

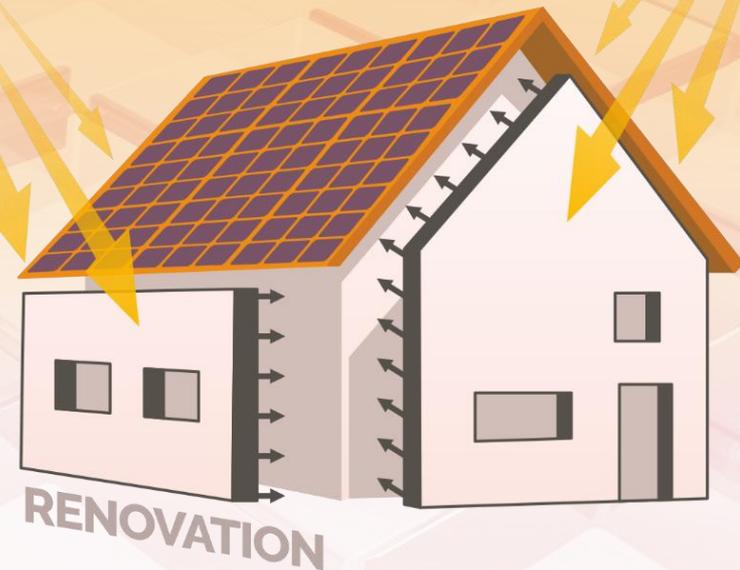
# Energy harVesting by Invisible Solar IntegratiON in building skins



Deep Renovation Joint Workshop  
5<sup>th</sup> October 2018  
Rome, Italy

## ENVISION Project Presentation

SOLAR ENERGY



# The project



ENVISION aims at developing and demonstrating an integrated renovation concept using all the available building surfaces for thermal and electrical energy harvesting.

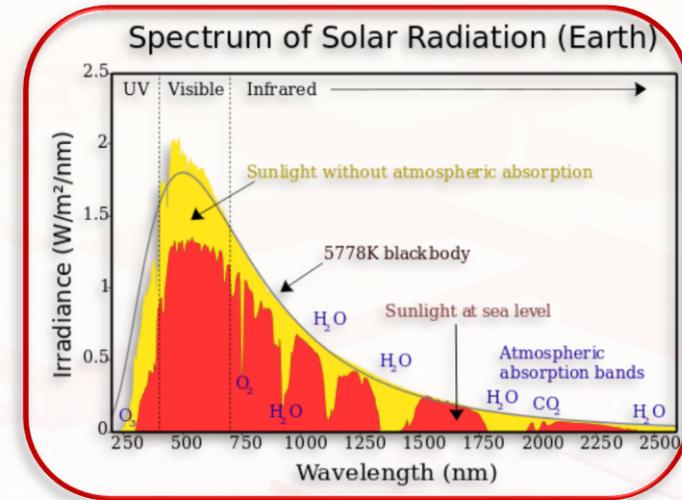
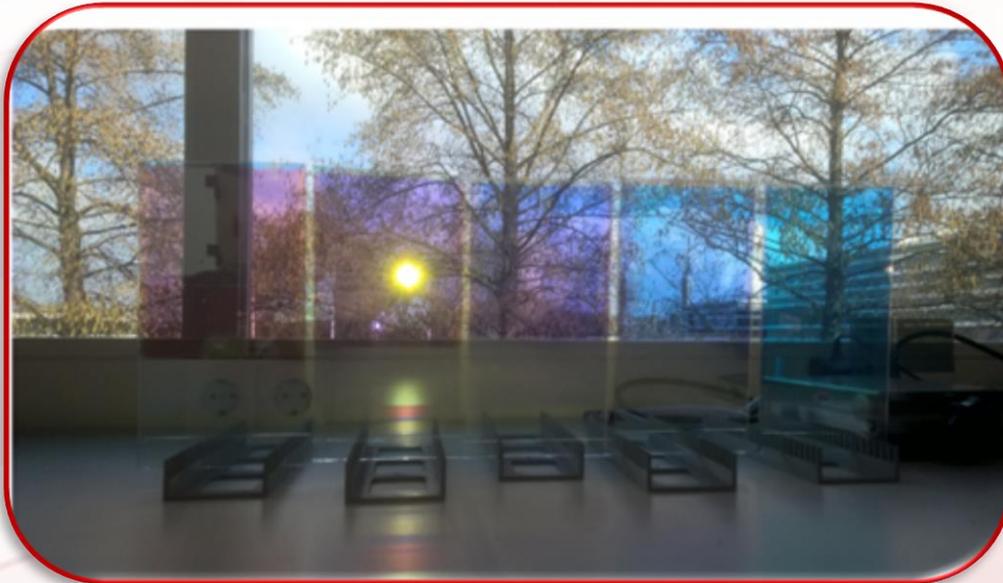


