MAP Discussion Paper

LONG-TERM VISION FOR RURAL AREAS: CONTRIBUTION FROM 20 SCIENCE-SOCIETY-POLICY PLATFORMS

MAP DISCUSSION PAPER

VENUS

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1. Introduction

1.1. MAP and MAP members

The topic included in the Multi-Actor Platform (MAP) is a combination of a territorial and thematic approach. Territorial approach represents the territory of the Local action group (LAG) Opavsko and the thematic approach addresses the topic of smart energy. VENUS members also assume further use of MAP knowledge by 2040 in other LAGs in Czechia. The MAP in Czechia was created in autumn 2019 and it is based on an existing LAG platform. The MAP activities were focused on the topic of SMART energy in rural areas. The MAP includes stakeholders from three main relevant actor groups. The groups are:

- Society (representatives of this group are local entrepreneurs and residents of family homes)
- Policy (representatives of this group are from different levels)
- Science (representatives are energy researchers or technologists)

A list of MAP VENUS participants is given in Table 1.

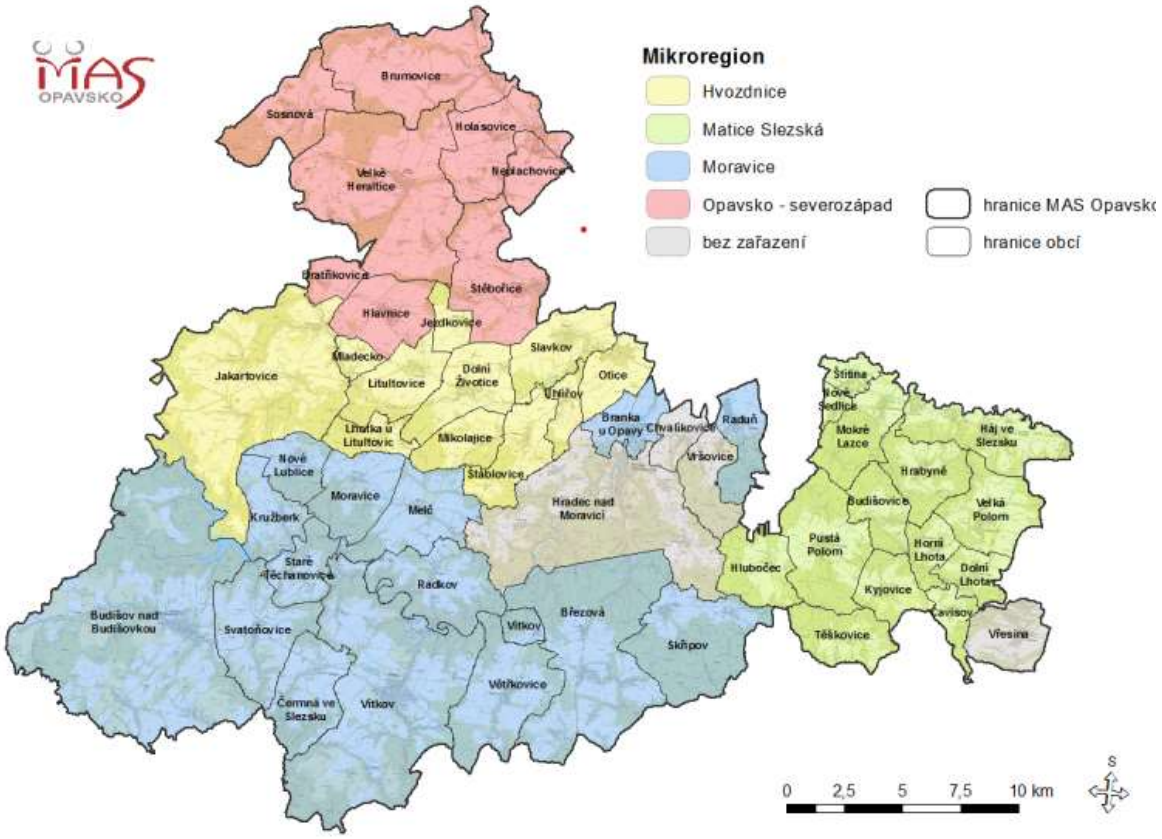
Table 1: Members of MAP VENUS

Science representatives			
Organisation	*Name*	*Gender*	*Geography, LAU1*
Czech Hydrometeorological Institute	Jaroslav Rožnovský	M	Brno
Czech Technical University in Prague	Jakub Maščuch	M	Praha
Technical University of Ostrava	Bohumil Horák	M	Ostrava
Institute of Agricultural Economics and Information	Group of experts	F (mostly)	Opava
Beneko-term	Leopold Benda	M	Opava
ČEZ - *innovation department*	Group of experts	M (mostly)	Praha
PROSENNA o.p.s	Miroslav Šafařík	M	Praha
PROSENNA o.p.s.	Vítězslav Malý	M	Praha
Policy representatives			
Organisation (level)	*Name*	*Gender*	*Geography, LAU 1*
Ministry of Industry and Trade (national)	Vladimír Sochor	M	Praha
Ministry for Regional Development (national)	Marie Zezulková	F	Praha
Ministry of the Environment (national)	Ivo Brauer	M	Praha
National network of LAGs (national)	Jiří Krist	M	Praha
LAG Opavsko (regional)	Petr Chroust	M	Opava
LAG Opavsko (regional)	Libor Čeněk	M	Opava
LAG Opavsko (regional)	Ranáta Veselská	F	Opava
Moravian-Silesian Region	one person from department of Environment	F	Ostrava
Society representatives			
Organisation	*Name*	*Gender*	*Geography, LAU1*
Association of Energy Managers of municipalities	Jaroslav Klusák	M	Litoměřice
Chamber of RES	Martin Mikeska	M	Praha
Regional Agrarian Chamber	Robert Kučera	M	Opava
Moravian-Silesian Innovation Centre	Irena Hluchníková	F	Ostrava
National network of healthy towns and villages	One person		Praha
Representatives of municipalities	Mayors (mostly), Approx 10 members	-	Opava

1.2. The geographical coverage of the MAP

The MAP VENUS was established in LAG Opavsko.

Picture 1: Map of the inclusion of the administrative territory of municipalities and micro-regions in the scope of the LAG Opavsko for the period 2014–2020



The LAG Opavsko operates in the territory of 52 municipalities lying in Moravian-Silesian Region. The LAG Opavsko is located south of the border with Poland. There are 60 000 inhabitants living on an area of 760 km^2. MAP VENUS (LAG Opavsko) operates in different type of areas (from suburban, industrial to the rural or nature areas). The territory of the LAG covers and area of two districts - Opava and Ostrava-město (where 90% of the territory is the part of the Opava district). Industry areas are mostly around cities (Opava, Ostrava) and nature, agricultural areas are on the border of the territory and in the military area (Libavá). The altitude is from 220 m to 600 m above the sea level. In the case of percentage expression, the territory of LAG Opavsko is mostly covered by municipalities with less than 1 000 inhabitants (56%), 32% of municipalities fall into the category of 1 000–2 000 inhabitants and the remaining 11% are municipalities with more than 2 000 inhabitants.

