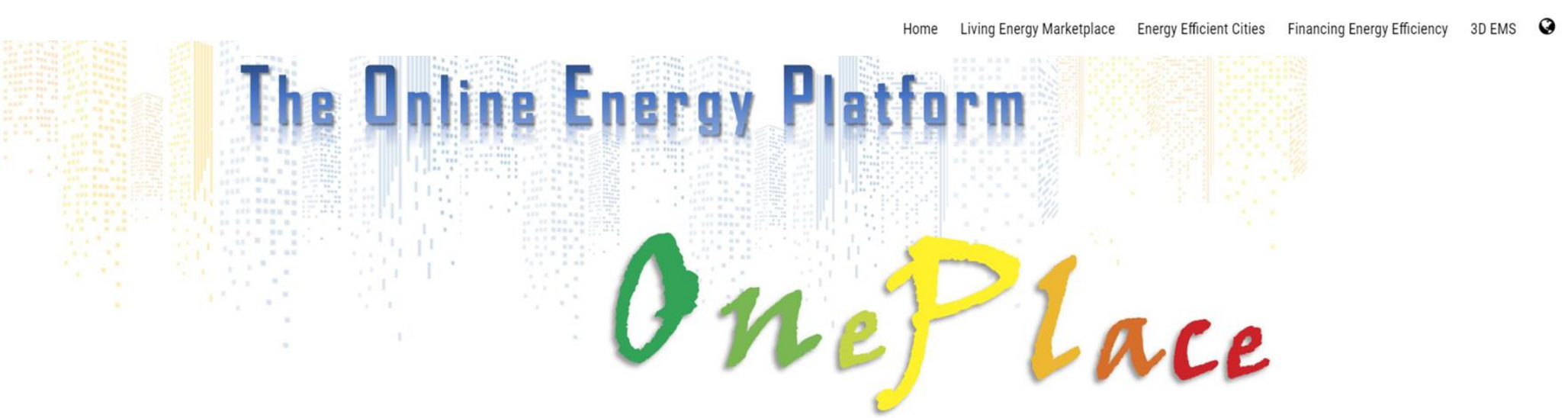
Warsaw 01.10.2019 r.

BOOSTEE-CE - Train the Trainers

Fabio Remondino - FBK, Trento, Italy
Anna Nowacka - EUWT NOVUM, Jelenia Góra, Poland
Tomáš Perutka - EAZK, Zlin, Czech Republic

THEMATIC PANEL



Fabio REMONDINO

3D Optical Metrology (3DOM)
Bruno Kessler Foundation (FBK)
Trento, Italy
Email: remondino@fbk.eu
http://3dom.fbk.eu

Anna NOWACKA

Europejskie Ugrupowanie Współpracy Terytorialnej NOVUM (EUWT NOVUM)
Jelenia Góra, Poland
Email: anna.nowacka@euwt-novum.eu
http://www.euwt-novum.eu

Tomáš PERUTKA

Energy Agency of the Zlín Region (EAZK)
Zlin, Czech Republic
Email: tomas.perutka@eazk.cz
http://http://www.eazk.cz/

FONDAZIONE BRUNO KESSLER

NOVUM Evropské seskupení pro územní spolupráci Europejskie Ugrupowanie Współpracy Terytorialnej

ENERGETICKÁ AGENTURA ZLÍNSKÉHO KRAJE, o.p.s.

The Online Energy Platform - OnePlace

Schedule of the module (9:00 - 10:45)

1. Introduction to OnePlace Platform
2. I module: Living Energy Marketplace
3. II module: Energy Efficient Cities
4. III module: Financing Energy Efficiency
5. IV module: 3D Energy Management System (3DEMS)
6. DEMO – practical use of 3DEMS

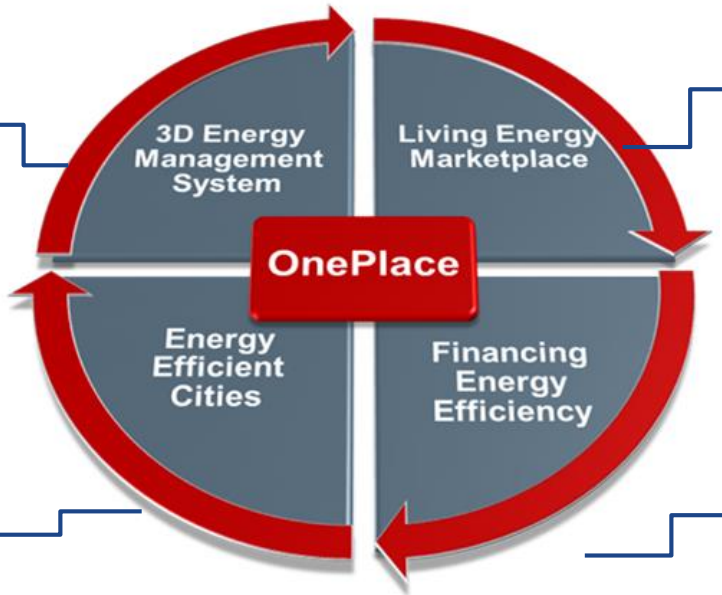
The Online Energy Platform - OnePlace

The Online Energy Platform - OnePlace

Web platform includes 4 interlinked modules enriched with energy related contents (best practices, database of devices, energy certificates, PV maps, etc.) **freely accessible** to policy makers, energy planners and citizens in order to improve the governance and understanding of energy efficiency.

A **webGIS viewer** for the visualization of energy- related information (consumptions, audits, PV potential, etc.) within **3D city models**

A collection of country-based **experiences, best practices and guidelines** in the energy efficiency sector for public authorities and citizens.

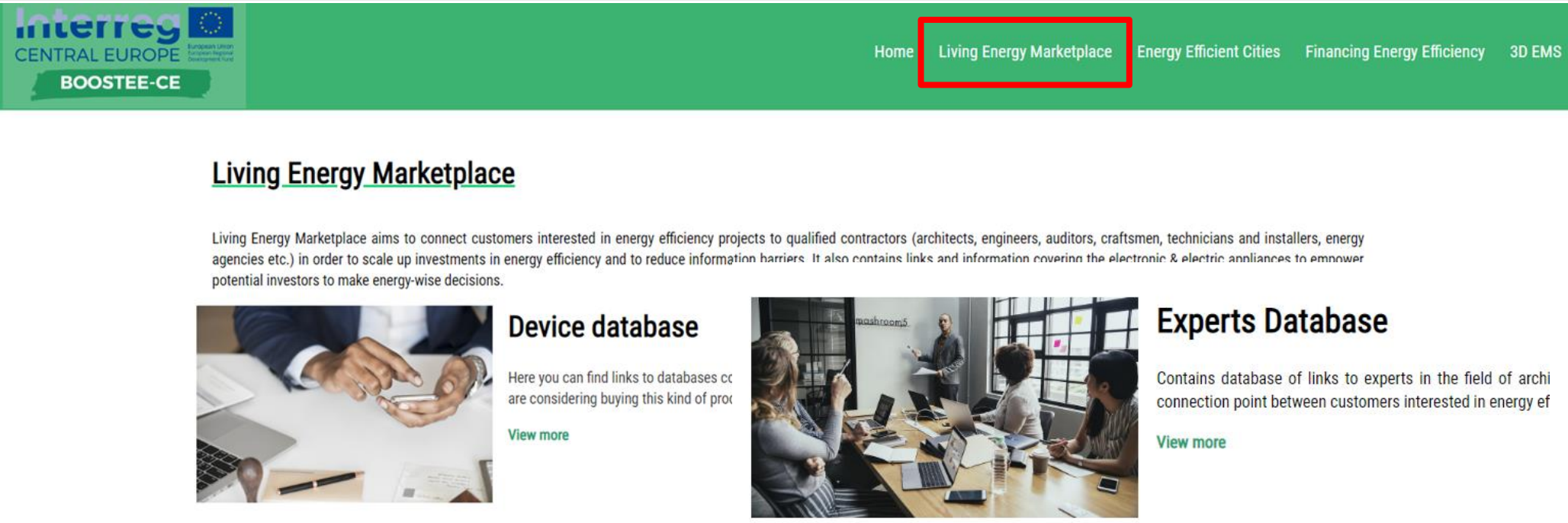


Database reporting information about electronic & electric appliances as well as a country-based list of qualified contractors (*engineers, auditors, technicians*) for EE projects.

Transnational strategy outcomes (*financial road map*), examples of best practice and practical steps to use the national & EU-level resources

The Online Energy Platform - OnePlace

OnePlace - Living Energy Marketplace



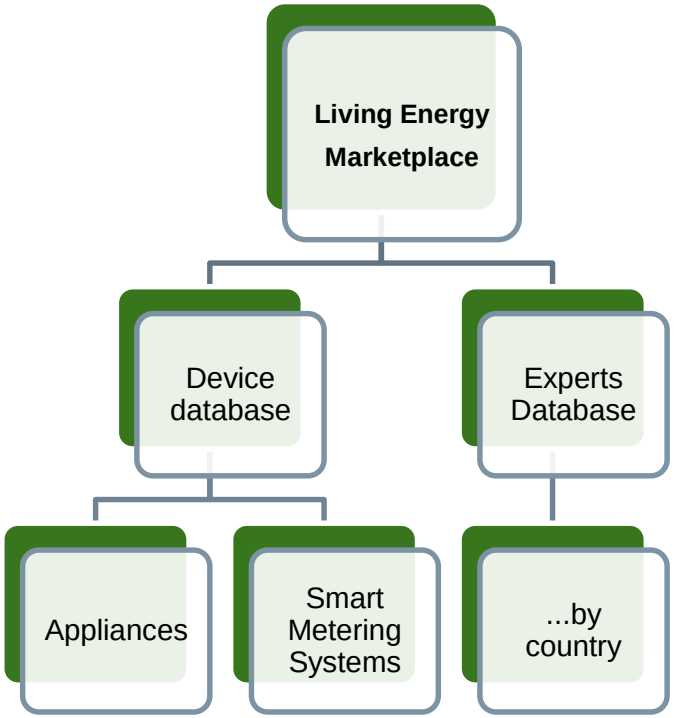
Living Energy Marketplace aims to **connect customers** interested in energy efficiency projects **to qualified contractors** (architects, engineers, auditors, craftsmen, technicians and installers, energy agencies etc.) in order **to scale up investments in energy efficiency** and to reduce information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

OnePlace - Living Energy Marketplace

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.

OnePlace - Living Energy Marketplace

Austria

Energieberatungsstellen

Sie planen eine Biomasseheizung, eine Wärmepumpe, eine Solaranlage und interessieren sich für eine Förderung Ihres Vorhabens? Zur Beratung und Einreichung Ihres Förderungsantrages stehen Ihnen zahlreiche „Ich tu´s"-Beratungsstellen in der Steiermark zur Verfügung.

→ Visit the page

Fördereinreichstellen

EINREICHSTELLEN – UND BERATUNGSSTELLEN in der Steiermark für folgende Ökoförderungen:

- Heizungsoptimierung - Biomasse
- Biomasse-Heizungen
- Heizungsoptimierung - Wärmepumpe
- Solarthermische Anlagen

→ Visit the page

Energieberater

Heizkostenvergleich

Der Heizkostenvergleich der Österreichischen Energieagentur ist ein Vollkostenvergleich, der Konsumentinnen und Konsumenten als Orientierung dienen soll. Die Auswahl der zu vergleichenden Heizsysteme erfolgt mit dem Fokus, den Stand der Technik der derzeit am häufigsten neu installierten Heizsysteme in Einfamilienhäusern in Österreich abzubilden. Der Heizkostenvergleich der Österreichischen Energieagentur vergleicht folgende Heizsysteme:

- Fernwärme
- Erdgas-Brennwert
- Öl-Brennwert
- Scheitholz
- Pellets
- Luft/Wasser-Wärmepumpe
- Sole/Wasser-Wärmepumpe mit Erdsonde

→ Visit the page

Effiziente Heizwerke

OeMAG - Abwicklungsstelle für Ökostrom

Die OeMAG Abwicklungsstelle für Ökostrom AG (auch Ökostromabwicklungsstelle) wurde 2006 eingerichtet., um die von anerkannten Ökostromanlagen in das öffentliche Netz eingespeisten Ökostrommengen gem. Ökostromgesetz 2012 (ÖSG 2012) und den geltenden Marktregeln abzunehmen und zu vergüten. Die gelieferten Strommengen werden an die auf österreichischem Bundesgebiet tätigen Stromhändler weitergeliefert. Die Weiterlieferung und Verrechnung erfolgt nach Maßgabe der an Endkunden abgegebenen Mengen an elektrischer Energie (Quotenregelung).

→ Visit the page

Monitoringstelle für Energieeffizienz

Die Monitoringstelle Energieeffizienz ist eine Einrichtung in der Österreichischen Energieagentur im Auftrag des Bundesministeriums für Nachhaltigkeit und Tourismus (BMNT) und Anlauf- und Informationsstelle für die laut Energieeffizienzgesetz verpflichteten Unternehmen, öffentlichen Stellen und

OnePlace - Living Energy Marketplace

Croatia

Arhitekti

Hrvatska komora arhitekata

Hrvatska komora arhitekata ustanovljuje se kao baštinik tradicije i nasljeđa udruga i organizacija arhitekata, te nastavlja slijed organiziranih strukovnih udruga arhitekata u Hrvatskoj. Komora promiče arhitekturu kao izraz identiteta naroda i kulturu građenja, unapređuje arhitektonsku djelatnost u cilju zaštite javnog interesa i zaštite interesa trećih osoba. Ovdje možete pronaći imenik ovlaštenih arhitekata.

→ Visit the page

Građevinski inženjeri

Voditelji projekata (elektrotehničke struke)

Voditelj projekta je osoba koja je odgovorna za ostvarivanje definiranih ciljeva projekta. Ključne odgovornosti voditelja projekta podrazumijevaju kreiranje jasnih i ostvarivih ciljeva projekta, definiranje zahtjeva projekta te upravljanje trima važnim elementima projekta, troškovima, opsegom te kvalitetom. Ovdje možete pronaći imenik ovlaštenih voditelja projekata.

→ Visit the page

Energetski certifikatori

IEC

eEnergetskiCertifikat

Energetsko certificiranje je skup radnji i postupaka koji se provode u svrhu izdavanja energetskog certifikata a uključuje energetski pregled zgrade, potrebne proračune za referentne klimatske podatke za iskazivanje specifične godišnje potrebne toplinske energije za grijanje, specifične godišnje potrebne toplinske energije za hlađenje, specifične godišnje isporučene energije, specifične

Izvođači

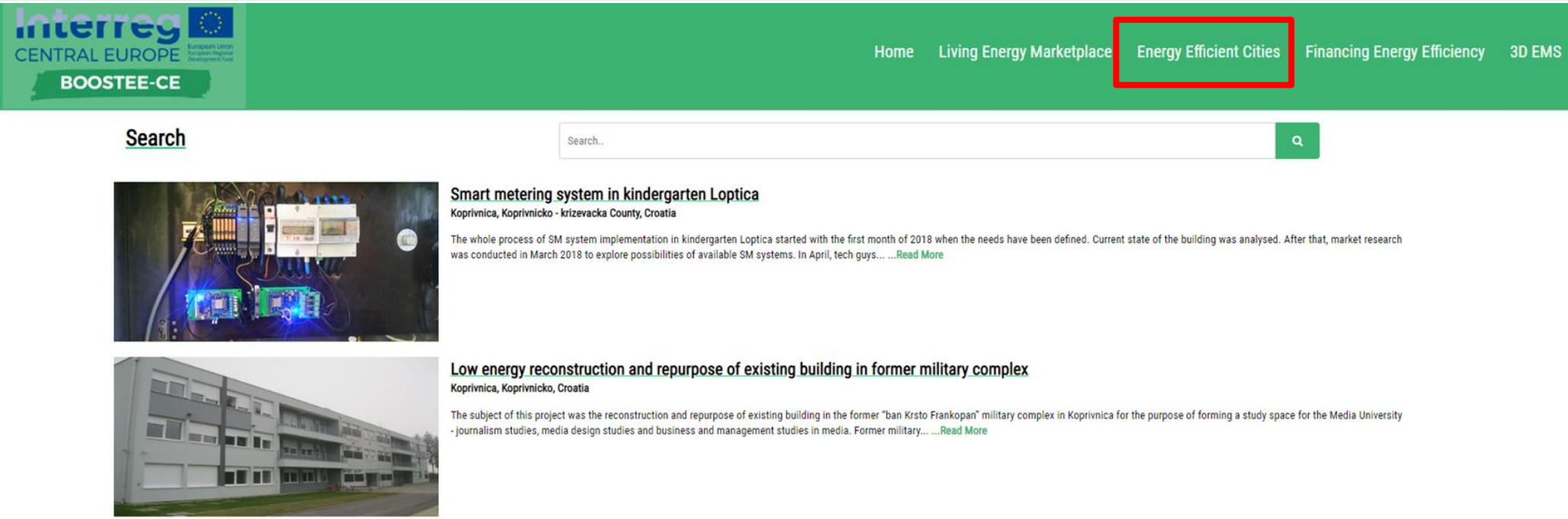
Izvođač je osoba koja gradi ili izvodi pojedine radove na građevini. Ako u građenju sudjeluju dva ili više izvođača, investitor ugovorom o građenju određuje glavnog izvođača koji je odgovoran za međusobno usklađivanje radova i koji imenuje glavnog inženjera gradilišta. Ovdje možete pronaći popis nekih izvođača u RH.

