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REPORT ON MEASURES AND PROPOSALS FOR MICROGRIDS AND ENERGY COMMUNITIES

PP4 - ENERGAP
PP11 - SELNICA OB DRAVI

ALPGRIDS Policy Document

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Short Description
<p>The document summarizes the specific measures proposed by ENERGAP (PP4) and SELNICA OB DRAVI (PP11) to public authorities in charge of energy plans, both at local and regional level. The energy plans were previously selected and analysed by the partner.</p> <p>The measures reported can be already integrated in the energy plan or just proposed to the public decision maker in view of next coming plan updates.</p> <p>Measures are supported by a preliminary qualitative and quantitative analysis estimating their potential impacts, associated costs and recommendations for the implementation.</p>

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PROJECT LEAD PARTNER

PP1 – Auvergne Rhône-Alpes Energy Environment Agency



**Auvergne
Rhône-Alpes**
Énergie Environnement

Rue Gabriel Péri 18 - 69100 Villeurbanne, France

Phone: (+33) 0478372914, +33 0472563365

Email: patrick.biard@auvergnerhonealpes-ee.fr,
gabrielle.heyvaert@auvergnerhonealpes-ee.fr

RESPONSIBLE PARTNER FOR THE COMPILATION OF THIS DOCUMENT

PP4 – ENERGAP

PP – SELNICA OB DRAVI



ENERGAP

SMETRANOVA ULICA 31, MARIBOR, SLOVENIA

00 386 2 234 23 60

vlasta.krmelj@energap.si



OBČINA SELNICA OB DRAVI

SLOVENSKI TRG 4, SELNICA OB DRAVI

00386 2 673 02 01

suzana.prajnc@selnica.si

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Introduction

Energy agency of Podravje (ENERGAP) is regional public energy agency and act as energy manager and coordinator of the implementation of local energy and climate concepts (LECC) in the region. ENERGAP has prepared Local energy and climate concepts for the municipalities that were part of the ALPGRIDS local plans analysis.

During the LECC preparation phase ENERGAŠP has introduced the microgrids and energy and RES communities to the local stakeholders. They have recognized the importance of presented models therefore the promotion and active work on microgrids and energy communities was involved as one of the measures in LECC for the next 10 years. They were all aware that more detailed legal and technical framework should be prepared but without active involvement of local authorities and communities the goals will be difficult to achieve.

Due to the historical reasons Slovenia has not experiences in establishing companies or cooperatives especially in energy field therefore more information and operative example are needed to foster the establishment. Slovenia is preparing guidelines on the energy communities that will help to organize them. It is expected to get also financial schemes and instruments for it.

4 municipalities (Maribor, Ruše, Lovrenc na Pohorju and Selnica ob Dravi) have proposed micro grids and energy community measures in their LECC. The measures are not very detailed but propose to prepare specific implementation plan and introduce pilots to show the operation of such systems. The results of the implementation will be checked on yearly basis and reports prepared. The reports will be presented to the municipal councils and to the responsible ministry.

1 CONTEXT ANALYSIS: LOCAL, REGIONAL AND NATIONAL LEVEL

Slovenia is small and centralized country and has only two administrative levels: national and local (municipalities). In Slovenia there are 212 municipalities. The energy planning is the responsibility of Ministry for infrastructure that prepares all legislative and other frameworks that municipalities should work on. By the law each municipality should have its own local energy plan, approved by municipal council and the ministry. Each year the report about implementation of proposed measures have to be presented to the municipal council and the ministry.

Energy and climate concept of the local community or municipality means long-term planning of the development of the municipality on energy and energy-related environmental development. It provides the basis for setting up and implementing an appropriate environmental, energy and climate policy. The Local Energy and Climate Concept in Slovenia is a document that directs the municipality and its inhabitants to introduce energy efficiency measures (RUE), increase energy efficiency, introduce renewable energy sources (RES) and measures to mitigate and adapt to climate change. Long-term planning of the energy development of the municipality is a key element of the long-term economic development of the municipality and the basis for reducing energy dependence and impacts on the environment and climate. Sustainable energy policy requires a comprehensive approach that harmoniously addresses and integrates the fields of energy, spatial planning, environmental protection and economic development, while also focusing on climate change mitigation and adaptation, an important cause of which is energy use.

