

SUPERHERO PROJECT - OVERVIEWED

GIULIANA BONVICINI (CC) - COORDINATOR

Adapt to Climate Conference 19/04/2021



Sustainability and PERformances for
HEROTILE-based energy efficient roofs



- TOPIC: CLIMATE CHANGE ADAPTATION
- SECTOR: URBAN ADAPTATION/PLANNING
- TOTAL AMOUNT: 3,032,924 €
- EU CONTRIBUTION: 1,563,160 € (55% of eligible costs)
- STARTING DATE: 1/07/2020
- ENDING DATE: 30/06/2025



THE CONSORTIUM

LIFE19 CCA/IT/001194



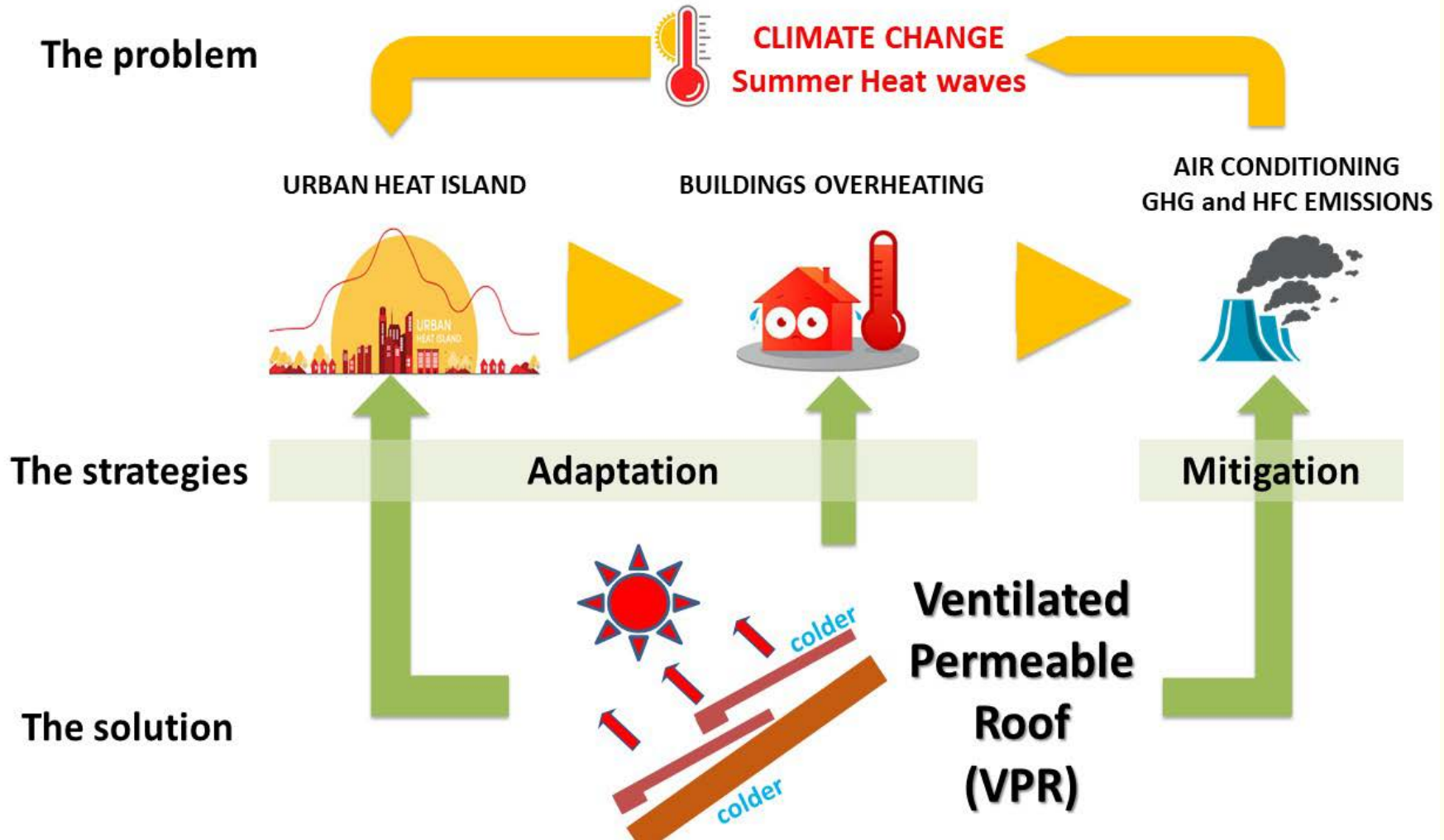
BACKGROUND

A previous project **LIFE HEROTILE** developed new types of roof tiles and demonstrated the effectiveness of the HEROTILES-based roof (**HBR**) in **reducing until 50% cooling energy** compared to other solutions.

