



Regional Action Plan for Energy Storage and Sector Coupling Alba County, Romania

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 Alba Local Energy Agency - ALEA as Romanian partner of the CSSC Lab.

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1. General Information

Country:	Romania
Region:	Alba County (Centru Development Region)
Responsible partner(s):	Alba Local Energy Agency - ALEA

2. Aim of the Regional Action Plan

Based on the identified current situation of the consumption and production of energy in Alba County, and the wider energy context the measures of the present RAP set out to respond to the current concerns related to the energy domain in the targeted region.

The Alba County CSSC Action Plan will accelerate CSSC technology implementation allowing the region to be more energy resilient, reduce negative environmental impacts of fossil fuel-based energy, and save on energy costs. The goals of the plan include:

- Foster local renewable energy projects in cities
- Strengthen energy reliability and security
- Accelerate the development of local sustainability projects and plans
- Boost the creation of EC especially among prosumers
- Reduce energy costs
- Reduce GES/ improve air quality

3. CHAPTER 1: European, national and regional context

The growing demand for energy, the continuous rise of prices, the problems related to energy supply and security as well as the level of the impact of the energy sector on the environment is a constant concern for the EU continuously strengthening its energy policies, in terms of increasing energy efficiency and the use of renewable energy sources, while continuing efforts to mitigate climate change.

At European level the energy initiatives started in October 2014 with the EU's climate and energy policy for 2030, setting the target to reduce greenhouse gas emissions by at least 40% by 2030. Then the Paris agreement confirmed EU ambitions on climate change mitigation, the implementation of the 2030 climate and energy policy framework becoming a long-term priority.

The latest EU Green Deal contains proposals to adapt EU climate, energy, transport, and taxation policies to reduce net greenhouse gas emissions by at least 55% by 2030 compared to 1990 levels.

Among the main elements, clean energy is closely related to CSSC. In this policy area, the EU Green Deal aims to reduce 75% of GES by an accelerated transition of the power sector towards renewable sources creating also an integrated, interconnected and digitalised EU energy market. Hydrogen also plays an important potential to harness reaching o at least 40 GW of electrolysers, producing up to 10 million tonnes of hydrogen by 2030.

Moreover, the EC with its 2030 climate plan aims to reduce greenhouse gasses by at least 55% by 2030 paving the road towards the climate neutrality target by 2050

At national level: The National Integrated Plan for Energy and Climate Change (PNIESC) Romania aims to reach a target of at least 30.7% of energy from renewable sources.

Regarding energy storage, PNIESC sets 2 main measures regarding electrical energy storage: the development of electricity storage capacities in hydroelectric pumping systems development of capacity and mechanisms for the integration of intermittent energy from RES in the National Energy System, in electric storage systems, including small storage capacities at the prosumer's locations.

The PNIESC proposes the development of energy storage capacities in batteries as well indicating the integration in the National Energy System of a capacity in batteries of at least 400 MW.

The Romanian Energy Strategy 2019-2030, with the perspective of 2050, is the new programmatic document that defines the vision and establishes the fundamental objectives of the development process of the energy sector. The document also indicates the national, European and global benchmarks that influence and determine policies and decisions in the energy field.

At regional level: Alba County sustainable energy policy is encompassed in Alba County Energy Strategy for 2018 – 2023 - a document elaborated by Alba County Council in 2017 with the technical assistance from Alba Local Energy Agency. Relevant to the sustainable energy at regional level in Alba County are the local Sustainable Energy and Energy Action Plans - part of the Covenant of Mayors Initiative as well as Efficiency Improvement Programmes - developed in compliance with 121/2014 Energy Efficiency Law for municipalities exceeding 5.000 inhabitants. These regional action plans and strategies are strongly increasing the awareness and interest for RES equipment and CSSC-type approaches in multisectoral settings, supporting the development of e-mobility and charging stations, nZeb buildings, green

public transport, efficient public lighting and equipment for increasing the share of RES in final energy consumption at regional level.

Available financing opportunities for CSSC applications implementation

- Mainly EU funds
- Electric-Up, a financing tool of the Energy Efficiency Directorate, from the Ministry of Energy ; it is the largest programme support for RES and EV chargers in Romania. The programme targets around 2000 SMEs and HoReCa enterprises with an estimated 120 MWp in photovoltaic panels and at least 2000 EV chargers all around Romania. Key requirement is that each SME or HoReCa beneficiary to become a prosumer with electricity injection in the power grid with the excess energy to be harvested by energy communities to cover the energy needs of those prosumers with a lack of generation during daylight.
- "Green House" on-grid PV – is a national programme through which the Authority of the Environmental Funds grants household owners a subsidy of 4 200 € for installation of PVs
- Private financing possibilities (FREE)

Technological aspects of the energy domain linked to CSSC

RES potential in Alba County:

- Biomass in the North West of the county
- Larger scale hydro potential available in the center and South, in Sebes Valley
- Solar is also present but not with great potential for large scale investments
- Wind potential in the Apuseni mountains (North West) but there is difficulty in implementing any investments due to accessibility and grid infrastructure

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

In Romania the stakeholder involvement was approached by:

- a dedicated workshop
- bilateral meetings

Aiming to reach out to targeted local authorities (Cities in Alba County) ALEA also identified the CEESEU (Central and eastern European Sustainable Energy Union - Horizon 2020 project) as support to carry out meetings for discussing CSSC development in the involved cities. The

project which targets SECAP development was a perfect opportunity to tackle the inclusion of CSSC measures in the ongoing SECAP development of the LAs.

