



ACTIVITY 1.2

REVISION OF LOCAL ENERGY PLANS THROUGH

INVOLVEMENT OF CITIZENS AND OTHER STAKEHOLDERS

DELIVERABLE 1.2.4.
Energy Roadmap

Version 1
03 2020



Introduction

The purpose and goals of the Sustainable Energy and Climate Action Plan of the City of Prelog (SECAP) 2020 is to:

- 1) identify the progress of the implementation of its SEAP, which has been adopted in 2014, and estimate its progress in reducing emissions in comparison to the initially established Baseline Emission Inventory
- 2) identify a new set of measures that the city can conduct until 2030 to further decrease its emissions and increase resilience to climate change, while at the same time involving citizens in the planning and decision-making process
- 3) Identify most vulnerable sectors in city area that are most likely to be hit first by the upcoming climate changes
- 4) identify measures and activities that the city can conduct in order to increase its resilience to the upcoming effects of climate change

Basic input data for the preparation of this document are the Sustainable Energy Action Plan of the City of Prelog (SEAP) from 2014, the Development Strategy of the City of Prelog from 2018 to 2028, data from participation in the ENES-CE project and the Climate Change Adaptation Strategy in the Republic Croatia for the period up to 2040 with a view to 2070 NN 46/2020. As part of the ENES-CE project, interviews were conducted with local entrepreneurs and representatives of local authorities, who also contributed to the understanding of the situation in the City of Prelog.

The vision of the city of Prelog is to become one of the economic centers of Northern Croatia, a highly developed and technologically modern economy, full of employment opportunities, a place where education and acquisition of knowledge are a way of life, place that is comfortable and attractive for all generations, place based on traditional values, cultural and natural heritage and sustainable development. In order to achieve this vision, the City of Prelog has, among other things, signed the Agreement of Mayors from 2013. In 2016 the Development Strategy of the City of Prelog was completed which, as one of the strategic goals, includes strengthening infrastructure, environmental protection and sustainable space and resource management.

This Action Plan is the next step in strengthening adaptation to climate change. It provides overviews of the risks identified by the analysis of energy consumption and emissions inventory and with the assessment of vulnerabilities and risks due to climate change.



Sectors / Stakeholders

In terms of mitigation measures, the City of Prelog mainly focuses on the sectors of energy, transportation and building, while in terms of adaptation to climate change it is most vulnerable in the sectors of agriculture, forestry, water resources and public health.

The main stakeholder groups that the City of Prelog can collaborate in order to increase its mitigation and climate adaptation efforts are:

- 1) Local small and medium sized enterprises (SME)
 - Local SME's have increased their heating and cooling demand, driving up natural gas consumption by 54% in comparison to the BEI from 2014 and electric energy consumption by almost 2.8 times the consumption from 2011. While this indicates the city has achieved substantial growth in its economic activity, it also shows that it has increased its carbon footprint, despite some of the measures implemented from the SEAP. It is in the interest of both the SME's and the city to reduce the costs related to their energy consumption - mainly by decreasing their demand for natural gas i.e. heating and cooling needs, but also by procuring electricity from sustainable sources or producing this onsite (for example with solar PV panels). At the same time, implementing the measures from the SECAP is an opportunity for local SME's (not necessarily from Prelog but from the region) to supply the city with the needed equipment. Ideally the city should strive to implement those measures that can at the same time benefit the local economy.
- 2) Agriculturists / Farmers
 - The upcoming climate change will most likely impact agricultural production in the area. Therefore, it is in the interest of the local farmers to mitigate and adapt to these future changes. The City can support this through conducting some of the measures that are highlighted in the SECAP - especially those that target the education of farmers to deal with the new conditions, for instance by planting more climate resilient crops, implementing intelligent irrigation systems etc.
- 3) Local citizens
 - Local citizens are of paramount importance for implementing the measures from the SECAP. Through their continued education and awareness raising they can mitigate climate change on an individual level - for instance by conducting energy efficiency measures in their homes, recycling waste, adopting sustainable transport options etc.



Aims and goals of the Municipality

Based on the revision of measures and activities proposed by SEAP 2014, we have chosen the ones that are most relevant for the above-mentioned stakeholders¹.

The analysis of the existing 2014 SEAP of the City of Prelog as part of the ENES-CE project included the individual analysis of all the proposed measures to reduce CO₂ emissions defined in the SEAP. In cooperation with the representatives of the city of Prelog, measures were individually analyzed and the progress of each of the envisaged measures was assessed and presented in a separate document whose summary will be presented here.

