



Regional Action Plan for Energy Storage and Sector Coupling Podravje, Slovenia

Version final

A stream of cooperation



The CSSC Lab project summary

The CSSC LAB project is being funded within the third call of the INTERREG DANUBE TRANSNATIONAL Programme of the European Commission, under the specific objective SO 3.2: Improve energy security and energy efficiency. It aims to contribute to the energy security and energy efficiency of the region by supporting the development of joint regional storage and distribution solutions and strategies for increasing energy efficiency and renewable energy usage.

The CSSC project targets medium-sized and smaller target cities in the Danube area, aiming to accelerate the up-take of energy storage and sector coupling solutions. To build up the capacities of municipalities and related city actors to assess, define and implement concrete implementation projects, the CSSC Lab project will:

- develop a set of model solution for typical urban CSSC use cases, together with a toolkit for the assessment of potential CSSC applications in terms of energy efficiency indicators, operational requirements, related business models and financing solutions
- a comprehensive capacity building programme for municipalities with local basic and advanced trainings, complementary webinars and individual city coaching sessions will be developed and piloted
- pilot investments will be established in four demo-centers in different locations in the project region to demonstrate the feasibility and performance of typical CSSC solutions
- a series of study visits and demo sessions will allow city representatives from all parts of the project region to learn from practical demo-cases implemented under Danube region framework conditions.

About this document

This document is part of OT.1 within T1.1 of the CSSC Lab project and will contribute to SO3. This document was prepared by LEASP and The Municipality Destrnik in cooperation with regional partners and Alba Local Energy Agency - ALEA – work package lead partner.

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1. General Information

Country:	Slovenia
Region:	Podravje (NUTS2)
Responsible partner(s):	LEASP, Municipality Destrnik

2. Aim of the Regional Action Plan

The main objective of this action plan is to present measures to increase the use of energy from renewable sources, energy storage and the merging of sectors. At the forefront of the use of renewable sources is the production of electricity from photovoltaics and in the case of heat, the use of heat pumps. Energy communities and community self-sufficiency come to the fore. The implementation of measures presented in this action plan together with the development of smart grids enables the implementation and further development of energy communities.

3. CHAPTER 1: European, national and regional context

The following legislation, action plans and strategies are responsible for smart grids and communities:

- Integrated National Energy and Climate Plan for the period up to 2030.
- Energy concept of Slovenia.
- Energy Act.
- Act on the Promotion of the Use of Renewable Energy Sources.
- Energy Efficiency Act.
- Electricity Supply Act.

Integrated National Energy and Climate Plan for the period up to 2030

The NEPN predicts that greenhouse gas (GHG) emissions would be reduced by at least 20 % compared to 2005, namely in transport +12 %, in general use -76 %, agriculture -1 %, in waste management -76 %, in industry -43 % and in the energy sector -34 %. Coal use will be phased out by 30 % by 2030. The NECP envisages at least 27 % share of RES in final energy consumption, improvement of energy efficiency by at least 35 % compared to 2007, final energy consumption should not exceed 54.9 TWh/a, reduction final energy consumption in buildings by 70 % per year. It will be necessary to ensure a reliable and competitive energy supply, establish

and maintain a high level of electricity connectivity with neighbouring countries, achieve at least 75 % self-sufficiency in electricity supply, increase the resilience of the electricity distribution network, establish system services and play an active role. with electricity, to develop and integrate energy storage technologies, infrastructure and services, the development of an efficient and competitive market to take full advantage of the flexibility of the electricity system, which undoubtedly shows the orientation towards the development and establishment of smart grids.

Energy concept of Slovenia (EKS)

The EKS sets out an energy policy strategy for 2030 and a vision for 2050. The EKS has not yet been approved by the National Assembly, but contains two ambitious goals:

- reduce energy-related greenhouse gas emissions by at least 40 % by 2030 compared to 1990 levels.
- reduce energy-related greenhouse gas emissions by at least 80 % by 2050 compared to 1990 levels.

