

# StepUP

## for Technology Providers Cluster (TPC)



[www.stepup-project.eu](http://www.stepup-project.eu)

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The project has received funding from the EU's Horizon 2020 programme. Grant N° 847053.

Already collaborating with **StepUP**  
Technology Provider Cluster:



## Introduction

Deep renovations are a key element to drastically reduce the current building energy demand (40% of overall European Union energy consumption) and start moving towards a decarbonised building stock by 2050<sup>1</sup>. **Most of the technology to achieve this reduction is available on the market today.** However, renovation rates are far from the target 3%, and **shallow retrofits persist with low impact on energy consumption.** Comfort levels are one of the main reasons why owners renovate, however this opportunity is not captured in the motivational framing for energy renovation. Current business models also rely strongly on the public sector as an investment source, which is not a long-term or sustainable solution.

In order to transform the current scenario, the StepUP project will develop a **new process for deep energy renovation** with fast design to operation feedback loops. The new methodology will integrate all the value chain stakeholders to verify and support its development. The aim is to minimise the performance gap and optimise investments, while scaling up promising technologies solutions to **Plug&Play (P&P)** building level application.

## The need for a Plug & Play Protocol

The StepUP methodology aims to help owners and designers identify a **flexible selection of Energy Conservation Methods (ECMs)** that answers the buildings' needs through iterative installation and verification loops, while delivering a functional renovation solution. Currently, there is a wide range of deep renovation technologies in the market. However, there is always a need for compromise on the design side to minimise the downsides of their interaction.

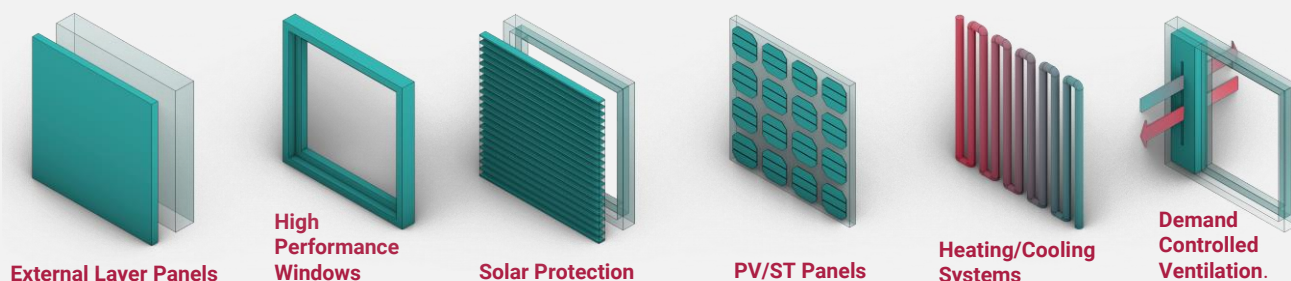
The StepUP project offers a paradigm shift to transform the market of deep renovations by defining and demonstrating a production process that maximises the efficacy of solutions' interaction, while minimising life cycle cost and installation time. The **P&P Protocol** is the way for the StepUP methodology where **technical aspects of the renovation process and specifications for product interaction** are defined. This ensures a successful uptake of project technologies into the deep renovation market with fast design to operation feedback loops.

**The Plug & Play Protocol Principles define a set of requirements and specifications intended to foster an ecosystem of interoperable components and technical solutions for deep renovation**

P1	Industrialisation	P1.1	Preassembled Offsite
		P1.2	Low Intrusive System
		P1.3	Easy and time-saving on-site installation
P2	Customisation	P2.1	Adaptable to different architecture geometries
		P2.2	Adaptable to different architectural aesthetics
P3	Compatibility and Interoperability	P3.1	P&P Envelope and Smart Heat
		P3.2	P&P Envelope and TPC
		P3.3	SmartHeat and TPC
		P3.4	SmartHeat and District Systems
P4	Circularity	P4.1	Low Embodied Energy
		P4.2	Lean Philosophy
		P4.3	Design for Disassembly
P5	Open Exchange Information	P5.1	Technical Sheets
		P5.2	2D   3D Drawing
		P5.3	BIM objects
P6	Certification and Regulation	P6.1	European Union Regulations
		P6.2	Environmental Certificates

