DELIVERABLE D.T2.1.2

D.T2.1.2 Downstreaming eCentral tool for data collection and inventory of PA buildings

Version 1

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D.T2.1.2 Downstreaming eCentral tool for data collection and inventory of PA buildings

A.T2.1 Downstreaming past ICT EE solutions for spatial energy management, monitoring and visualization

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1. Introduction

The deliverable T2.1.2 belongs to the activity related to the downstreaming past ICT energy efficiency solutions for spatial energy management, monitoring and visualization (A.T2.1). Downstreaming actions include, beside tools adjustment, also data collection in all Pilot Actions (PAs).
The eCentral solution (The Living EPC Tool) is being adjusted and tailored in a way that they can be further rolled-out and used at other national, regional or local levels. They will be deployed and tested in the new-comer PAs of the project consortium (WPT4) and proposed on a wider range of public buildings (through the energy management plans - WPT4).

2. eCentral – Description

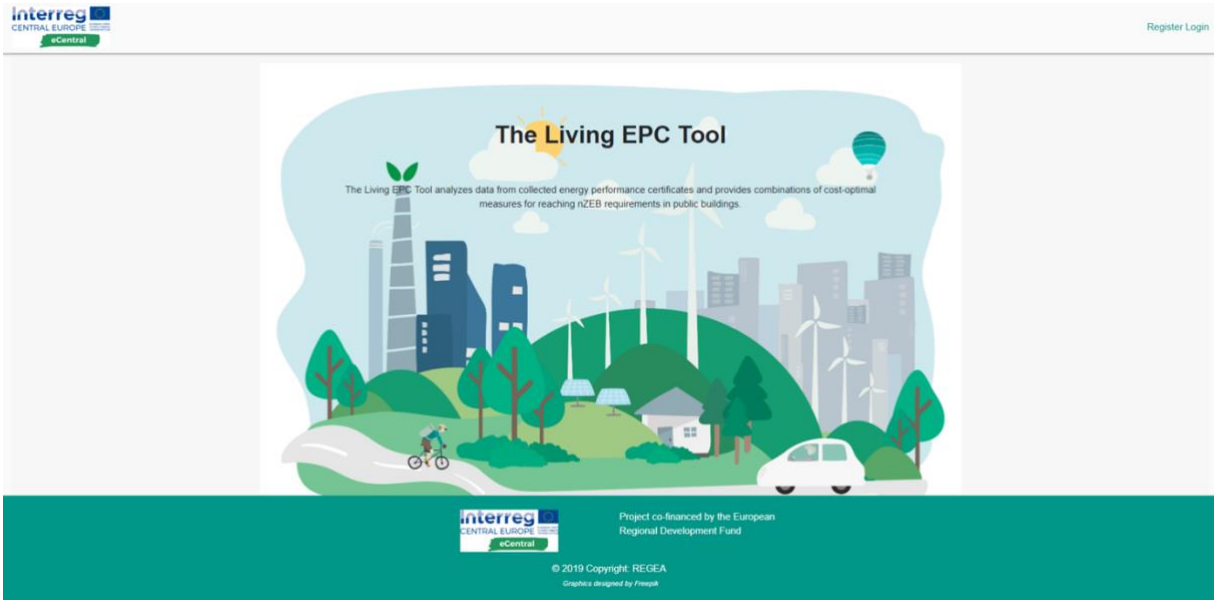
The Living Energy Performance Certificate (EPC) Tool is a complex interactive web-based tool consisting of data from collected energy performance certificates and audit reports, as well as consumption information, that offers different combinations of cost-optimal measures for reaching nZEB requirements for each building imported. It helps in demystification of nZEB standard in renovation of buildings, defining the energy and other parameters for each building and showing which energy efficiency measures and renewable sources systems implementation measures should be combined in cost-optimal way, in order to achieve nZEB standard.

There are different versions of the Living EPC Tool for each project partner region, depending on nZEB requirements on regional/national level – Croatian and Slovenian is based on the similar template, while the Hungarian version differs due to completely different requirements. The version in English language has also been made due to understanding purposes, with implemented Croatian technical and legislative requirements. Nevertheless, the use principal is standardized – similar data to be inserted as input, as well as similar report as output. The basic application is in English, while the translated text into Croatian, Slovenian, Hungarian, German and Italian have been provided.