→ Visit the page

Esco tvrtke

OnePlace - Energy Efficient Cities

OnePlace - Energy Efficient Cities



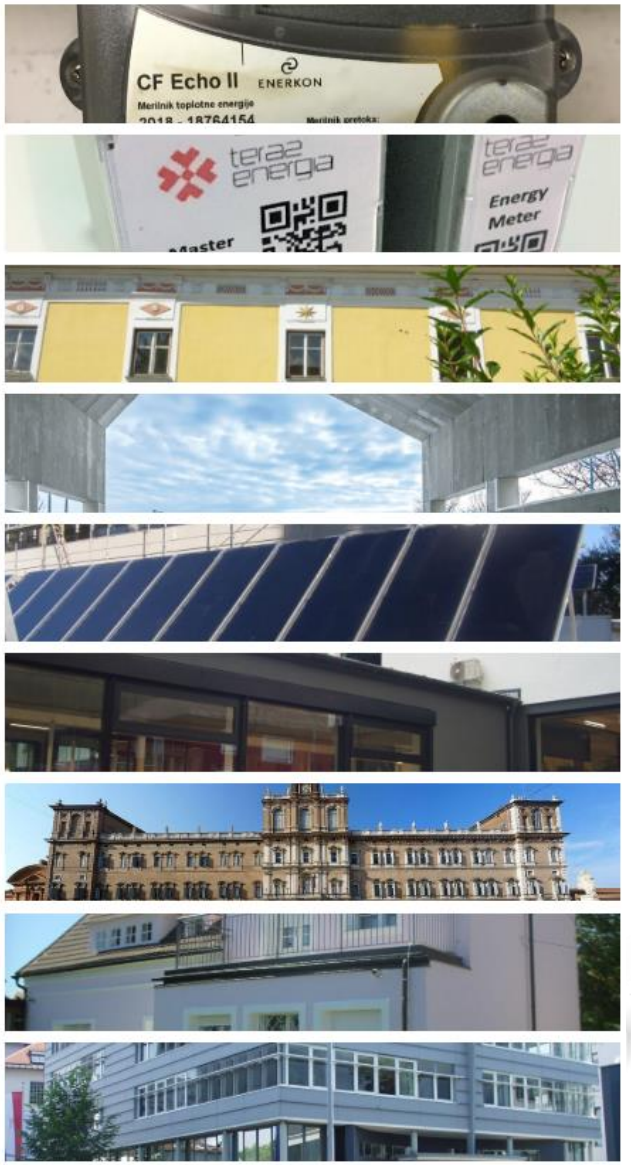
The **Energy Efficient Cities** module is an **exchange platform of experiences** and identification of **good practices** within energy efficiency sector for public authorities and other public users.

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.

OnePlace - Energy Efficient Cities

It contains:

- **24 Best Practices from 7 CE 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.



OnePlace - Energy Efficient Cities

Energy renovation of 7 buildings of Kindergarten Ptuj with the co-financing share of 85% from the European cohesion fund

Ptuj, Podravska, Slovenia

Total heating surface of 4,408 m2. High consumption of energy for heating and a bad condition of the buildings envelope (windows, ceilings, and facades) were the reasons for the renovation. Implementation of measures on the buildings envelope:

- Windows (935 m2)
- Façade (2323 m2)
- Attic (4408 m2)

Benefits

It's a remarkable case of a good practice (on a municipal level) in terms of improving and ensuring environmentally friendly and energy-efficient spatial conditions for children in the context of educational process and improving working conditions for employees. These renovations can be easy transferred into other regions.

Documents:

D.T2.1.2 Energy renovation of 7 kindregartens SLOVENIA (160 KB) Download

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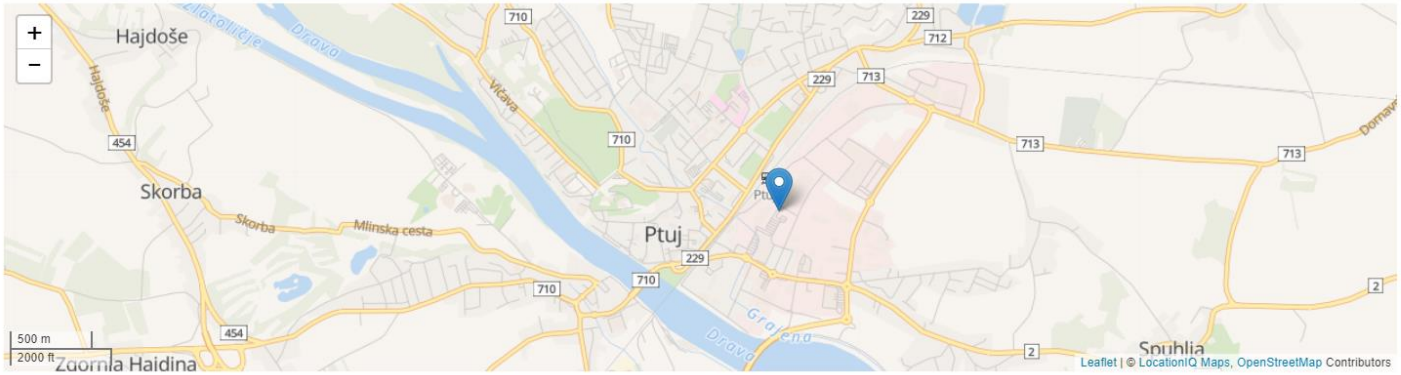
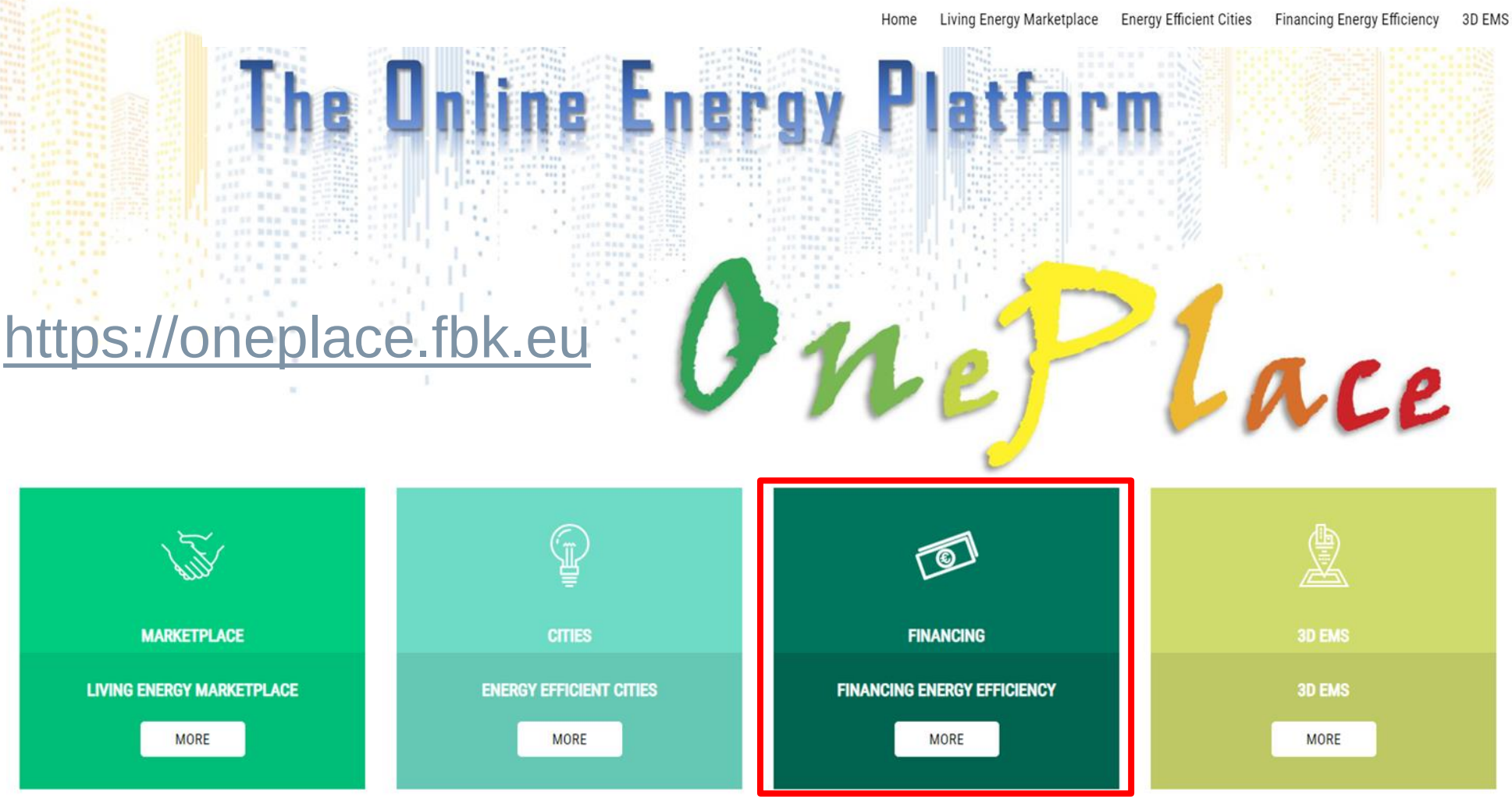
Next ->

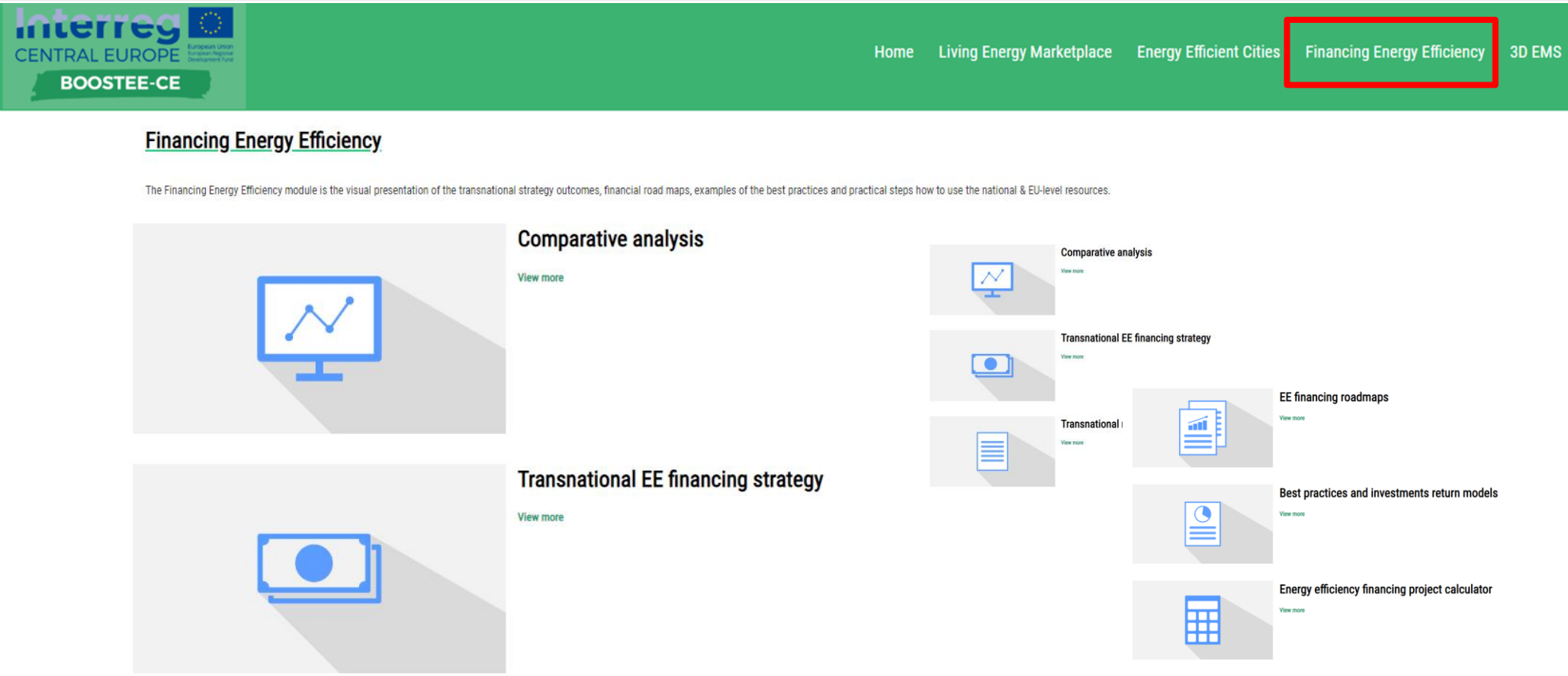


OnePlace - Financing Energy Efficiency

Interreg CENTRAL EUROPE
European Union
European Regional Development Fund
BOOSTEE-CE



OnePlace - Financing Energy Efficiency

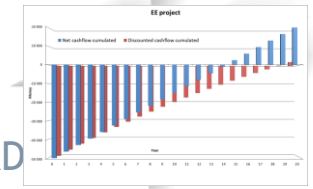


The **Financing Energy Efficiency** module is the visual presentation of the transnational **strategy** outcomes, **financial road maps**, examples of the **best practices** and practical steps how to use the national & EU-level resources.

OnePlace - Financing Energy Efficiency

It contains:

- ❑ 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

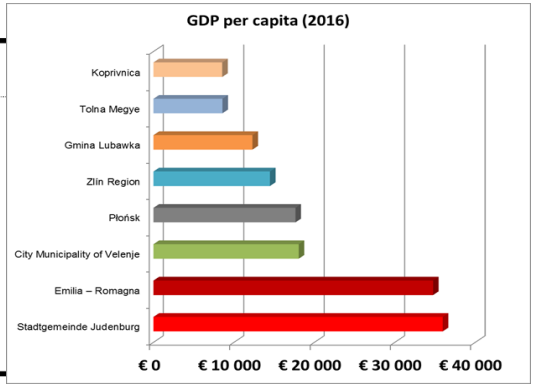


OnePlace - Financing Energy Efficiency

Comparative analysis of financial schema in CE countries

Analysis & elaboration of **differences among financial schema** in partner countries, considering EU grants/funds, possible normative obstacles, investment return, models, etc.

Name of the region / area
Judenburg
Emilia – Romagna
Velenje
Płońsk
Zlínský kraj
Lubawka
Tolna Megye
Koprivnica

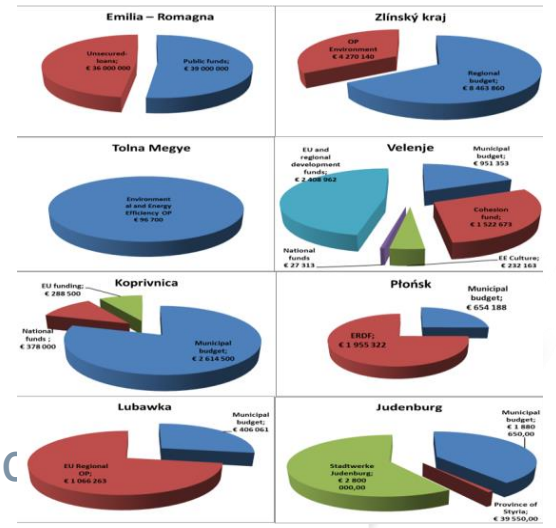


- **Basic comparison of analysed areas**
  against - population
  - area size
  - GDP
  - GDP per capita

- **Current EE financing situation in partners´ areas**

  EE services - core activities which must be continuously provided to fulfil partner´s EE strategic objectives

  EE projects - short-term, self-contained activities that augment the EE services, boost the energy efficiency by reducing the amount of energy required to provide services and products



Transnational Energy Efficiency Financing Strategy

A review of the existing energy financing solutions and models that are or will be in the future the important enablers for EE and energy savings in public infrastructures. The strategy evaluates the potential of different financial models and give recommendations.

