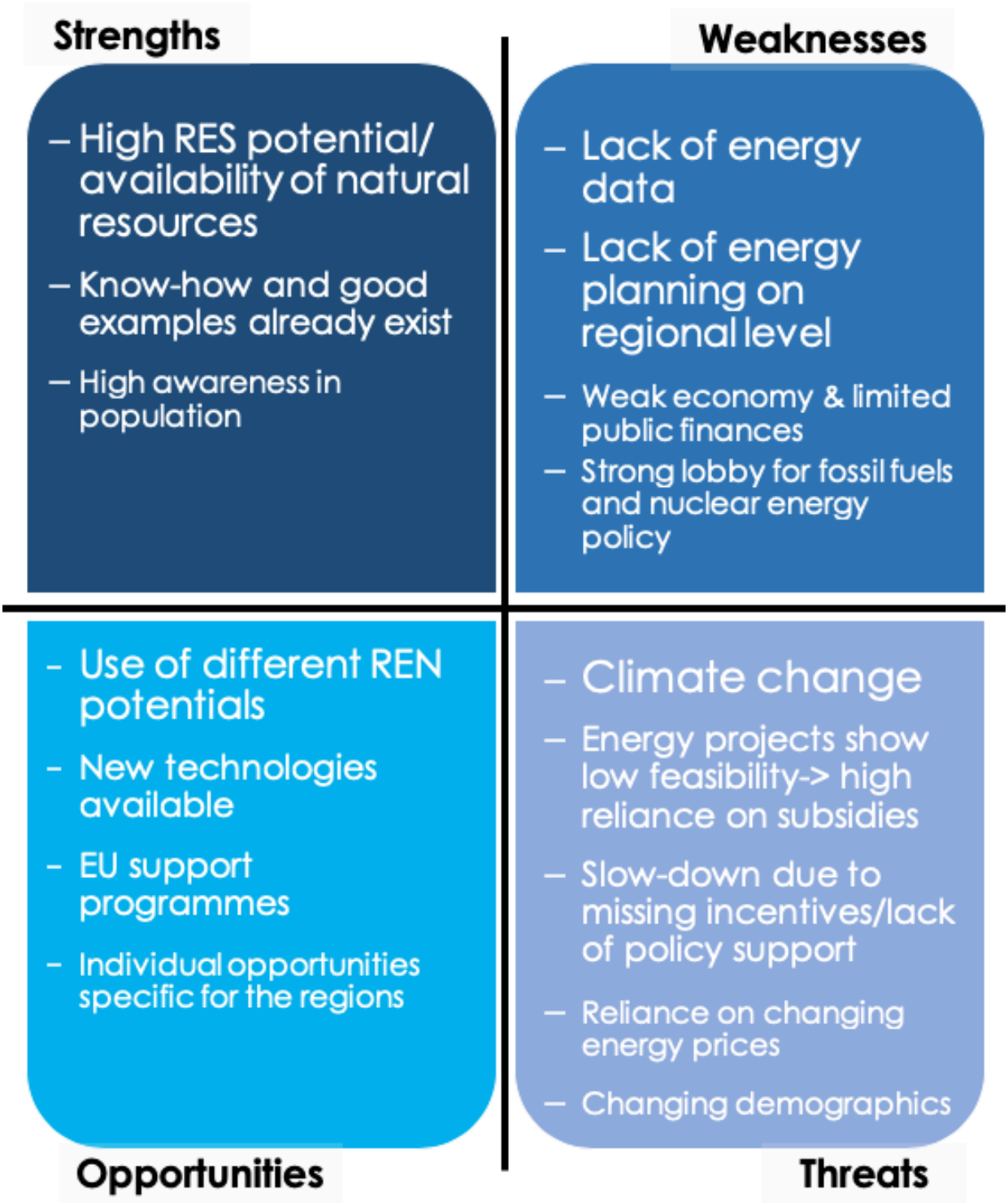


Regions with lowest energy intensity



The REP was further used to steer the choice of which stakeholders needed to be involved and how to involve them in the roadmapping process (e.g. as part of implementation team, for the endorsement by policy-makers, multiplicators, etc.). The analysis of the REP showed major influencing factors regarding the energy balance or carbon emissions. The identified sectors and its stakeholders should have been in the focus of further activities and specifically addressed in the roadmap.

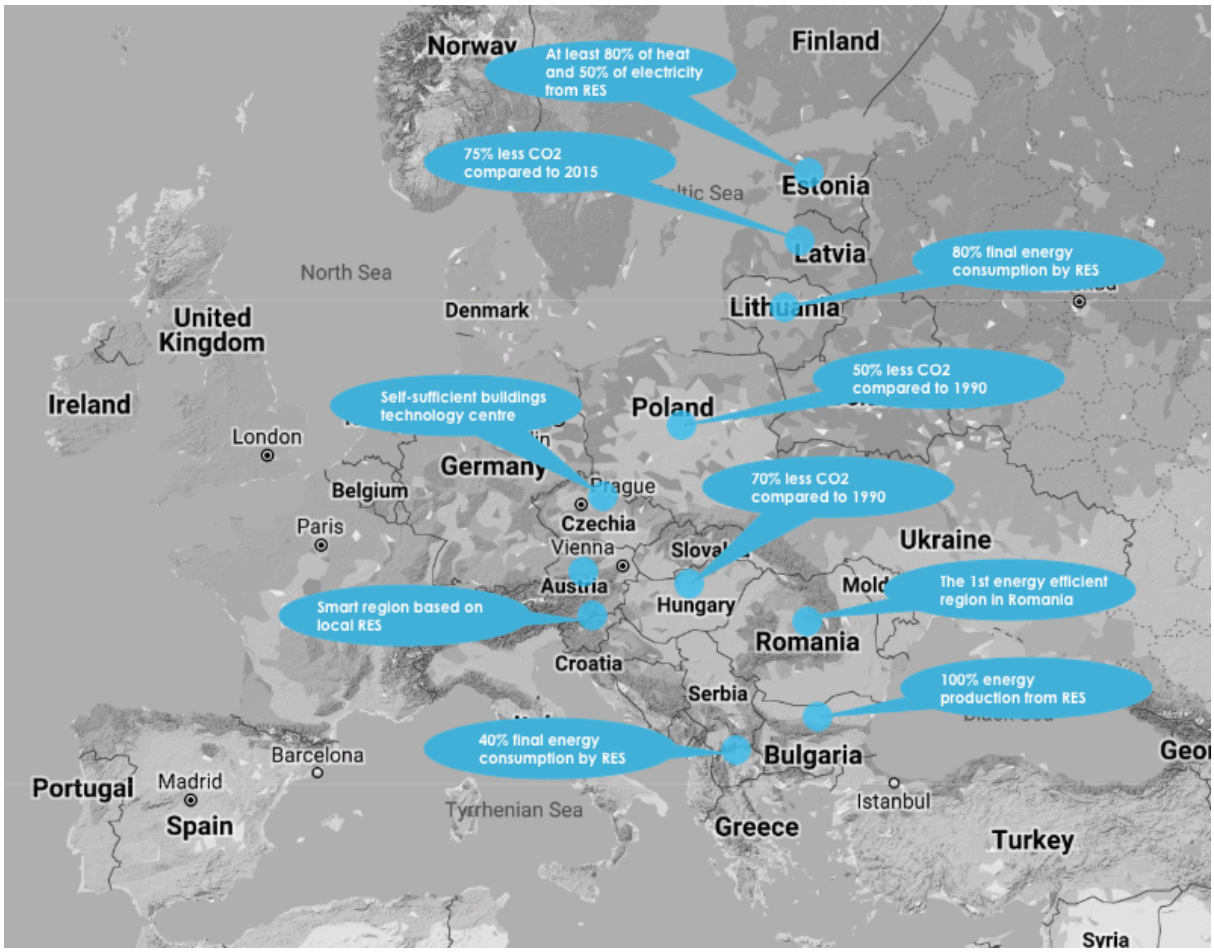
SWOT analysis for the CEE regions



To find out more refer to *"Energy Efficiency Situation of Central and Eastern European Region. CEESEN, 2018"*

Regional vision (D3.3)

In principal Regional Vision are related to whole Roadmap and Action Plans (AP) as in particular AP are concrete measures fulfilling the Regional Vision. The vision constitutes the headline and guiding principal of the Roadmap.



All vision statements refer to a development paths with a time horizon until 2050. The visions take into consideration already existing targets (national or EU-wide), e.g. for 2020 and 2030 – if possible, broken down to regional level). All visions contribute to the national and EU-wide climate change mitigation strategies and targets. In the formulation coherency of the vision with other policy documents was observed, e.g. economic and regional development, employment strategy, agriculture policy, etc. Consistent with the project objective the vision described the regional interpretation and contribution towards a low-carbon economy.

An analysis of the vision documents showed that the focus regions approach the path towards a low-carbon economy in different ways. The chosen development targets and paths strongly depended on the regional characterizes. Both institutional framework conditions as well as geographical/resource-wise characteristics influenced the direction of the stated targets.

The 10 visions focus each on specific region. Most visions (8 out of 10) directly mentioned the needed increase of the renewable energy share as essential component to reach the

low-carbon economy. 6 of these regions also claimed increased energy efficiency as complementary condition. The role of innovative technologies and in particular the use and development support for smart energy production and consumption technologies was emphasized.

A couple of regions pledged to become forerunners in their countries and EU-wide, e.g. the region of South Bohemia (CZ) through setting the cornerstones for establishing off-grid buildings as building standard in South Bohemia, Bucharest-Ilfov region aiming to become the first energy efficient region of Romania, or the Podravje region (SI) becoming a forerunner in terms of smart energy systems.

Specific barriers were identified which are at the moment hindering the development towards a low-carbon economy and need to be addressed in order to reach the vision. A significant barrier for the realization of the vision is the low availability of domestic expertise and consultancy services both for public and private sector. PANEL2050 already started to address this barrier through focused regional training during the project duration. Trainings and knowledge transfer will also play an important role in the future to realize the vision.

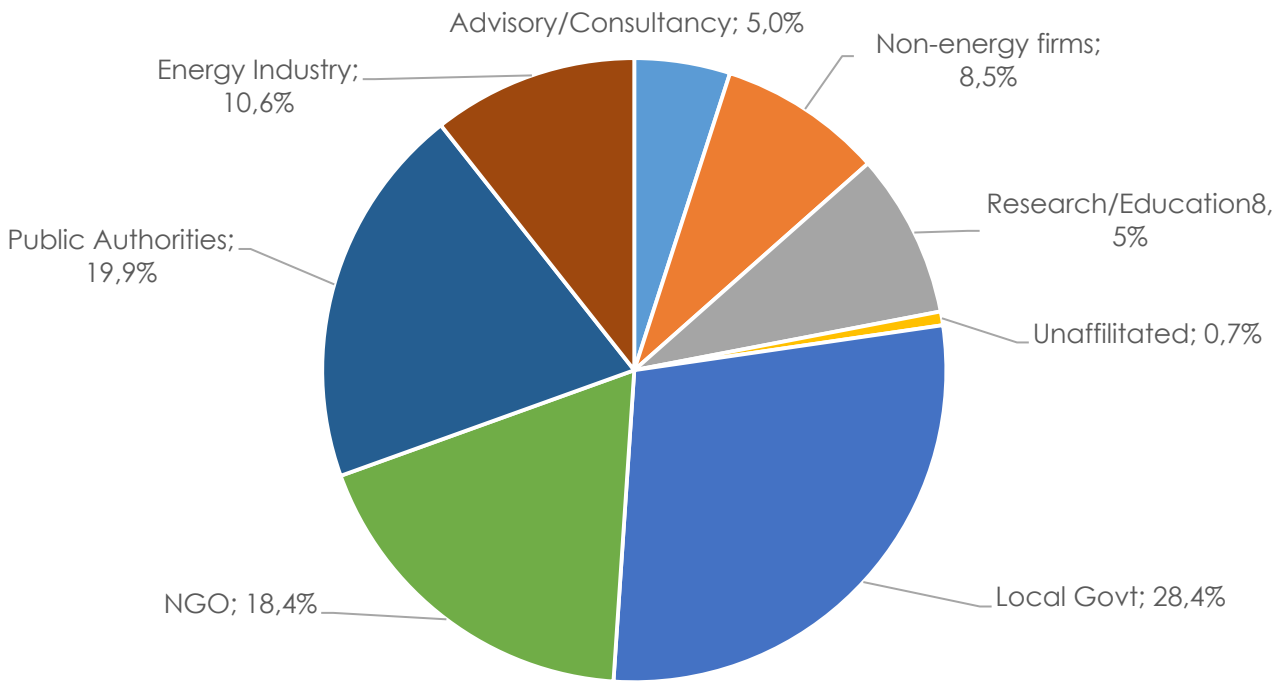
Moreover, there is a lack of awareness in the general population about climate change mitigation and the influence of the energy sector or individual energy consumption on GHG emissions.