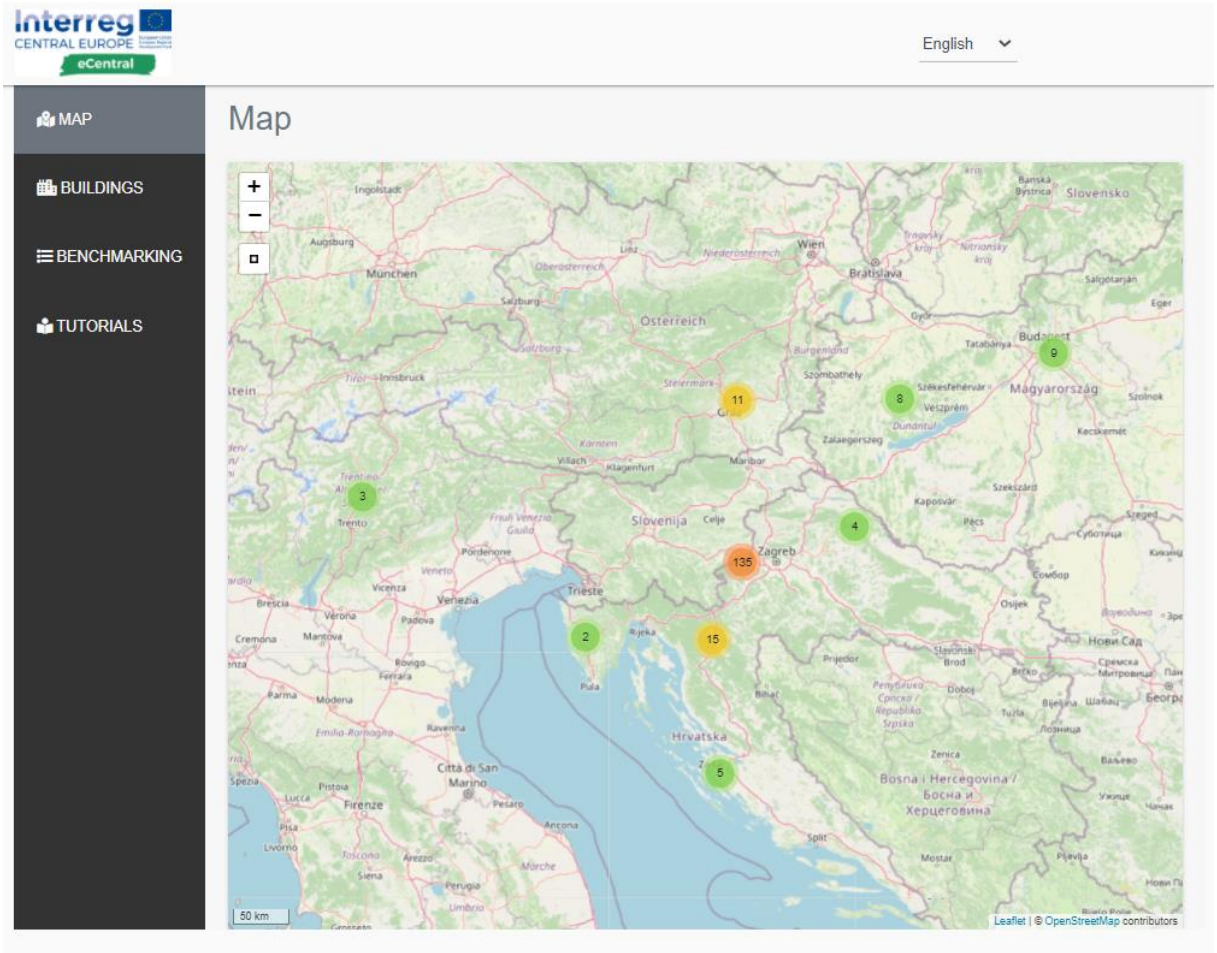
The Living EPC Tool is designed according to the needs of public authorities regarding the buildings which they own/use, providing relevant information, in order to facilitate their systematic monitoring of facilities and allow more precise identification of key projects of energy reconstruction with concrete quantification of all energy and financial indicators resulting with achievement of nZEB standard. The final product, including the source code and intellectual rights, belongs to the eCentral project consortium.