- **Key stakeholders, their needs and investment barriers**

  Identification the key public and private actors responsible for Energy Efficiency Financing Strategy. Examination of barriers to investment of these actors, ways to deal with barriers and assessment of their knowledge and experience regarding financing models for energy efficiency upgrades

- **Existing funds and assistance in CE countries** (Italy, Austria, Slovenia, Croatia, Hungary, the Czech Republic and Poland):

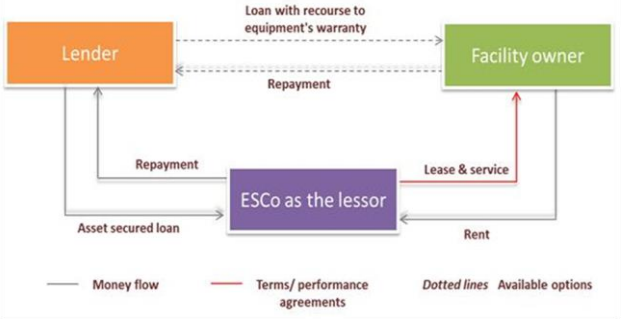
  Funding leveraged by ESIF

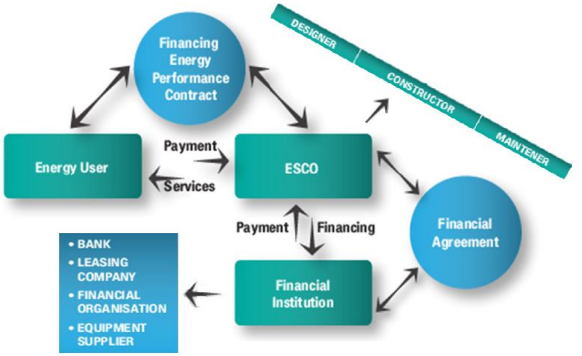
  National Funding

Transnational Energy Efficiency Financing Strategy

❑ Assessment of the existing models of financing

- Proven financing instruments in partner countries - assessment with description of main factors that contributed to success of each financial instrument, along with recommendations for further improvement.
- Transferring of established financing instruments (FI) in partner countries - measures that could enable transferring of experiences critical for deployment of established FIs to partner countries that were not able to deploy pertinent FI.
- Deployment of new financing instruments – selection of instrument that could be developed in partner countries with measures required for deployment of each financial instrument.





❑ Principles for creating own EE financing strategy

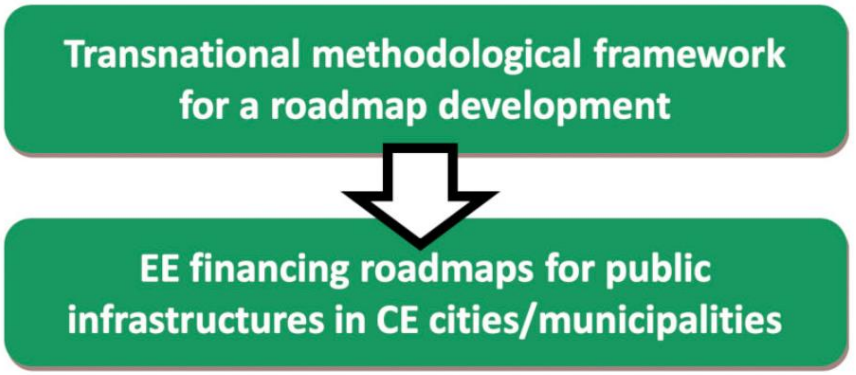
- Balanced level of core financing and programme funding, exploration financing options for activities within key services, organisational background, sustainability etc...

OnePlace - Financing Energy Efficiency

Transnational methodological framework for a EE roadmap

The aim of the financial roadmap is to help public authorities to deal with many different financing grants in the EE domain. The methodological framework builds **upon the practical knowledge of public institutions** and provides an overview of financing models used to finance EE upgrades in the public sector with the specific focus on:

- ❑ **financial models** to minimize the load on public budgets;
- ❑ **recommendations** for decision-makers on identifying & implementing a suitable financing model;
- ❑ **risks and measures** in case of financial investm
- ❑ **case studies.**



Funding sources for energy efficiency

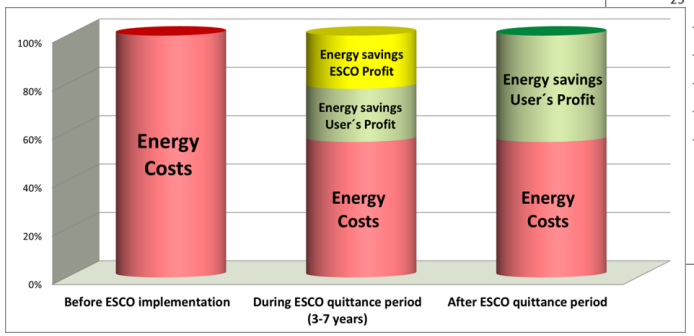
- ❑ European level, national level, self-financing and alternative schemes, intermediaries.

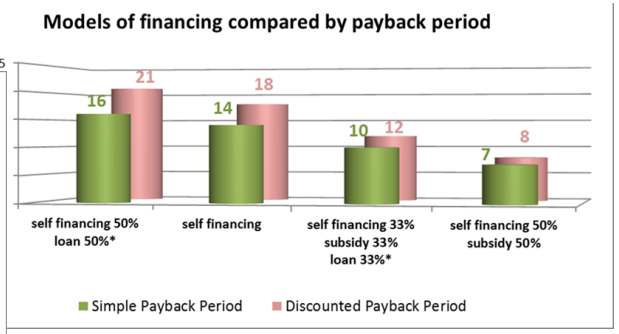
OnePlace - Financing Energy Efficiency

Transnational methodological framework for a EE roadmap

Financing models for energy efficiency

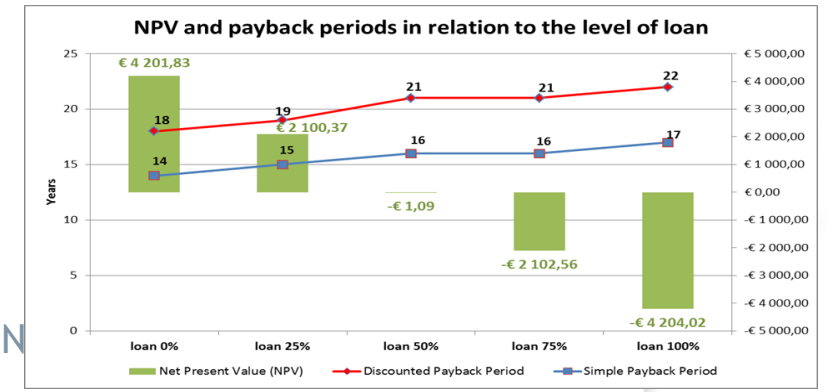
- Conventional models of EE project financing (Self-financing through energy savings, Debt financing, EU funds and operational programmes
- Energy Performance Contracting
- Citizen Cooperatives
- Crowdfunding
- Green municipal bonds
- On-bill financing
- Revolving loan funds





Indicative structure for EE financing roadmap

- Introduction & Internal and External Conditions
- Strategic Targets & Priority Areas
- Action plan & Financing
- Monitoring & Evaluation



OnePlace - Financing Energy Efficiency

Energy efficiency financing roadmaps for public infrastructures in CE municipalities

Financing roadmaps designed to achieve a desired goal of energy efficiency in public infrastructures in specific towns/municipalities in CE cities.

Energy Efficiency Financing Roadmaps for:

- Zlín Region, Czech Republic
- Regione Emilia – Romagna, Italy
- Mestna občina Velenje, Slovenia
- Tolna Megye, Hungary
- Grad Koprivnica, Croatia
- Stadtgemeinde Judenburg, Austria
- Lubawka, Poland
- Płońsk, Poland

OnePlace - Financing Energy Efficiency

Best practices and investments return models in energy efficiency financing

Collection of the best practice examples from CE countries on various financial investments return models through which market-enabling actions for large investments are highlighted. The best practices are presented and analysed on **attractive factsheets**

BP #1 - Zlín Region, Czech Republic

BP #2 - Emilia-Romagna, Italy

BP #3 Tolna County, Hungary

BP #4 – Loški Potok, Slovenia

BP #5 - Koprivnica, Croatia

BP #6 - Płock , Poland

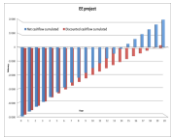
BP #7 - Płońsk, Poland

BP #8 - Jelenia Góra, Poland

BP #9 - Judenburg, Austria

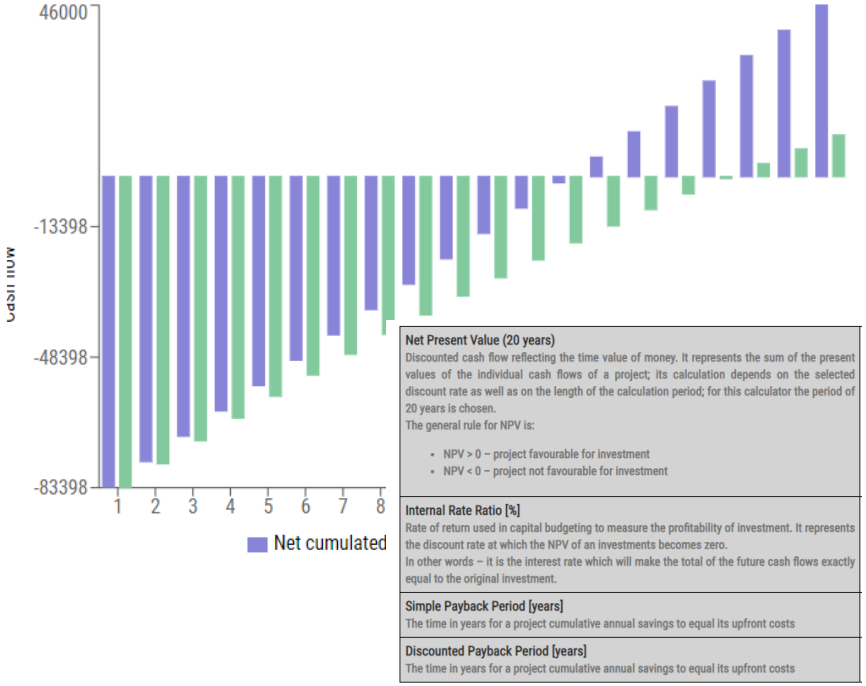
BP #10 - Judenburg, Austria

OnePlace - Financing Energy Efficiency



Energy Efficiency Financing Project Calculator

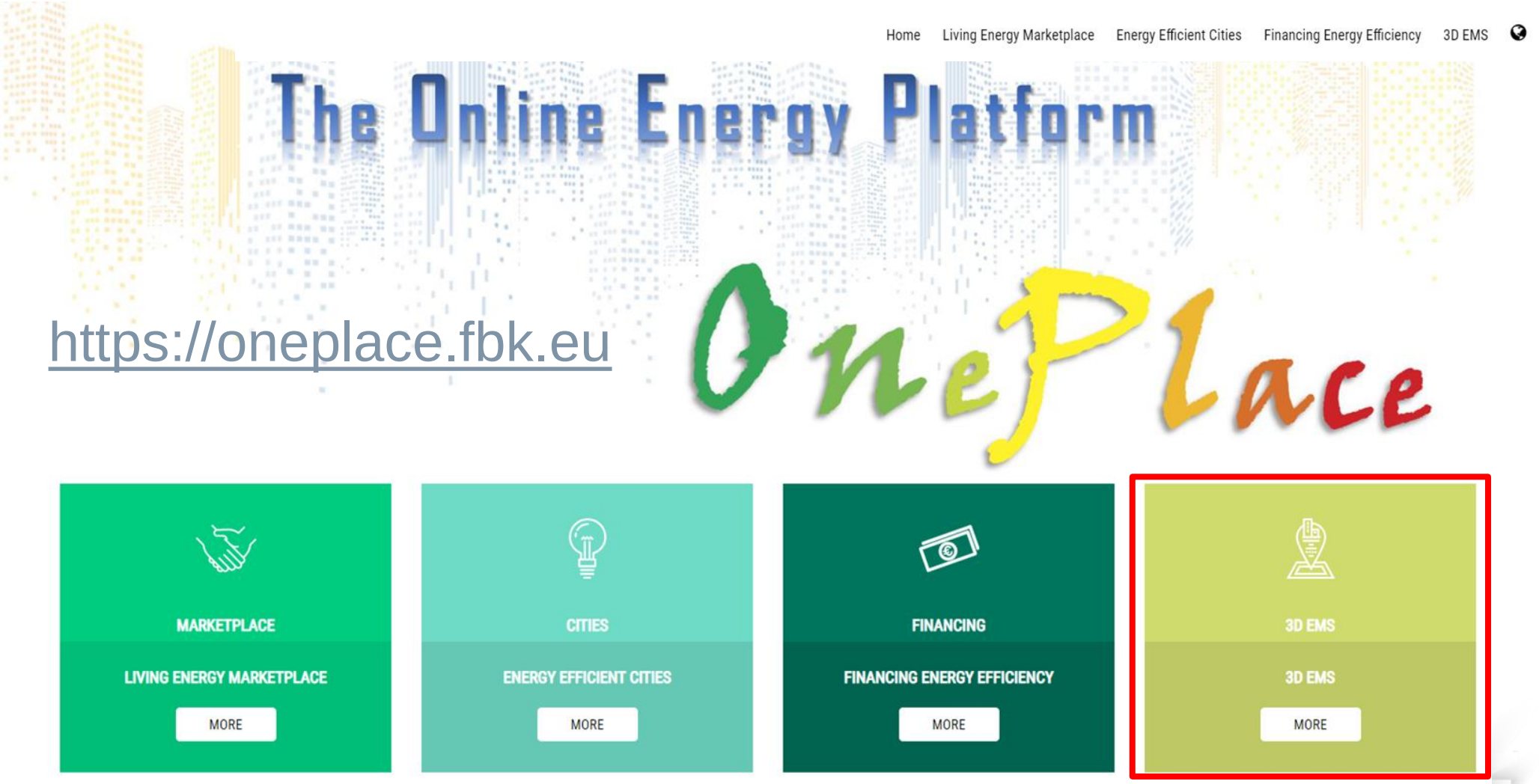
- The simple EE project calculator which gives to the user a basic indicative idea of the profitability and advisability of the investment into an energy efficiency or RES project.
- It counts **just with own sources**, **not considering subsidies or loans** which both can change foreseen values significantly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



- 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!*

OnePlace - 3D Energy Management System



OnePlace - 3D Energy Management System

- **Cities occupy** some **2% of the earth's surface** but their inhabitants consume approximately **75% of the world's energy resources.**
- Various European Directives, including the Energy Efficiency (EE) Directive 2012/27/EU (2012), is **aiming for a 27% cut in Europe's annual primary energy consumption** by 2030**.**

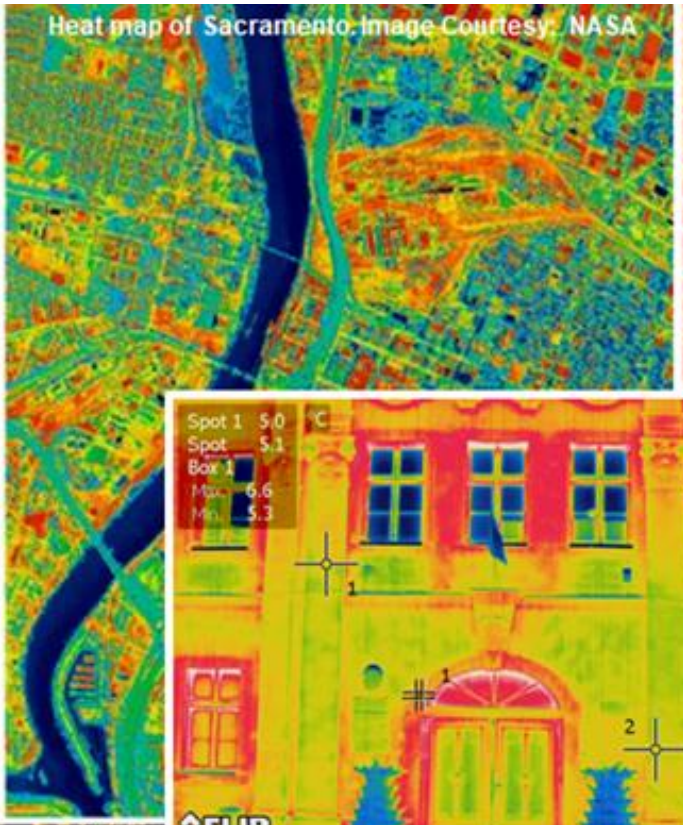
- Measures to reduce the energy consumption **focus** particularly **on the building sector** as buildings alone consume some 40% of the total energy.
- For existing constructions (buildings, streets, etc.), large attention is being paid to **improve energy efficiency** as they are accountable for large electric power consumption as well as night light pollution.