Partners from the focus regions together with their stakeholders identified a certain lack of political will to support and implement a transition to a low carbon economy through legislation changes or strict and binding policy targets. At least 5 of the focus regions are encountering this problem. This includes also bureaucracy for approval of RES facilities, inconsistencies between policy strategies (e.g. environmental and economic development) and a strong commitment to conventional and centralized energy systems.

The visions were developed with strong involvement of different stakeholder groups. In almost all cases local municipalities were involved in the determination and formulation of the vision statement. In some cases, e.g. MK, also regional government representatives were included to ensure the endorsement of the vision. Strong partners in the development process were experts from the energy sector as well as representatives of interest groups and NGOs. Where the private sector plays an important role for the implementation of the vision, e.g. in South Bohemia (CZ), Vidzeme's region (LV) and Mazovian Voivodeship (PL), representatives of local businesses, including technology providers were included as well.

In the final Roadmap document the vision acted as introduction to the Roadmap: a brief description of selected energy vision, its potential and expected impact for the region ideally based on data from the previous Regional Energy Profile analysis or explained if this linkage to concrete energy-related challenges in the region.

Following figure shows which type of stakeholders were engaged in Visioning process:



To find out more refer to "*Regional Visions for Sustainable Energy Future. Synthesis report on CEE region. CEESEN, 2018*".

Roadmap (D3.5)

The roadmap document is the heart of the process channeling baseline analysis and vision into a concrete pathway towards a sustainable energy future. The document is divided into particular strategical challenges which have potential to drive the region towards the set vision, i.e. priority areas. Each priority area was defined and described including regular milestones of the development towards the vision (= describing a business-as-usual scenario in comparison with a scenario in order to reach the vision).

Each priority area was described in a uniform way covering the following topics:

1) Conditions and challenges for further development mainly from the following point of views: R&D, know-how and technology transfer, stakeholder collaboration, public measures, strategical activities, policy
2) Stakeholder list covering public institutions, R&D, business sector, public including their influence share on given priority topic
3) Target group list covering public institutions, R&D, business sector, public
4) Financing and other sources for implementation of suggested strategy activities

To find out more refer to "*Roadmaps Towards a Sustainable Low-Carbon Economy. Collection of Roadmaps from CEE countries. CEESEN, 2019*" and see the chapter *Energy Roadmaps*.

Regional Action Plans (D3.7)

Based on priority areas 10 concrete and detailed Action Plans were developed with following structure:

1) Definition of the measure / action – in relation to given priority topic, financing, justification of inclusion to Action Plans and methods of solution.
2) Currently running projects, measures including their actors and results. Potential for utilization of these results.
3) Suggested solutions – innovations, education, coordination, measures, research topics. Summary of outputs and their impacts on the region.
4) Main potential participants and partners – public institutions, R&D, business sector. Identification of guarantor who should come from the public authority, furthermore other key actors should be listed including international partners.
5) Estimated costs, financing sources and required measures to support for given Action Plan's implementation.
6) Target and monitoring indicators including a monitoring methodology
7) Time plan including milestones and deliverables in time.

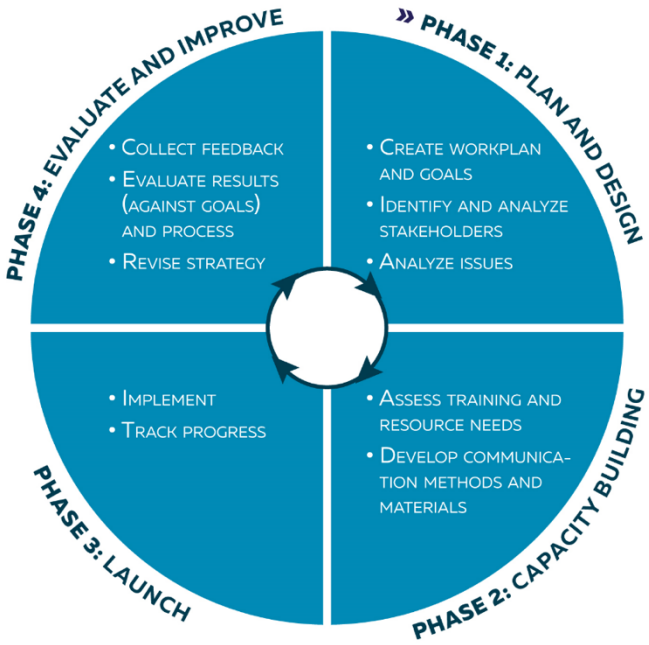
By providing a uniform structure and methodology partners were required to think about and plan for all of the above-mentioned dimension of the Action Plan.

Stakeholder Engagement and Forerunner Concept

Stakeholder Engagement is a strategic approach for involving the community in local energy decision-making and management. During the project, stakeholders in each of the targeted regions were invited to participate in long-term energy planning, to ensure that decisions reflected their knowledge, experience and perspectives. Regional and local actors were involved in the planning and implementation process from the beginning to guarantee the success of the effort. PANEL partners conducted various capacity building activities to increase the competency of these stakeholders, which are further described below. They also sought to identify those stakeholders who could play a most important role in the process, referred to as forerunners, which is also described below.

The PANEL 2050 model used a participatory approach for stakeholder management to systematically identify and engage stakeholders. This includes the following steps):

- Defining different aspects of the social and natural system affected by the planned decision or action
- Identifying individuals and groups who are affected by or can affect those parts of the system
- Prioritizing these individuals and groups for involvement in the decision-making process
- Convincing these identified stakeholders to participate in planned efforts
- Regularly interacting with these stakeholders at key points in the process to ensure that they continue to be engaged



Capacity building actions

PANEL 2050 conducted multifaceted actions to build the capacities of the local stakeholders. The empowering actions consist of 4 components:

- **Train-the-Trainer Workshops** - Focused on providing the practical skills and technical knowledge needed by PANEL partners to be able to train local stakeholders to lead roadmapping processes –10 Stakeholder Engagement Persons (SEP)s were trained among partners. SEPs led the engagement process throughout the project.
- **Local Training** – conducted based on the PANEL 2050 curriculum, 1240 participants were trained in total.
- **In-Depth Training/Forerunner Bootcamp** - In-depth skills training for key stakeholders who were taking leadership roles in their communities (forerunners) - 22 stakeholders were trained in total. 13 out of 22 were actively involved in the

local roadmapping processes. In Hungary, Romania bootcamp participants were not involved in the raodmapping teams and visioning process.

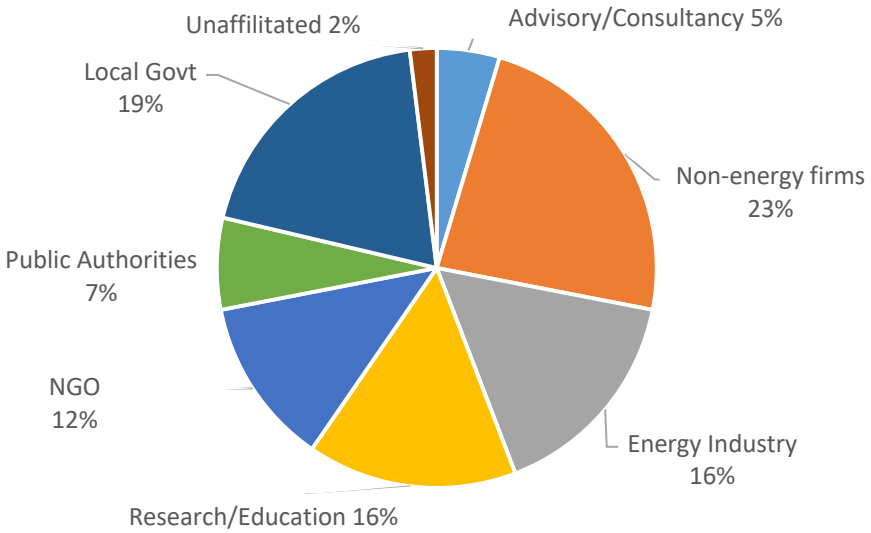
- **Energy Advocacy Curriculum and Guidebook** – Brought together and expanded on the content of the previous activities in one manual that was used by partners and other organizations seeking to promote sustainable energy in their communities. It also can be used as a study book of all the relevant topics of sustainable energy advocacy.

Forerunner concept

Although the PANEL 2050 model calls for working with large numbers of diverse stakeholders, it also seeks strategic engagement with key constituencies, especially with 'forerunners' who could be more influential to other community members, capable of pushing forward road mapping efforts. At the beginning of the engagement process, partners identified important energy actors - that were potential stakeholders. These actors who participated in capacity building activities were considered PANEL stakeholders. Stakeholders who were continuously involved in regional trainings, visioning and roadmapping processes, and registering on CEESEN platform were identified as forerunners.

Forerunners served at least three distinct roles in the roadmapping processes. First, they were instrumental in helping to get important stakeholders to participate in the process. Second, forerunners took active role in the roadmapping process itself, participating in visioning workshops and in roadmap development. Finally, forerunners by commitment letter are supposed to monitor the implementation of roadmaps, pushing various actors in the government, business and other sectors to fulfill promises made.

PANEL Engagement Statistics



As shown in the diagram, a diverse range of stakeholders were engaged within the PANEL 2050 project.

Other relevant engagement numbers in the PANEL 2050 project included:

- Stakeholdres Involved/Informed: Stakeholders made aware of the issue of energy transition and offered access to tools – **2 450 members of CEESEN**

- Capacity Built: **1 240 Stakeholders** attended trainings on topics such as Financing Mechanisms, Project writing, Energy Planning etc. – **232 public officers** were directly trained.
- Engaged: **126 Stakeholders** participated in visioning and road mapping activities for their community –**.** Public officers from National Public Authorities, HEI, Local municipalities, Public energy agencies and companies – **659 public officers** in total.
- Forerunners: Stakeholders who assumed leadership roles – participating in multiple stages of activity (receiving training, and be member of roadmapping team efforts) – **95 stakeholders** participated in multiple stages of activity such as joining CEESEN, receiving training, and be member of roadmapping team efforts.