Local communities have a key role to play in tackling energy use and climate change. Together, they need to establish a strategy for the future, find ways to achieve it and invest in the necessary human and financial resources. It is important to achieve the greatest possible effects with the available resources, with the least possible additional burden on users and citizens.

The goal of the local energy climate concept (hereinafter LECC) is to analyze the energy situation in the municipality and plan appropriate measures to implement local community-friendly solutions for efficient, economical and environmentally and climate-friendly energy services in housing, businesses and public institutions. In addition to the primary goal, which is based on reducing greenhouse gases, energy use, its efficient use and introduction of RES, the implementation of measures will achieve the following goals: reducing greenhouse gas emissions, creating savings for the municipality and its population in energy, gaining opportunities to subsidize various projects by the state and the European community in the field of energy, as well as to achieve a better quality of life and public health.

The municipalities in the region are actively working to reduce energy use, especially in the public sector. In the coming years, in order to achieve the ambitious goals of reducing carbon dioxide emissions, to which the Member States of the European Union (hereinafter the EU), including Slovenia, have committed themselves, they must accelerate the implementation of larger energy programs.

The legal framework for the activities of the European Union and thus Slovenia towards climate neutrality by 2050 is the Paris Climate Agreement, the first universal and legally binding global climate agreement adopted in December 2015. The key objective of the agreement is to keep the average global temperature well below 2 ° C. compared to the pre-industrial period or to continue efforts to limit the rise in temperature to 1.5 ° C compared to the pre-industrial period, recognizing that this would significantly reduce the risks and effects of climate change. In order to overcome climate and environmental challenges and achieve the set goals of climate neutrality, in December 2019 the European Commission presented the European Green Agreement, the EU's central

development strategy and a comprehensive action plan for the transition to a green sustainable economy. Following the onset of the pandemic and the awareness of the need to address its consequences for the recovery of the European economy, the Green Agreement is an important aspect of the European Economic Recovery Plan and the EU Recovery Plan.

In accordance with EU Regulation 2018/1999 on the governance of the Energy Union and climate action, Member States, including Slovenia, have prepared national energy and climate plans (NEPs). The NEPN represents one of the most important steps of Slovenia towards climate neutrality by 2050. It includes energy and climate goals, policies and measures until 2030 with a perspective until 2040. Objectives set in the NEPN in relation to reducing greenhouse gases, increasing the share of RES and energy efficiency, will intensify in the near future, as more ambitious targets for 2030 are currently being adopted at European level, starting with the goal of reducing greenhouse gases by at least 55% by 2030.

Policies for the transition to a climate-neutral society are most visibly implemented at the local level, so municipalities and local communities are the key actors in the implementation of the NEP and also more broadly in Slovenia's transition to climate neutrality. All documents, activities and measures that will be planned and implemented at the local level must be prepared in accordance with the goals and guidelines of the NEPN.

The basic starting point of all planned NEPN activities for the transition to a climate-neutral society and a circular economy is the improvement of energy and material efficiency in all sectors. Further key starting points for a fair transition are based on increasing the use of renewable energy sources, the need to change the paradigm, as existing approaches will not be able to achieve ambitious energy and environmental goals. Digitization of processes and connection of networks will also be crucial (eg better integration of energy-intensive industry into the local environment, establishment of energy communities, joint power plants, integration of excess heat into local district heating systems, elimination of white spots in electricity distribution and telecommunications networks).

The key challenges facing Slovenia in the field of energy and climate policy are as follows:

- gradual reduction of energy consumption and increase of energy and material efficiency in all sectors,
- sustainable traffic management,
- technological development and commercial breakthrough of renewable energy sources, advanced technologies and services, including storage, energy efficiency and production of renewable gases (hydrogen, synthetic gases, biogas...),
- accelerated development of district heating and cooling systems,
- decarbonisation of the natural gas supply (introduction of renewable gases),
- accelerated development of the electricity distribution network and interconnection of sectors (utilization of excess heat and cold, greater integration of heat pumps, meeting the requirements related to the accelerated introduction of modern concepts of electromobility and accelerated integration of renewable energy sources),
- phasing out fossil resources in all sectors.