Overall analysis of all individual measures has shown that little progress has been made in implementing the measures under the 2014 Sustainable Energy Action Plan (SEAP) of the City of Prelog. Furthermore, implementation of several measures has not even begun, and rarely measures are progressing at an appropriate pace or are in a high degree of completion. As a reason, local stakeholders primarily cite lack of adequate sources of funding from national and EU funds, and lack of willingness to take on financial risk from citizens when investing in the projects outlined in the measures, due to the lack of a clear picture of the profitability of the investment and the lack of funds for co-financing from public sources.

Through the analysis of individual measures, external stakeholders have also been identified with significant potential impact for the implementation of individual measures. In the city of Prelog, there are no professional organizations or external experts who could contribute in a qualitative way to the development or implementation of the action plan, however, there are citizens' organizations and companies that could be engaged in the implementation of certain measures that are relevant to their activities. An example of this is e.g. even two cycling clubs that are already influencing the implementation of a measure to encourage the use of bicycles as a sustainable means of transport that reduce emissions from fossil-powered passenger cars, but do so independently and without coordination with the city government.

Due to the limited funding and professional capacities available from public sources it is the involvement of citizens and the creation of partnerships with interested stakeholders that is potentially the key that can provide great momentum for progress - by engaging local stakeholders in implementing measures and supporting city government in their efforts. Whether they are technical experts, business owners with an economic interest in implementing measures, various citizens' associations or citizens in their various roles - parents, homeowners, company employees - there is great potential for much more significant implementation of GHG reduction measures compared to the SEAP analyzed, if

¹ The explanation of this section was not vast enough, so we have been focusing only on the measures that are showing the significant impact on current stakeholders.



the stakeholders are involved in the planning and implementation of measures when developing the SECAP, which is the next step within the ENES-CE project.

By analyzing the vulnerability of the City of Prelog, we concluded that the city authorities should pay special attention to the sectors of agriculture, forestry, water resources and human health. Due to its geographical area, the City of Prelog is exposed to more and more frequent heat shocks and droughts and now is the time to take preventive measures.

Most relevant measures from SECAP 2020 in the climate adaptation domain are as follows:

- 1) Workshops for local farmers on the risks posed by climate change and activities to mitigate them.
 - Relevant for: AGRICULTURISTS / FARMERS
- 2) Development and distribution of promotional materials on the effects of climate change on human health and how to protect oneself.
 - Relevant for: ALL STAKEHOLDERS
- 3) Mapping of water sources outside the public water supply system and water quality analysis.
 - Relevant for: ALL STAKEHOLDERS
- 4) Project of creating new green "forest" areas in the City area.
 - Relevant for: LOCAL CITIZENS

Tools and sources used by the municipality to support partners

The following tools and sources will be provided by the City of Prelog to support all involved partners / stakeholders.

- 1) Communication materials focused on mitigation and adaptation:
 - a. Communication about relevant topics and results of actions on the city area via City of Prelog website and official Facebook page. This can be also transferred via local radio and TV stations. Focus is on eco-friendly (digital) channels of communication.
 - b. Data repository about achievements and latest updates on action plan can be incorporated within the official website so it is available for anyone, publicly.
 - c. Written materials and brochures for people that are not digital or technical savvy. To decrease the level of paper consumption, the City can determine the households that should be communicated this way (for instance those with more elderly population)
- 2) Networking and knowledge transfer:
 - a. The City of Prelog and dedicated Internal Sustainability Officers can prepare twice a year a local conference on the topic of "Energy consumption mitigation and adaptation to climate changes - What is our role?" where people can hear the latest achievements in this field on



national and local level. This way local people can have open discussions and place for Q&A to the local authorities that drive the action plan. This also enables creation of small support communities within local citizens and idea sharing hub.

- b. Online webinars can be done more often directly via Facebook or any other platform (for example, for any major achievement) and/or informing citizens about climate mitigation and adaptation
 - c. Study trip in September 2020 to Germany (Pfaffenhofen an der Ilm) for best practices exchange. Other similar study trips can facilitate the exchange of best practices.
- 3) Public facilities:
- a. The City of Prelog can offer its public facilities to local citizens, entrepreneurs, or other interested groups to use it for brainstorming sessions and meetings that support action plan whenever they need.
- 4) Other:
- a. The City of Prelog can dedicate one person in local authorities to be assigned to constantly review possibilities around, green financing sources (such as EU funds) and suggest actions based on insights (e.g. to work in stakeholders best interest).