The main event dedicated to involve STKs within the CSSC lab project was **the Regional Action Planning Workshop** held online due to ongoing pandemic restrictions. The event was attended by 20 participants and it was set up as a 2 part event:

- Part 1 – Presentation session (Topics: CSSC technologies and CSSC Lab project)
- Part 2 – Interactive discussion on the regional action plan

During the presentation sessions the participants were introduced to the CSSC Lab and the CSSC related technological and financial aspects. The information was centered around the main suitable CSSC technologies identified as model solutions for Alba County cities as well as the main financing and funding sources of CSSC project implementation. Also during the event the ongoing CSSC related projects of Alba Iulia Municipality (the county seat of Alba County) were outlined.

The second part was an opportunity for free discussions among the participants where the goal was to put forward ideas for the regional action plan measures. The session was highly interactive, it enabled participants to present known initiatives related to the CSSC field and they also gave input related to feasible measures. The workshop stemmed ideas that were taken up and introduced as measures in the present RAP.

The workshop was attended by representatives of local authorities (technical staff), an ESCO company, consulting companies, companies operating in the energy field, university and research centers.

Beside the workshop ALEA kept close contact with local authority representatives through bilateral meetings, either through telecommunication means or face-to-face meeting updating on the project in general and on the regional action planning process in particular.

5. CHAPTER 3: SWOT analysis of the regional context

PARTICIPATORY SWOT ANALYSIS OF THE REGIONAL CONTEXT IN BRINGING CSSC APPLICATIONS INTO REAL CASES	
INTERNAL FACTORS	
Strengths	Weaknesses
<ul style="list-style-type: none"> ● Existence in the target region of local energy planning tools (eg. SEAPs and SECAPs, local energy efficiency plans) that could uptake CSSC initiatives at local level ● Existence in the target region of a national planning framework endorsing RES solutions and CSSC technologies (National Action Plan for Renewable Energy, National Plan for Energy and Climate change 2030) ● Existence in the target region of a regional energy observatory ANERGO to monitor sectoral energy consumptions and municipal level and other specific energy indicators. ● Existence in the target region of an Energy Strategy supporting sustainable energy solutions at local and regional level and providing a framework for local energy planning. ● There are already some viable options on the local market regarding energy storage solutions (batteries) and specialists available to provide 	<ul style="list-style-type: none"> ● Lack of tangible examples like energy storage and small-scale sector coupling in the target region and at national level. ● Lack of well-defined policies and regulations applicable at national and regional levels, containing provisions more specific to CSSC technologies ● Existence of old components in national and regional electricity grids, making the adoption of CSSC technologies more difficult. ● Lack of sustained scientific research and implementation of other energy storage types (other than batteries and hot water) in the target region ● Difficult access to funding schemes in the target region, for CSSC solutions, through ROP or other funding sources ● Long approval periods for permits due to bureaucracy in relation with grid operators (electricity, natural gas) regarding new CSSC implementations for

<p>custom storage and sector coupling solutions in the target region.</p> <ul style="list-style-type: none"> ● Existence in the target region of CSSC solutions providers in the region are innovation oriented, providing extra flexibility for implementation and cost optimization. ● Existence in the target region of multiple public and private buildings with installed RES equipment or having this planned to be installed, alongside with prosumer agreements with energy grid operators. ● Important renewable energy resources potential in the target region (biomass, micro-hydro and solar) could complement with energy storage and sector coupling technologies 	<p>municipalities, businesses, and individuals.</p> <ul style="list-style-type: none"> ● Underdeveloped marked High implementation cost of energy storage solutions and ● Lack of awareness and basic technical knowledge regarding CSSC solutions among possible users/administrators of municipal/private buildings and facilities
EXTERNAL FACTORS	
Opportunities	Threats
<ul style="list-style-type: none"> ● Cooperation between solution providers and enterprises and cities in the target region focusing on the CSSC solutions. ● Consolidation of interest from local business and individuals from the target region towards energy storage solutions, with support from CSSC project ● Mitigating the growing cost of electricity at national level (due to electricity market 	<ul style="list-style-type: none"> ● Lack of development for strategic CSSC support at national level (legislation, good practices database) ● Battery degradation over long-term usage affecting energy storage implementations. ● Energy market instability and tariffs oscillation is expected in the target region. ● Expected population migration/changes in population density patters in the target

