CEESEN Roadmaps

Roadmapping methodology



CENTRAL EASTERN EUROPEAN SUSTAINABLE ENERGY NETWORK

CEESEN Roadmapping Approach

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 will need to be individualised on regional or local level in the countries of Central and Eastern Europe. In order to shape the process CEESEN supports 10 regions in CEE in developing roadmaps for a sustainable energy future.

The overarching vision is 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.

Backcasting 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 will be 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 are ask to follow is divided into different **steps building on each other** from the first initial data collection to an complete implementation plan. This **4 stages-model** should help structure the process for the roadmapping teams and ensure that the sequence of tasks is 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 are implemented by the project partners.

The following figure shows the CEESEN roadmapping model.





The model will be 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 provides an "empty" template of the above infographic to the partners and will support them in visualising their individual roadmapping process.

As an example WP3 lead already prepared the infographic for the CZ region of South Bohemia visualizing the ongoing roadmapping process. This example will be provided to the whole partnership and updated throughout the upcoming activities.



The roadmaps and related documents will be made available both in the local language and English. This will provide 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 should give a comprehensive analysis of local energy production, imports, exports and energy consuming sectors as well as analyse strengths and challenges with regard to the transition towards a low carbon community.

The REP will further be used to steer the choice of which stakeholders need 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 will show major influencing factors regarding the energy balance or carbon emissions. The identified sectors and its stakeholders should be in the focus of further activities and specifically addressed in the roadmap.

Methods to be used: Desk research

Output: Regional Energy Profiles including SWOT analysis to be used in upcoming roadmapping tasks (bilingual)

Tools provided to the partners:

- Template for structure of Regional Energy Profile (<u>https://drive.google.com/open?id=1-Xpc9IOLJpiRFPobN9biatUwoZPvp_n2</u>)
- Template for calculation methodology for generating/interpolating missing energy data (<u>https://ceesen.org/?dlm_download=tool-for-developing-a-</u> regional-energy-profile)

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.

In the final Roadmap document the vision will act 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.



The vision should moreover draw the connection to existing energy and development targets of the region and position itself to ideally fill the gap between existing policies and the overall goal of a regional low-carbon economy.

Methods to be used: At least 1 Visioning workshop with key stakeholders (first choice), other stakeholder involvement formats possible

Output: Vision document including documentation of visioning process; 2 pages max, bilingual

Tools provided to the partners:

- Guide for preparing an energy vision (<u>https://ceesen.org/?post_type=dlm_download&p=1691&preview=true</u>)
- Guide to holding a vision workshop & template for vision document (<u>https://ceesen.org/?post_type=dlm_download&p=1697&preview=true</u>)
- Documentation of visions created by stakeholders during CEESEN Boot Camp

Deadline for delivery by partners: 11.5. 2018

Roadmap (D3.5)

The roadmap document is the heart of the process channelling baseline analysis and vision into a concrete pathway towards a sustainable energy future. The document should be divided into particular strategical challenges which have potential to drive the region towards the set vision, i.e. priority areas. Each priority area should be 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 should be described in an uniform way covering the following topics:

- 1) conditions and opportunities 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



Methods to be used:

- Catalogue of stakeholder involvement formats useful for the roadmapping process (included in the How-to-Guide for the Roadmap)
- CPU will offer to the partners the opportunity to have one-on-one roadmapping workshops in order to facilitate the on-time delivery of high quality outputs –2 workshops between May to Aug 2018.

Output: Roadmap document including documentation of roadmapping process; 20 pages max, bilingual

Tools provided to the partners:

- Guide for preparing the energy roadmap (link tbd)
- Documentation of roadmap outlines created by stakeholders during CEESEN Boot Camp

Deadline for delivery by partners: 17.8. 2018

Regional Action Plans (D3.7)

- 10 per region, bilingual

Based on priority areas 10 concrete and detailed Action Plans will be 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 partners are required to think about and plan for all of the above-mentioned dimension of the Action Plan. Additional involvement of members of the implementation group is a must.



Methods to be used:

- Catalogue of stakeholder involvement formats useful for the roadmapping process (included in the How-to-Guide for the Roadmap)
- CPU will offer to the partners the opportunity to have one-on-one roadmapping workshops in order to facilitate the on-time delivery of high quality outputs –2 workshops between May to Aug 2018.

Output: Action Plans ready for implementation including endorsement of implementation group as well as local decision-makers

Tools provided to the partners:

- Guide and template for Action Plan (link tbd)
- Documentation of exemplary Action Plans created by stakeholders during CEESEN Boot Camp

Deadline for delivery by partners: 21.9. 2018

The translation into local languages of all last 3 deliverables (vision, roadmap and APs) should take place collectively at the end of the activities (Sep 2018).



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Annex I Template for structure of Regional Energy Profile

https://drive.google.com/open?id=1-Xpc9IOLJpiRFPobN9biatUwoZPvp_n2



REGIONAL ENERGY PROFILE

Region: XXX English version



PANEL 2050 – Partnership for New Energy Leadership 2050 Deliverable 3.1

Date: XXXX



CENTRAL EASTERN EUROPEAN SUSTAINABLE ENERGY NETWORK



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1. Methodology

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 will provide 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 will collaborate on creating regional energy strategies and action plans.

The present Regional Energy Profile was prepared in order to get a better understanding of the energy-related status quo in the region of XXXX, analysing strengths and challenges with regard to the transition towards a low carbon community.

This energy profile constitutes the groundwork for the preparation of a Regional Energy Roadmap and related Action Plans and will be essential for the communication with regional stakeholders.

For completing this Regional Energy Profile the following sources were used:

Please provide a summary of main source of information (a full list can be added in the Annex), stakeholder events contributing to the results, etc.



2. General introduction of the region

max 2 pgs

Name of the region and NUTS identification

Geography and policy:

Describe the location of the region + provide also a political map showing location of the region in your country

Geography of the region, including morphology, geology, climate, hydrology, flora and fauna related to energy (text description)

Brief history overview of the region – state the most important milestones related to the industrial / regional development (e.g. significant energy projects, power plants, etc.), ideally related to energy

Public administration procedure – brief profile of current energy planning process in your region starting from the national level down to the region (see also your desk research within WP3.1)

Highlight significant characteristics differentiating region from others and give short (!) introduction of energy targets and challenges in the region



3. Basic demographic data and figures

max 1 pg

Regional demographic indicators:

| Population of region | сар |
|-------------------------------------|---------------------|
| Area of region | km² |
| Population density | cap/km ² |
| Number of individual municipalities | mun. |
| Data from 2015 | |

Basic demographic data

Population growth, age distribution in last 20 year - text description

Socio-economic development of past 3-5 years

| Unemployment rate | % |
|--|-------------|
| Average annual income per capita (gross) | EUR |
| difference from the EU average (34.500 EUR gross annual earning) | % |
| Share of employees in agriculture industry services | % % % |
| Share of population with tertiary education | % |

Text description for figures above

The spatial distribution of the population, level of urbanisation

Insert histogram – use attached xls template to generate it



4. Regional economy and economic trends

max 2 pgs

Regional economic indicators:

| GDP, total | million EUR |
|----------------|-------------|
| GDP per capita | EUR/cap |
| HDI | |
| Data from 2015 | |

| GDP per economic sectors: | | | | | | |
|---------------------------|----------------|--|--|--|--|--|
| Agriculture | % of total GDP | | | | | |
| Industry | % | | | | | |
| Services | % | | | | | |
| Data from 2015 | | | | | | |

Regional economy

Please provide information about the regional economy, past development and trends using GDP and other indicators. If available, include graphs about GDP / HDI development of last 10-20 years.

| number of operating entrepreneurs (SMEs, large and individual) | |
|--|---|
| \rightarrow share of SMEs | % of total number of operating businesses |
| number of operating nonprofit organisations | |
| Amount of EU funds (2007-13) | EUR |

What are the main contributors/contributing sectors to the regional GDP? How stable are these sectors (qualitative assessment)?