Actions for involving Partners / Stakeholders

Based on the initial consultations with citizens, interviews with local stakeholders and expert analysis, the following three projects have been chosen as top candidates to be implemented in the second phase of the project. Therefore we present only them although the new SECAP has identified 26 measures (9 of which have been adopted and modified from the SEAP of the City of Prelog, as they are promising but were not implemented to a large extent in the period between 2014 and 2020).

Workshops for local entrepreneurs on financing energy projects

The workshop should aim to bring together city representatives, relevant experts, and local entrepreneurs to discuss the role of reducing energy consumption (through natural gas consumption) in local industrial infrastructure. The primary focus would be on identifying large energy consumers. It would also focus on finding financial resources (public and private) to make it easier for these same consumers to move to more sustainable ways of doing business. For example, under the EU Green Deal - the European Commission's main investment initiative to boost the economy and tackle climate change at the same time - and other similar EU funds.

	DESCRIPTION OF ACTION
ACTION NAME	Workshops for local entrepreneurs on financing energy projects



CONCRETE REDUCTION MEASURES	It is not possible to directly measure the effects of this measure.
COST EFFICIENCY OF THE PROJECT	18.000 HRK per workshop / total of 54.000 HRK
TIME FRAMES AND ASSIGNED RESPONSIBILITIES AND SUPPORTING ACT OF THE MUNICIPALITY	<p>The commercial sector of the City of Prelog is among the sectors most responsible for the increase in emissions - in comparison to 2011 emissions from the sector have increased by 87,91%. Based on this we suggest a series of workshops aimed at the commercial sector and with the purpose of educating those stakeholders in measures to finance energy projects within their production facilities. The goal is to inform them about possible private and public funds, and enable them to more easily estimate the profitability of individual energy saving measures or measures to produce renewable electricity. The educations would consist of:</p> <p>Module 1: Feasibility studies of energy projects - a workshop for entrepreneurs designed to understand the calculation of cost-effectiveness of projects, as a step towards launching projects aimed at reducing energy consumption and CO2 emissions. This module can use Tool 2 developed as part of the ENES-CE project.</p> <p>Module 2: Project financing - workshops intended to understand the sources of financing for launching projects to reduce energy consumption, i.e. energy efficiency in production processes. Under this module, participants would gain insight into the advantages and disadvantages of various sources of financing including financing with loans from commercial banks, EU funds, etc.</p> <p>Module 3: EU Funds - a workshop designed exclusively to understand access to EU funds in the field of environment and energy. As part of this, the intention is to bring as guest lecturers' consultants who are professionally engaged in writing EU projects and to go through the whole process in a targeted manner.</p> <p>Module 4: Public private partnerships - a workshop to define concrete steps in developing such a partnership. Some possible elements of this cooperation could be reducing of administrative hurdles for installing renewable energy installations, developing turnkey solutions for projects etc.</p>
TIME FRAME AND ASSIGNED RESPONSIBILITIES OF THE PARTNER	<p>This measure is primarily focused on local entrepreneurs whose facilities have high energy consumption. The Partner (local SME) will be notified about the workshop and highly recommended to attend it. Their obligation will be to explore other options that are applicable to its facilities, where experts will support them in choosing the best option for them.</p>

Bike sharing project and construction of bike lanes

In addition to the increase in energy consumption in the business sector, this analysis found that the private transport sector is responsible for the largest increase in emissions compared to the SEAP (102% or additional 6.954.17 kg CO2). Given this, we believe that in the City of Prelog emphasis should be on encouraging the use of vehicles that do not use fossil fuels by 2030. Although this primarily includes the transition to electric cars, we believe that in the short term it is most cost-effective to encourage the use of electric bicycles and bicycles in general. More intensive use of bicycles would also reduce emissions, as well as enable more flexible movement of citizens between these settlements, as well as in Prelog itself.

For this purpose, we propose that the City of Prelog helps establish a bike sharing system. A bicycle sharing system, or public cycling scheme, is a service in which bicycles are made available to individuals for short-term use. In addition to this service, the City of Prelog needs to improve the existing infrastructure for the use of bicycles, by building bicycle paths.



