Joint methodology of the preparation of the Action Plans

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DeCarb Action A5.1

November 2020

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1. Introduction

This document covers the DeCarb activity "Joint Development of Action Plans" (A5.1). Its aim is to provide project partners with instructions for the preparation of action plans that will be implemented in the second phase of the DeCarb project. The main purpose of the following methodology is to present the developed conclusions resulting from the international cooperation of partners, to provide feedback on selected activities, their time frames and financial goals,

The instructions in the document are based on:
- Records contained in the DeCarb application form,
- Proposals contained in the Interreg Europe program manual,
- Analyses and reports prepared as part of the DeCarb project.

In order to help DeCarb partners preparing their action plans, the document contains the following information:

1) General definitions and requirements to be included in the Action Plans,
2) Defining the approach to developing a strategic development path on which all activities under the plan will be based,
3) Conclusions and recommendations based on the joint analysis (action A1),
4) Recommendations on how to use EU funding for specific types of projects based on the results of joint analysis (action A1) and capacity building (action A3),
5) Methods of stakeholder involvement in the implementation of action plans,
6) A three-step process to ensure the quality of DeCarb's action plans.
7) Peer review and monitoring methods for the implementation of action plans.
8) Model action plans based on the Interreg Europe Program Manual.

Program activities should enable:

- mutual exchange of regions' experiences on decarbonisation in order to build skills of public administration employees;
- preparation of action plans supporting the decarbonisation of regions based on the gained experiences.

2. Main objectives of the DeCarb project

The European Union's 2030 climate and energy framework assumes a significant reduction in carbon dioxide, which forces the phasing out of fossil fuels and replacing them with carbon-neutral energy technologies. In addition, the policy goals for 2050 are to achieve carbon neutrality in the European Union. Specifying specifically the targets for 2030, they assume: a 40% reduction in greenhouse gases compared to the 1990 level, 27% of energy from renewable sources (share of energy consumed) and 27% improvement in energy efficiency. Decarbonisation programs are designed to help achieve this goal.

The move away from fossil fuel-based energy, which is fundamental to climate protection, can have serious social and economic implications. Hard coal mining in the European Union provides employment for approx. 240 thousand people[1]. The numbers include workforce directly employed in the industry and subcontractors - companies that provide technology, equipment, transport and logistics services.

To be effective, energy transformation must be conducted in accordance with the principles of social justice. Therefore, it requires the coordinated efforts of many partners: central, regional and local authorities, scientific institutions and trade unions for the careful development of policies and regulations. The measures should allow for minimizing the negative effects, i.e. enabling changes in employment, e.g. transfers to other energy sectors and the inclusion of employees in the industry in social programs. Particular emphasis should be placed on harnessing the potential of companies involved in the coal supply chain, facilitating entry into other markets or sectors with products or services adapted to the needs of new markets. Activities may include programs to facilitate research and development aimed at developing new products and services.

The economic activity of companies, if possible, can be redirected towards sustainable energy. Mining areas are usually located close to generation, electricity and heating facilities, therefore these areas have significant potential to interconnect power plants based on renewable sources. These activities should be implemented in accordance with the documents of the regional energy policy and spatial plans.

[1] Eurostat data, 2017, data concerned large entities that dominate the extraction of fossil fuels.

In response to these requirements, DeCarb therefore aims to support partner regions by:

- Increasing the knowledge and abilities of public authorities and employees of Partners to define stable paths for the development of the post-carbon economy,
- Planning the needs of the labour force retraining and land development after the end of coal mining,
- Promotion of public dialogue to resolve conflicts and consensus building on the clean energy transition, involving the energy sector, social partners and citizens,
- Increasing the awareness of public authorities and employees of Partners about the need to plan in advance a new energy mix (change in the share of various sources of energy production).

The project consortium consists of 9 partners:

- Stara Zagora Regional Economic Development Agency (Bulgaria),
- Lodzkie Region (Poland),
- ENEREA Eszak-Alfold Regional Energy Agency (Hungary),
- South-West Oltenia Regional Development Agency (Romania),
- Ministry for Economic Affairs, Labour and Energy of the State of Brandenburg, (Germany),
- House of Energy (Denmark),
- Regional Association of Local Governments of Western Macedonia (Greece),
- Energy Agency of Savinjska, Saleska and Koroska (Slovenia),
- Energy Agency Extremadura (Spain)

The project concerns the shaping of regional policies, in particular operational programs aimed at implementing the tasks set out in the regional development strategy. In this regard, the goals that are related to decarbonization include:

- focusing the policy on modernizing the energy sector and changing the selection of fuels to low-emission ones,
- release of investments and financing of renewable energy sources,
- increasing the number of renewable energy sources (RES),
- increasing the environmental balance in coal-based mining,
- provisions of skills and expertise in clean energy development through retraining,

- strengthening the economic and social cohesion of regions by reducing the negative effects of decarbonisation processes,
- tackling the negative economic impact and job loss,
- supporting bottom-up synergies with the private sector,
- increasing economic stability through the application of integrated support measures for regions,
- adopting a local impact perspective by providing effective legal and technical support to entities operating in the region and implementing activities related to decarbonisation,
- harmonization of the objectives of the regional energy policy with the assumptions of the EU policy in this area.

2.1. Expected results of the Interreg DeCarb project

Implementing the DeCarb project results is expected to bring the following improvements to regional development policies:

Development of new projects:

- improving the implementation of renewable energy use,
- diversified use of post-mining areas,
- monitoring of the energy decarbonisation process,
- development of professional training in the field of renewable energy,
- monitoring the social effects of the decarbonization process,
- scaling up clean energy projects.

Better management:

- compliance with EU energy goals,
- identification and support of bottom-up synergies specific to the region,
- integrated energy planning, assuming the achievement of a sustainable energy mix,
- involvement of stakeholders from the scientific community and experts.

Partners will develop a strategic development path towards improving their policy instruments by building on the results of DeCarb's activities.

A description of the sequence of steps that must be performed to accomplish this task is provided in the next chapter explaining what the DeCarb Action Plan is. They are the final key result of the DeCarb project.

3. What is an Action Plan?

3.1. Definition

Action Plans implemented in the context of the Interreg Europe program are documents containing detailed information on how the conclusions of interregional cooperation will be implemented in order to improve the instruments of regional policy, their time scope, contractors, costs (if any), sources of financing.

An Action Plan can be defined as a description of the sequence of steps that must be performed in order to implement the strategy. The plan includes the key elements:

a) defining specific actions - "what will be done and by whom?",
b) time horizon - "when will it be done?",
c) determination of resources - "what funds will be allocated to what activities?"

3.2. The process of creating and implementing the Action Plan

Action Plans can be implemented according to the following methodology:

1. **Defining the problem** - assessment of the situation in order to understand what the issue is about and to search for a solution to the stated problem,
2. **Collecting and analyzing data** - its purpose is to confirm or contradict the assumptions made in the first step,
3. **Clarification and prioritization of problems** - if there is more than one problem, specify which one is more important,
4. **Defining goals for individual solutions** - after collecting data and identifying problems, specific goals should be defined. They should meet the requirements of the SMART methodology, i.e. be: precise, measurable, achievable, corresponding to the problems, with a specific time horizon,
5. **Determining the method of implementation and writing a plan** - in step five, it is determined:

a. reference to the goals set for individual activities - the plan should answer the questions - what?, when?, how?, where?, who?,
b. a resource list,
c. a list of potential barriers,

6. **Identifying the rules of monitoring** - the next element is planning the method of monitoring the results. It should allow you to determine whether the goal and plan allows you to correct the problem. Additionally, it should allow you to check whether the plan is working or should be corrected.
7. **Identifying a new problem or redefine the old one -** the problem solving process is a cyclical activity, if the first problem is successfully solved, you should look for more to solve. If it cannot be resolved, you should restart the analysis process.

3.3. Components of Action Plans

The Action Plans follow the model set out in the Interreg Europe Program Manual[2]. The main elements of the Action Plan are:

1. Part one – **general information**, the purpose of this section is to quickly identify the role of the action plan, the context in which it was prepared, the organizations responsible for implementing the plan, including the main address details.
2. Part two – **list of actions**, the main task of this part is to define all activities to be implemented in the final phase of the project. The Action Plan template from the handbook requires to include key elements such as:
    a. **Context description**: experience in the project forming the basis for the development of an action plan,
    b. **Action**: description of actions to be implemented,
    c. **Involved Stakeholders**: a list and a brief description of the organizations in the region, their role in the development and implementation of the Action Plan, and an explanation of their tasks,
    d. **Duration**: determining the time required to complete each task,
    e. **Cost:** determining the cost of individual activities,
    f. **Sources of funding:** identification of sources of financing for planned activities.