Energy Act (Official Gazette of the Republic of Slovenia, No. 60/19, 158/20 - ZURE, 121/21 - ZSROBVE, 172/21 - ZOEE, 204/21 - ZOP)

The Energy Act sets out the principles of energy policy, in particular reliability and quality energy supply, diversification of energy sources, competitive energy supply, use of RES and flexibility of energy consumers. It determines the competencies and responsibilities of the Energy Agency and defines the energy infrastructure (energy network and other energy facilities and other networks) and determines the procedures and authorizations for the location of energy facilities in space. The construction of electricity infrastructure, especially the transmission and distribution network of electricity, is specifically defined.

Electricity Supply Act (ZOEE) , (Ur.l.RS No. 127/21)

This Act lays down the rules for the operation of the electricity market, generation, transmission, distribution, storage and supply of electricity, the rights of final customers, security of supply measures and measures to prevent energy poverty.

The first part of the Act describes the rights and duties of the electricity distributor, the rights of final customers, the necessary consents and conditions for connection to the electricity network. Article 17 of the Act speaks of the right to a contract with dynamic electricity prices, if of course it has a built-in advanced electricity meter, which is the basis for entering the market as a prosumer (producer and consumer of electricity). The end customer or prosumer has the right to periodic information on electricity consumption.

Article 24 defines the energy communities of citizens (established as a cooperative) who can be self-supply producers or sellers of electricity. Article 28 stipulates that the distribution operator must install advanced electricity metering systems at final customers, and the technical requirements of the advanced metering system are stipulated in Article 29 of this Act.

Article 45 determines the activity of the system operator (ELES), which must ensure secure, reliable electricity supply, construction and maintenance of the transmission system, provision of long-term network capacity, management of electricity flows, organization of the balancing services market, the purchase of electricity to cover losses in the transmission system, the provision of long-term capacity and the operation of the transmission system and the quality of supply.

With the consent of the Energy Agency, the system operator may own or develop, operate and operate electricity storage devices (eg batteries and pumps). Article 65 stipulates that the system operator must include advanced technologies in the provision of system services.

Article 69 determines the activity of the distribution operator, especially with regard to the maintenance of the distribution system, planning and development of the distribution system, capacity, quality of supply and purchase of electricity to cover the losses of the distribution system. ELES also performs these tasks in the Republic of Slovenia. Every two years, he is obliged to prepare a development plan for the distribution network, which also includes smart grid planning. Article 77 requires the electricity operator to enable the connection of charging stations for electric vehicles as easily as possible. It may also, with the consent of the Energy Agency, own or develop and operate electricity storage facilities, provided that these elements are fully integrated into the grid.

Articles 126 and 127 determine the network charge for the distribution system and the connecting power, which are intended for financing the maintenance and development of the distribution system. Pursuant to Article 130, the Energy Agency determines tariff items for electricity, both static and dynamic.

Article 139 sets out the procedures and requirements for connection to the transmission and/or distribution system. A legal or natural person must acquire:

- consent for connection (by which the system operator checks the technical properties and the method of connecting the equipment to the network);
- after the installation of the equipment, he must sign a connection contract.

Act on the Promotion of the Use of Renewable Energy Sources

(ZSROVE), Ur. L. RS no. 121/21, 189/21)

The law stipulates that all RES energy producers must obtain an appropriate declaration for the production of electricity from RES, which confirms that the plant meets the conditions and requirements regarding the type of energy production plant, suitability of metering equipment, energy sources used, selected operating regime and device efficiency requirements. The Energy Agency also issues a certificate of origin of energy produced, e.g. from renewable sources. Such installations, which have a valid declaration and certificate of origin, are eligible for financial support for the electricity produced if the production price is higher than the market price. Contracts for concluding grants and paying out grants are implemented by Borzen, as a support center. The law also sets out the possibilities for joint projects with Member States and third countries with a view to improving energy supply and the quality of supply, as well as in the field of smart grids.