The territory (MAP area) is LAG it is only small part of Moravian-Silesian Region (you can see in the Table 2.)

Table 2: Population and territory size in LAG Opavsko, Moravian-Silesian Region and Czechia (k 31. 12. 2014).

	Inhabitants	Area (km^2)	Inhabitants/km^2
LAG Opavsko	58 967	749,35	78,69
Moravian-Silesian Region	1 217 676	5 427,15	224,37
Czechia	10 538 275	78 867,79	133,62

Source: SCLLD LAG Opavsko, 2014

The MAP members' face-to-face meetings were generally in small groups thanks to COVID-19.

***Keywords**: smart energy, local action group, innovation, standardization of energy projects, renewable energy sources*

2. Results from the desk research

2.1. Review of key trends

Many trends affect the future of rural development and small towns demographic change, structural changes in the economy, transport and mobility, climate change, resilience and more. In the case of smart energy, the main trend for reducing fossil fuel consumption is coal fuel abandonment and increasing the use of renewable energy sources (RES). The second notable trend is the energy saving path.

Other tendencies were described in studies or programming documents (such as RDP CZ 2007-2013[1]and 2014-2020[2]). Challenges and opportunities are also available in policy reports and research papers (for example: Eurostat, 2017 and 2019; OECD, 2018 and 2019).

Rural areas show considerable change in the past decades due to several key factors, including socio-economic changes, access to natural resources, technological development and policy initiatives from both the national and the EU level. The European Green Deal expects to transform the EU into a fair and prosperous society, with a modern, resource-efficient and competitive economy with no net emissions of greenhouse gases in 2050. To decarbonise Europe, clean renewable power production must become the main source of energy, while keeping the stability and resilience of the EU Power System.

The key trends to change access to smart energy use are linked to the people who will make the change and the space that will make the change possible. The expected change will be made by younger and more educated people using RES.

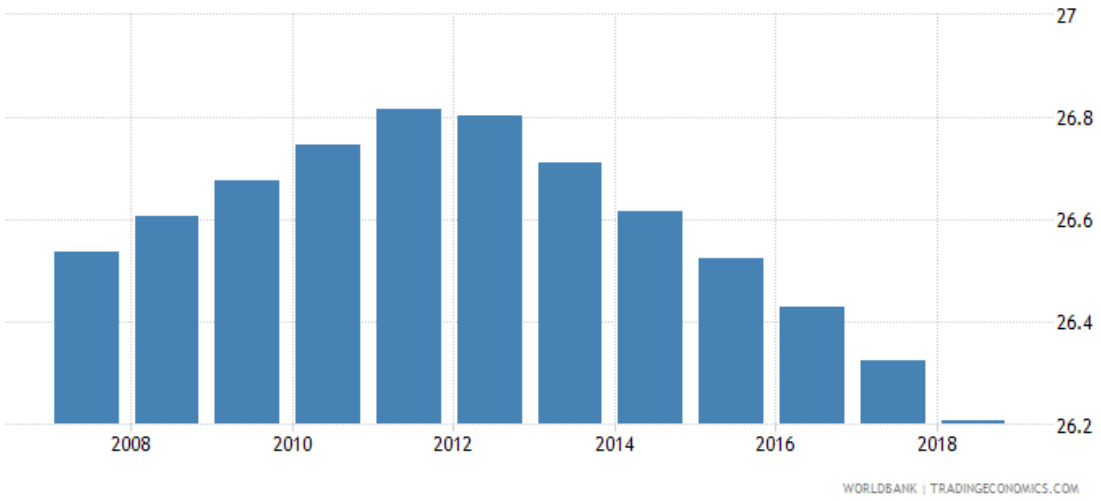
2.2. Demographic trends

Rural population (% of total population) in Czechia represents 26.21% (2018) according to the World Bank collection of development indicators, compiled from officially sources. Czech Republic - rural population - actual values, historical data, forecasts and projections were obtained from the World Bank on June of 2020. [1].

[1] Rural Development Programme of the Czech Republic for 2007–2013, Ministry of Agriculture, VÚZE Prague, 2008. Available from: http://eagri.cz/public/web/file/10574/RDP_November_2008.pdf, https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/key_policies/documents/rdp-factsheet-czech-republic_en.pdf

[2] Factsheet on 2014-2020 Rural Development Programme for the Czech Republic, European Commission. Available from: https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/key_policies/documents/rdp-factsheet-czech-republic_en.pdf

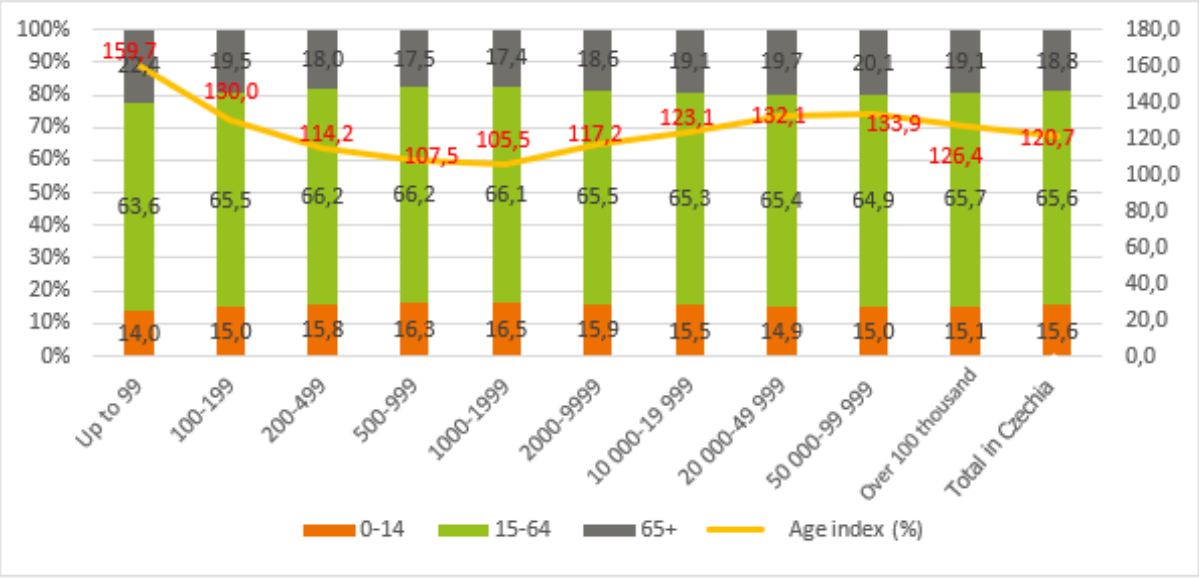
Picture 2: Rural population (%) in Czechia



Classified as rural municipalities in the CZ are municipalities with less than 2 000 inhabitants. They represent 89.82% of all municipalities and administer the territory covering 73.6 % of the total territory of the CZ. However, only one fourth (26.2 %) of the population lives in the rural municipalities. In rural municipalities (except for small municipalities up to 200 inhabitants) the positive migration balance exceeds the natural decrease of population and thus the total balance is positive. The overall figures show that the depopulation of rural areas has come to the end, but more detailed view modifies it a bit: In reality this trend is caused by a massive construction of family houses in the surroundings of big towns and cities and by the development of high-density satellite housing in these suburban areas. However, the intermediate and remote rural areas still face the depopulation. These are mainly the border areas, areas of the so called internal peripheral areas and regions with higher unemployment rate.