[2]Source:https://www.interregeurope.eu/fileadmin/user_upload/documents/Call_related_documents/Interreg_Europe__Programme_manual.pdf)

3.4. Description of key development paths based on the results of analyses and thematic studies, taking into account relevant policy instruments

All actions included in DeCarb Action Plans should be based on the results of thematic studies and analyses (Actions "A1"), especially those pointing to specific recommendations related to the needs and opportunities of the DeCarb regions for the clean energy transition. The analytical activities (A1) identify the following types of activities for DeCarb regions:

A1. „Report on ex-ante analyses of the social and economic impact of the decarbonisation of regions”,
A2. “Good practices guide. Decarbonisation and clean energy transition”,
A3. „SWOT analysis report to determine decarbonisation growth pathways in partners' territories”,
A4 .„Needs analysis report on environmental restitution & land restoration in DeCarb regions”.

Each Partner responsible for preparing the Action Plan will have to compare the conclusions of the analyses with the recommendations of their policy instruments listed in the DeCarb application form or other relevant policy instrument. Partners will therefore be able to design a strategic development path towards improving their policy instruments by leveraging the results of DeCarb's activities.

In line with the Interreg Europe Program Manual, the process of drawing up Action Plans based on the conclusions of the analyses must be documented and the link to the knowledge exchange and learning of partners should be clearly identified as the source of the action.

For a DeCarb project, this process may include the following:

a. Reports containing analyses and thematic studies, taking into account a broad background and outlining both the **context of the decarbonisation process** and the **overall logic of the project's intervention** - this is described in Report A1.1. (see Chapter 4.1.),
b. Case studies and good practices described, inter alia, in Reports A1.2. and A1.4. providing **a potential basis for inspiration and examples** for the activities contained in the Action Plans (see Chapters 4.2 and 4.4.),
c. SWOT analysis included in the A1.3 report, **summarizing the data**, supporting decision making by project partners and individual regions. Finally, the action is aimed at determining **the paths**

of the decarbonisation process, taking into account the regional specificity of each of the partners (see Chapter 4.3.),

d. Summary of the events in the formula of social dialogue constituting **a verification of ideas and assumptions** of future plans with regional partners. This allows for the comparison of international practice with regional realities (see Chapter 5),
e. The planned activities must be linked to the **specificity of the decarbonisation process** – i.e. take into account the three pillars of the process and their mutual integration (see Chapter 6),
f. An additional element of **mutual learning and verification are project forms** (the so-called matrix), describing the initial planned activities to be introduced into the Action Plans, it is an element of prompts for other project partners (see Chapter 7).

4. Conclusions and experiences from supra-regional cooperation

As explained in the previous section, DeCarb's analytical activities (A1) provided the knowledge and recommendations that underpin all changes in the implementation of partner policy instruments that could be achieved by the DeCarb project. Conclusions and recommendations for each of the analyses (Actions A1) are summarized in the following sections.

4.1. Report on ex-ante analyses of the social and economic impact of the decarbonisation of regions (A1.1)

The document comprises the analysis of the potential effects of the decarbonisation process on carbon-based value chains and its impact on the state of the regional economy and employment. The ex-ante report is the starting point for the Action Plan, as it defines **a wide background for the decarbonisation policy** and describes the **intervention logic** of decarbonisation processes.

The main conclusions of the ex-ante analysis concerning the decarbonisation process are:

a. In terms of consumption on the EU scale, the median of solid fuel consumption significantly exceeds the production median. Referring to the median production and consumption of hard coal and its derivatives and lignite, both curves show a downward trend, however, production exceeds consumption.
b. In terms of supply and carbon intensity - the presence of coal on the side of energy supply affects the energy mix, hence the emissivity of the electricity sector may be correlated with the share of renewable electricity in the energy mix. **The higher the share of RES, the lower the emissivity.**
c. When examining the processes, the entire carbon value chain and its impact on the regional economy in terms of the dependence of sectors and enterprises should be taken into account. The value chain is understood as an economic activity undertaken at every stage of the transmission of coal fuels from the mine to the power plant. Belong to them:

- Outlays - industries related to coal mining that facilitate mining activities. These include manufacturers and / or suppliers of equipment, machines, services, goods vehicles,
- Transport and storage - services that facilitate the transfer of fuels from mines to energy producers and coal-dependent industries. These are transport companies, freight railways, fuel suppliers for vehicles,
- Final market - combined heat and power plants and / or power plants, carbon-intensive industry.

d. **There are a number of parameters that can be used to assess the impact of the carbon value chain on the regional economy and businesses**. Economic measures describing the state of value chains include annual turnover per industry / demand in the final supply chain, annual input expenditure for the industry involved and / or the entire value chain. Parameters describing the regional dependence on the carbon value chain include the carbon intensity of GDP, e.g. emissions per unit of GDP.

e. The assessment of the economic impact of the carbon value chain on the economy should take into account the following relationships:
   - Level of dependence of the regional economy on the coal value chain,
   - Level of dependency ("dependency factors") between sectors / companies within the value chain. This degree will determine both agglomerations in terms of the input / output values of the sectors involved and the number of jobs affected by changes in another sector,
   - Change in the value of inputs, products and final demand in the value chain (expenses, turnover).

f. **Decarbonisation impact on the employment** is a **key aspect that this process can have on value chains.** The authors present the following indicators characterizing the labour intensity of carbon value chains:
   - Total number of jobs in power plants and coal mines in NUTS2 regions,
   - Number of jobs in mines in each NUTS-2 region,
   - Share of jobs in coal mines,
   - Share of jobs in coal-fired power plants,
   - Number of jobs directly related to coal,
   - Number of people employed in the production of machinery for mining and quarrying
   - and construction in coal producing countries,
   - Number of enterprises producing machinery for mining, quarrying and construction in coal-producing countries,

- Share of all jobs in countries (or regions) with coal mines,
- Number of enterprises from the hard coal and lignite mining sector, PKD,
- Types of professional groups employed in mining activities,
- Share of professional groups employed in mining activities.

g. **The measure of success for the decarbonisation process is the reversal of the relationship between economic development (GDP growth) and an increase in greenhouse gas (GHG) emissions and energy consumption.** An additional parameter is the dependence of GDP on the coal value chain (mining-transport-combustion). The parameter measures the dependence of the economy on any activities related to the use of non-renewable energy sources.

The result of the considerations of ex-ante analysis is, among others definition of an **intervention logic** customized to the research scope of the DeCarb project. The following table lists the method components and the description of each element.

Intervention logic components	**Description**
Needs	○ Reducing the negative effects of climate change ○ Sustainable regional development
Goals	
Overall	○ Reduction of CO2 emission ○ Increasing regional competitiveness ○ Energy safety/efficiency
Specific	○ **Decarbonization of the energy sector**
Operational	○ Limiting imports of coal and fossil fuels / phasing out of mining, processing and burning of coal

	○ Increasing of RES
Input	○ Financial / administrative resources (e.g. RES financing, CO2 taxation, development of technical skills, modification of the ETS system)
Output	○ RES support and financing systems ○ Increased CCS, RES technology
Results	○ Reduced energy production, CO2 emissions, increased use of renewable energy, ○ Restructured energy production value chain

4.2. Identifying good practice for decarbonisation and the clean energy transition (A1.2)

The report presents 22 selected good practices from the countries covered by the DeCarb project, grouped into 6 categories:

- Energy mix
- Emission reduction drivers
- Renewable Energy Sources
- Energy Economic Instruments affecting demand for carbon and/or renewables
- RES awareness, capacity building & socio-economic management
- Post-mining environmental management.

The practice list can be used as a guide when formulating action plans. The aim of the DeCarb project is, inter alia, exchange of practices and use of the learning process when creating own activities by the regional authorities. A summary of the activities analysed by project partners is summarized below.

