TARGET-CE - Train the Trainers

Fabio Remondino - FBK, Trento (Italy)
Anna Nowacka - EUWT NOVUM, Jelenia Góra (Poland)
Hana Kolenc - KSSENA, Velenje (Slovenia)

TRAIN-THE-TRAINERS agenda

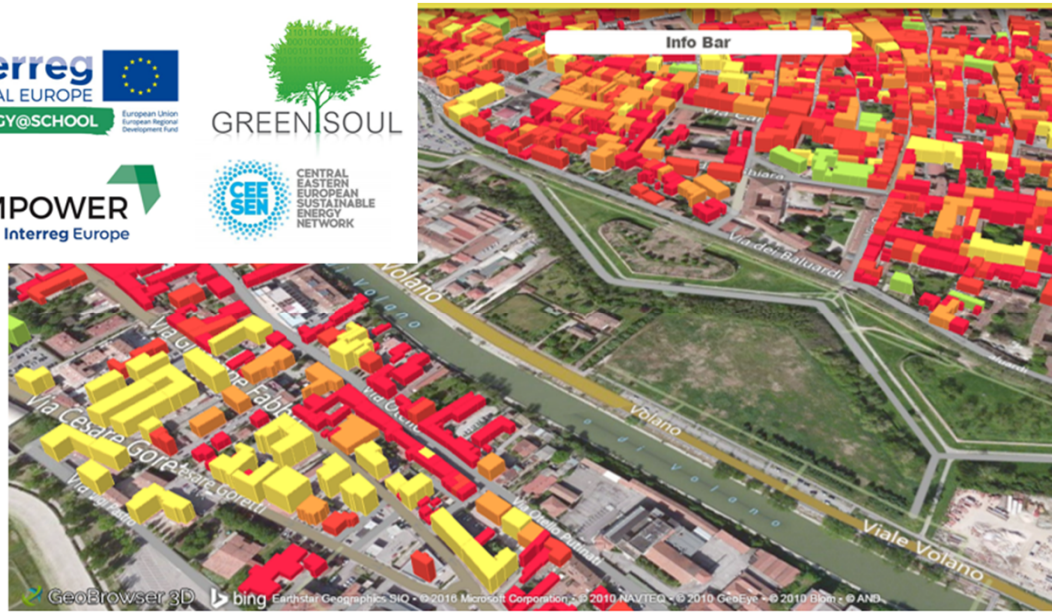
9:45-10:30	**Module #1 - TARGET-CE energy efficiency tools** • OnePlace web-platform & 3D EMS tool (BOOSTEE-CE) • Energy Ghost simulation game (Energy@School) • Living Energy Performance managing tool & database (eCentral) • Energy Dashboard (CitiEnGov Toolkit) • Stickers for behavioral change (GreenSoul)	Fabio Remondino (FBK) Anna Nowacka (EUWT) Hana Kolenc (KSSENA)
10:30-10:45	**Coffee break**	
10:45-11:45	**Module #2 - Regulations, legislations and financial sources of EE solutions** • Renovation wave, with excursus on linked topics: EU Green Deal, EPDB regulation, NZEB concept, New EU Bauhaus • Innovative support methods to implement and finance the renovation wave	Marco Costa (AESS Modena - external expert supporting UCBR)
11:45-12-45	**Module #3 - Interactive session on "Energy Performance Contracts"** • Group work on Energy Performance Contracts (EPC) models: brainstorming and feedback (own experience, local enabling factors and barriers, relevant stakeholders)	Marco Costa (AESS Modena - external expert supporting UCBR)
12:45	**Wrap-up, questionnaire and conclusions**	

TARGET-CE project

- **TARGET-CE** collects and adjusts ("**capitalize**") ICT tools, financial models, action plans and training material related to Energy Efficiency and deploy everything to local and regional administrations integrating them into territorial and thematic strategies
- **TARGET-CE** aims to become an energy efficiency (EE) flagship, offering & showcasing solutions for Energy Efficiency in public buildings within a unique web platform, the BOOSTEE-CE **OnePlace** (http://oneplace.fbk.eu)

The Online Energy Platform

OnePlace



TARGET-CE project

https://www.youtube.com/watch?v=jOl21eNKxzs

website https://www.interreg-central.eu/Content.Node/TARGET-CE.html

facebook https://www.facebook.com/TARGETCE2022

twitter https://twitter.com/CeTarget

THEMATIC MODULE #1

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European Union European Regional Development Fund
TARGET-CE

Interreg CENTRAL EUROPE BOOSTEE-CE
Interreg CENTRAL EUROPE TARGET-CE

Home | Capitalized Projects | Marketplace | EE Cities | EE Strategies | EE Finances | EE Tools

The Online Energy Platform

OnePlace

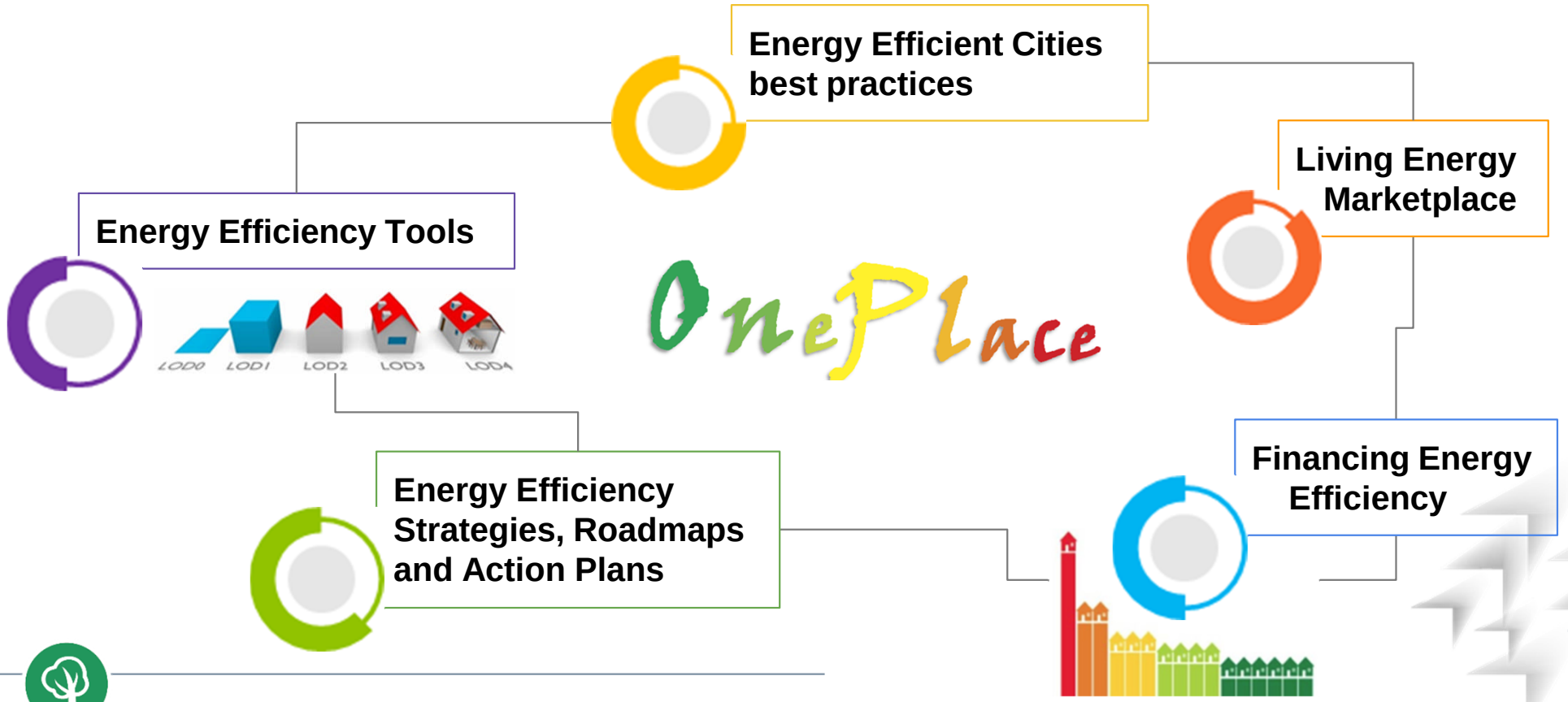
https://oneplace.fbk.eu/

Contents of module #1

1. OnePlace web-platform & 3D EMS tool (BOOSTEE-CE)
2. Energy Ghost simulation game (Energy@School)
3. Living Energy Performance Certificate managing tool & database (eCentral)
4. Energy Dashboard (CitiEnGov Toolkit)
5. Stickers for behavioral change (GreenSoul)

The Online Energy Platform - OnePlace

Web platform includes 5 interlinked modules enriched with **energy related contents** (best practices, database of devices, energy certificates, finances, strategies, etc.) **freely accessible** to policy makers, energy planners and citizens in order to improve the governance and understanding of energy efficiency.



The Online Energy Platform - OnePlace

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BOOSTEE-CE
Interreg CENTRAL EUROPE BOOSTEE-CE

PANEL 2050
CEE SEN CENTRAL EASTERN EUROPEAN SUSTAINABLE ENERGY NETWORK

EMPOWER
EMPOWER Interreg Europe

ENERGY@SCHOOL
Interreg CENTRAL EUROPE ENERGY@SCHOOL

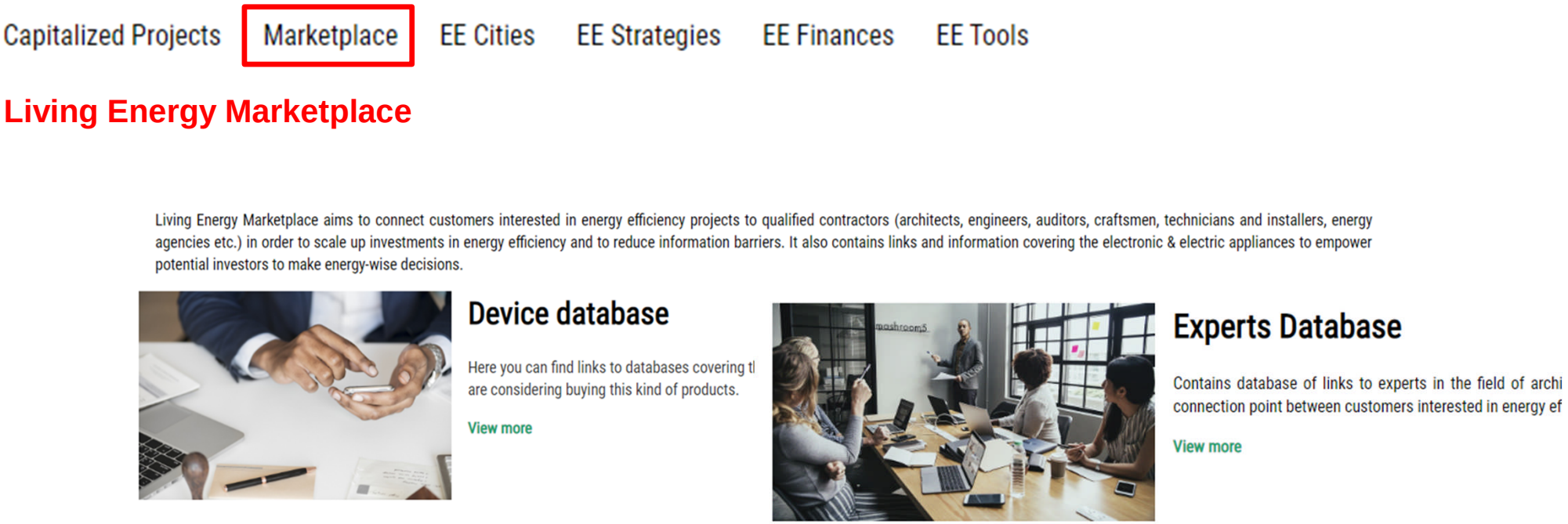
ECENTRAL
Interreg CENTRAL EUROPE eCentral

FEEDSCHOOLS
Interreg CENTRAL EUROPE FEEDSCHOOLS

CITIENGOV
Interreg CENTRAL EUROPE CitiEnGov

GREENSOUL
GREENSOUL

The Online Energy Platform - OnePlace



Living Energy Marketplace aims to **connect customers** interested in energy efficiency projects **to qualified contractors** (architects, engineers, auditors, craftsmen, technicians and installers, energy agencies etc.) in order **to scale up investments in energy efficiency** and to reduce information barriers.

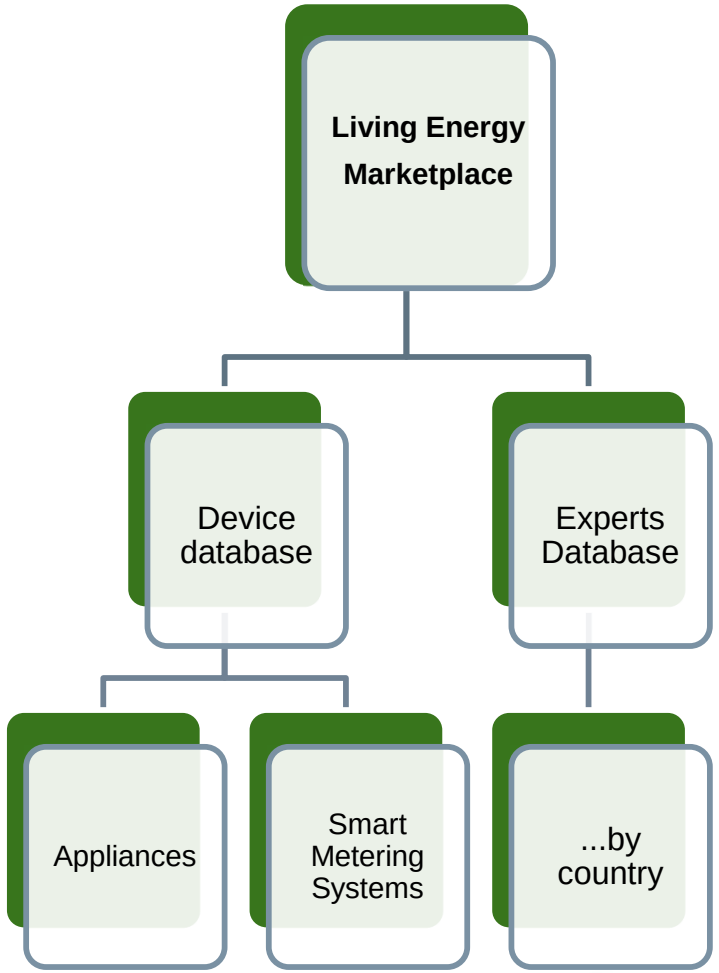
The Online Energy Platform - OnePlace

Capitalized Projects | **Marketplace** | EE Cities | EE Strategies | EE Finances | EE Tools

It contains:

- links and information covering the **electronic & electric appliances** to empower potential investors to make energy-wise decisions.

- and **database of links to experts** in the field of architecture, engineering, energy efficiency, renewable energy sources etc. This database is meant to serve as **a connection point between customers** interested in energy efficiency projects and qualified contractors.



It is basically a **database of devices and experts** to empower potential investors to make energy wise decisions.

The Online Energy Platform - OnePlace

The **Energy Efficient Cities** module is an **exchange platform of experiences** and identification of **good practices** within energy efficiency sector for public authorities and other public users.

It demonstrates the range of **approaches and measures** various cities have used **to undertake efficiency improvements** and thus helps to guide cities in designing effective urban energy efficiency policies and programs.

The Online Energy Platform - OnePlace

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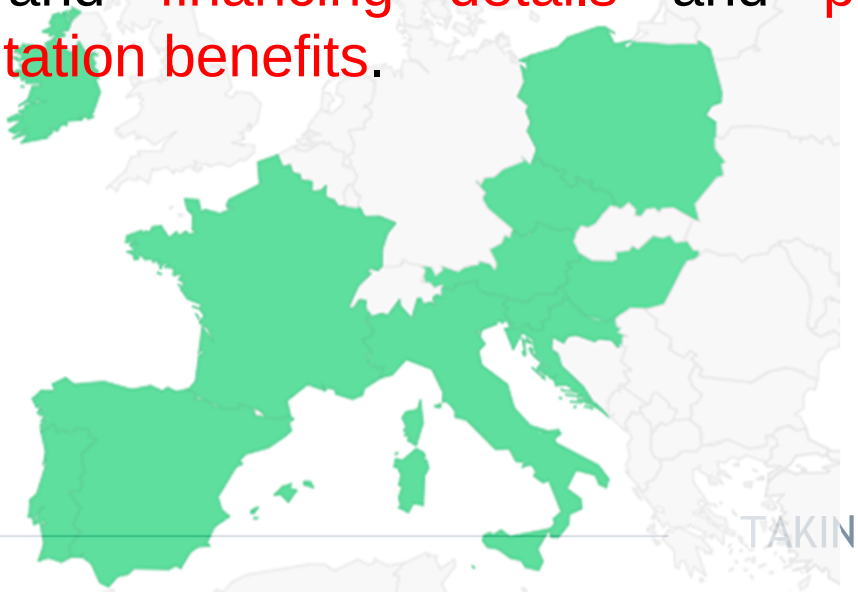
Capitalized Projects | Marketplace | **EE Cities** | EE Strategies | EE Finances | EE Tools

It contains:

- **55 Best Practices from 11 countries** (constantly updated) covering energy efficiency of buildings and smart metering.

- Each best practice **contains basic information**, system characteristics, financial sources and financing details and project implementation benefits.



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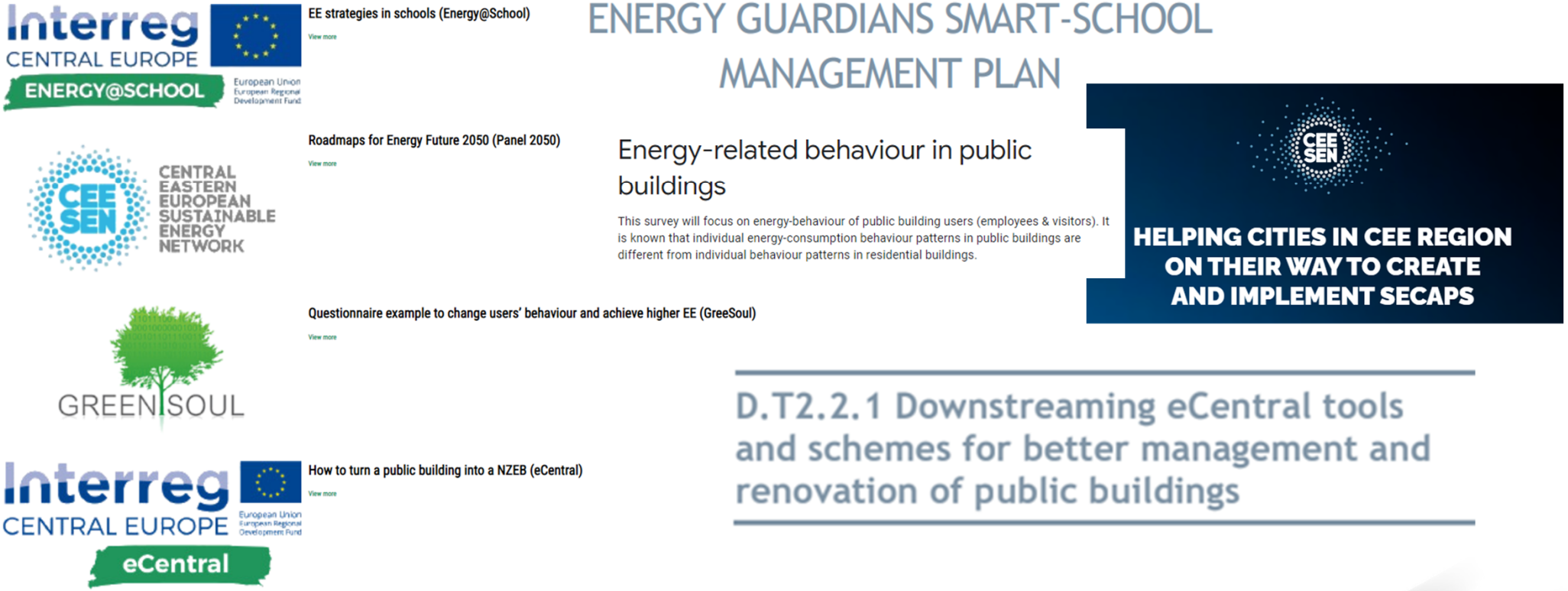
Energy Efficiency Strategies, Roadmaps and Action Plans



The **EE Strategies** module collects past strategies, roadmaps and action plans developed in the past years by various European projects.

