STRENGTHENING CLUSTERS MANAGEMENT ACTIVITIES AND RUNNING TRANS-NATIONAL FOR IMPLEMENTATION OF NEARLY ZERO ENERGY BUILDINGS - SMART4NZEB[1]

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Summary: *Construction Cluster DUNDJER from Niš is taking part in an European COSME project (SMART4NZEB, Grant Agreement No. 874425). Near Zero Energy Building – nZEB concept does not seem to be easily applicable yet in many European countries, in particular in the regions targeted by the current presented project (Romania, Serbia, Slovenia, and Poland). Previous research showed that required investments and optimal integration of the technologies suitable for the construction and/or renovation of buildings at nZEB levels, together with updating the relevant knowledge and skills of all key actors, are among the most important barriers. Moreover, gaining the confidence of building industry and building owners in the real energy performance nZEB and mitigation of actual risks associated with new technologies appear to be strategic issues whose solution could facilitate the uptaking of large investments required in the process of increasing energy efficiency of existing building stock.*

The main objective of SMART4NZEB is to create a sustainable collaboration between the involved partners and relevant stakeholders representative for the nZEB market in the selected Central and East-European countries, with a view to develop the involved clusters management excellence and to support interregional partnerships to facilitate the development of competitive products and technological solutions intended for new and existing buildings, which will lead to market penetration of nearly zero energy buildings, related to their production, use and reuse.

The proposed action is in line with the policies and guidelines defined by the Strategic Framework for EU Industrial Policy – Circular and Low Carbon Economy tackling topics like nearly Zero Energy Buildings, sustainable energy, renewables, resource efficiency etc. and supports the goals of the Smart Specialisation Communication on 'Strengthening Innovation in Europe's Regions'. This called for stronger strategic inter-regional cooperation, sustainable linkage, and investments between regional ecosystems along

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value chains to maximise Europe's innovation potential with smart specialisation and clusters.

Keywords: *Cluster Management, Energy Efficiency, Passive House, nearly Zero Energy Buildings, Environment, Buildings, Green Deal, COSME, Cluster Collaboration, sustainable energy, renewables, resource efficiency, inovations in construction, construction industry.*

1. INTRODUCTION

Both worldwide and in Europe buildings account for about 40% of all primary energy use and therefore contribute to significant greenhouse gas emissions. A combination of measures for making buildings more energy-efficient and for using a larger fraction of renewable energy in the global energy consumption is therefore a key issue to meet the global challenges related to climate change and fossil resource shortages. However, achieving substantial reductions in energy use and greenhouse gas emissions from this sector requires much more than incremental increases in energy efficiency. According to the Recast of the Directive on energy performance of buildings (EPBD), member states are required to actively promote the higher market uptake of buildings of which both carbon dioxide emissions and primary energy consumption are very low or equal to zero, by producing national plans with clear definitions and targets for their uptake.

The nZEB concept does not seem to be easily applicable yet in many European countries, in particular in the countries / regions targeted by the current project proposal (Romania, Serbia, Slovenia, and Poland). Previous research showed that required investments and optimal integration of the technologies suitable for the construction and/or renovation of buildings at nZEB levels, together with updating the relevant knowledge and skills of all key actors are among the most important barriers. Moreover, gaining the confidence of building industry and building owners in the real energy performance nZEB and mitigation of actual risks associated with new technologies appear to be strategic issues whose solution could facilitate the uptaking of large investments required in the process of increasing energy efficiency of existing building stock.

In this context, the SMART4NZEB project aims at boosting competitiveness and supporting the scaling-up of more than 570 SMEs active in construction, energy efficiency and renewable energy sectors through strengthening capacity-building of 5 representative clusters as drivers of innovation in Central and Eastern Europe (Poland, Romania, Serbia, and Slovenia) and facilitating trans-national exchanges and strategic partnerships with a focus on sharing experience between different practices, skills gaps, policies, target goals and level of engagement related to nearly Zero Energy Buildings (nZEB).

