Feasibility study for deep renovation at a district scale

Using digital simulation and visualisation tools

This project has received funding from the European Union's Horizon 2020 Programme for Research and Innovation under Grant Agreement no 847053

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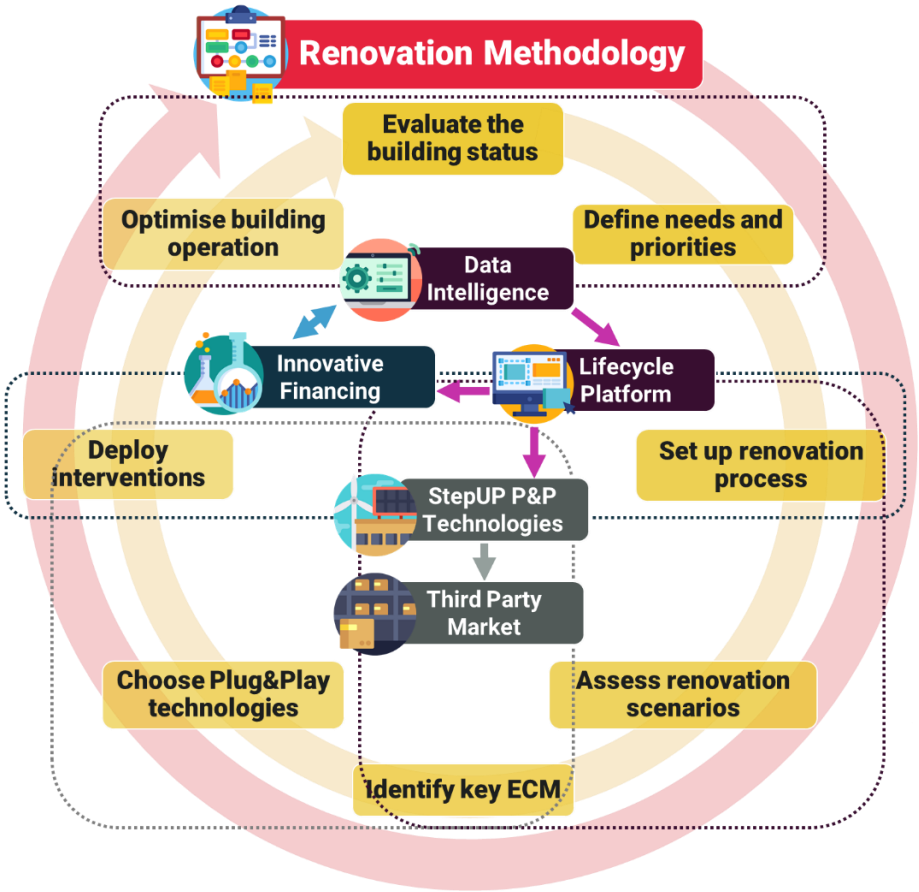
Concept and Methodology



An iterative and holistic methodology

- Methodology for a systematic whole building renovation, incorporating the **stakeholders' needs** at the centre.
- **StepUP** methodology, based in Data Intelligence, has the objective to deliver affordable deep renovation technologies, another step towards EU building decarbonisation.

> *"At the core of the StepUP project relies an **incremental, iterative renovation methodology** aimed to cover every phase of the renovation process to make each step more effective"*

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Project key objectives

Make renovation more attractive and reliable with a new methodology based on near-real time data intelligence.

Reduce the performance gap to 10% difference between design and operations by developing an integrated life-cycle software platform.

Optimize renovation investments by developing innovative financing models for integrated optimization of energy

Minimise time on site to 40% of current renovation onsite work by advancing innovative passive and active technologies to a market-ready modular renovation package of Plug & Play Technologies.

Accelerate the renovation market via an interoperability protocol for renovation solutions, enabling compatibility with the StepUP solutions to allow the integration of third party market products, fostering an open Plug&Play technological environment accessible to innovative SMEs.