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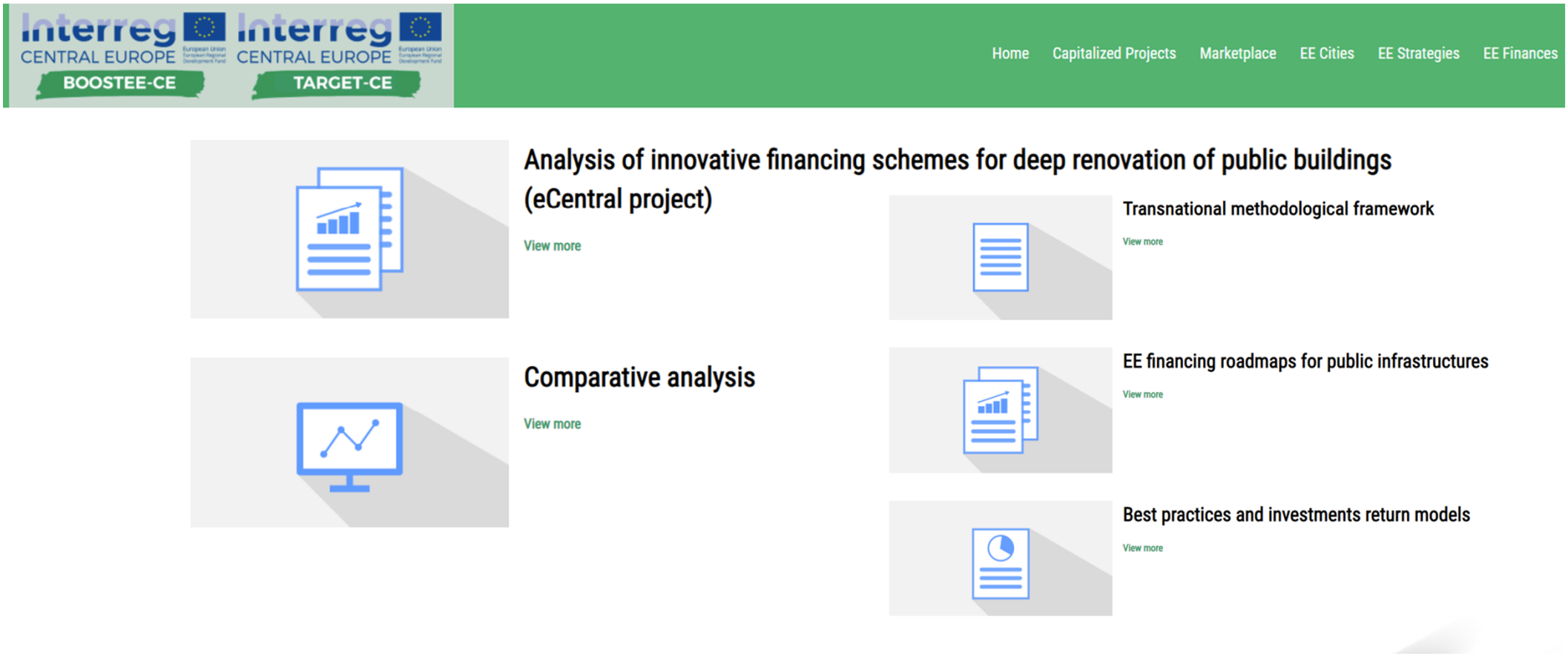
Financing Energy Efficiency



The Financing Energy Efficiency module is the visual presentation of the transnational strategy outcomes, financial roadmaps, examples of the best practices and practical steps how to use the national & EU-level resources.

The Online Energy Platform - OnePlace

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Financing Energy Efficiency module consists of:

- **Analysis of innovative financing schemes** for deep renovation of public buildings (eCentral project)
- **Comparative analysis of financial schema** in CE countries
- Transnational Energy Efficiency **Financing Strategy**
- Transnational methodological framework for a **EE roadmap development**
- Energy efficiency **financing roadmaps for public infrastructures** in CE municipalities
- **Best practices and investments return models** in energy efficiency financing
- Energy Efficiency **Financing Project Calculator**

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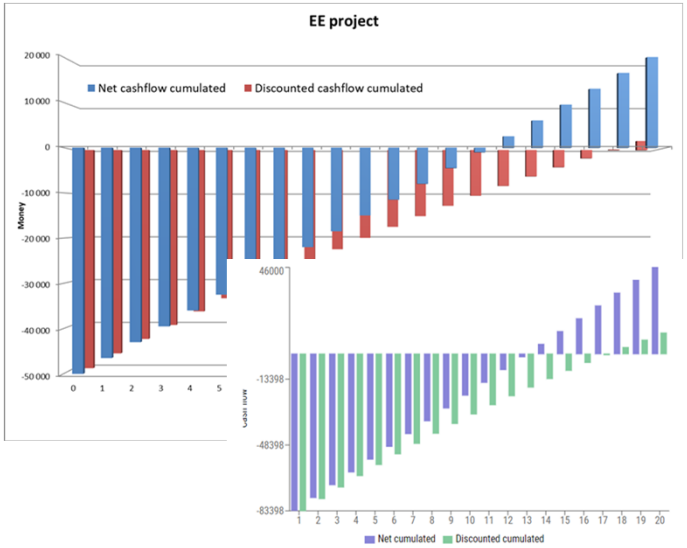
Financing Energy Efficiency

- The simple EE project calculator which gives to the user a basic indicative idea of the profitability and advisability of the investment into an energy efficiency or RES project.
- It counts **just with own sources**, **not considering subsidies or loans** which both can change foreseen values significantly (*If subsidies are* involved*, the NPV and IRR are increasing and payback periods are shortening, while loans affect the investment in the opposite way)*

Energy Efficiency Financing Project Calculator



- Terms and definition of **basic financial indicators** included (NPV, IRR, Discount rate, payback period)
- Involves **graphical illustration of cash flow** and discounted cash flow.

Important note *– the calculator is just an indicative tool, for concrete investment calculations it is highly advisable to carry out a proper financial analysis by a financial expert!*

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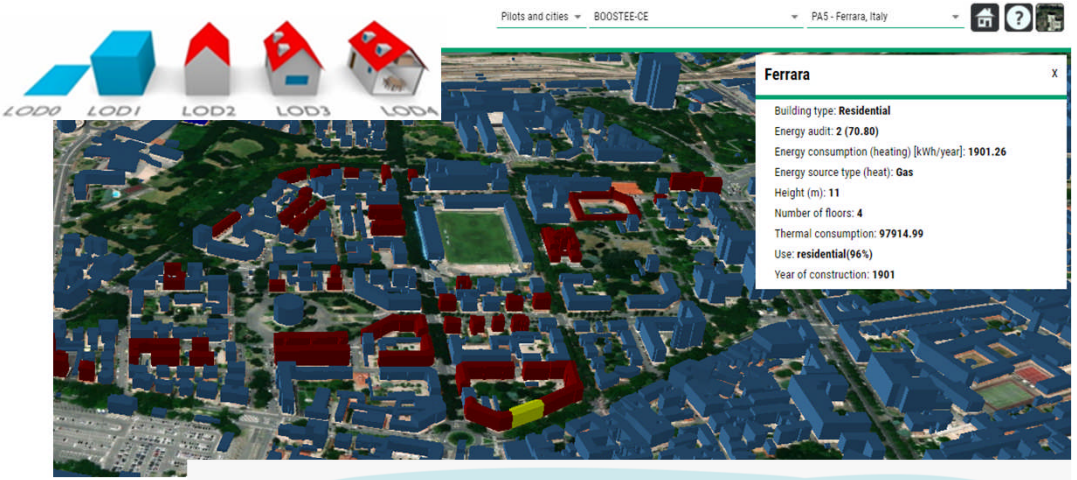
Energy Efficiency Tools

3DEMS

The 3D energy management tool (3DEMS) serves as seedbed for ir building models for energy-related needs.

View more



Energy Ghost simulation game

Energy@school app developed as an educational tool to train stude

View more

The Living EPC Tool

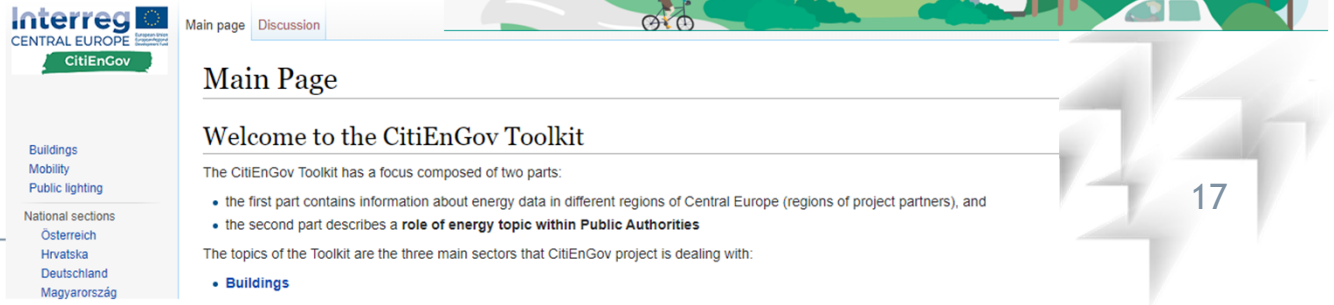
The Living EPC Tool is a complex interactive web-based applicatic public authorities to identify investment opportunities, by

View more

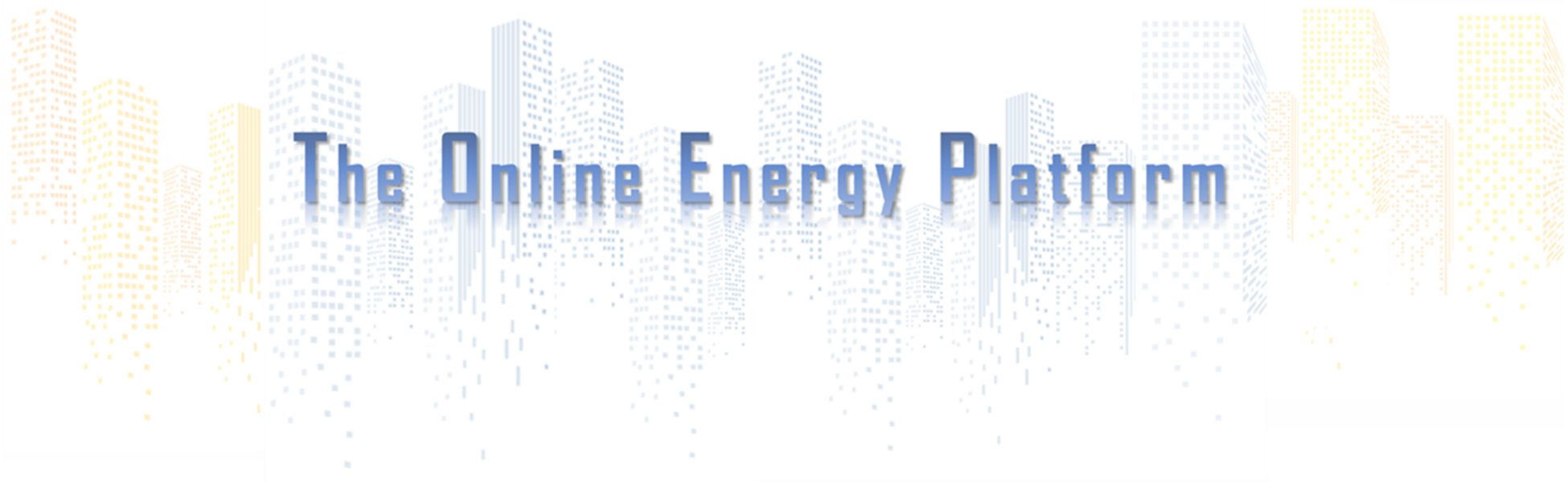
Energy Dashboard

View more

EE Stickers



The Online Energy Platform - OnePlace



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The Online Energy Platform - OnePlace - the 3D EMS tool -

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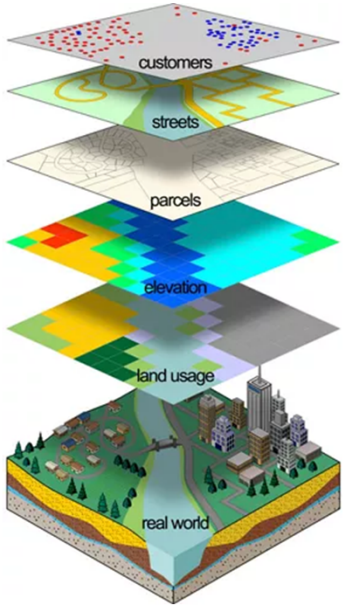
Interreg CENTRAL EUROPE — BOOSTEE-CE

3D Energy Management System; 3D EMS tool (https://oneplace.fbk.eu/3d/)

DATA + GIS + 3D CITY MODELS



Spatial and non-spatial energy-related data integrated with **3D city models into GIS environments** have been already adopted in some cities, but we are very **far away from** their **widespread** utilization and daily use.

Although **on-going initiatives** have demonstrated the potential of geospatial data, 3D city models and webGIS for better planning and management of energy efficient buildings, there is still a **gap between a "nice to have" attitude and a "need to have" one.**

A more extensive and powerful use of **GEOSPATIAL DATA** and ICT tools **FOR ENERGY EFFICIENCY** can support the creation of **SMART** and **LOW-CARBON CITIES**

www.williamsnd.com/Department/GIS

The Online Energy Platform - OnePlace
- the 3D EMS tool -

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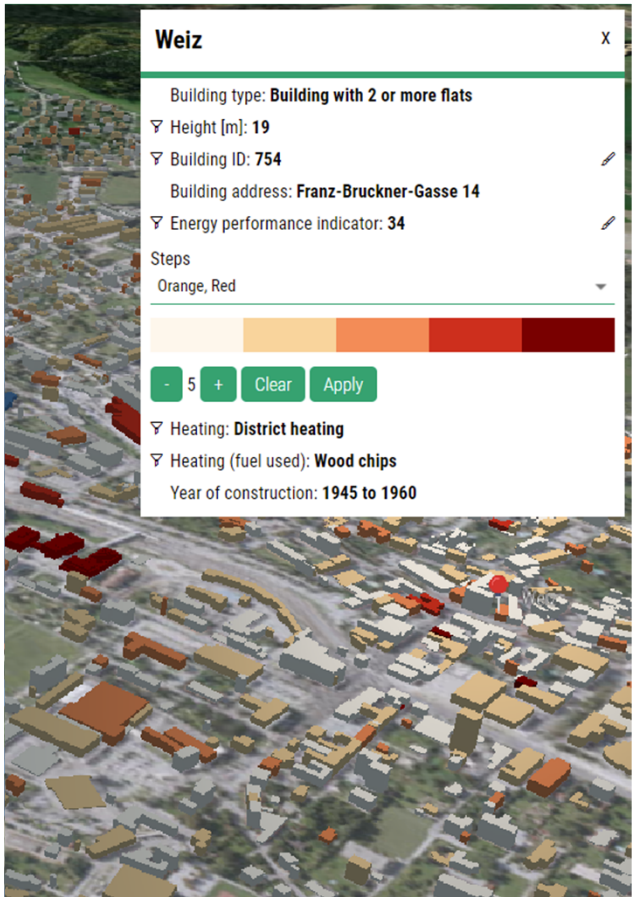
3D Energy Management System; 3D EMS tool (https://oneplace.fbk.eu/3d/)

3D Energy Management System is a module (**WebGIS tool**) to visualize, query and manage energy information / uses / loses / audit certificates of (public) buildings using 3D building models.