However, general public, professionals and Building stakeholders, are not able to recognize the cooling potential of **ventilated permeable roofs (VPR)** and, thus, are not aware of the environmental and economic benefits of these new technologies (**VPR & HBR**).



THE PROBLEM TARGETED

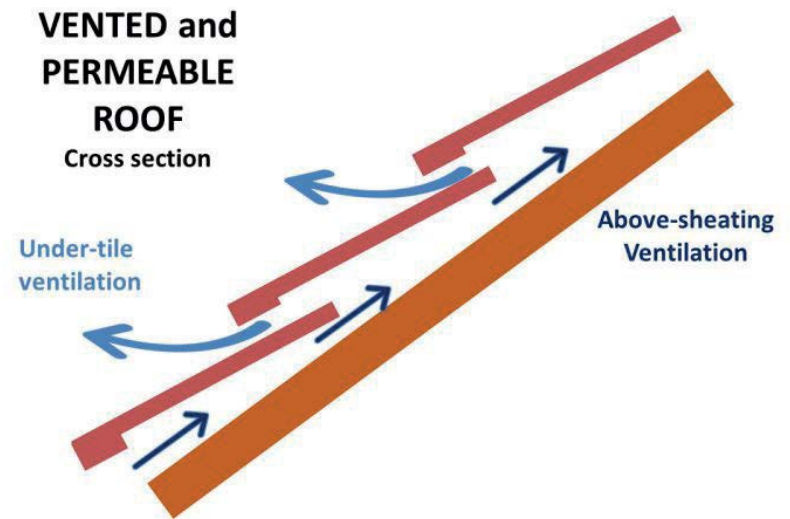


THE SOLUTION PROPOSED

An effective, sustainable and low-cost answer to cities and buildings overheating is using building “passive cooling” technologies, which allow to reduce the temperatures of buildings envelope (roofs and walls) and consequently of the surrounding air (thus limiting Urban Heat Island), rather than increase energy demands from artificial cooling.

The use of Ventilated and Permeable Roofs (VPR) is the most sustainable and promising strategy.

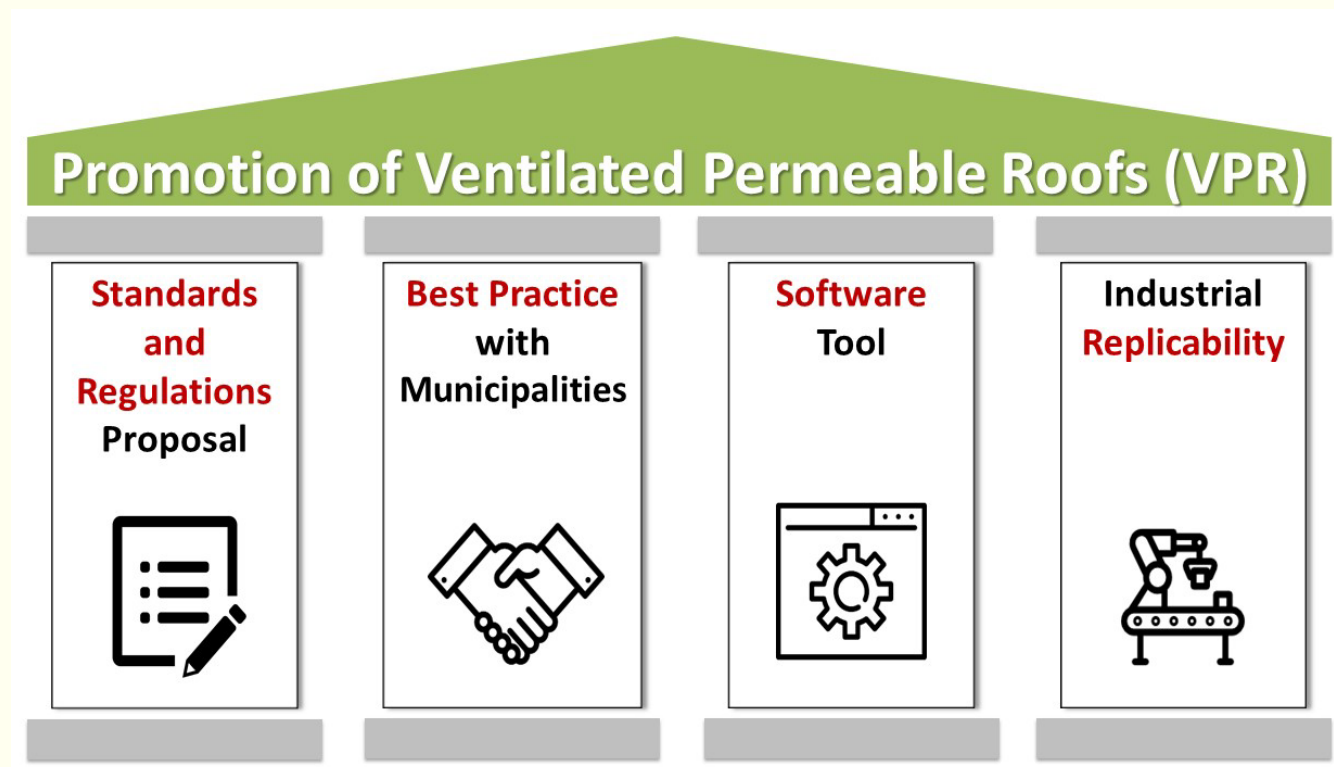
Fighting Urban Heat Island and buildings overheating and mitigating the CO₂ and HFC emissions