-  To achieve the European goal of an energy-neutral built environment in 2050, harvesting of solar energy from all surfaces of buildings should be maximized.
-  Considering that approximately 85% of existing dwellings were built before 1990 with poor insulation ( $R \leq 1.6 \text{ m}^2\text{K/W}$ ), major renovation will take place in the upcoming period.
-  Efficiently managing solar radiation on buildings provides an enormous potential, since in EU28 a total of 60 billion square meters of façade surfaces exists, and the current usage of solar radiation on opaque surfaces is still minimal.
-  Together with roofs this would mean a total of 120 billion square meters of potential energy harvesting surfaces!

# Concept

## Energy harvesting of the façade.

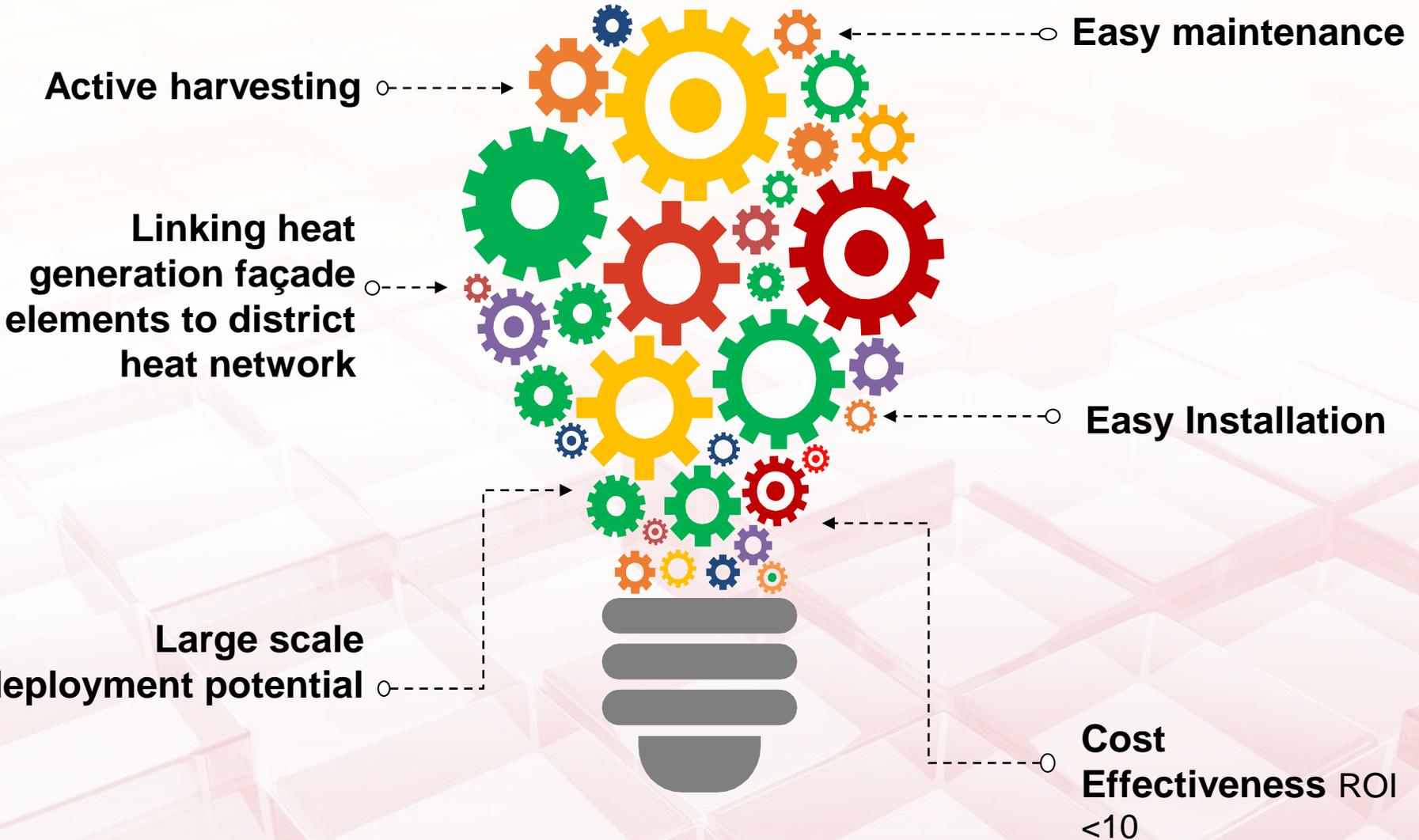
ENVISION uses the invisible part of solar radiation (the **near-infrared (NIR)**), roughly **50% of the solar energy spectrum**.