The first group of case studies presents two initiatives implemented in Hungary and Bulgaria. They are related to the **mechanisms supporting the development of the New Energy Mix.** They include:

a. Introduction of a legal requirement for the appointment of energy specialists in economic entities, which facilitates the implementation of energy efficiency, in Hungary. This applies in particular to industries related to energy,
b. The implementation of the incentive stimulates the implementation of solar photovoltaic systems on roofs and facades, using the feed-in tariff for the purchase of energy by distributors. The project was implemented by the German-Bulgarian Chamber of Commerce and allows for overcoming administrative and financial barriers.

The second group presents ways to achieve a **diversified fuel mix and reduce emissions**, significantly reducing the share of coal in energy generation, thanks to the use of regional energy assets. Cases are in the regions of EszakAfold (Hungary) and Extremadura (Spain). The proposed actions are:

a. Diversification of the energy mix in the EszakAfold region thanks to the use of biomass and waste incineration (60% of heat consumption) and the use of geothermal resources. Other sources are cogeneration of energy and heat (95 MW, based on biogas, hydropower, biomass and wind) and various renewable sources with an installed capacity of 25 MW. The region achieved the target of 11% of RES share in 2016.
b. The region of Extremadura (Spain) covers the local electricity demand entirely from renewable sources. The total production of energy (produced from solar energy, hydroelectric plants and wind farms) is in 22.5% from renewable energy sources, of which 60% is concentrated solar energy and photovoltaics. 100% of households' needs are covered by these energy sources.

The section on **Renewable Energy Sources (RES)** presents case studies of various types, including:

a. Investments in large-scale photovoltaic installations - example of a 200 MW solar farm on 400 ha of land in Kozani (Greece), responsible for 10% of energy generation in the region. It is the largest such project in the region,
b. the inclusion of third parties and energy performance contracting in the modernization or construction of buildings,

c. open tenders to select partners for the construction, operation and maintenance of biomass CHP plants in Western Macedonia (Greece),
d. modernization of energy networks in order to improve the conditions of renewable energy installations, and the implementation of a net measurement system and the introduction of friendly tariffs, allowing for distributed energy self-consumption in Greece,
e. the strategy of phasing out nuclear energy and achieving 100% renewable energy in the region in the Extremadura region, the action concerns the coordination between the phased implementation of RES and the closure of the nuclear power plant in order to avoid problems with the stabilization of power supply and minimize social costs.

The chapter on **economic instruments** describes the experiences of the project partner countries with regard to economic incentives and financing schemes supporting the development of renewable energy sources and energy infrastructure and discouraging the use of coal. Examples include:

a. using the mechanism of reducing emission allowances under the ETS system to support the implementation of renewable energy in Denmark,
b. use of profits from emissions trading to finance research and implementation of renewable energy systems and linking support with social assistance - the Green Finance System in Hungary,
c. increasing the costs of emission permits in relation to the use of high-carbon fuels (Denmark),
d. use of private repayable funds (Energy Efficiency and RES - EERSF) in Bulgaria,
e. support for individual investors of micro wind turbines - use of energy purchase tariffs and subsidies (Denmark).

Awareness-building experiences include activities such as:

a. creating cooperation platforms for regional self-governments, the so-called regional forums (e.g. the Mayors' Forum, held in 2018 in Kozani, Greece, brought together representatives of local governments from coal regions from Germany, Poland, Slovakia, Bulgaria and Romania),
b. training in forest management as a carbon sequestration mechanism (Hungary),
c. university and vocational education as part of the education reform (Hungary),
d. RES Academy - training of specialists for the renewable energy sector. An example of the Romanian Wind Energy Association, which together with the Minister of Energy and the Petrosani University and its companies (including CEZ Romania, Monson-RESS) plan to

establish the Jiu Valley Academy of Renewable Sources and Energy Distribution. The Academy will apply for funding under the Cross-border Carboniferous Platform and will train approximately 5,000 wind energy specialists and 3,000 electricians and power hydraulics mechanics annually.

The last group of cases is devoted to the **management of the post-mining environment** and includes examples of activities aimed at revitalization and reclamation of post-mining areas. The following examples are indicated:

a. Oltenia energy complex in Romania, including monitoring of the stability of heaps and monitoring of environmental parameters, implementation of forest management and agriculture,
b. Activities of the Mine Restructuring Company as a specialized entity coordinating economic activities, reclamation and documentation of activities (database and knowledge),
c. Restitution of post-mining areas across the states of Saxony and Brandenburg (Germany) - using 26 artificial lakes for various types of tourist activity and restoring natural activity,
d. The Ecological Renewal Program, implemented by the Slovenian energy company Sostanj Thermal Power Plant and the Velenje Coal Mine – associated with renaturalization, the use of workings as artificial lakes and the development of tourism.

4.3. SWOT analysis identifying the most favorable growth areas in relation to the existing workforce and territorial specificities in order to create an alternative to coal activities (A1.3)

The purpose of SWOT analysis is to determine the paths of decarbonisation of the region, taking into account their local specificity. The analysis includes information on the conditions related to coal mining and use, possibilities and limitations related to the transition to low-emission energy and the identification of potential development areas in connection with the existing employment and economy structure.

The SWOT analysis is a significant help in creating an action plan as it includes:

a. Comparative analysis for all regions - they allow to search for common aspects related to decarbonization and to **identify and justify the similarities** between project partners,
b. SWOT analysis for regions - as above, **they allow to justify** the selection of activities in the Action Plan.

Below, we summarize the conclusions of joint benchmarking that can help identify **common relationships between determinants and decarbonisation activities** that can be used in developing Action Plans for all partners.

The reports summarize the **data related to coal mining and use in the partner regions**, with an in-depth analysis of the following aspects:

a) Regional energy demand, carbon consumption and carbon efficiency potential,
b) The presence of renewable energy sources in the energy mix of regions,
c) Infrastructure for heat distribution,
d) Jobs related to coal value chains,
e) Employment structure in the region,
f) Educational and research abilities,
g) Innovation and experience in the private sector,
h) Instruments to support political and organizational restructuring.

The chapter on **energy demand and coal consumption** lists mines and power plants as well as figures describing the regions' dependence on coal. The figures include coal energy production (presented in GWh / year), as well as coal exports, imports and total consumption. Coal dependency is defined by three KPIs, formulated as coal electricity and heat production and total **coal energy consumption per 1,000 inhabitants**. Other indicators, showing the percentage of the region's population in the total population of the country, illustrate the country's dependence on the production of energy from coal.

The results of the inquiry show that in terms of dependence on coal fuels:

a. The highest dependencies appear in Western Macedonia (Greece) and in Savinjska region (Slovenia),

b. Mid-level dependencies appear in Lodzkie Region (Poland), Brandenburg (Germany), Yugoiztochen (Bulgaria) and Danish Nordjylland region.
c. Low dependency appears in Eszak-Afold region (Hungary), South-West Oltenia (Romania) and Extremadura region (Spain).

In terms of **the potential for the use of renewable energy sources** in partner regions, it indicates the following results:

In terms of thermal energy:

a. the highest share of heat production from renewable sources is in the Danish Nordjylland region and the Slovenian Savinjska region. Both regions use biomass as the main renewable heat source,
b. the lowest use of renewable energy sources was in the regions Yugoiztochen (Bulgaria) and the Lodzkie (Poland).

In terms of electricity:

a. the highest share of renewable electricity was recorded in the regions of Extremadura (Spain), Nordjylland (Denmark) and Eszak-Alfold (Hungary),
b. the lowest shares were also noted by Stara Zagora (Bulgaria) and the Lodzkie Region (Poland).

In terms of heating infrastructure in the region, the results of modelling carried out with the use of the HotMaps tool were presented, which facilitated the assessment of the potential for further development of heating systems. The assessment was carried out taking into account the requirements for various types of heating systems, including the minimum heat demand per hectare of area provided by the heating network and the minimum thermal power of the system. For each of the voivodships, the potential for the development of heating was assessed. The analysis revealed a low share of district heating networks in heat consumption in DeCarb regions. Using the percentage share of district heating sales (ratio of the volume of heat supplied by network systems to the total heat demand), the highest share of district heat is exhibited by:

a. Nordjylland Region (51%), Denmark,
b. Lodzkie Region (27%), Poland,

c. South-West Oltenia (23%), Romania,
d. Yugoiztochen (19%), Bulgaria.

The share of district heating in other regions is below 15%, with the lowest share in the region of Western Macedonia (0.8%).