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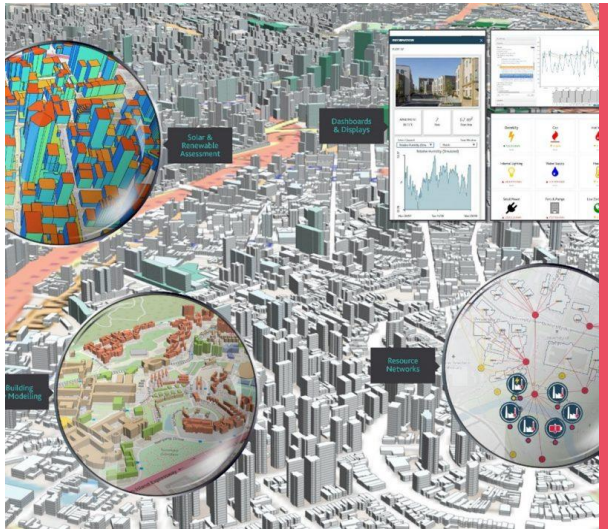
Technologies

Plug & Play Envelope System

Flexible heating solution

Innovative financing tools for deep renovation



Software tools and platform for data collection

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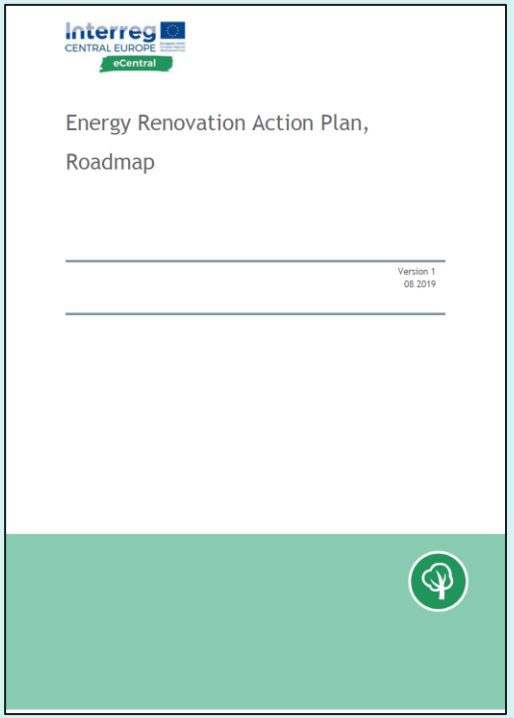
Aim

Create a portfolio analysis for the municipality that would allow portfolio managers to make decisions about where to invest next

- Identifying the worst performers
- Testing renovation scenarios
- Tracking progress over time