Describe the regional job market, employment/unemployment rates per sectors – agriculture and forestry, industry, services

Importance of trade; Import/ export balance, if available



5. National and local energy strategies

(task WP 3.1) max 1 pg

List of relevant and most influencing strategies / roadmaps / measures to local energy situation or development – already provided in task WP 3.1

| Region | Brief description of current | legal requirement OR voluntary initiative | National/ regional/ local level | Original title + link (if possible) | English title + brief description | Organisation in charge | Type (EE,EPB,RES , etc. or combinatio n) |
|--------|---------------------------------|---|--|--|---|---------------------------|--|
| | | | | | | | |
| | | | | | | | |



6. Energy Production

6.1. Conventional energy production capacities (fossil fuels and nuclear power)

Give an overview of energy production by fossil fuels and nuclear power plants – concentrate on the most significant 3 to 5 power plants.

| Name & Location (city, town) | Owner | Year of commis- sioning (refur- bishment) | Type of plant & fuel | Capacity in MW | Annual energy production in MWh | Annual CO ₂ - emissions in t | Utilization rate (qualitative assessment) |
|---------------------------------|---|---|----------------------------|---------------------------------------|--|--|---|
| | [choose: Public / private SME / private large enterprise] | | | [state: electr. and/or heat] | | | [choose: Constantly used / sometimes / seldom / to be decommissioned] |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

Add additional details to describe the conventional energy production capacities in the region. What are current trends? What influence have age, regional economy, fuel imports, and fuel prices on the on the current status?

6.2. Renewable energy production

Energy production capacities

Give an overview of energy production by renewable energy capacities (e.g. small/large hydro, solar PV, solarthermal, biomass, geothermal & other production capacities – concentrate on the most significant 3 to 5 power plants or aggregation of production facilities.

| Name & Location (city, town) | Owner | Year of commis- sioning (refur- bishment) | Type of plant & fuel | Capacity in MW | Annual energy production in MWh | Annual CO ₂ - emissions in t | Utilization rate (qualitative assessment) |
|---------------------------------|---|---|----------------------------|---------------------------------------|--|--|---|
| | [choose: Public / private SME / private large enterprise] | | | [state: electr. and/or heat] | | | [choose: Constantly used / sometimes / seldom / to be decommissioned] |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |



Add additional details to describe the renewable energy production capacities in the region. What are current trends? What influence have age, regional economy, fuel availability or renewable energy potential, and subsidy systems on the current status?

6.3. Transmission and distributions

What kind of facilities constitute the electric transmission and distribution system? Who are the owners? Who are the operators? Please add relevant map if available.

Give an overview of other centralised or decentralised energy distribution systems (e.g. natural gas pipelines, heat grids, etc.).

Give an overview on interconnections of regional energy production with the rest of the country. Are there large production facilities in the region on which the rest of the country's energy supply might depend?

6.4. Jobs in the energy sector

Give an overview about the status of the energy sector in the regional economy. How many jobs are there at the moment in the energy sector. How important are new "green job" for regional economy development. If possible, quantify investments in the energy sector.

Are coal and lignite mining undertaken in the region? What role does fossil fuel mining play for the regional economy and for regional energy security?



7. Final energy consumption

Final energy is a form, which might already been subject to conversion from the raw fuel. It is the energy made available to the user.

For the sectoral analysis please use regional statistics as far as they are available to you and quote your sources.

If no regional data is available please use the Excel tool, which will give you a suggestion to estimate the needed indictors using national statistics.

Please always use kWh, MWh, GWh, etc. You can find a good conversion tool here: <u>https://www.iea.org/statistics/resources/unitconverter/</u>

7.1. Households

| | Regional final energy consumption of household sector | GWh |
|------|--|--------|
| Heat | consumption | |
| | Total heat energy consumption of households sector (heating and hot water consumption) | GWh |
| | Average heat energy consumption per household | kWh/hh |

Describe the average building standard. What is their average age of existing building stock? Are energy efficient renovations in progress?

Electricity

| Electricity consumption of households | GWh |
|---|--------|
| Average electricity consumption per household | kWh/hh |

Describe if there are any national or regional programmes for reducing household electricity consumption (e.g. washing machine or refrigerator replacement programme). If yes, please elaborate it briefly.

Cooking

Gas consumption for cooking appliances of households

GWh

Describe if gas is a significant energy source for cooking in the household sector.



General information

| Household electricity price | EUR/kWh (incl. taxes) |
|--|-----------------------|
| Household natural gas price | EUR/kWh (incl. taxes) |
| Household district heating price | EUR/kWh (incl. taxes) |
| Household price: other energy sources – specify: | EUR/kWh (incl. taxes) |
| Energy expenditure by household | % of income |

Is there any element of Demand Side Management of electricity on household level in place? If yes, please describe it (e.g. peak price, smart metering)

Is energy poverty an issue in the region? If yes, please describe how many people are affected, in what extent?

Give an estimate of the trend in final energy consumption in the household sector using values from - 5- to +5 where (-5 is a strong reduction, 0 means neither growth nor reduction, +5 strong growth).

7.2. Service Sector

Regional final energy consumption of service sector

GWh

What are the main sub-sectors driving energy consumption in the in the service sector (building standard, number of businesses, ...)? How important is service sector for the regional economy?

Give an estimate of the trend in final energy consumption in the service sector using values from -5to +5 where (-5 is a strong reduction, 0 means neither growth nor reduction, +5 strong growth).

7.3. Industry



| Total energy consumption of the industrial sector | GWh |
|---|-----------------------|
| Industry electricity price | EUR/kWh (incl. taxes) |
| Industry natural gas price | EUR/kWh (incl. taxes) |
| Household district heating price | EUR/kWh (incl. taxes) |
| Household price: other energy sources – specify: | EUR/kWh (incl. taxes) |

What are the main sub-sectors driving energy consumption in the in the industrial sector? How important is industry for the regional economy?

7.4. Transport

| Regional final energy consumption of transport sector | | GWh |
|---|--|-----|
|---|--|-----|

Describe the main characteristics of the transport sector: transport infrastructure, motorisation rate, availability of public transport and differences between urban and rural environments.

Passenger transport Motorisation rate - number of passenger cars/1 000 inhabitants Regional energy consumption of passenger transport in the region GWh Freight transport Regional energy consumption of road freight transport GWh

If the rail, or transport by pipeline is a significant way of the freight transport, please describe their main characteristics.

Use of alternative fuels

Describe the market development for alternative fuel vehicles (natural gas, biogas, electric cars). What supporting mechanisms for alternative fuel are available on national and regional level? Describe challenges and barriers, e.g. infrastructure, technological, supply, financial barriers, etc..



Give an estimate of the trend in final energy consumption in the transport sector using values from -5-to +5 where (-5 is a strong reduction, 0 means neither growth nor reduction, +5 strong growth).

Other relevant sectors (delete if not relevant)

Regional final energy consumption of other sectors GWh

Please give a summary of large energy-consumers, which were not covered in the chapters above.



7.5. Summary

7.5.1. Final energy indicators

General indicators for the region

Use the Excel tool to fill the following tables and generate graphs. If regional data is available, use this information and quote your sources.

| Total final energy consumption | GWh |
|-------------------------------------|---------|
| Final energy consumption per capita | kWh/cap |
| Electricity consumption per capita | kWh/cap |
| Heat consumption per capita | kWh/cap |
| % of total country consumption | % |

Final energy consumption per sector



Give an estimate of the trend in final energy consumption using values from -5- to +5 (where -5 is a strong reduction, 0 means neither growth nor reduction, +5 strong growth).