## Technology Provider Cluster

First steps towards developing the specifications for technologies' interoperability has been identifying the key stakeholder categories needed to complement StepUp Technologies



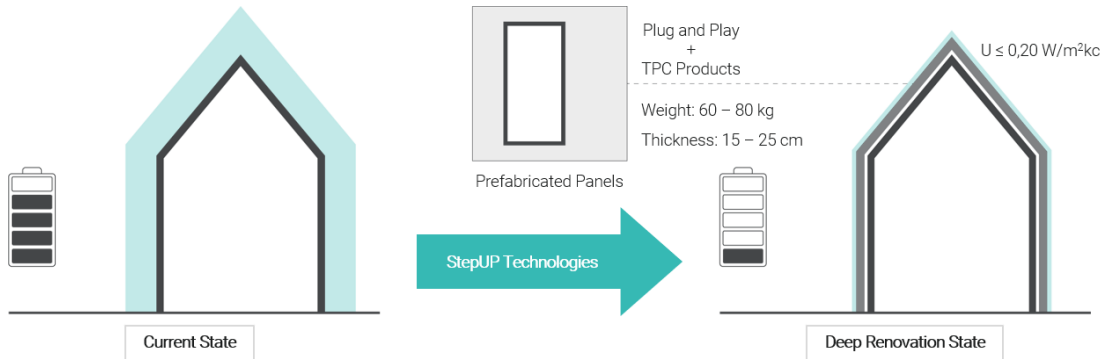
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**The P&P Envelope is the technology that aims to improve the passive system of the building**

**SmartHeat focusses on enhancing the active system performance**

## Plug&Play Envelope

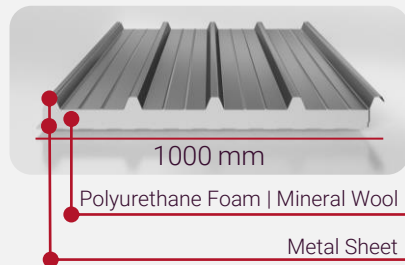
Improving the passive performance of the building envelope is the first and foremost intervention in deep renovation of poorly insulated buildings, **as a reduction in energy demand** in turn significantly affects the energy production needs. However, this is traditionally one of the most time-consuming interventions with a disruptive impact on the building use and operations. By using preassembled enveloped panels that integrate windows and provision for the technical systems P&P Envelope is capable of greatly reducing time on site.



The new envelope uses a steel structure provided by [Manni Group](#) that can easily be attached to existing slabs of the building without affecting its structural balance. The existing technology consists of a cold-formed steel framing construction system that supports [Isopan](#) (Manni Group Company) mineral wool or polyurethane sandwich panels. The fabrication of the structure is based on a digital design and production processes that allows to adjust the dimensions to design requirements. The insulation panels guarantee thermal and sound insulation, strength and air tightness, and an excellent reaction to fire and sound absorption. The sandwich panels consist of a layer of polyurethane or mineral wool as insulating material and two external metal sheets. The panels are light and a versatile and easy to install solution adequate for facade renovation. Subsequently, an external layer – which can meet a broad range of aesthetical requirements – is installed employing brackets. The goal of StepUP is to redefine and tailor the above-described technologies into preassembled façade panels that **integrate windows and all necessary predispositions** for the active system, as well as complementary features for the passive system. The peculiarity of the **new market-ready renovation package** is that modules can vary both in height (3.00-4.00 m) and width (1.50-2.00m) to adjust to different façade configurations and fit transport limitations. This dimensionality is also relevant to facilitate the installation of the panels in the building site.