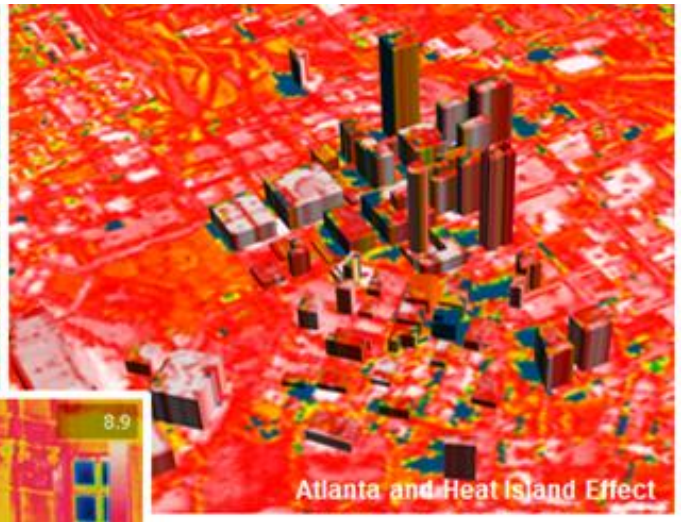
A more extensive and powerful use of **GEOSPATIAL DATA** and ICT tools **FOR ENERGY EFFICIENCY** can support the creation of **SMART** and **LOW-CARBON CITIES**

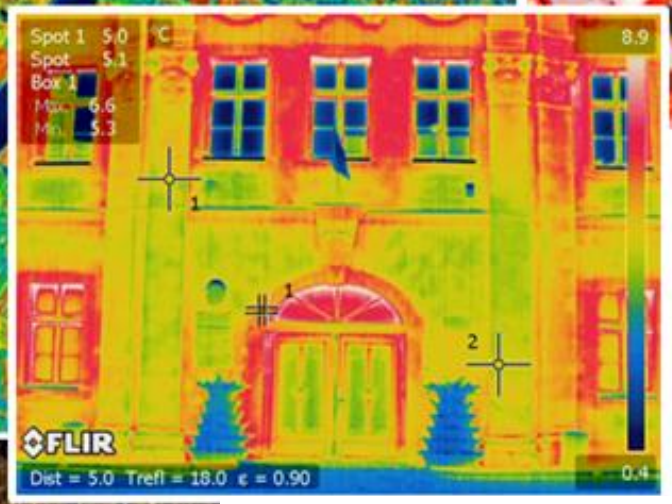
OnePlace - 3D Energy Management System

Interreg CENTRAL EUROPE
European Union
European Regional Development Fund

BOOSTEE-CE







Examples of

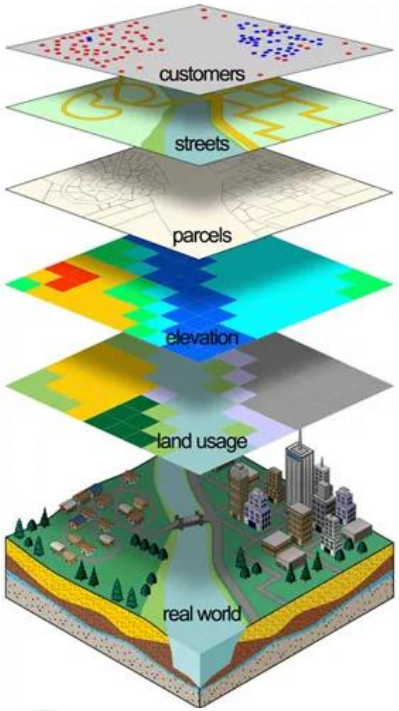
VALUE ADDED GEOSPATIAL DATA…

…as useful tools to estimate, analyze and visualize heating flows, urban heat islands, night light pollution, etc.

OnePlace - 3D Energy Management System

DATA + GIS + 3D CITY MODELS

While (2D) **GIS** are almost common in public administrations, the use of **3D city models** is still **confined** and mainly applied **to visualization purposes.**



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.**

www.williamsnd.com/Department/GIS

OnePlace - 3D Energy Management System

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European Regional Development Fund

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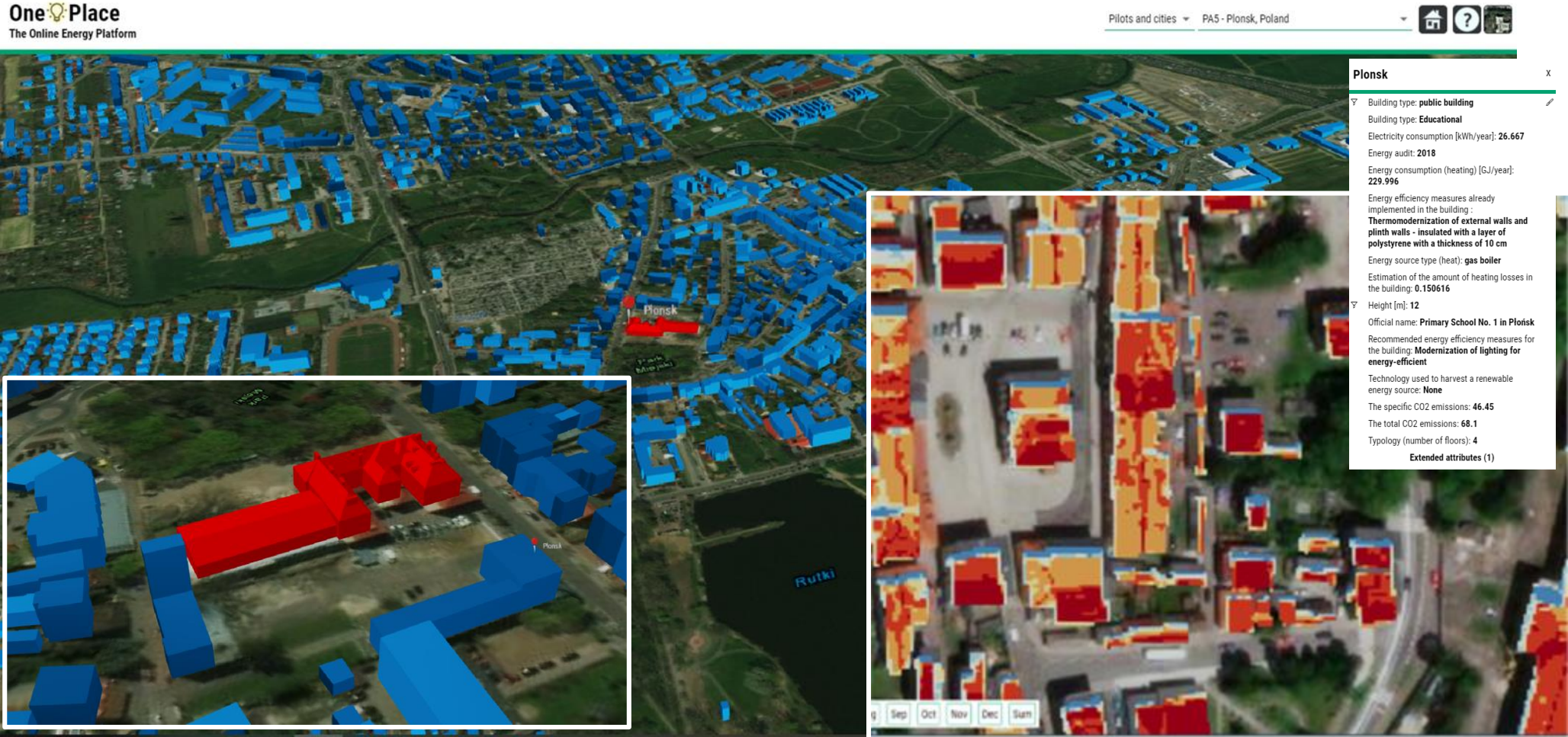
3D Energy Management System is a module (**WebGIS tool**) to visualize, query and manage energy information / uses / loses / PV potential / audit certificates of (public) buildings using 3D building models.



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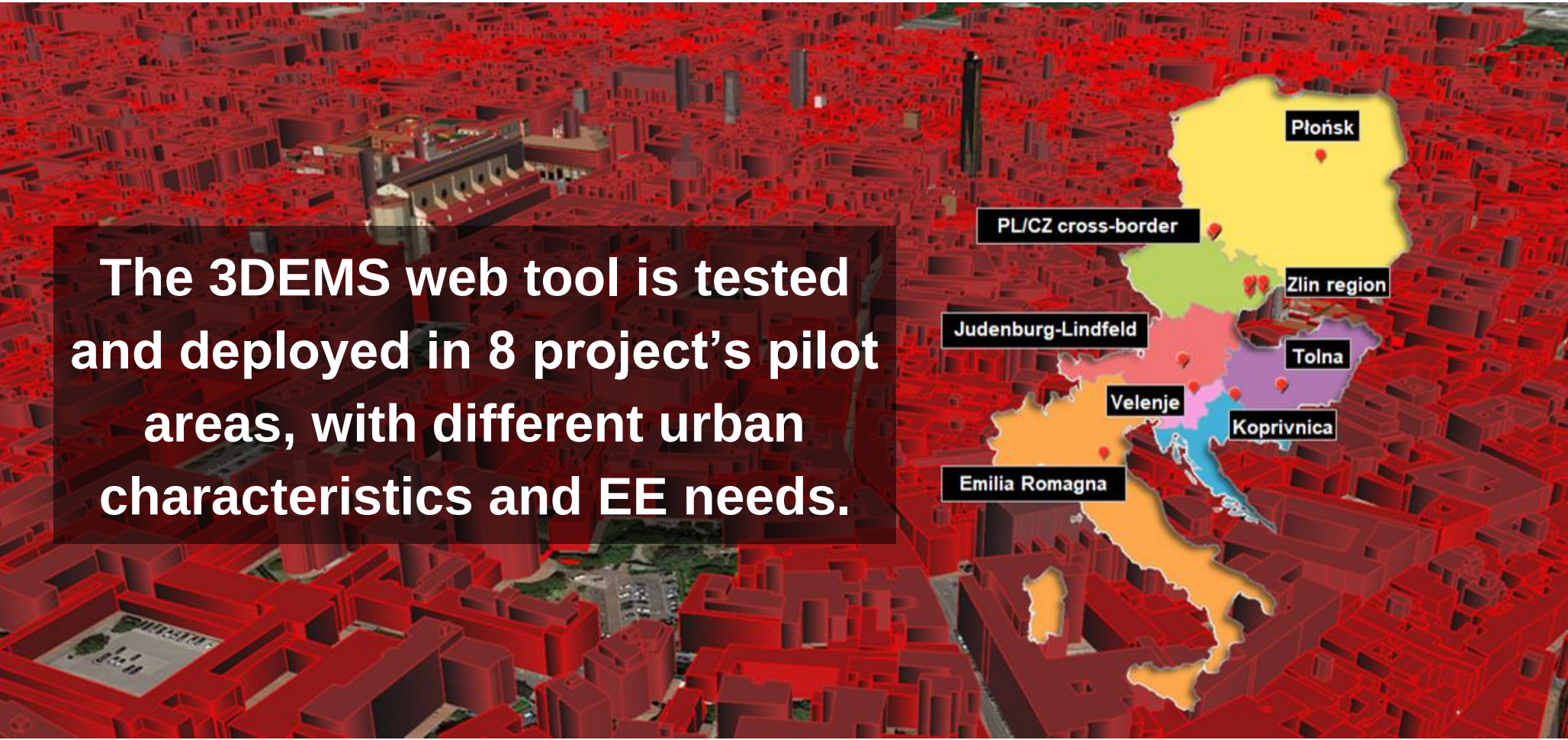
In the **pilot areas**, for selected public buildings, **geospatial databases** with urban and energy data are created in order to **combine** them **with 3D building** geometries within the **3DEMS** tool.



The 3DEMS web tool is tested and deployed in 8 project's pilot areas, with different urban characteristics and EE needs.

OnePlace - 3D Energy Management System

To create the **3DEMS tool**, heterogeneous data were collected, harmonized and stored in the **2 categories** (**spatial** and **non-spatial data**):

a) spatial data

(i) land **cadastre maps** (2D vector or raster) / **building footprints** with attribute info

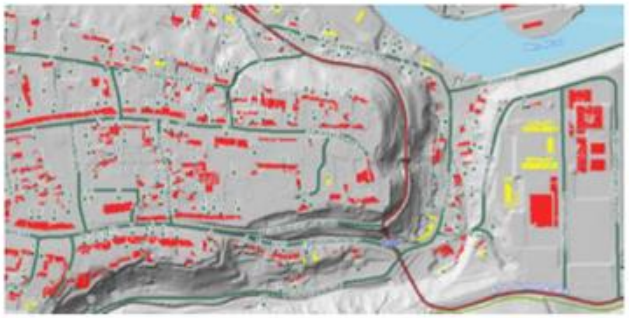
(ii) **2.5D and 3D point clouds** (derived from LiDAR or photogrammetric flights)

OnePlace - 3D Energy Management System

To create the **3DEMS tool**, heterogeneous data were collected, harmonized and stored in the **2 categories** (**spatial** and **non-spatial data**):

a) spatial data

(iii) **solar energy potential maps** (available or produced from DEM data with GIS)



(iv) **3D building model LOD1 / LOD2** (produced from footprints + DEM data)

OnePlace - 3D Energy Management System

To create the **3DEMS tool**, heterogeneous data were collected, harmonized and stored in the **2 categories** (**spatial** and **non-spatial data**):

a) non-spatial data

(i) Energy Performance Certificates incl.

- energy consumptions
- carbon dioxide emissions
- energy efficiency indexes
- etc.

(ii) Data from the register of buildings

- official name
- typology
- building type
- etc.

(iii) Statistical and survey data

- construction plans
- energy bills
- etc.