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2. THE SPECIFIC OBJECTIVES (SO) OF THE PROJECT

SO1 – Strengthening cluster management excellence of 5 representative clusters in Central and Eastern Europe through enhancement of cluster managers' skills, Cluster Management Excellence certification and reviewed/new robust development and innovation strategies, in order to provide top quality services for their associated SMEs.
SO2 – Strengthening the business model innovation, marketing and sales skills both for participating cluster managers and project managers as well as for linked SMEs (cluster members).
SO3 – Boost competitiveness and support the scaling-up of 577 SMEs active in construction, energy efficiency and renewable sectors through improved and tailored services offered by the clusters based on the specific needs of the involved SMEs.
SO4 – Facilitating strategic and sustainable partnering in the EU by designing a partnership strategy and joint collaboration activities such as creating a network of complementary partners for SMEs cooperation on international market through participation of 55 relevant stakeholders in a ClusterXchange Programme.
SO5 – Building up synergies and value chains between the 3 key sectors: construction, energy efficiency (EE) and renewable energy sources (RES), to facilitate the effective implementation of nearly Zero Energy Buildings (nZEB) concept through cross-sectoral and transnational cooperation & transversal training in resource efficiency, decarbonisation, nZEB, EE, RES.
SO6 – Defining and Implementing a Communication & Dissemination Campaign for promotion and exploitation of project results and promoting the nZEB concept in order to increase the demand and to raise the performances of new and renovated buildings.

The communication and dissemination campaign will be developed following a common structure and will be tailored for each national/regional application, following specific goals:

- To promote the training programmes in order to increase the interest of target group and to ensure their sustainability after the project ends,
- To raise awareness about the reviewed/developed cluster strategies and the partnerships created within the project for exploitation of results,
- To increase interest in the ClusterXchange Program by promoting the advantages in participating in such a program in order to reach a maximum number of candidates,

- To promote the nZEB concept among relevant stakeholders in order to increase the demand for nZEB and to raise the quality of new and renovated buildings.

By the carefully defined and tailored implementation of the Communication & Dissemination campaign, the members of the five clusters will be informed and activated, the target group for the training & coaching plan will be ensured and an effective exchange will be performed during the dedicated program.
SO7 – Increasing the recognition of clusters, clustering and therefore the number of SMEs in participating clusters.
Recognition of clusters' capacity and excellence both at national/regional level and at international level will be realized through Cluster Management Excellence certification, training and coaching programmes, reviewed/new development strategies, participation in the ClusterXchange which will lead to increased capacity for collaboration and coordination resulting in attracting and involving new 5 SMEs in each cluster at the end of the project.

3. TARGET GROUP/AUDIENCE

The target group / audience of the proposed action is variate, covering different stakeholders:
SMEs in: architecture, civil engineering, construction and renovation of buildings, energy efficiency, sustainable energy & renewables, power generation / renewable sources, new or improved service processes, materials, technologies and components providers,
Circular economy providers in construction sector (aka specialized demolition or decomposition services),
Public authorities (national, regional) as investors, users and owners and public acquirers,
Business networks & representative associations,
Research & Education,
Related industries, for example specific nZEB related technologies in agro (biofuels, use of wool sheep, reed, straw or other renewable materials for insulation), ICT (building/energy management, smart grids) or other sectors.

4. DESCRIPTION OF WORK METHODOLOGY AND TOOLS

The work methodology includes activities such as identifying the type of services that generate the greatest added-value and the ways to deliver these services in the most effective manner. These support services can cover, amongst others, efforts to boost internationalisation, market research, technology/knowledge transfer and promoting SME's uptake of innovation, advanced technologies, digitalisation, servitization, new business models, low-carbon and resource-efficient solutions, creativity and design, and skills upgrading.
The enhancement of cluster manager skills shall take into account the benefit of networking and peer learning, notably in view of future synergies and partnership building in the longer term for facilitating the integration of cluster actors into existing or new industrial value-chains. Such benefits can originate from organising joint activities such