In order to **maximize offsite preassembled solutions** Manni group will prepare a kitted product, containing all the extra features produced by companies members of the TPC. At the building site, a multi-disciplinary qualified team, with clear instructions, will oversee and execute the installation process helping **reduce intervention time**.

The possibility of having a **tailored external layer and an overall customised façade solution** can have an impact on the **quality of life of the users**: improving the aesthetic appearance of the building is an important feature to engage owners in the desire to renovate; the capability of the system to adapt and support different compositions is relevant to achieve similar customised results to standard renovation processes.



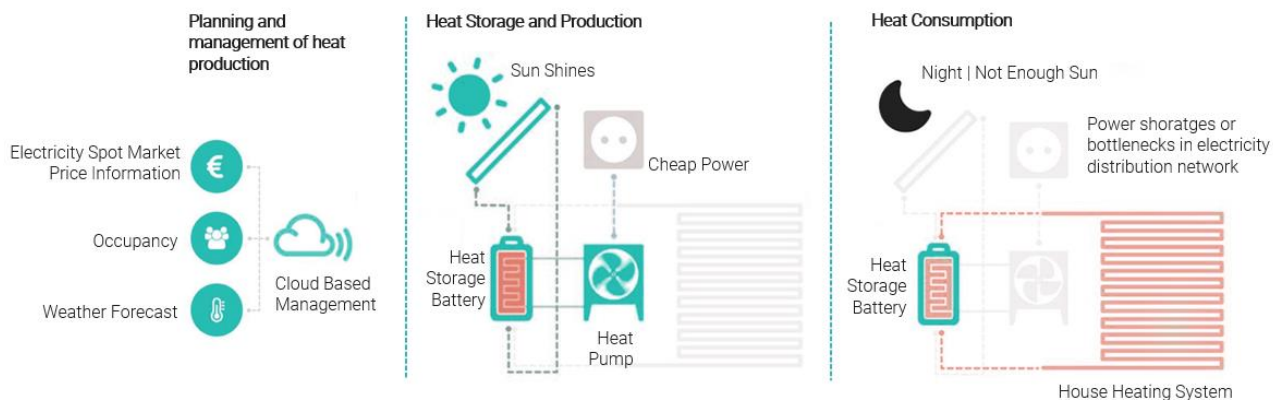
Second Mock- up.>  
Phase I. Spain

< First Mock-up. Italy

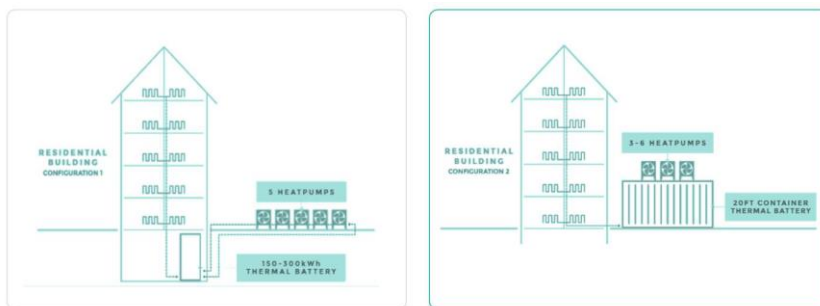


## SmartHeat System

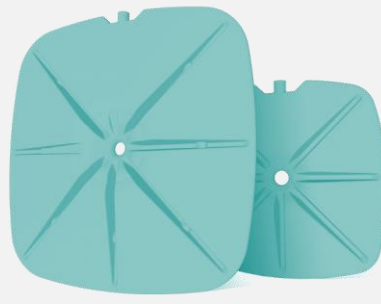
Storage systems have been identified as a key player in enabling the EU to develop a low/zero-carbon energy system. Batteries are main technological drivers as they can **store the excess energy generated and deliver it when necessary**. Suntherm's integrated and ground-breaking heating system is composed of an innovative heat storage battery connected to established technologies: Photovoltaic collectors, smart grid enabled heat pump (6kW), and cloud-based management.