In terms of employment generated by the coal sector, data on employment in the coal sector are presented as the number of direct and indirect jobs related to coal activities. These numbers are also presented as the number of employees per 1000 inhabitants of the region. The presented data show the **proportionality of the region's dependence on coal in terms of energy consumption and the number of jobs**. Statistics also show regions **depend on labour from outside the region**. The absolute employment **in operating and maintaining a plant** is typically just over **30% of the employment in mining**. Moreover, in most cases, except the Yugoiztochen region in Bulgaria, the share of the labour force from outside the region tends to exceed that of the region employed.

Taking into consideration the absolute values of the statistical data, the analysis reveals that employment in the plant operation and maintenance usually constitutes slightly over 30% of the employment values in the mining sector. Also, in most cases, besides the Yugoiztochen region, in Bulgaria, the share of labour from beyond the region usually exceeds the percentage of employment from within the region. Taking into consideration the direct and in-direct jobs in the coal sector per 1000 inhabitants, the regions characterized with the highest number of jobs include Western Macedonia, Yugoiztochen, Savinjska. The regions characterized with medium number of jobs in the coal sector include South-West Oltenia and Lodzkie. The lowest number of jobs in coal sector is represented by Lausitz-Spreewald, Eszak-Alfold and Nordjylland. The report does not present data for Extremadura region.

Analysis of the general employment schemes in the partner region reveals that employment in most of the coal dependent regions is dominated by three types of activities – industry, raw materials extraction and utilities, trade and transport and construction. The listed types of activities, besides few cases, sum up to around 40 to 60% of the economic activities. In the case of regions dependent on coal imports, trade and transport activities are dominating. Experience and skills of the labour employed in the industrial and construction sector can be important assets in the energy transition process.

Conclusions from the chapters dedicated to education and research as well as innovation can be summarized using the Regional Innovation Scoreboard, based on Eurostat data. The Scoreboard is using 18 indicators for the assessment of the regions (level NUTS-2), which combine data on e.g. R&D expenditures in public and private sectors, innovations in SMEs, percentage of the population with tertiary education, scientific publications etc. Among the partner regions 4 have been classified as modest innovators (Yugoitzchen, Eszak-Alfold, South-West Oltenia, Extremadura), 3 moderate innovators (Western Macedonia, Lodzkie, Savinjska) and only 2 regions of Nordjylland and Brandenburg as respectively – strong innovator and innovation leader. Comparison results in the conclusion that the **presence of coal sector does not have a positive effect on the development of innovative regional economy.**

SWOT analysis facilitates identification of the positive and negative aspects of the regional conditions related to the implementation of sustainable energy policy (strengths and weaknesses) as well as recognize positive and negative trends occurring at the country and international level (opportunities and threats). Therefore, the analysis enables elaboration of the new or amendment of the existing policies in order to enhance positive aspects and trends and counteracting the negative trends maintained at the country or international level by lobbying activities.

Comparison of the SWOT analyses for the partner regions reveals significant differences between the political support for energy transition, education, research and innovation, thus **ambition levels of the regions advanced in the implementation of climate and energy policies is much higher than in the case of the countries in transition**. Ambition levels are influenced by a range of political, legal as well as social and cultural factors. The factors concerning political and legal stability constitute the matter of state responsibility that provide sustainable energy investors with certainty concerning stability of business development and provide risk mitigation measures necessary for innovation processes, in the form of stable support system for renewables and funds for research and innovation. Important factor influencing the ambitions is the social, cultural and technical heritage of the coal regions, which often constitute fundaments of the regional identity. Technical heritage may pose a significant barrier for the innovation, opposing abandonment of the fossil fuel technologies.

Review of the SWOT analyses reveals a sound difference in the approaches towards energy transition between the Danish, Spanish and German regions and the regions of Central and Southern Europe. Regional policies of the Central and Southern Europe regions express awareness concerning environmental impacts of the coal and lignite industries upon the quality of soils and air. At the same

time they express concerns related to insufficient measures mitigating negative environmental impacts. They also emphasize the labour and social dependence upon coal industry. The policies also perceive the coal sector as the limiting factor for innovation and the fact of the sector's reaching the threshold limits of the innovation capacity. Technological advancement in energy field and the international instruments supporting abandonment of fossil fuels (Emission Trading System) result in a sound reduction of the sector competitiveness, rising costs of coal mining over income and contributing to an increase of unemployment.

The elements common for most of the partner regions include the necessity of R&D advancement in the field of energy storage and energy management systems as the mean facilitating an effective use of renewable energy sources and the use of waste energy from industrial plants. In the latter case, SWOT analyses for Denmark and Germany indicate the complicated tax systems as barriers for the transfers of waste heat from industrial plants.

4.4. Needs analysis report on environmental restitution & land restoration in DeCarb regions (A1.4)

Needs analysis report on environmental restitution and land restoration refers to the mechanisms of using post-mining excavations. The main conclusions on possible courses of action, possible objectives for actions for these sites and examples of good practice are described below. They can be used in particular in relation to countries planning remediation activities - especially in the case of Central and Eastern European partners, where the decarbonisation process is just beginning.

Mine closures usually occur when supplies of natural minerals are completed or when the activity ceases to be profitable (marginal cost equals marginal revenues). The termination of mining activities triggers a discussion on the reclamation of post-mining areas that have been severely degraded. Exploitation causes disturbance in the functioning of the environment through air pollution, soil erosion, water pollution and loss of biodiversity. Exploitation also has a negative impact on the landscape defined as "land degradation", the response are activities related to the restoration of land usability, they can be defined as follows:

- **Land restoration** - the process of restoring the functioning of ecosystems (including restoring the ecological balance, restoring plant and animal habitats, biodiversity, water circulation in the

environment) and their integrity after the end of mining activities. Recovery also applies to activities such as agricultural production.

Expected **environmental and planning** needs implemented as part of recovery activities:

1. **Sequestration and storage of carbon dioxide** (CO2) - associated with the planning of green areas, tree planting and the use of greenery for sequestration processes;
2. **Biodiversity and ecosystem services** - is associated with the improvement of the natural environment as a result of the introduction of environmental protection and biodiversity repair, reconnection with ecological corridors in the event of significant damage, improvement of ecosystem services, such as, for example, ensuring water sources, security of agricultural production, pollination or carbon sequestration;
3. **Water supply, cleanliness and quality** - improving the quality and safety of the water supply is one of the main benefits of remedial action. It is associated with a reduced demand for production processes as well as pollution from mine outflows, rainfall from dumps, processing waste, heaps and other pollutants. One of the expected effects of improving the use of the catchment area is the reduction of the level of sulphur compounds, chloride or heavy metals. The water treatment process is lengthy and may require engineering to remove contaminants.

The process of restitution post-mining areas is a long-term activity that requires taking into account various local social, economic and landscape needs. The reclamation rules are established at the concession stage. Planning of restitution operations includes the following key aspects:

a. Planning should focus on designing **entire landscapes and not just excavations**;
b. The focus should also be on **restoring the environment** or repurposing;
c. Planning should provide **a range of social and economic benefits**;
d. Number of **different alternative strategies and actions** should be planned and adapted to the regional realities. Final decisions must be made taking into consideration the results of the various technical and economic data as well as the participation of the key stakeholders;
e. Further **maintenance of extraction activities requires explanation**, restitution is not an action but also a choice of the region's development policy;
f. Actions should be adapted to **local needs and development priorities,** there are no universal solutions, actions should be adapted to demographics, economic, employment, social and cultural factors;
g. Plans should be **implemented in an adaptive manner**, adapted to changing conditions.

The partners' experience shows that these activities are implemented comprehensively and that the rehabilitation strategies include several activities simultaneously. The selection of new use involves not only environmental processes, but also the introduction of solutions related to economic development. These activities include, for example, the adaptation of former workings for the needs of tourism, selected examples include: regeneration of lakes in the region of **Lusatia, Saxony-Brandenburg** - as part of the 10-year repair program, 30 rehabilitation projects were implemented (excavations and other areas). As part of the re-use of the area of opencast mines, the largest complex of artificial lakes was created, around the largest of them (Senftenberger and Geierswalder) recreational centers (hotels, recreational routes) were built, and infrastructure related to inland navigation was also implemented. The special purpose vehicle for remediation - the Lausitz Mining Administration (LMBV), covering over 30,000 ha, also carried out a number of other activities, including lake restoration, tree planting, groundwater restoration and others. The activities were financed thanks to the compilation of own funds of the mines, regional and central authorities.