In terms of population age structure and possible changes, there are no significant differences between rural municipalities of up to 2 000 inhabitants and cities. Population ageing is reflected in a decline in the share of working population (15-64 years) per capita in both cities and rural areas, as well as a slower increase in the proportion of children under 15 (see Picture 3).

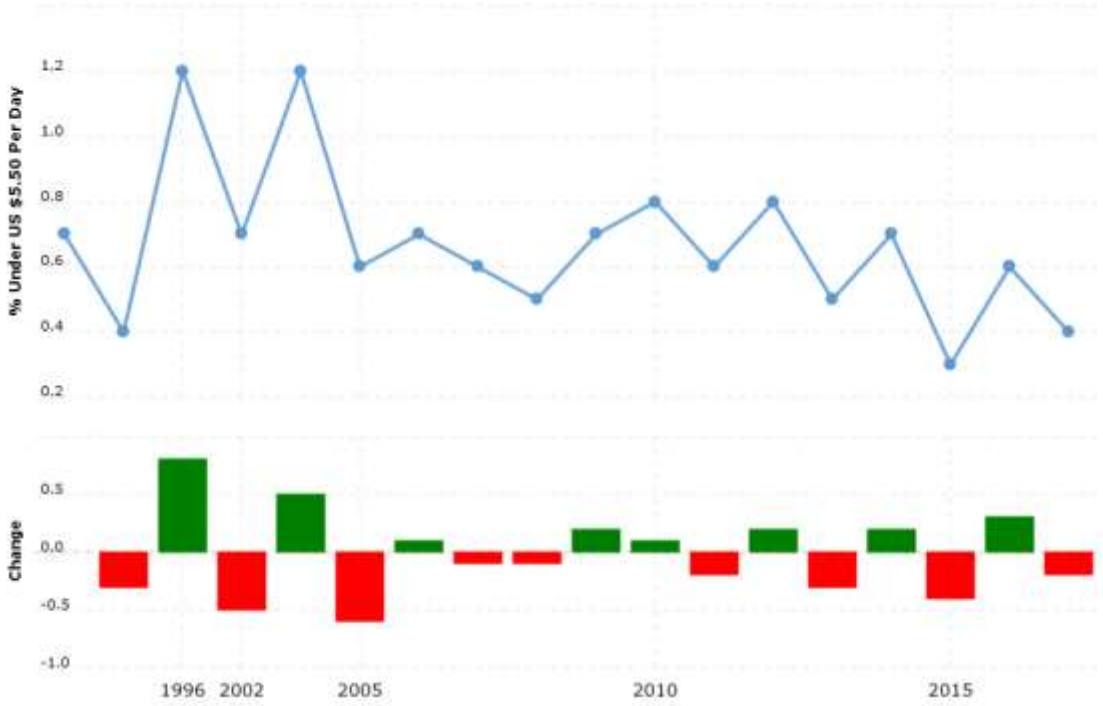
Picture 3: Age structure of population (%) and age index in size groups of Czech municipalities in 2017



Source: Malý lexikon obcí ČR, 2017

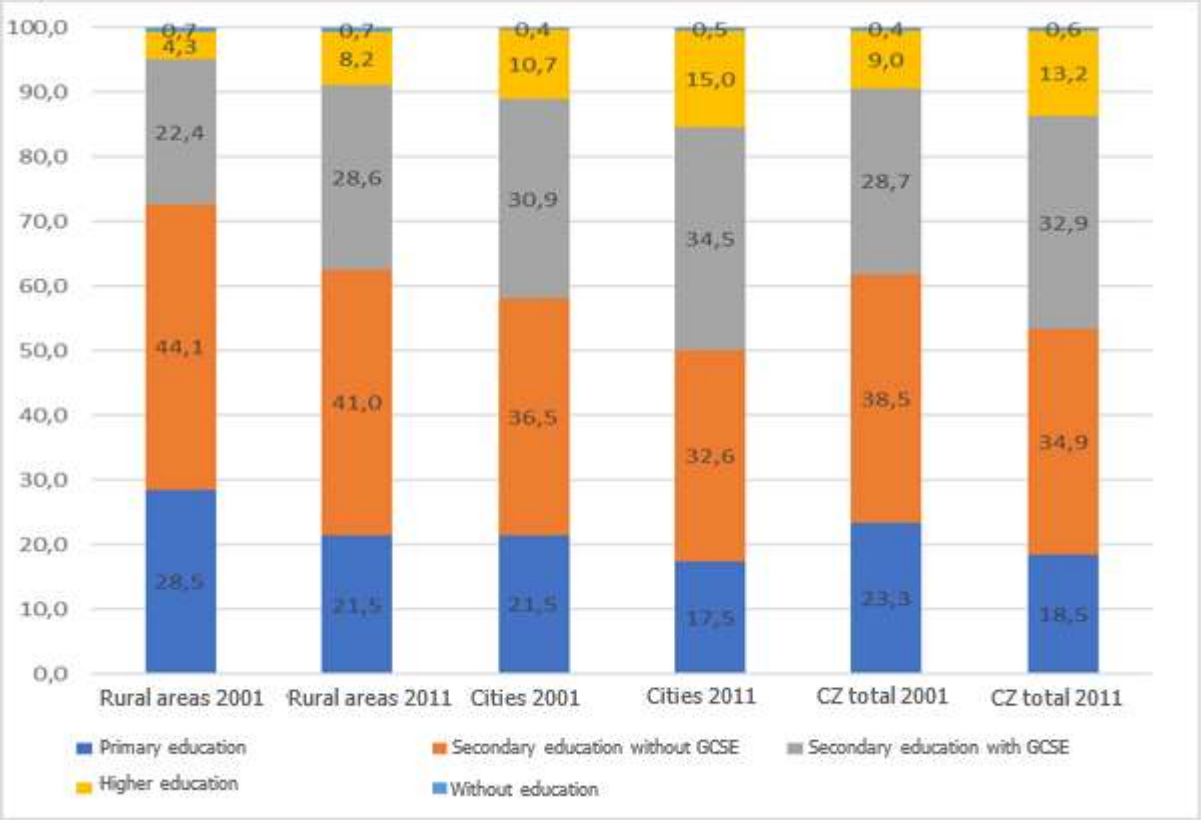
The important indicator for change of using other sources of energy could be financial situation in families. The poverty rate in Czechia is showed on the Picture 4. [2].

Picture 4: Poverty headcount ratio at $5.50 a day is the percentage of the population living on less than $5.50 a day at 2015 international prices in Czechia. [2]



Development in the educational structure of the rural population is improving, the proportion of people with a basic education has fallen relatively more compared to rural towns, and the proportion of people with a full secondary education has increased even more. But the educational structure of the rural population in 2011 was still worse than in cities in 2001. Higher education is also increasing at a relatively slower pace in the countryside.