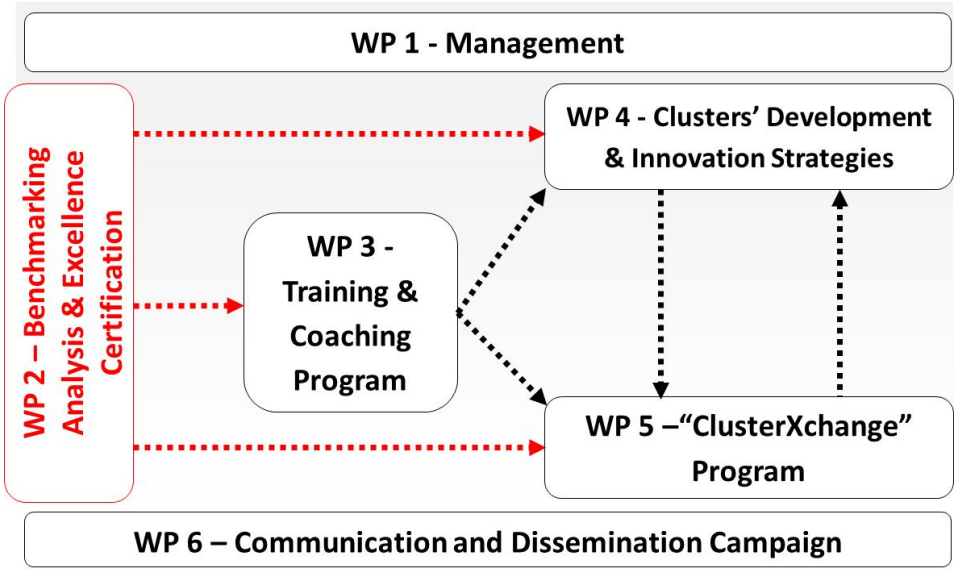
as, for instance, twinning, mentoring, matchmaking, peer learning, knowledge sharing and/or action learning workshops, the development of platforms for knowledge sharing and mutual study visits within each consortium as well as across the consortia selected under this call for proposals.

The main objective of SMART4NZEB is to strengthen management excellence of five representative clusters in Central and Eastern Europe through a specific work plan which is design to respond to the seven specific objectives, in order to provide top quality services for their associated SMEs.

Starting from a Benchmarking analysis in which the market complexity and nZEB readiness of each type of member will be assessed, the evaluation of clusters management performance for obtaining Cluster Management Excellence certification will be performed (WP2 – Working Package 2). This will include the identification of training needs for the clusters management and relevant stakeholders for the development of training programs for the enhancement of their skills through participation in training and coaching programs (WP3) and recommendations for future development of the clusters that will be used in the review/elaboration of the development and innovation strategies (WP4).

Furthermore, the work plan is designed to facilitate transnational, cross-regional, sectoral and cross-sectoral cooperation between clusters and their members through a tailored ClusterXchange Program (WP5). This will be achieved through an effective coordination of the project (WP1) and will be supported by a strong Communication and Dissemination Campaign (WP6) which will create also a sustainable collaboration between the involved partners and relevant stakeholder's representative for the nZEB market in the selected countries.

The work packages and their interrelations are presented in the following figure.



5. ORGANISATIONAL STRUCTURE

According to the eligibility criteria of the COS-CLUSTER-2018-03-02 call, the participants in the SMART4NZEB project are legal entities established in the EU Member States (Poland, Slovenia and Romania) and in a country participating in the COSME programme pursuant to Article 6 of the COSME Regulation (Serbia) and are cluster organisations and business network organisations involved in supporting the enhancement of collaboration, networking and learning in innovation clusters to stimulate innovative activities and are registered on the European Cluster Collaboration Platform.
The consortium is composed of five different legal entities, established in four countries and three of the consortium members are established in regions classified as 'less developed', according to the mapping proposed for Structural Funds eligibility for the period 2014-2020 (Eastern Construction Cluster - Poland, 'Bioenergy for the Region' Cluster - Poland and Construction Cluster DUNDJER - Serbia).
As profile of the clusters, one is specifically promoting the nearly zero energy building (nZEB) concept, three of them are construction clusters and one is promoting sustainable energy but all have in common the same goals in terms of climate change and energy efficiency.
Cluster for Promoting Nearly Zero Energy Buildings - Pro-nZEB (https://www.pro-nzeb.ro/) is a non-profit association, established in early 2016, with the main objective to promote the nearly zero energy building concept (nZEB) in Romania in order to reduce the greenhouse gas emissions generated by the use of buildings, aiming at the development of market-oriented research in the field of energy efficient buildings in Romania.
The aim of the Pro-nZEB cluster is to bring together key players from the building materials market, research and development institutions, educational representative organizations, public authorities, professional associations and other organizations having a catalyst role, in order to create and improve collaborative relationships for developing and implementing in Romania the concept of nZEB.
Construction Cluster of Slovenia – SGG (http://www.sgg.si/en/) was established in 2004 as a not-for-profit and an innovation cluster with the main goal to improve domestic and international competitiveness of its members through commercial cooperation and networking, R&D and innovation, education, training and policy action. SGG is aimed at the broad scope of companies with a wider field of building and construction, especially for energy efficient and sustainable construction and renovation of buildings, new materials, products and services, and business models - but also all the other organizations that are related to construction or to sustainable development of the built environment, green, and circular economy.
Eastern Construction Cluster Poland (http://www.budowlanyklaster.pl/en/) is coordinated by Polish Advisory and Consulting Association (PSDiK) and was founded in 2012 for providing systematic support to institutions and entrepreneurs operating in the field of construction services by establishing solid grounds for cooperation, creating an innovative network of connections based on the transfer of knowledge, technology and innovative solutions between the members of the Cluster, business environment institutions, research and development entities, research institutions and local governments in order to elaborate a strong competitive position in the field of construction

services of the Eastern Poland region, particularly Podlachian, Warmian-Masurian and Lublin Voivodeships.