The conclusions from the report indicate three main directions of activities that can be implemented in relation to the post-mining areas:

a. These activities are related to renaturalization, including **restoration of land for agricultural production and forestation** of post-mining areas. Regions that show potential for this type of use include South-West Oltenia (Romania), West Macedonia (Greece), Yugoiztochen and Savinjska region (Slovenia).
b. The second direction is **placing RES** in the former excavations. According to the analysis, each of the regions allows for the implementation of this type of tasks, some of them are better or worse adapted to particular types of renewable energy (sun, wind, biomass, etc.),
c. The third, strategic direction is the **development of tourism.** These activities combine the processes of reclamation of workings with the use of the existing potential of the region (areas of nature reserves, mountain areas, tourist and recreational centers). The regions of Brandenburg (Germany), South-West Oltenia (Romania), Savinjska (Slovenia) and Lodzkie (Poland) were indicated as particularly useful for the implementation of this strategy.

5. Conclusions and experiences based on the regional action "New Energy Mix" – a social dialogue event

Regional social events (Action A2.2) are important elements of the mutual learning process under the Interreg Europe Program. They also provide the opportunity to discuss and verify potential decarbonisation measures with regional stakeholders. The participants are mostly members of the local energy sector - producers and operators of distribution networks, entrepreneurs representing SMEs, members of non-governmental organizations and representatives of regional and local authorities. According to the methodology of social dialogue of the DeCarb project, three topics were discussed during the meetings:

1. Economic alternatives after phasing out coal-intensive activities in partner regions,
2. Expected socioeconomic impact from the cessation of coal driven activities,
3. Environmental restitution and land restoration needs and possible post mining land uses

The partners will be able to use the developed conclusions, which will be summarized in the meeting report prepared by the Partner from Slovenia - Savinjska, Saleska and Koroska Energy Agency. The report is to emphasize the key social issues that the Partners should take into account when developing the Action Plans.

6. Methodology of preparing action plans

The proposed methodology is intended to support the preparation of regional action plans to be developed by the DeCarb partner regions. While project member regions face similar challenges, they differ in their degree of dependency on coal mining, energy generation or other coal-related economic activities, but also in economic, legal, technological and social conditions. Therefore, the methodology should provide a common framework for developing an action plan adapted to the conditions in the regions.

6.1. Methods of involving stakeholders in the implementation of the action plans

The implementation of an action plan covering a range of aspects related to decarbonisation requires the active involvement of regional stakeholders representing both public and private actors that may be exposed to the impacts generated by the process. One of the tools is building cooperation mechanisms within the region. The Stakeholder Representative Forum should be composed of the following members:

- Coal/lignite mine operator,
- Power plant operator,
- SMEs participating in the carbon value chain,
- Regional Chamber of Commerce,
- Regional sustainable energy clusters and industry organizations,
- Coal industry trade unions,
- Higher education and research centers,
- Business support organizations,
- Local and regional NGOs

The proposed composition of the Regional Stakeholder Forum aims to reflect several aspects of the decarbonisation process and to ensure adequate representation of the process stakeholders. The structure of the body should be organized in a way that facilitates the participation of members in the relevant activities according to their profiles.

6.2. The Quality Assurance Process for DeCarb's Action Plans

After drawing conclusions on the types of actions to be included in its own action plans, each partner will have to go through a screening procedure to ensure that the proposed policy measures meet the following criteria:

a. are adequate for the purposes of the project,
b. have been described in detail and accurately,
c. are written in a way that guarantees a real impact on the expected changes

The meaning of each of these criteria is explained below:

6.2.1. Compliance with the objectives of the project

The first criterion is to ensure that the proposed activities are in line with the project objective, the general objective, the expected changes and the operational objectives of the project, as set out in the application form:

Main goal: The project aims to support public authorities in taking initiatives, joining forces and exchanging experiences in order to:

a. determine a growth strategy to mitigate the impact of decarbonisation,
b. maximize the use of EU funds and financial tools and
c. promote public dialogue on conflicting interests.

Results expected:

a. Increased capacity of 200 public administration employees to effectively support new paths of energy growth and security
b. ~ € 19 million unblocked to support renewable energy projects, workforce retraining and post-mining land development

c. Increased awareness and consensus building among the energy sector, workforce and citizens to support clean energy transition measures (over 1000 people).

Operational objectives:

a. Increasing the knowledge and capacity of public authorities on growth paths beyond coal and ensuring energy security and stability
b. Support the development of job creation plans to counter the shrinkage of the coal industry, and analyze the territorial impact to identify worker retraining and the need for post-mining land use
c. Promote public dialogue for conflict resolution and consensus building on the clean energy transition, involving the energy sector, social partners and citizens
d. Raising awareness of the importance of planning ahead and implementing measures for new energy. Secondly, all proposed measures should be in line with the investment priorities set out in each partner's policy instruments.

Moreover, the proposed measures should be broadly in line with the recommendations based on the conclusions drawn in the analytical activities described above, as well as with the investment priorities to which each policy instrument relates.

6.2.2 Accurate and detailed description

The second criterion aims to ensure that the action plan and all its measures are accurately described so that they are understood by any member of the public sector involved in policy making and implementation procedures. The term "accurate and detailed description" refers to:

context: Partners responsible for preparing action plans should ensure that they describe clearly and comprehensively the rationale for the proposed measures together with the lessons learned from the project on which they are based. More specifically, describing the rationale means articulating the strategic path of development on which the actions are based, as well as their position within the existing policies at which they are directed.
actions: The proposed measures / actions should be described in a way that can be understood by any member of the public sector involved in policy making and implementation procedures.

key actors: Action plans should list all actors and stakeholders for each measure / activity proposed, and detail their role in policy development and implementation procedures.

timeframe: The action plans should describe the time frame and work plan for the implementation of the activities / measures, if possible in the form of a Gantt chart.

costs: Action plans should include a detailed description of all expected costs resulting from the implementation of the proposed actions / measures.

funding sources: Action plans should include a detailed description of all sources of financing for the implementation of the proposed activities / measures, such as:

a. ERDF
b. Horizon 2020 program
c. Territorial cooperation programs
d. ESPON
e. EAFRD

6.2.3. Guaranteeing a real impact

Before implementing the action plan, partners should ensure that the proposed actions / measures as well as the strategic development path overall have a potentially positive impact, if possible, in all of the following areas:[3]:

a. funds,
b. administration employees,
c. economy,
d. society,
e. environment.

[3] https://www.legislationline.org/documents/id/17155

6.3. Recommendations to use EU funding for specific types of projects, including based on the analytical results (action A1) and capacity building (action A3).

The analysis of project reports and reports summarizing social dialogue events that took place in the project partner regions shows the presence of four main types of projects, responding to the needs related to the implementation of the decarbonisation process:

a) Educational programs supporting the change of the employment profile of employees hired in companies participating in the value chain. Activities include the development of new programs at both higher education and vocational school levels. As engineering staff are usually offered more employment opportunities, special emphasis should be placed on training for miners and technical staff.
b) Actions aimed at environmental restoration and land reclamation, fostering the restoration of natural ecosystems, development of extensive organic farming, reforestation and tourism development.
c) Investments in sustainable energy systems, including renewable energy sources, measures to improve the energy efficiency and performance of buildings, development of energy management systems and energy storage systems.
d) Research and development activities related to sustainable energy systems, research projects related to land reclamation, social and economic effects of the energy transformation.

The main EU funding programs available for 2021-2027 include:

a) the European Regional Development Fund
b) Horizon Europe - the EU framework program for research and development;
c) the European Social Fund Plus (ESF +) - a fund supporting social cohesion;
d) LIFE + - a fund supporting nature protection projects under the Natura2000 network;
e) The Just Transition Mechanism, consisting of three pillars:
    - Just Transition Fund - a mixed fund in which each euro will be matched by the Member States with other EU funds - ERDF, ESF +. The fund will be targeted at regions in transition.

- InvestEU Program - co-financing energy and transport infrastructure projects, including gas and heat infrastructure, but also decarbonisation projects, economic diversification and social infrastructure. Addressed to transition countries and other regions.
- EIB loan facility - This facility aims to provide the public sector with the means to implement measures to support the transition to climate neutrality. Eligible projects will include energy and transport infrastructure, district heating networks, energy efficiency measures including building renovation, as well as social infrastructure.