Picture 5: Educational structure of the population 15 + in rural municipalities and towns of the Czech Republic in 2001, 2011



Note: GCSE = General Certificate of Secondary Education
Source: Czech Statistical Office SLDB population and housing census 2001,2011

More than 20% of all rural companies are business and small services entrepreneurs, 15% represent small industrial activities, about 10% of subjects is held by professional, construction, accommodation and social services companies. Farmers represent 5% of companies in rural areas. Rural areas, according to the business structure with regard to the sector, are in the Table 3.

Table 3: Rural areas according to the business structure

Sector	Share of business activities
Retail, wholesale (incl. repair of motor vehicles)	20,4%
Industry	14,9%
Professional and technical activities	10,0%
Construction	9,8%
Health and social care professions	9,7%
Accommodation, catering, hospitality	9,2%
Agriculture	5,0%
Others	21,0%

Sources: Statistical Yearbooks of Counties 2017, CSL 2017, IAEI, State of Agriculture Report, 2017

Energy

"The Strategic goals of the Czech energy sector 2015–2040" which was created by the Ministry of Industry and Trade. [3], contains following strategic objectives:

a) Security of energy supplies ensuring essential energy supplies for consumers in normal operation
b) Competitiveness (of the energy sector and social acceptability) final energy prices for industrial consumers and for households that are comparable with prices in other countries in the region and those of other direct competitors
c) Sustainable energy - structure sustainable in the long term period from the viewpoint of the environment (no further damage to the environment), finance and the economy (financial stability of energy enterprises and the ability to provide the necessary investment in renovation and development), human resources (level of education), social impact (employment), and primary sources (availability).

It was clear from the MAP VENUS discussion that the most important objective for rural areas is the third one (c): sustainable development and environmentally friendly. The expected development of the Czech energy sector until 2040 focuses on the replacement of coal and oil by nuclear sources. The objectives also show an effort to generate energy savings and the support of energy research. On the other hand, a stronger focus on rural areas, households and the small and medium of entrepreneurs is not clearly visible in the state strategy.

The potential of wind energy is mostly limited by the landscape relief, which predetermines the only a part of CZ area. Other limiting factors include residential complexes, protected natural areas such as national parks, Protected Landscape Areas and localities belonging to the Natura 2000 system, military radar zones, etc. Wind energy's realistic potential is determined in the study by the Institute of Atmospheric Physics compiled for the Czech Society for Wind Energy as being approx. 2 300MW in a medium-case scenario.

The potential of solar energy is limited primarily by the climate of Czechia, i.e. especially by its meteorological conditions and altitude. With a view to long-term sustainability, the protection of agricultural land precludes the systematic use of agricultural land for photovoltaic purposes.

In the Czechia "The Strategic goals of the Czech energy sector CZ 2015 - 2040 2040" has been approved by the government. The ecologists criticize a weaker focus on increasing of energy efficiency. They also discuss its accuracy, because the strategy relies mainly on nuclear energy, and the document lacks the government's view on breaking the limits of coal mining and utilization.

For the last 5 years, energy production from RES has stagnated in agriculture and forestry. In particular, high specific investment and operating costs are due to the low efficiency of most resources, the overly constrained conditions of investment incentives, the unclear outlook for the legislative environment and its frequent, even retroactive changes. Another cause of high biomass fuel price is farmers' reluctance to switch from growing conventional market crops to growing energy biomass. Low flexibility in land-use change options (multi-annual stands), the absence of long-term production contracts but also fragmented land ownership itself can be mentioned as major obstacles.

2.3. Review of main challenges and opportunities

One of the main priorities of the Moravian-Silesian Region and its Regional Authority [4] is to improve the overall quality of life and the environment for all residents and to promote sustainable development in the Region through implementation of SMART activities. The Moravian-Silesian Region has initiated the creation of a design for a SMART region built on the SMART Cities principle. The Region is supporting and introducing innovative and intelligent technologies for developing transport, energy management, and construction and for human and social capital investments – all in accordance with sustainable development and increasing regional quality of life.

The energy sector significantly affects the quality of the environment. Especially in terms of air protection, natural resources and the exploitation of mineral resources. In the prepared measures, the Region puts most emphasis on the most efficient use of energy sources, energy savings, and the use of alternative and renewable energy sources.

The above topics are the main pillars of the Environmental Policy of the Moravian-Silesian Region in the implementation of the energy concept of the Region. The Moravian-Silesian Region has the ambition to

determine the direction of future development and demonstrate its ability to act in the implementation of specific projects.

Selected measures are e.g. "Greening of transport" (use of alternative fuels in the public sector) and "Promoting the use of the local potential of biomass as a substitute for fossil fuels". This will result in reducing energy dependency, promoting local energy self-sufficiency with positive impacts on air quality while the issue of employment in municipalities will be also partially addressed. Although the Moravian-Silesian Region is perceived primarily as an industrial region, it has an important position in the Czech Republic in terms of nature and landscape protection, and rightly enjoys public interest in this area. In addition to the large, specially protected mountain areas, such as Beskydy, Jeseníky and Poodří, there are dozens of small specially protected areas, and several natural parks and extensive areas of the European Natura 2000 - significant European sites and bird areas - system in the Region.

The VENUS project will build on data from the Energyregion project [5], in which LAG Opavsko participated in 2012-2013. Data from 2012 will be compared with the current state and will be used to develop time series – such as the speed of implementation of changes in the energy performance of buildings, the pace of energy savings, etc.

The countryside prefers bottom-up management, which will allow solved specific problems or use strengths in a given region (small-scale production of electricity and the use of most types of power plants – cogeneration, hydro, wind, photovoltaic and biogas power plants).

The MAP VENUS stakeholders come from various branches, such as science, policy and society. The stakeholders are mostly interested in smart villages especially with emphasis on smart energy. The vision of smart energy development in the LAG Opavsko in following 20 years is based on chosen goals from national and regional strategy [3, 4].

Strategy Community-Led Local Development (SCLLD) LAG Opavsko is based on data of period 2012–2014. Annual time series are only exceptionally. One of the main topics is energy-saving in area of LAG Opavsko. The energy intensity of public buildings in the territory of LAG Opavsko was initiated by LAG Opavsko itself [6]. The survey was conducted in 2012 at 225 public buildings owned by municipalities. Almost half of the monitored buildings represent smaller buildings with a floor area of up to 500 m2 and the total consumption of all these buildings reaches 28 565 MWh/year. The estimated energy savings for these buildings are a potential energy saving of 6 111 MWh/year. Only 1% of buildings was in category "extremely economical". In 2020[3], LAG Opavsko will repeat the survey one more time in order to see whether the situation changed. There is no other available detail information for the period between 2012 and 2020.

2.4. Summary of existing foresight(s)

Demographic foresight

The Czech Statistical Office provides predictions up to 2050. From this study we report:

The total population of the Czech Republic started to decline in 1994. Until then, the population had grown steadily (the difference between live births and deaths) and migrations. Migration continued to increase the population, but the losses, mainly caused by low birth rates, were no longer enough to compensate.

The overall decline in population by 2050 is the result of three projection variants (low, optimal, high), with the low variant calculating permanent declines as early as 2004, the medium after 2015 and the high only after 2042. Under 10 million, the population of the Czech Republic would fall for the first time in 2034, according to the low in 2017, and in the event of a development close to the high variant, the total population would not fall below this threshold by 2050 [8].