The Online Energy Platform - OnePlace - the 3D EMS tool -

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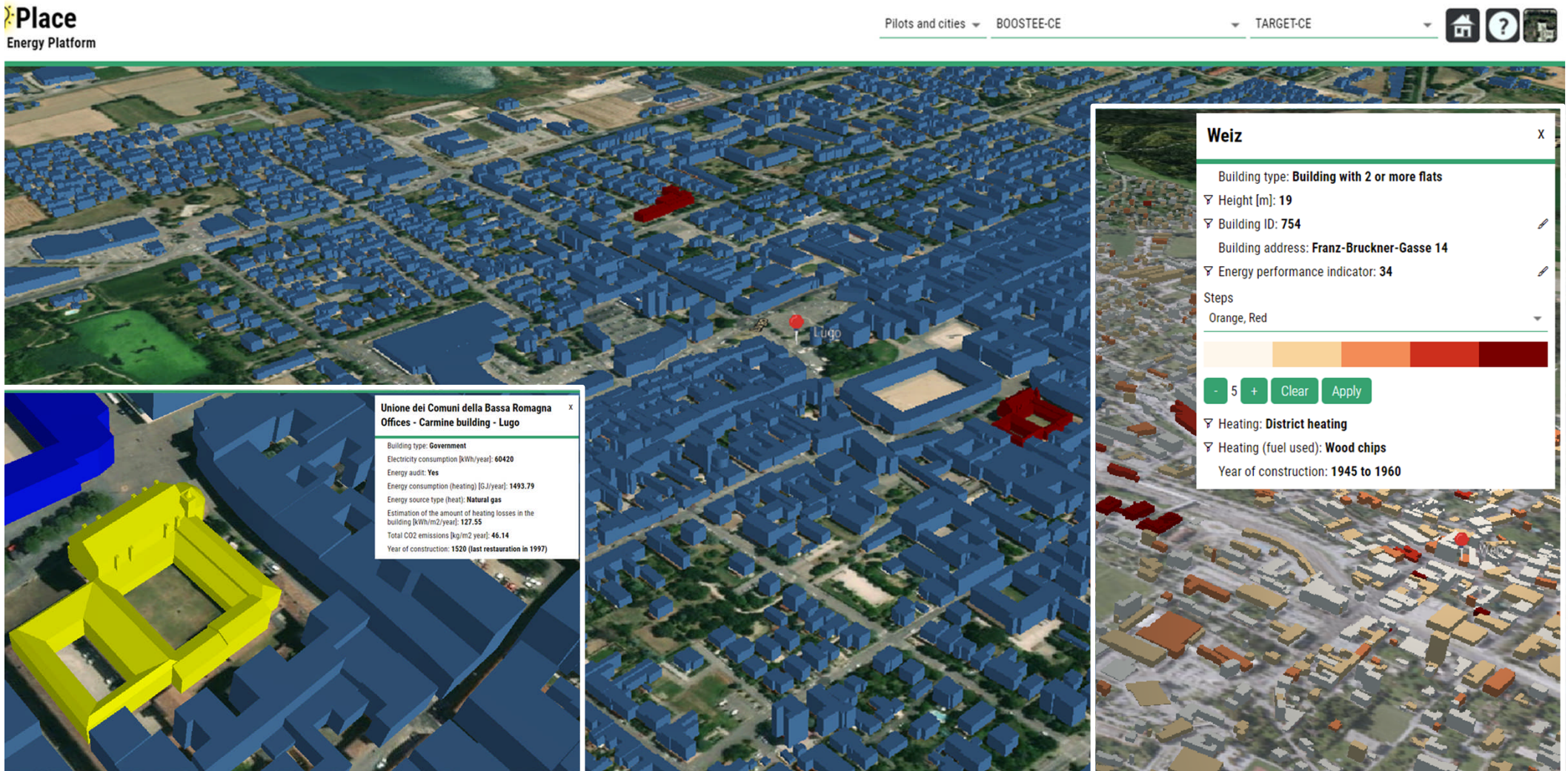
[3D Energy Management System; 3D EMS tool (https://oneplace.fbk.eu/3d/)](https://oneplace.fbk.eu/3d/)



The Online Energy Platform - OnePlace - the 3D EMS tool -

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BOOSTEE-CE

[3D Energy Management System; 3D EMS tool (https://oneplace.fbk.eu/3d/)](https://oneplace.fbk.eu/3d/)

In the **pilot areas**, for selected public buildings, **geospatial databases** with urban and energy data were created in order to **combine** them **with 3D building** geometries within the **3DEMS** tool.

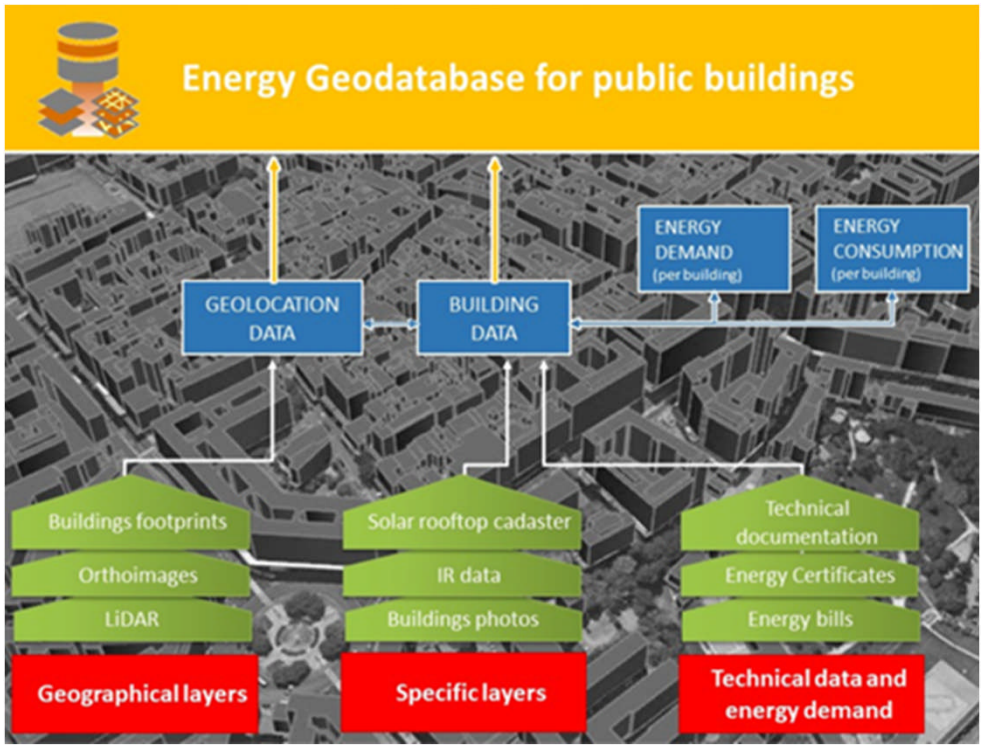
The Online Energy Platform - OnePlace - the 3D EMS tool -

Capitalized Projects | Marketplace | EE Cities | EE Strategies | EE Finances | **EE Tools**

BOOSTEE-CE

[3D Energy Management System; 3D EMS tool (https://oneplace.fbk.eu/3d/)](https://oneplace.fbk.eu/3d/)

The **3DEMS webGIS** tool **allows the user to:**



(i) **navigate** through the urban environment at different altitudes and camera angles (based on Cesium);

(ii) **visualize and interact** with LOD1 building models at urban scale, LOD2 building models at single building scale (selected pilots);

(iii) **select** a building of interest and **retrieve** energy and other cadastral/building info, incl non spatial data;

The Online Energy Platform - OnePlace
- the 3D EMS tool -

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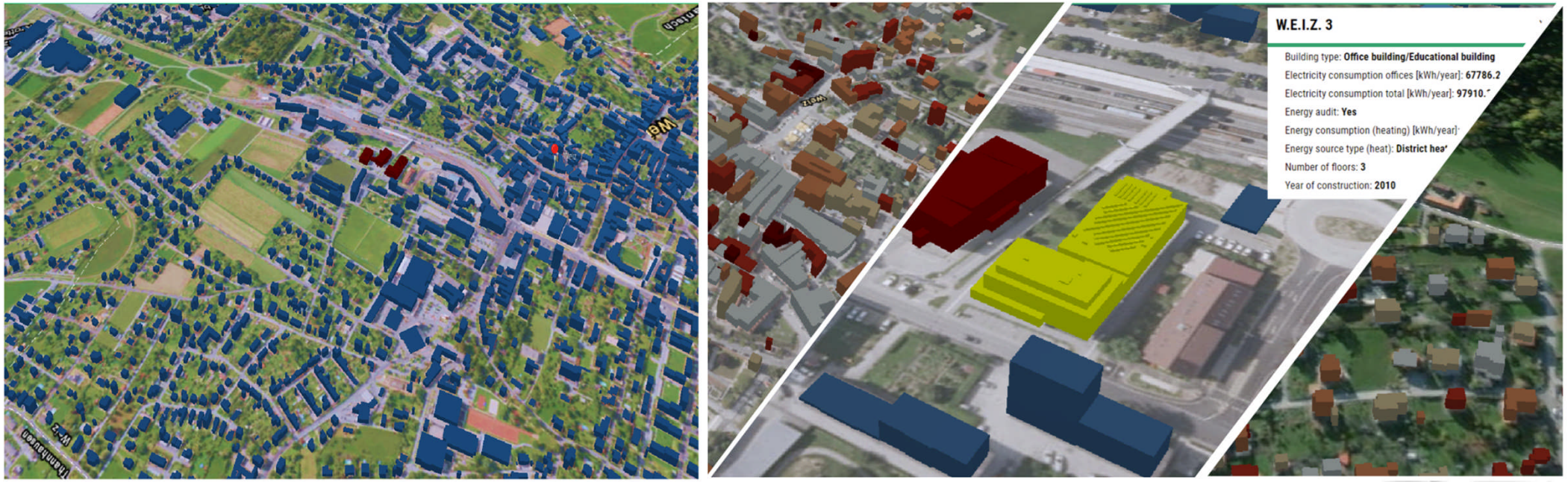
BOOSTEE-CE

3D Energy Management System; 3D EMS tool (https://oneplace.fbk.eu/3d/)

Example of web based visualization of **building geometry** (LOD1 and LOD2) with associated **energy database**



More than 10,000 buildings were reconstructed in LOD1 (some 35 in LOD2) and visualized in 3D environment

The Online Energy Platform - OnePlace - the 3D EMS tool -

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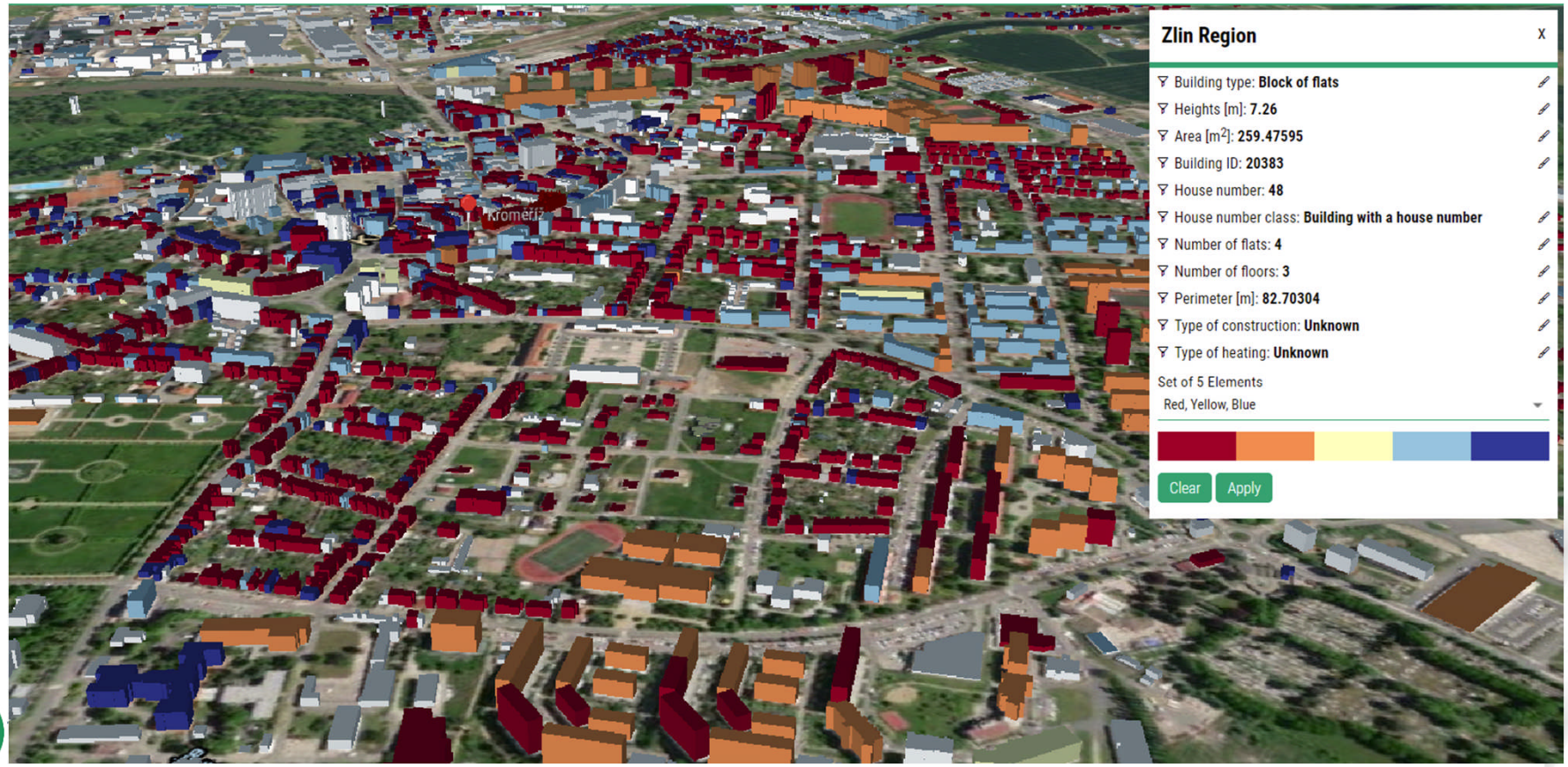
BOOSTEE-CE

3D Energy Management System; 3D EMS tool (https://oneplace.fbk.eu/3d/)

Example of **aggregation** functions within 3DEMS:

energy sources used for buildings' heating



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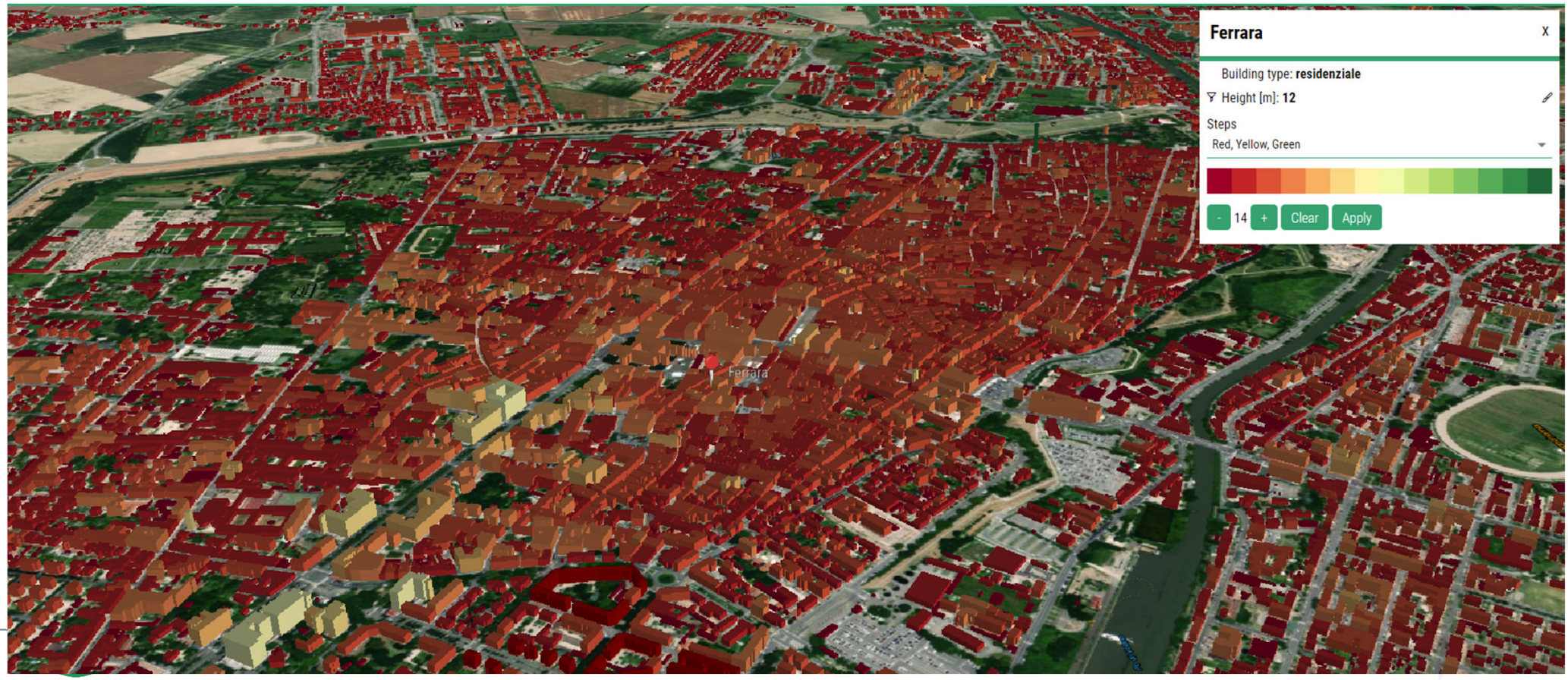
BOOSTEE-CE

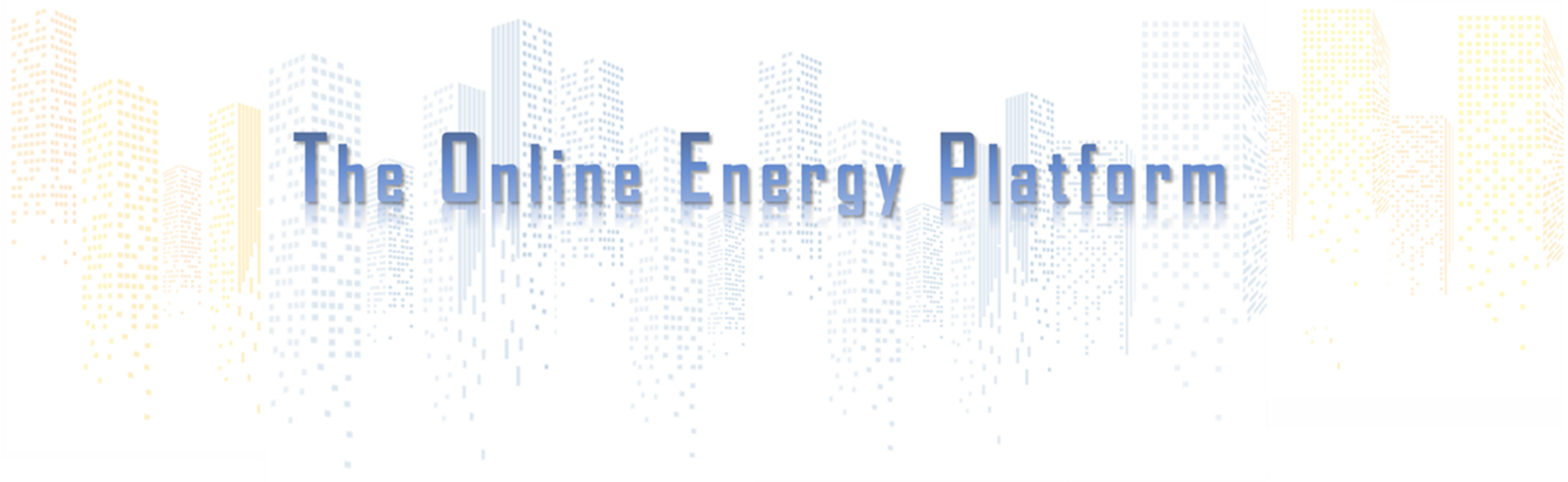
[3D Energy Management System; 3D EMS tool (https://oneplace.fbk.eu/3d/)](https://oneplace.fbk.eu/3d/)

Example of **aggregation** functions within 3DEMS:

height



The Online Energy Platform - OnePlace



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The Online Energy Platform - OnePlace - the Energy Ghost simulator -

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Energy Ghost simulation game (Energy@School)

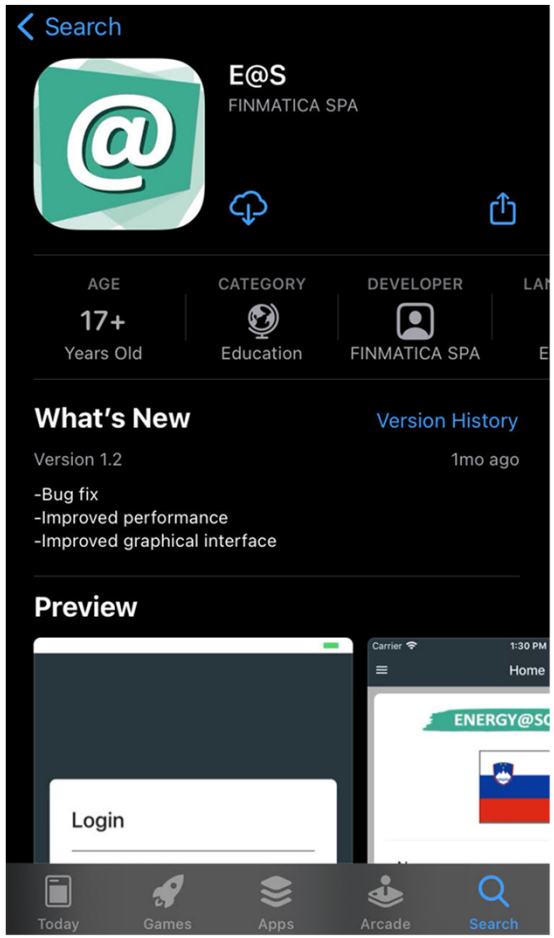
The aim of **ENERGY@SCHOOL App** is to collect and monitor the **energy consumption data of schools** by increasing user engagement. It can be used both from fixed and mobile devices and it provides:

- configuration of the school/classrooms to be monitored;
- temperature data for each class to be monitored and from any electrical/heat sensor;
- display of graphs for electrical/heat consumption on a specific date;
- gamification section.

