



# **Regional Action Plan for Energy Storage and Sector Coupling Bosnia and Herzegovina, Sarajevo Canton**

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 Sarajevo Economic Regional Development Agency in cooperation with regional partners and Alba Local Energy Agency - ALEA – work package lead partner.

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## 1. General Information

<b>Country:</b>	Bosnia and Herzegovina
<b>Region:</b>	Bosnia and Herzegovina, Sarajevo Canton
<b>Responsible partner(s):</b>	Sarajevo Economic Region Development Agency SERDA

## 2. Aim of the Regional Action Plan

The energy sector is one of the strongest economic sectors in Bosnia and Herzegovina (BiH) with a long tradition and significant potential as well as opportunities for further development and investment. BiH ratified the Paris Climate Agreement (2016) and initially proposed national contributions to decarbonisation (NDC) by 2030. The proposed NDCs are less ambitious not only than the EU targets but also the proposed contributions to the decarbonisation process in neighboring countries in the region. Western Balkans (WB). The decarbonisation process is still not adequately understood and sufficiently accepted among decision makers and stakeholders at all levels. Bosnia and Herzegovina has a unique and extremely complex political structure, with more than 100 ministries across the country and at different levels of government (state, entity, cantonal, municipal), which further complicates the situation. Implementation of CSSC solutions requires prerequisites in terms of legislation and support for the establishment of new technological solutions, as well as raising knowledge among public government and institutions, public awareness of citizens about CSSC, energy efficient solutions and their benefits. It would be useful within a transnational project to conduct a similar demo project in Bosnia and Herzegovina, which lags far behind other EU countries in terms of knowledge and application of CSSC solutions. CSSC solutions are important because an alternative is needed, especially due to raising air quality, which is extremely worrying in our country and Sarajevo.

## 3. CHAPTER 1: European, national and regional context

With the entry into force of the Stabilization and Association Agreement, Bosnia and Herzegovina has committed itself to follow the *acquis Communautaire* and to adapting existing national laws and regulations to the applicable laws of the European Union.

Based on its membership in the Energy Community, BiH has undertaken to implement certain aspects of decarbonisation of the energy sector by

transposing relevant EU legislation: e.g., by adopting action plans to increase the participation of renewable energy sources (RES) - NREAPI2 and to increase efficiency in the final energy use sector - NEEAPI3

The Energy Efficiency Action Plan in Bosnia and Herzegovina defines goals for reducing final and primary energy consumption for the three-year period 2019-2021. The goals are defined based on the trajectories of final (TFEC) and primary (TPES) energy, which are the result of the official LEAP model (Long-range Energy Alternatives Planning) of the energy sector in Bosnia and Herzegovina. The model ensures continuity in planning until 2030 and is the basis for integrated energy and climate planning, defined by the Integrated Energy and Climate Plan of Bosnia and Herzegovina. Energy efficiency planning for the period 2022-2030. will be integrated into the energy-climate framework, defined by Regulation 2018/1999 on Energy Union Governance and Climate Action, where the establishment of Bosnia and Herzegovina's obligations through the Energy Community Treaty is expected.

There is no law on energy efficiency at the central state level in BiH. The current entity EE laws were developed almost in parallel, at a time when the primary goal was to take over the previous acquis in the field of energy efficiency within the EnCT - i.e., the already obsolete Directive 2006/32 / EC on energy services (ESD):

In the Federation of BiH:

- Law on Energy Efficiency (15.02.2017, Official Gazette of FBiH, No. 22/17), which transposed Directive 2006/32 / EC on EE in final consumption and energy services, Directive 2010/30 / EU on labeling of products using energy and Directive 2010/31 / EU on the energy performance of buildings.
- Law on the Use of Renewable Energy Sources and Efficient Cogeneration (Official Gazette of the Federation of BiH, No. 70/13 and 5/14).

In Republika Srpska:

- Law on Energy Efficiency (Official Gazette of RS, No. 59/13), which transposed Directive 2006/32 / EC on efficient final consumption and energy services and Directive 2010/30 / EU on labeling of energy-using products.
- Law on Spatial Planning and Construction (Official Gazette of RS, No. 40/13, 106/15, 84/19), which transposed the provisions of Directive 2010/31 / EU on the energy performance of buildings and amended the provisions of Directive 2012/27 / EU on energy efficiency related to the energy performance of buildings;

- Law on Renewable Energy Sources and Efficient Cogeneration (Official Gazette of RS, 39/13, 108/13).