The highest gains are expected at the highest age. Today's number of people aged 85 and over is relatively low because they are dominated by members of very weak baby boomers born during World War I. The rapid gains that occur after 2005 (the entry into this age of those born during the post-war compensatory rise in the birth rate) will slow temporarily in 2015-2025 (the weaker years of the 1930s) but accelerate substantially thereafter. Indeed, the more numerous 1940's and (mainly) younger ones will begin to live to the age of 85. By the middle of the 21st century, one out of 20 will be 85 years or older [8].

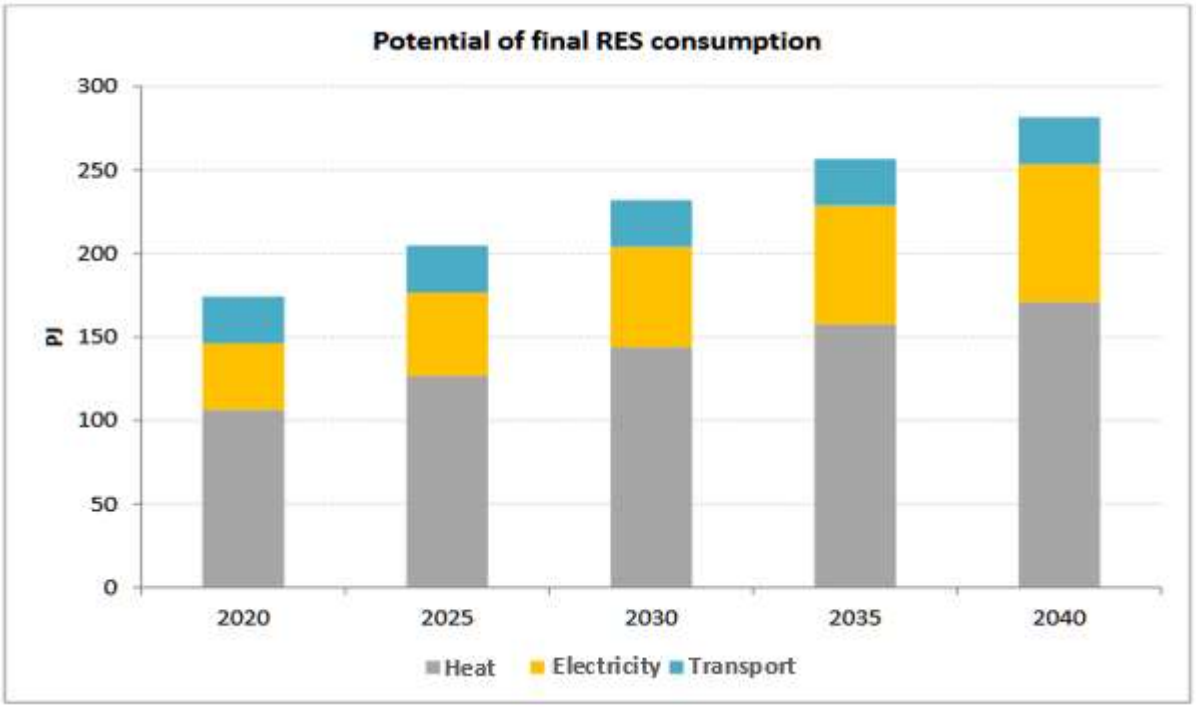
[3] The final results of the monitoring of buildings will be in December 2020.

The trend indicated above implies that the economic burden on the economically active population will rise soon, despite an increase in the retirement age. At the same time, the structure of dependants will also be changing, with a much higher proportion being those of post-productive age. When working with projection results and interpreting them, it should be kept in mind that the fundamental direction of future population development can be predicted, but it is no longer possible to predict its sudden fluctuations. The most accurate estimate can be made of the expected changes in mortality levels, which are more difficult to predict further trends in fertility development, but the most unpredictable is the further development of migration [8].

Energy forecast

The Strategy states that possibility of using the various energy sources is limited in the Czechia due to the country's natural potential and economic specifics, which naturally determine their comparative advantages and disadvantages. The naturally limited potential for developing and using renewable resources is shown in the Picture 6.

Picture 6: Potential of final RES consumption

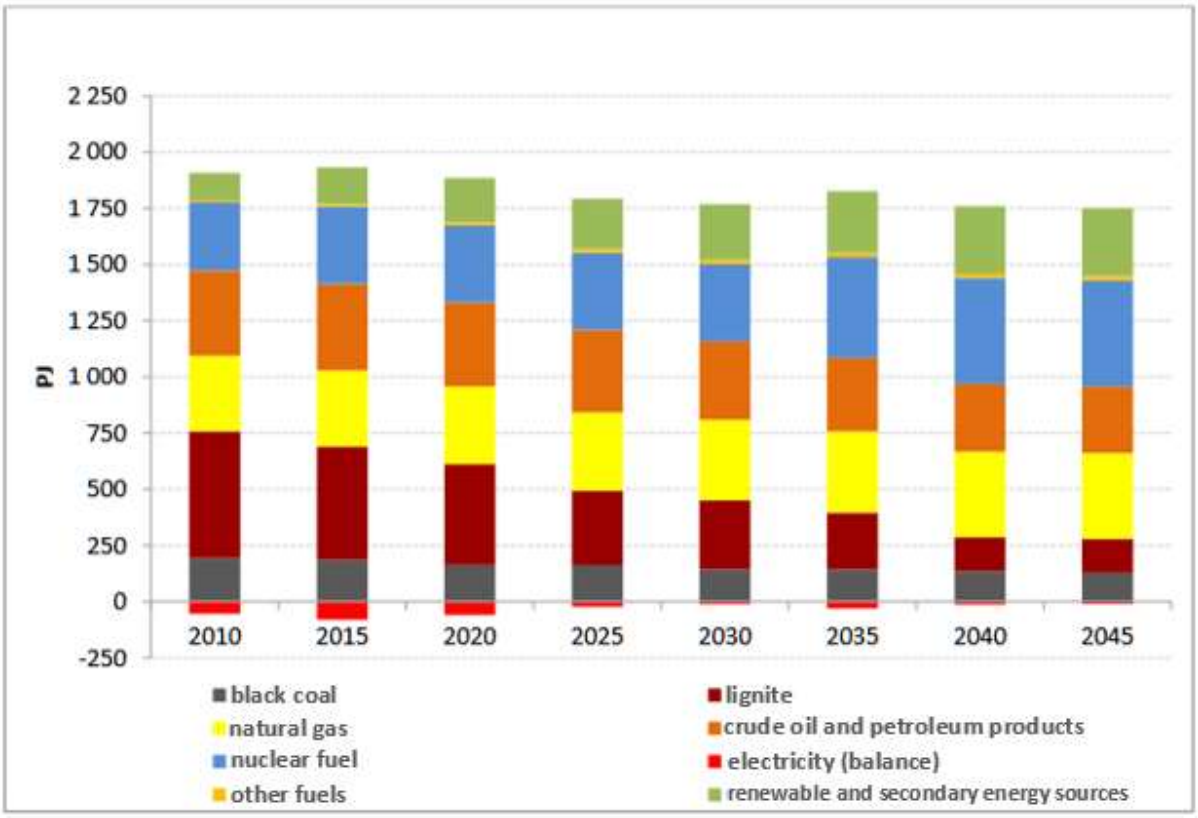


Source: [3] State Energy Policy of The Czech Republic

The Ministry of Industry and Trade in Czechia has created several scenarios predicting the development of energy. The most discussed is the so-called optimized scenario until 2045. The forecast leads to long-term sustainable energy that is based on the economically efficient use of domestic energy sources. This strengthens energy security. The scenario also involves the development of nuclear power, which was criticized in MAP.