Article 37 of the Act stipulates that end customers connected to the network may become end customers with self-sufficiency as individuals or through self-sufficiency communities, which is the basis for the development of smart grids. Article 38 stipulates that self-sufficient producers may consume the produced energy themselves, store it or sell it on the market, so in the case of electricity production alone, they may only store it in batteries. Such prosumers are entitled to non-payment of part of the network charge for electricity supplied to the grid, other charges and a proportionate part of the power contribution.

Article 42 determines the procedures for the construction and start-up and operation of installations for the production of energy from RES:

- consent for connection from the distribution operator;
- signing a connection agreement with the distribution operator;
- contract on access to the electricity network (contract on the use of the system).

Article 51 stipulates that the state must establish these. a contact point that guides investors in the construction and commissioning of self-sufficient devices. The Borzen Support Center has been named. Field tasks will be taken over by local energy agencies next year.

4. CHAPTER 2: Engagement of decision makers and other key stakeholders in the region

Regional Approach

Stakeholders

For the regional action plan in Slovenia, several stakeholder groups have been identified:

- Mayors and municipal representatives
- Utilities
- Regional small and medium size enterprises
- Households

5. CHAPTER 3: SWOT analysis of the regional context

<p>STRENGTHS</p> <ul style="list-style-type: none"> • The grid is relatively stable as it is a part of a large EU energy system • Investments in the development of smart grids • Prepared is a new Electricity Supply Act that includes sector coupling and energy storage, which indicates the political support in this area • the need for energy storage has been recognized by all key actors 	<p>WEAKNESSES</p> <ul style="list-style-type: none"> • Outdated grid infrastructure • Poor preparedness for the challenges of dispersed electricity generation and storage • Currently lacking policies on sector coupling and energy storage • Slow development of appropriate policies • No support schemes for CSSC investments • Lack of investors
<p>OPPORTUNITIES</p> <ul style="list-style-type: none"> • Introduction of energy storage to ensure grid stability and flexibility • To support the development of national policies/strategies for CSSC • To push the further development of financial support schemes for new energy projects that include Sector coupling and energy storage • Opportunity for further research and development of new technologies 	<p>THREATS</p> <ul style="list-style-type: none"> • Electricity from dispersed sources can adversely affect network stability • No political support from local representatives • financial support programs will not adapt to the development of the CSSC • low interest to implement CSSC solutions by potential investors

- Opportunity for the development of new services

6.CHAPTER 4: ACTIONS

Action 1	One stop shop for RES projects
<p>Brief description</p>	<p>Among the novelties of the extensive legislative act in the field of energy, adopted by the European Union (EU) under the 'Clean energy for all Europeans', is the introduction of a contact point that Member States are obliged to provide to help investors in the administrative field of RES investment.</p> <p>The directive thus "establishes a contact point between measures to simplify, speed up and increase the harmonization of administrative procedures related to investments in RES".</p> <p>The establishment of a contact point for the Borzen Support Center is required by the National Renewable Energy Promotion Act (ZSROVE), which was adopted in July 2021.</p> <p>At the request of the applicant, the contact point will direct applications for permits and other acts, such as spatial acts, licenses, registrations and administrative actions necessary for the construction, reconstruction, renovation or operation of the production plant and for obtaining support for the production plant. This includes in particular:</p> <ul style="list-style-type: none"> • application for a public tender for support; • the decision on the conclusion of support and the conclusion of a contract on it; • amendment or adoption of a spatial implementation act; • location check; • building permit; • water permit;

	<ul style="list-style-type: none"> • operating Permit; • consent to connection to the transmission or distribution system; • network connection; • environmental and other consents or permits, if required; • any other permit relating to a production facility required for construction or reconstruction and for putting into service; • production facilities.
Activities/ Implementation steps	<ul style="list-style-type: none"> • Establishment of a contact point in Slovenia • Performing tasks as described above • Providing information on incentives for the use of RES • Integration into the self-sufficiency system and the creation of community self-sufficiency • Preparation of a guide for investors
Timeframe	<ul style="list-style-type: none"> • The establishment of a contact point and information system is currently underway. • The implementation of the contact point will start at the end of 2022
Milestones	Commencement of the contact point in 2022
Estimated costs	n/a
Financing sources	n/a
Estimated impact/results	Increased investments in RES projects
Actors involved	Borzen, Local Energy Agencies

Action 3	Promoting home battery storage
Brief description	During the regional action planning workshop, small stationary battery storage for households have been identified as a feasible solution for the future.