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Data collected

Geometry and construction

- Floor area
- Glazing ratio
- Building type
- Year
- Construction

HVAC system

- HVAC type
- Fuel type

Energy data

- Heating demand
- Electricity demand
- Cooling demand

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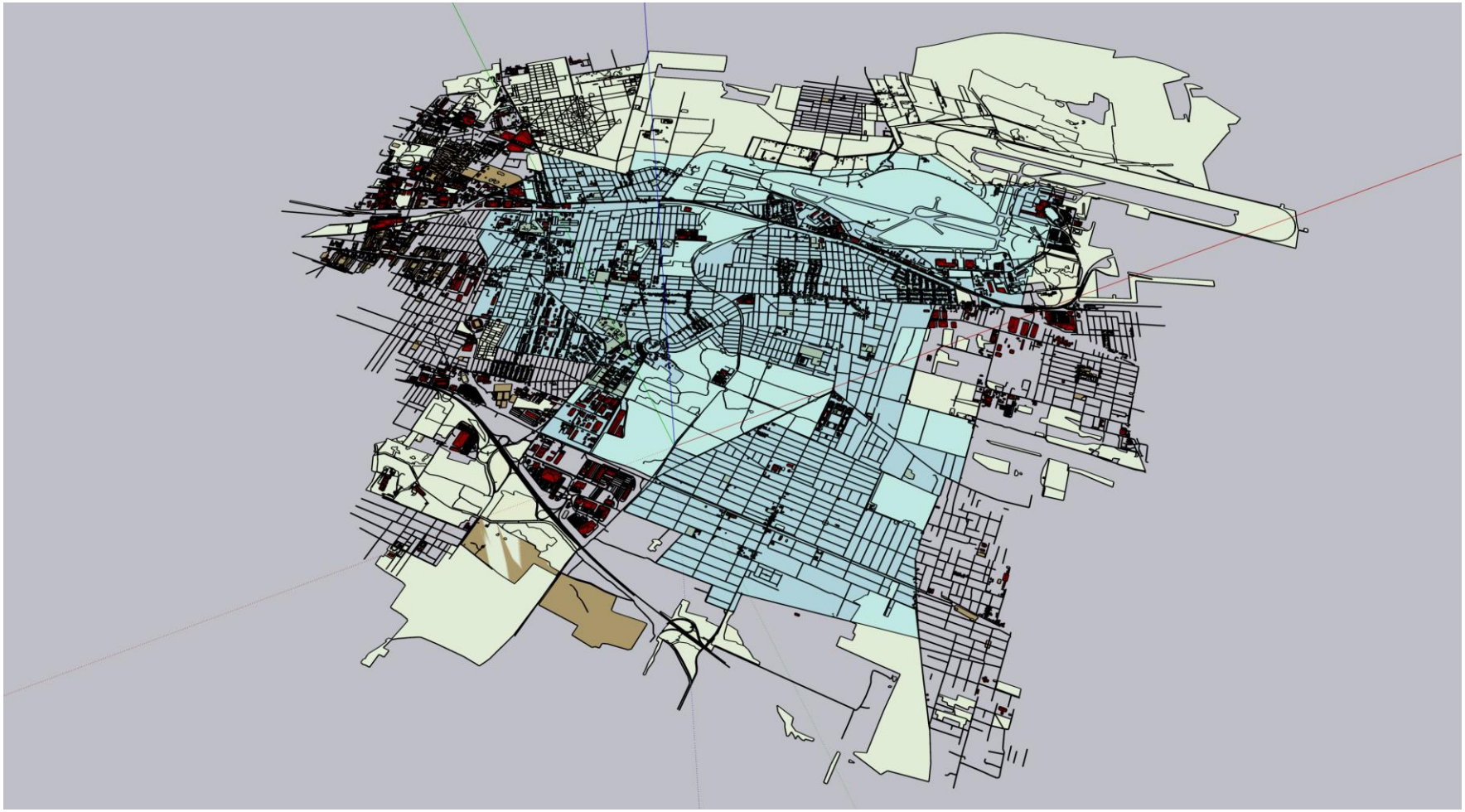
Modelling approach