The key challenges for future development are based on trust and implementation, and it is necessary to move from the (too often) phase of mistrust to the phase of systematic implementation. It is easy to write a good strategy that will stay on paper, but if we do not start implementing, by actually placing projects in space, we will not achieve results. Municipalities have been very active and successful in recent years in the field of energy efficiency and sustainable mobility, but now other areas are becoming important, such as green electricity production and the introduction of other advanced technologies, creating energy communities, connecting networks and integrating RES into suitable areas. and in a way that incurs the least additional cost to the

network. It is necessary to promote science, professionalism and integration with industry, find new solutions, develop new products and integrate into the urban environment.

The key objectives set out in the NEPN that local communities must pursue are:

- improve energy efficiency by at least 35% by 2030 compared to the 2007 baseline scenario
- reduce final energy consumption in buildings by 20% by 2030 compared to 2005 and ensure that GHG emissions in buildings are reduced by at least 70% by 2030 compared to 2005
- achieve at least 27% share of renewables in final energy consumption, ie: at least 2/3 of energy use in buildings from RES by 2030 (share of RES use in final energy consumption without electricity and district heat), at least 30% share of RES in industry (including excess heat), 43% share in the electricity sector, 41% share in the heat and cooling sector, 21% share in transport (the share of biofuels is at least 11%).

The measures defined in the NECAP, which refer to municipalities, are the following:

- optimization of heat use and supply and introduction of advanced solutions (utilization of excess process heat, connection with RES systems);
- promoting local energy communities - setting up a scheme to promote the development of local energy communities (including under the ERDF), including technical and human resources support for setting up the scheme and other projects at local level - Energy communities in industrial zones: identifying and exploiting potential for construction of SE, utilization of excess heat from industrial processes, construction or connection to the district heating system of the industrial zone and nearby settlements;
- proactive role of the state in the identification and spatial location of environmentally acceptable locations for the use of hydro and wind energy and other RES - the key role of municipalities in terms of demonstrated interest;
- incentives for better network integration of RES production plants and adjustment of consumption;
- energy management in the public sector;
- energy efficiency repayment schemes in the public sector;
- non-repayable investment financial incentives for energy rehabilitation of buildings in the public sector, aimed at increasing the share of projects implemented through energy contracting;
- achievable ICT infrastructure - cost optimization through joint planning, design and construction of all public infrastructure: road, water, sewage, electricity, public lighting, telecommunications, district heating and cooling infrastructure, gas infrastructure everywhere, especially in rural areas, which improve economic viability and reduce overall investment costs;
- ensuring the quality of energy renovation projects of buildings in the public sector;
- integrated transport planning at local and regional level with a regional level of mobility management.

Adequate awareness and training, a culture of cooperation, trust and acceptance of the necessary investments, as well as a proactive role of the state and the opportunities of actors, will play an important role in achieving the goals and challenges of the transition to a climate-neutral society at the local level.

Topic of microgrids and energy communities is presented in NECAP (National energy and climate action plan)

In order to achieve ambitious goals of energy and climate policy, Slovenia will provide better conditions for accelerated development of the electricity distribution network for its greater strength, resistance to disturbances, for progress and exploitation of resource and burden flexibility, as this network is the foundation of the future transition to climate neutral. It will enable the accelerated connection of heat pumps and the fulfilment of requirements related to the accelerated introduction of e-mobility and the accelerated integration of devices for the production of energy from renewable sources.

The current development plan does not meet the expected increased needs in the field of electricity distribution, so Slovenia will introduce more development-oriented financing of future development of the distribution network for greater capacity, resilience, progress and exploitation of resource and burden flexibility. Greater progress and the ability to exploit the flexibility of resources and burdens of the distribution network will also be achieved by better connectivity of the elements behind the metering point with the elements in front of the metering. Slovenia will establish an incentive legislative framework for faster community development in the field of renewable energy use (joint power plants) and target investments in RES in areas where no major additional investments in the network are needed. As part of the planned legislative measures, promote the flexibility of consumption and all active customer roles (encourage the introduction of battery storage, distributed generation, community aggregation, energy communities, simultaneous contracts with several suppliers and independent aggregators, the possibility of supply at dynamic prices, etc.).