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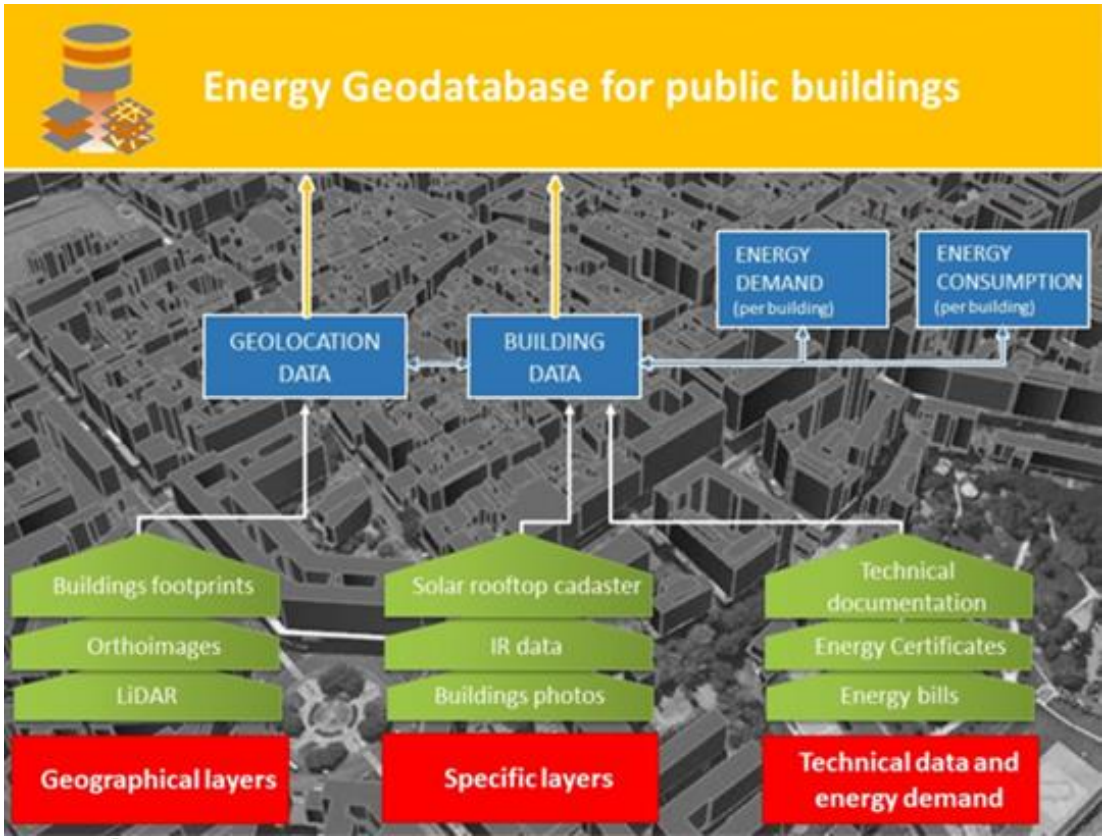
Starting from these (collected, generated and harmonized) data, the **3DEMS webGIS** tool **allows the user to:**



(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;

(iv) **analyze** the solar maps and energy maps (heating loss), visualized as additional building texture.

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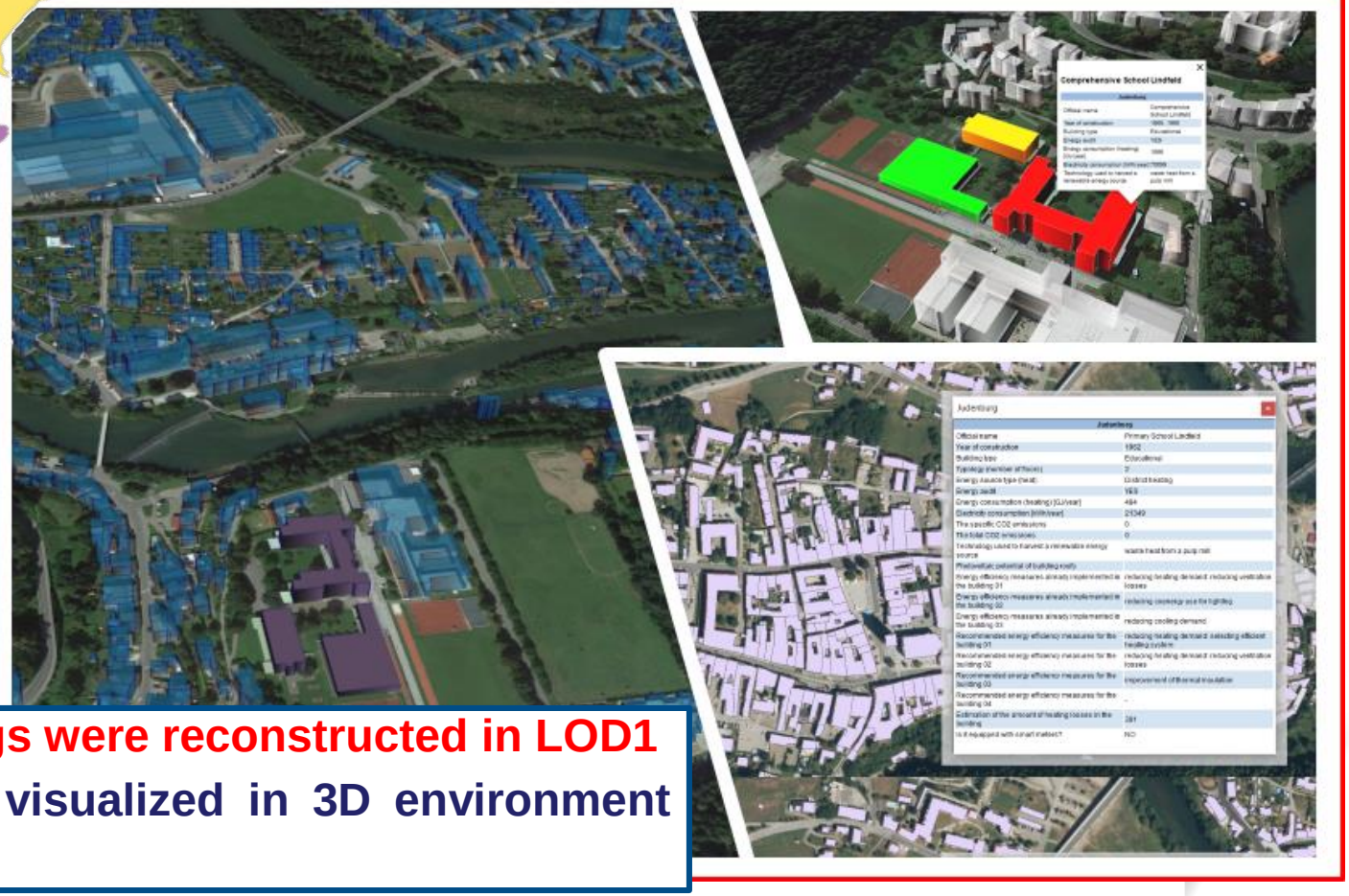
Example of web based visualization of **building geometry** (LOD1 and LOD2) with associated **energy database**



More than 10,000 buildings were reconstructed in LOD1 (some 25 in LOD2) and visualized in 3D environment

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Example of **visualization LOD1 building models** at urban scale &
LOD2 building models at single building scale

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

energy sources used for buildings' heating

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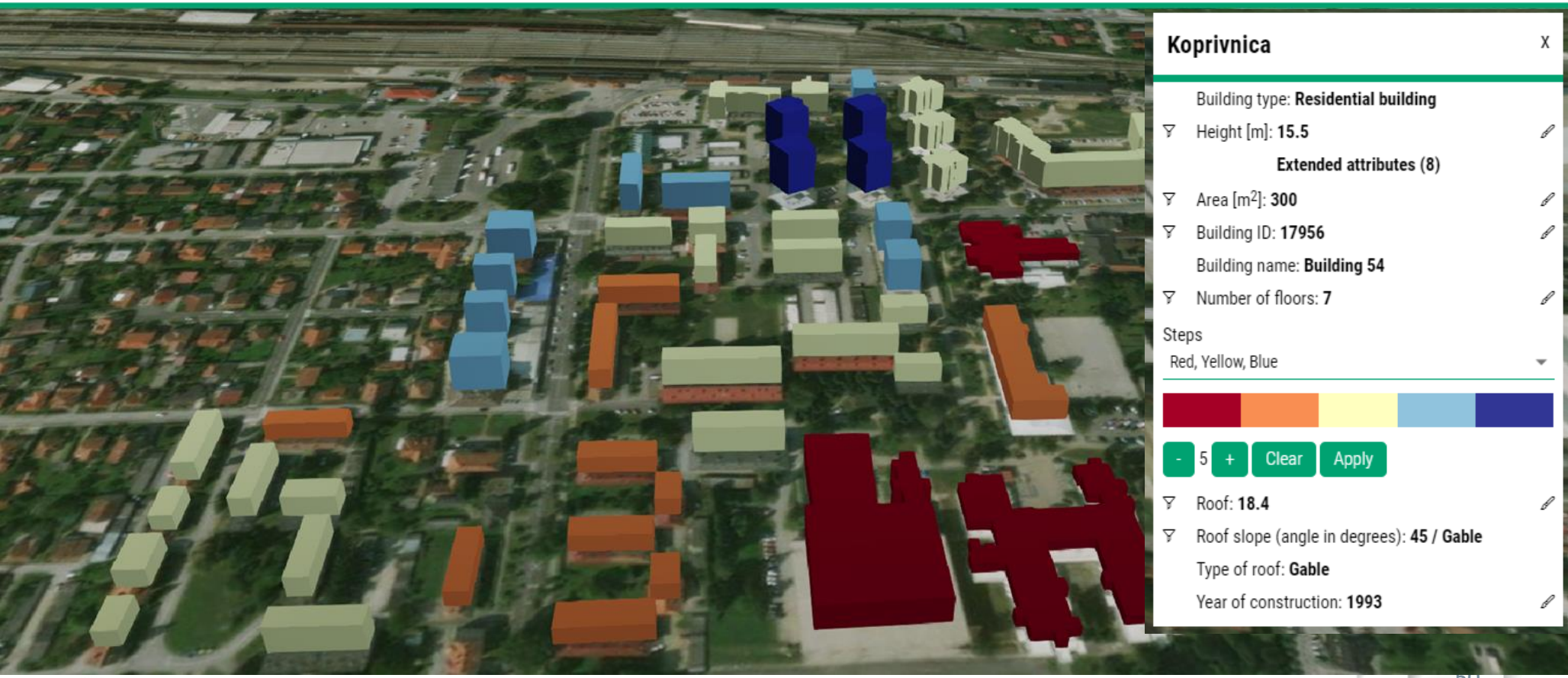
Example of **aggregation** functions within 3DEMS:

number of floors



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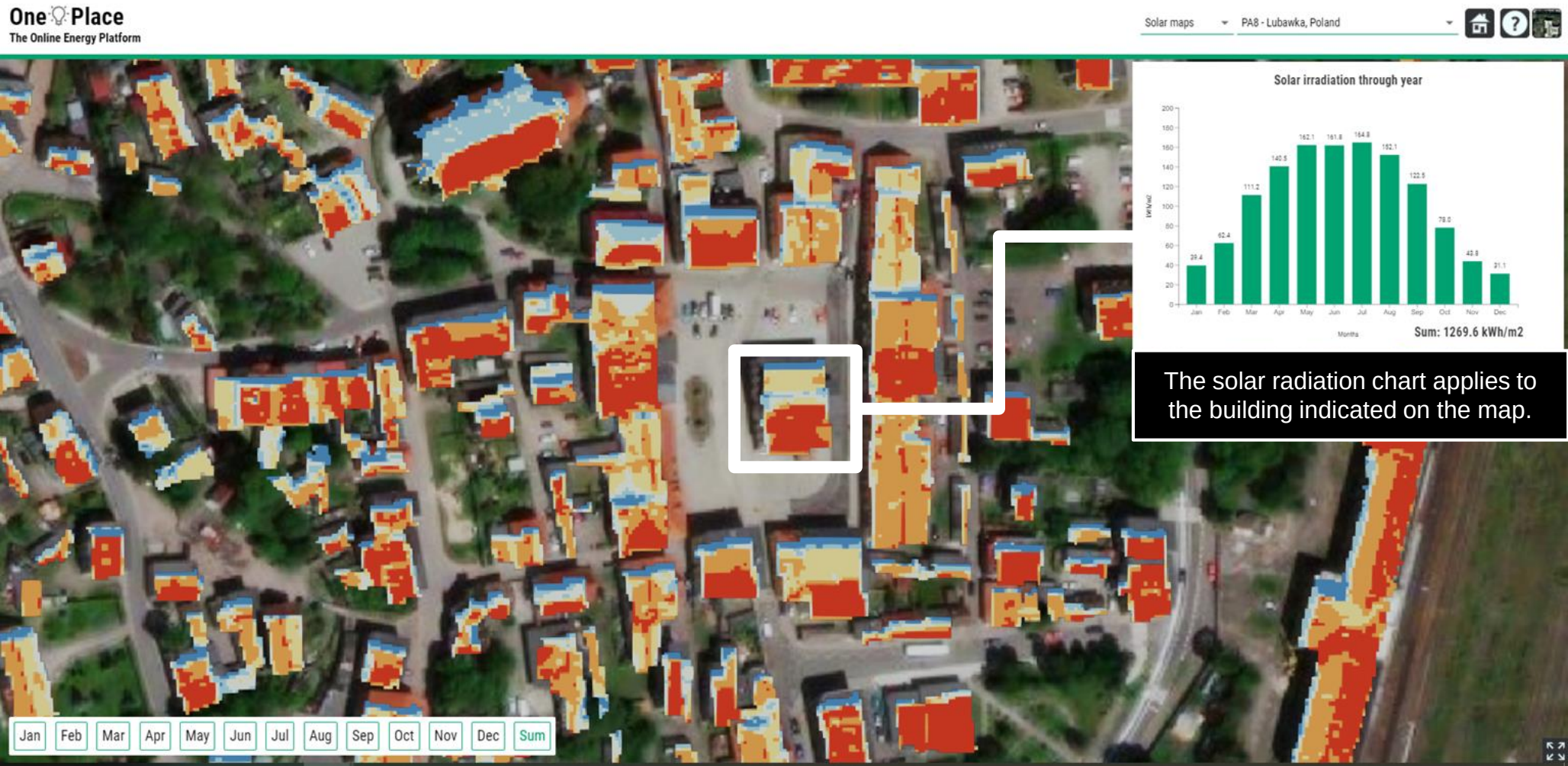
Example of web based visualization of **photovoltaic PV maps**:

hourly global incoming solar radiation, aggregated on a monthly and yearly basis



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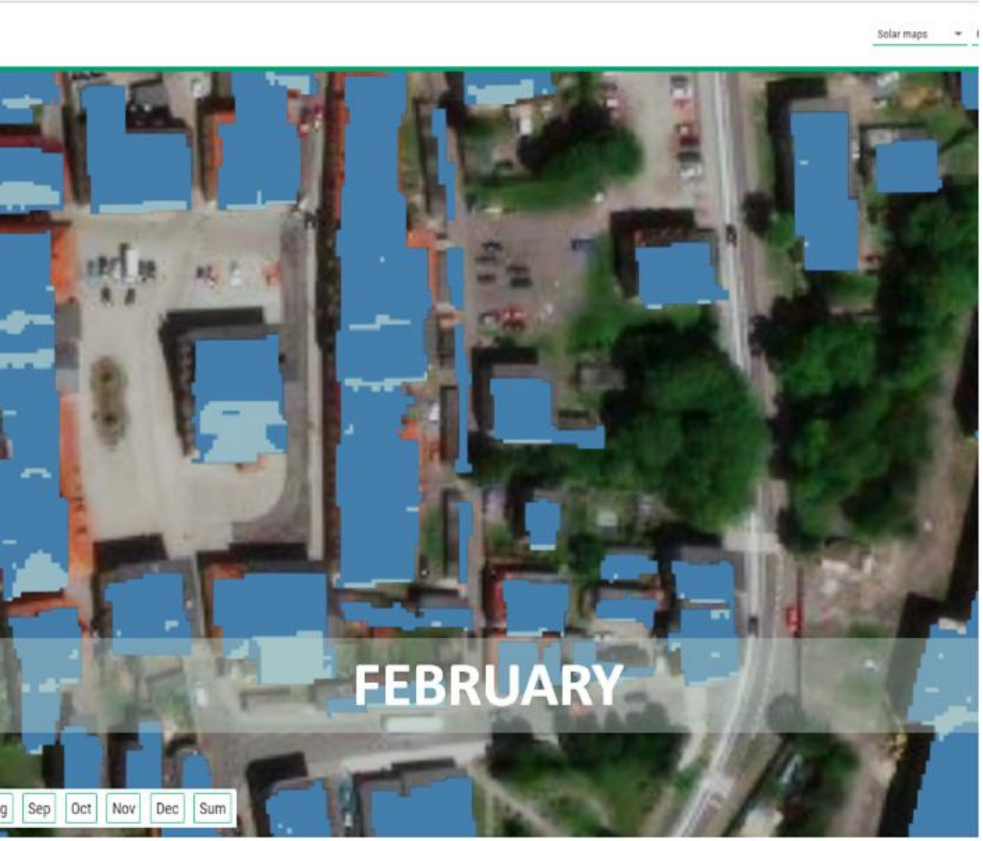
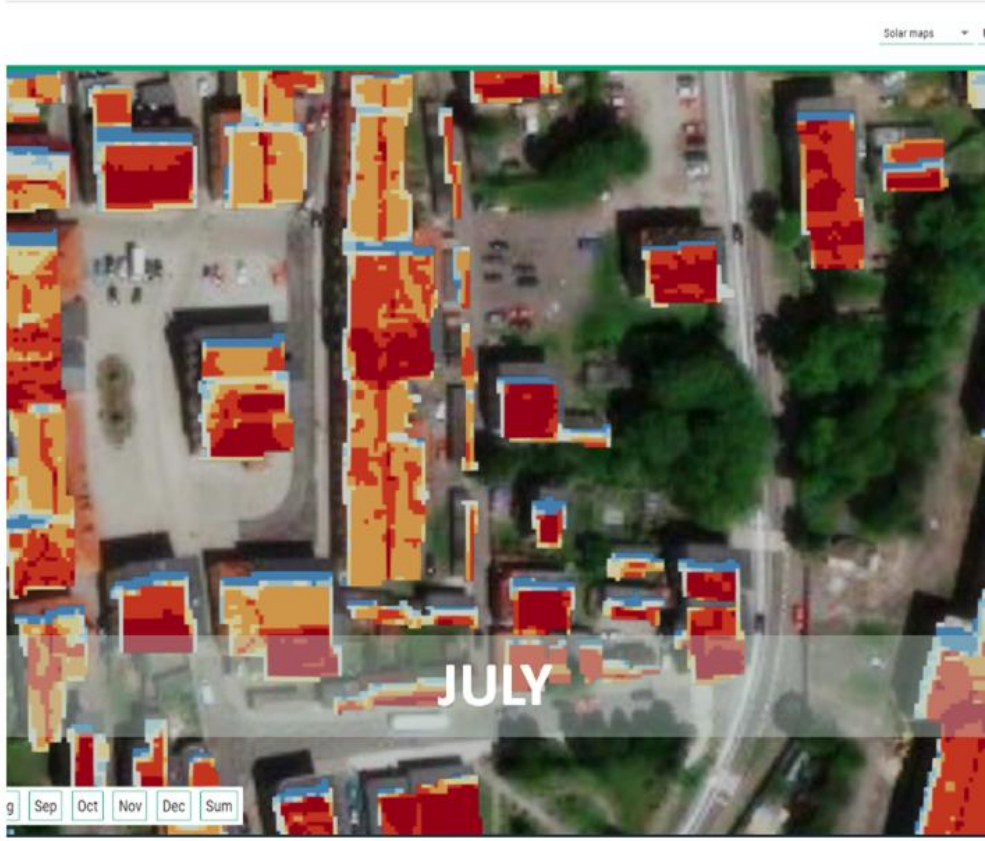
Example of web based visualization of **photovoltaic PV maps in February (**on the left**) and July (**on the right**)**





