Solutions and technologies for deep energy renovation process uptake

Reliable and cost-effective solutions
to decarbonise existing buildings

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StepUP general overview

Solutions and technologies for deep energy renovation processes uptake

- European project funded under the topic: *LC-SC3-EE-1-2018-2019-2020 - Decarbonisation of the EU building stock: innovative approaches and affordable solutions changing the market for buildings renovation*
- **3,5 years** duration, from 1/08/2019 to 31/01/2023
- **Budget**: 4,9 M€, of which 3,6M€ funded by the EC
- **10 participants** from **7** different **European countries**
- Coordinated by **Integrated Environmental Solutions LTD**
- **Grant agreement ID**: 847053

Consortium

10 partners from 7 European countries

6 (5)	1	1	2
Industrial companies (SMEs)	NPO	RTOs	Owners and contractors

The context

Making decarbonisation of existing buildings a reliable and attractive investment

- The European **Energy Performance of Buildings Directive (EPBD)** identifies **deep renovation** as a key action to **drastically reduce energy demand** and achieve the EU vision of a **decarbonised building stock by 2050**.
- The **Renovation Wave** initiative is aimed to increase the rate and quality of renovation existing buildings and help to decarbonise building stock.
- **Most of the technology to achieve this reduction is available on the market today**. However, shallow retrofits persist with low impact on energy consumption.

*Currently, only **1% of European buildings are being renovated yearly***

About StepUP

Cost-effective deep renovation technologies to make buildings decarbonisation a reliable, attractive and sustainable investment

- **StepUP** develops a new process for deep renovation for decarbonisation, to minimise performance gap, reduce investment risk and maximise value.
- To achieve this, the project uses continuous **feedback loops and promotes an iterative deep energy renovation approach**, based on data insights, which positively impacts on energy costs, Indoor Environmental Quality (IEQ) and comfort.

*"The **StepUP approach** relies on a set of solutions and technologies applied at different phases of the implementation of the renovation methodology"*

Objectives

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

Reduce the performance gap to 10% by developing an integrated life-cycle software platform

Optimise renovation investments by developing innovative financial models

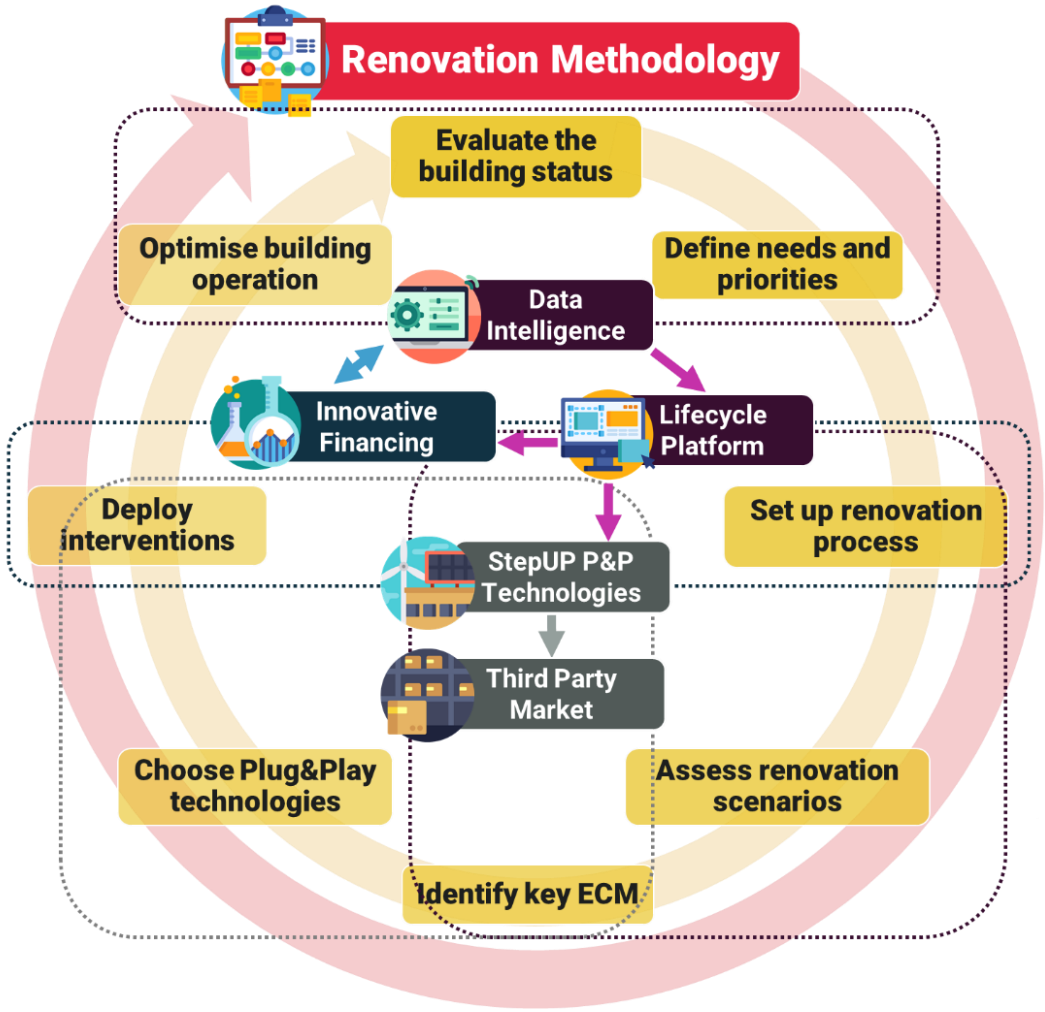
Minimise time on site to 40% of current renovation onsite work by creating a market-ready modular renovation package of Plug & Play technologies