From this source (optimized forecasts), we present a table (4) and a chart (picture 7).

Picture 7: Development and structure of primary energy sources



Source: Supplementary analytical material to the State Energy Concept update proposal

Table 4: Development and structure of RES on primary energy sources

Renewable and secondary energy sources	u	2010	2015	2020	2025	2030	2035	2040	2045
Biomass	PJ	82,7	92,7	104,7	116,6	130,4	144,6	159,9	159,8
Biogas	PJ	7,4	22,1	27,1	28,8	31,1	33,5	35,9	38,2
Biodegradable fraction (municipal solid waste)	PJ	2,6	3,3	4,7	9,9	13,3	13,3	13,3	13,3
Biodegradable part (industrial wastes and alternative fuels)	PJ	1	1	1	1	1	1	1	1
Biofuels	PJ	9,8	18,3	28,1	28,1	28,1	28,1	28,1	28,1
Water plants	PJ	10	8,9	9,1	9,1	9,1	9,1	9,1	9,1
Wind power plants	PJ	1,2	2,3	3,6	4,8	5,8	7	8,2	8,2
Photovoltaic power plants	PJ	2,2	8,2	8,7	12,8	12,8	17	21,2	21,2
Geothermal energy	PJ	0	0	0,7	1	1,2	1,7	2,5	2,5
Heat pumps	PJ	1,8	3,7	6,6	8,9	11,2	13,4	15,7	15,8
Solar collectors	PJ	0,4	0,8	1,4	3	3,5	5	5	5
RES and SES total		119,1	161,4	195,6	223,9	247,5	273,7	299,8	302,2

Note: PJ *(Petajoule)*

Source : Supplementary analytical material to the State Energy Concept update proposal

The energy forecast directly for rural areas is not monitored, the closest approximation is that of household energy consumption in Czechia.

Table 5: Household energy consumption

Household energy consumption	u	2010	2015	2020	2025	2030	2035	2040	2045
Coal	PJ	2,2	2,9	2,9	2,9	2,9	2,9	2,9	2,9
Brown Coal	PJ	21,1	15,8	9,2	2,6	1,8	1,8	1,8	0
Briquettes	PJ	4,8	3,9	4,9	4,9	3,9	3,9	3,9	0
Coke	PJ	0,7	0,7	0,7	0,7	0,7	0,7	0,7	0,7
Natural gas	PJ	96,9	88	88,1	75,4	75	74,4	73,7	73,7
Biomass	PJ	48,5	53,3	57,9	62,4	61,2	60,4	60,6	60,6
Heat pumps	PJ	1,2	2,6	4,6	6,2	7,8	9,4	11	11
Solar collectors	PJ	0,3	0,6	1,1	2,4	2,8	4	4	4
Electricity	PJ	54,1	51,5	51,4	52,4	52,8	52,1	51,9	51,9
Heat Supply Systems	PJ	50,1	49,2	47,3	44,7	42	41,1	40,1	38,8
Total HEC	PJ	279,9	268,5	260	254,7	250,7	250,6	250,6	243,7

Note: PJ *(Petajoule)*

Source : Supplementary analytical material to the State Energy Concept update proposal

MAP VENUS respects the state plan but it focuses mainly on the local level, and the forecast for 2040 will be made using the questionnaires by the company Prosena. Currently, MAP members estimate that it will save in the region of 100,000 Gj and build RES with an annual output of 10 MW. The forecast was made with a horizont of 10 years, so we can also consider higher values of the output. But the bottom line is because new concepts of shared energy are forming in MAP VENUS, which can make a major contribution to sustainability and resilience in the region.

3. Results from interviews with MAP members

The discussion on the topic of challenge and opportunity was opened in two workshops, face-to-face interviews took place as well as the questionnaire survey. The evaluation of the questionnaires will take place in the end of the year 2020. For now, the results of the discussions are as follows:

All experts agreed that the diversification of energy sources using local renewable potentials and save energy are the basis for SMART energy. A higher degree of required change in SMART energy is the system of shared energy in the locality (eg. in the municipality).

Two complementary aims have been set:

Aim 1: Creating of measures and technologies which provide energy savings
Aim 2: Creating of technologies which use renewable energy sources

Challenges and opportunities are affected by:

Expenditures of municipalities and cities are 2/3 operating and 1/3 investment,

- An impact covid-19 - estimate 20% decline in municipal revenues and this will be mainly in investment (- 50%)
- Main policy principles EU:
  - Implementation of the Paris Agreement
  - Support for decentralization, RES, diversification of energy sources
  - Strengthening the role of consumers and weakening the role of traditional energy distributors
  - Community energy (energy sharing)
- Goals of Czechia:
  - reduce CO_2 emissions by 30% (compared 2005 and 2030)
  - by 2030 the share of energy from RES will be 22%

From the strategies of the EU and the Moravian-Silesian Region, two main aims are proposed, see below. This is in line with the views of experts and regional politicians from MAP VENUS. Partners in VENUS have included these objectives in the Dynamic action plan (DAP) and LAG Opavsko is something like a case study for other regions.

Aim 1: Creating of measures and technologies which provide energy savings

- Reduction of energy consumption by 5 % in 10 years (to save energy 100 000 Gj),
- Thermal insulation of buildings better than the existing norm,
- Heating savings - replacement of heat sources,
- Modernization of interior and public lighting,
- Effective building materials, new building standards.

Aim 2: creating of technologies which use renewable energy sources

- A newly built capacity of smart energy equipment eg. RES (10 MW),
- Creating methodological procedures for citizens to smartly address their energy needs with return on investment and the possibility of shared energy,
- Creation of at least three centers with diversification of energy sources and with shared energy (test sites),
- Number of inhabitants informed about energy prices, possibilities of energy savings and possibilities of RES (5000).

3.1. Challenges and opportunities in the next 20 years

The interviews with MAP members was carried out at two meetings[4]. First was on 25 of May 2020 and second was on 28 of May 2020. The respondents come from village societies, mayors, business, farmers, researchers and practise experts. The main question was: What are the current and expected trends for the rural area covered by the MAP VENUS with a time horizon of 2040? All members got detailed questionnaire which will be evaluated in the end of year 2020. The results of the meetings were supported by face-to-face interviews with members who could not attend and who are key experts in SMART energy.

The interviewees identified the following five key trends influencing the evolution of the energy situation in the region covered by MAP VENUS:

1) Rising energy prices affect the willingness to save energy consumption,
2) EU pressure to increase energy savings, a gradual transition to RES and the introduction carbon neutral technologies,
3) New environmentally friendly technologies are becoming affordable,
4) Energy independence and affordability,
5) He demanded that the company "have a better solution".