OnePlace - 3D Energy Management System

Why create your own 3D EMS? Different reasons:

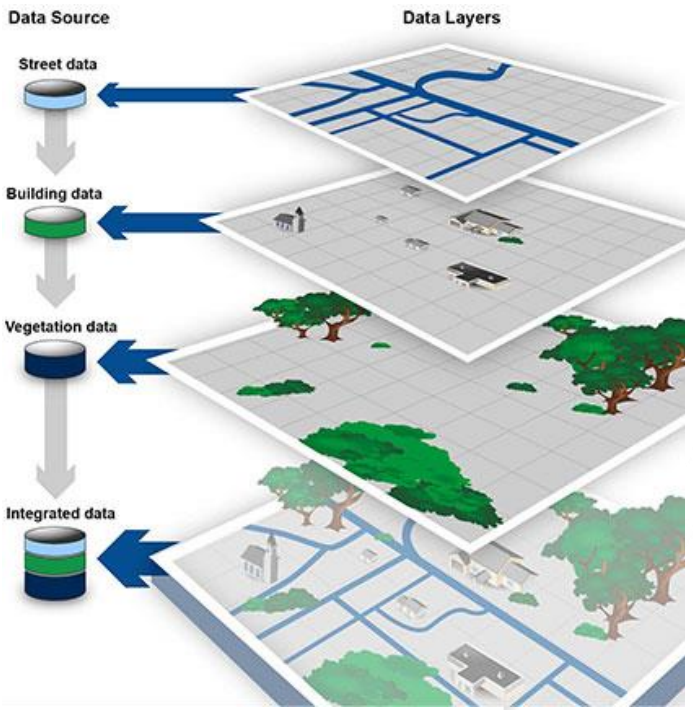
1. Data you need is on a paper map (documents) and needs to be converted to a digital format.

2. To organize geospatial data and 3D building models for energy-related needs

3. To plan retrofits to save energy and improve energy efficiency.

4. Data need to be accessed /used by multiple people at the same time.

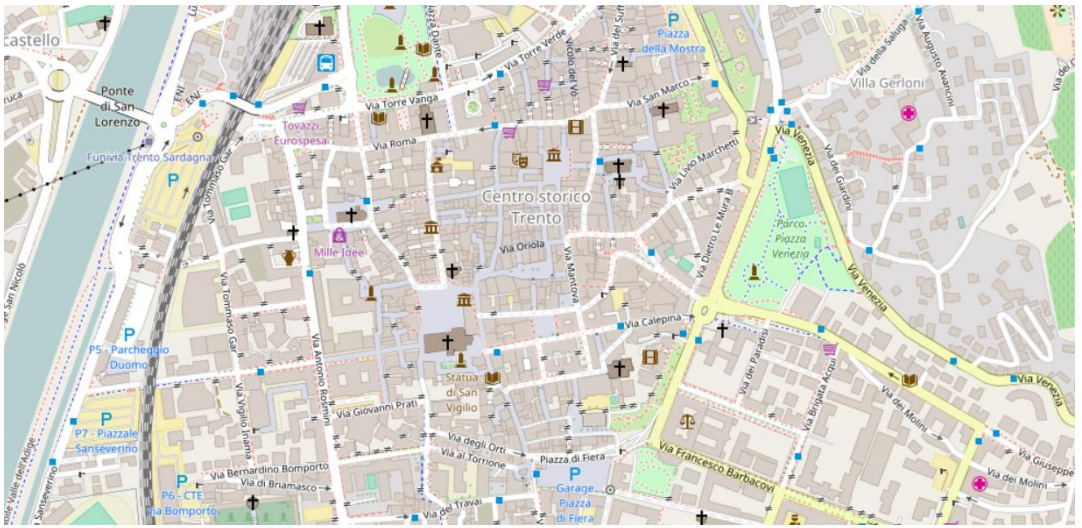
...and many other reasons.



HOW TO START?

1. **(spatial) data collection:**
- **geospatial data to create 3D building models**
  (*building footprints, maps, LiDAR point clouds, terrain models, orthoimages, etc.*)

Building footprints



Building footprint but much more (semantics)

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HOW TO START?

1. **(spatial) data collection:**
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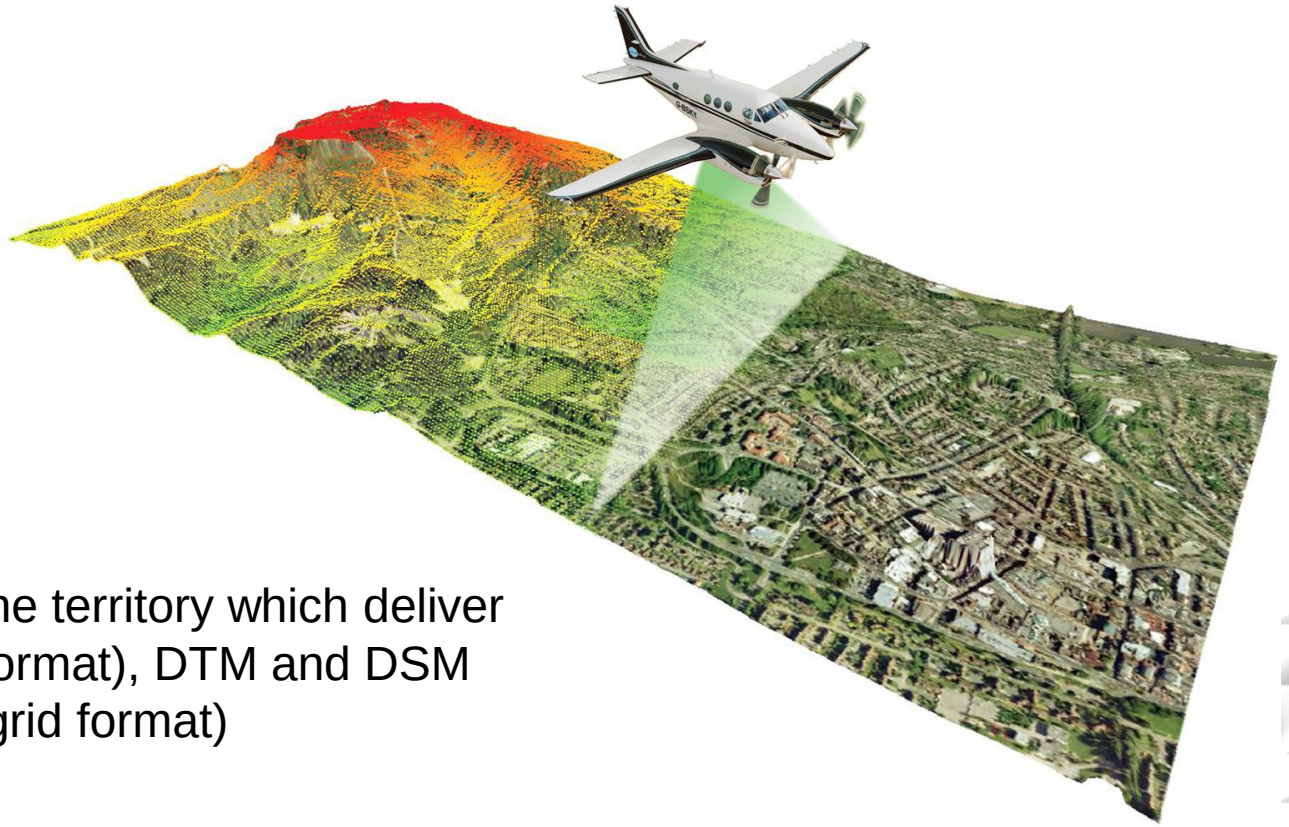
  (*building footprints, maps, LiDAR point clouds, terrain models, orthoimages, etc.*)



Aerial 3D survey of the territory which deliver point clouds (LAS format), DTM and DSM (ASCII grid format)

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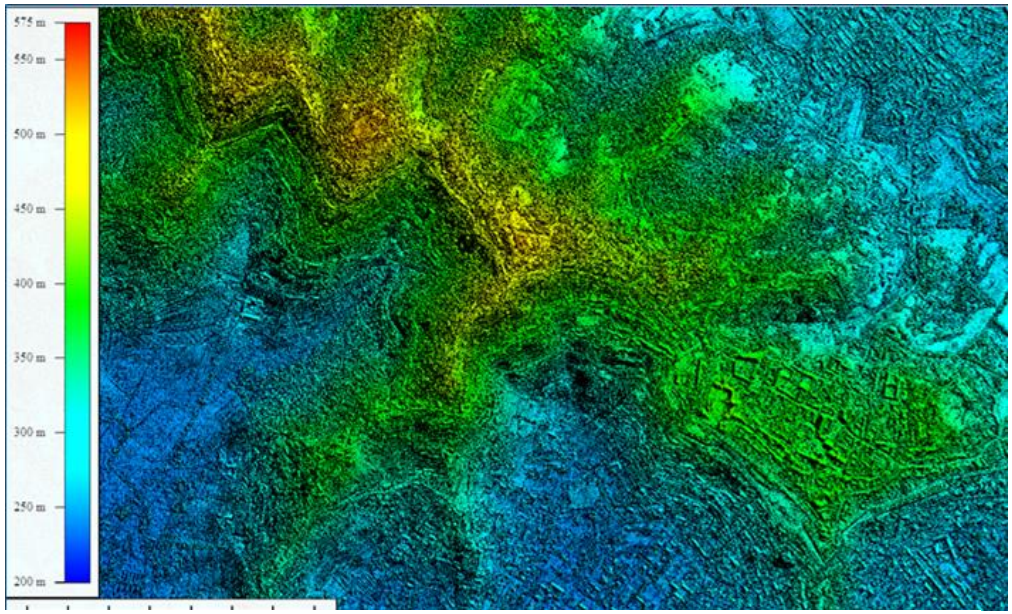
HOW TO START?

1. **(spatial) data collection:**
- **geospatial data to create 3D building models**
  (*building footprints, maps, LiDAR point clouds, terrain models, orthoimages, etc.*)



DSM (Digital Surface Model) - raster format

DSM (Digital Surface Model) - point cloud format

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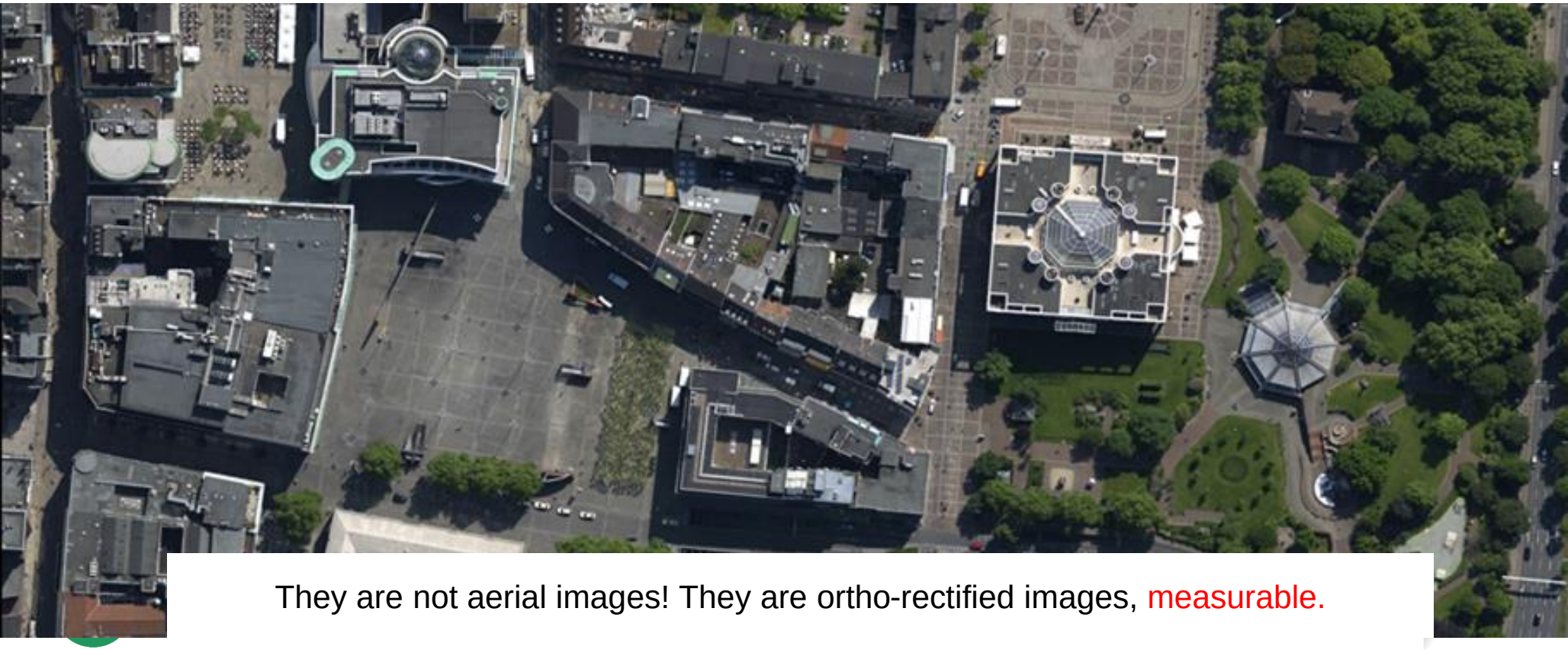
HOW TO START?

1. **(spatial) data collection:**
- **geospatial data to create 3D building models**
  (*building footprints, maps, LiDAR point clouds, terrain models, orthoimages, etc.*)



They are not aerial images! They are ortho-rectified images, measurable.

HOW TO START?