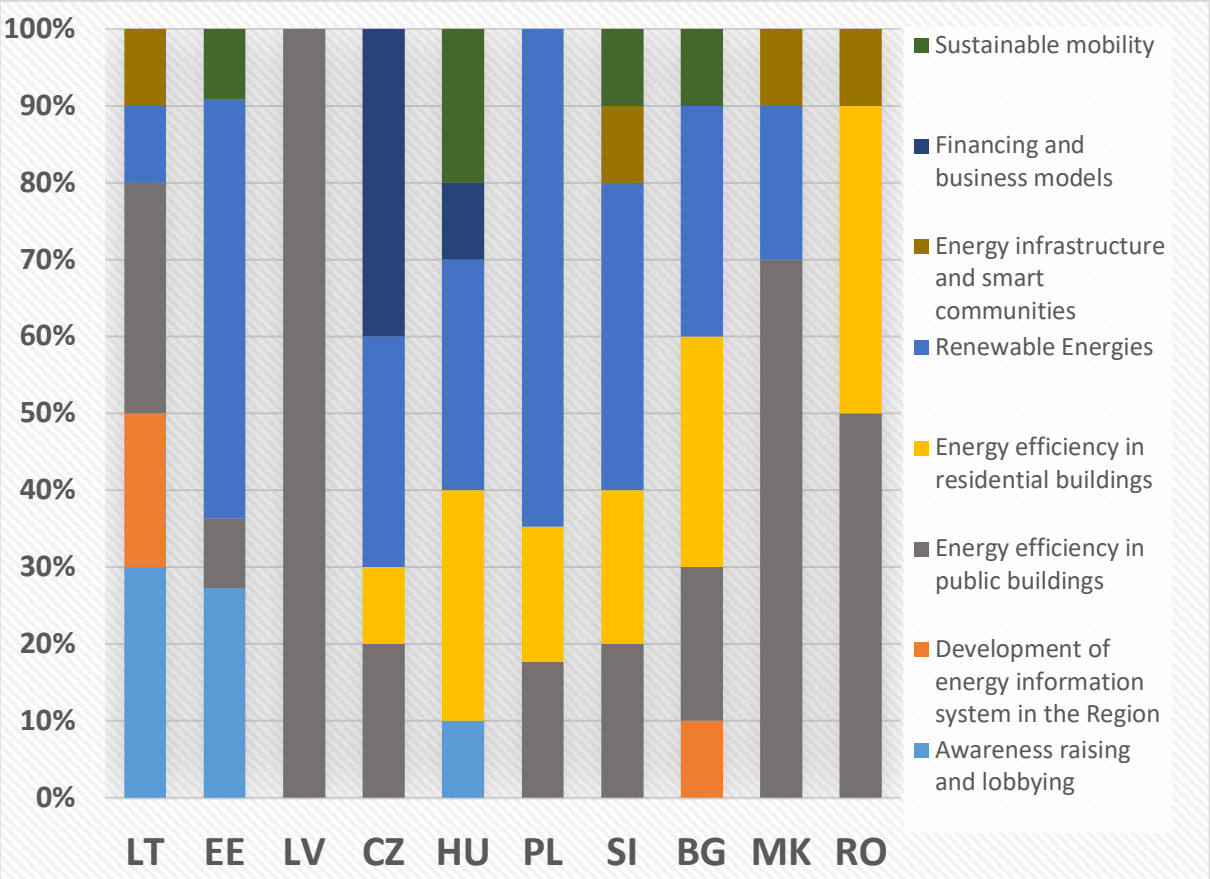
Energy Roadmaps

Ten Roadmaps towards a sustainable low-carbon economy were developed. Nine of these roadmaps concentrate on the regional level and only the Estonian case is a national roadmap and has developed Action Plans accordingly. Since Estonia is a relatively small country with flat hierarchies between local, regional and national level, including only few decision-makers working solely for the regional level, the decision was made to focus the Roadmap on the national level.

Partners needed to set specific priorities in their roadmap. Priority areas were chosen with the capacities and outreach of the roadmapping team in mind. The resulting Action Plans were endorsed by political decision-makers and/or members of the roadmapping team, taking responsibility for the implementation.

Analysing the chosen priority areas, it is apparent that a strong focus lies on Energy efficiency in buildings as well as development of renewable energy both in the public and the private sector. Sustainable mobility, as important contribution to more efficiency and a long-term fuel shift in the transport sector, is presented as well in four countries. Three regions (CZ, HU, BG) developed dedicated measures within the topic of energy financing.

The following graphic gives a summary of the identified priority areas of the Roadmaps:



The focus on topics concerning the public sector is strongly presented in the Roadmaps. One the one hand the public sector is in all participating regions a major energy-consuming sector (buildings, infrastructure) with significant potential for improvement. On the other hand, PANEL 2050 actors, e.g. as regional energy or development agencies, are

acting through existing cooperation with municipalities, public officers and also political decision-makers on a regional level. The cooperation with the public sector was deemed essential in the roadmapping process, not only due to the involvement of decision-makers but also considering the potential of the public sector to act as role model to spark additional actions.

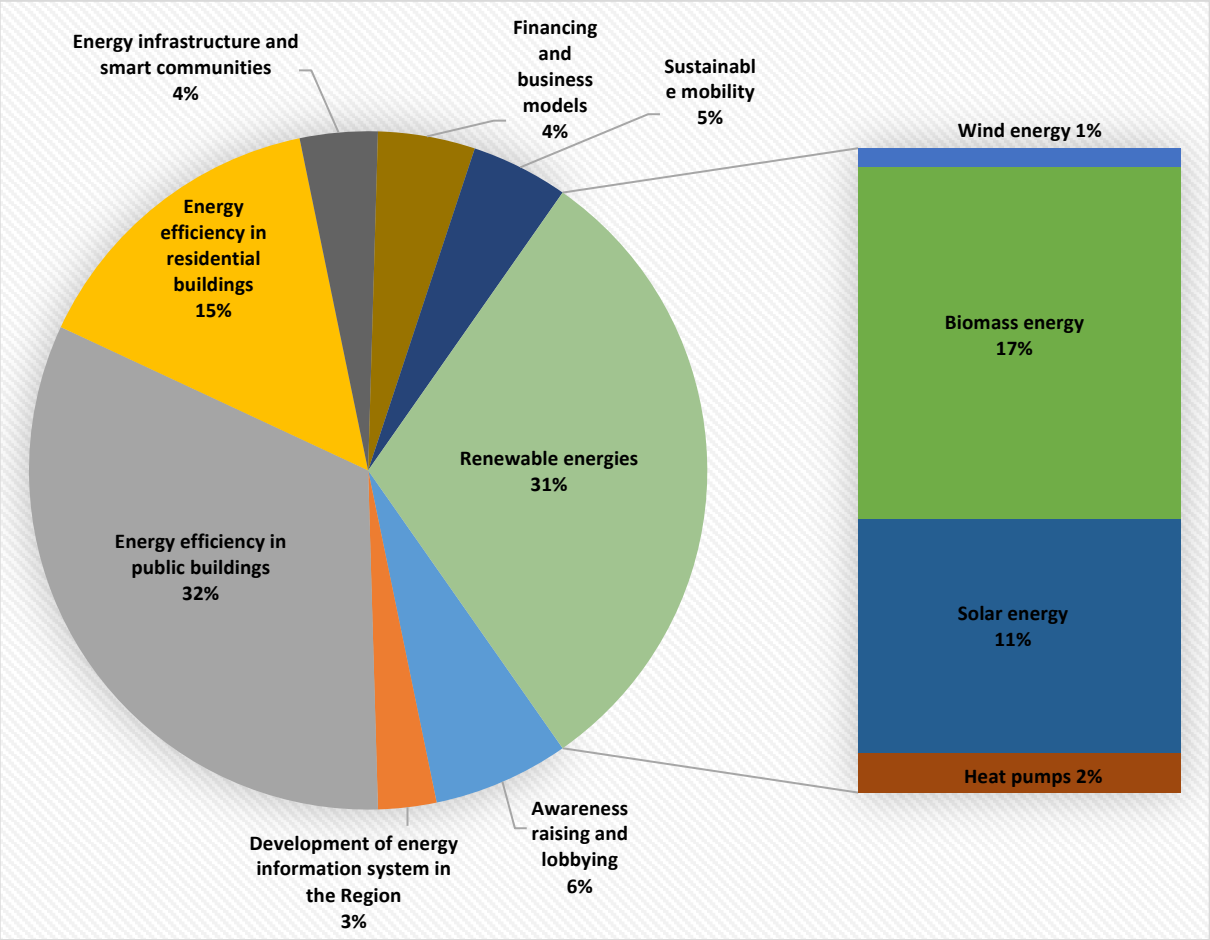
In the Roadmaps private sector engagement could be more prominent as reaching the vision will impact mostly economic sectors, and finally also require private financing means in addition to public funds. To be more specific, for example the Estonian Roadmap foresees a significant shift of the local economy from an oil-shale dominated energy industry to renewable energies. In particular, in the development of new (smart) energy technologies and electromobility, technology and R&D focussed companies will play an important part in facilitating a feasible technology shift. More awareness in the sector of private businesses and industries will be key. Good example in this field provide the Roadmap for Estonia and also Borsod-Abaúj-Zemplén and Heves counties (HU) as awareness raising and lobbying for a low-carbon economy is part of their implementation strategy.

Another example from Czech Republic on one hand shows importance of bottom-up technology initiatives (self-sufficient buildings), on the other hand reflects the current needs of a highly developed biogas sector that is now seeking its critical break point related to the termination of the operational subsidy scheme and measures towards regional financing tools for energy efficiency. An example from Lithuanian's region Ignalina is closely related to the Nuclear Power Plant decommissioning and synced to the consequences as well as the benefits of this long-term project that will affect the social, economic and environmental development of this area. Five regions (PL, RO, LV, MK and partly BG) chose to design their action plans specifically for concrete municipalities mainly in the field of energy efficiency or renewable energy.

For the overview of each Roadmap structure and priority areas focus see Annex 1 of this report and for the full details read the individual Roadmaps.

Action Plans

As essential part of the 10 presented roadmaps in total **108 Action Plans** were developed and endorsed by implementing organisations or groups. The majority of actions concentrated either on the improvement of buildings (51 of 108) –– with a clear majority focusing on the public sector – or the strengthening of renewable energy production (33 of 108). The rest of the actions either concentrated on awareness raising, the mobility sector or financing and business models.



Time frame of the Action Plans and thereby their implementation frame ranged from short term measures (up to three years) to more strategic long-term plans aiming at continuous action until reaching their targets in 2050.

It was obvious that the roadmapping team (consisting of PANEL 2050 experts and local stakeholders and implementers) strongly influenced the methodological development as well as orientation of the Action Plans. Accordingly, different approaches in determining needed actions were chosen.

The Action Plans for Latvia, Poland, Romania, Macedonia and partly Bulgaria very much concentrate on municipal level. They aim at acting on single municipal level in order to spark the transition in chosen municipalities and use them as concrete examples for the whole region to multiply the results. The timeframe of the Action Plans is on average 3 to 5 years with many activities supposed to starting right after the PANEL project termination (Q1 2019), whereby some of them already started.

A similar time frame was chosen in the collection of Action Plans developed for the Podravje region, Slovenia. All Action Plans are aimed at implementation on regional scale but follow the strategy to start on single city/municipality level with pilot projects. The experiences and results gained from the pilots will be used for the further region-wide roll-out.

For the counties of Borsod-Abaúj-Zemplén and Heves, Hungary, and Estonia different approaches were chosen. Implementation of the endorsed Action Plans are starting as well in Q1 2019, but their direction is more long-term oriented with constant monitoring, evaluation and corrective measures planned until 2050.

For the full list of Action Plans see Annex 2.