Therefore, specific types of projects identified as part of DeCarb's analysis would be supported from the following EU funds:

a) Educational programs supporting the change of the employment profile:
   - European Social Fund Plus
   - Just Transition Fund

b) Environment restitution i land reclamation:
   - ERDF
   - LIFE +

c) Sustainable Energy Projects:
   - ERDF
   - InvestEU
   - EIB loan

d) R+D projects:
   - Horizon Europe ERDF

7. Summary of Project Matrix questionnaires

The Project Matrix questionnaires were implemented as a tool for collecting the initial list of proposed action plans. Questionnaires were completed by all DeCarb partners. The questionnaires contained questions that highlighted the key elements of future action plans. They included, inter alia: short description of activities, main area of activities, short description of the regional policy instrument to which the measure relates, description of the link between the activity and the project results, indication of: key stakeholders, lead institution, key partners, time frames, estimated costs, estimated sources financing.

The questionnaires contained preliminary proposals that will be developed later. The exchange of draft action plans is part of mutual learning, sharing practices.

All regions participating in the DeCarb project have submitted their proposed targets for action plans and described how they intend to achieve this target. The questionnaire describes two of the projects recommended for the action plans, together with the sources of financing, estimated cost and implementation schedule. The participants were asked to choose which axis their actions relate to and what priority was given to that axis in the action plan. The aim of this activity was to gather initial concepts and to provide mutual feedback as a step in the joint learning process of the project partners.

The results of the questionnaires are summarized in the text below.

7.1. Bulgaria – Stara Zagora Regional Economic Development Agency

a) Selected instruments of the regional policy

The activities are related to the Regional Development Strategy and the Regional Development Plan for the South-East region for 2014-2020 and 2021-2027 and the Operational Program Development of Regions 2021-2027.

b) Selected actions

a. Training current and former mining workers in adapting to new professions.

b. Plan and road map to outline the re-use of post-mining sites and available land in the energy complex.

c. Diversification of the regional economy with an emphasis on clean technologies.

c) Key actors

The Stara Zagora Regional Economic Development Agency (SZREDA) was responsible for completing the questionnaire. Stara Zagora County Board will be the leading institution for the first action, supported by SZREDA, Ministry of Labour and Social Policy, State Employment Agency, Mini Maritsa - Iztok Jsc, three main coal power plants in the region, chamber of commerce and Trakia University of Stara Zagora. The leading institution of the second action is the Ministry of Development and Public Works together with the Ministry of the Environment, with the support of SZREDA, Mini Maritsa-Iztok Jsc., Mini Maritsa 2 Coal-fired plant, Contour Global, AES; County Administration of Stara Zagora, Sliven, Yambol, Galabovo and Radnevo Municipalities, Trakia University, ProDroneSys. Ltd. The leading institution in the third action will be the Ministry of Development and Public Works, supported by SZREDA, Stara Zagora County Board, Sliven County Authorities, Yambol, Burgas; Regional communes, Chamber of Commerce, Ministry of Economy, Ministry of Finance, National Agency for SMEs, Local Business, Trakia University Stara Zagora and Bioeconomy Cluster.

d) Timeframe

The time frame of the project covers the year 2020, with the perspective of including activities in the new Strategy of Regional Development of Stara Zagora 2021-2027. The time frame for the second project is 2021-2027. The third activity will take place within the 2020-2027 timeframe.

e) Costs and sources of financing

The cost of the first action has not yet been calculated and will be financed from the Just Transition Fund, the Human Resources Operational Program, and the National Budget. The cost of the second measure has not yet been estimated and will be covered by the

Just Transition Fund, OP Environment, OP Regional Development, national budget and public-private financing. The cost of the third action has not yet been calculated and will be covered by the Just Transition Fund, OP Innovation and Competitiveness, OP Regional Development and the national budget.

f) Main priorities for actions – link with the DeCarb project

Awareness, capacity building and socio-economic governance are priorities in the Action Plan. The Regional Development Plan identified the need for economic restructuring, without further detail on the need for economic diversification and thus creating a regional economy that would not be so heavily dependent solely on the energy sector. Socio-economic awareness, capacity building and governance are key to mitigating the social and economic impacts of the transition to a low-carbon economy on the affected regions. The priority is to **explore all the possibilities of diversifying not only the entire sector of the economy, but also the energy sector.** The most important factors in selecting all measures are: the supporting legal framework, the existing infrastructure and technical competences in the region (skills and personnel), existing business competences, the possibility of PPP involvement in the project and the availability of R&D infrastructure. This is also the best answer in a regional context.

7.2. Poland - Lodzkie Region – Marshal's Office of the Lodzkie Region

a) Selected instruments of the regional policy

The activities are related to the implementation of the Regional Operational Program of the Lodzkie Region for the years 2014-2020 with the perspective of their development under the Regional Operational Program of the Lodzkie Region for the years 2021-2027.

b) Selected actions

a. building awareness and drawing attention to the social effects of the energy transition
b. promoting the development of renewable energy sources.

c) Key actors

The process is conducted by the Marshal's Office of the Lodzkie Region.

The key stakeholders involved in the first action are the local government units of the Lodzkie Region, Lodz University of Technology, University of Lodz and Lodz Regional Development Agency. The main actors of the second action are PGE GiEK Elektrownia Bełchatów and Veolia Energia Łódź.

d) Timeframe

The timeframe covers the year 2020, with the horizon for 2021-2027.

e) Costs and sources of financing

Regional Operational Program of the Lodzkie Region for 2014-2020 and 2021-2027, state budget, H2020, Life + Program, private funds. The sources are indicative, the cost has not yet been calculated.

f) Main priorities for actions – link with the DeCarb project

The action plan will focus on **building awareness, capacity and socio-economic governance for a fair transition.** Emission reduction factors and renewable energy sources were also distinguished. All the proposed factors are interrelated and are of great importance for energy transformation efforts. Awareness raising and capacity building are seen as key in introducing investment and support programs and are therefore considered to be of the greatest importance.

The identified potential of **renewable energy sources** in Poland is largely untapped. Solar and wind installations are the most popular and popular among individual investors, and wind energy has the largest share in the production of "green" energy.

It is planned to build and expand renewable energy sources in the field of electricity generation together with energy storage for the needs of a given RES source; construction and expansion of renewable energy sources in the field of heat generation along with heat storage facilities operating for the needs of a given RES source; supporting clusters and

energy cooperatives and the development of prosumer energy, as well as eliminating the instability of energy production from renewable energy sources through accompanying installations and balancing energy production, i.e. hybrid installations; raising qualifications and supporting the creation of "green" jobs.

ROP should update the objectives and criteria in the field of environmental protection, energy production and sustainable development; at present, the region still has untapped potential in terms of the share of renewable energy sources.

In the ROP, it is also necessary to pay attention to the **social effects of the energy transformation** in terms of reducing the phenomenon of energy poverty, towards comprehensive solutions, including the installation of renewable energy devices and the promotion of energy efficiency.

By using available EU funds (e.g. Horizon 2020 program), the region can take measures to correct the energy sensitivity of EU territories, understood as the lack of sufficient access to inexpensive and reliable energy supplies, exposing individuals or households to health / welfare risks in order to effectively prevent energy poverty in households, i.e. when people or households are unable to adequately heat or provide other required energy services in their homes at an affordable cost.

7.3. Hungary – ENEREA Eszak-Alfold Regional Non-profit Energy Agency

a) Selected instruments of the regional policy

It is planned to use the Territorial and settlement development Operational Programs.

b) Selected actions

a. **Integrated action aimed at energy modernization of municipal buildings** under the Operational Program for Territorial and Urban Development in the village of Fülesd. The main axis of the project is the mitigating factors (major and secondary).

The main policy instrument of this action is energy management - energy modernization of municipal buildings in Fülesd.

b. **Energy modernization of the 100% self-owned buildings of Vásárosnamény Municipality (Building Development, solar systems etc.)** as part of the Operational Program for Territorial and settlement Development. The main axis of the project is the mitigating factors (major and secondary). The main policy instrument affected by this measure is energy management - energy modernization of the self-owned buildings of Vásárosnamény Municipality.

c) Key actors

PP3-ENEREA completed a questionnaire for the Szabolcs-Szatmár-Bereg district. The main stakeholders involved in the first activity are the Secretary of State for Energy and Climate and the Municipality of Fülesd. The main stakeholders involved in the second activity are the Secretary of State for Energy and Climate and the the Vásárosnamény Local Government.

d) Timeframe

The timeframe is 2019-2021

e) Costs and sources of financing

The project will be financed under the TOP TOP-3.2.1-16-SB1 competition, and the estimated cost is € 112,907. The second project will be funded under the TOP TOP-3.2.2-15-SB1 competition and the estimated cost is € 1 144 916.

f) Main priorities for actions – link with the DeCarb project

The region will prioritize **emission reduction factors** (primary and secondary), **renewable energy sources** and **post-mining environmental management** as an important axis of the action plan. Factors that influenced the above selection of the axis were: favourable

legal framework, best climate change mitigation performance and past experience (policy continuity).