7.5.2. Final energy consumption by fuel

Use the Excel tool to fill the following tables and generate graphs. If regional data is available, use this information and quote your sources.



Total final energy consumption by fuel

| | Year: 20 <mark>XX</mark> | | % |
|----|--------------------------|-----|--------|
| Сс | al and lignite | GWh | |
| Re | enewables and waste* | GWh | |
| Na | atural gas | GWh | |
| Oi | l, petroleum and | GWh | |
| pr | oducts | | |
| El | ectricity | GWh | |
| Ot | ther fuels | GWh | |
| | Sum | GWh | 100,0% |



*Hydro, wind, solar, tide/wave, biomass and waste, geothermal

7.5.3. Primary energy equivalent

Primary energy is an energy form found in nature that has not been subjected to any conversion or transformation process. It is energy contained in raw fuels.

If regional data is not available for these indicators, use specific national indicators to break energy supply down to regional level. Refer to Excel tool for suggestions on calculation methodologies. Quote your sources and assumptions

| Total Primary Energy Consumption | GWh |
|---------------------------------------|----------|
| Primary energy consumption per capita | kWh/cap |
| Primary energy factor of electricity | - |
| Energy intensity | TPES/GDP |

Give an overview of the regional primary energy supply by fuel.

Use the Excel conversion tool using primary energy coefficients suitable for your region.

Primary energy equivalent by sector

Use the Excel tool to fill the following tables and generate graphs. If regional data is available, use this information and quote your sources.



What is the level of primary energy supply dependencies: Which fuels need to be imported form the rest of the country and internationally.



Dependency on fuel imports: very high / high / average / low / very low

7.5.4. Regional CO₂-emissions associated with energy consumption

Use the Excel tool to fill the following tables and generate graphs. If regional data is available, use this information and quote your sources.

| Total CO ₂ -emission associated with energy sector | Mio t |
|---|---------|
| CO ₂ -emissions per capita | t/cap |
| CO ₂ -emissions per GDP | t/€ GDP |

Give an overview of the regional primary energy supply by fuel. Use the Excel conversion tool using CO_2 -emission coefficients suitable for your region.

Energy-related CO₂-emissions by sector

| Year: 20 <mark>XX</mark> | | % |
|--------------------------|-----|------------------------|
| Households | t C | O ₂ |
| Service sector | t C | O ₂ |
| Industry | t C | <mark>O</mark> 2 |
| Transport | t C | O ₂ |
| Agriculture, Fishing and | t C | <mark>O</mark> 2 |
| Other | | |
| Sum | t C | <mark>O₂</mark> 100,0% |





8. Renewable energy sources – status and potential

8.1. General information

Use the Excel tool to fill the following tables and generate graphs. If regional data is available, use this information and quote your sources.

| Renewable Energy Targets: | |
|--|---|
| 2020 RES share in gross final energy consumption | % |
| 2030 RES share in gross final energy consumption | % |
| | |
| Current RES share (20 <mark>XX</mark>) | % |
| thereof RES out of the region | % |

Share of final energy consumption produced by renewable fuels

| Year: 20 <mark>XX</mark> | % |
|--------------------------|------------|
| Hydro | GWh |
| Wind | GWh |
| Biomass, biofuels and | GWh |
| renewable wastes | |
| Solar | GWh |
| Geothermal | GWh |
| Tide, Wave, Ocean | GWh |
| Sum | GWh 100,0% |



Share of total electric demand covered by renewable fuels

| Year: 20 <mark>XX</mark> | % |
|--------------------------|------------|
| Hydro | GWh |
| Wind | GWh |
| Biomass, biofuels and | GWh |
| renewable wastes | |
| Solar | GWh |
| Geothermal | GWh |
| Tide, Wave, Ocean | GWh |
| Sum | GWh 100,0% |



Describe if and how renewable energy sources are integrated in the transport sector, e.g. biofuels, electric vehicles.



Describe the status of REN production in the region. % of total energy and electricity demand covered by REN. If available give a historic overview of the REN production capacities for the last 5 to 10 years.

Describe if there are incentive programmes/schemes (financial and non-financial) in place to support REN-development. Are these programmes on national, regional or local level?

Describe the top 5 regulatory barriers slowing down current and future REN-development. Should these barriers be addressed at national, regional or local level?

Give an estimate of the trend in renewable energy production using values from -5- to +5 (where -5 is a strong reduction, 0 means neither growth nor reduction, +5 strong growth). Describe supporting factor as well as barriers.

8.2. Available natural resources in the region

8.2.1. Biomass

How are forest areas used? For what purpose? What is the regional energy potential using existing forest areas? Please state whether it is a theoretical or technical potential and describe regulatory support systems as well as barriers.

What are main agricultural products at the moment? What is the regional energy potential from agricultural products? Please state whether it is a theoretical or technical potential and describe regulatory support systems as well as barriers.

Provide a land use map or map indicating biomass energy potential of the region, if available. You can use e.g. the Corine Land Cover 2012 database: <u>http://land.copernicus.eu/pan-</u> <u>european/corine-land-cover/clc-2012/view</u>



8.2.2. Hydro power (incl. tide and wave power)

Give an overview of hydro power sources used at the moment and describe the energy potential for the different technologies: run-of-river hydropower plants, reservoir hydropower plants, use of tide and wave power, if applicable. Differentiate between small and large hydro power. Describe the energy potential based on geographical and political frameworks.

8.2.3. Solar power

Give an overview of both solar thermal and PV usage hydro power sources at the moment and describe the energy potential based on geographical and political frameworks.

Provide a map indicating solar irradiation in the region, if available.

You can use e.g. the interactive map or posters provided by EU JRC PV database: Photovoltaic Geographical Information System (PVGIS), <u>http://re.jrc.ec.europa.eu/pvgis/</u>

8.2.4. Wind power

| Average wind velocity | from to | m/s |
|-----------------------|---------|-----|
| Full load hours | | h/a |

Give an overview of wind power use at the moment and describe the energy potential based on geographical and political frameworks. Differentiate between offshore and onshore potential Use regional/national studies but if not available, you can refer to the EEA study for approximation of wind speed or full load hours: <u>http://www.eea.europa.eu/publications/europes-onshore-andoffshore-wind-energy-potential/at_download/file</u>

Provide a wind map for the region, if available

8.2.5. Geothermal energy



Give an overview of use of geothermal energy at the moment and describe the energy potential based on geographical and political frameworks.

You can use e.g. this study as staring point: A prospective study on the geothermal potential in the EU <u>http://www.geoelec.eu/wp-content/uploads/2011/09/D-2.5-GEOELEC-prospective-study.pdf</u>

Provide a geothermal map for the region, if available

8.2.6. Waste

Describes overlaps between waste management and energy sector. Is municipal solid waste used for energy production? How is the energy from waste incineration plants used, e.g. electricity generation, district heating (cogeneration)?

8.2.7. Other natural resources

Provide information about any other natural/renewable resources usable for energy production.

8.2.8. Restriction through protected areas

Are there environmentally protected areas, which are not available for REN facilities or restrict the overall potential?



9. Energy efficiency – status and potential

What is the status of the implementation of the Energy Efficiency Directive?

What is the status of the implementation of the Energy Performance of Buildings Directive (e.g. data on low/zero energy buildings)?

Analyse the sectors:

Households: Are energy efficiency measures implemented in this sector? Are there awareness campaigns to highlight the potential? Is there support for the implementation (financial and non-financial)?

Service sector: Are energy efficiency measures implemented in this sector? Are there awareness campaigns to highlight the potential? Is there support for the implementation (financial and non-financial)?