'Bioenergy for the Region' Cluster Poland (http://www.bioenergiadlaregionu.eu) is coordinated by Research and Innovation Centre Pro-Akademia and was founded in 2007 as a co-operation platform of over 80 companies, research institutions, local administration and business support institutions with the main aim of sustainable energy development in Central Poland. In the context of climate change the cluster promotes innovative solutions in renewable power engineering and energy efficiency in local and regional dimensions. In 2012 the Cluster was selected by Polish Agency for Enterprise Development (PAED, government agency) as a cluster of supra-regional importance for Polish economy. According to the results of the "Indepth cataloguing of clusters in Poland – 2015" by PAED, the Bioenergy for the Region cluster "meets all obligatory standards of cluster management established by PAED and can be a model good practice in the field of science and business cooperation for other clusters (especially in the energy sector)".

Construction Cluster Dundjer Serbia (http://www.dundjer.co.rs) was founded in 2008 with focus on development, research, and application of innovations in the building process and application of new materials through numerous workshops and trainings, as well as development of human resources that should prepare Serbian construction sector for successful presentation at the EU market. Among other member it includes 6 faculties, University of Nis, 2 R&D institutions, 3 municipalities, 8 supported institutions, and the rest are from construction industry.

6. nZEB – NEARLY ZERO ENERGY BUILDINGS GENERAL CONCEPT & STATUS IN EACH PARTICIPATING COUNTRY

Reaching of the 2020 and 2030 energy and climate objectives represents a major challenge to the construction sector, which needs to be ready to deliver high energy performing renovations and, in particular, nearly Zero Energy Buildings.

In order to stimulate an increased number of energy efficient buildings, the Energy Performance of Buildings Directive (EPBD, 2010/31/EC, revised (EU) 2018/844) introduced the definition of nearly Zero Energy Building (nZEB) as a building with very high energy performance where the nearly zero or very low amount of energy required should be extensively covered by renewable sources produced on-site or nearby. EPBD foresees that after 31 December 2020, all new buildings should be nZEBs, while for public buildings the deadline is set for 31 December 2018 and EU countries have to draw up national plans to increase the number of NZEBs.

Poland, Romania, and Slovenia have drafted national plans for increasing the nZEBs and the situation per country is:

- in Romania at this moment nZEB solutions are not considered affordable and the use of renewable energy technologies in buildings is not yet a common practice while big efforts for changing the attitude of all the stakeholders are made through training and promotion of the concept (through the Pro-nZEB cluster and Horizon 2020 projects such as: Train-to-nZEB, Fit-to-nZEB).

- in Slovenia the methodology of calculation is available, there are plans for implementation in public buildings and energy efficiency, resource efficiency and circular economy are the main topics.
- in Poland the nZEB concept is not very popular; however, there is a huge push for renovation of buildings turning them in energy efficient/green buildings and including RES in the context of air pollution (e.g. using the state support available in the ongoing Clean Air programme with the budget of approx. 25 billion euro for energy efficiency renovation and RES installations in residential buildings).
- in Serbia there are rules and regulations regarding to Energy efficiency (energy passport) that are obligatory for the new buildings, but problem exist with old building. The use of renewable energy technologies in buildings, and use of recycling building materials are still not the common practice. The nZEB concept is very interesting for the citizen, but not so interesting for the public institutions, because they don't want to lose control of this resources.

Pro-nZEB Cluster will coordinate the SMART4NZEB project and will be the interface with the Project Officer/Adviser. A Steering Committee (SC) for the project will be formed including executive representatives of all project partners, gathering at regular intervals determined at the kick-off meeting having a significant role in the decision-making.