2 ENERGY PLAN(S) SELECTION AND ANALYSIS

Local energy and climate action plans that were adopted before 2020 have not have any measure special designed for microgrids or energy communities.

4 municipalities were selected to introduce microgrids and energy and RES communities in their new local energy and climate action plans:

- Municipality of Selnica ob Dravi,
- Municipality of Ruše,
- Municipality of Lovrenc na Pohorju and
- Municipality of Maribor.

3 LECC were already approved by municipal council and the ministry at the end of 2021 and in January 2022. Municipality of Selnica ob Dravi will have the reading in February 2022. LECC are valid till 2031.

2.1 Barriers for microgrids and energy communities

There are many barriers for establishing microgrids and energy communities in Slovenia:

- complexity of administrative procedures (for the regulation of self-sufficient community the investor needs almost three times more documentation than in the case of individual self-sufficiency);
- long waiting periods for obtaining consent for the connection of power plants by electricity distributors and in many cases refusing consents due to network incapacity;
- old and inefficient electricity networks with not enough capacity, no intelligent networks with new technologies that take into account the dynamic demands of consumption and planned diversified production;
- low knowledge about electricity and grid operation;
- historical background and not enough knowledge about company management, especially in the field of energy.
- relatively cheap electricity and running national scheme for net-metering.

2.2 Local/regional potentials for microgrids and energy communities

There is big potential for microgrids and energy communities in Slovenia.

LOCAL/REGIONAL AUTHORITIES IN CHARGE OF THE PLAN

2.3 Strategic vision

All municipalities where measures for microgrids and energy communities were adopted have the vision to be active municipality and working strong to achieve climate neutrality and environmental and economic as well as social benefit for citizens.

2.4 Contacts and meetings

- Municipality of Selnica ob Dravi, Mrs. Suzana Prajnc and Mr. Karl lampreht
- Municipality of Ruše, Mr. Saša Ajd
- Municipality of Lovrenc na Pohorju, Mr. Marko Rakovnik
- Municipality of Maribor, Mr. Marko Rojs and Mr. Tomaž Robič

The preparation of new LECC is more than 1 year. In all municipalities many meetings, discussions and analysis were done to prepare a list of measures. Different local administrative staff, technical and financial experts cooperated. Important discussion was also with mayors and vice mayors to understand the importance of local production and open electricity market where all citizens could work and benefit. The documents were presented at the municipal council where politicians have heard and asked about the measures and what positive influences they could have.

3 DEFINITION OF THE MEASURES/Strategies SUPPORTING MICROGRIDS AND ENERGY COMMUNITIES

All involved municipalities have the same measures.

3.1 Reasons for proposing the measure

To implement more RES, to use local sources, to be independent, to be active market player, to get economic and social benefits, to achieve carbon neutrality and care for the environment.

3.2 Measure/Strategy description

- Promoting the self-sufficiency of residential and commercial buildings

Due to the growing number of climate storms, blizzards, ice,... resulting in power outages. Remediation of the damage can take several days, which cuts off residential and commercial buildings from the electricity grid for a few days. The Decree on Self-Supply of Electricity from Renewable Energy Sources determines three types of self-sufficiency: individual self-sufficiency, self-sufficiency of multi-apartment buildings and self-sufficiency of the community for the supply of energy from RES.

Activities:

- promoting self-sufficiency in electricity for residential, multi-apartment and commercial buildings
- promoting energy communities,
- conducting lectures on the topic of self-sufficiency in electricity and the installation of a solar power plant
- conducting lectures on the progress of the construction of a solar power plant - from the decision to the micro power plant