OBJECTIVES & SCOPE

LIFE SUPERHERO is a **Best-Practice project**: it promotes the use of **ventilated permeable roofs (VPR)** as sustainable and cost-effective solutions for building “passive cooling”, increasing building occupants’ and cities summer comfort (**adaptation**) and decreasing buildings’ energy and green-house gasses emissions (**mitigation**).

Based on a 4 pillars strategy!

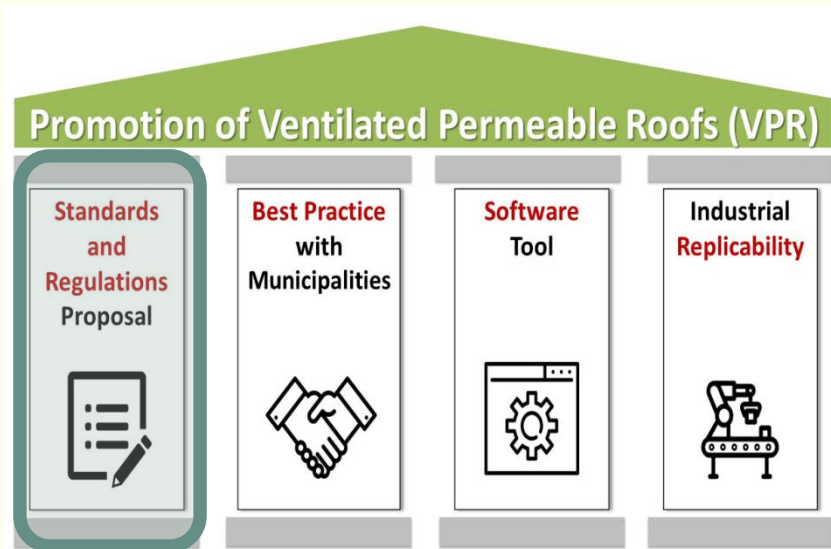


ACTION TIMELINE

DURATION: Start: 01/07/20 - End: 30/06/25

Action		2020				2021				2022				2023				2024				2025			
Action number	Name of the action	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
A. Preparatory actions (if needed)																									
B. Purchase / lease of land and / or compensation payments for use rights																									
C. Implementation actions (obligatory)																									
C.1	Standards and regulations proposals			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
C.2	Best practice for realization of HEROTILE-based roofs					■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
C.3	Development of the user-friendly opensource SUPERHERO software							■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
C.4	Replicability, transferability with the creation of a trademark and a best practice for tile producers									■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
D. Monitoring of the impact of the project actions (obligatory)																									
D.1	Environmental impact assessment and monitoring					■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
D.2	Monitoring the socio-economic impact of the project									■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
D.3	Reporting of the outputs and impacts from the project			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
E. Communication and dissemination of results (obligatory)																									
E.1	Public awareness, dissemination of results and best practices implementation			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
F. Project management (obligatory)																									
F.1	Project Management			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	