Endorsement by implementers and decision-makers

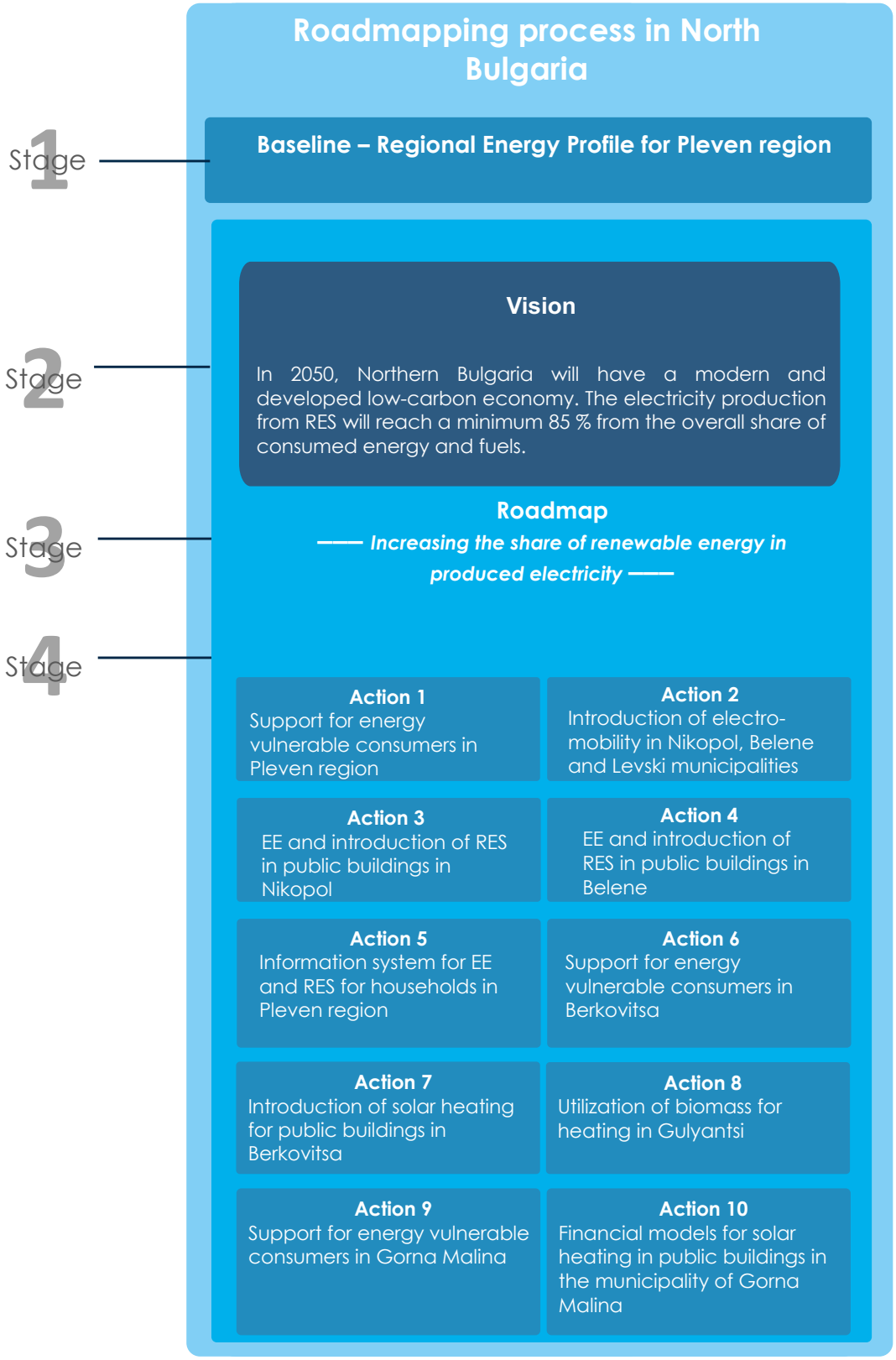
Formal endorsement of the roadmap is key to ensure the continuity and implementation of the roadmap including the Action Plans.

All partners have delivered formal signed letters of commitments / intents providing a commitment of their signatories towards the individual Action Plans or Roadmaps in general. In majority the confirmations were issued by municipalities or related public bodies as well as associations or directly by the implementers who act like guarantors of particular measures. In some cases, the Roadmaps/Action Plans were also recognized officially as a strategic project or approach on regional level.

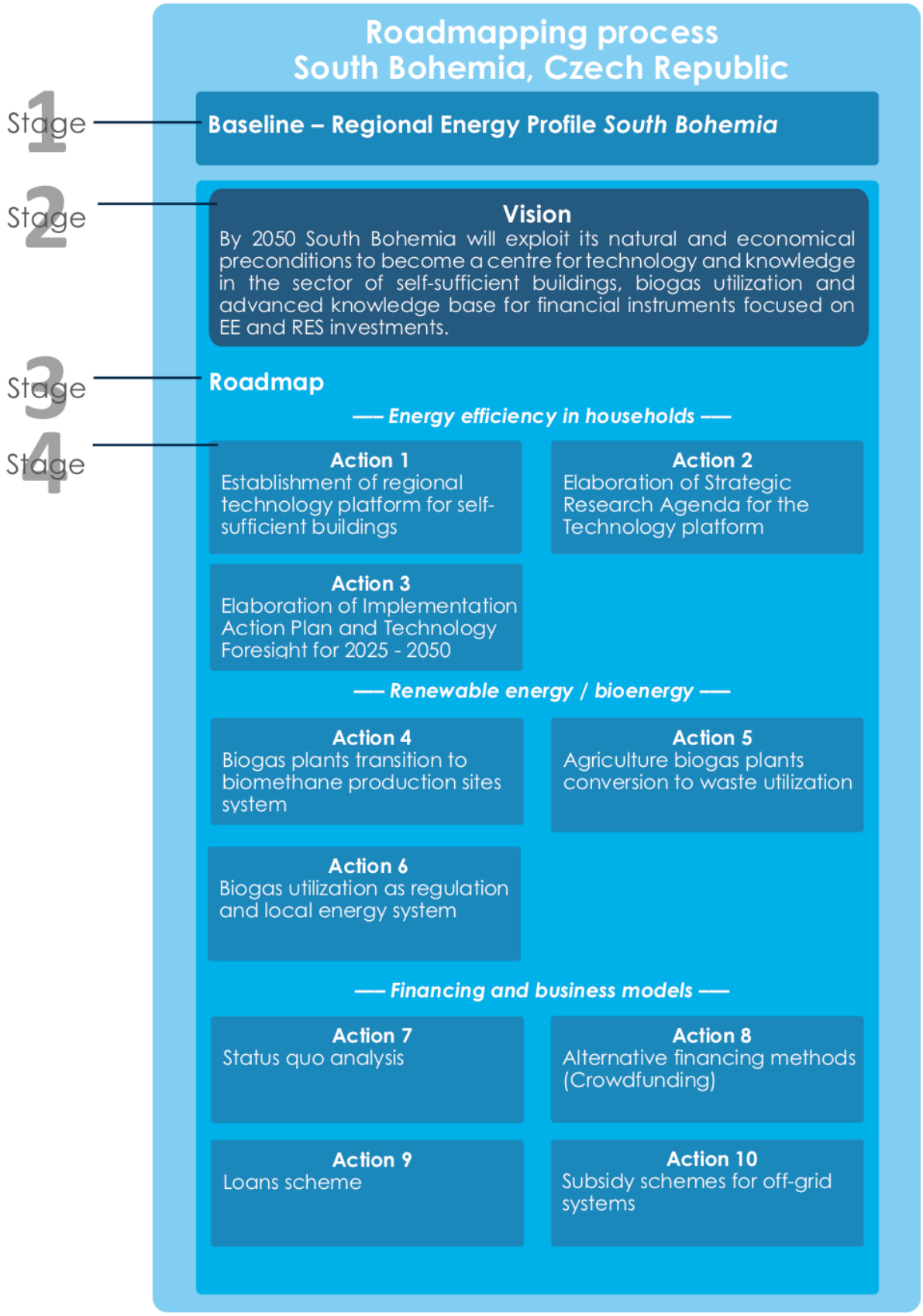
List of collected commitments for Energy Roadmaps / Action Plans is attached in Annex 3.