Accelerate the renovation market via an interoperability protocol for renovation solutions, enabling compatibility of StepUP with third-party market products

StepUP 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.

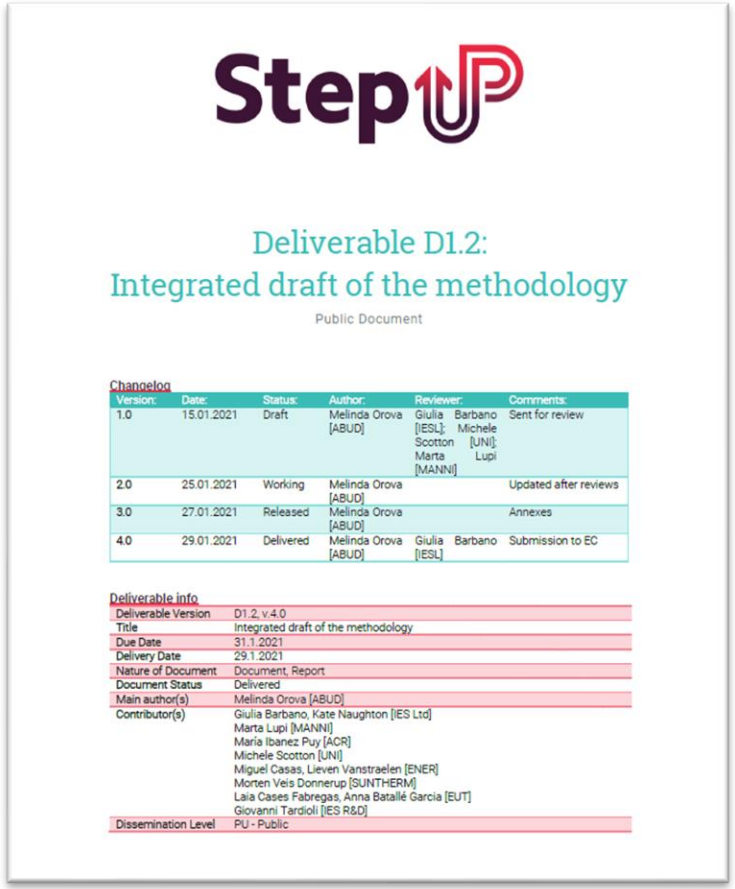


*At the core of the StepUP project relies an **incremental, iterative renovation methodology** aimed to cover every phase of the renovation process to make each step more effective*

StepUP methodology

First public drafts available

- Methodology scope and boundaries, discussion of phases; companion data collection requirements
- Open for feedback – get in touch!
- https://www.stepup-project.eu/contact/



StepUP

Deliverable D1.2:
Integrated draft of the methodology

Public Document

Changelog

Version:	Date:	Status:	Author:	Reviewer:	Comments:
1.0	15.01.2021	Draft	Melinda Orova [ABUD]	Giulia Barbano [IESL]; Michele Scotton [UNI]; Marta Lupi [MANNI]	Sent for review
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4.0	29.01.2021	Delivered	Melinda Orova [ABUD]	Giulia Barbano [IESL]	Submission to EC