	<p>Battery storage in individual buildings in Slovenia is currently not being implemented. The net-metering system we have in place makes it not feasible to use batteries to store electricity from PV. There are discussions and “efforts” to change production and consumption billing within the net-metering system and with this changes the battery storage will become feasible and will gain on importance.</p> <p>In the frame of the CSSC Lab project, Municipality of Destrnik together with LEA Spodnje Podravje implemented a system of photovoltaics combined with a stationary battery as an alternative to the existing net metering system and electric vehicle charging station. The demo center in Destrnik will serve as a showcase for all local/regional/national promotional activities.</p>
Activities/ Implementation steps	<ul style="list-style-type: none"> • Promotion of the Demo centre in Destrnik. The activities will include presentation of the demo centre at national/regional events, media, site visits • Promotion of home battery system in the frame of regular LEASP activities
Timeframe	2022 -2025
Financing sources	Own sources, future EU projects
Estimated impact/results	<ul style="list-style-type: none"> • Increase of use of stationary battery systems is expected after 2023, when the new Regulation on self-sufficiency in electricity from renewable energy sources comes into play.
Actors involved	<ul style="list-style-type: none"> • LEA Spodnje Podravje • Municipality Destrnik • Municipalities in Spodnje Podravje

Action 3	Energy storage in DH system
Brief description	Municipality of Ptuj aims to renovate and upgrade the local district heating system with the transition to renewable sources. Because of the decline in the heat consumption due to the

	<p>renovation of buildings connected to the district heating system, the expansion of the network has been shown to be economically justified. With the reconstruction of the district heating on natural gas an additional wood chip boiler will be installed in order to meet the requirements of the Energy Act of Slovenia, which imposes at least 50 % of heat generated from renewable sources or waste heat, or 75 % of heat produced from CHP or 75 % as a combination of all above. The district heating system today: 55 % of heat is provided from 3 natural gas boilers (3 x 7 MW, 1985) and 45 % from the combined heat and power plant – CHP (2,3 MW) The district heating system includes 44 heat substations:</p> <ul style="list-style-type: none"> • 27 apartment blocks (103.729 m²); • 2 single house buildings (300 m²); • 15 non-residential buildings (54.086 m²). <p>The total installed capacity of the heat substations is 22.576 kW. The annual average of the delivery of heat energy is 10.932 MWh. Project scope: Renovation of the boiler house with the transition to RES. Upgrading and reconstructing the existing district heating system which is using only natural gas, with a wood biomass boiler. The planned wood chip boiler with the power of 2,3 MW will be able to produce 9,2 GWh of heat (together with heat storage tanks). The peak needs will be covered by existing natural gas boilers.</p>
<p>Activities/ Implementation steps</p>	<p>Renovation of the boiler house. In this phase all necessary construction and installation works will be carried out in order to renovate the boiler house and to move to the use of renewable sources. The construction works are covering the construction of wood chip storage facility and all necessary works in the boiler room that are needed for the new boiler. The installation works are covering the installation of a wood chip boiler, the wood chip transport system, the</p>

	storage tanks, cleaning system for exhaust gases and other necessary works.
Timeframe	<ul style="list-style-type: none"> • 2019 – all necessary permissions are obtained and the start of the construction works can begin. Project is designed so that the 1. Phase can be finished and already put in operation independent from the 2. Phase. • 2022 – start of the works
Milestones	2022 - start of works
Estimated costs	3,2 mio. EUR
Financing sources	Javne Službe Ptuj own resources
Estimated impact/results	Reduction of CO2 emissions of about 2.500 t CO2/a (75 % reduction)
Actors involved	<ul style="list-style-type: none"> • Municipality of Ptuj • Javne Službe Ptuj • LEA Spodnje Podravje