The Online Energy Platform - OnePlace - the Energy Ghost simulator -

Capitalized Projects | Marketplace | EE Cities | EE Strategies | EE Finances | **EE Tools**

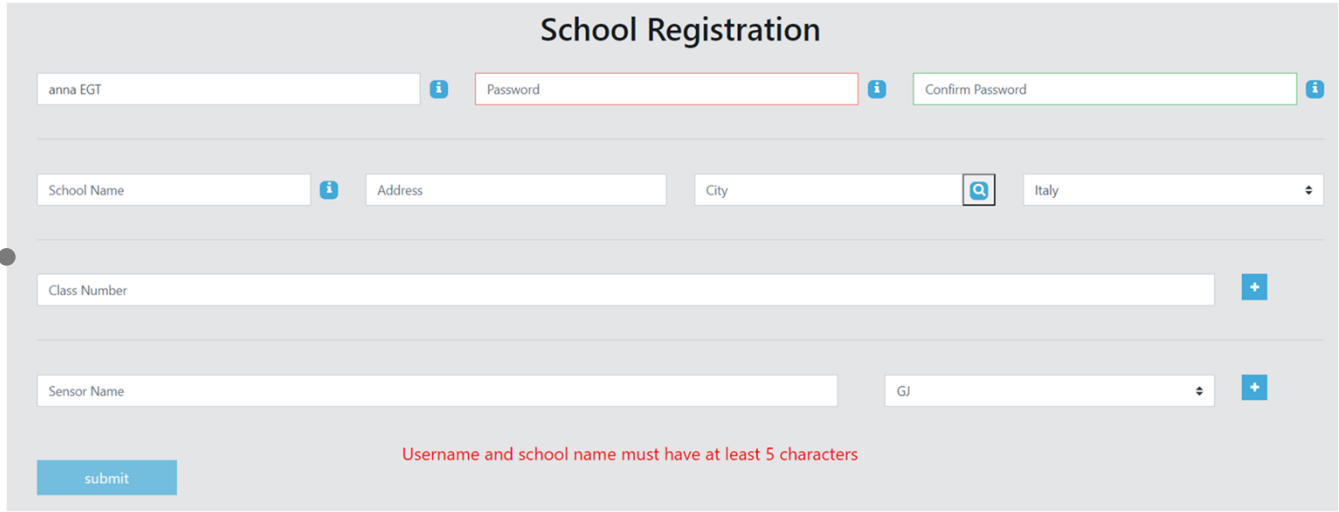
Energy Ghost simulation game (Energy@School)



user: UserDemo
pass: demo2021

Login to register a new school

https://energyatschool.finmatica.it/#/registrationlogin



TUTORIALS:

1) https://youtu.be/jb4bnOQhlWg
2) https://youtu.be/UmHaScT5L8E
3) https://youtu.be/x6YWPVIMyUg

The Online Energy Platform - OnePlace - the Energy Ghost simulator -

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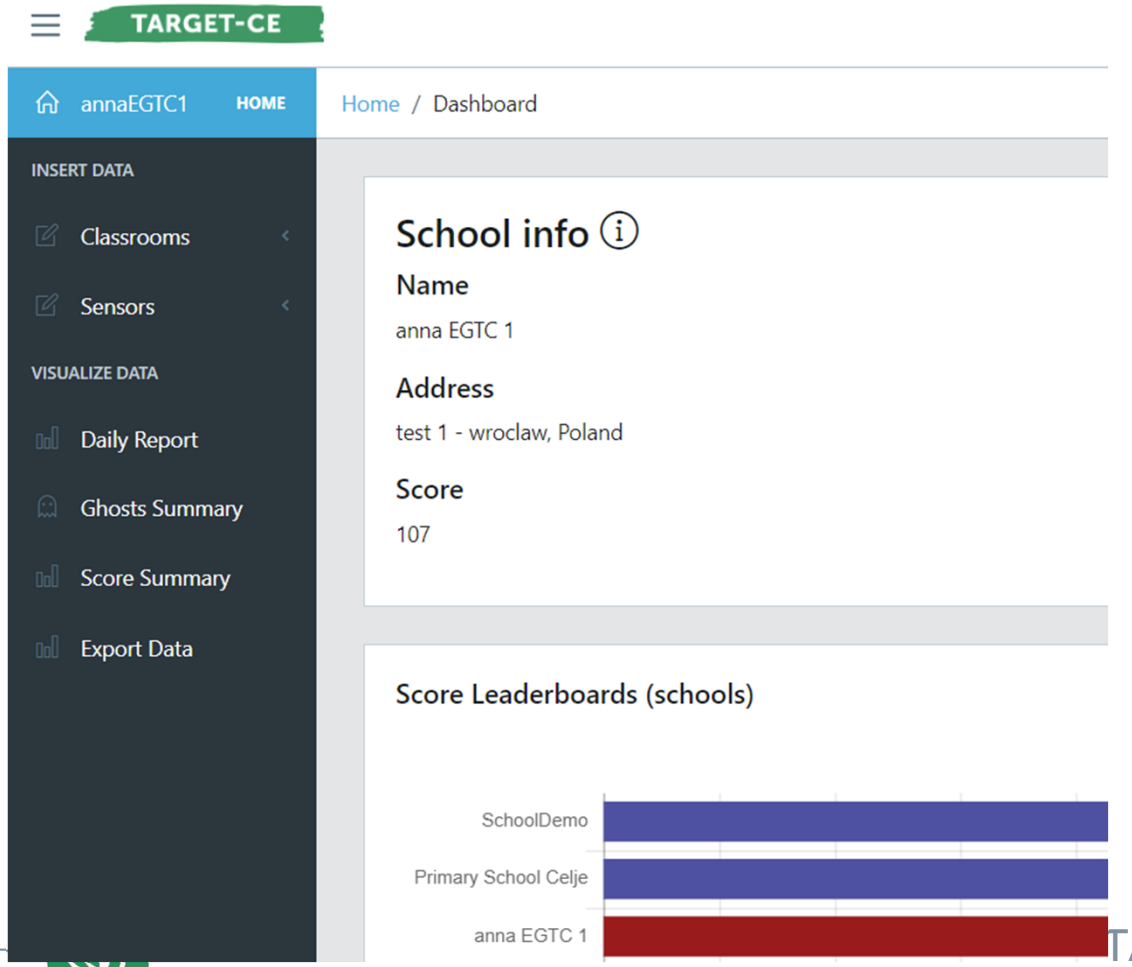
Energy Ghost simulation game (Energy@School)



Homepage structure

- Menu on the left, showing tools for users (classrooms, sensors, graphs).

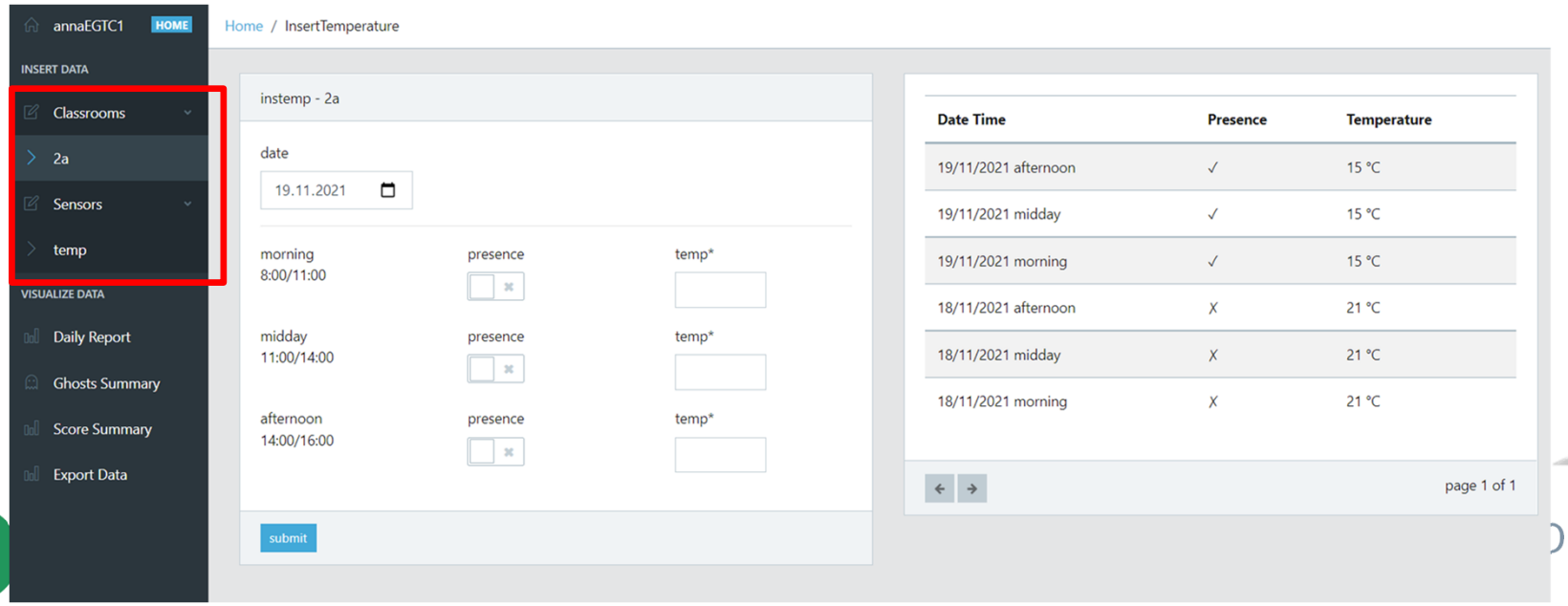
The Online Energy Platform - OnePlace - the Energy Ghost simulator -

Capitalized Projects | Marketplace | EE Cities | EE Strategies | EE Finances | EE Tools

Energy Ghost simulation game (Energy@School)

Data collection form

- By selecting a classroom, the user gets access to the data collection page
- Through a form, the user enters data on attendance and temperature in the chosen day
- Next to the form, a table with entered data shows up
- By selecting a sensor, the user may fill in a similar data collection form



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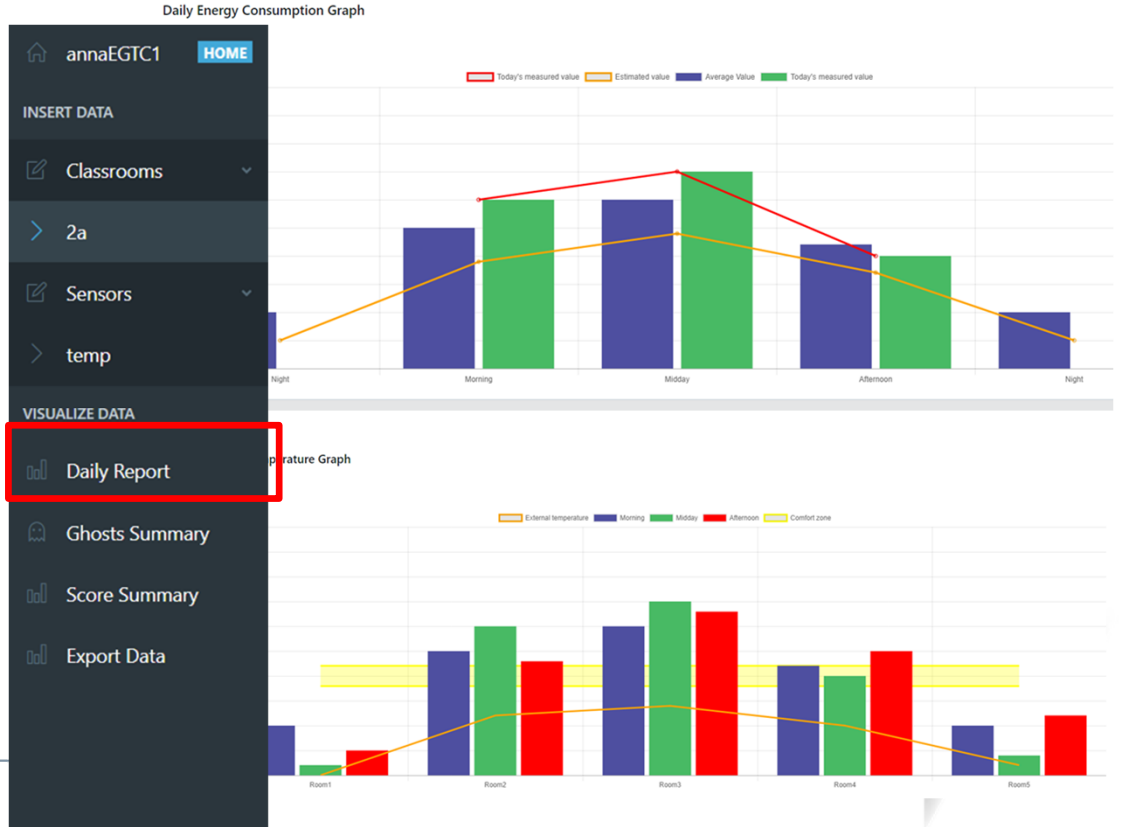
Energy Ghost simulation game (Energy@School)

Electric consumption graph

- Actual consumption in the morning / afternoon / night and baseline, measured by each smart meter
- Mean of actual consumption during the monitoring period

Classroom temperature graph

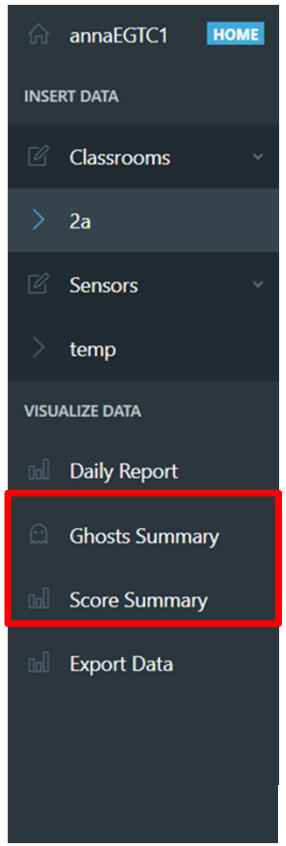
- T° measured in the fixed intervals
- External T° (measured by external web service)



The Online Energy Platform - OnePlace - the Energy Ghost simulator -

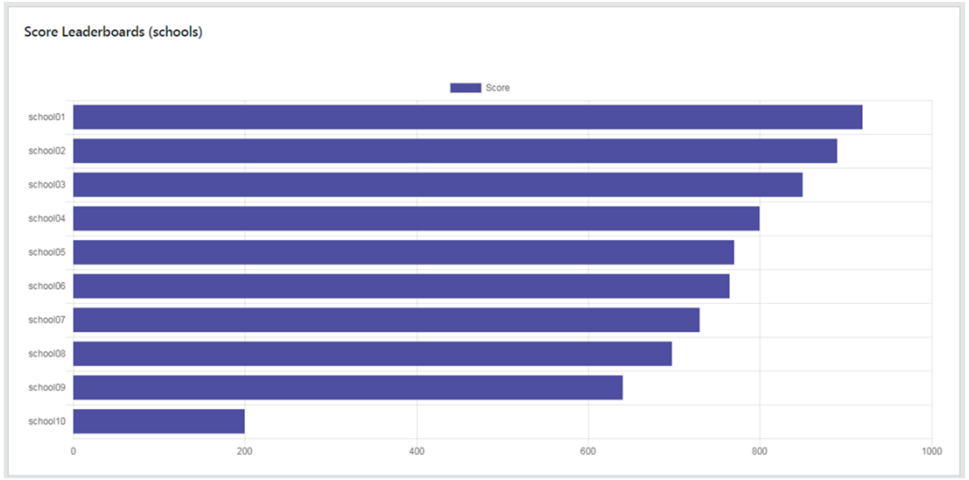
Capitalized Projects | Marketplace | EE Cities | EE Strategies | EE Finances | **EE Tools**

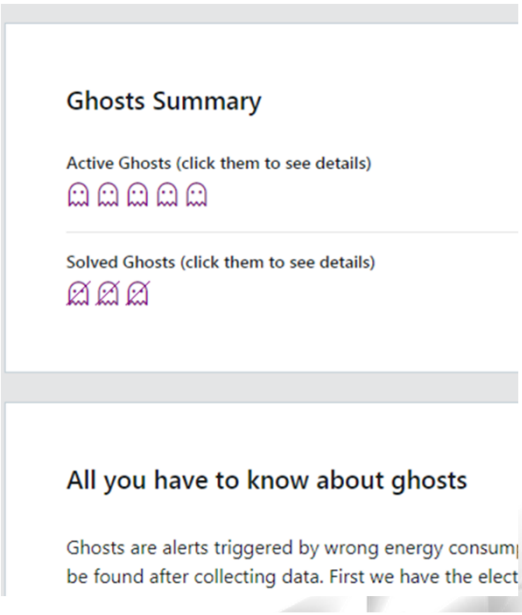
Energy Ghost simulation game (Energy@School)



SCORING OF SCHOOLS

- The scores of each school are represented in a bar graph which is updated based on the points acquired or lost during the game.





The ghost management is displayed in the **Ghosts Summary**: every time a ghost is generated it is added to the Active Ghosts list, while when a ghost is closed it switches to the Solved Ghosts list.

The Online Energy Platform - OnePlace

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The Online Energy Platform - OnePlace - the Living EPC tool -

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Living EPC tool (eCentral)

WHAT IS THE LIVING EPC TOOL?

- Complex interactive web-based tool.
- Offers different combinations of cost-optimal measures for reaching nearly zero-energy building (nZEB) requirements.
- Based on inserted data from energy performance certificates, audit reports or energy consumption information.

The Online Energy Platform - OnePlace - the Living EPC tool -

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Living EPC tool (eCentral)

FOR WHO WAS DESIGNED AND WHY?

Local authorities

- For public building which they own or use.
- To facilitate their systematic monitoring of building stock.
- Supports them in identification of key project for energy renovation
- Offers concrete quantification of energy and financial indicators, resulting with achievement of nZEB standard.