ANNEX 1 - Summary of Roadmaps and Action Plans

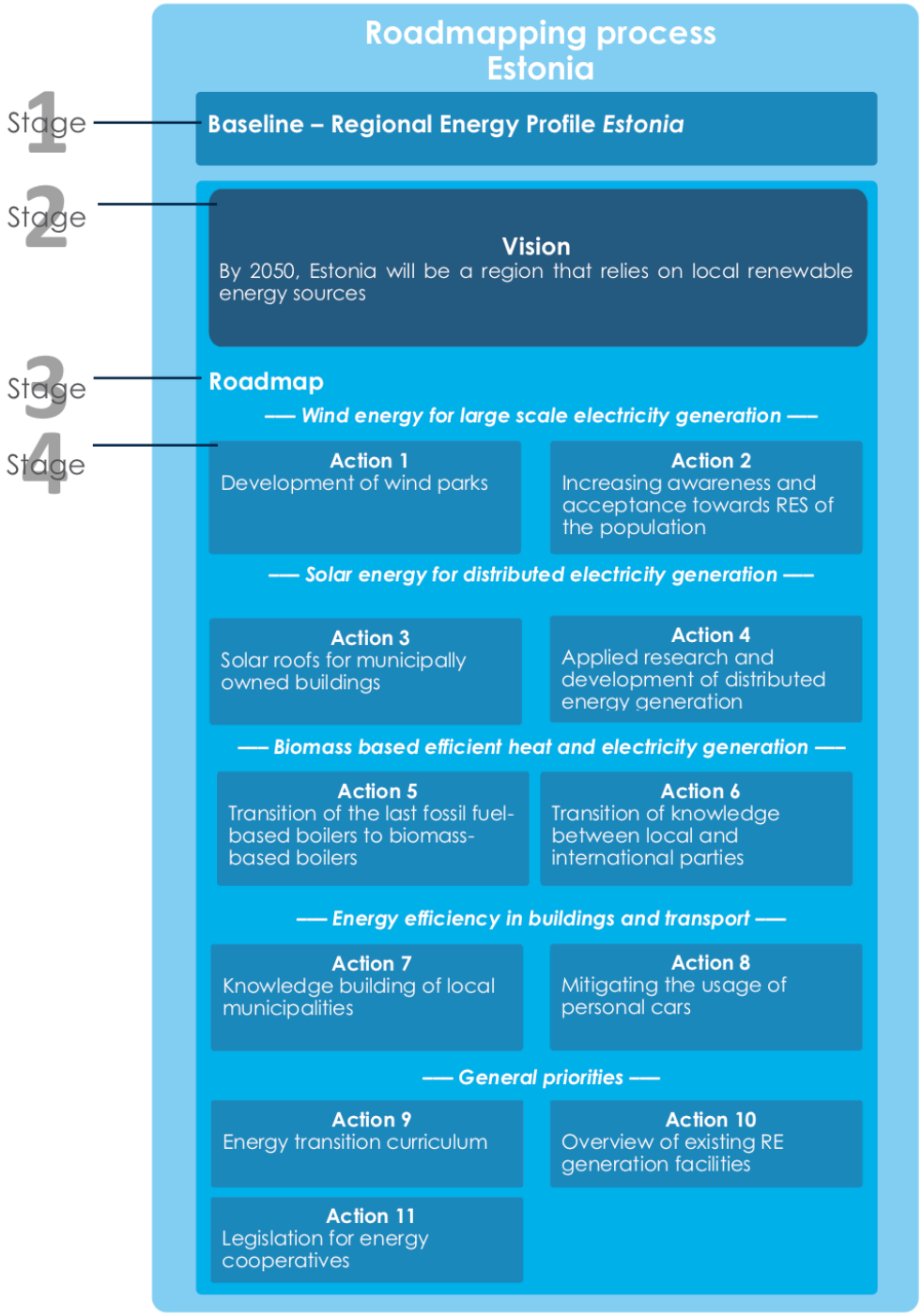
North Bulgaria, Bulgaria



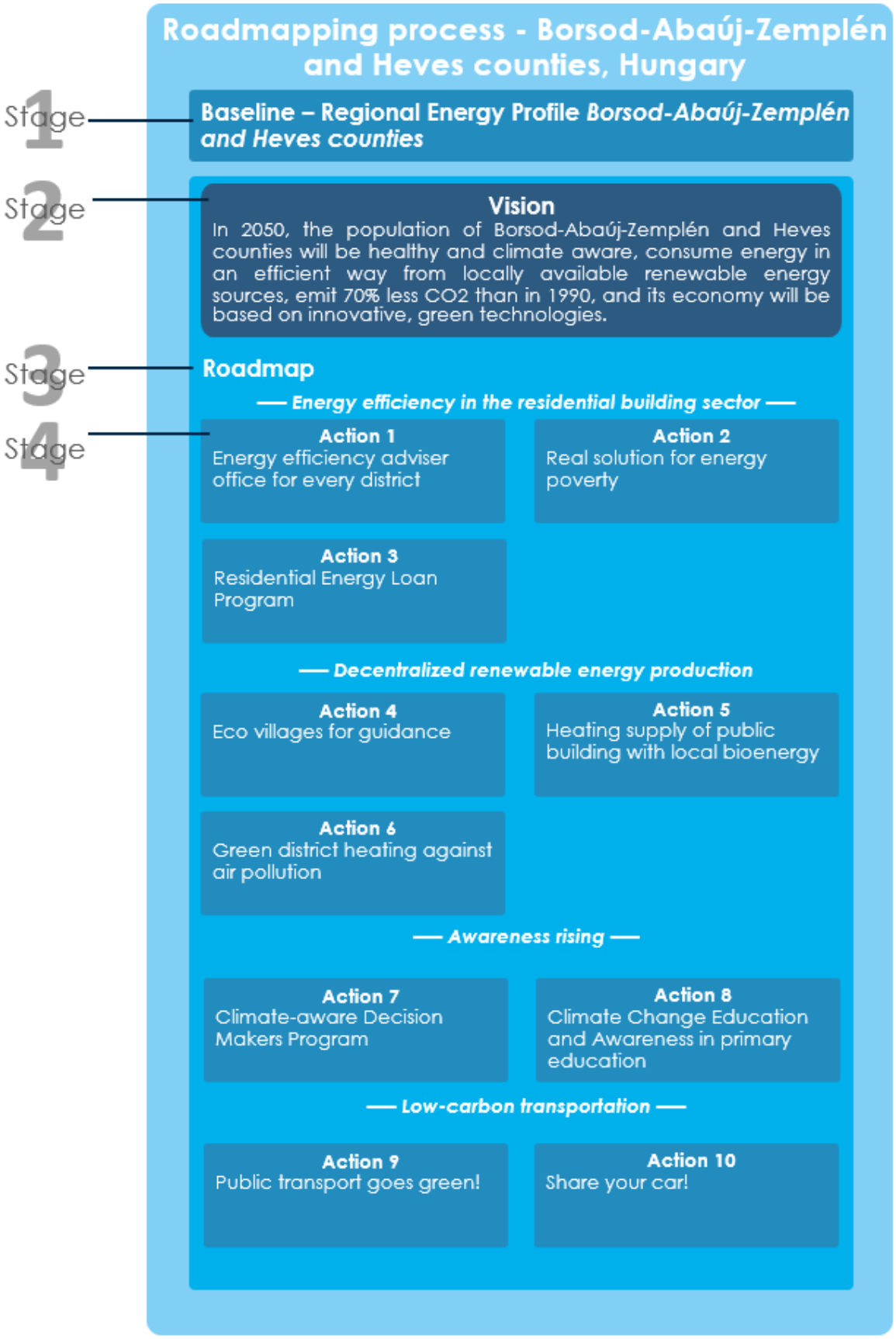
South Bohemian region, Czech Republic



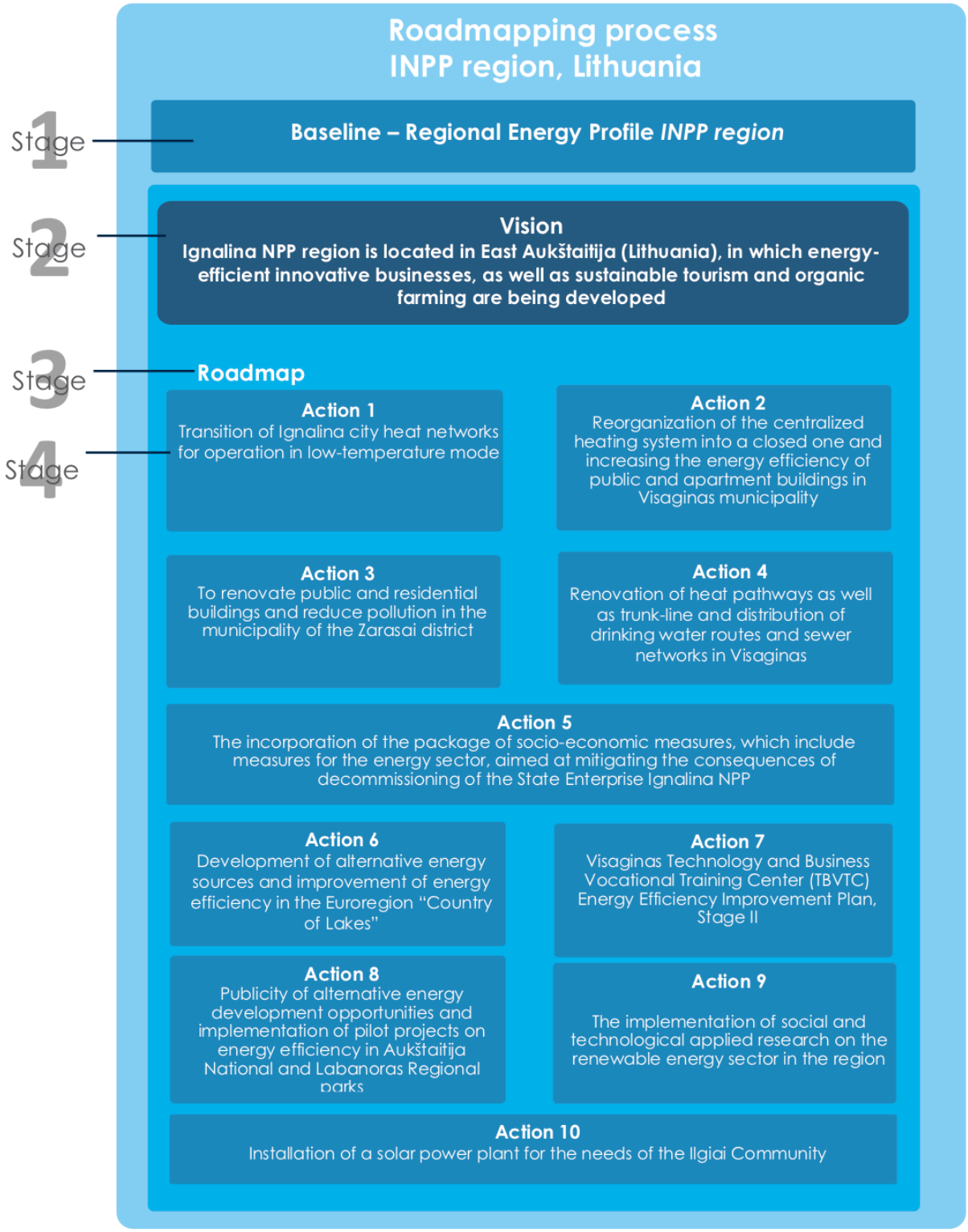
Estonia


Roadmapping process
Estonia
Stage 1
Baseline – Regional Energy Profile Estonia
Stage 2
Vision
By 2050, Estonia will be a region that relies on local renewable energy sources
Stage 3
Roadmap
Stage 4
— Wind energy for large scale electricity generation —
Action 1
Development of wind parks
Action 2
Increasing awareness and acceptance towards RES of the population
— Solar energy for distributed electricity generation —
Action 3
Solar roofs for municipally owned buildings
Action 4
Applied research and development of distributed energy generation
— Biomass based efficient heat and electricity generation —
Action 5
Transition of the last fossil fuel-based boilers to biomass-based boilers
Action 6
Transition of knowledge between local and international parties
— Energy efficiency in buildings and transport —
Action 7
Knowledge building of local municipalities
Action 8
Mitigating the usage of personal cars
— General priorities —
Action 9
Energy transition curriculum
Action 10
Overview of existing RE generation facilities
Action 11
Legislation for energy cooperatives

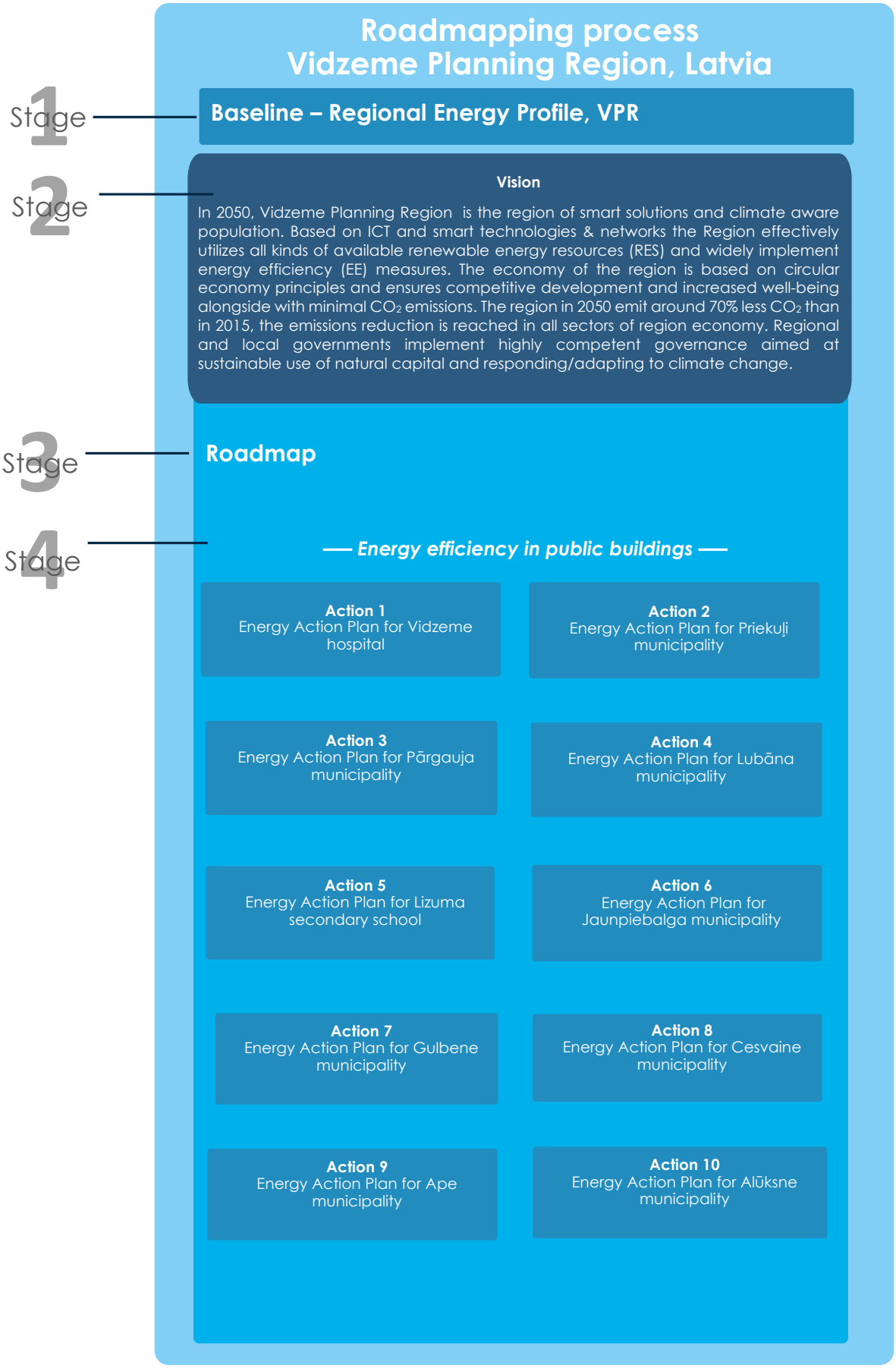
Borsod-Abaúj-Zemplén and Heves counties, Hungary