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Modelling approach

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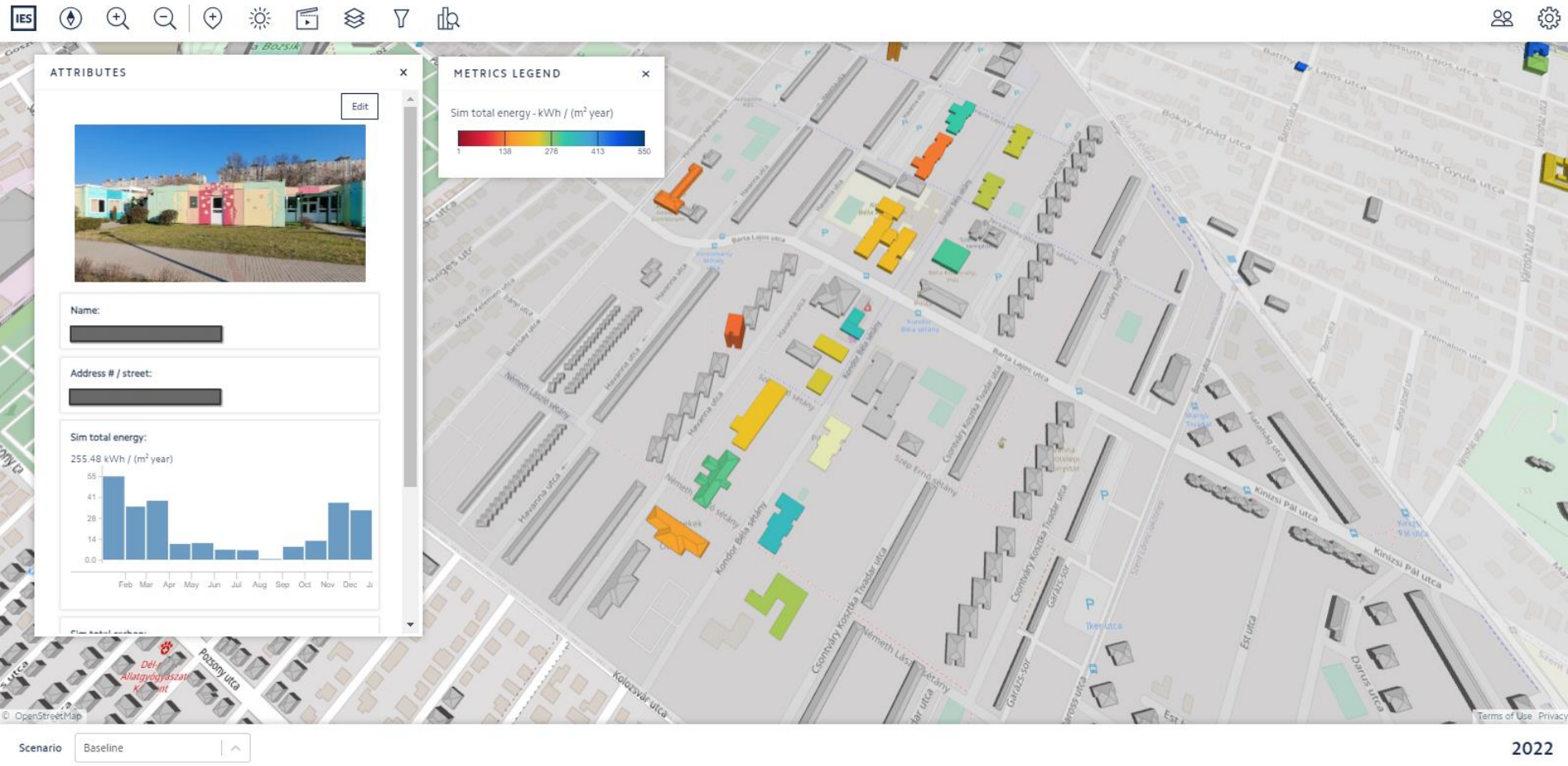


ATTRIBUTES
Sim water kitchen tap use
0 l / (m² year)
Sim water shower use
32.5 l / (m² year)
Sim water toilet use
97.06 l / (m² year)
Sim water total
223.79 l / (m² year)
Sim water urinal use
13 l / (m² year)
Sim water washroom tap use
81.24 l / (m² year)
TIMESERIES
Annual Metered Gas (Integration over time)
44.35872 kW
HOURLY
MONTHLY
1hr 1d 1w 1m 3m 6m
60
0
--
kW
Jan 01
Feb 01
Mar 01
Apr 01
Apr 01
Jul 01
Oct 01
USER DEFINED
Annual Metered Gas (Integration over time)
10.22 MWh / year

- District level digital twin created to support better decision making for renovation investments
- Rapid model creation using OpenStreetMap import functionality
- Validate with data collected from 114 municipality buildings
- Accessible visualisation platform to communicate and engage different stakeholders throughout the renovation process
- Lifetime asset which can be used to assess/refine strategies and track progress over time

“The platform brings all the innovative renovation tools together that are needed for essential decision-making for organisations such as municipalities and provides a common understanding of the project between stakeholders.” – Pilot leader BP18 municipality

Thank you

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Project : www.stepup-project.eu

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