As a resulted from interviews, respondents talked often about the risks to the development of SMART energy in the region covered by MAP VENUS:

1) Low knowledge of residents and entrepreneurs about energy, energy prices, (energy ignorance),
2) Decision-making is based on short-term experience (eg. A a heat pump company designs them everywhere, even where this is not the most appropriate solution for users of a building or family home. Users do not think through the terms of reference sufficiently and there is no clear approach to the information on which they should make it.).
3) There is a significant gap in the advice, especially with a comprehensive approach with regard to energy sources and conditions of the applicant,

[4] The workshops took place after the covid-19 situation eased. There were representatives of specialized companies in smart energy (research), representatives of NN LAGs (politics) and entrepreneurs and representatives of municipalities (socio).

4) Existence of a large amount of information of various quality and less complex information, structured and clear about the problem and solution of smart energy,
5) Little interest in the change to smart energy, especially in municipal and state institutions,
6) Concerns about the huge bureaucracy associated with change,
7) Most consultants are vendors of the same technology,
8) There is a low willingness to reduce lifestyle and comfort at the expense of saving energy (gas vs. wood chips).
9) There is de facto no legislative support for shared (community-based) multi-stakeholder energy. Pilot projects represent only an experiment.
10) High distribution fees also build a significant barrier, handicapping the view of energy savings (electricity, gas). These distribution charges do not favour local production and consumption, which is an economically disincentive.

3.2. Desirable future for 2040

Stabilization in politics, including energy policy, is particularly important for the 2040 vision, which will lead to the goals of green deals. There are known the possibilities that can be implemented to rural areas and they are more easily put into practice with help of private sector. In 2040, we should have more confidence in the decentralization of regional governance and development.

Not just over the period of 20 years, but as soon as possible, energy legislation have to be changed, which blocks the development of shared energy.

At the political level, there is a need to address the price ratios between energy used and purchased for small and medium-sized consumers/producers and to reduce distribution charges.

3.3. Challenges in reaching the vision

The results of the questionnaires and interviews will provide a relatively clear idea of the potential and attitude of the respondents to change to SMART energy. At the end of 2020, it will be possible to quantify result indicators in measured units of energy and finance. VENUS wants to accept these result indicators as binding, ie. how much energy will be saved and how much technology will change the source from fossil to RES. How many subjects will be involved in the shared energy project.

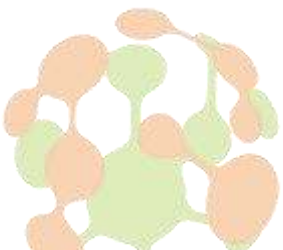
4. Conclusion and next steps

VENUS shall influence education due to activities with young people (pupils and students) – future is important mostly for them. VENUS shall help advisory services: looking for energy leaders who have a holistic approach, looking for connections in the community.

Next step

- The questionnaire: Gathering data on the energy saving situation and the potential for further development in the transition from fossil fuels and central energy sources to smart energies and a shared form of RES energy sources in the region. At the same time manager VENUS will be polling municipalities, entrepreneurs and citizens about willing to change energy sources and the use of innovative technologies.
- Completion of the design of methodologies,
- Creating "cookbooks" of good practice with an analysis of savings, costs and returns
- Verification of field procedures/methodologies,
- Creating an energy concept for the region
- Creation of a manual for the creation of energy concepts in other regions

- Involvement of the young generation in SMART energy planning in the LAG Opavsko
- Presentation and publishing activities
- Sharing the experience gained with other regions.



Annex 1. References

1] WORLDBANK, TRADINGECONOMICS.COM, https://www.macrotrends.net/countries/CZE/czech-republic/poverty-rate

2] https://tradingeconomics.com/czech-republic/rural-population-percent-of-total-population-wb-data.html

3] State Energy Policy of The Czech Republic, December 2014, Ministry of Industry and Trade, https://www.mpo.cz/assets/en/energy/state-energy-policy/2017/11/State-Energy-Policy-_2015__EN.pdf

4] Strategie rozvoje chytrého regionu Moravskoslezského kraje 2017-2023 „Chytřejší kraj", SMART Region, https://www.msk.cz/assets/doprava/strategie-rozvoje-chytreho-regionu-msk-2017-2023-vcetne-analyticke-casti-13-06-2017_1.pdf¨

5] Energyregion Effective development of dispersed renewable energy in combination with conventional energy in Regions, 2011 / 2014, http://www.porsennaops.cz/projekty-a-sluzby/mezinarodni-spoluprace/projekt-energyregion#

6] SCLLD MAS Opavsko

http://www.masopavsko.cz/dotacni-podpory/strategie-clld-2014-2020/

7] Malý lexikon obcí ČR, 2017, https://www.czso.cz/csu/czso/maly-lexikon-obci-ceske-republiky-2017

8] ČSÚ Projekce obyvatelstva České republiky (Czech population projections)

https://www.czso.cz/documents/10180/20538390/4025rra.pdf/9142790b-9517-463c-860b-8fc78897f30d?version=1.0

Annex 2. Survey Questionnaire

A notice: The questionnaire was created and sent before information of vision 2040, it is reason that we have future 2030.

Questionnaire – Energy savings

The Local Action Group (LAG) Opavsko, with the support of the Ministry of Industry and Trade of the Czech Republic, verifies the possibilities of energy savings, using local energy sources and energy efficiency of private and public buildings on the territory of the municipalities of LAG Opavsko. The questionnaire serves as a basis for planning energy savings subsidies, for using of renewable energy sources in the region LAG Opavsko and for creating „a pool of projects„ for the forthcoming EU programming period 2021 - 2027. Both the EU and the Government of the Czech Republic will finance projects in the areas of energy savings and climate change mitigation in the period 2021–2027. The „pool of projects „will serve as a basis for creating a strategy in the area of energy saving in the LAG Opavsko and for planning investments and implementing municipal development plans.

1. ***identification***

- *Email*
- *Name of the village*
- *Fill (name, surname, position)*

Thank you for your time and willingness. If you need a consultation, contact the responsible person Libor Cenek (phone number: 778 888 157). The questionnaire can be fill by prior arrangement in paper form or with Mr.Cenek telephone assistance. We will help you as much as possible.

Revision of the current energy intensity of municipal buildings

In 2014 LAG Opavsko conducted a detailed survey of energy efficiency of municipal buildings. Please carry out a brief revision of energy performance of municipal buildings in 2020. If it is necessary, add new columns with buildings and describe them according to monitored parameters.

Write down all municipal buildings. If you have more than one object of the same type (e.g. primary school), enter the number of objects in brackets. If you have 2 objects in one building (e.g. MA and library), state it as one with a note (MA + KN = MA), etc. If the object is not heated, state it in brackets (unheated). If you use category other, please describe type of object. If you have problems with definitions of your building, please contact Libor Cenek.