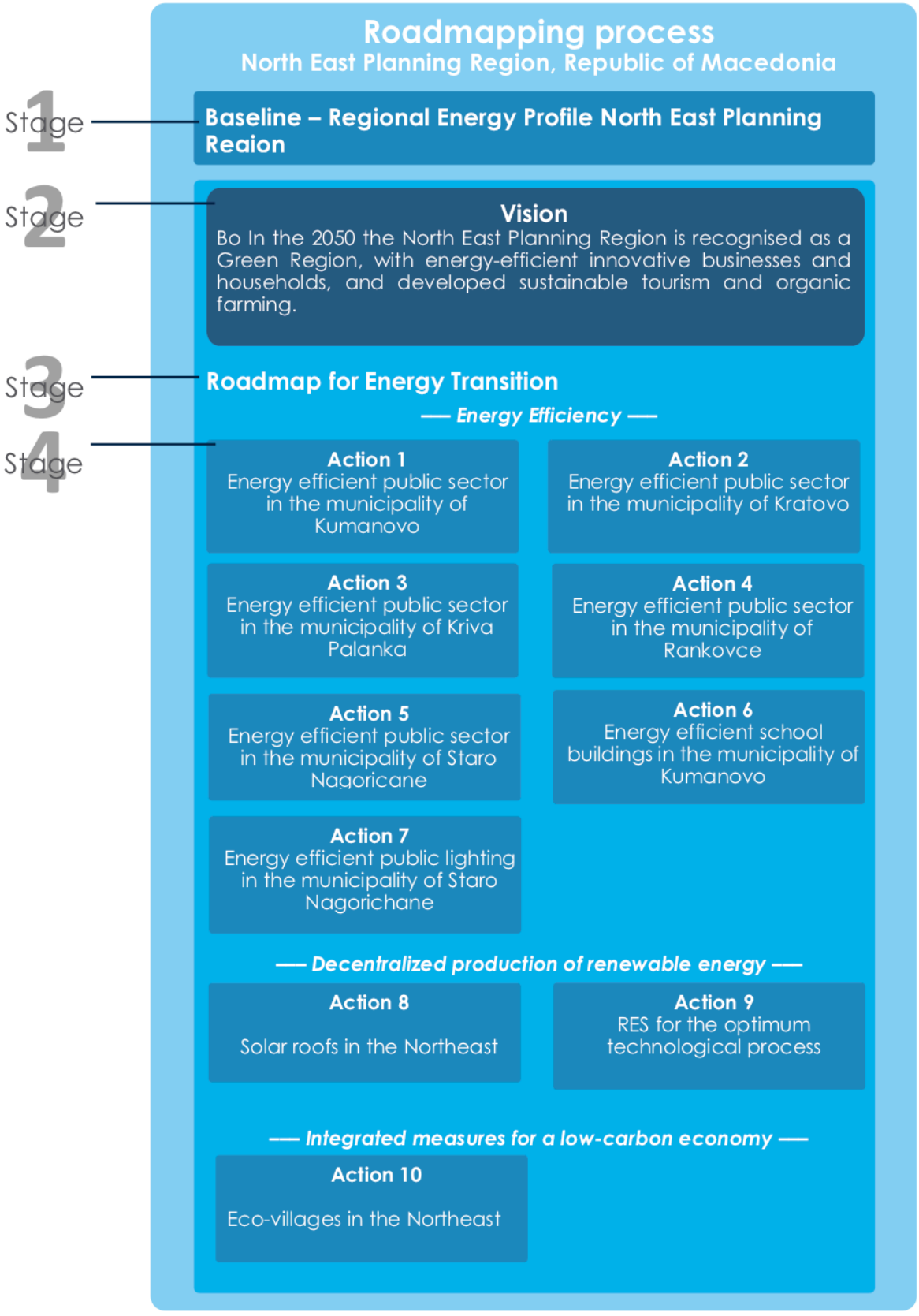
Ignalina NPP region, Lithuania



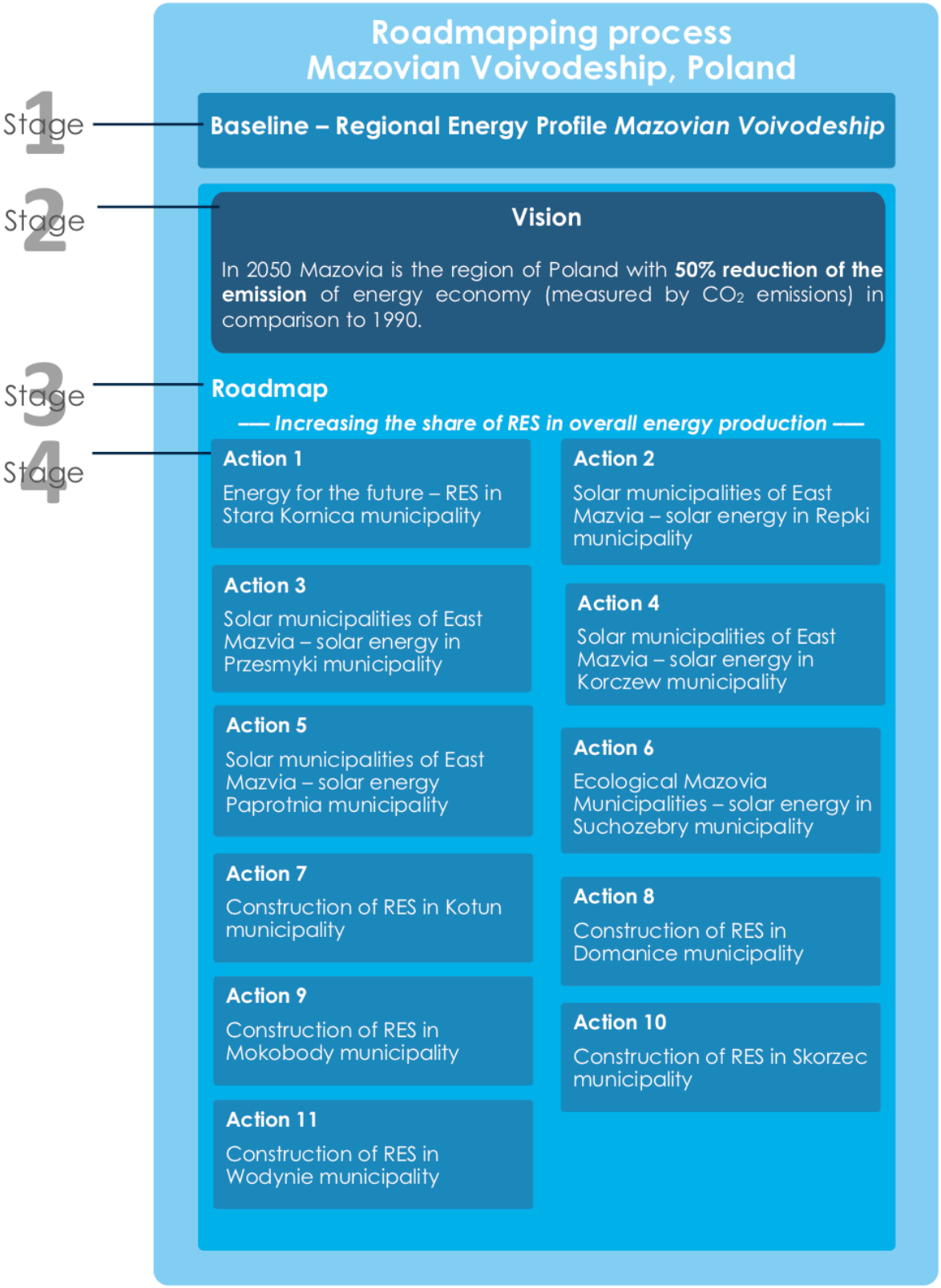
Vidzemes planning region, Latvia



North East Planning region, Macedonia



Mazovian Voivodeship, Poland



— Increased energy efficiency in public sector —

Action 12

Thermomodernization of public buildings in Stara Kornica municipality

Action 13

Thermomodernization of public buildings in Korczew municipality

Action 14

Thermomodernization of public buildings in Kotun municipality

— Increased energy efficiency in housing sector —

Action 15

Replacement of heating devices in residential buildings in Korczew municipality

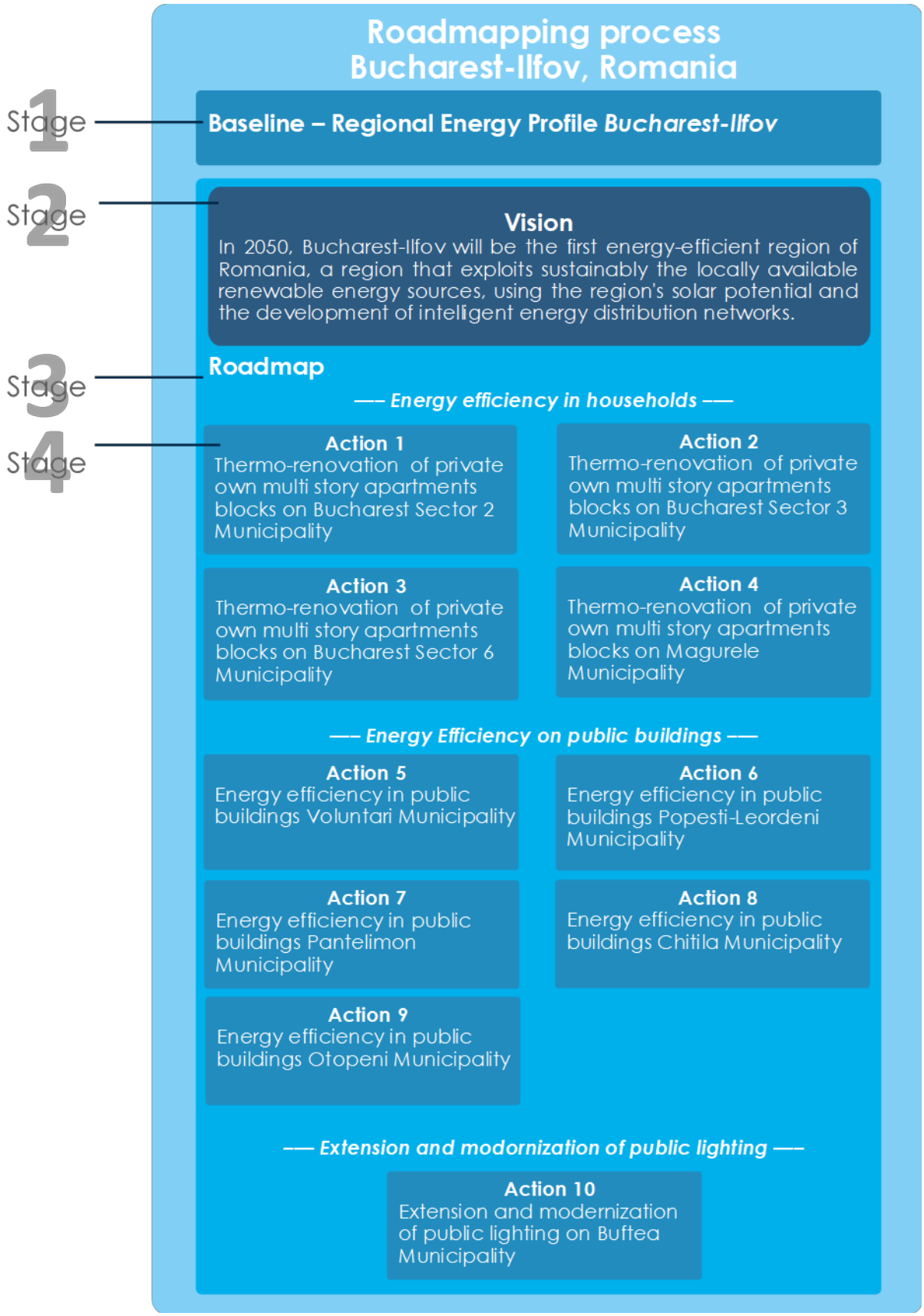
Action 16

Replacement of heating devices in residential buildings in Jablonna Lacki municipality