## Keeping the aesthetics

The NIR radiation can be harvested while **retaining visible and aesthetic aspects** of the façade.

# Objectives



# Project Video

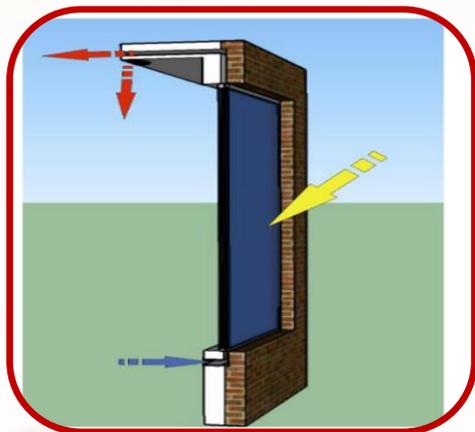




**Solar heat collectors based on the usage of NIR absorbing coloured coatings**

**Covered solar heat collectors using colored NIR transparent glass**





**Smart ventilated heat harvesting window**

**Photovoltaic (PV) harvesting glass**



# Demonstration



## **SOLAR-BEAT (SEAC, The Netherlands)**

TRL6 real case-study of subsystem prototypes will be tested (façade element)

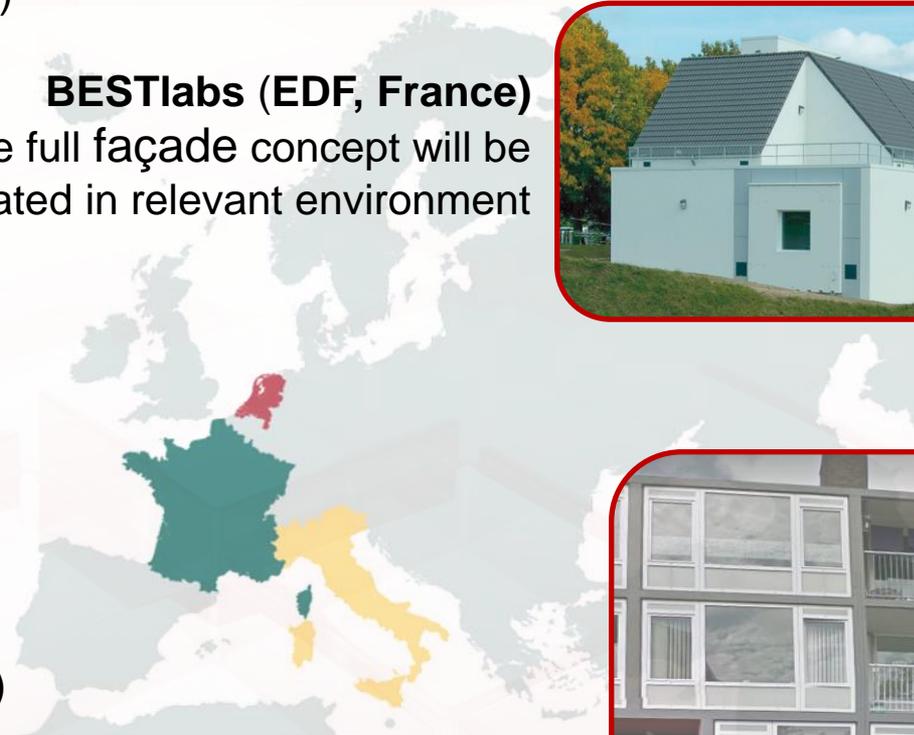
## **BESTlabs (EDF, France)**

TRL 7, the full façade concept will be demonstrated in relevant environment



Testing in real environment (TRL8)

- Link to district network and grid  
**(Italy, University of Genoa Savona Campus)**
- Real case study of a renovation action  
**(VESTIA apartments, Delft)**



# Consortium



**TNO** innovation  
for life





*Thank you for your kind attention*

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