The Online Energy Platform - OnePlace - the Living EPC tool -

Capitalized Projects | Marketplace | EE Cities | EE Strategies | EE Finances | EE Tools

Living EPC tool (eCentral)

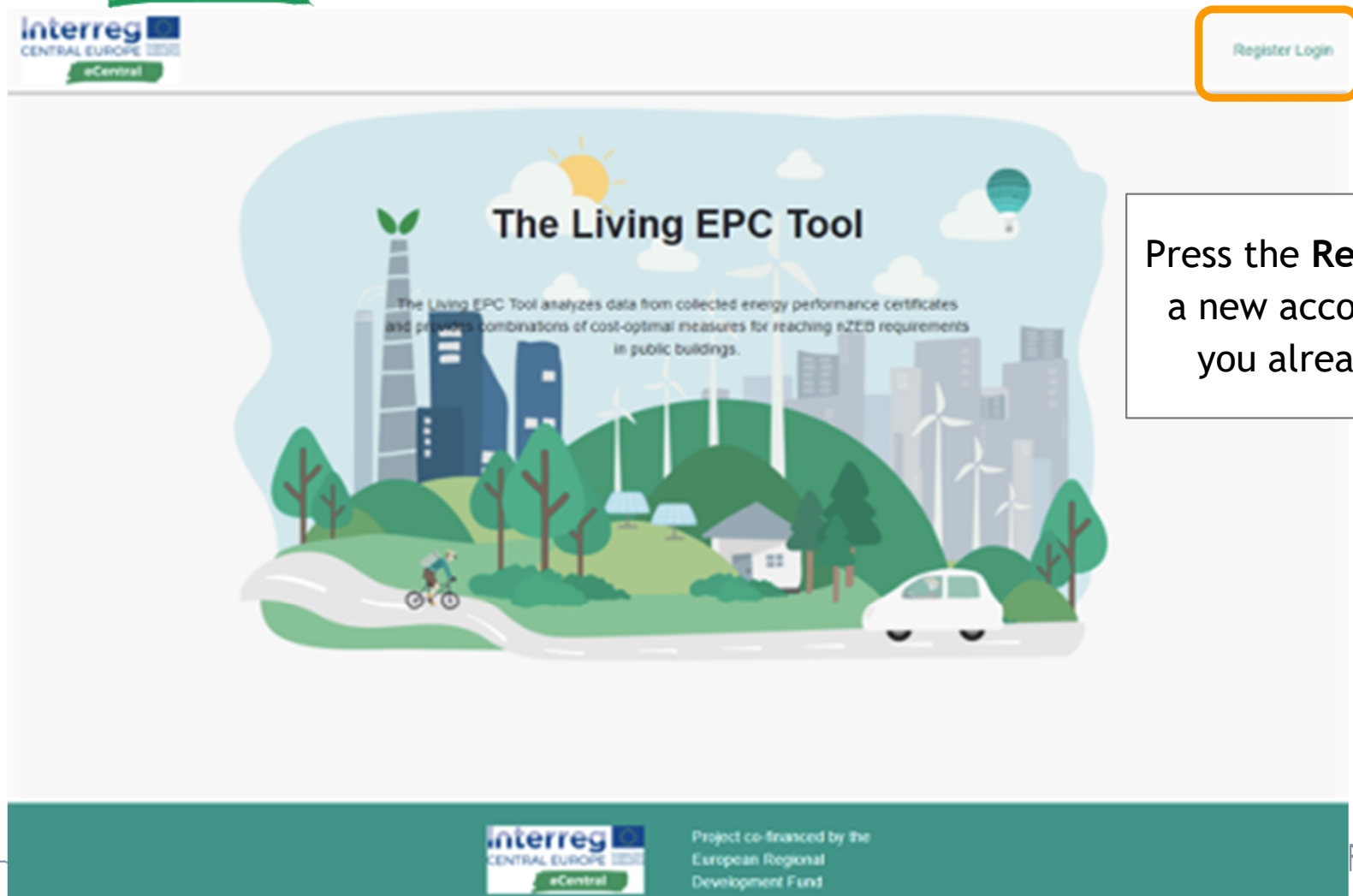
HOW DOES THE TOOL WORKS?

- The Living EPC tool is based on seasonal method of ISO 13790 (which is currently in use in various EU countries).
- Predefined values are used to simplify the process of data input and NZEB estimation.
- Currently the tool can be used in 6 countries: Croatia, Hungary, Italy, Austria, Slovenia and Poland. Which means that the tool is adapted to country specific legislation and specification regarding nZEB standard.

The Online Energy Platform - OnePlace - the Living EPC tool -

Capitalized Projects | Marketplace | EE Cities | EE Strategies | EE Finances | EE Tools

Living EPC tool (eCentral)



Press the **Register** button to create a new account or **Login** button if you already have an account.

The Online Energy Platform - OnePlace - the Living EPC tool -

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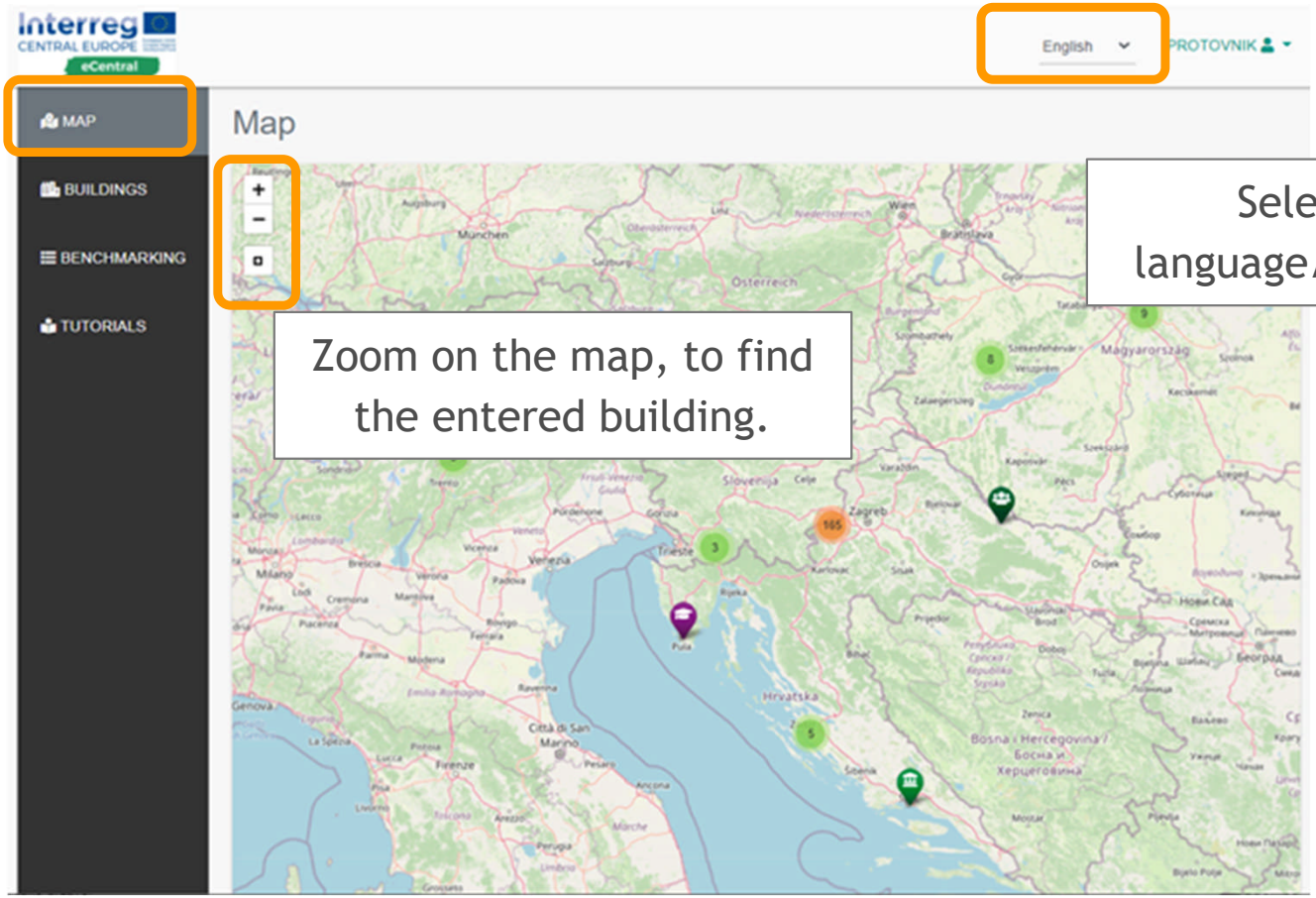
Living EPC tool (eCentral)



The Online Energy Platform - OnePlace - the Living EPC tool -

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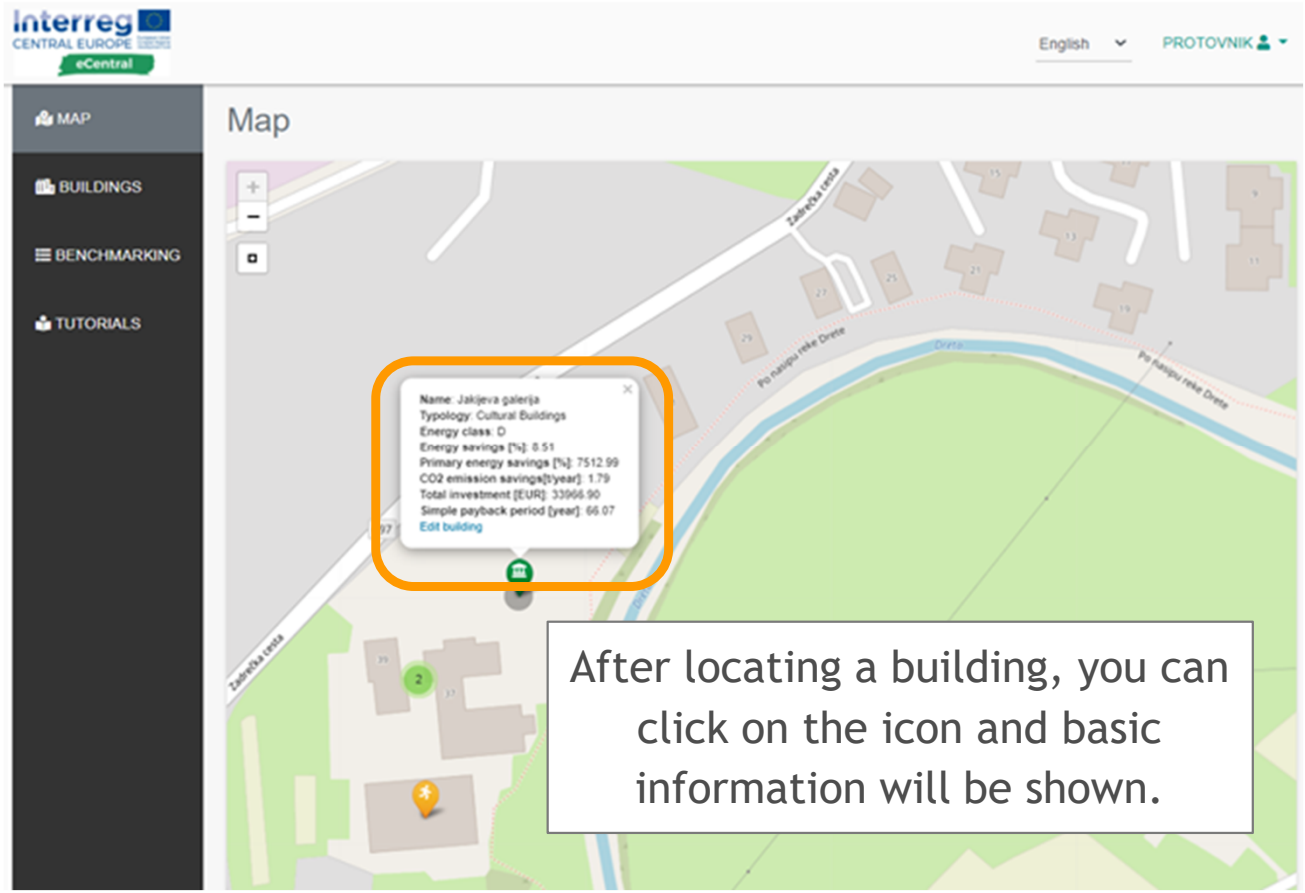
Living EPC tool (eCentral)



After locating a building, you can click on the icon and basic information will be shown.

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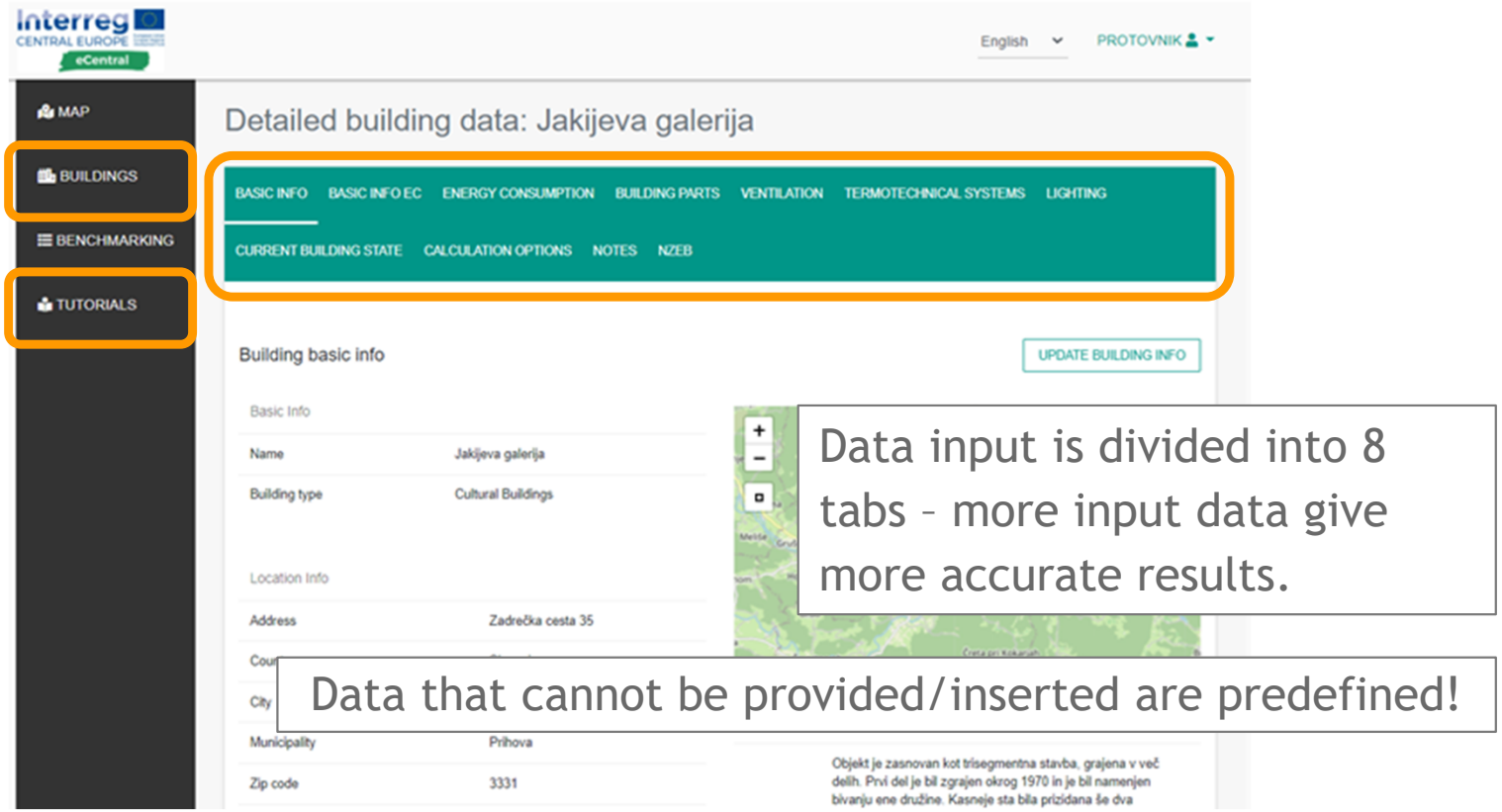
Living EPC tool (eCentral)



Data input is divided into 8 tabs – more input data give more accurate results.

Data that cannot be provided/inserted are predefined!

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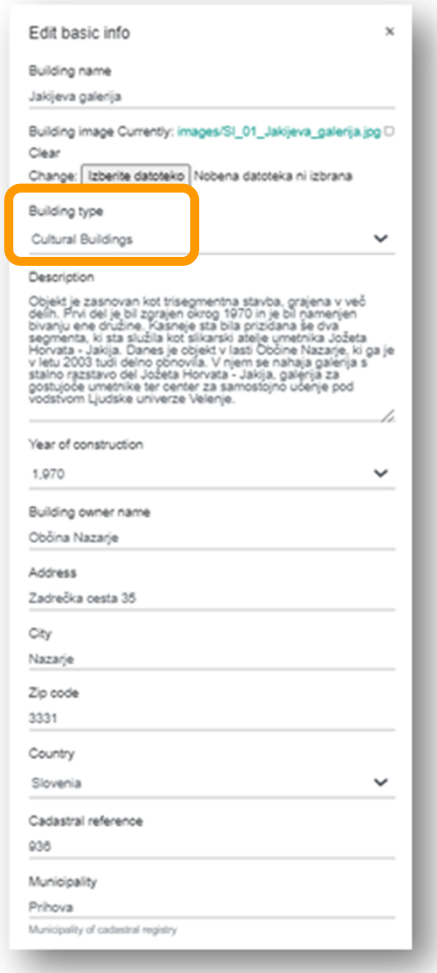
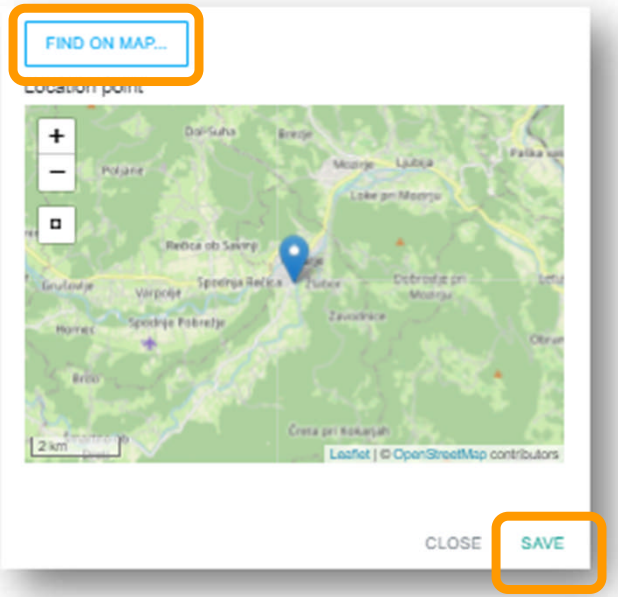
Living EPC tool (eCentral)

EXAMPLE OF DATA INPUT



It is important to select the building type.

If the correct address (city, street) is filled - user can click FIND ON MAP button and the tool will show the building location on the map.