Industry: Are energy efficiency measures implemented in this sector? Are there awareness campaigns to highlight the potential? Is there support for the implementation (financial and non-financial)?

Transportation: Are energy efficiency measures implemented in this sector? Are there awareness campaigns to highlight the potential? Is there support for the implementation (financial and non-financial)?

Give an estimate of the trend in energy efficiency development using values from -5- to +5 where (-5 is a strong reduction, 0 means neither growth nor reduction, +5 strong growth).





Demand side management, smart metering, storage



10. SWOT analysis

Please make a SWOT-analysis for the development of your region towards a low-carbon economy in 2050. Include stakeholders in the process.

| | Strengths | Weaknesses |
|---|---------------|-------------------------------------|
| • | Ххуу ууzz | Xxyyyyzz |
| | | |
| | Opportunities | Threats |

Assess the following trends:

- Policy Support for reaching energy and climate goals
- Public awareness building
- EE Potential Households
- EE Potential Private Sector & Industry
- EE Potential Transport
- Regional REN production
- Availability of relevant energy data

Self-assessment:

See Excel template or modify the graph provided here (right-click).

Points:





1 ... no measures set/ potential unused

to

5 ... fully developed/ potential fully used





11. Annex: List of sources /bibliography /List of relevant stakeholders/institutions in the region

Please include your sources/bibliography, a list of identified stakeholders, etc

Annex II Guide for preparing an energy vision

https://ceesen.org/?post_type=dlm_download&p=1691&preview=true


Visioning the energy transition in CEE countries

Practical Guide for preparing Local Energy Visions

Concept note by Marek Muiste v.20180405

Visioning the change

| Mapping the stakeholders & networking | Collecting data | Mapping the possibilities (scenario building) | Proposing the Vision | Consensus | Roadmap |
|--|--------------------|--|-------------------------|-----------|---------|
|--|--------------------|--|-------------------------|-----------|---------|

Creating a Vision is the first formals step towards energy transition. Vision helps to describe the desired outcome and spell out the desire to change. Visioning process, if done right, will help to build acceptance and support among the community for a change to happen. Vision will help to mobilize the people and investments to push the community to the right direction. Local Energy Vision will be the first milestone of Roadmapping process in PANEL 2050 project.

The visioning process requires time, effort (among the other resources like money) and must be well prepared and well coordinated. In framework of PANEL 2050 project, the Project Partners will take the role of the leader of local visioning teams. In other context the leader can be nominated or elected by local organizations. The leaders will recruit the Local Rodmaps Teams, involve the experts, collect the data, propose a Vision and work for creating a consensus. Everyday administration and communication with external entities (State Administration, other municipalities) will also be the role of the leader. To balance out different challenges is the role of the leader of the visioning team.

Visioning is a collective process

Creating a vision for the community is a collective effort and should not happen behind the close doors and in the silence of anemic office environment. It should be made in cooperation with the members of the community and should favor active participation of the local institutions. There should be a wider awareness among the members of the community about the vision building and the voices of local people must included. For maintaining the trust also follow-up session for every stakeholder group is required to reflect how much was implemented of their suggestions. The suggestions of the community members should be collected to a dedicated document and analyzed by the expert team.

Energy Transition in CEE countries

Eastern European countries have been in constant transition process for the last three decades. We have experienced a rapid development in most aspects of our lives. This process has been influenced by the global economic forces and our own expectations for what we understand as 'a good life'. Only recently have we learned that many elements of that desired future can have profound negative effect to our quality of life. Main challenge for CEE countries in 21st century is to learn to live this good life without jeopardizing the richness of our natural environment and the wellbeing of our communities.

Throughout the Soviet Era and the following transition period, the economic opportunities have been limited for the citizens of CEE countries. Today the 'right to consume' feels for many people in Eastern Europe (but also in Asia and other developing regions) as a fundamental basis of liberal democracy.

During the roadmapping process, this desire to endlessly increase the consumption must be balanced out with the realistic perception of the impact of this consumption. Consumerism in its modern form in this region is a new phenomenon and the collective conciseness still has strong memory of the 'survival skills' of the past, when people were happily preparing their own food, building their own houses and repairing broken items, instead of disposing them. These latent skills and the supporting mindset can be used for suggesting more sustainable ways of living in the future.

Another challenge is the conflict between the public and private interest. This problem is common for sustainable development everywhere (why should I be the one to reduce my consumption to save the world?), but in developing countries, the roles of the individuals are less fixed and more open for negotiations. The opportunistic nature of the prevalent economic climate favors the bold individualistic behavior and decreases the platform for common agreement. Readiness for compromises should be considered to be one of the main requirements for participating in roadmap team for all the stakeholders. These compromises should favor collective achievement over the individual ones but should not hinder the personal initiative of the forerunners.

Working with the stakeholders

In energy transition, working with the stakeholders is a continues process. In PANEL 2050 project, the stakeholders are already identified, and their role has been evaluated during the previous work. These people have been participating also in capacity building program and developing international contacts with like minded individuals. This process has been facilitated by the formed network of dedicated experts of the engagement that have established and maintained direct contact with the stakeholders. One-to-one work with the stakeholders is essential for integrating them into the process of roadmapping.

Not all the stakeholders are equally accessible. In fact, stakeholders can prefer not to spend their valuable time in the meetings and discussions of the roadmap. The challenge for the team leader is to identify the relevant stakeholders early on and commit themselves to involve these to the process, sometimes also tailoring the procedures to suit the needs of the stakeholders.

Supporting the niches of sustainability

Ideas of the sustainability are not always part of the mainstream discussion in CEE countries. Quite contrary, often these ideas are marginalized and overrun by the materialistic ideals of consumer society. Because of this, ideas of sustainability are sometimes developed out of the sight of the media and main interest of the community. One of the roles of the roadmapping team is to find the more hidden ideas of sustainability, evaluate their potential and include them into the process of energy transition. These less prominent ideas are called 'niches' and with the proper support it may be possible for these to realize their true potential up to the point where they can be the key factors of energy transition. The most promising innovators can be considered to be the forerunners of sustainable energy transition.

Forerunners of transition

Transition to low-carbon economy will take some time and effort. It is seen to be a gradual process that is geared by the progress on several fields like renewable energy technologies, smart grids/metering, circular economy. The forerunners of these fields are the ones who are helping the community to shift their economy and are in the focus of every energy transition project. Role of the roadmapping team is identify the local forerunners and include them into the roadmapping process. All the local actors are usually aware of the forerunners so they are relatively easy to identify but (because of limited time available) not always easy to involve to the roadmapping process. Forerunners tend to select carefully the processes they decide to support and set high expectations for the work

they are participating. They usually expect to share the same values with the people they are cooperating. Emphasizing the possible impact of their work and demonstrating shared values helps to find a common ground with the forerunners and integrate them into the roadmapping process.

Role of experts

Involving experts and professionals of energy/transport field is vital because of the extended knowledge and understanding they represent. Experts can help to identify the important stakeholders, access/analyze data, show the specter and magnitude of potential technologies, evaluate the scenarios, build the consensus and support the implementation of the Vision. At the same time the experts can not be the sole initiators of the Vision. Setting up the Vision for Energy Transition is a political process, not technical task. Preparing a Vision is a collective process that requires wider acceptance in the community.

Sometimes the local administrations feel the urge to delegate the preparation of the energy plan entirely to one team of experts. This cannot be suggested. There are specific challenges on working on experts and professionals. The members of the 'industry' can sometimes favor the future that is supporting the role of their company/university over the long-term interest of the community. Working professionals (especially in smaller communities) can sometimes favor the existing hierarchies and by this can prefer to maintain *status quo*, instead of transition. Experts who have profound understand about their discipline can sometimes underestimate the importance of the field of science distant to theirs. These biases should be foreseen and reduced by the team leader by balancing the expert team with the experts with diverse interest, expertise and field of working.