Throughout the period of the process of improving energy efficiency in Bosnia and Herzegovina, starting in 2010, with the perspective of implementation within the integrated process of energy and climate until 2030, and further until 2050, we strive to maintain continuity in a single structure of measures to improve these properties. The measures listed in the EE Action Plan in BiH are divided into final consumption sectors, according to the following groups:

- Housing sector
- Public and commercial services sector
- Industry sector
- Transport sector

Some of direct measures relate to improving the energy performance of existing and installing new energy efficient technical systems (eg improving the efficiency of heat generators and replacing energy sources, replacing old fossil fuel or electricity boilers with high energy efficiency boilers for biomass replacement of individual heat sources in high energy central heating systems efficiency, etc., connection of apartment buildings and family houses to existing district heating systems using renewable energy sources and / or cogeneration, optimization of distribution pipeline network, pumping systems, safety and control equipment, improvement of regulation and control devices, installation of low temperature heating systems and high-temperature cooling systems (underfloor heating and ceiling cooling, combination with ventilation system, passive cooling systems and induction devices), installation of energy efficient HVAC heating systems, ventilation and air conditioning, the use of waste air heat (recuperative and regenerative heat exchangers) and waste heat condensation of refrigeration equipment; application of night ventilation technique of buildings, etc.); Production of energy from renewable sources in households, procurement and installation of solar systems for the production of thermal energy for space heating and / or preparation of domestic hot water; procurement and installation of solar photovoltaic systems for electricity generation; replacement of existing and installation of new thermotechnical systems with heat pumps that use air, soil or groundwater or geothermal energy as a heat source Encouraging the production of electricity and other types of energy supplied to the network and creating technical preconditions for its acceptance, etc.

Funds to support the implementation of energy transition programs are or will be available from international financial institutions (acronym IFI), such as the EIB, EBRD, KfW, WB and EU development funds. However, significant

funding from private investors (including small investors organized into energy cooperatives) will be key to implementing a comprehensive transition.

When it comes to state finances, there is still no clear financial framework, i.e., a system of support schemes for energy efficiency measures in Bosnia and Herzegovina.

The Sarajevo region cannot count on its own energy sources of larger capacities but must be based primarily on the use of systems for continuous energy supply, which are in the function of the wider region, the Federation of BiH and the state. The possibility of supplying energy from alternative energy sources comes down to, so far insufficiently explored potential opportunities for using geothermal potentials, construction of small hydropower plants on watercourses in the wider Sarajevo area, wind and solar energy, also in the wider city environment.

Electricity generation in mini hydropower plants in the Sarajevo region does not currently exist. The situation is the same with the production of electricity in wind farms. Solar power plants in Sarajevo Canton are:

BIČAKČIĆ d.o.o. 0,01 MW 14,484 MWh, ELEKTROTEST d.o.o. Sarajevo 0,0099MW 14,10MWh, EKO SAN d.o.o. 0,023 MW 28,20 MWh, GROHS H&G d.o.o. 0,14975 MW 202,219MWh, MINI SOLARNA ELEKTRANA VEDO 0,0108 MW 14,969 MWh, OD SE SOLAR 1-2 0,1332 MW 160,00MWh, OD VRTOVI HEĆO 0,01MW 16,00MWh

There are two facilities in tourism that use geothermal energy from hot water. Biomass production for heat production: XYLON CORPORATION 2,75 MW, KLEJTON d.o.o. 0,9 MW, HULIO No 1 0,27 MW, - Drvo Produkt d.o.o. 4,4 MW, Bioenergy (Hospital Jagomir ) 0,8 MW, Elementary School Aleksa Santić 0,78 MW , Settlement TIBRA . When it comes to the production of electricity from biogas, it should be noted that the plant for wastewater treatment of Sarajevo Canton with a plant to produce electricity with a capacity of 1 (MW) is in trial operation. Biodiesel production does not currently exist. Finally, when it comes to the production of electricity from landfill gas, a plant for the use of landfill gas with an installed capacity of 0.432 (MW) is located at the location of the city landfill.