Don’t forget to save your work!

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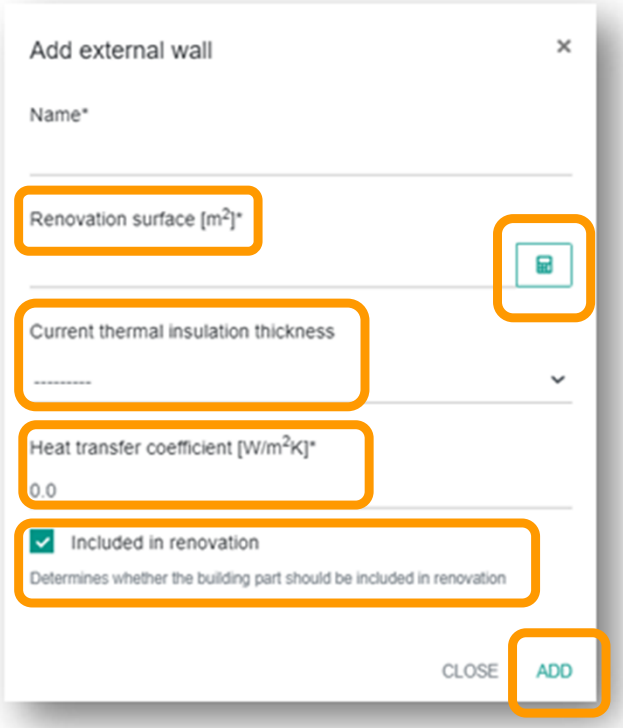
Living EPC tool (eCentral)

EXAMPLE OF DATA INPUT



Define the surface that needs to be renovated.

It can be calculated by the tool using the Database predictions

When selecting thermal insulation thickness, heat transfer coefficient will be selected automatically, but you can modify it, if needed.

Here is an option, whether you would like to include this building part in the calculations.

Click on ADD button to save.

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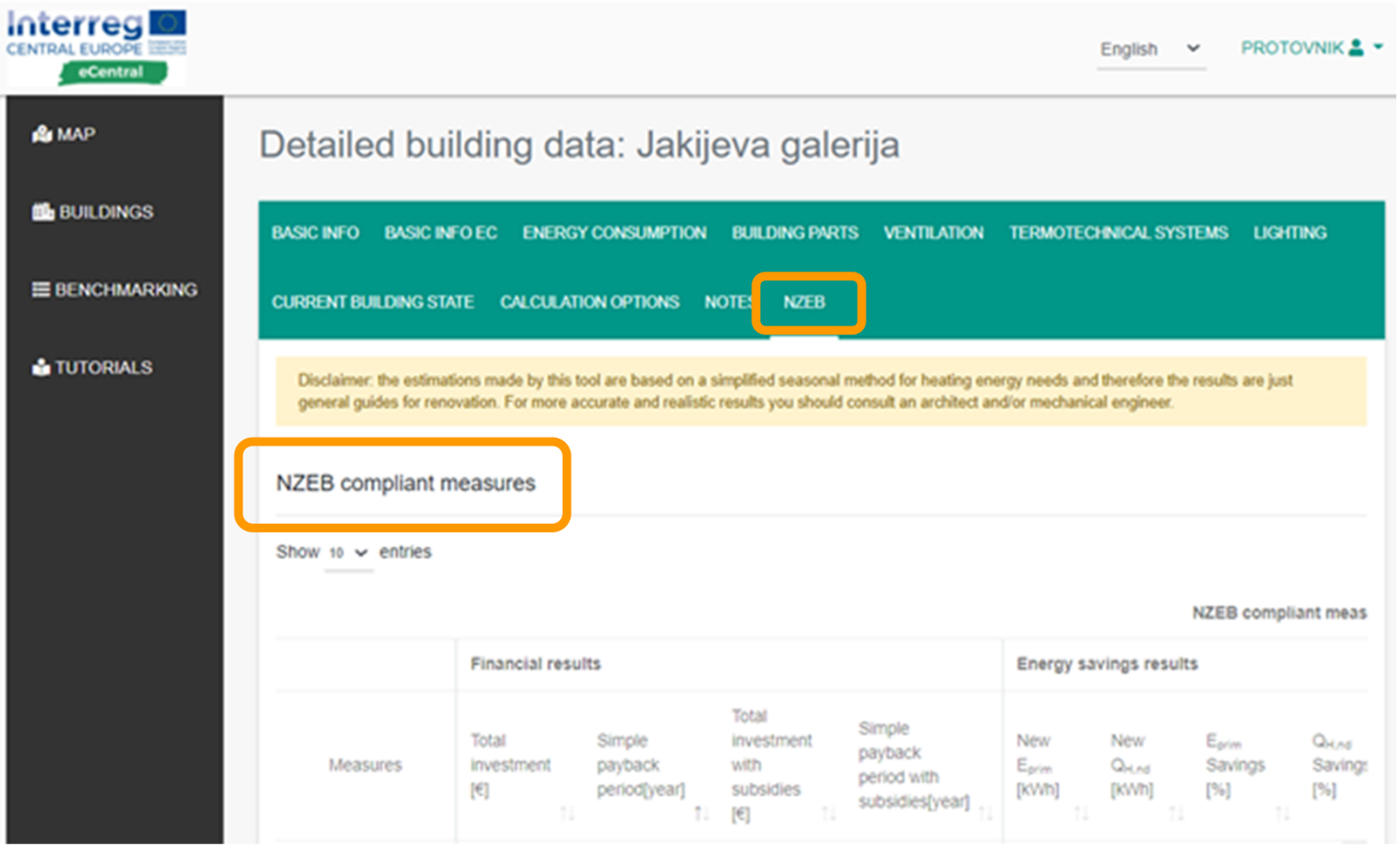
Living EPC tool (eCentral)



Here you can find all possible combinations of measures for achieving the nZEB standard in accordance with the current legislation for specific country.

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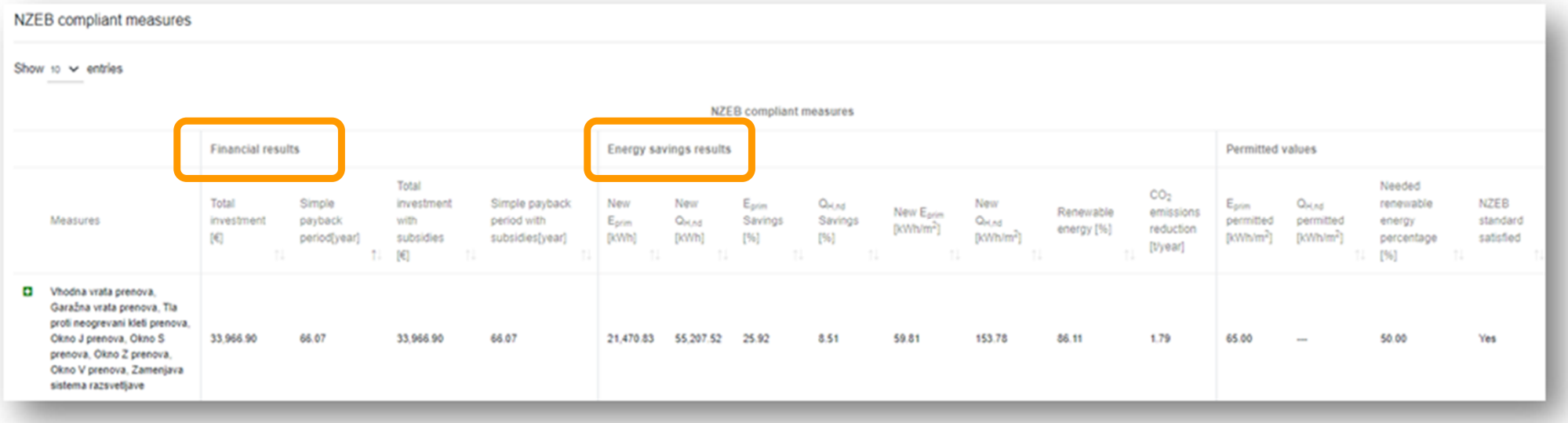
Living EPC tool (eCentral)



NZEB compliant measures

Show 10 entries

NZEB compliant measures

	Financial results				Energy savings results								Permitted values			
Measures	Total investment [€]	Simple payback period[year]	Total investment with subsidies [€]	Simple payback period with subsidies[year]	New E_{prim} [kWh]	New $Q_{H,nd}$ [kWh]	E_{prim} Savings [%]	$Q_{H,nd}$ Savings [%]	New E_{prim} [kWh/m²]	New $Q_{H,nd}$ [kWh/m²]	Renewable energy [%]	CO_2 emissions reduction [t/year]	E_{prim} permitted [kWh/m²]	$Q_{H,nd}$ permitted [kWh/m²]	Needed renewable energy percentage [%]	NZEB standard satisfied
Vhodna vrata prenova, Garažna vrata prenova, Tla proti neogrevani kleti prenova, Okno J prenova, Okno S prenova, Okno Z prenova, Okno V prenova, Zamenjava sistema razsvetljave	33,966.90	66.07	33,966.90	66.07	21,470.83	55,207.52	25.92	8.51	59.81	153.78	86.11	1.79	65.00	---	50.00	Yes

Results are presented through financial and energy savings perspective.

The Online Energy Platform - OnePlace - the Living EPC tool -

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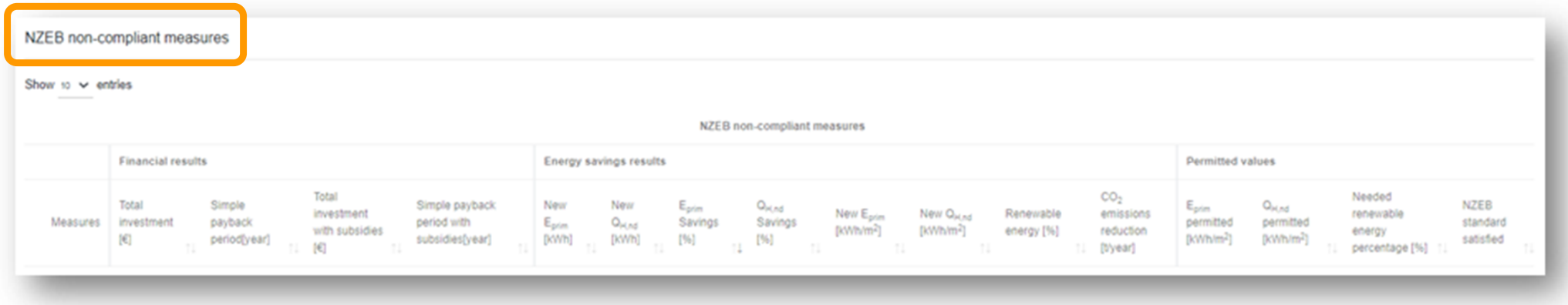
Living EPC tool (eCentral)



NZEB non-compliant measures

Show 10 entries

NZEB non-compliant measures

Measures	Financial results				Energy savings results								Permitted values			
	Total investment [€]	Simple payback period[year]	Total investment with subsidies [€]	Simple payback period with subsidies[year]	New E_{prim} [kWh]	New $Q_{H,nd}$ [kWh]	E_{prim} Savings [%]	$Q_{H,nd}$ Savings [%]	New E_{prim} [kWh/m²]	New $Q_{H,nd}$ [kWh/m²]	Renewable energy [%]	CO_2 emissions reduction [t/year]	E_{prim} permitted [kWh/m²]	$Q_{H,nd}$ permitted [kWh/m²]	Needed renewable energy percentage [%]	NZEB standard satisfied

If the tool cannot estimate nZEB potential- user will receive information about renovation measures which is possible to implement in order to achieve certain level of energy savings.

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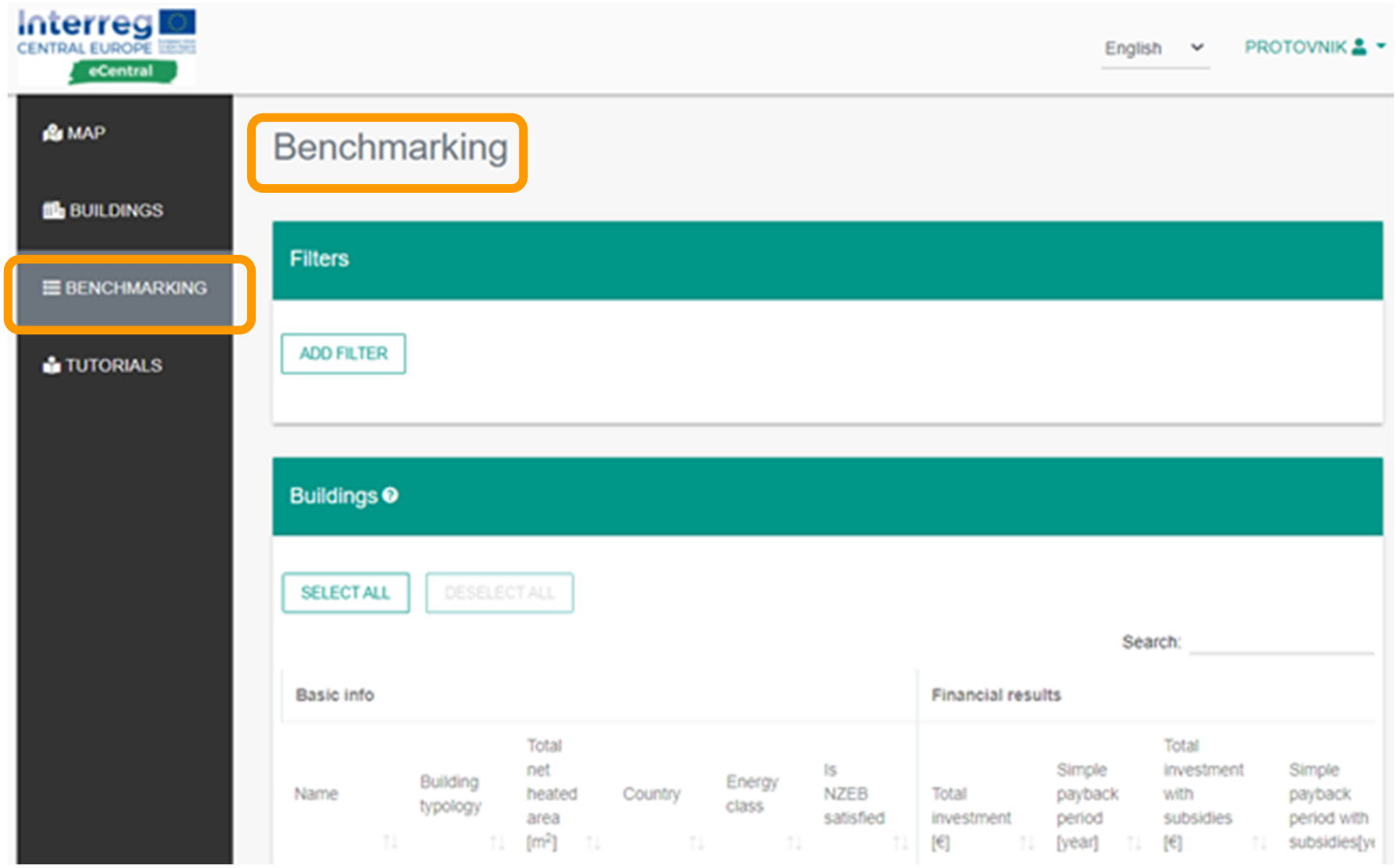
Living EPC tool (eCentral)



Benchmarking offers a possibility for comparison between selected buildings and also extracting a report for selected buildings.

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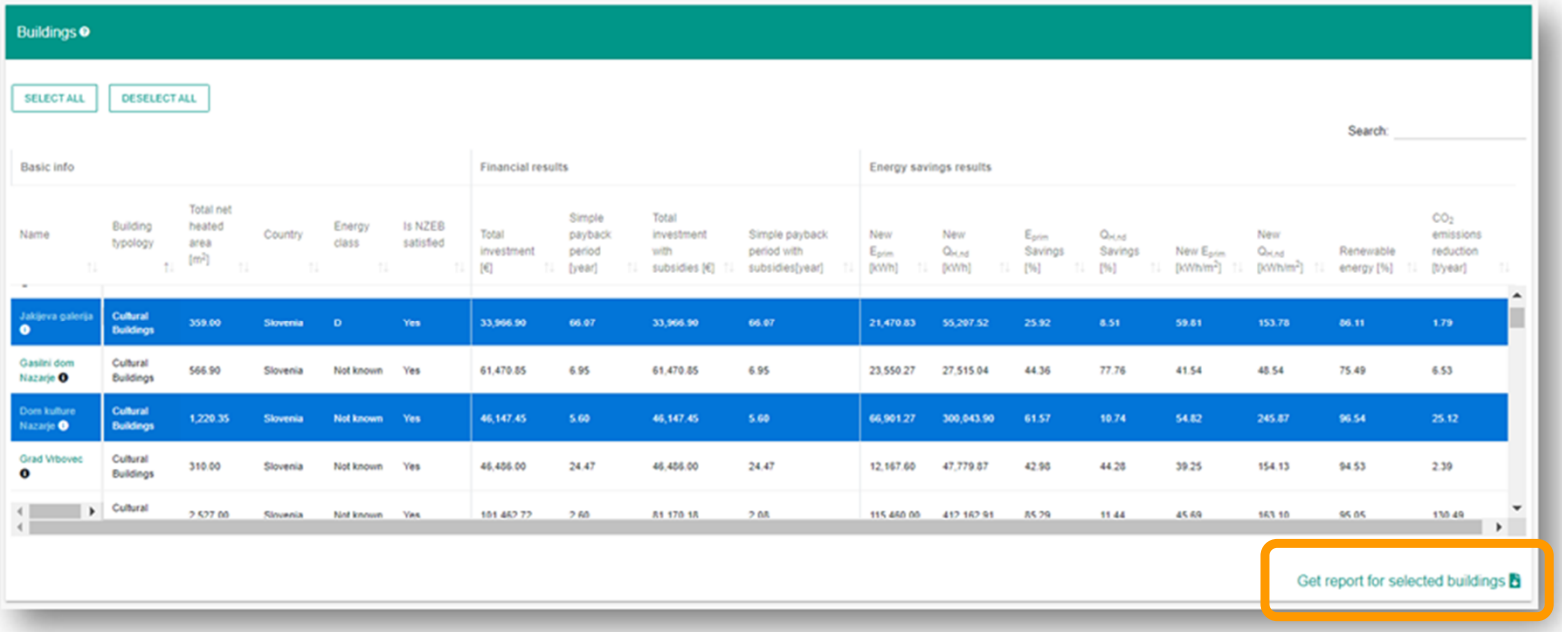
Living EPC tool (eCentral)



You can download the report for all selected buildings.

