

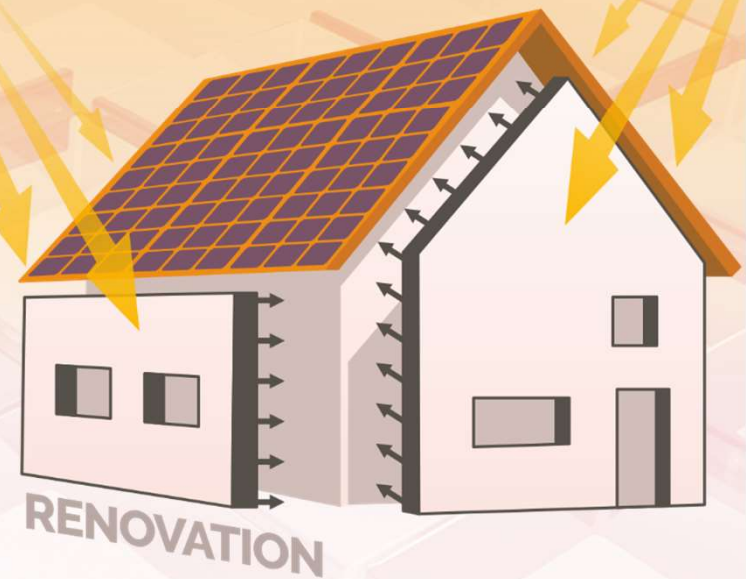
Energy harVesting by Invisible Solar IntegratiON in building skins