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

The reference document is the Sarajevo Canton Development Strategy, in which Strategic Goal 4 is the basis for responsible management of the environment, space, natural and infrastructural resources. The document defines that responsible management of space and infrastructural

resources will have various intersectoral effects, which will be reflected, among other things, in key indicators of the success of economic and social development of Sarajevo Canton.

It is planned to be achieved through more complete energy efficiency programs, buildings, adequate protection and rescue measures and waste management based on a circular economy, etc. There are no specific goals related to CSSC solutions, but in this document this area is partially covered by Priority Goal 4.3 Increase energy efficiency and encourage the use of renewable energy sources - Number of public facilities where energy efficiency measures have been implemented.

During the implementation of the CSSC Lab project, the Sarajevo Regional Agency SERDA contacted various stakeholders such as representatives of public authorities, local communities, energy agencies and companies, district heating companies, educational institutions, NGOs. Everyone is of the opinion that better legal solutions are needed, as well as better implementation of the existing ones. The lack of information on decarbonisation and CSSC solutions should be overcome by information campaigns to the population and decision makers, as well as public demonstration of such solutions. Also, financial support for such solutions is not easy in BiH. The introduction of mandatory use of CSSC solutions in new residential buildings is emphasized as necessary, given the large housing construction in Sarajevo Canton. The insight into various documents clearly shows the presence of great energy potential, but also the insufficient use of renewable energy sources

## 5. CHAPTER 3: SWOT analysis of the regional context

<b>PARTICIPATORY SWOT ANALYSIS OF THE REGIONAL CONTEXT IN BRINGING CSSC APPLICATIONS INTO REAL CASES</b>	
<b>INTERNAL FACTORS</b>	
<b>Strengths</b>	<b>Weaknesses</b>
<ul style="list-style-type: none"> <li>• energy sector well developed</li> <li>• long tradition, significant potential and opportunities for further development and investment in energy sector</li> <li>• the area of the capital has a large presence of scientific and professional institutions (Universities, Institutes, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>• general population insufficiently familiar with CSSC solutions and technology, with poor insight into such solutions and technologies</li> <li>• increased use of fossil fuels and options for non-renewable energy sources such as natural gas, coal, wood, pellets in individual furnaces.</li> </ul>



<ul style="list-style-type: none"> <li>• growing awareness of environmental protection and the abandonment of fossil fuels</li> <li>• preserved natural resources and development potentials</li> <li>• availability of thermo-mineral and geothermal water</li> </ul>	<ul style="list-style-type: none"> <li>• there are no incentives for cleaner production</li> <li>• there is no plan to develop cleaner energy.</li> <li>• inadequate policies and measures to address climate change pressures.</li> <li>• lack of policies / investments in technologies that use energy from renewable sources</li> <li>• outdated technological infrastructure and lack of innovation of business entities</li> <li>• insufficient implementation of existing legislation and insufficient inspection supervision</li> <li>• insufficient use of renewable energy sources</li> </ul>
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**EXTERNAL FACTORS**

Opportunities	Threats
<ul style="list-style-type: none"> <li>• availability of EU and other international funds</li> <li>• harmonization of policies with the principles and directions of EU strategic documents</li> <li>• increased investment in research and development</li> <li>• application of environmentally friendly technologies</li> </ul>	<ul style="list-style-type: none"> <li>• political situation / dependence of development on political changes and political will at all levels of government</li> <li>• global economic and political situation</li> </ul>