2.1. Current state of energy performance of municipal buildings. Select and tick current category of individual objects according to energy label or building's energy performance certificate (EPCs). *(MA = municipal authority; PS = primary school; KG = kindergarten; CH = cultural/municipal/federal house; LIB = library; SP = sports or leisure time place ; APART = apartment building, nursing home, retirement home; COM = commercial space, municipal shop, restaurant etc.; Other = another heated object.*

	MA	PS	KG	CH	LIB	SP	APART	COM	Other
A – extremely economical									
B – economical									
C – satisfactory									
D – unsatisfactory									
E – uneconomical									
F – very uneconomical									
G – extremely uneconomical									
I don't know, not identified									

2.2 Insulation, heating and energy savings measures of municipal buildings. Current state of municipal buildings. Select all relevant categories and put a tick next to it.

	MA	PS	KG	CH	LIB	SP	APART	COM	Other
modern windows and doors									
thermal insultation									
insulated floors and ceilings									
DHW preparation using the sun									
Equithermal or other system control									
modern regulation on radiators									

2.3. Energy source. Current state and heating sources of municipal buildings – Select relevant category and put a tick next to it.

	MA	PS	KG	CH	LIB	SP	APART	COM	Other
old gas boiler									
unsatisfactory solid fuels boiler (coal, sludge, coke)									
old boiler for wood, wood chips, biomass									
Heat pump									
condensing gas heat									
gasification boiler for wood with accumulation									
photovoltaics (electricity)									
photothermic (heat)									
cogeneration (common production of electricity and heat)									
district heat supply									
other									

2.4. Ventilation and air conditioning efficiency. Current state of energy performance of municipal buildings. Select all relevant categories and put a tick next to it.

	MA	PS	KG	CH	LIB	SP	APART	COM	Other
effective shading									
recuperative ventilation									
cooling, air conditioning									
energy saving lighting									
water savings									
Rainwater using									

2.5. New energy savings measures. Check and tick, if you have a current intention to improve insulation or heating of the selected object. Implementation in the period 2020 - 2023.

	MA	PS	KG	CH	LIB	SP	APART	COM	Other
economical windows, doors									
thermal insultation									
insulated floors, ceilings									
replacing source for a better one with higher efficiency									

solar energy photovoltaics or photermics using									
modern heating control									
cogeneration									
microgrid, interconnection of buildings									
connection to district heat									

2.6. New energy savings measures. Check and tick, if you have a long-term intention to improve insulation or heating of the selected object. Implementation in the period 2024 - 2030.

	MA	PS	KG	CH	LIB	SP	APART	COM	Other
economical windows, doors									
thermal insultation									
insulated floors, ceilings									
replacing source for a better one with higher efficiency									
solar energy photovoltaics or photermics using									
modern heating control									
cogeneration									
microgrid, interconnection of buildings									
connection to district heat									

2.7. New energy savings measures. Efficiency of ventilation, air condition and other energy savings measures of municipal buildings. Check and tick, if you have a current intention to improve the state of the selected object. Implementation in the period 2020 -2023.

	MA	PS	KG	CH	LIB	SP	APART	COM	Other
effective shading									
recuperative ventilation									
cooling, air conditioning									
energy saving lighting									
water savings									
rainwater using									

2.8. New energy savings measures. Efficiency of ventilation, air condition and other energy savings measures of municipal buildings. Check if you have a long-term intention to improve the state of the selected object. Implementation in the period 2024 – 2030.

	MA	PS	KG	CH	LIB	SP	APART	COM	Other
effective shading									
recuperative ventilation									
cooling, air conditioning									
energy saving lighting									
water savings									
rainwater using									

2.9. Public lighting - current state. *Choose one answer.*

a) old standard

b) only partially economical (LED)

c) most economical (LED)without advanced control

d) most economical (LED)and advanced control

2.10 Do you want to modernize public lighting? (energy saving LED / smart control)

a) No

b) yes, we will fill most of the missing LEDs

c) yes, we will modernize the smaller part that still missing

e) we intend to modernise public lighting management

f) modernization in the period 2020 – 2023 (relevant now)

g) modernization in period 2024 – 2030 (intending)

3. Do you consider using renewable sources of energy?

This involves the use of RES such as biomass, wood, pellets, wood chips, agropellets, grain, etc. or energy from sun and wind, geothermal energy for heating and electricity production in municipal projects.

3.1 Check if you have such an intention

	Yes 2020 - 2023	Yes 2024 - 2030	No	Don´t know
firewood from the municipal forest				
firewood grown outside the forest (short rotation coppice)				
wood chips from municipal forest				
wood chips (not from forest)				
wood pellets				
agropellets				
photovoltaic power plants (municipal roofs)				
photovoltaic power plants (brownfield)				
Photothermal panels (heat)				
hydroelectric power				
wind power plant				
geothermal energy (boreholes)				
biogas				
other				

If you answered YES in the previous question, please specify. How many square meters of roofs, how many hectares, how many kilowatts, how many m3, etc.

3.2 Subsidies - financial support

Do you use any subsidies titles for implementation energy saving measures or renewable resources of energy?

... for what purposes and in what time horizon?

	Yes, in 2020 - 2023	Yes, in 2024 - 2030	No	Don´t know
modernization of the boiler room, heating sources				
insulation of municipal buildings				
modernization heating systems and regulation				
use of renewable energy sources (RES)				
smart solution, microgrid				

3.3 What kind of investments are you able to do? What resources are you willing invest in municipal buildings and energy consumption projects by 2030? You can select more options.

a) *Only from the municipality's own resources*

b) *subsidies and co-financing from own resources*

c) *we do not have to invest alone; we would allow entry of external investors (ECP method (Energy Performance Contracting) = is a form of 'creative financing' for capital improvement which allows funding energy upgrades from cost reductions loans)*

d) *collective / community investment, we are willing to involve citizens of the municipality and investors from the region*

e) *other*

3.4 What amount of funds depending on the level of subsidy are you able to invest in municipal buildings and energy consumption projects by 2030?

	subsidy up to 20%	subsidy 21 - 40%	subsidy 41 - 60%	subsidy 60 - 80%
up to 1,000,000				
1,000,000 - 5,000,000				
5,000,001 - 10,000,000				
10,000,000 - 20,000,000				
more than CZK 20 million				

3.5 Community energy. Is your municipality willing and able to start on so-called commutal energy projects? *It means involvement municipal budget and capacities, local citizens and investors from the region in energy savings projects or production common electricity from renewable sources (water, wind, sun, ...). Choose one answer.*

a) *Yes, we are ready*

b) *Yes, but we don't know how*

c) *One could consider*

d) *Probably not, we have no options or ideas*

e) *Excluded, it is stupid*

f) *I don't know, I have no information*

3.6 What help would you need (from LAG Opavsko) in the implementation of energy and development projects? *Select one or more options.*

a) *contacts for energy specialists and designers*

b) *processing or updating of (strategic) municipal development program*

c) *processing of municipality energy concept*

d) *mediation of optimizing energy performance of a specific building*

e) *technical assistance with project preparation*

f) *ensuring feasibility studies*

g) energy manager services

h) preparation / submission application for subsidy

i) seminars, excursions, examples of good practice

j) announcing calls for subsidy applications

k) common energy auctions

l) other:

Conclusion notes. Write anything what would you like to say to LAG Opavsko related to this topic.