<p>liberalization) with the help of CSSC solutions</p> <ul style="list-style-type: none"> ● Development of new CSSC oriented businesses/market in the target region, handling storage facilities, providing equipment maintenance, replacement, and recycling. ● The future to be developed e-mobility charging infrastructure in the target region is an opportunity for CSSC technologies integration and readiness, including the use of dynamic e-battery storage available. ● Advancements in rechargeable batteries technology will be beneficial to both existing and future energy storage implementations both in terms of capacity/sqm and specific costs. ● Energy storage technologies could facilitate the electrification of several isolated rural villages within the target region. ● Growing costs of electricity and other fuels at national and regional level leads to increased reasoning for implementing CSSC solutions 	<p>region could cause significant changes in demand.</p> <ul style="list-style-type: none"> ● Expected industrial changes (profiles) in the target region could cause significant changes in demand
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6.CHAPTER 4: ACTIONS

Action 1	Implementation of CSSC applications in Alba Iulia
Brief description	<p>Alba Iulia is engaged in developing its sustainable plans and strategies in line with its energy transition related objectives. The city has already elaborated its Local Climate and Energy Action Plan (SECAP) and the Alba Iulia SMART City Strategy.</p> <p>To be able to reach the sustainability related goals the city needs to enrich the project portfolio in this domain and enhance the RES related project with CSSC technology implementation. The analyses related to CSSC potential and development demand conducted within the CSSC Lab project revealed that there is potential for CSSC take up especially given that the city energy grids are above average and that the city's engagement level and initiatives in RES production is high</p> <p>In line with this objective the city also needs to enhance its capacity to correctly evaluate adequate technologies to be implemented as well as to identify projects with high impact on the locally produced energy form RES to be consumed locally</p>
Activities/ Implementation steps	<ol style="list-style-type: none"> 1. Joint analyses of energy related projects foreseen to be implemented by the Municipality to identify the ones that could involve the implementation of CSSC technologies. Analyses of adequate CSSC measures to be implemented in these identified projects 2. Joint analyses ALEA-Alba Iulia Municipality to identify financing sources for the identified measures 3. Elaboration of project proposal applications. Involving the implementation of CSSC technologies (within the framework of EU funded projects, national programmes)

Timeframe	2022-2023
Milestones	n/a
Estimated costs	Organizational costs Staff costs
Financing sources	Alba Iulia Municipality own budget
Estimated impact/results	2 projects identified for CSSC technology take up 2 measures introduced in the SECAP (and or PIEE)
Actors involved	Alba Iulia Municipality ALEA

Action 2	Introduction of CSSC measures in the energy action plans of LAs in Alba County
Brief description	<p>Several municipalities in Alba County have elaborated voluntary and mandatory energy related plans in line with their CO2 emission reduction targets. Thus, several Sustainable Energy and Climate Action Plan (SECAP) as well as the mandatory Local Energy Efficiency Improvement Programmes (PIEE) are in place within the municipalities of Alba County plans that are due to be updated according to their official refreshment schedules.</p> <p>These plans are all elaborated approach at large extent measures to enhance the RES domain at local level so the main aim is to update these plans with inclusion of CSSC technology implementation. This action will boost local RES production as well as the locally produced energy form RES to be consumed at local level.</p>
Activities/ Implementation steps	<ol style="list-style-type: none"> 1. Building capacity and raising knowledge of responsible municipality staff in CSSC related issues (consultation sessions, work meetings etc). The main objective of such activities is to raise know how levels of the municipality staff to take CSSC measures and find adequate ways to introduce them in the existing energy related plans.

	2. Introduction of measures in the energy related plans (SECAP, PIEE)
Timeframe	2023-2024
Milestones	n/a
Estimated costs	Staff costs Organizational costs
Financing sources	Municipalities own budget
Estimated impact/results	9 measures introduced in the Alba County municipalities existing action plans
Actors involved	ALEA Alba County Municipalities (Alba Iulia, Sebes, Zlatna, etc)

Action 3	Set up of a consultancy service for prosumers in Alba County for installing CSSC technologies
Brief description	Creation of a regional level advisory body bringing together energy specialists, building specialists, companies (CSSC technology retailers etc. whose role will be to provide feedback / information / views on the installed RES technologies and ways to improve the energy produced to be used locally
Activities/ Implementation steps	<ol style="list-style-type: none"> 1. Organization of know-how raising campaigns for prosumers, and other capacity building events. 2. Set up of a CSSC technologies related database available on the market, 3. Facilitation of experience exchange among the prosumers and technology providers as well as other specialist in the CSSC Field (research centers).
Timeframe	2023
Milestones	n/a
Estimated costs	Staff cost Organization of events

Estimated impact/results	20 prosumers involved 3 experience exchange events organized
Actors involved	ALEA Engineers specialized in energy CSSC companies operating in Alba County and beyond