C1 Standards and regulations proposal: to overcome the existing policies, legislative and standard barriers to the diffusion of VPR and HBR, with:



- the production of a standardised **air permeability test method**;

- the proposal of updating green rating systems and public procurement including **VPR environmental benefits**;

- the proposal of **improving existing CEN standards** in order to include VPR into building energy calculation

Action C1.1 Approach

WHY

Regulation in force on building energy efficiency are mainly focused on winter heating saving, neglecting effective solution for summer cooling such as sustainable passive cooling roof ventilation/air permeability solutions. The main identified regulatory deficiencies to addressed in this action are:

- The lack of a standard defining proper air permeability test methods
- The lack of acknowledgment of VPR environmental performance in BRS & BGPP
- The lack of standard methods to assess VPR cooling performance in order to include it into building energy calculation methods

WHAT

Production of a standardised air permeability test method.

An ETA (European Technical Assessment) on “Air permeable roof tiles” and an EAD (European Assessment Document) listing method and criteria defining VPR performances will be produced.

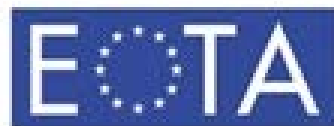
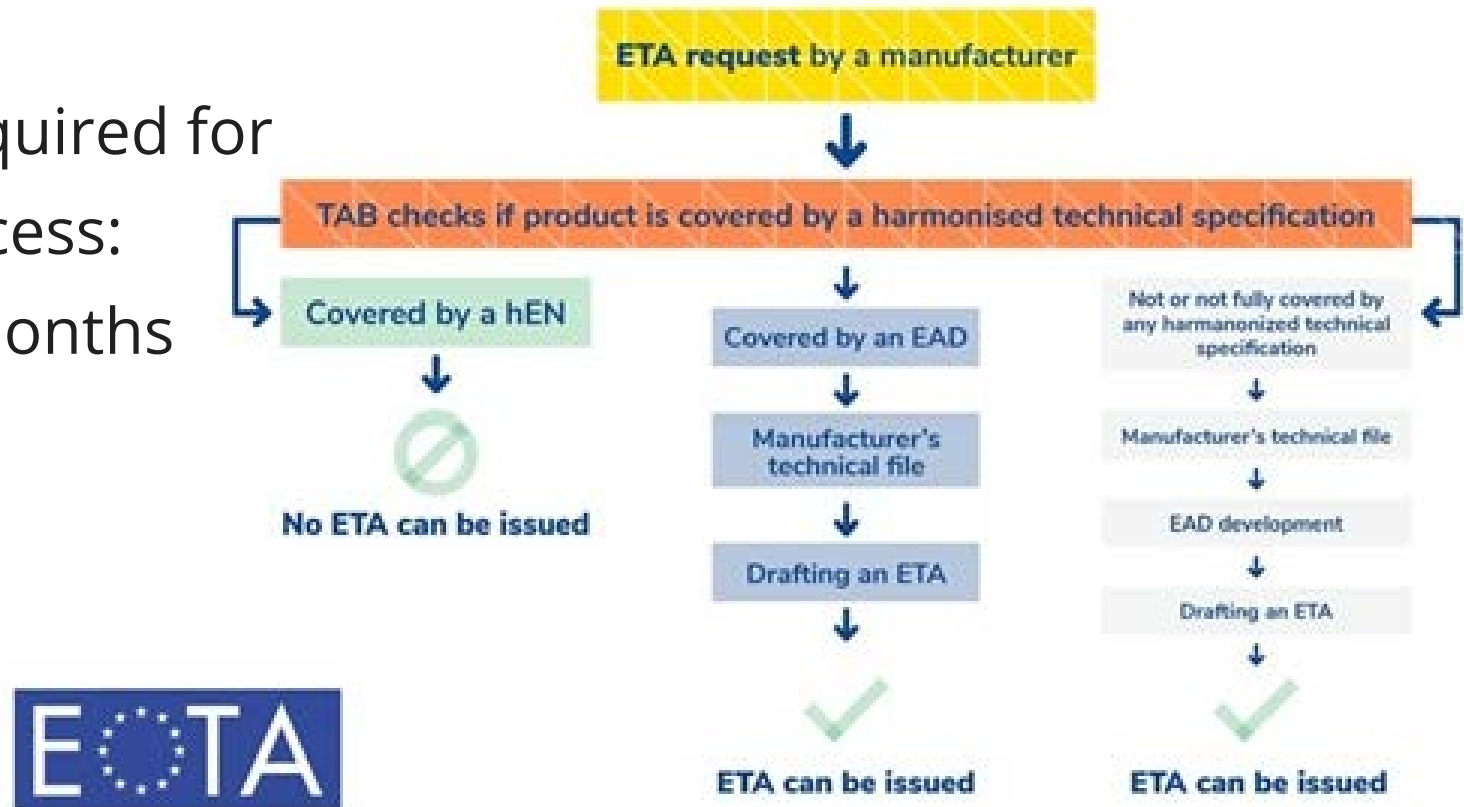
HOW