One of the challenges for team leader will be the nurturing of the cooperation of experts of different fields. It is highly suggested to include not only experts of energy and transportation but also the experts of social and political sciences, communication, environmental experts, arts, humanities etc. Local expert groups will be developed according to the local needs and resources, but it would be highly beneficial to aim for diversity and openness when inviting the experts. It is also suggested to put extra effort into creating an environment of mutual acceptance and understanding between the representatives of different fields and disciplines.

Experts, like forerunners, can be sensitive when it comes to time and effort they are expected to invest into the roadmapping process. For maintaining their interest, a direct and proper feedback is required with well developed arguments for including or rejecting their input.

Learning during the roadmapping

Roadmapping gives a possibility for mutual learning for the whole roadmapping team. This learning originates from the need of exchanging the ideas, introducing the new concepts, collecting/analyzing the data, building scenarios, introducing technologies etc. At the end of the roadmapping, the knowledge pool inside the community will be increased and more equally shared. The benefits of this learning can be even higher if the provided information will be collected, categorized and shared with the community. Online tools like *Wikimedia* can be used for granting better access to well categorized information. Learning should be supported by the Team Leader by sharing the information and allocating time and space for learning to take place. In the contexts of PANEL 2050 project, the learning will be part of the wider capacity building program, available for local stakeholders.

Energy Vision Ideal Types

Methodology energy visions is based on the work of prof. Christoph W. Frei (World Economic Forum, World Energy Council) described in policy paper "What if...? Utility vision 2020" (Energy Policy 2008). The overall purpose of the paper was to describe investment models that would correlate the

innovation driven energy sector. One of the ideas offered in the paper was the concept of the Energy Vision Ideal Types – four main categories that will form the framework for future energy developments. Author tries also to evaluate and map the involvement of different interest groups in the community. Following figure (from the paper) describes the development framework on the dimensions of most energy intense sectors (transport and electricity), ideal types, involvement of social groups and possible conflicts in that process.

Economy based on hydrogen & electricity

| Centralized | Nuclear Society (including Hydrogen) | Energy 2.0 Society (including 'personal technology', hydrogen / renewables) | Localized |
|-------------|--|---|-------------|
| electricity | Clean Coal Society (including conventional fossil fuel with Carbon Capture technologies, also nuclear) | Bio Society (with efficiently used renewables) | electricity |

Economy based on liquid fuels

| Туре | Nuclear/Hydrogen | Energy 2.0 | Віо | Clean Coal |
|--------------|------------------|------------|---------|------------|
| NGOs | Object | Support | Support | Neutral |
| Cities | Object | Support | Neutral | Support |
| Big Business | Support | Object | Neutral | Support |
| Countries | Support | Neutral | Object | Support |
| etc | | | | |

Figure 1. Energy Vision Ideal Types based on the work of C. W. Frei .

Methodology is based on the notion that we would align our investments accordingly if we would have the clear understanding about what will energy and transport sector look like after 50 years. Unfortunately, nobody has that knowledge today. We can only make predictions, and the most useful way is to define our energy future in the overlap of electricity and mobility technologies dividing these based on the energy production on the scale from centralized to localized (for electricity) and from liquid to hydrogen (for mobility). From this framework four complementary and contrasting Energy Vision Ideal Types will emerge that will have different impacts and implications to the local community. All these have their specific challenges and supporters and none of them comes for free. Community can draw out the main parameters of its energy vision with the help of this tool.

This method is the fastest and most effective way for the community to envision their energy and transport sector in the future. Energy Vision doesn't have to strictly follow one of the Ideal Types (most cases it won't) but it must be agreed by all the stakeholders who will support the development in the future. Financial support or behavioral change – without the active support of the local stakeholders and forerunners, the vision won't be anything more than piece of paper. It is useful to also identify the stakeholders that do require more effort to involve into the roadmapping process. The challenge of the Team Leader will be to convince to opposing stakeholders to open up the discussion for possible compromise.

Designing the Vision

PANEL partners working with their regional roadmap teams will work towards developing long term energy visions based upon the methodology described in this document. Key to the visioning process is obtaining feedback and input from as wide a range of primary, secondary and tertiary stakeholders as possible. Thus, a range of different methods will be used to solicit input:

- Regional Roadmap Meetings, made up of stakeholders who have been identified as forerunners and provided the full range of training will be convened to discuss the relevant themes from task 3.4 such as Government and the role of state, the presence and possibility of skills shortages, the levels of consumer/citizen acceptance, etc.
- Focus groups will be held with specific stakeholder groups to discuss issues relevant to them. For example, a focus group of citizens would discuss the topic from the point of view of nonaffiliated consumers.
- Expert Interviews for certain stakeholders, such as government officials, individual interviews would probably be more appropriate than focus groups. These will be used especially for reaching stakeholders who have not participated in other project activities (i.e. training from WP2 or participation in the knowledge network described in WP 5) especially stakeholders from outside of the region who still can have an impact, such as representatives of state ministries.

After obtaining input from these consultations, short vision documents will be prepared by each partner in their native language. This vision document can be used as an additional tool for conducting advocacy. The country vision reports will be translated to EN and compiled into a broad vision statement for the CEE region.

Studio Model

Team leader will be responsible for setting up the workflow of roadmapping team. For achieving outstanding results, formal office meetings should be avoided as main working method. There are number of innovative approaches used in contemporary strategy design (notably the living labs concept) but one of the most suitable one for creating a vision for the region is the idea of Studio Design Model (or simply Studio Model) as developed by Finnish national development agency Sitra. Studio Model is a way to organize the strategic development as a series of well-focused and carefully prepared collective brainstorming sessions (called 'studios') with a clear goal, selected participants and suggested duration of one full week (or longer). The 'studios' should be organized in a spacious environment that relates to the problem in hand and should provide adequate infrastructure to work, interact and rest. The concept of Studio Model can be implemented depending on the resources and possibilities of the organizing team, but the focus has to be on its core relationships – people, process, problem and place. According to Sitra, a successful application of the Studio Model requires the right people, a flexible process, a carefully defined problem and a place that is conductive to collaboration - all applied with an open-minded sprit. Detailed guidelines for the Studio Model are made publicity available under Creative Commons license. Essential guideline for Studio Model is available in PANEL library and the comprehensive guide Boyer, B. et al Recipes for Systematic Change is available through Sitra as a free download or print-on-demand.

Maintaining the vision

After the successful preparation of the Vision the next step will be preparing a full roadmap for the community. Preparing a vision and roadmap are part of the same process but have a different focus. By its nature, a Vision is a social agreement proposed by the forerunners and accepted by community. Roadmap will be a guideline for achieving the Vision, consisting a series of technical steps towards the

desired outcome. Compared with the Vision, roadmap is more of an expert document exploring the possibilities and realities of energy transition. Roadmaps will be complimented with even more focused Regional Action Plans.

The challenge is to find the organizations that would commit themselves to vision, especially after the funding for coordination will end. In the ideal world the vision should be supported by its imitators until it will be fully realized. This is not always the case. There are several reasons for forerunners to lose their interest for following the Vision. In the constant stream of new information and ideas, Vision may lose its relevancy, especially if it is not promoted and updated. New projects may bring new activities and may emphasize different areas of sustainability. Lack of motivation can be a key factor, especially for the small organizations with only limited funding.

Sustainability of the Vision is important task for the Team Leader from early on. It is crucial to set up a Roadmapping team so that it will consist also organizations who won't have to face the challenges of financial sustainability and individuals who will personally care for carrying the vision (not all the people are motivated solely by money). Good balance between the formal support (by local administration etc) and non-formal (citizens, forerunners etc) can help to support the Vision in the future as non-formal alliances tend to be more independent on their decisions.