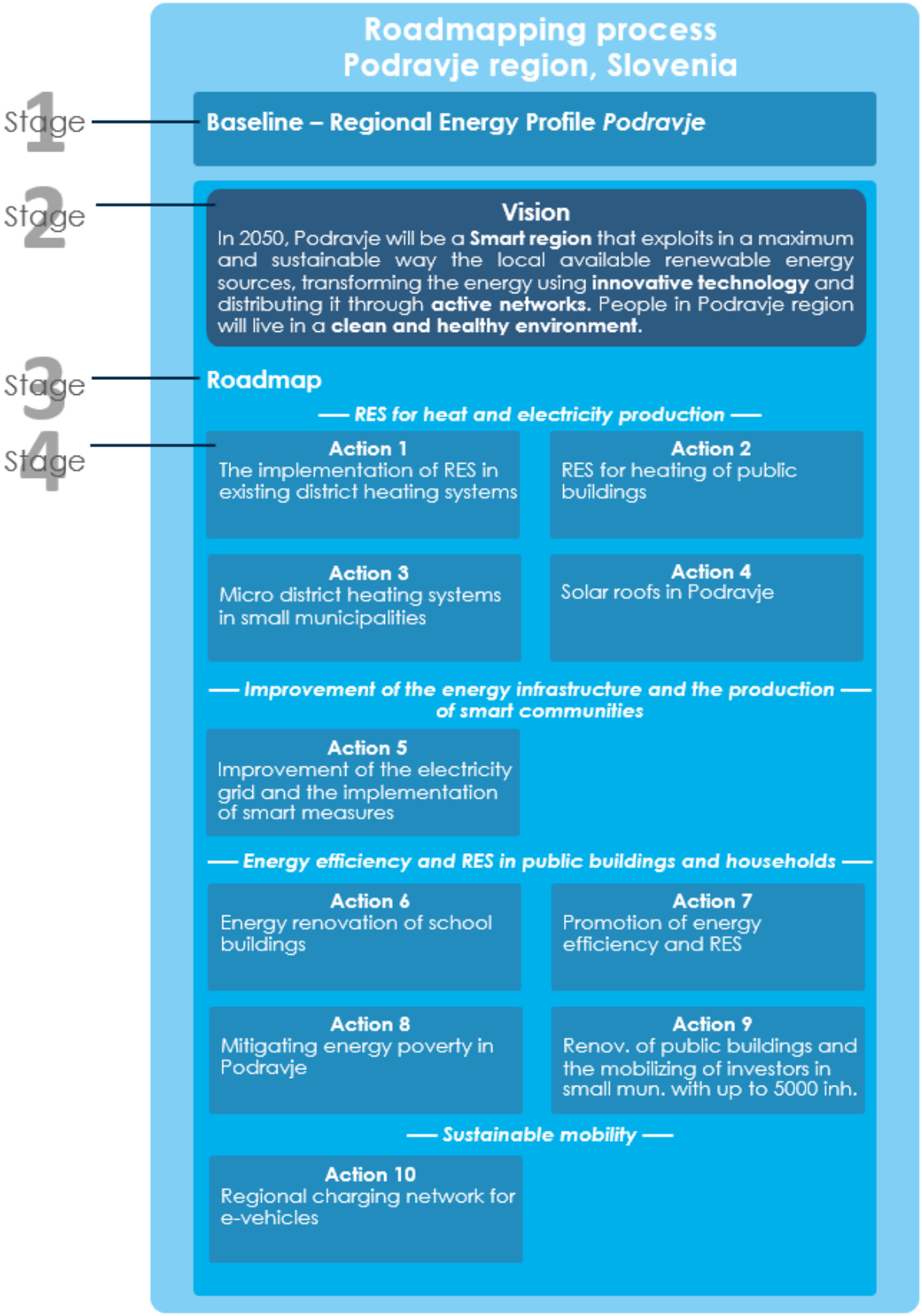
Action 17

Replacement of heating devices in residential buildings in Stara Kornica municipality

Bucharest-Ilfov, Romania



Podravje region, Slovenia



ANNEX 2 - Full list of Action Plans developed

North Bulgaria, Bulgaria

- Protection and support of energy vulnerable consumers in Pleven Province
- Introduction of electro-mobility and development of adequate interurban bus transport system and connections at Nikopol, Belene, Levski municipalities
- Implementing Energy Efficiency measures combined with RES installations for municipal buildings to reduce energy use in Nikopol Municipality
- Implementing Energy Efficiency measures combined with RES installations for municipal buildings to reduce energy use in Belene Municipality
- Development of an information system and awareness raising measures for the promotion of EE and RES among households in the municipalities of Pleven
- Protection and support of energy vulnerable consumers in Pleven Province
- Analysing the possibilities for building solar heating system for public buildings in the municipality of Berkovitsa
- Utilization of wetland biomass and agricultural residues as local heating source in Guliantsi Municipality
- Protection and support of energy vulnerable consumers in Gorna Malina Municipality
- Development of possible financial schemes for implementation of solar heating system in municipal buildings – Gorna Malina Municipality

South Bohemian region, Czech Republic

- Establishment of regional technology platform for self-sufficient buildings
- Elaboration of Strategic Research Agenda for the Technology platform
- Elaboration of Implementation and Technology Foresight for 2025 - 2050
- Biogas plants transition to biomethane production sites system
- Agriculture biogas plants conversion to waste utilization
- Biogas utilization as regulation and local energy system
- Status quo analysis
- Alternative financing methods (Crowdfunding)
- Loans scheme
- Subsidy schemes for off-grid systems

Estonia

- Development of wind parks in Estonia
- Increase of knowhow about renewable energy production among locals
- Installing Solar panels to Tallinn municipal buildings
- Research and development activities on micro- and distributed production of renewable energy
- Transfer of fossil fuel boilers to local alternative energy sources and adaptation of legislation to motivate investment and enable energy companies to enter the market.
- Developing local and international technology transfer in renewable energy
- Increasing the awareness of local governments about improving energy efficiency in public buildings (improvement of local government energy management skills)
- Reduction of private car use in the cities
- National energy transition training program
- Increasing the energy management capacity of local level administration
- Creating supportive environment for developing community energy production units

Borsod-Abaúj-Zemplén and Heves counties, Hungary

- Energy efficiency in the residential building sector
- Real solution for energy poverty
- Residential Energy Loan Program
- Eco villages for guidance
- Heating supply of public building with local bioenergy
- Green district heating against air pollution
- Climate-aware Decision Makers Program
- Climate Change Education and Awareness in primary education
- Public transport goes green!
- Share your car!

Ignalina NPP region, Lithuania

- Publicity of alternative energy development opportunities and implementation of pilot projects on energy efficiency in Aukštaitija National and Labanoras Regional parks
- The implementation of social and technological applied research on the renewable energy sector in the region
- Transition of Ignalina city heat networks for operation in low-temperature mode
- Installation of a solar power plant for the needs of the Ilgiai Community
- The incorporation of the package of socio-economic measures,
- Development of alternative energy sources and improvement of energy efficiency in the Euroregion "Country of Lakes"
- Reorganization of the centralized heating system into a closed one and increasing the energy efficiency of public and apartment buildings in Visaginas municipality
- Visaginas Technology and Business Vocational Training Centre Energy Efficiency Improvement Plan, Stage II
- To renovate public and residential buildings and reduce pollution in the municipality of the Zarasai district
- Renovation of heat pathways as well as trunk mains and distribution mains of drinking water and sewer networks in Visaginas municipality

Vidzemes planning region, Latvia

- Alūksne County Energy
- Ape County Energy Management Pilot Plan
- Cesvaine County Energy Plan for 2018-2025
- Sustainable Energy of Gulbene County Municipal Building for 2018-2020
- Jaunpiebalga County Council Energy Management Plan for 2018 - 2022
- Lizums Secondary School Energy Action Plan
- Energy Plan for Lubāna Pre-School
- Sustainable Energy of Pārgauja County for 2018-2023
- Priekuļi County Energy Plan for Rūpnīcas Street 8, Liepa, Liepa Parish, Priekuļi County for 2018 – 2025
- Energy Management Plan of Vidzeme Hospital

North East Planning region, Macedonia

- Energy Efficient Public Sector in the Municipality of Kumanovo
- Energy Efficient Public Sector in the Municipality of Kratovo
- Energy Efficient Public Sector in the Municipality of Kriva Palanka
- Energy Efficient Public Sector in the Municipality of Rankovce

- Energy Efficient Public Sector in the Municipality of Staro Nagoricane
- Energy Efficient School Buildings in the Municipality of Kumanovo
- Energy efficient street lighting in the Municipality of Staro Nagoricane
- Solar Roofs in the Northeast
- RES for optimal technological process
- Eco-villages in the Northeast

Mazovian Voivodeship, Poland

- Energy for the future - renewable energy sources in the Stara Kornica municipality
- Sunny municipalities of East Mazovia - solar energy is the energy of the future in the municipality of Repki
- Sunny municipalities of East Mazovia - solar energy is the energy of the future in the municipality of Przesmyki
- Sunny municipalities of East Mazovia - solar energy is the energy of the future in the municipality of Korczew
- Sunny municipalities of East Mazovia - solar energy is the energy of the future in the municipality of Paprotnia
- Ecological Mazovia Municipalities - friendly solar energy for humans in the Suchozebry municipality
- Construction of renewable energy installations in the Kotun municipality
- Construction of renewable energy installations in the Domanice municipality
- Construction of renewable energy installations in the Mokobody municipality
- Construction of renewable energy installations in the Skorzec municipality
- Construction of renewable energy installations in the Wodynie municipality
- Thermo-modernization of public buildings in Stara Kornica
- Thermomodernization of the Commune Office building in Korczew municipality
- Thermo-modernization of public utility buildings in the Kotuń municipality
- Replacement of heating devices In residential buildings in Korczew municipality
- Replacement of heating devices In residential buildings in Jablonna Lacki municipality
- Replacement of heating devices in residential buildings in Stara Kornica municipality

Bucharest-Ilfov, Romania

- Thermo-renovation of private own multi story apartments blocks on Bucharest Sector 2
- Thermo-renovation of private own multi story apartments blocks on Bucharest Sector 3
- Thermo-renovation of private own multi story apartments blocks on Bucharest Sector 6
- Thermo-renovation of private own multi story apartments blocks on Magurele Municipality
- Energy Efficiency in public buildings Voluntari Municipality
- Energy Efficiency in public buildings Popesti-Leordeni Municipality
- Energy Efficiency in public buildings Pantelimon Municipality
- Energy Efficiency in public buildings Chitila Municipality
- Energy Efficiency in public buildings Otopeni Municipality
- Extension and modernization of public lighting on Buftea Municipality

Podravje region, Slovenia

- The implementation of RES in existing district heating systems

- RES for heating of public buildings
- Micro district heating systems in small municipalities
- Solar roofs in Podravje
- Improvement of the electricity grid and the implementation of smart measures
- Energy renovation of School buildings
- Promotion of energy efficiency and RES
- Mitigating energy poverty in Podravje
- Renovation of public buildings and the mobilizing of investors
- Regional charging network for e-vehicles