Here you can find the link to The Living EPC tool: https://nzeb.thorium.software/

Here you can find more information on how to use the tool (available after the registration): https://nzeb.thorium.software/tutorials



Picture 1: The Living EPC Tool



Picture 2: The Living EPC Tool Map

2.1 Living EPC Tool – Adaptation to new pilot areas

The Living EPC Tool will be used in the TARGET-CE project for buildings in pilot areas in 4 different countries. The tool will be integrated within OnePlace platform as a link to the tool. Each partner that will use the tool will have to create a new account, define potential user and through the registration select username, password, e-mail address and the country in which the buildings will be located. The user will then receive an e-mail activation request, which is subsequently approved or rejected by the administrator. The administrator determines the range of objects that are visible to an individual user. Entering a new building can be done by a user with editing and admin editing capabilities.

➢ Austria

The Austrian project partner (Weizer Energie- & Innovationszentrum: PA07) will include three pilot buildings into the living EPC Tool. For all three buildings, an energy audit was already available, from which the data for the data entry into the EPC Tool was done. The data entry into the system was clear and structured. As for the Tool itself: the programme could not find a set of measures that reached NZEB standard for any of the 3 pilot buildings. This could be because the pilot buildings were already built with a high standard for energy efficiency and therefor no effective measures can be derived. As a future recommendation, the living EPC tool could be used for other public buildings in the municipality of Weiz, so that firstly measures can be derived for these buildings and secondly a database for relevant energy data of public buildings can be established.

➢ Poland

During usage of the tool by MAE, 7 pilot buildings in the City of Podkowa Leśna were added to the building database. These buildings are:

- Social Welfare Center in Podkowa Leśna – Health Institution
- City Hall of Podkowa Leśna – Office Building
- Center for Cultural & Civic Initiatives in Podkowa Leśna – Cultural Building
- Municipal Building at Jana Pawła II 29 in Podkowa Leśna – Residential Building (input as Office Building)
- Municipal Building at Jaworowa 13 in Podkowa Leśna – Residential Building (input as Office Building)
- Municipal Public Library in Podkowa Leśna – Educational Building
- “Casino” Palace in Podkowa Leśna – Cultural Building

For most buildings, all the information required by the tool was obtained, excluding information on built-in lighting and the ventilation system. These data include:

- basic information about building
- energy usage
- external partitions and it’s specification
- heating and domestic heating water systems
- lighting

Input of data was transparent and whole gathering was based on documents e.g. energy audit and energy certificates. The tool indicates use of common energy indicators/indexes.

The tool turned out to be a simple way to simplify the economic and energy calculations of potential energy improvements in buildings and can identify solutions that are necessary - however, these solutions could also be determined without the use of this tool. The advantage in this case, however, is the speed and the ability to save and generate reports for analysis.

On the other hand, the obtained results of the calculations do not completely coincide with what is presented in the verified energy calculations (energy audits etc.). This is probably due to the lack of certain data, generality of data (it is not possible to divide the rooms of buildings into individual temperature rooms, e.g. separation of rooms with a temperature of e.g. 12°C and 20°C, which is reflected in the obtained heat losses), which are entered into the EPC Tool and, which is the main reason, the differences in calculations, assumptions and technical conditions for buildings between the standards of southern European (as used in this case technical conditions in Croatia) countries and Poland.

At the moment, the EPC Tool is not fully adapted to operations in Polish conditions and this is a barrier that means that the results currently obtained are different from those that are actual.

For all 7 buildings, it was not possible to find solutions that would make any of the imported buildings a nZEB building – mostly it's because of its age.

At present, it is impossible to locate the building in Poland in the tool, which is also an obstacle. At the moment buildings are located in Croatia – it needs to be changed.