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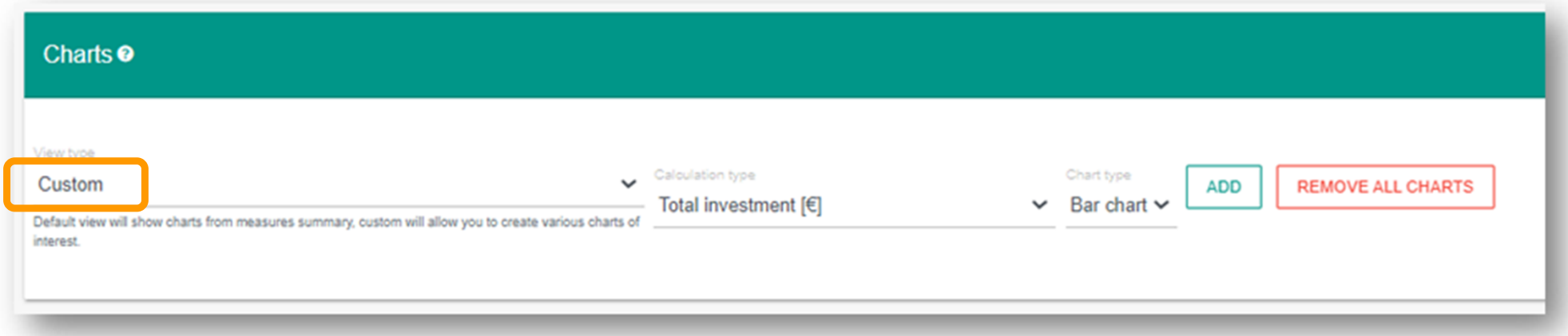
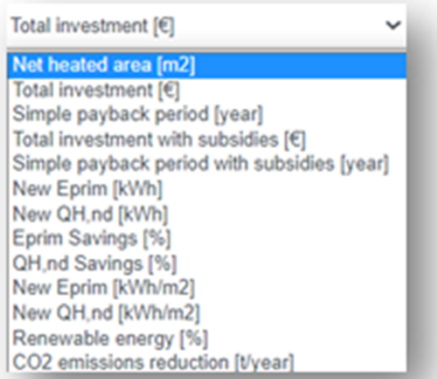
Living EPC tool (eCentral)



There is the possibility to create customized charts.



Charts can be based on different calculation type and for several selected buildings at the time.

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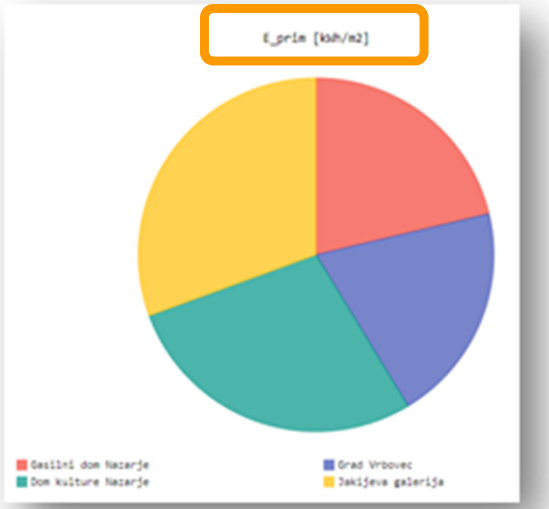
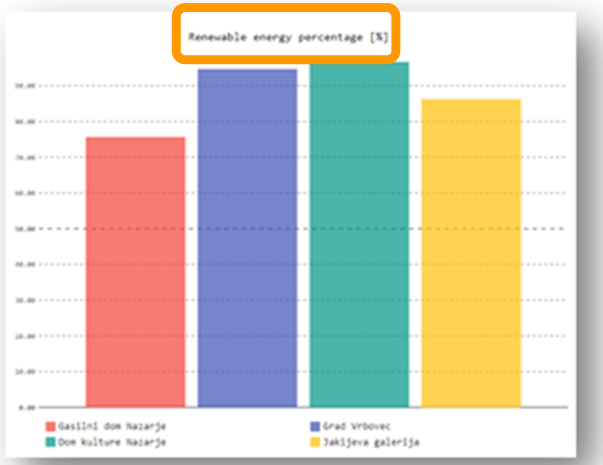
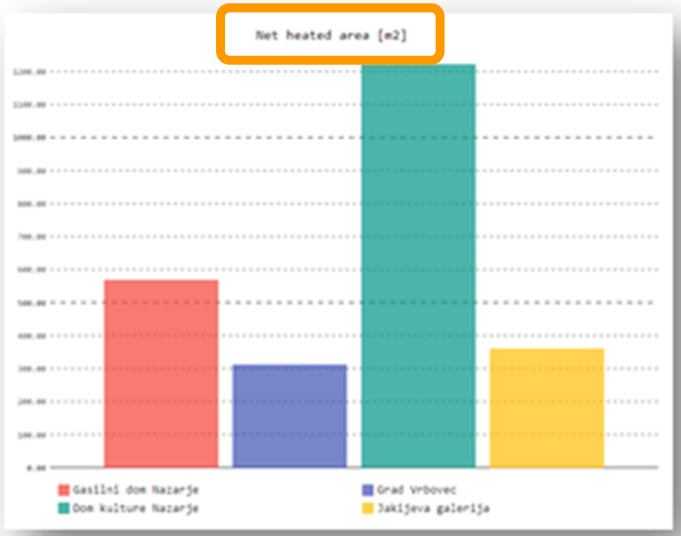
Living EPC tool (eCentral)







The Online Energy Platform - OnePlace - the Living EPC tool -

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Living EPC tool (eCentral)

Link to the tool: https://nzeb.thorium.software/

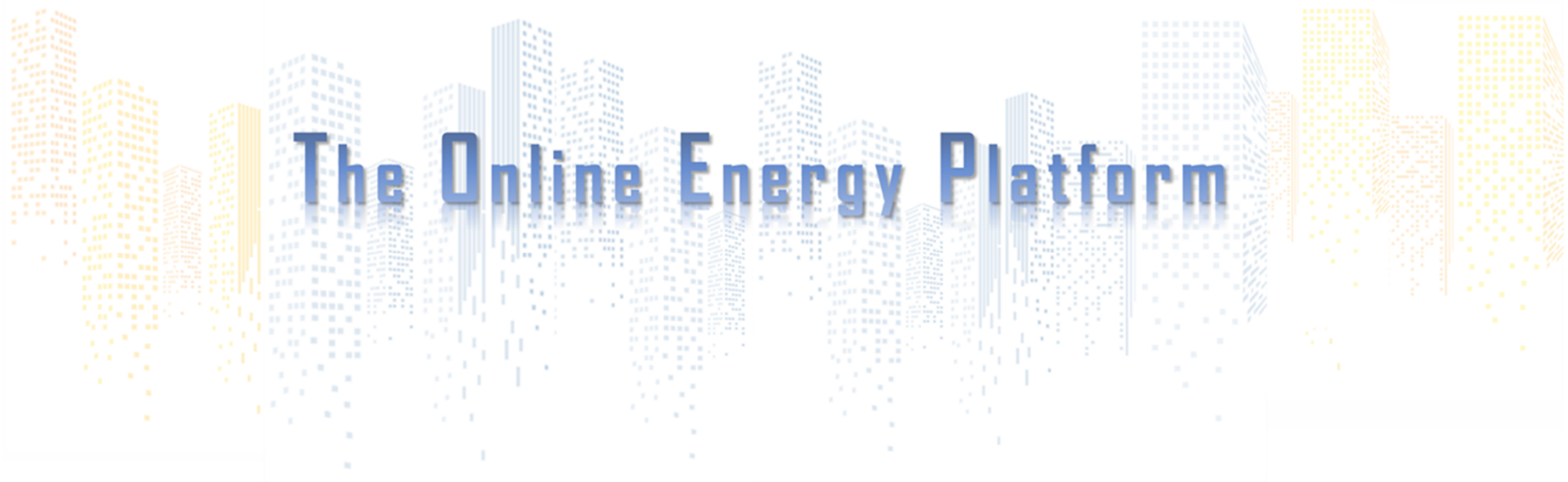
Demo account

User name: kssenatarget

Password: target2020

Disclaimer: the estimations made by this tool are based on a simplified seasonal method for heating energy needs and therefore the results are just general guides for renovation. For more accurate and realistic results you should consult an architect and/or mechanical engineer.

The Online Energy Platform - OnePlace



1. OnePlace web-platform & 3D EMS tool (BOOSTEE-CE)
2. Energy Ghost simulation game (Energy@School)
3. Living Energy Performance Certificate managing tool & database (eCentral)
4. **Energy Dashboard (CitiEnGov Toolkit)**
5. Stickers for behavioral change (GreenSoul)

The Online Energy Platform - OnePlace - the Energy Dashboard -

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Energy Dashboard (CitiEnGov Toolkit) - http://toolkit.citiengov.eu/

- A solution to **better deal with energy-related data** about buildings, mobility and public lighting
- It was developed following the **need for harmonized energy-related data**
- Better / harmonized data implies a **better knowledge** about supply & demand of energy resources - including their spatial distribution within urban areas, thus to **enable effective scenario modelling** and to **support overall policy processes**
- Development of the CitEnGov harmonized data model, based on INSPIRE EU Directive (https://inspire.ec.europa.eu/)

The Online Energy Platform - OnePlace - the Energy Dashboard -

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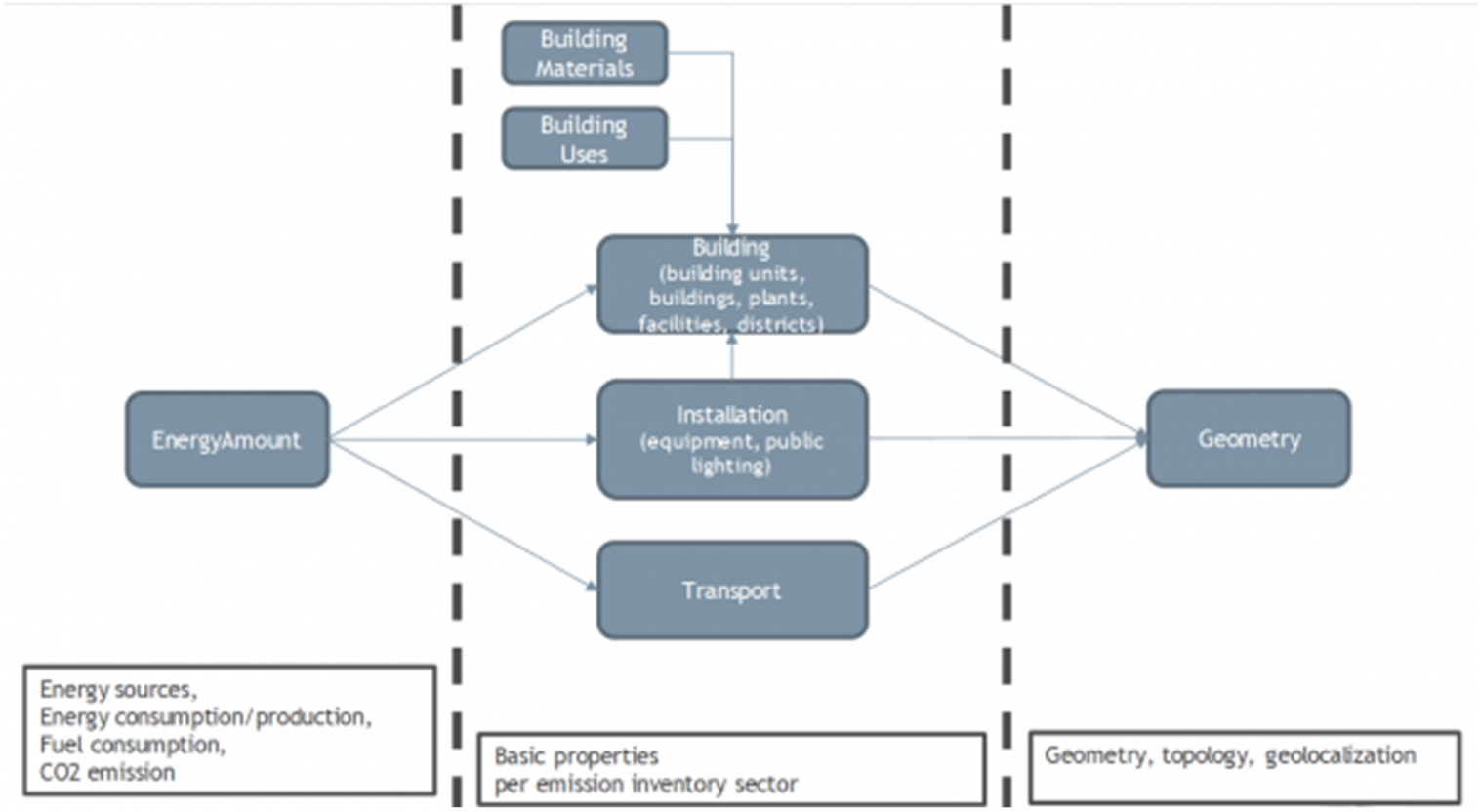
Energy Dashboard (CitiEnGov Toolkit) - http://toolkit.citiengov.eu/

- Conceptual data model based on the INSPIRE Data Specifications



The Online Energy Platform - OnePlace - the Energy Dashboard -

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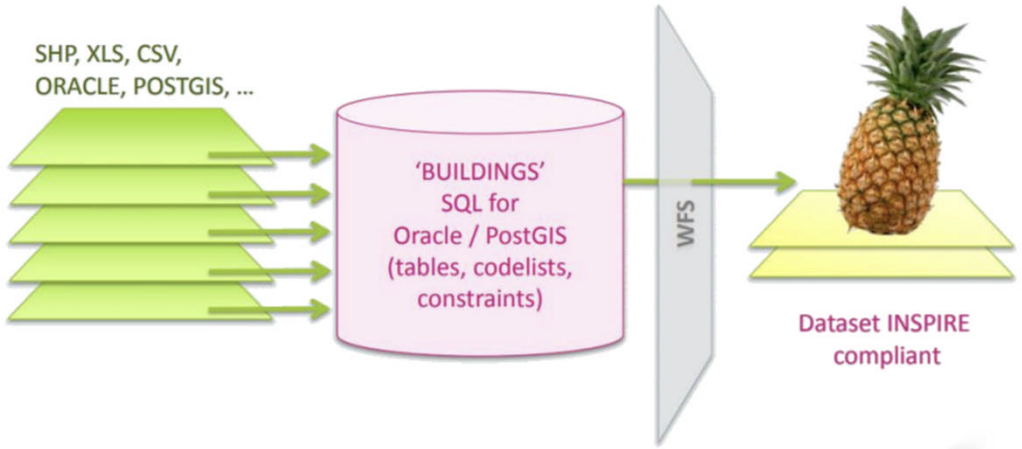
Energy Dashboard (CitiEnGov Toolkit) - http://toolkit.citiengov.eu/

- Implementation of the data model based on two different platforms mostly used, Oracle and PostgreSQL/PostGIS.
- The SQL scripts for creating the database are available at
  http://toolkit.citiengov.eu/images/4/4e/CitiEnGov_Data_Model_Oracle.pdf
  http://toolkit.citiengov.eu/images/4/4a/CitiEnGov_Data_Model_PostGIS.pdf



The Online Energy Platform - OnePlace - the Energy Dashboard -

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Energy Dashboard (CitiEnGov Toolkit) - http://toolkit.citiengov.eu/

DEMO

http://sit.comune.fe.it/geonext/login.html

The Online Energy Platform - OnePlace - the Energy Dashboard -

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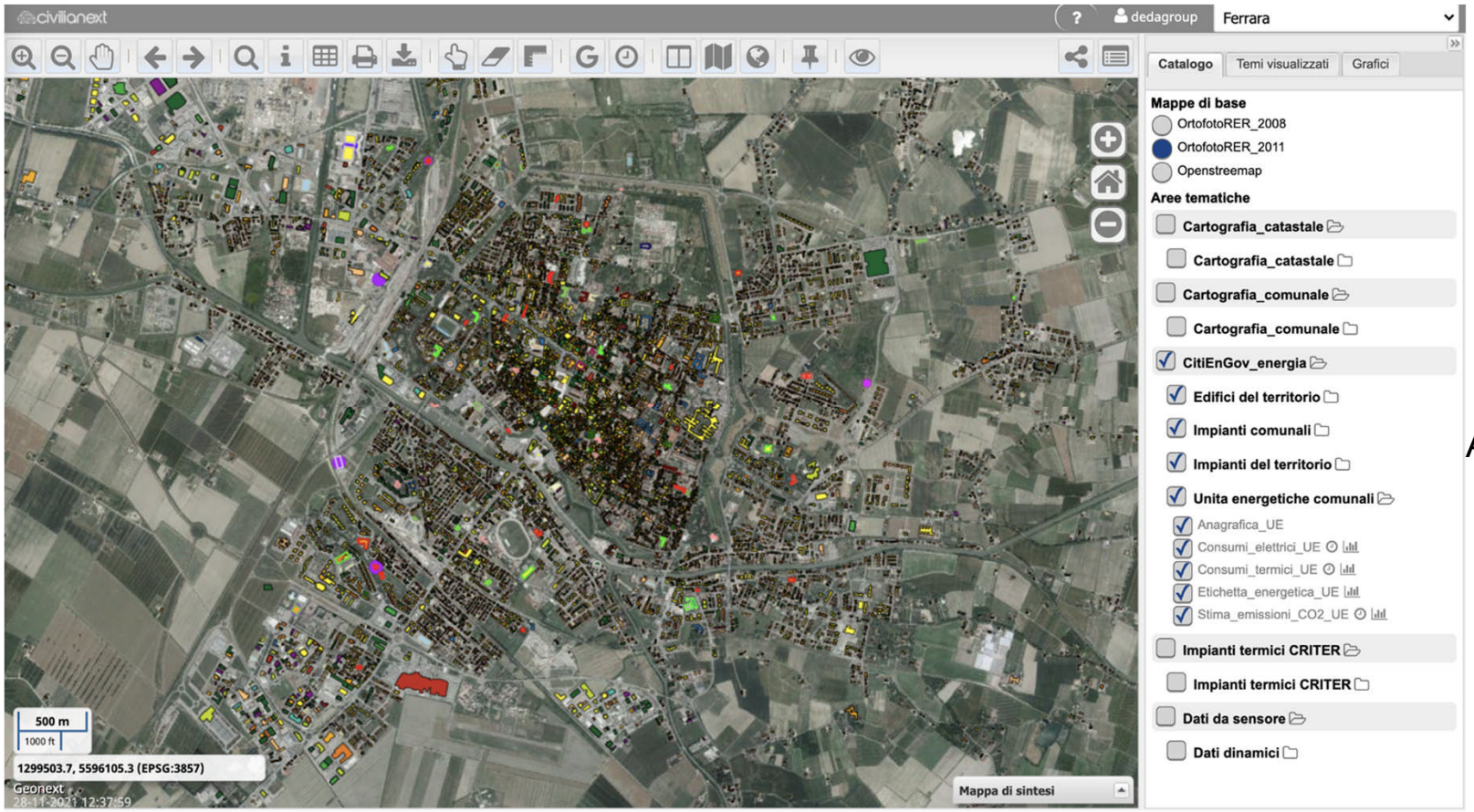
Energy Dashboard (CitiEnGov Toolkit) - http://toolkit.citiengov.eu/