Team Leader can support the sustainability of the Vision by initiating new projects that will carry the Vision and the Roadmap further. These projects can utilize the local and national funding sources but also can apply for regional (INTERREG) and EU funding (H2020), growing out of the international cooperation in CEE Sustainable Energy Network CEESEN. These contacts can be facilitated by Regional Partners of PANEL 2050 project or alternatively can by made directly on the virtual platform ceesen.org.

ANNEX 1. Example of preparing Energy Vision for Region N

About 75 % of the electricity is produced by coal in the Region N. Last years have shown the severe increase of the electricity prices that is correlating with new EU regulations on additional taxation of large scale boilers. Previous studies have shown that the region has a potential for producing energy from wood residues, but this resource won't be enough to cover the existing energy demand. Another study has identified the potential for more efficient usage of energy. Local development team has involved the Forerunners:

- Municipal Waste Water Plant,
- University of Applied Sciences,
- Photovoltaics service provider,
- ESCO for renovations of apartment buildings,
- National Green Movement,
- National Association for Energy Efficient Buildings,
- National Renovation Council,
- National Forest Association,
- Coal Chemistry Company.

Based on the National Energy Profile, the Forerunners have defined the vision for energy transition of the whole region for 2050 as a mix of Energy 2.0 and Bio Society Ideal Types, focusing on increasing the efficiency of energy consumption and increasing the usage of bioenergy (using municipal waste and wood waste). The Forerunners and experts involved have identified these areas having the biggest positive impact to whole region: less pollution, new and smarter jobs, better prospects for young people and best usage of local resources. The future of the coal mining will be related with usage of coal as a resource of chemical industry (Smart Coal). Need for dedicated social program for the mining industry has been indicated in the vision. Based on the vision a reach for new Forerunners was carried out to cover the areas of bioenergy production and energy supply.

Economy based on hydrogen & electricity

| Centralized | Nuclear Society (including Hydrogen) | Energy 2.0 Society (including 'personal technology', hydrogen / renewables) | Localized |
|-------------|--|---|-------------|
| electricity | Clean Coal Society (including conventional fossil fuel with Carbon Capture technologies, also nuclear) | Bio Society (with efficiently used renewables) | electricity |

Economy based on liquid fuels

Figure A1. Energy Vision Ideal Types and Vision of example Region N.

| Туре | Nuclear/Hydrogen | Energy 2.0 | Bio | Clean Coal |
|-------------------|------------------|------------|---------|------------|
| Municipal Waste | Neutral | Support | Support | Neutral |
| Water Plant | | | | |
| University of | Neutral | Support | Support | Neutral |
| Applied Sciences | | | | |
| Photovoltaics | Object | Support | Support | Object |
| service provider | | | | |
| ESCO for | Neutral | Support | Support | Neutral |
| renovations of | | | | |
| apartment | | | | |
| buildings | | | | |
| National Green | Object | Support | Support | Neutral |
| Movement | | | | |
| National | Neutral | Support | Support | Neutral |
| Association for | | | | |
| Energy Efficient | | | | |
| Buildings | | | | |
| National | Object | Support | Support | Neutral |
| Renovation | | | | |
| | | a | | |
| National Forest | Object | Support | Support | Object |
| Association, | | Nia tasi | C | C |
| Coal Chemistry | Object | Neutral | Support | Support |
| Company | | NI. L.J | | C |
| Coal Power | Object | Neutral | Object | Support |
| Service Provider | Neutral | | Neutral | Course ant |
| Cheap Electricity | Neutral | Object | Neutral | Support |
| Party | Neutral | Neutral | Ohiost | Comment |
| Transport | Neutral | Neutral | Object | Support |
| Association | | | | |

Table A1. Support of the stakeholders for Energy Vision Ideal Types in example Region N.

During the preparation of the Vision, a local Roadmapping Team was set up by the Regional Partner acting as a Team Leader. All the partners were previously contacted and many of them were also participating in the training Program. For more efficient data management and opening up the roadmapping process a dedicated online platform was created, acting also as a platform for wider engagement of the community. Online platform is used for collecting and publishing all the previously collected data and studies about the energy, transport and environment of the Region N. During the Visioning process, the platform is acting as a forum and discussion board between the experts, interest groups and citizens.

During the Visioning process, several expert groups are created with a regular meeting schedule. The work of the expert groups is finished with a week-long workshop to formulize the sectoral visions and finally with one collective workshop to compile the final Vision. Sectoral visions are tested out during the public workshops, acting as the Living Lab for energy transition scenarios. The feedback of the Living Labs is used as an input for the final collective workshop. All the outcomes and feedback are documented and made public using the online platform.

Workshops and forums are supported by the series of open lectures for the public by the Forerunners focusing on various aspects of the energy transition. Lectures are recorded and published on the platform. Final Vision is published on the platform and printed out as a travelling exhibition for disseminating the ideas in several locations of Region N and also in neighboring regions. Visioning process is opened and finalized with the big public event for discussing innovative ideas, networking and having a great time.

Brief overview of sectoral visions

Energy

Coal based electricity will be replaced by high-efficient diverse production model with emphasis on renewable energy sources like sun, wind, urban waste, bio-waste etc. Consumption is driven by the Smart Grid with local consumers selling back their abundance of local electricity production. Occasional overproduction of electricity will be geared towards hydrogen production to be used during the peak consumption. Electricity consumption will be also balanced by large scale wood pellet production that is providing the fuel for the central and local heating systems. Energy balance of the whole region N will be positive.

Transport

Transport system will be fueled by electricity and hydrogen. The efficiency of transport system will be improved by introducing more flexible mass transit (including on-demand models for the 'last mile') solutions and reduction of the private car usage. Active transport modes (cycling, walking) will be encouraged by urban design, the design of regional transport roads and mass transit hubs. Multimodality will be supported by unified ticketing/registration system and the emphasis of the convenience and the speed of the journey.

Cities

Solar City, Walkable City and Livable City will be used as layout for the urban design. Taking advantage of solar radiation will be a priority for designing and planning the urban space with integrated passive heating and cooling solutions. Urban design will also encourage the active lifestyle of the citizens. Private cars will see increasing restrictions in cities with only exception of emergency services and mobility services for elderly/disabled. Accessibility and equality of urban services will be increased for all the society to support the active community. Cities will improve their resilience by producing most of the energy, water and big share of food used in urban environment.

Buildings

Energy performance of the buildings will be improved and all the buildings in the region will be renovated to be Near Zero Energy Buildings. Building skills of the community will be improved by the continues training programs with the emphasis on the prevailing Build-It-Yourself culture. Buildings will favor locally produced materials, mainly timber. Energy and water consumption of the buildings will be monitored and provided for the (potential) home owners.

Industry

Consumption will be based on transparency and informed decisions. Consumers will be provided a clear information about the origin, impact and trade of the food products they are purchasing. Local production will be clearly identified, and its resource usage and the impact will be regularly evaluated. Focus of the production will be on highly advanced production models in a lesion with the research and development institutions. All the producers will be directly responsible for reuse, recycling, repairing or dismantling of their products.

Agriculture and Food Industry

The emphasize of the sector will be on improving the quality of the products, reducing the energy/water cost and minimizing the waste. Food Industry will publish the whole product chain of their products as well as the usage of chemical components used in the production. The resource usage and the impact of the agricultural sector will be regularly evaluated. All the main food groups will be produced locally in the region or in the neighboring regions with the minimal waste in the production chain. Resellers will take full responsibility for food waste in the distribution network.