1. (non-spatial) data collection:

- energy-related data

(*e.g. energy consumption, CO2 emissions, heating consumption, etc.*)

Field	Units	Description
Official name	-	-
Year of construction	-	-
Building type	-	**Type of building:** residential, agricultural, civil, medical, educational, government, industrial, military, religious, transport.
Typology (number of floors)	-	-
Energy source type (heat)	-	**Type of the heat source:** geothermal energy, district heating, cogeneration unit, heat pump, biofuel boilers, solid fuel, electricity, natural gas, oil.
Energy audit	-	-
Energy consumption (heating)	GJ/year	-
Electricity consumption	kWh/year	-
The specific CO2 emissions	tons/year	-
The total CO2 emissions	tons/year	-
Technology used to harvest a renewable energy source	-	**Type of the technology:** photovoltaics (PV), solar collectors, biofuel boilers, heat pumps
Estimated photovoltaic potential of roof	kW	Calculated from the solar potential maps
EE measures already implemented in the building	-	**Type of the measures:** (i) reducing heating demand: improving the insulation, limiting the exposed surface area, reducing ventilation losses, selecting efficient heating system, new roof; (ii) reducing cooling demand, (iii) reducing energy use for lighting, (iv) reducing energy used for heating water, etc.
Recommended EE measures for the building	-	
Estimation of the amount of heating losses	MWh/year	-

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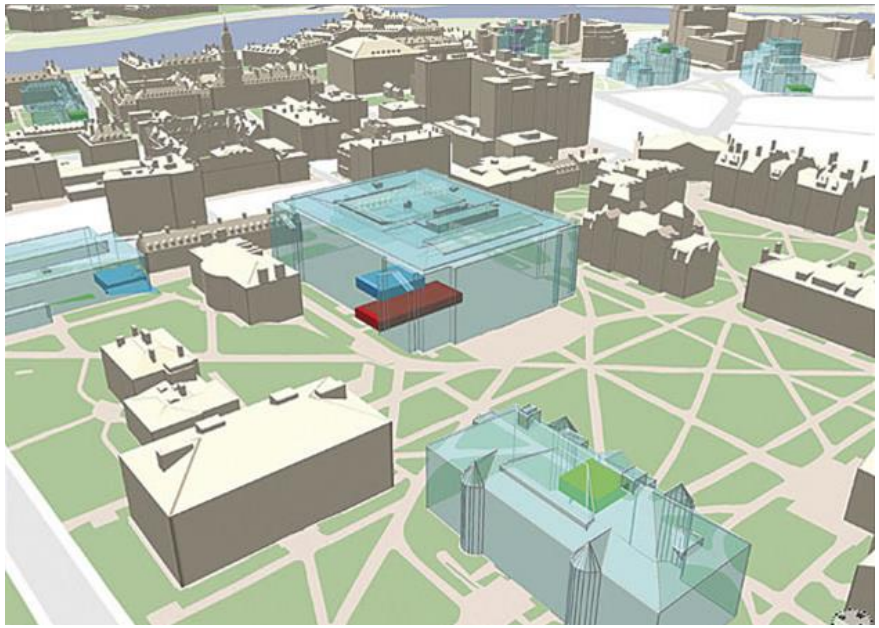
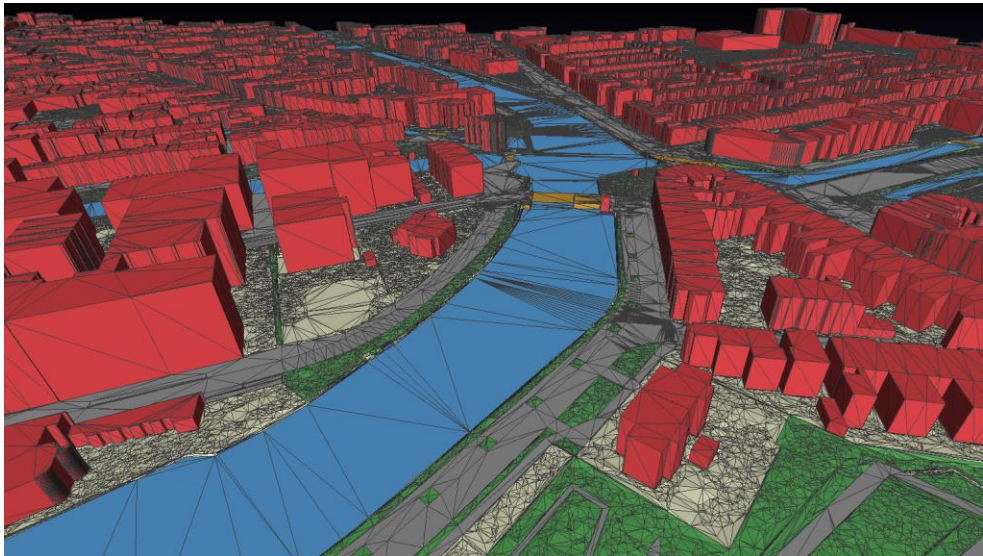
HOW TO START?

2. 3D model generation:

depending on the available geodata, different procedures can be applied to produce 3D geometries, *i.e. 3D envelops, at different geometric resolution and with different levels of detail*

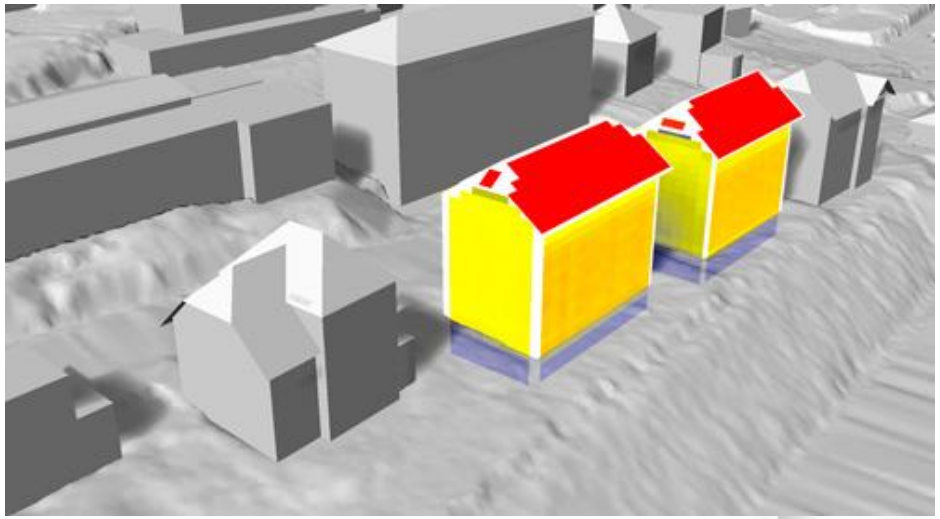




HOW TO START?

3. Further data generation and collection:

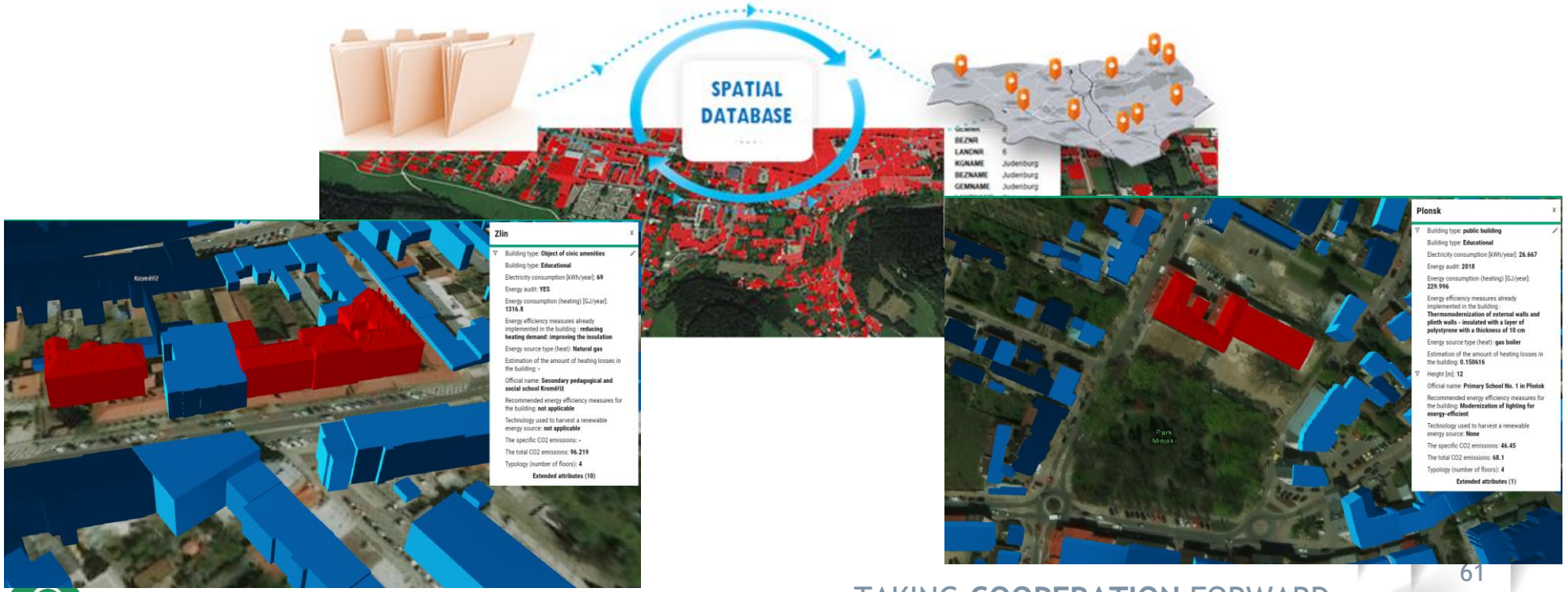
3D building geometries, coupled with terrain information, occlusions and geolocations, can be used to estimate the photovoltaic (PV) potential of building roofs and produce 3D solar maps



HOW TO START?

4. Data and geometry linking:

the created **geospatial databases** allow to connect heterogeneous information (*also non-spatial attributes available in the geoDB*) **with geometric/3D information**, retrieving such info on demand and with specific tools



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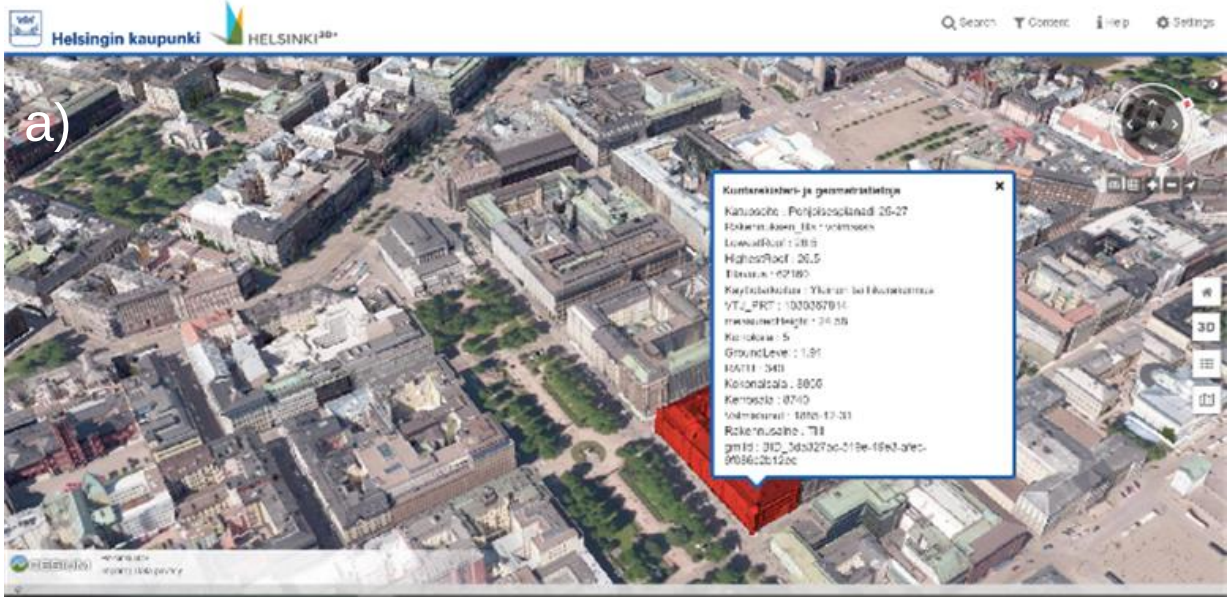
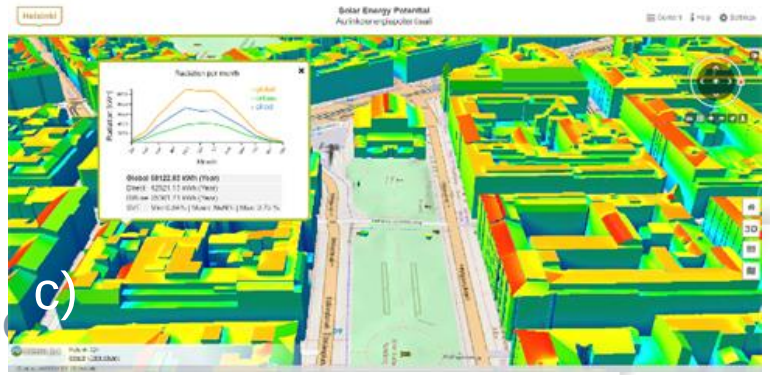
HOW TO START?

5. Data visualization on the web:

using OGC web platforms (e.g. Cesium) all collected / generated information can be visualized online. Queries can be performed producing new visualization scenarios in order to better understand energy flows, requests, etc.





a) - Helsinki 3D+: https://kartta.hel.fi/3d/); buildings categorized by energy source
b) - The Climate and Energy Atlas: https://kartta.hel.fi/3d/atlas); solar irradiation analyses on the LOD2 building models
c) - Helsinki Solar Energy Potential: https://kartta.hel.fi/3d/solar/

OnePlace - DEMO
- practical use of 3DEMS -

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OnePlace - DEMO
- Living Energy Marketplace: 5 min -

Living Energy Marketplace

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

Device database

Here you can find links to databases covering the electronic & electric appliances. This databases can help you to make energy-wise decisions if you are considering buying this kind of products.

View more

Experts Database

Contains 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.

View more

OnePlace - DEMO
- Energy Efficiency Cities: 5 min -

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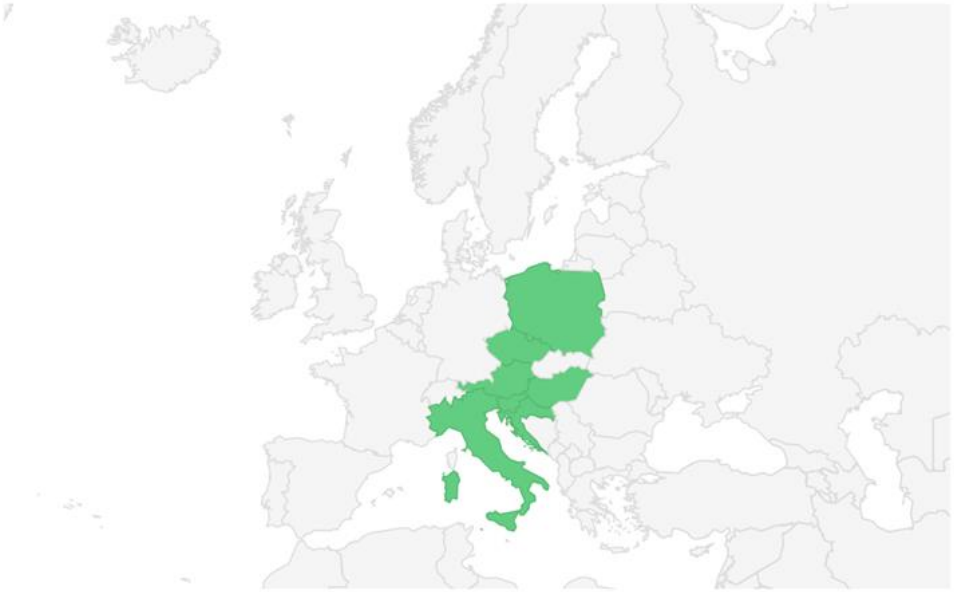
Energy Efficient Cities

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.