7. 4. Romania – South-West Oltenia Regional Development Agency

a) Selected instruments of the regional policy

It is planned to use the Operational Programs 2014-2020 and 2021-2027.

b) Selected actions

a. The first action will improve the quality of life within the target groups of the project, reduce CO2 emissions and implement the National Action Plan for energy efficiency (approved by GD No. 122/2015). Renewable energies and awareness, capacity building and socio-economic management are at the heart of the action. The main policy instrument referred to as a result of the measure is the Regional Operational Program (ROP) for Romania, covering 9 thematic objectives (TOs).
b. A program to retrain coal workers (currently employed in the region's coal power plants or ancillary activities) to the renewable energy sector. The main axis of action is the energy mix. As part of the measure, initiatives will be taken to implement training to develop the skills of the workforce during the transition to low-carbon energy in order to increase the technical capabilities of the workforce. It will also improve cooperation between retraining activities and businesses to provide opportunities that will enable coal workers to transition to the renewable energy sector.

c) Key actors

The South-West Oltenia Regional Development Agency completed a questionnaire for the South-West Oltenia Region. The leading institutions responsible for the first action are: the Ministry of European Funds, Gorj County Council, Turceni City Council, which will be supported by local authorities: SUDUL Local Action Group GORJULUI, CE Oltenia - Turceni Power Plant, Rovinari City Hall, Urdari City Hall, Negomir City Hall, Farcasesti City

Hall, Motru City Hall. For the second action, the leading institution will be the Ministry of European Funds, Gorj County Council, Turceni City Hall, with the support of central and local authorities, NGOs, representatives of civil society, local authorities: Local Action Group SUDUL GORJULUI, CE Oltenia - Turceni Power Plant, Rovinari City Hall, Urdari City Hall, Negomir City Hall, Farcasesti City Hall, Motru City Hall.

d) Timeframe

The timeframe for this actions is 2020, with the possibility of transferring to the new programming period 2021-2027.

e) Costs and sources of financing

The cost of the action has not yet been estimated and will be covered by the Regional Operational Program 2014-2020 (ROP) or its next operational program for 2021-2027.

f) Main priorities for actions – link with the DeCarb project

The region will prioritize the **Awareness, Capacity Building and Socio-Economic Governance Axis** in its Action Plan as this is key to mitigating the social and economic impact that the transition to a low carbon economy will have on the affected regions. It is also a priority to explore all **possibilities to diversify not only the economic sector** as a whole, but also the energy sector.

7.5. Germany – Ministry for Economic Affairs, Labour and Energy of the State of Brandenburg

a) Selected instruments of the regional policy

The region's energy strategy 2030

b) Selected actions

a. This region has chosen **PV Area Analysis** as determining which areas are available for potential PV systems and the capacity of such installations throughout the region.
b. Financing the further development of the **Regional Energy Concept** as two key actions that are most recommended under the Action Plan. Both activities do not define one main axis on which they focus by selecting all the suggested suggestions.

c) Key actors

The questionnaire was filled by the Ministry of Economy, Labour and Energy of Brandenburg (Germany). The first action will be led by the Ministry of Economy, Labour and Energy, supported by several other ministries and five regional planning communities.

The leading institution in the second action will be the Lusatia Spreewald Planning Association, supported by partners: seeconIngenieure GmbH, Brandenburg Economic Development Agency (Energy Agency), Ministry of Economy, Labour and Energy, other regional planning communities, planning region counties, the City of Cottbus.

d) Timeframe

The first action will be implemented in a time perspective from October 2020 to the end of 2021. The second action is also scheduled to run until the end of 2021.

e) Costs and sources of financing

The PV analysis is financed by the federal state. The update of the regional energy concept, on the other hand, is 80% funded by ERDF.

f) Main priorities for actions – link with the DeCarb project

The Brandenburg region **will prioritize renewables over factors limiting emissions, improving the energy mix** and **energy management instruments influencing the demand for renewable energy,** leaving the rest of the action axes at a medium priority level. Priorities

are based on the existing infrastructure factor, best mitigation performance, best regional response, early success factor and policy continuity in the region.

7.6. Denmark – House of Energy (cluster)

a) Selected instruments of the regional policy

The municipal infrastructure development strategy for the municipality of Aalborg for 2020-2023

b) Selected actions

Decarbonise Nordjyllandsværket power plant by replacing the coal currently used to produce energy - a mixture of various green production methods including wind turbines, heat storage, CSP, heat pumps and harvesting excess heat from industry or new methods.

c) Key actors

The questionnaire was filled by the municipality of Aalborg (House of Energy). The leading institution of the action will be the commune of Aalborg, supported by the above-mentioned organ and Energy Cluster Denmark.

The Nordjyllandsværket power plant is managed and owned by the municipal company Aalborg Forsyning.

d) Timeframe

The actions should be completed in the years 2020-2023.

e) Costs and sources of financing

The cost of the operation has not yet been estimated, it will be financed from the budget of the municipality, Aalborg Business Council and the North Business Region.

f) Main priorities for actions – link with the DeCarb project

The project is related to the implementation of goals related **to the improvement of the energy mix** and **support for the implementation of renewable energy sources**.

7.7. Greece –Regional Association of Local Governments of Western Macedonia

a) Selected instruments of the regional policy

Regional Operating Program 2021-2023.

b) Selected actions

a. Retraining the workforce for clean energy work and post-mining land reclamation.
b. Land reclamation and its use for productive use after the end of lignite mining.

c) Key actors

The questionnaire was filled by the Regional Association of Local Governments of Western Macedonia (PEDDM). The key stakeholder will be PEDDM, supported by DEI (owner of coal power plants), Ministry of Labour, Ministry of Development, Hellenic Manpower Employment Organization, Region of Central Macedonia, Chamber of Commerce, RES-SKILL (E + project, synergy, PEDDM is also involved).

d) Timeframe

The timeframe for the project is 2021-2023.

e) Costs and sources of financing

The cost of the action has not yet been estimated, but will be financed from the Just Transition Fund, ROP and the state budget.

f) Main priorities for actions – link with the DeCarb project

The Regional Action Plan for Western Macedonia will prioritize as a major axis awareness, **capacity building and socio-economic management and management of post-mining sites.** Actions have been selected because they will be the best response to the regional context.

7.8. Slovenia – Energy Agency of Savinsjka, Saleska and Koroska

a) Selected instruments of the regional policy

Operational Program for the implementation of the EU Cohesion Policy in 2014-2020.

b) Selected actions

a. **Increase of investment in alternative fuels infrastructure and decarbonisation of transport** by developing sustainable (zero emission) mobility projects to **improve air quality in urban and intercity areas**.
b. **Revitalization of environmentally degraded areas through the development of sustainable tourism.** The overall aim is to use areas that have been degraded by coal mining processes and reuse / re-use them together with an innovative and sustainable tourism offer for visitors.

c) Key actors

The energy agency for the Savinjska, Saleska and Koroska region (KSSENA) completed the questionnaire for this region of Slovenia. The lead institution of the first activity is

KSSENA, supported by the municipality of Velenje (Mestna obcina Velenje - MOV), the municipality of Sostanj as the main beneficiaries (Obcina Sostanj - OS), the holding of Slovenian power plants (Holding Slovenskeelektrarne - HSE) and the Thermopower power plant Sostanj (Termoelektrarna Sostanj). The leading institution for the second action is the municipality of Velenje, supported by the development agency SASA (Razvojna agencija Savinjsko Saleske regija) and the Velenje coal mine (Premogovnik Velenje - PV).

d) Timeframe

The first action will be completed by 2024, the second in 2027. Some infrastructure projects will end in 2021.

e) Costs and sources of financing

The estimated cost of the action is EUR 9.5 million and will be covered by the National Environmental Fund, government funds, and the JTS - restructuring of coal regions. The estimated cost of the second action is EUR 15 million and will be covered by the municipality of Velenje, EU cohesion funds and government funding (base budget).

f) Main priorities for actions – link with the DeCarb project

The action plan for this region gives priority to renewable energy sources. All the proposed factors are interrelated and play a significant role in energy transformation efforts. Nevertheless, facilitating the development of renewable energy (production and new technologies) applies simultaneously to all segments of sustainable development (reduced greenhouse gas emissions, supporting socio-economic structures, revitalization of degraded landscapes, etc.), so they were considered the most important. On the other hand, awareness raising and capacity building are seen as something that is introduced in addition to specific ("traditional") investment and support programs and should be seen as accompanying rather than stand-alone areas / methods of intervention.