Community

Social life will be organized around large amount of micro-communities that are strongly linked to the local resources and local economic and cultural activities. The citizens are highly mobile, well connected, well-educated and aware of the local problems/challenges. Equal access to information, education, wellbeing and security are considered to be a human right and granted for everybody. Diverse cultural activities will carry the mindset of open society and help to exchange the ideas between different communities and cultures.

Environment

Consumption, resource usage and the impact will be personalized with the help real-time monitoring. The responsibility of the consumption will be shared between the users and the producers in the way that both parties will be motivated to reduce its negative impacts. Environmental situation of the region will be closely monitored and improved. Environmental science will focus on the main challenges of the region: mitigating the existing damage from the coal production and preventing the potential damage of increasing forest usage. Close cooperation with the scientist, industry, regional administration and environmental NGOs will help to improve the richness of environmental heritage in the region N.

Economy

Smart Economy will create new opportunities for the region focusing on high-tech chemical industry, cleantech material production, environmental sciences, food and energy production from renewable sources. New, knowledge-based economies will give more equal opportunities for the new generation of entrepreneurs, especially women. Local economy will be considered to be essential element of the vital community and clearly identified as such. All the consumer items will have clear identification about their origin, impact and trade.

Annex III Guide to holding a vision workshop & template for vision document

https://ceesen.org/?post_type=dlm_download&p=1697&preview=true



How to develop an Energy Vision for the CEESEN Roadmap



CENTRAL EASTERN EUROPEAN SUSTAINABLE ENERGY NETWORK

Tips and tricks for Vision development

Involve a large group of stakeholders in the vision development. Make sure that you have representatives from different professions and groups. The objective of the vision process with your stakeholders is to

- Build consensus about the direction you want your region to develop
- Evaluate and verify assumptions (such as technology costs or performance metrics)
- Identify barriers which need to be addressed
- Define alternatives pathways to overcome barriers
- Define priorities for actions
- Get implementing partners (public authorities, NGOs, business, ...) on board (also for further development of Actions Plans)
- Get input about alternative development paths to reach your goals

Conduct at visioning workshop with key stakeholders in order to get a broadly endorsed vision

To make the visioning process easier for your stakeholders, plan the process beforehand. Keep the following points in mind

- Define a core "visioning team" and make sure that everybody is on the same page regarding energy status quo of the region (Provide them with your REPs to get an overview)
- Define a business-as-usual (BAU) scenario and explain it to your stakeholders
- Use the BAU scenario as starting point for defining your vision
- If possible, prepare beforehand different energy scenarios and projections for your region
- Test the scenarios with key stakeholder groups
- Make sure that the vision and defined targets present an additional added-value compared to the BAU scenario

Visioning workshop

Working material:

- Cards and pens for the participants to write down their vision statements
- Posters present all statements and to do the clustering
- Stickers, Post-its for prioritisation exercise

Workforce:

2 people (one moderator, one not-taker responsible for collecting, clustering, writing out the participant's contribution)

For large groups you should think about additional moderator to structure the work in sub-groups.



Exercise:

Start with presenting the energy-related status quo for your region and explain our approach to facilitate an energy transition. Explain the business-as-usual (BAU) scenario where there are gaps towards national/regional targets and the pathway towards a low-carbon economy. If possible, prepare beforehand different energy scenarios and projections for your region.

In the interactive part, ask participants to give a definition of how the regional lowcarbon economy should like. Alternatively, you can also ask about the different energy scenarios presented before to get more specific answers.

Participants should describe the future scenario with statements in the present tense. Examples: In a low-carbon economy 100% of our energy comes from renewable sources. In a low-carbon economy air-quality in the city is optimal as we are only using electric cars.

You can do this in smaller groups (up to 5) in a brainstorming exercise to come up with different statements.

Come back in the large group to collect all statements and try to cluster them. You can do this either with a poster or using a visualization tool on your computer and projecting it on a wall for everybody to see.

Find consensus for certain areas but also identify areas of disagreement and mark them accordingly. Ask the participants to prioritise certain areas or single statements. Concentrate on the areas were you already established a consensus. Priorisation can be done by providing everybody with 3 stickers/post-its or 3 votes and ask them to indicate the top 3 areas. Give the participants enough time to go through all the statements once again, move to the board and have short discussion among each other.

Create a new list with statements which have strong support.

Your vision can be a single statement or a group of elements. If you have time you can work together on the concrete formulation of the vision. For larger groups it might be a good idea to summarize and formulate the vision after the workshop. Present the participants with the finalised statement and ask if they have comments or something to add.

You can use the following template to structure your vision.



ENERGY VISION

Region: XXX English version

prepared by XXXX

PANEL 2050 – Partnership for New Energy Leadership 2050 Deliverable 3.3

Date: XXXX



CENTRAL EASTERN EUROPEAN SUSTAINABLE ENERGY NETWORK

Vision Statement

Summaries your vision in a concrete statement giving a target and timeframe.

Vision Description

- Describe the status quo from which you come from. Use your REP to provide the required energy data.
- Describe a business as usual scenario and show the alternative pathway needed to realise the vision.
- Be very specific: give concrete targets and the timeframe.
- Lay out scenario to reach the vision target. Describe the difference to a businessas-usual scenario. Rely on the REP for current energy data.
- Emphasise the contribution towards the goal of a regional low-carbon economy by 2050.

Addressed barriers

Describe the policy, institutional, technological, financial barriers, which are addressed through this vision

Contribution to national and regional targets

Describe relation to national and regional energy and development targets

Contribution to climate change mitigation

Describe relation to climate targets and contribution to climate change mitigation

Required data for scenario development

Are there any knowledge gaps which need to be filled?

What kind of data is required to realistically plot the development scenario.

Involvement of stakeholders

Which stakeholder/ organizstions were involved during the process



Describe involvement process



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Annex IV Guide for preparing the energy roadmap

https://drive.google.com/file/d/1W85RydE9HivH55bPHT33ZKdiJqDU2el-/view?usp=sharing



ROADMAP towards a sustainable low-carbon economy

Region: XXX English version

prepared by XXXX

PANEL 2050 – Partnership for New Energy Leadership 2050 Deliverable 3.5

Date: XXXX



CENTRAL EASTERN EUROPEAN SUSTAINABLE ENERGY NETWORK

Roadmap scheme

We will paste Roadmap infographic from ppt here.



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< Instructions or tips can be deleted and substituted by your text>

1 Introduction

State the vision of the roadmap and give a short summary of the roadmap development as described in the following chapters.

2 Priority areas

Depending on the vision statement priority areas should be defined. These areas constitute the umbrella for several related Action Plans.

2-3 areas would be optimal. Priority areas could e.g. be

Energy efficiency priority areas

- Households
- Industry
- Public buildings
- Public lighting
- Transport sector
- Financing and business models

Renewable energy priority areas

- Bioenergy
- Wind
- Solar
- Geothermal
- R&D
- Financing and business models

Describe how these priority areas were identified and why actions in these sector are important to reach the vision. Substantiate the choice e.g. by giving savings potentials per priority area/sector.

3 Actions and development scenarios

On top of your roadmap stands your vision for the region. The roadmap gives the general direction and concrete steps how to move towards to this vision. The development scenario or several different scenarios described in the roadmap gives the pathway from the status quo (baseline analysis) to the regional vision.



The analysis of several scenarios constitutes the basis for energy-related decisions to be taken and according actions planned. Using scenarios, the influence of long-term decisions can be validated against their contribution to the agreed regional vision.

Action Plans as integral part of the roadmap, contribute step-by-step to reaching the vision and making the development path concrete and realizable.

3.1 Status of R&D, innovations and technology

Current status of R&D, innovations and technological prerequisites within the sector including overview of the related actors.

3.2 Business-as-usual scenario

Start by plotting a business-as-usual (BAU) scenario. Your starting point should be your REP. Based on the data given there plot the development of the region with no additional actions taken.