A round-robin test will be arranged to characterize the VPR performance, in four independent laboratories (CC, UNIVPM, CTMNC, BMI) to collect data and figures for the definition of standards ETA and CEN.

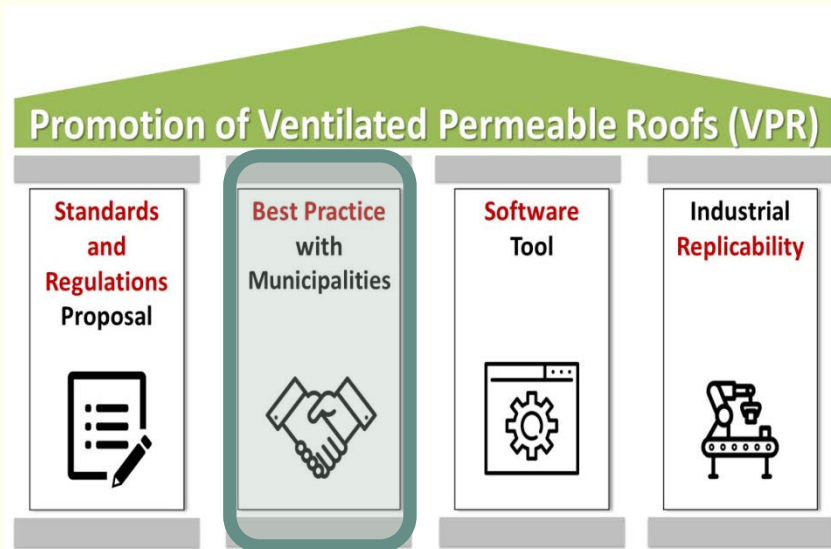
3 partners (EDILIANS, ICP, TERREAL) will supply the roof tiles to be tested

ETA (European Technical Assessment) on “Air permeable roof tiles” and an EAD (European Assessment Document)

time required for the process:
24-36 months at least



C2 Best practice for realization of HEROTILE-based roofs: to develop guidelines on proper roof renovation strategies to be used as climate solutions.



HBR will be installed on two buildings in Reggio Emilia, demonstrating its easy and cost-effective realization, while entailing high energy and environmental performance.

Action C2 in a Nutshell

Action N°	Action title	Action scope	Start month	End month
C.2	Best practice for realization of HEROTILE-based roofs	To develop a best practice for the realization of HEROTILE-based roofs (HBR) as the best available climate adaptation solution of Ventilated/Permeable roofs and a mean to limit the Urban Heat Island (UHI) phenomenon	January 2021	December 2023
Sub-Actions			Participants	
Sub-action C2.1 Monitoring activity in existing real buildings and retrofitted ones with a special focus on roof external temperatures			UNIVPM (leader), CC	
Sub-action C2.2 HEROTILE-based roofs project and installation			ACER (leader), COMREGGIO, ICP, TERREAL, UNIVPM, CONFCER	
Sub-action C2.3 Data Sharing Platform for Climate-ADAPT			UNIVPM (leader) CC, HYSPALIT, CTMNC	