7.9. Spain – Energy Agency Extremadura

a) Selected instruments of the regional policy

Regional Operational Program for Extremadura for 2014-2020 and 2021-2027.

b) Selected actions

a. **Achieve the clean energy transition by 2030,** building on the experiences of other countries and best practices acquired by the project in the regional integrated energy and climate plan for Extremadura.
b. **Identifying the barriers that have slowed the development of renewable energy sources and focusing on the need for disposable green energy**. It will work by promoting large-scale renewable power plants to achieve the energy transition.

c) Key actors

Agenex, the regional energy agency, completed a survey for the Extremadura region. The lead institution will be the Ministry for Ecological Transition and Sustainability, through the Ministry of Ecological Change and Sustainable Development, supported by AGENEX. The lead institution of the second activity will be the Ministry for Ecological Transition and Sustainability, through its Ministry of Ecological Transformation and Sustainable Development, supported by AGENEX and additionally by private promoters and installers through the regional energy cluster.

d) Timeframe

The time frame for action is 2020-2021, and for implementation 2021-2023. The second action will take place in 2021-2022.

e) Costs and sources of financing

The cost of the action has not yet been estimated and will be financed with own resources from the regional budget or the ERDF.

f) Main priorities for actions – link with the DeCarb project

The Extremadura region will give priority to renewable energy sources and energy economic instruments influencing the demand for renewable energy sources in its regional action plan. Secondary priority will be the drivers of emission reduction (primary and secondary) and the energy mix. Priorities are based on the region's needs and potential. They were selected on the basis of a supporting legal framework, a supporting financial framework, the existing technical competences in the region (skills and staff), the best results from a climate change mitigation perspective and the best regional response.

8. The methods for carrying out peer review procedures and the approach to monitoring the implementation of action plans.

After finalizing the pre-selection of actions to be included in the action plans, the partners will prepare action plans based on the model in the Interreg Europe Program Manual (point 9, Annex to the Methodology). These plans can then be subject to a peer review process by all other partners.

The process should respect the following principles:
- Efficiency: Peer review procedures should be systematic and not be overly burdensome. They should provide an objective and consistent assessment of whether the action plans are effective, realistic, as short as possible and in line with the objectives of the Interreg Europe project and program.
- Fairness: Peer review procedures should ensure equal treatment for all regions under review. The review process should provide everyone from partners the opportunity to react to the assessment received by other partners.

- Objectivity: Peer review procedures must be based on objective criteria, in the sense that regions should be assessed in line with the EU-approved Interreg Europe program rules and project objectives, in line with the agreed methodology.

- Coordination with partners: Peer review procedures should be designed to avoid duplication of effort. If some partners terminate their action plans after other partners have already been peer reviewed, they should consider the peer review feedback when finalizing their action plans.

An effective way to make sure that the peer review procedures are in line with the above principles is to use the common evaluation form which is based on the criteria in section 6.3) and provides a common basis for establishing a comparable, fair and objective evaluation of each partner's action plan. The mutual evaluation form does not require the partners to evaluate specific information on the territory of other partners, which is contained in the action plans. For this reason, the questions will not be on the third criterion (ensuring impact), as addressing these issues requires information that is mostly available to the authority responsible for preparing each action plan, and not to all partners.

The Questionnaire might look like this:

<table>
<tr><th colspan="5">DeCarb- Action Plan Peer Review Form</th></tr>
<tr><td colspan="5">A. Adequacy</td></tr>
<tr><td colspan="5">Question 1</td></tr>
<tr><td colspan="5">To what extent is the strategic development path described in the action plan consistent with the overall objective and operational objectives of the project as defined in the application form?</td></tr>
<tr><td>Not at all</td><td>Poorly</td><td>Averagely</td><td>Significantly</td><td>In their entirety</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="5">Please explain your view / choice briefly:

……</td></tr>
<tr><td colspan="5">Question 2</td></tr>
<tr><td colspan="3" rowspan="2">Are there any activities that are not consistent with the achievement of the overall goal and operational objectives of the DeCarb project as stated in the application form?</td><td>YES</td><td>NO</td></tr>
<tr><td></td><td></td></tr>
</table>

Which one? Please explain your view / choice briefly:

……

Question 3

Is the connection between the strategic development path in the action plan and the conclusions of the project understandable:

Not at all	Poorly	Averagely	Significantly	In their entirety

Please explain your view / choice briefly:

……

B. Accuracy and detailed description

Question 4

Is the connection between the strategic development path in the action plan and the conclusions of the project understandable:

Not at all	Poorly	Averagely	Significantly	In their entirety

Please explain your view / choice briefly:

……

Question 5

How accurate and detailed is the description of the actions in the action plan?

Not at all	Poorly	Averagely	Significantly	In their entirety

Please, list that are not fully described:

……

Question 6

How accurate and detailed is the description of stakeholders involved in the activities of the action plan?

Not at all	Poorly	Averagely	Significantly	In their entirety

Are there any activities where stakeholder involvement has not been fully described?

……

Question 7				
How accurate and detailed is the description of the timeframe and work plan for the implementation of the activities in the action plan?				
Not at all	Poorly	Averagely	Significantly	In their entirety
Are there any activities where the timeframe / work plan was not clearly described? **……**				
Question 8				
How accurate and detailed is the description of the implementation costs in the action plan?				
Not at all	Poorly	Averagely	Significantly	In their entirety
Are there any actions for which the cost description did not seem sufficient? **……**				
Question 9				
How accurate and detailed is the description of the funding sources for the implementation of the activities in the action plan?				
Not at all	Poorly	Averagely	Significantly	In their entirety
Are there any activities for which the description of the financing sources did not seem sufficient? **……**				

Monitoring means regularly checking to what extent the activities described in the action plans are being implemented in the region, assessing progress and collecting evidence of success. Continuing interregional cooperation is important for the following reasons:

- Partners should continue to learn from each other in the implementation phase of the action plans. They can exchange experiences and build on the successes achieved or the difficulties encountered.

- Some initiatives in the action plan of a region may require know-how from another region. In particular, when referring to a specific action developed in one region, a "using" region may need advice from a "providing" region on how best to adapt the experience to its own context.

- In order to ensure proper project management and monitoring of the various action plans, the partnership must remain active and the lead role will be to consolidate the information received from the various partners.

9. Annex – Action Plan Template based on the Interreg Europe Program Manual

Part I – General information

Project:

Partner organization: _____

Other partner organisations involved (if relevant): _____

Country: _____

NUTS2 region: _____

Contact person: _____

Email address: _____

Phone number: _____

Part II – Policy context

The Action Plan aims to impact:

Investment for Growth and Jobs programme	
European Territorial Cooperation programme	
Other regional development policy instrument	
Name of the policy instrument addressed:	

Part III – Details of the actions envisaged

Strategic development pathway (please describe the shortages of the policy instrument, the aims of the policy measures included and the lessons learnt from the project that constitute their basis)

_____

_____

_____

_____

_____

ACTION X (to be repeated for each separate action)

1. The background (please describe the lessons learnt from the project that constitute the basis for the development of the present Action Plan)

_____

_____

_____

_____

_____

2. Action (please list and describe the actions to be implemented)

_____

_____

_____

_____

_____

3. Players involved (please indicate the organisations in the region who are involved in the development and implementation of the action and explain their role)

_____

_____

_____

_____

4. Timeframe

_____

_____

_____

_____

5. Costs (if relevant)

_____

_____

_____

_____

6. Funding sources (if relevant):

_____

_____

_____

_____

Date:_____

Signature: _____

Stamp of the organisation (if available): _____