Activate of shown layers

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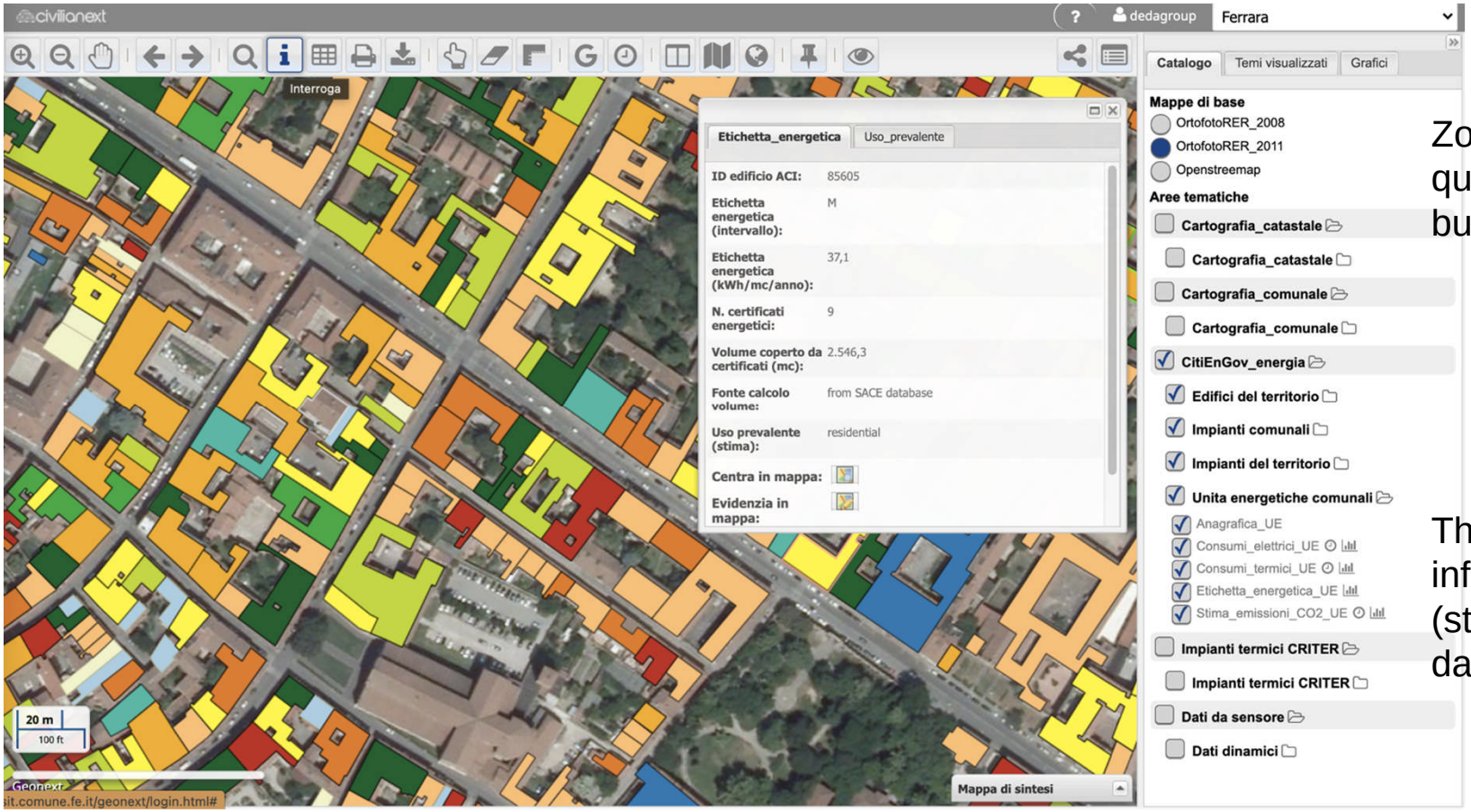

Zoom to the city center and query a building using the ***i*** button ("Interroga")

The energy-related information of the building (stored with the Citiengov data model) are popped-up

The Online Energy Platform - OnePlace - the Energy Dashboard -

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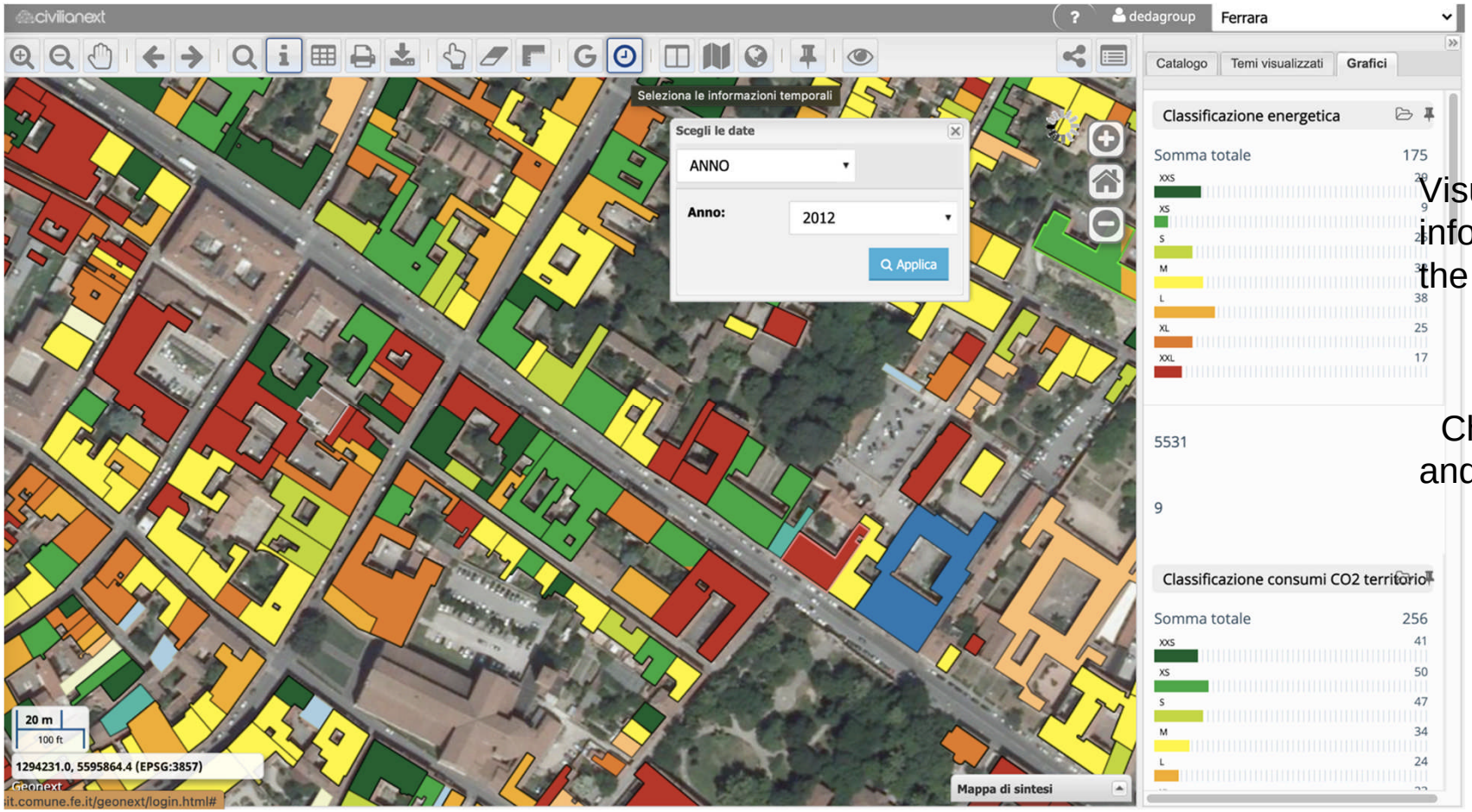
Energy Dashboard (CitiEnGov Toolkit) - http://toolkit.citiengov.eu/



Visualized energy-related information per year using the icon

Choose the year (2012) and Apply to see results in the visualized area/quartier

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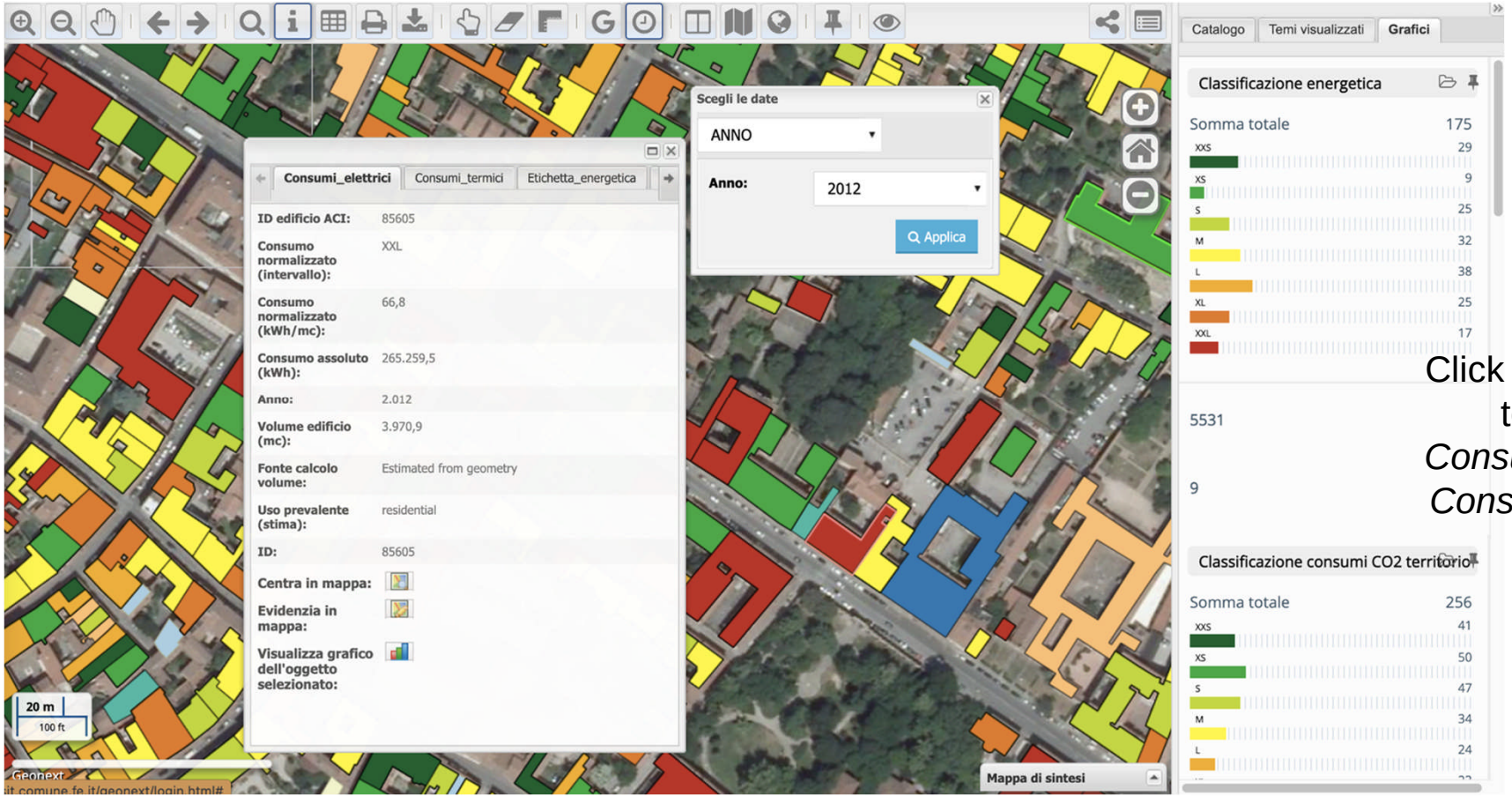

Click on a specific building to see its *Electric Consumption* and *Thermal Consumption* data for that specific year

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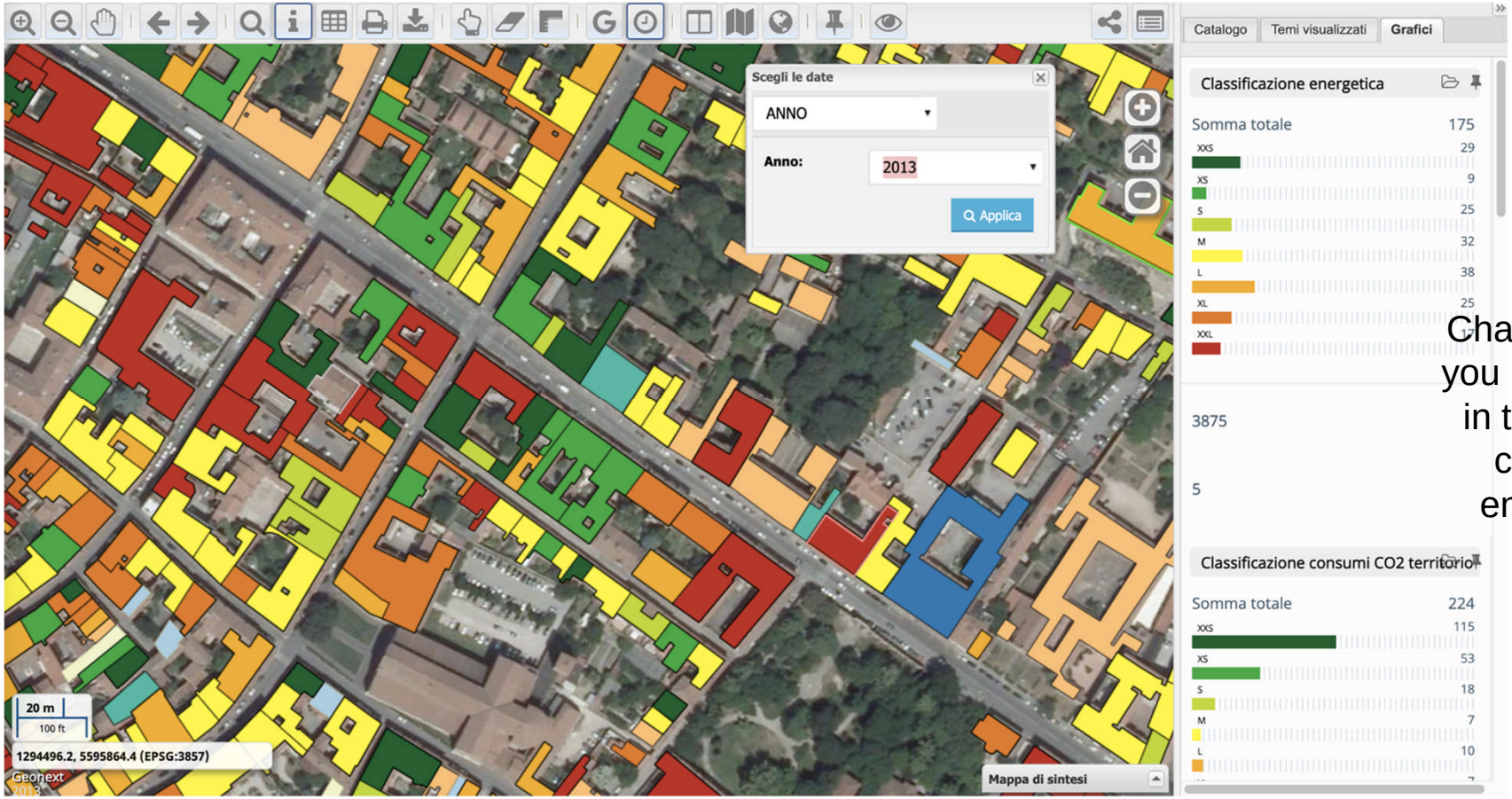
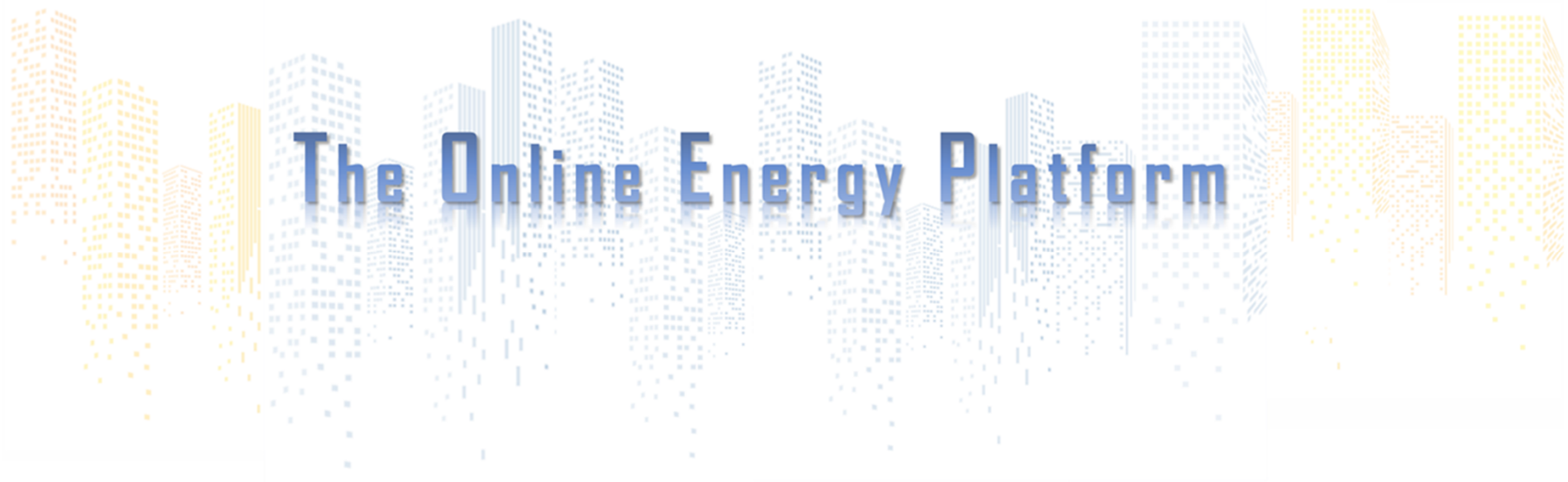


Changing the year (2013) you might notice changing in the building colors, ie changes in the their energy consumptions

The Online Energy Platform - OnePlace



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The Online Energy Platform - OnePlace - the Energy Dashboard -

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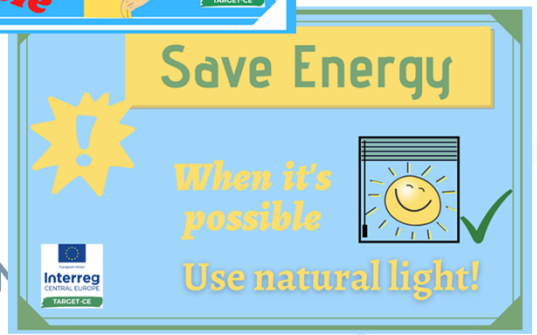
Stickers for behavioral change

- Series of **printable stickers** to motivate people to save energy, change behavior wrt to energy, support the environment and act sustainable
- Slightly adaptation from the material produced within the H2020 **GreenSould** project
- Stickers available in English, Italian, German, Polish, Slovenian and Czech languages



THEMATIC MODULE #1

Home Capitalized Projects Marketplace EE Cities EE Strategies EE Finances EE Tools

https://oneplace.fbk.eu/

The Online Energy Platform

OnePlace

Thank you for your attention