Deliverable info

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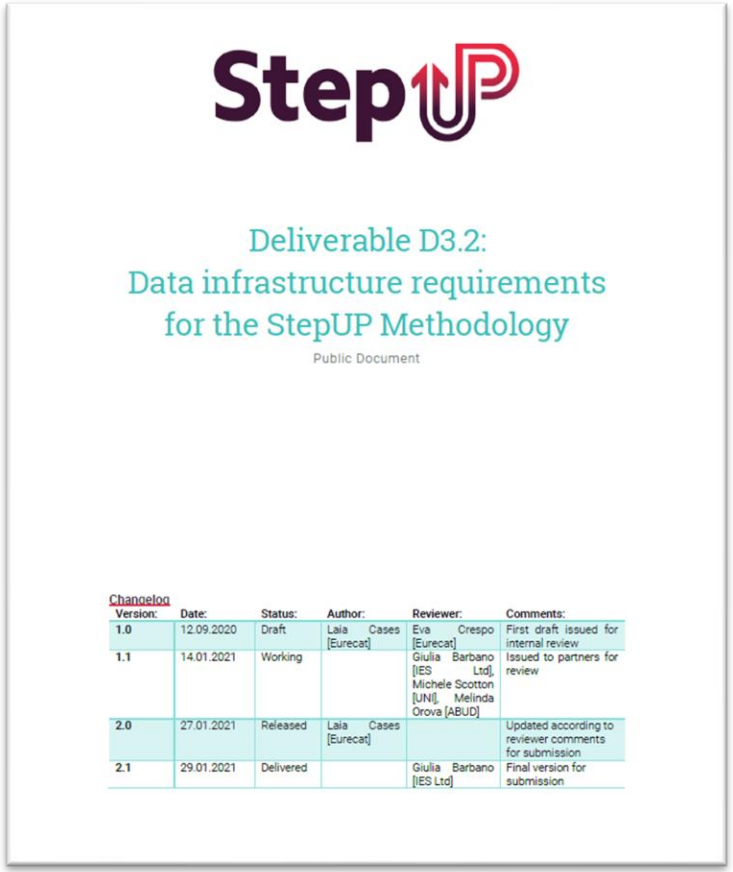
Dissemination Level	PU - Public



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Deliverable D3.2:
Data infrastructure requirements for the StepUP Methodology

Public Document

Changelog

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1.0	12.09.2020	Draft	Laia Cases [Eurecat]	Eva Crespo [Eurecat]	First draft issued for internal review
1.1	14.01.2021	Working		Giulia Barbano [IES Ltd], Michele Scotton [UNI], Melinda Orova [ABUD]	Issued to partners for review
2.0	27.01.2021	Released	Laia Cases [Eurecat]		Updated according to reviewer comments for submission
2.1	29.01.2021	Delivered		Giulia Barbano [IES Ltd]	Final version for submission

StepUP

StepUP solutions

1. **Plug & Play Envelope System**
   Pre-assembled enveloped panel integrating windows and provisions for the technical systems

2. **Plug & Play SmartHeat solution**
   Groundbreaking technology for flexible consumption of thermal energy monitored and optimised through StepUP data tools

3. **Innovative financing tools for deep renovation**
   Energy Performance Contracts (EPCs) based on co-investment, continuous performance measurement and management

4. **Software tools and platform for data collection**
   Data intelligence solutions to generate a sound base for the continuous measurement and verification of the renovation

P&P Envelope mockup

https://youtu.be/gcAKyxm2BJc

Key data

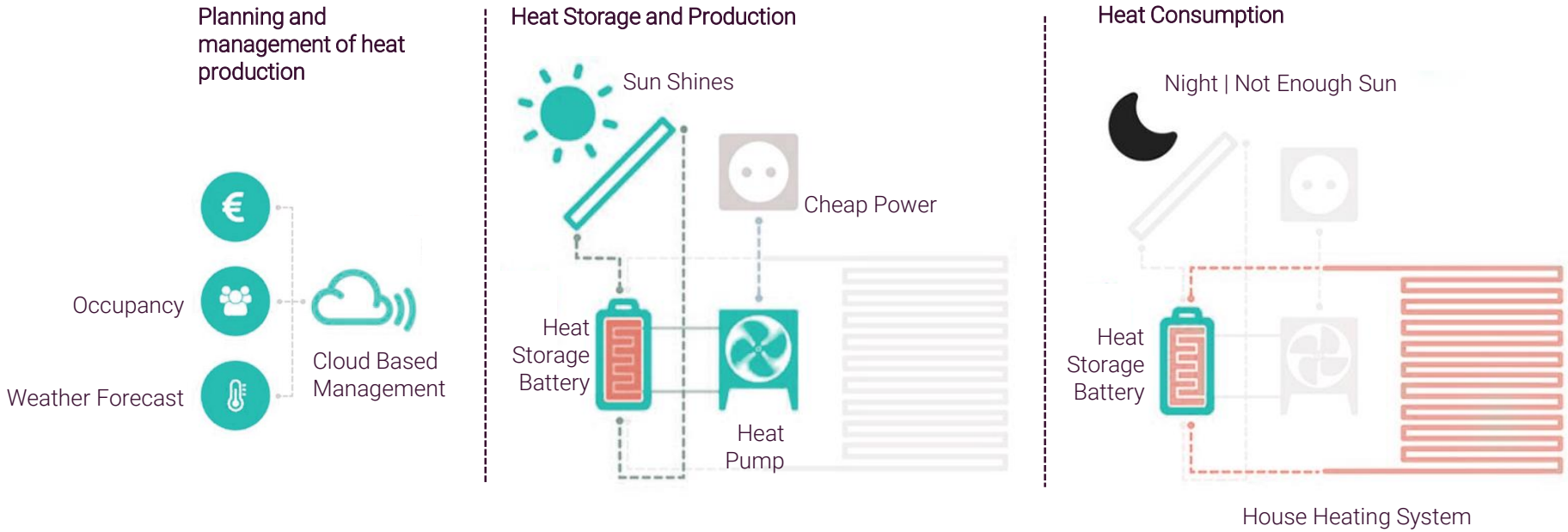
- 2 people (assembly, + 1 crane operator to install)
- 45 m^2
- Assembly: 6 days
- Installation: 1 day