ACTION C.2_Best-practice for HBR

HEROTILE-based roofs project and installation



ICP

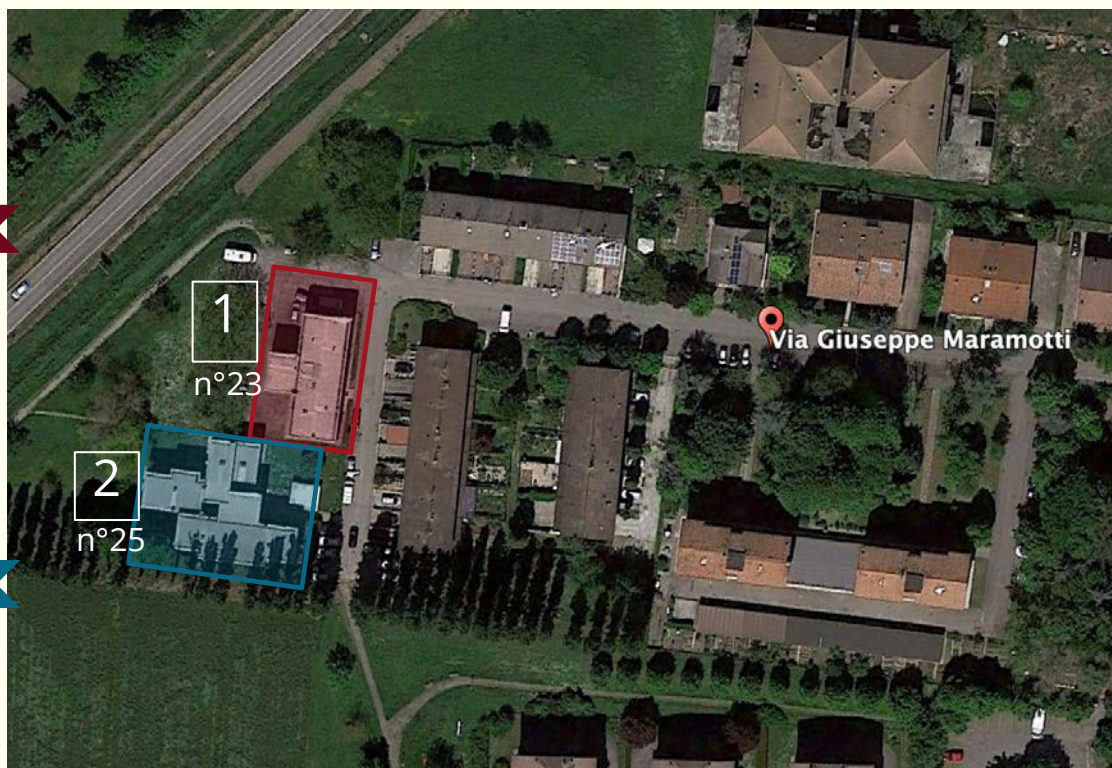


HEROTILES Portuguese

TERREAL



HEROTILES
Marseillaise

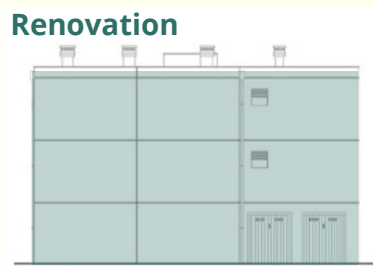


ACTION C.2.2

ACTION C.2_Best-practice for HBR

Monitoring schedule

2021	2022	2023
Existing buildings	Renovated buildings	Buildings with new HBR
Monitoring before renovation	Monitoring after renovation	Monitoring after renovation with HBR



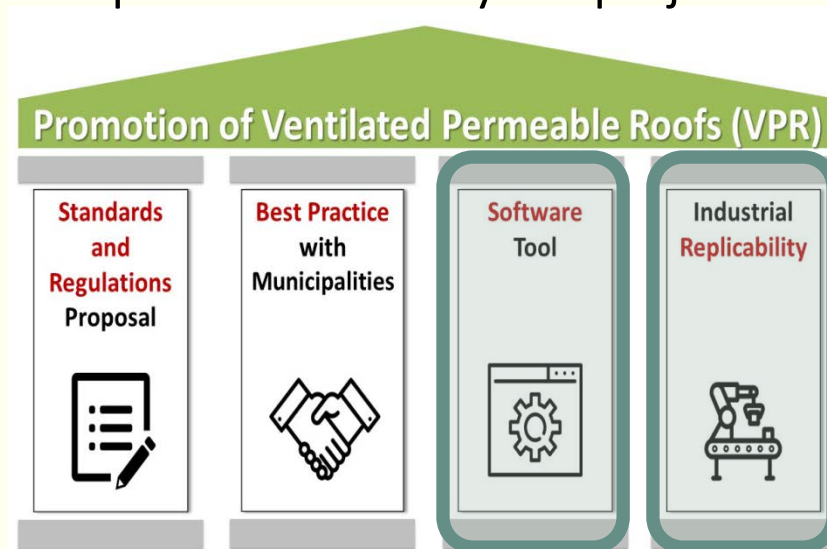
1
monitoring
season

ACTION C3 & C4

C3 Development of SUPERHERO software: a decision support tool for building consultants and public administrations to assess life-cycle environmental and economic benefits of VPR and HBR, in order to select the best design solutions.