The SmartHeat battery is Ø60x160cm with thermal storage capacity of 15kWh, uses a salt hydrate solution that **allows the storage of heat equivalent to approximately 1500 litres of hot water** storage and can cover the daily needs of a family for heating. One solution is to place the storage in the basement. However, the option that has the PCM storage and the Heat Pumps inside a 20" container is faster to install. The container can be covered by a similar solution to the one applied in the façade for a better integration of the technology.



Axiotherm capsules increase the capacity of heat and cold storage. Melting Point from -51 to +84 degrees.





**Provide  
Technologies to  
Complement P&P  
Envelope and  
SmartHeat**

## Technology Provider Cluster

The StepUP project aims to interact with the renovation value chain throughout all its activities, by establishing **clusters of third-party technology producers**, who produce market technologies which are **complementary to the Plug&Play Envelope and SmartHeat System** developed by StepUP partners Manni Group and Suntherm.

Role (output) and Benefits (input) of participating in the project

### 01 What is the Role of the TPC

Participating companies are consulted for **feedback** during different stages of the project development. The assessment on the project methodology, technologies and the P&P Protocol aims to ensure sufficient **flexibility and adaptability** of StepUp solutions for **third-party products co-integration**.



## Plug&Play Protocol Verification

**Use of StepUp  
Mock-up to  
showcase and test  
the integration of  
your state of  
the art  
technology**



### 13. Product Testing and Verification

Part of StepUp projects' tasks is **developing real scale mock-ups** to test the technologies verifying the assembly methods, properties, technical performance and specifications. TPC companies are invited to integrate their products in the Spanish mock-up located at **Isopan** facilities in Tarragona.

The next step to validate the P&P specifications and TPC components is taking place in August and September 2021. A 1:1 scale model will be built integrating the components of the TPC that want to engage in the project. The built mock-up will also serve as a testing scenario for future technology implementation.

### 12. Networking, exposure and visibility



StepUP is a project that has received funding from the EU's Horizon 2020. Engaging with our program and activities allows you to be part of a European Union **network of companies and key players in the renovation market**.

We will promote you through the StepUp channels and showcase the components that have been integrated with our solutions: P&P Envelope and SmartHeat. You will also be invited to relevant events where you can connect with other leading companies in the sector, **exchange ideas and potentially establish new partnerships**.



### 14. Innovative Environment

Get involved in a cluster made of technology manufacturers, contractors, and researchers **leading the transformation of the construction sector** into a more responsible and sustainable practice. Together we are an active team developing promising technologies and state of the art solutions to improve the current building stock.

## Components Specifications

The specifications for the TPC products arise from the previously defined **StepUP protocol principles**

			External Layer Panels	High Performance Windows	Solar Protection	PV / ST Panels	Heating / Cooling System	Demand Controlled Ventilation
Requirements	R1.1	Delivery of components in kits	X	X	X	X	X	X
	R1.2	Installed outside the building envelope	X	X	X	X		X
	R2.2	Aesthetical options	X	X	X	X		X
	R3.1	Integration of services and sensors within the passive solution		X	X	X	X	X
	R3.2	Adapt to P&P modularity and characteristics	X	X	X	X	X	X
	R3.3	Physical requirements active TPC components				X	X	
	R3.4	Tailored heating strategies					X	
	R4.2	Lean Construction	X	X	X	X	X	X
	R4.3	Create deconstruction and maintenance plans	X	X	X	X	X	X
	R5.1	P&P Technical Sheets	X	X	X	X	X	X
	R5.2	Drawing exchange format .dxf	X	X	X	X	X	X
	R5.3	5D BIM objects	X	X	X	X	X	X
	R6.1	CE   Local Regulations	X	X	X	X	X	X
	R6.2	Environmental Product Declaration	X	X	X	X	X	X

**Are you a manufacturer of construction products?**

**Do you want to know how to Industrialise your technology and prepare it for the next AEC paradigm?**

**Join in the StepUp Technology Provider Cluster!**

Contact:

Website: <https://www.stepup-project.eu/>

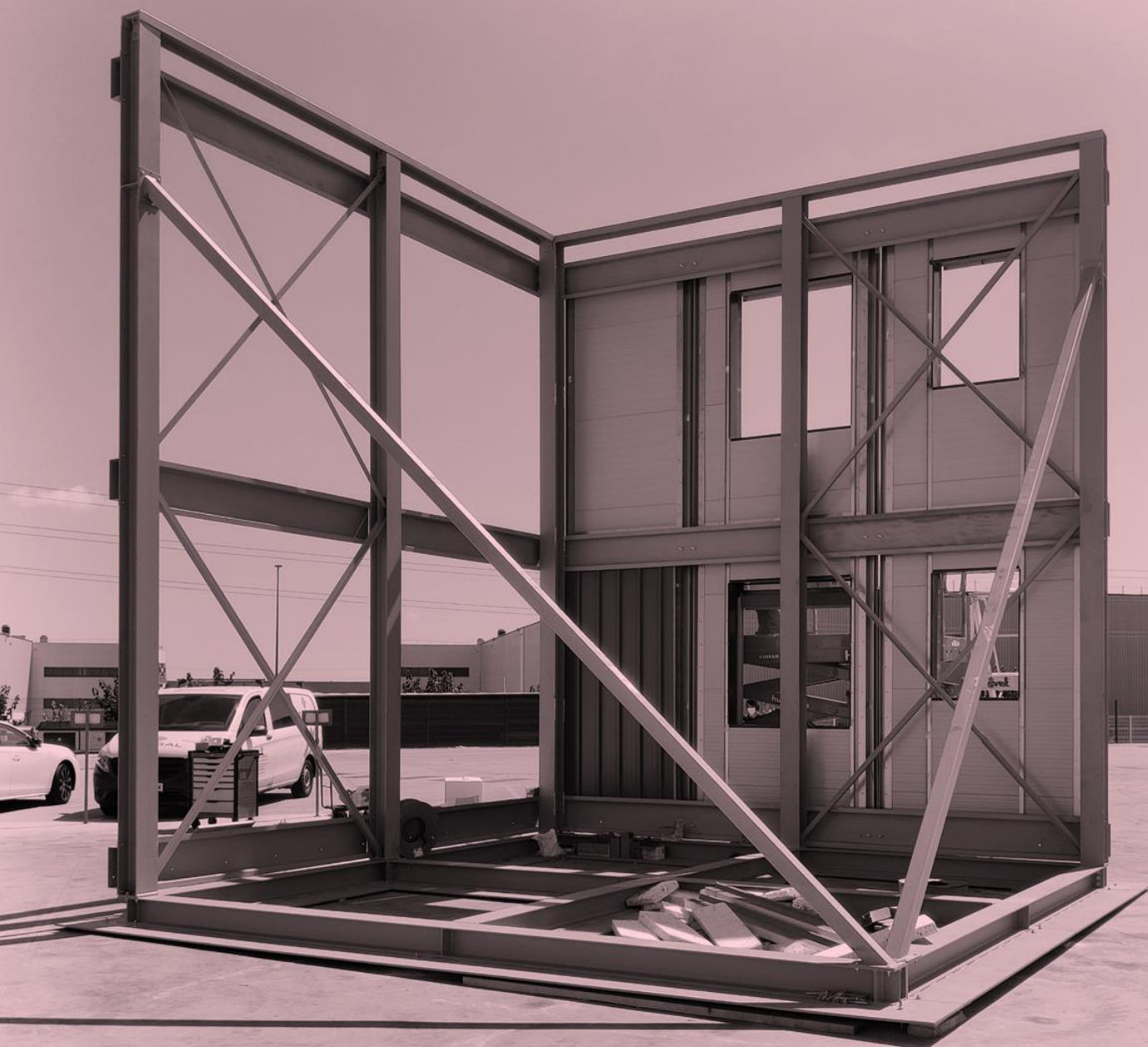
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