SmartHeat Solution

SUNTHERM

Key data

- Heat storage battery connected to photovoltaic collectors, smart grid enabled heat pump (6kW) and a cloud-based management
- 15kWh thermal storage capacity
- Heat storage of 1500 litres of hot water
- PCM storage module available in various sizes



StepUP pilots

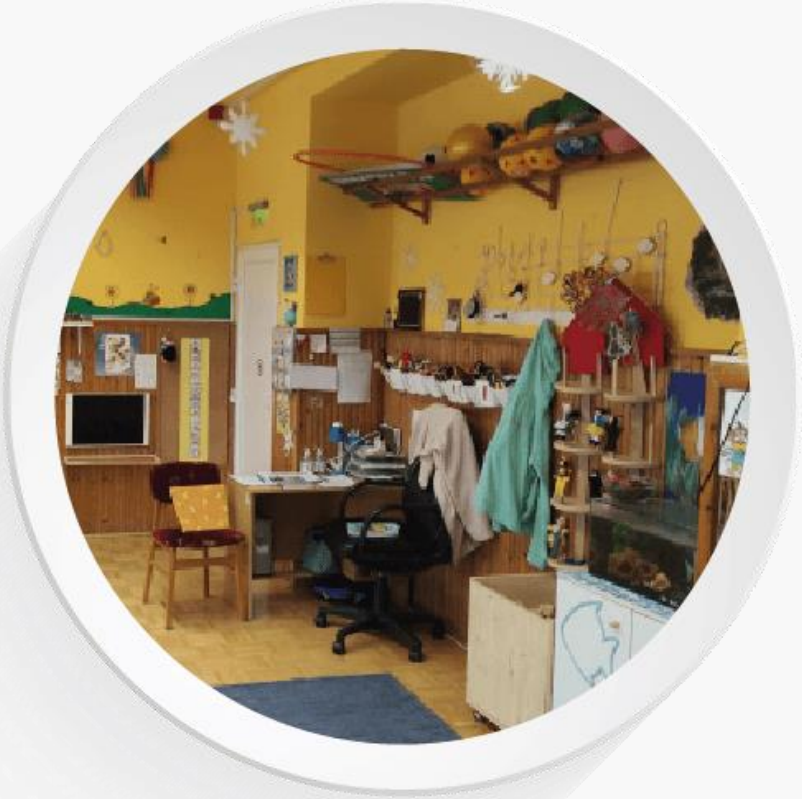
StepUP solutions will be demonstrated in three different types of buildings

1. **Public non-residential buildings** (Hungary)
2. **Rental private office buildings** (UK)
3. **Multi-family residential dwellings** (Spain)

StepUP pilots - Schools

Zöld-Liget Kindergarten

- Located in the **18th District of Budapest (Hungary)**, the Zöld-Liget Kindergarten is a representative case of the needs for deep renovation in public buildings.
- The current energy performance of the building is poor due to **significant heat loss through the roof and walls**.
- The energy efficiency measures included in this pilot comprise the installation of the P&P envelope and SmartHeat system, roof insulation, the installation of PV panels and the change of the heat distribution system.



This pilot will demonstrate StepUP solutions for public authorities

StepUP pilots - Offices

The IES HQ office

- A virtual pilot in the IES HQ office located in Glasgow (Scotland) built after 2000.
- Chosen to demonstrate a common case for missed opportunities in deep renovation in the European built environment: the long-term office lease.

> *This pilot will test StepUP analysis and diagnosis in working conditions*

StepUP pilots - Apartments

Pamplona Pilot (Spain)

- Multi-owner apartment blocks from the 70s with 40 apartments.
- The building was built before the implementation of energy efficiency regulations and currently deal with thermal discomfort, low airtightness values and high energy consumption.
- StepUP will help owners' community to increase the overall thermal insulation of the building and improve the energy rating from E to B or C after the renovation.

Applying StepUP to common European housing

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Solutions and technologies for deep energy renovation process uptake

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THANK YOU!

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StepUP Project

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