Search Database

OnePlace - DEMO
- Financing Energy Efficiency: 10 min -

Financing Energy Efficiency

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

Comparative analysis

View more

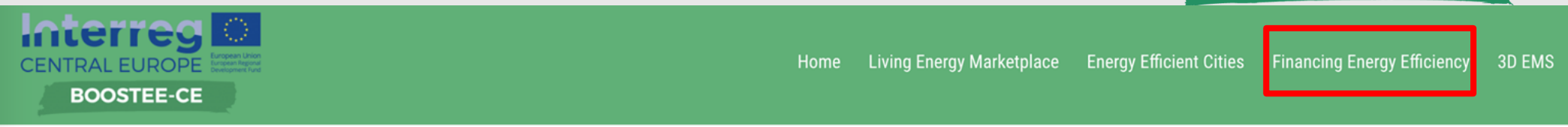
Transnational EE financing strategy

View more

Transnational methodological framework

View more

OnePlace - DEMO
- Financing Energy Efficiency: 10 min -



Energy efficiency financing project calculator

This is the simple web based energy efficiency project calculator which gives to the user a basic indicative idea of profitability and advisability of the investment into an energy efficiency or RES project. It counts just with own sources, not considering for instance grants and subsidies on one side or loans on the other side which both can significantly change foreseen values.

If grants and subsidies are involved, the NPV and IRR are increasing and payback periods are shortening, on the other hand, loans affect the investment the opposite way, i.e. when you are co-financing the investment project with a loan, the NPV and IRR are decreasing and payback periods are extending.

You can check also graphical illustration of cash flow and discounted cash flow on a separate sheet.

For concrete investment calculations it is highly advisable to carry out a proper financial analysis by a financial specialist!

You can find instruction on how to use the calculator here.

Capital costs

Capital costs

Capital costs are fixed, one-time expenses incurred on the purchase of land, buildings, construction, and equipment. The sum of the different type of costs related to the considered investment, for example the capital costs of building refurbishment, new EE and RES installations, infrastructure reconstruction etc.

Annual Energy Savings

Annual Energy Savings

Annual sum of money savings generated by the investment, for instance costs saved for heating, hot water preparation, electricity etc.

Annual Revenues

Annual Revenues

Annual sum of money generated by the investment, for instance electricity sales received on a basis of feed in tarrifs, overall heat and electricity sales to customers etc.

Operational Costs

Operational Costs

OnePlace - DEMO
- 3D Energy Management System: 15 min -

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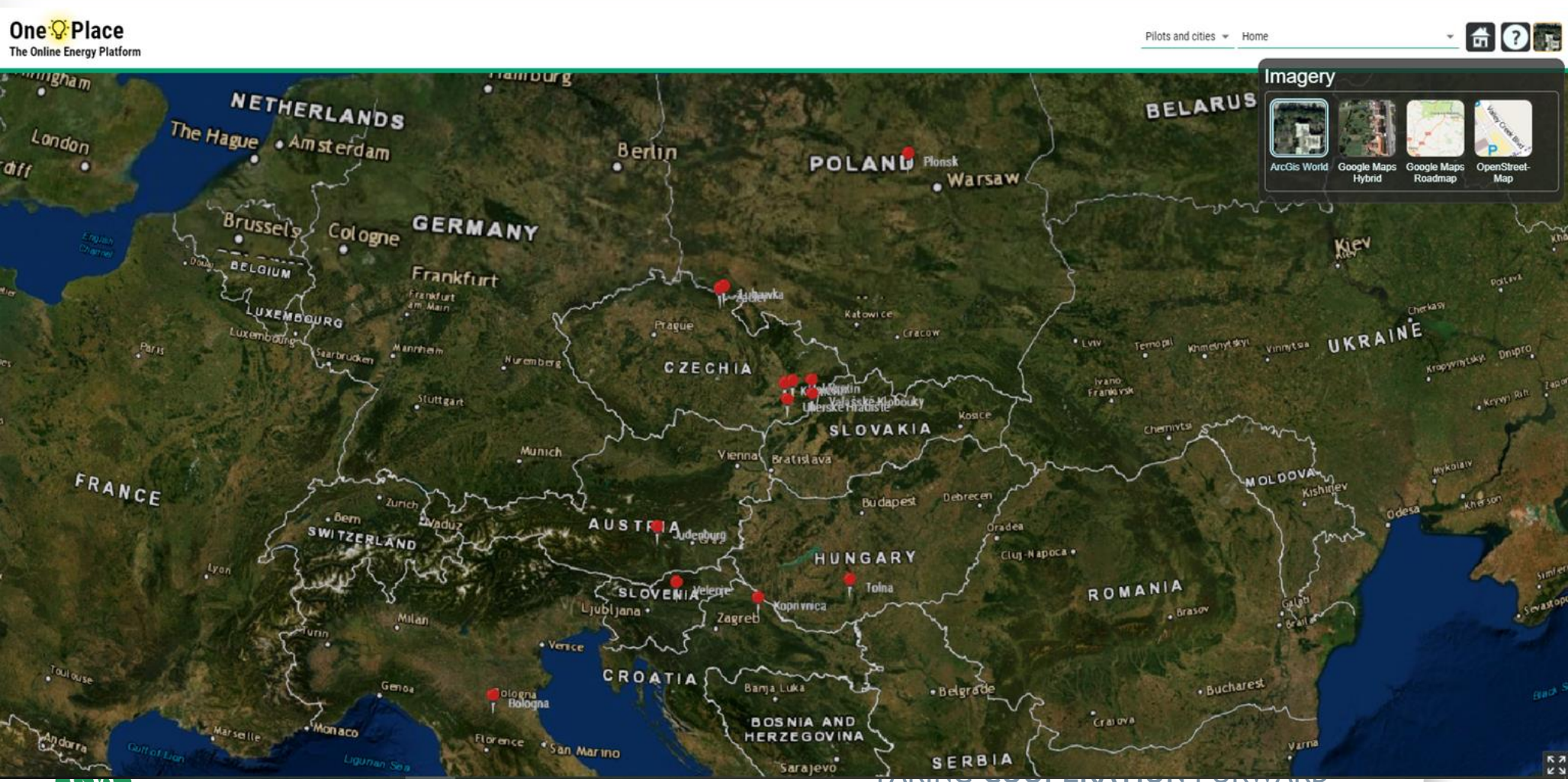

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- 3D Energy Management System: 15 min -

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Pilots and cities | PA3 - Zlin_Kroměříž, Czech Republic

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- 3D Energy Management System: 15 min -

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Pilots and cities | PA7 - Velenje, Slovenia

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- 3D Energy Management System: 15 min -

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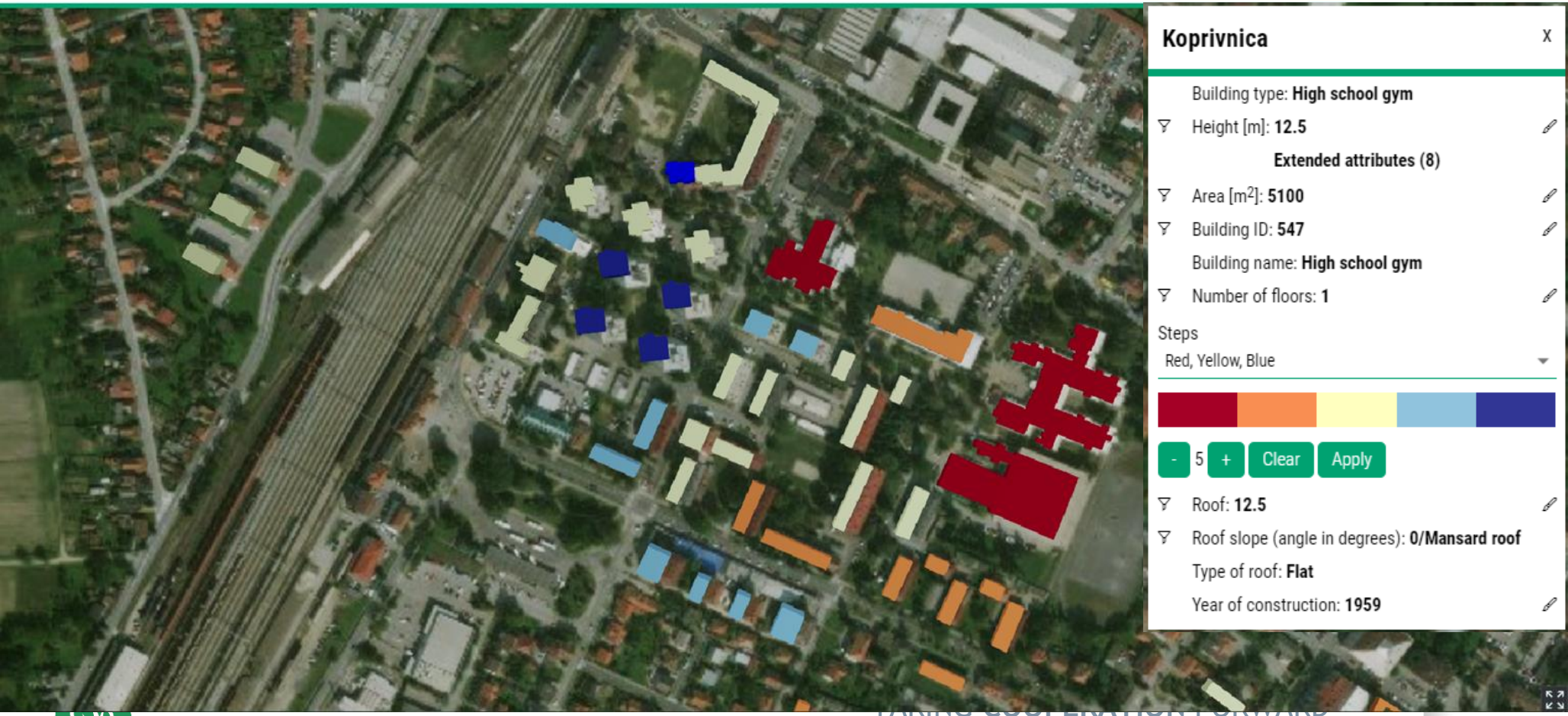
Pilots and cities | PA6 - Koprivnica, Croatia



Koprivnica X

Building type: **High school gym**
Height [m]: **12.5**

Extended attributes (8)

Area [m²]: **5100**
Building ID: **547**
Building name: **High school gym**
Number of floors: **1**

Steps
Red, Yellow, Blue

- 5 + Clear Apply

Roof: **12.5**
Roof slope (angle in degrees): **0/Mansard roof**
Type of roof: **Flat**
Year of construction: **1959**

OnePlace - DEMO
- 3D Energy Management System: 15 min -

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Pilots | PA5 - Plonsk, Poland

Plonsk X

- Building type: **public building**
- Building type: **Educational**
- Electricity consumption [kWh/year]: **26.667**
- Energy audit: **2018**
- Energy consumption (heating) [GJ/year]: **229.996**
- Energy efficiency measures already implemented in the building : **Thermomodernization of external walls and plinth walls - insulated with a layer of polystyrene with a thickness of 10 cm**
- Energy source type (heat): **gas boiler**
- Estimation of the amount of heating losses in the building: **0.150616**
- Height [m]: **12**
- Official name: **Primary School No. 1 in Płońsk**
- Recommended energy efficiency measures for the building: **Modernization of lighting for energy-efficient**
- Technology used to harvest a renewable energy source: **None**
- The specific CO2 emissions: **46.45**
- The total CO2 emissions: **68.1**
- Typology (number of floors): **4**

Extended attributes (1)

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- 3D Energy Management System: 15 min -

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Pilots | PA8 - Lubawka, Poland

Lubawka

Building type: **Government**

Electricity consumption [kWh/year]: **58200**

Energy audit: **YES**

Energy consumption (heating) [GJ/year]: **1650**

Energy efficiency measures already implemented in the building : **not applicable**

Energy source type (heat): **Natural gas**

Estimation of the amount of heating losses in the building: **no data**

Height [m]: **16.100006**

Official name: **Town hall in Lubawka**

Recommended energy efficiency measures for the building: **no data**

Technology used to harvest a renewable energy source: **not applicable**

The specific CO2 emissions: **no data**

The total CO2 emissions: **no data**

Typology (number of floors): **3**

Extended attributes (1)

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- 3D Energy Management System: 15 min -

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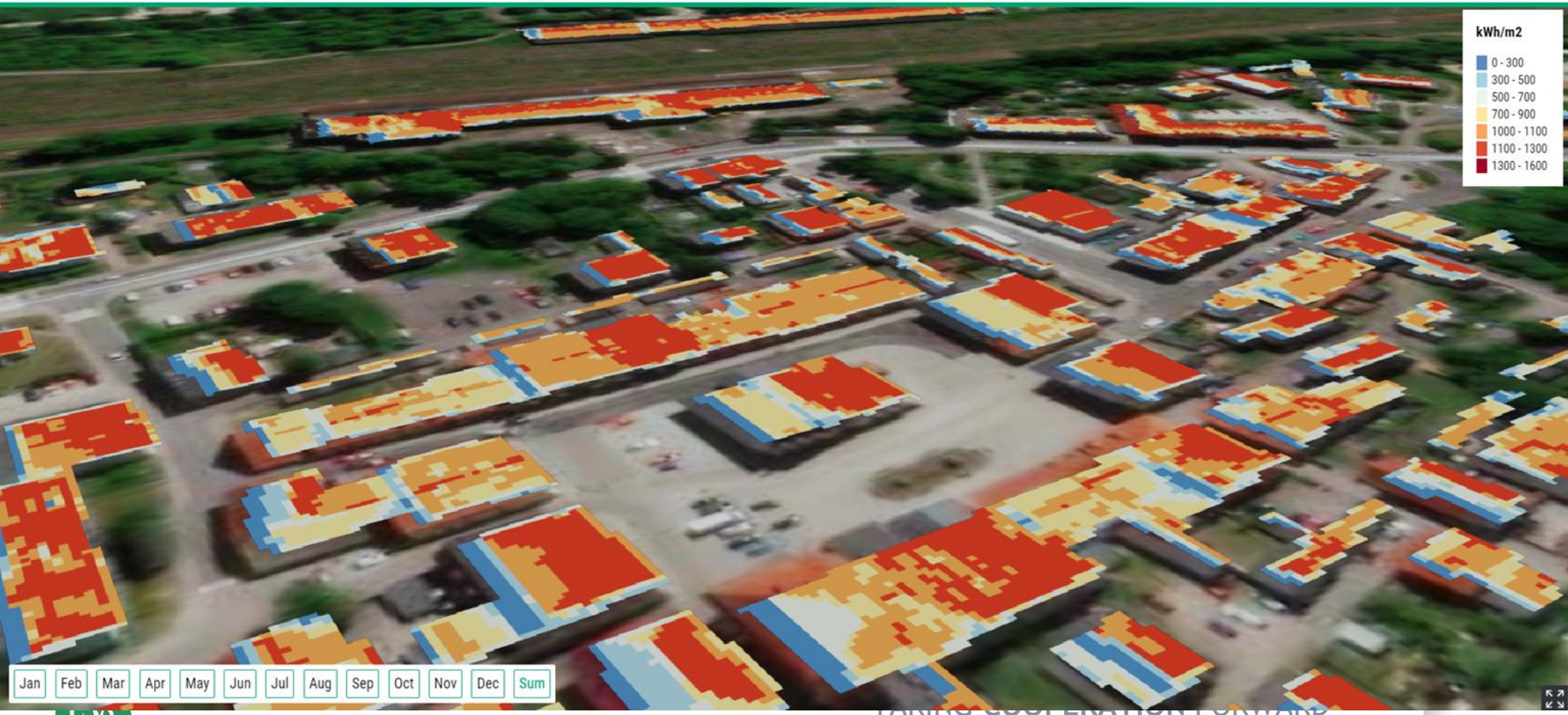
One Place
The Online Energy Platform

Solar maps | PA8 - Lubawka, Poland



THANK YOU!

BOOSTEE-CE

BOOSTEE-CE Train the Trainers

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Fabio REMONDINO

3D Optical Metrology (3DOM)
Bruno Kessler Foundation (FBK)
Trento, Italy
Email: remondino@fbk.eu
http://3dom.fbk.eu

Anna NOWACKA

Europejskie Ugrupowanie Współpracy Terytorialnej NOVUM (EUWT NOVUM)
Jelenia Góra, Poland
Email: anna.nowacka@euwt-novum.eu
http://www.euwt-novum.eu

Tomáš PERUTKA

Energy Agency of the Zlín Region (EAZK)
Zlin, Czech Republic
Email: tomas.perutka@eazk.cz
http://http://www.eazk.cz/

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