In order to adapt the tool to Polish conditions, it is necessary to change the method of calculating heat losses, building demand for heat and domestic hot water and adapt them to Polish standards and norms. Another problem is the number of proposed types of buildings, as at the moment.
For example, inputted Municipal Buildings at Jaworowa 13 and Jana Pawła II 29 cannot be classified in a right way and supposed to be included as residential buildings.

To conclude – there's need to change some variables in the tool (to be in line with norms and laws for right calculation of energy indicators for buildings in Poland). By adding additional functions, you can customize the tool so that the obtained calculations will be valid and will match those obtained during the energy certification stage. For this matter MAE need to cooperate with KSSENA to provide right outcome.

- **Croatia**

"Youth Center Split" is a semi-finished interdisciplinary cultural center created in the early 1980s, with an area of 10,400 m^2 of indoor space. It is an institution for the organization and promotion of cultural programs in the fields of visual, film, performing and musical arts and currently has a gallery space, amphitheater, concrete cinema and a number of workshops and gathering places for dance, drama, film, music, computer science and sports. The stage of the amphitheater is home not only to the institutionalized theater and dance scene, but also to other performing arts - circus, performance, music, storytelling. Conferences, public debates, workshops, tribunes also take place on the stage.

In the last 10 years, a systematic arrangement of space has been initiated. The concept of a centrally organized building with a single-stage focus has replaced a set of multiple and diverse spaces for the production and presentation of contemporary art and youth culture, a hybrid model that relies on a series of initiatives running its programs in different regimes. This innovative model of organizing space in culture is being developed with the support of the City of Split, the owner of the building. The space is now used by a large number of associations and institutions gathered in an advocacy network called the Youth Platform.

The City of Split will prepare an Energy Certificate for the "Youth Center Split", which will give us insight about the possibilities for energy refurbishment, provide us with an opportunity to gain funding and investment, reduce energy costs and achieve the EU goal of reduced CO_2 emissions in public buildings. “

- **Slovenia**

Our selected Pilot area is Municipality Nazarje. All 8 selected buildings are public and owned by Municipality Nazarje:

- Gallery »Jakijeva Galerija«
- Kindergarten Nazarje
- Sports hall Nazarje
- Primary school Nazarje
- Cultural center Nazarje
- Vrbovec Castle
- Health Center Nazarje
- Fire station Nazarje

In our overall experience with the tool, we could say that it has met our expectations.
We obtain the necessary data from the prepared energy performance certificates and energy audits. After entering the first building we gained enough experience with the tool so that further work does not pose major problems. The data entry into the system itself is clear and transparent, the tool is well designed and covers all key areas: basic building info, building energy certificate info, energy consumption, building parts, ventilation, termotechnical systems, lighting and current building state. After completing the data entry, the program offers possible scenarios of measures for the renovation of the building to comply with the nZEB standard. In our experience we could say that the results obtained at the end of the calculation are relevant.

2.2 Living EPC Tool – Problems occurred in capitalization

We did not encounter any major problems with the capitalization of the tool. At the beginning we had to determine whether the tool would remain on the existing domain or be moved to the OnePlace platform, but on the advice of programmers we decided not to move it due to its complexity and unnecessary additional costs. But we have provided free access to the tool by adding the link on the OnePlace platform and also the developers has assured us with free access to the tool in the years after the project end.

3. Results and examples of tailored tool in new PAs

As mentioned above the tool will be used in 4 different countries, on 19 pilot buildings. When the data entry is completed, the tool offers different combinations of energy efficiency measures and renewable sources systems implementation measures that should be combined in cost-optimal way, in order to achieve nZEB standard. It also includes the Living EPC Tool Database which enables better insight into the state of the local building stock and renovation potential.

4. Conclusions

The Living EPC Tool is complexed program, but if the buildings has its energy certificates and energy audits done it can easily be used by all interested. It is designed according to the needs of public authorities regarding the buildings which they own/use, providing relevant information, in order to facilitate their systematic monitoring of facilities and allow more precise identification of key projects of energy reconstruction with concrete quantification of all energy and financial indicators resulting with achievement of nZEB standard.