E.g. you can use the EU Reference Scenario 2016 as inspiration to define the business-asusual scenario.<u>https://ec.europa.eu/energy/en/data-analysis/energy-modelling</u>

Describe your BAU scenario here.

3.3 Development scenarios

Business as usual will not be enough to reach the regional vision in the planned timeframe. Several "corrective actions" have to be implemented in order to reach the agreed vision. Each action represents a step towards reaching the goal of the regions.

Give a <u>short</u> portrait of each planned action [details about the implementation strategy are not needed here and will be covered in the next phase about Action Plans]

[State Priority Area 1]

Action title 1: [choose not only a descriptive title but something people can identify with, e.g. 1,000 solar roofs initiative, Green the future, etc.]

Objective: [give quantifiable numbers and also break them down into sub-sector or per year, e.g. 2 % improved efficiency in the household sector every year until 2040]

Timeline: [even if your vision goes until 2050 not each action might have such a long horizon. Clearly define the timeline]

Action title 2: [choose not only a descriptive title but something people can identify with





Each of the described actions and their quantifiable objectives should have an influence on the BAU scenario. Plot the difference between the BAU scenario and different other development paths depending on how successful the actions are implemented.

Be as concrete as possible in planning intermediary steps towards your vision. For longer intervals, it is recommended to plan review cycles e.g. every 5 years, to check and review the roadmap and update planned priorities and actions according to technical progress, changes of the legal framework and overall policy goals.



Presentation of your scenarios could look like this:





3.4 Milestones

Plan for specific Milestones along the way, where you can evaluate the progress against the set targets and adapt the concept in regular time intervals.

4 Impacts on regional economy

Describe how each of the scenarios might impact the overall economy of the region including employment and specialized jobs, vulnerability to fuel price changes, security of supply, development of competitive knowledge, etc.

How will the scenarios contribute to regional economic development strategies and targets or smart specialisation strategies?

Is there a risk of a conflict of goals with other policy strategies?

5 Involvement of stakeholders

Plan and implement comprehensive stakeholder engagement. Exemplary methods for stakeholder engagement

Co-ordination meetings of the working group

• Should take place on a regular basis



- To assess process of roadmapping
- Opportunity to invite external experts for specific thematic inputs

Disadvantage:

• Internal organisational meeting involves the risk of getting routine

Regular meeting of energy groups – regulars' table

- Takes place regularly
- Meeting with informal character
- Can features different focus areas for discussion
- Opportunity to exchange experience in a specific group of experts of the field

Disadvantage:

• Heterogeneous group with changing members

Thematic workshops

- Provides specific feedback to your questions
- Generates input from a wide range of stakeholders on expert level
- Possibility to have different thematic focuses

Disadvantage:

• Participants and speakers have to be well chosen to get representative results

Field trip and study visits

- Practical, tangible way to convey a message
- Gives best practice examples the opportunity to present
- Participants get insider knowledge and can engage in discussion with implementers

Disadvantage:

• More time and resource consuming than other event types

Awards and competitions

- E.g. energy conversation competition, awards for outstanding energy projects, "boiler exchange" program, "Ice-block challenge"
- Can be targeted at different user groups, e.g. individuals, households, businesses, schools, ...
- Award events raise public awareness
- Award participants act role models and multiplicators
- Low-threshold methods to collect ideas and visions for regional energy future



Disadvantages:

- Resources for setup, marketing and prices have to be allocated
- Possibility of failure due to low public interest

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Citizen action groups / DIY groups

- Mostly self organized movement of citizen to apply renewable energy system on local level
- (e.g. solar thermal, PV)
- Development of common ownership model in the REN sector
- Long-term commitment to a renewable energy future

Disadvantage:

• Depends on the commitment of individuals

6 Endorsement by implementers and political decisionmakers.

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

Describe the endorsement you ensured to this point and how it will contribute to the implementation of the Roadmap and Action Plans.

Describe necessary future steps to ensure the endorsement of the energy roadmap.

7 Financing



Describe possible and already secured sources of funding. Explain actions needed to secure funding.



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Annex V Guide and template for Action Plan

https://drive.google.com/file/d/1mMHCZMy9yFQDxvw9A51_8xzl2aW4wKhv/view?us p=sharing



ACTION PLANS

for the Region of XXX

English version

prepared by XXXX

PANEL 2050 – Partnership for New Energy Leadership 2050 Deliverable 3.7

Date: XXXX



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Roadmap scheme

We will paste Roadmap infographic from ppt here.



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Title of Priority Area

Action Plan: title

Choose not only a descriptive title but something people can identify with, e.g. 1,000 solar roofs initiative, Green the future, etc.

1 Objective

Give quantifiable numbers and also break them down into sub-sectors or per year, e.g. 2% improved efficiency in the household sector every year until 2040]

1.1 Objective scope and targets values

State the objective of the Action Plan in detail. Break the objective down into subobjectives, e.g. covering different areas of action like technical improvements, capacity buildings, consumer information, etc.

The targets of the Action Plan should be

- Specific
- Measureable
- Action-Oriented
- Realistic
- Time-sensitive

1.2 Target indicators

Describe which indicators will be used to measure the status of the objective and how measurement will take place.

| Objective | Target indicator | Method of measurement and validation |
|-----------|--|--|
| | e.g. MWh persons informed documents developed EUR investments into XX sector Network built Events held | e.g. annual energy bills flyers sent out participant lists of events technical approval for new projects etc. |



| • etc | |
|-------|--|
| | |

2 Implementation strategy

2.1 Typical actions including R&D and innovations

Develop a list of potential future R&D and innovative actions based on challenges from the Roadmap.

2.2 Step by step description

Structure the Action into steps/tasks building on each other.

Each step/task should have a

- Clear objective, if possible with quantified success criteria
- Timeline supporting the logical sequence of tasks
- Assigned roles and responsibilities

For larger Actions it might also make sense to structure several tasks in work packages, which can go in parallel.

2.3 Time schedule

Include a time schedule for the steps given above.

E.g. using a timeline like this





2.4 Budget and resources needed

Estimate the budget and other resources (human, equipment, locations) needed for the implementation of the set-out steps/tasks.

3 Collaboration with stakeholders

Describe which stakeholders were already involved in the preparation of the Actions Plans and how. Add a description of the implementation team as of now. Consider actors who need to be involved in the future.

Roles and responsibilities of different actors for Action Plan implementation

State who will be involved in the implementation of the Action Plan as well as related stakeholders and target groups.

| Stakeholder group | 05 | Role and responsibility | Involvement and communication strategy |
|------------------------------|----|-------------------------|--|
| Implementing parties | | | |
| Political decision-makers | | | |
| Target groups | | | |



| etc | | |
|-----|--|--|
| | | |
| | | |

4 Monitoring Strategy

Describe when and how target indicators will be checked against the implementation plan. Name responsible parties to continuously monitor and evaluate the progress in certain time intervals.

Monitoring should take place on a continuous basis and the monitoring strategy an integrative part of the implementation plan.

The evaluation of monitoring parameters, AP objectives, and target indicators should take place every 3 to 5 years. The evaluation should in a first step compare the progress made to the given target indicators for the timeframe. Based on these results the objectives themselves should be re-evaluated in order to be aligned with possible changes of the implementation environment, e.g. technical progress, institutional and policy changes. If necessary, the results of the evaluation have to be used to plan corrective measures to be integrated into the original implementation plan.

5 Risk management

Describe possible risks and according mitigation measures. If needed, you can use the following table.

| Risk | Probability of realising | Mitigation measure |
|--|-----------------------------|--|
| Describe the risk and how it might affect the reaching of the objective | High/ medium/ low | Describe mitigation measures with clear responsibilities |
| | | |
| | | |



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