## 6.CHAPTER 4: ACTIONS

<b>Action 1</b>	<b>“Meet the CSSC“</b>
<b>Brief description</b>	This action aims to raise knowledge among public government, municipalities and institutions, as well raise public awareness of citizens about CSSC, energy efficient solutions

	and their benefits. With better knowledge of the solutions, they will be more willing to accept and apply such solutions
<b>Activities/ Implementation steps</b>	1. Organising trainings for representatives of the cantonal and local governments (municipalities) 2. Design, print of promotion materials (brochures)
<b>Timeframe</b>	1 year period
<b>Estimated costs</b>	Approx. 15.000,00 euro (Staff costs, Costs of education events, Costs of promotion materials)
<b>Financing sources</b>	FBiH Environmental Protection Fund
<b>Estimated impact/results</b>	-Population of Sarajevo Canton aware of CSSC solutions and technologies -Representatives of 11 local government institutions built their capacities regarding CSSC benefits and solutions, and ready to advocate for CSSC solutions in relevant plans and legal frameworks
<b>Actors involved</b>	Sarajevo Canton Energy Efficiency Office Sarajevo Economic region Development Agency SERDA

<b>Action 2</b>	<b>CSSC demo project/site in Bosnia and Herzegovina, Sarajevo Canton</b>
<b>Brief description</b>	Conduct a CSSC demo project/site in Bosnia and Herzegovina. Demo site will be place in Sarajevo Canton area and will use for demonstration and promotion of the good energy solution (for example. power to heat, storage of sensible heat solution)
<b>Activities/ Implementation steps</b>	1. Identifying a potential local partner(s) and identifying of potential demo site 2. Development of conceptual / technical solution project of the demo location 3. Apply for ongoing EU calls for proposals
<b>Timeframe</b>	Approx. 3 years
<b>Estimated costs</b>	Approx. 150.000,00 euro

<b>Financing sources</b>	EU IPA funds (EU INTERREG Programs or other) Local funds (municipalities, Canton, etc.)
<b>Estimated impact/results</b>	<ul style="list-style-type: none"> <li>• 1 demo site launched and fully operational</li> <li>• The CSSC concept was introduced and presented to the general population as an example of a useful and good solution that they can apply themselves</li> </ul>
<b>Actors involved</b>	Local partners - Sarajevo Canton government, City of Sarajevo, 9 municipalities of Sarajevo Canton Sarajevo Economic Region Development Agency SERDA

<b>Action 3</b>	<b>CSSC in smart villages</b>
<b>Brief description</b>	Activities on drafting document that will define activities and actions to encourage local self-governments in rural areas in Sarajevo Canton area to use innovative CSSC solutions and modern technologies and thus contribute to the improvement of energy efficiency, reduced negative impact on the environment and improve the lives of the local rural population
<b>Activities/ Implementation steps</b>	Mapping Creating a strategy Creation of an action plan Initiating activities
<b>Timeframe</b>	Approx. 1 years
<b>Estimated costs</b>	Approx. 30.000,00 euro
<b>Financing sources</b>	EU IPA funds (EU INTERREG Programs or other) Local funds (municipalities, Canton, etc.)
<b>Estimated impact/results</b>	Identified potential smart village and developed document of CSSC solutions to deal with challenges in their local context
<b>Actors involved</b>	Local partners - Sarajevo Canton government, Sarajevo Economic Region Development Agency SERDA

<b>Action 4</b>	<b>Modernization of DHS network in Sarajevo</b>
<b>Brief description</b>	Due to the shortcomings of the application of modern technologies in B&H, the lack of knowledge and expertise of professional operators for the application of such technological solutions is also a consequence. Modernization and implementation of CSSC solutions requires upgrading and acquiring a knowledge. The focus is on the modernization of DHS by building the knowledge and capacity about CSSC solutions and technologies and creation of CSSC operators within DHS, who will be able to implement CSSC solutions and share knowledge and expertise with other DHS and representatives of local communities in the country.
<b>Activities/ Implementation steps</b>	Conducting a needs assessment Drafting an education plan and forming learning centre within DH company in Sarajevo canton Selection of the best candidates to be educated Conducting education
<b>Timeframe</b>	Approx. 1-2 years
<b>Estimated costs</b>	Approx. 50.000,00 euro
<b>Financing sources</b>	EU IPA funds (EU INTERREG Programs or other) Local funds (municipalities, Canton, etc.)
<b>Estimated impact/results</b>	Produced operators with required expertise in construction and in applying efficient and renewable energy technologies. Modernized DHS network with replicated approach /solutions defined in CSSC Lab
<b>Actors involved</b>	Local partners -Sarajevo Canton government, local DHS company Sarajevo Economic Region Development Agency SERDA