Promoting the establishment of electrical micro-networks

A micro grid is a small electrical network that can operate independently or be connected to the state electrical network. It involves several energy stakeholders in energy production and consumption. This can be e.g. one or more solar power plants connected to one or more users who have their own electricity provided when it is available. They can be connected to the national electricity grid, which provides them with energy when their own resources are not enough, but they can only operate with their own source. Where the micro-network does not have a connection to the national grid, it must have the capacity to store energy and sufficient capacity to start the grid. In addition to increasing the use of RES, the advantages of micro-networks are that in more remote places, which are often less connected to the state electricity networks and thus more often exposed to power outages during natural disasters, they reduce the vulnerability of the population to electricity supply. Microgrids are also possible in the field of heat production

The activities under this measure are:

- Create a supportive environment for the development of micro networks;
- Preparation of educational and promotional material
- Awareness raising through various channels;
- Feasibility study for the establishment of a micro network in the municipality;
- Established network and energy obtained from RES.

Energy and RES communities

According to the amended Decree on self-sufficiency in electricity from renewable energy sources from 2019, self-sufficiency may be individual in the case of individual household or small business

customers. In the case of interconnected household and small business customers with a self-sufficiency device, it is a matter of community self-sufficiency:

- which may include the self-sufficiency of multi-apartment buildings, or
- RES community, which can be connected to customers who consume electricity through two or more metering points that are or are connected to the low-voltage network of the same transformer station. According to the new Act on the Promotion of the Use of Renewable Energy Sources (ZSROVE), end customers can connect to community self-sufficiency in two ways: (1) by establishing an independent legal entity or (2) on a contractual basis under the rules of contract interpersonal relationships. The RES Community, which has legal personality, is a community based on open and voluntary participation, independent and effectively controlled by partners or members located in the vicinity of renewable energy projects owned by that legal entity. and develops them. The main goal of the RES community is to provide environmental, economic and social benefits to its partners or members or the local areas where it operates, and not so much financial gains. These RES communities may choose any legal form of entity, provided that such entity can exercise rights and assume obligations on its own behalf. The Electricity Supply Act defines the Energy Community of Citizens, which is established as a cooperative and operates in the electricity markets as a legal entity, without its members losing their rights as final customers. Such an energy community is based on voluntary and open cooperation, effectively controlled by members or partners, which can be natural persons, local authorities, including municipalities or small businesses. Its primary purpose is to ensure the environmental, economic or social benefits of the community for its members or partners or for the local areas in which it operates, and not to generate financial gain. It may participate in production, including production from renewable sources, electricity supply, consumption, aggregation, energy storage, energy efficiency services or the provision of charging services for electric cars, or its members or. provides partners with other energy services, such as electricity sharing the energy they produce in their device, which does not affect the payment of network charges and other charges.

The activities under this measure are:

- In connection with the previous measure, prepare several technical variants for the installation of the self-sufficiency device / devices and the establishment of community self-sufficiency.

3.2.1 Impact quantification

- measuring energy production from microgrid
- number and size of energy communities

3.2.2 Economical benefits

- reducing energy costs
- local self-sufficiency in energy
- establishing company
- more jobs

3.2.2.1 Environmental benefits

- use of energy from renewable energy sources
- impact on more efficient energy use
- reduction of CO2 emissions
- reducing the amount of dust particles

3.2.3 Social benefits

- fostering local cooperation
- new knowledge, skills and experiences
- old and young generation could be involved

3.2.4 Measure template

Measure name	
Short description of the measure	
Activities to be implemented	
Goals	
Responsible person or organisation	
Financial plan and sources	
Time of implementation	
Indicators of success	
Yearly energy savings	
Yearly CO2 savings	

4 INTRODUCTION OF MICROGRID MEASURES IN ENERGY LOCAL PLANS

4.1 Recommendations for the measure implementation

It is very important that local stakeholders understand the measure, so it is necessary to constantly carry out educational and communication activities. People need to understand the activity if they want to be actively involved. It is also necessary to carry out smaller pilot projects and invite as many people as possible to the soldiery. All possible financial mechanisms and EU funds must be used. With successful small projects, people will see the benefits and understand how they work. It is necessary to constantly cooperate with the network operators and the energy regulator in order to foster the implementation of all technical measures to enable the connection and operation of smart grids.

4.2 Monitoring indicators and measure update

Each year the results of implementation will be checked and reports prepared. The reports will be presented to the municipal council and to the responsible ministry and publicly available.