ANNEX 3 - List of collected commitments for the Roadmaps and Action Plans from the decision makers

Country	Title of the AP (or shortcut)	Commitment by
Hungary	Energy efficiency adviser office for every district	Borsod-Abaúj-Zemplén County Council
Hungary	Real solution for energy poverty	Borsod-Abaúj-Zemplén County Council
Hungary	Residential Energy Loan Program	Borsod-Abaúj-Zemplén County Council
Hungary	Eco villages for guidance	Borsod-Abaúj-Zemplén County Council
Hungary	Heating supply of public building with local bioenergy	Borsod-Abaúj-Zemplén County Council
Hungary	Green district heating against air pollution	Borsod-Abaúj-Zemplén County Council
Hungary	Climate-aware Decision Makers Program	Borsod-Abaúj-Zemplén County Council
Hungary	Climate Change Education and Awareness in primary education	Borsod-Abaúj-Zemplén County Council
Hungary	Public transport goes green!	Borsod-Abaúj-Zemplén County Council
Hungary	Share your car!	Borsod-Abaúj-Zemplén County Council
Estonia	Development of wind parks in Estonia	Estonian Wind Power Association
Estonia	Increase of knowhow about renewable energy production among locals	TREA
Estonia	Installing Solar panels to Tallinn municipal buildings	Tallinn Energy Agency
Estonia	Research and development activities on micro- and distributed production of renewable energy	EMU
Estonia	Greening Estonian heat sector	Estonian Biofuel Association
Estonia	Developing local and international technology transfer in renewable energy	EMU
Estonia	Increasing the awareness of local governments about improving energy efficiency in public buildings	TREA
Estonia	Reduction of private car use in the cities	Tartu city
Estonia	National energy transition training program	University of Tartu
Estonia	Increasing the energy management capacity of local level administration	EMU
Estonia	Creating supportive environment for developing community energy production units	TREA
Lithuania	Publicity of alternative energy development opportunities and implementation of pilot projects on energy efficiency in Aukštaitija National and Labanoras Regional parks	Aukštaitija National and Labanoras Regional parks
Lithuania	The implementation of social and technological applied research on the renewable energy sector in the region	Future Society Institute
Lithuania	Transition of Ignalina city heat networks for operation in low-temperature mode	Ignalina region municipality administration
Lithuania	Installation of a solar power plant for the needs of the Ilgiai Community	Ilgiai Community
Lithuania	The incorporation of the package of socio-economic measures, which include measures for the energy sector, aimed at mitigating the consequences of decommissioning of the State Enterprise Ignalina NPP in the final agreement between the Republic of Lithuania and the European Commission on the funding of the	IAERPA

	decommissioning of the State Enterprise Ignalina Nuclear Power Plant.	
Lithuania	Development of alternative energy sources and improvement of energy efficiency in the Euroregion "Country of Lakes"	Euroregion "Country of Lakes"
Lithuania	Reorganization of the centralized heating system into a closed one and increasing the energy efficiency of public and apartment buildings in Visaginas municipality	Visaginas municipality administration
Lithuania	Visaginas Technology and Business Vocational Training Centre Energy Efficiency Improvement Plan, Stage II	VTVPMC
Lithuania	To renovate public and residential buildings and reduce pollution in the municipality of the Zarasai district	Zarasai region municipality administration
Lithuania	Renovation of heat pathways as well as trunk mains and distribution mains of drinking water and sewer networks in Visaginas municipality	SE "Visagino energija"
Poland	Energy for the future - renewable energy sources in the Stara Kornica municipality	Stara Kornica Municipality
Poland	Sunny municipalities of East Mazovia - solar energy is the energy of the future in the municipality of Repki	Repki Municipality
Poland	Sunny municipalities of East Mazovia - solar energy is the energy of the future in the municipality of Przesmyki	Przesmyki Municipality
Poland	Sunny municipalities of East Mazovia - solar energy is the energy of the future in the municipality of Korczew	Korczew Municipality
Poland	Sunny municipalities of East Mazovia - solar energy is the energy of the future in the municipality of Paprotnia	Paprotnia Municipality
Poland	Ecological Mazovia Municipalities - friendly solar energy for humans in the Suchozebry municipality	Suchożebry Municipality
Poland	Construction of renewable energy installations in the Kotun municipality	Kotuń Municipality
Poland	Construction of renewable energy installations in the Domanice municipality	Domanice Municipality
Poland	Construction of renewable energy installations in the Mokobody municipality	Mokobody Municipality
Poland	Construction of renewable energy installations in the Skorzec municipality	Skórzec Municipality
Poland	Construction of renewable energy installations in the Wodynie municipality	Wodynie Municipality
Poland	Thermo-modernization of public buildings in Stara Kornica	Stara Kornica Municipality
Poland	Thermomodernization of the Commune Office building in Korczew municipality	Korczew Municipality
Poland	Thermo-modernization of public utility buildings in the Kotuń municipality	Kotuń Municipality
Poland	Replacement of heating devices In residential buildings in Korczew municipality	Korczew Municipality
Poland	Replacement of heating devices In residential buildings in Jablonna Lacki municipality	Jabłonna Lacki Municipality
Poland	Replacement of heating devices in residential buildings in Stara Kornica municipality	Stara Kornica Municipality
Slovenia	The implementation of RES in existing district heating systems	Javne Službe Ptuj
Slovenia	RES for heating of public buildings	Municipality of Ormož
Slovenia	Micro district heating systems in small municipalities	Municipality of Cirkulane
Slovenia	Solar roofs in Podravje	Municipality of Destrnik
Slovenia	Improvement of the electricity grid and the implementation of smart measures	Municipality of Destrnik
Slovenia	Energy renovation of School buildings	School Centre Ptuj

Slovenia	Promotion of energy efficiency and RES	Municipality of Cirkulane Municipality of Destrnik
Slovenia	Mitigating energy poverty in Podravje	Municipality of Cirkulane Municipality of Destrnik
Slovenia	Renovation of public buildings and the mobilizing of investors	Municipality of Cirkulane Municipality of Destrnik
Slovenia	Regional charging network for e-vehicles	Municipality of Cirkulane Municipality of Destrnik
Romania	Thermo-renovation of private own multi story apartments blocks on Bucharest Sector 2	Bucharest Sector 2
Romania	Thermo-renovation of private own multi story apartments blocks on Bucharest Sector 3	Bucharest Sector 3
Romania	Thermo-renovation of private own multi story apartments blocks on Bucharest Sector 6	Bucharest Sector 6
Romania	Thermo-renovation of private own multi story apartments blocks on Magurele Municipality	Magurele municipality
Romania	Energy Efficiency in public buildings Voluntari Municipality	Voluntari municipality
Romania	Energy Efficiency in public buildings Popesti-Leordeni Municipality	Popesti-Leordeni municipality
Romania	Energy Efficiency in public buildings Pantelimon Municipality	Pantelimon municipality
Romania	Energy Efficiency in public buildings Chitila Municipality	Chitila municipality
Romania	Energy Efficiency in public buildings Otopeni Municipality	Otopeni municipality
Romania	Extension and modernization of public lighting on Buftea Municipality	Buftea municipality
Czech Republic	Establishment of regional technology platform for self-sufficient buildings	Czech Sustainable House
Czech Republic	Elaboration of Strategic Research Agenda for the Technology platform	Czech Sustainable House
Czech Republic	Elaboration of Implementation and Technology Foresight for 2025 - 2050	Czech Sustainable House
Czech Republic	Biogas plants transition to biomethane production sites system	Czech Biogas Association, European Biogas Association
Czech Republic	Agriculture biogas plants conversion to waste utilization	Czech Biogas Association, European Biogas Association
Czech Republic	Biogas utilization as regulation and local energy system	Czech Biogas Association, European Biogas Association
Czech Republic	Status quo analysis	Regional Development Agency of South Bohemia
Czech Republic	Alternative financing methods (Crowdfunding)	Regional Development Agency of South Bohemia / South Bohemian Innovation Agency
Czech Republic	Loans scheme	South Bohemian Technology Park / South Bohemian Innovation Agency
Czech Republic	Subsidy schemes for off-grid systems	South Bohemian Technology Park / Czech Sustainable House
Macedonia	Energy Efficient Public Sector in the Municipality of Kumanovo	The Council of the North East Planning Region*
Macedonia	Energy Efficient Public Sector in the Municipality of Kratovo	The Council of the North East Planning Region
Macedonia	Energy Efficient Public Sector in the Municipality of Kriva Palanka	The Council of the North East Planning Region
Macedonia	Energy Efficient Public Sector in the Municipality of Rankovce	The Council of the North East Planning Region
Macedonia	Energy Efficient Public Sector in the Municipality of Staro Nagoricane	The Council of the North East Planning Region

Macedonia	Energy Efficient School Buildings in the Municipality of Kumanovo	The Council of the North East Planning Region
Macedonia	Energy efficient street lighting in the Municipality of Staro Nagoricane	The Council of the North East Planning Region
Macedonia	Solar Roofs in the Northeast	The Council of the North East Planning Region
Macedonia	RES for optimal technological process	The Council of the North East Planning Region
Macedonia	Eco-villages in the Northeast	The Council of the North East Planning Region
Latvia	Energy vision and Roadmap towards a sustainable low-carbon economy	The Development board of Vidzeme Planning Region
Bulgaria	Protection and support of energy vulnerable consumers in Pleven Province	Pleven Province
Bulgaria	Protection and support of energy vulnerable consumers in Gorna Malina Municipality	Gorna Malina Municipality
Bulgaria	Protection and support of energy vulnerable consumers in Berkovitsa Municipality	Berkovitsa Municipality
Bulgaria	Implementing Energy Efficiency measures combined with RES installations for municipal buildings to reduce energy use in Nikopol Municipality	Climate Action Coalition, Institute for Zero Energy Buildings, Municipal Energy Efficiency Network EcoEnergy, Center for Energy Efficiency EnEffect, Political Party Zelenite
Bulgaria	Implementing Energy Efficiency measures combined with RES installations for municipal buildings to reduce energy use in Belene Municipality	Climate Action Coalition, Institute for Zero Energy Buildings, Municipal Energy Efficiency Network EcoEnergy, Center for Energy Efficiency EnEffect, Political Party Zelenite
Bulgaria	Analysing of the possibilities for building solar heating system for public buildings in the municipality of Berkovitsa	Berkovitsa Municipality
Bulgaria	Development of possible financial schemes for implementation of solar heating system in municipal buildings – Gorna Malina Municipality	Gorna Malina Municipality, Climate Action Coalition, Institute for Zero Energy Buildings, Municipal Energy Efficiency Network EcoEnergy, Center for Energy Efficiency EnEffect, Political Party Zelenite
Bulgaria	Utilization of wetland biomass and agricultural residues as local heating source in Guliantsi Municipality	Guliantsi Municipality, Climate Action Coalition, Institute for Zero Energy Buildings, Municipal Energy Efficiency Network EcoEnergy, Center for Energy Efficiency EnEffect, Political Party Zelenite
Bulgaria	Introduction of electro-mobility and development of adequate interurban bus transport system and connections at Nikopol, Belene, Levski municipalities	Climate Action Coalition, Institute for Zero Energy Buildings, Municipal Energy Efficiency Network EcoEnergy, Center for Energy Efficiency EnEffect, Political Party Zelenite
Bulgaria	Development of an information system and awareness raising measures for the promotion of EE and RES among households in the municipalities of Pleven Province	Climate Action Coalition, Institute for Zero Energy Buildings, Municipal Energy Efficiency Network EcoEnergy, Center for Energy Efficiency EnEffect, Political Party Zelenite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