DESCRIPTION OF ACTION	
ACTION NAME	Bike sharing and construction of bike lanes
CONCRETE REDUCTION MEASURES	Reduction of transport emissions by 10% until 2030
COST EFFICIENCY OF THE PROJECT	Around 4.2 million HRK
TIME FRAMES AND ASSIGNED RESPONSIBILITIES AND SUPPORTING ROLE OF THE MUNICIPALITY	<p>Phase 1: Locating locations for bicycle stations: identify the main routes of movement of citizens between the settlements of the City of Prelog. In doing so, it is necessary to conduct a study that determines the main routes of movement of citizens on a daily basis. This would also determine the need for this measure. Given the possibility that citizens do not travel only between the settlements around Prelog and the City of Prelog, but on longer routes - for example, the City of Prelog - Čakovec. The study would indicate the real effect of this measure. Further to the study, this project should be revised and focus only on those routes on which the introduction of bicycles would really increase the mobility of citizens. Besides this it is important to identify the exact model of the system I define questions like charging for using of the bikes.</p> <p>Phase 2: Estimation of the cost of performance: identify the need for the construction of additional bicycle paths and accordingly calculate the necessary financial resources. Also identify the exact cost of developing a mobile service for bike sharing.</p> <p>Phase 3: Project financing: finding financial means for project financing. This Phase could be linked to the project workshop described above.</p> <p>Phase 4: Implementation: construction of bicycle paths, purchase of bicycles, construction of bicycle stations, etc.</p> <p>An alternative to the above steps is to invite private companies to build and maintain a "bike-sharing" network, with the payment of a concession to the City of Prelog. Given the existing associations of cyclists in the City of Prelog, this measure could gain significant support from citizens.</p>
TIME FRAME AND ASSIGNED RESPONSIBILITIES OF THE PARTNER	This measure is primarily focused on local citizens, as they will use the bikes the most.

Crowdfunding project for solar panels

Crowdfunding of renewable energy in Croatia was first initiated by UNDP Croatia and later on adopted by Zelena Energetska Zadruga and Zadruga za eticno financiranje. We envisage that such a campaign could both boost the visibility of the City of Prelog efforts in implementing the SECAP among the local population, but also match the initial funding from the ENES-CE project (15.000 EUR). Due to the increased energy consumption within the city's industrial zones, we recommend the action to take place in collaboration with a local SME, situated in the industrial zone. Local participants in crowdfunding should be gathered in a dedicated entity - energy cooperative, citizen energy group or similar.

DESCRIPTION OF ACTION	
WHICH SECAP ACTION THE PROJECT IS CORRESPONDING TO	Crowdfunding project for solar panels



CONCRETE REDUCTION MEASURES	If 33 kW are developed as a pilot project - 0.37% reduction potential,
COST EFFICIENCY OF THE PROJECT	50.000 - 80.000 HRK for the promotion campaign, 30.000 EUR for a 33kW project
TIME FRAMES AND ASSIGNED RESPONSIBILITIES AND SUPPORTING ROLE OF THE MUNICIPALITY	<p>The results of the SECAP 2020 analysis showed that electricity consumption in the enterprise sector increased by 280% in comparison to the base year of 2011. For this reason, it is necessary to raise awareness and use renewable energy sources, as this will consequently reduce CO₂ emissions.</p> <p>The project is aimed at entrepreneurs as the largest consumers of electricity in the city. In cooperation with the City, entrepreneurs would launch a crowdfunding project on one of the well-known platforms (e.g. Indiegogo, Citizenergy, Causes, etc.) or implement a crowdfunding project similar to the project of the Green Energy Cooperative from Križevci.</p> <p>The first step is to identify the largest consumers of electricity in the industrial zone, and accordingly allocate the obtained funds. The largest consumer should also play a leading role in the campaign. The city would dedicate up to two person to help entrepreneurs find a suitable platform and prepare a project proposal. If necessary, an external consultant with experience in crowdfunding campaigns can be hired.</p> <p>Phase 1: Preparation of the campaign - finding an adequate partner from the private sector through a public call of the city. Detailed preparation of the campaign including the creation of a crowdfunding site on one of the identified platforms, the development of a communication strategy and the establishment of an implementation team (consisting of 2 to 3 full-time employees for one month).</p> <p>Phase 2: Implementation - intensive communication with citizens, holding public events at the local level with the aim of raising funds, etc.</p> <p>Phase 3: Installation of the PV system</p>
TIME FRAME AND ASSIGNED RESPONSIBILITIES OF THE PARTNER	This measure is primarily focused on local entrepreneurs with facilities bigger than 1000m ² and with high energy consumption. Based on this projects it would be beneficial to establish an energy group or cooperative that would further lead the process within the City of Prelog in the future.



Timeline

The following image is showing the assumed timeline for 3 projects that were mentioned above, related to CO₂ level decrease.