C4 Replicability, transferability and best practice creation for tile producers:

this action will set the basis for a strong market penetration of VPR and HBR, thus amplifying the climate impacts obtained by the project.



PROJECT'S HIGHLIGHTS

- LIFE SUPERHERO fights the **Urban Heat Island** and buildings overheating and **mitigates the CO₂ and GHG emissions** exploiting results of LIFE HEROTILE.
- LIFE SUPERHERO promotes the adoption of **Ventilated and Permeable Roofs (VPR)** as the most sustainable and promising “**passive cooling**” technology
- LIFE SUPERHERO overcomes **policies/legislative/awareness** existing barriers to properly spread the VPR and the “HEROTILE-based roof” (HBR).
- LIFE SUPERHERO envisages the participation of producers and association of Research centres, Producers, Municipalities and social housing, tenants.

EXPECTED IMPACTS

- To **overcome regulatory barriers** due to the lack of a consolidated legislative framework mainly focused on winter heating saving.
- To improve buildings and cities thermal comfort against overheating. It is possible to demonstrate that VPR and HBR (Herotile based roof) entail a **25% reduction of roof internal and external surface temperatures**.
- A widespread application of these solution can lead to a **reduction of maximum urban areas temperatures by 1,5° C**.
- To reduce building cooling consumption and GHG emissions. HBR can **save up to 50% of cooling energy and CO2 emission**.
- According to the project business plan, thanks to the VPR/HBR diffusion, the amount of **energy saved in EU at the project end will reach 126 GWhe**, corresponding to **44,112 tons CO2 saved**.

POLICY IMPLICATIONS

LIFE SUPERHERO project will improve the EU environmental policy, climate and occupational related legislation:

- **DG CLIMA** to fight climate change at EU and international level to promote low-carbon technologies and adaptation measures.
- **DG ENERGY** to promote a secure, competitive and sustainable energy use & to reduce energy consumption.
- **Climate Change Adaptation** policy (key policy area 1. **“Urban adaptation**) which limits the impacts of climate change” at cross-border level (transnational).
- **Climate Change Mitigation** policy thanks to **“Reduction of GHG”** (work areas 1) and **“Reduction of fluorinated gas”** (work areas 5)
- Directive (EU) 2018/844 on the **energy performance of buildings** and Directive 2012/27/EU on **energy efficiency** to be updated
- **Shared Commitment for Employment** (COM/2009/0257) & **Green Employment Initiative** in matching labour and skills demand related to the transition to the green and resource efficient economy

CONTINUATION

Continuation on standardisation and regulation to encourage the use of VPR and to exploit the VPR “equivalent” reflectivity (Re) index in relevant international and national councils, as CEN/TC 128/SC3, in buildings environmental rating systems (BRS), in building green public procurement (BGPP), in actual/new CEN standards on roofs thermal performance (as EN ISO 6946:2017) and in relevant international and national councils (as CEN TC 89/WorkGroup 13).

Continuation on best practice with municipalities and relevant players to spread the VPR roofs and a mean to limit the UHI in the context of: Covenant of Mayors initiative, European Climate Adaptation Platform Climate-ADAPT, Climate KIC and Authorities at Regional/National/EU level, interactive Data Sharing Platform “HUMAN-BEHAVIORS monitoring data Sharing” (HUBES).

Continuation on **open source software tool** for assessing the environmental and economic benefits of installing VPR. The software will be integrated in **BIM** commercial solutions.

The project will lead to important results in terms of Economic Performance, Market Uptake, Replication estimated of about 3 million of building covered within 3 years after project ending



life SUPERHERO

www.lifesuperhero.eu



LIFE19 CCA/IT/001194

With the contribution of the LIFE financial instrument of the European Community