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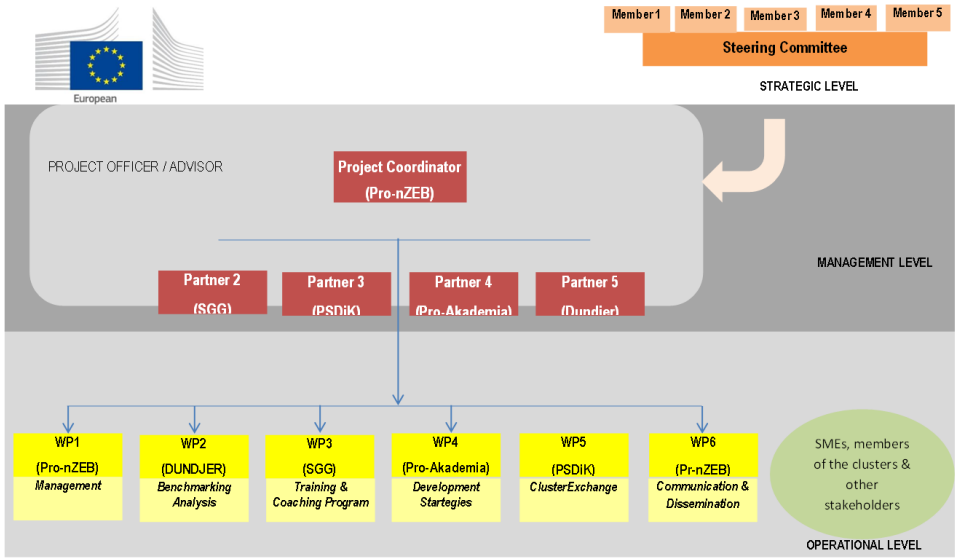

Figure 1. Organizational chart

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ЈАЧАЊЕ МЕНАЏЕРСКИХ АКТИВНОСТИ КЛАСТЕРА И ПОСПЕШИВАЊЕ МЕЂУНАРОДНЕ САРАДЊЕ РАДИ ИЗГРАДЊЕ ЗГРАДА СА ПОТРОШЊОМ ЕНЕРГИЈЕ БЛИСКОМ НУЛИ

Резиме: *Градјевински Кластер DUNDJER из Ниша учествује у Европском пројекту COSME (акроним пројекта је SMART4NZEB, Grant Agreement No. 874425). Концепт градње објеката са потрошњом енергије блиском нули (Near Zero Energy Building – NZEB) није лако применљив у многим европским земљама, посебно у циљаним регионима овог пројекта (Румунија, Србија, Словенјиа и Пољска). Раниja истраживања су показала да су потребна инвестирања и оптимална интеграција погодних технологија за изградњу и/или реконструкцију зграда на nZEB нивоу,*

заједно са осавремењавањем релевантних технологија и вештина свих кључних учесника у процесу, најрелевантније препреке у реализацији. Штавише, задобијање поверења грађевинске индустрије и власника зграда за стварне енергетске перформансе nZEB концепта и смањење актуелних ризика везаних за нове технологије постају стратешки циљеви чије решавање може поспешити велика улагања у процес повећање енергетске ефикасности постојећег грађевинског фонда. Главни циљ пројекта SMART4NZEB је да креира одрживу сарадњу између ангажованих партнера и релевантних представника кључних фактора на нЗЕБ тржишту у изабраним државама Централне и Источне Европе, уз јачање изврсности менаџмента ангажованих кластера и подршку међурегионалних партнерстава у развоју конкурентних производа и технолошких решења за нове и постојеће зграде, што ће водити тржишном продору изградње зграда са потрошњом енергије блиском нули, тј. изградње, коришћења и поновног коришћења зграда. Предложена активност је у сагласности са политиком и препорукама дефинисаним у Стратешком оквиру за политику у индустрији Европске Уније – циркуларна економија и економија ниског угљендиоксида (Strategic Framework for EU Industrial Policy – Circular and Low Carbon Economy) обрадјујући теме као што су nZEB, одржива енергија, обновљиви извори, ефикасна потрошња ресурса, итд., уз подршку циљева Паметне комуникације у специјализацији у акцији 'Strengthening Innovation in Europe's Regions'. Ово захтева јачу међурегионалну сарадњу, одрживо повезивање и инвестирање између регионалних еко-система у складу са ланцима вредности, ради максимизирања европског иновационог потенцијала помоћу паметне специјализације и кластера.

Кључне речи:*Кластер менаџмент, енергетска ефикасност, пасивна кућа, зграде са потрошњом енергије блиском нули, заштита околине, зградарство, Grin dil, COSME, Сарадња кластера, одрживо снабдевање енергијом, обновљиви извори, иновације у грађевинарству, грађевинска индустрија*