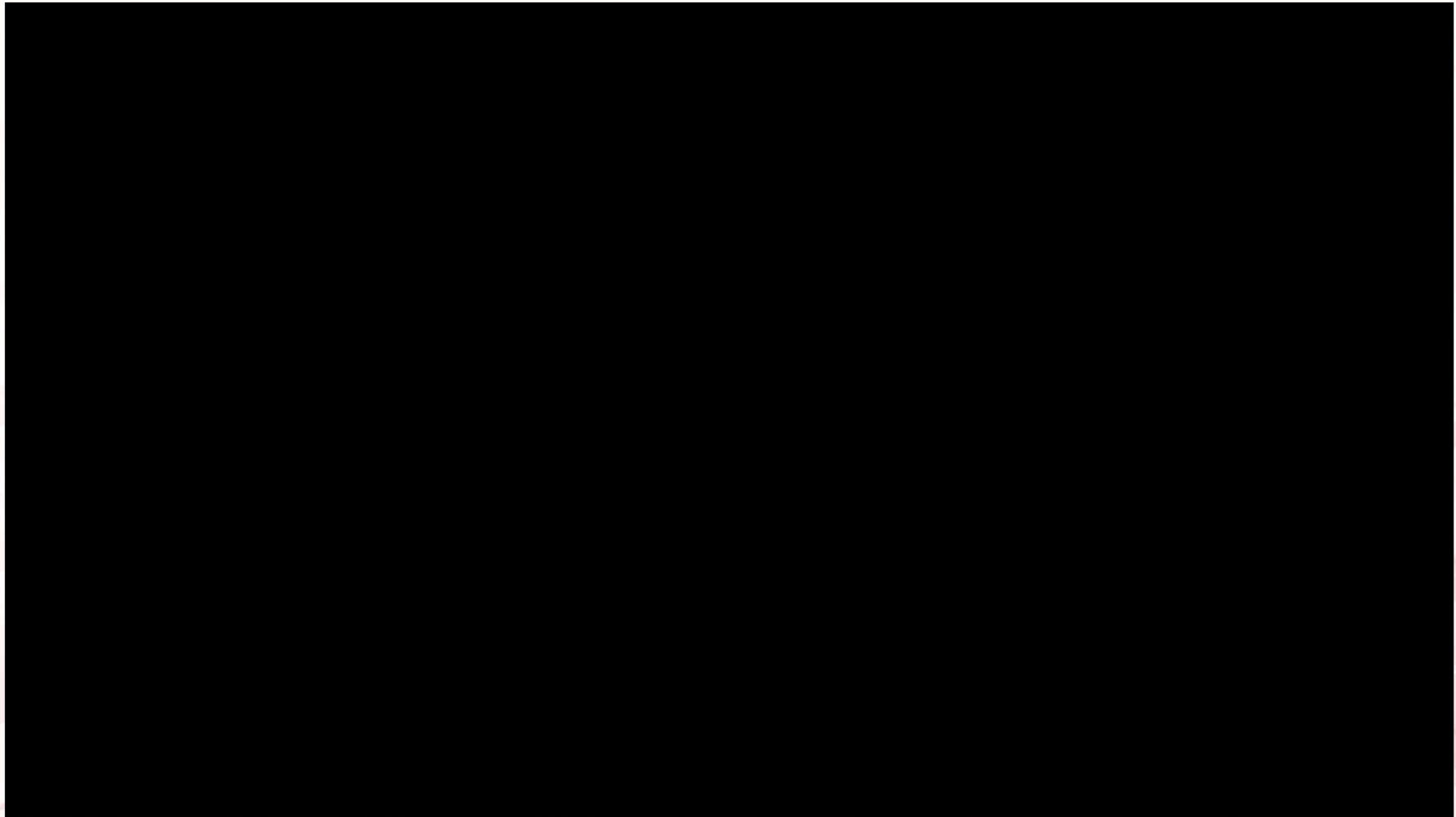
 Sunday

SOLAR ENERGY

**HORIZON 2020
ENVISION**



Project Video







The project



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



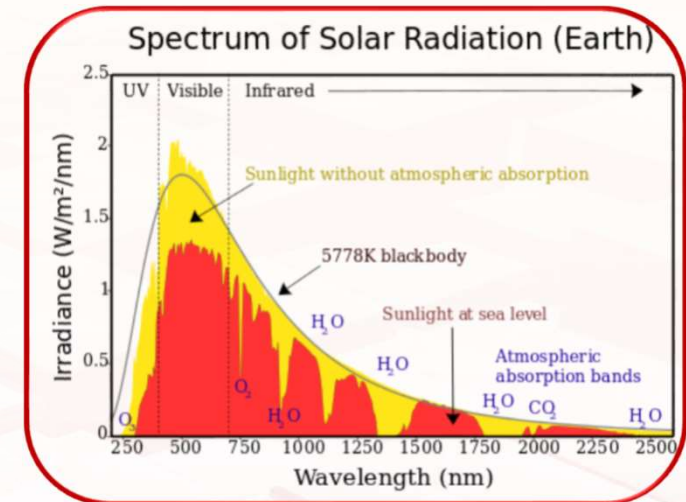
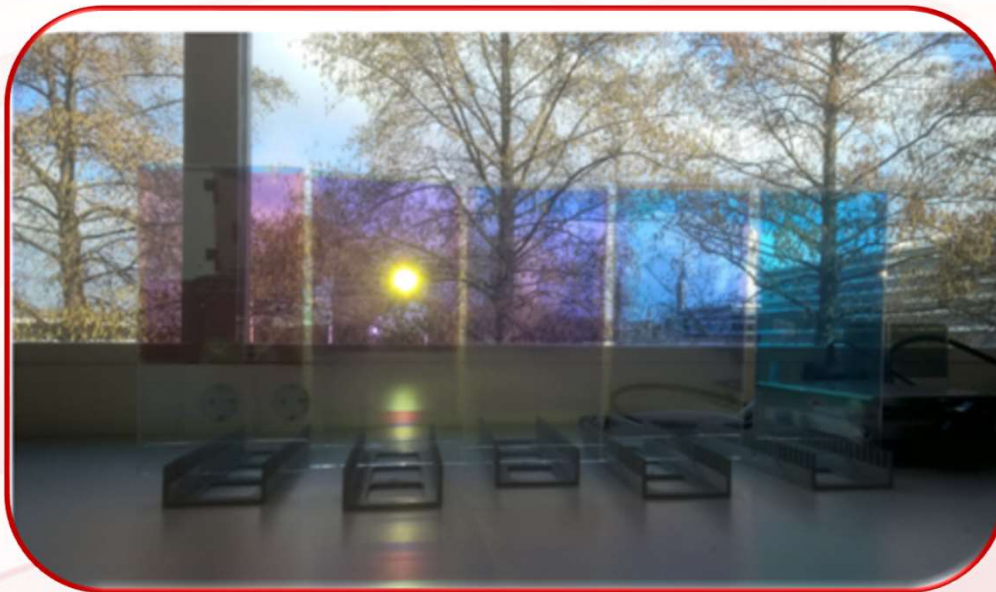
-  To achieve the European goal of an energy-neutral built environment in 2050, harvesting of solar energy from all surfaces of buildings should be maximized.
-  Considering that approximately 85% of existing dwellings were built before 1990 with poor insulation ($R \leq 1.6 \text{ m}^2\text{K/W}$), 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.

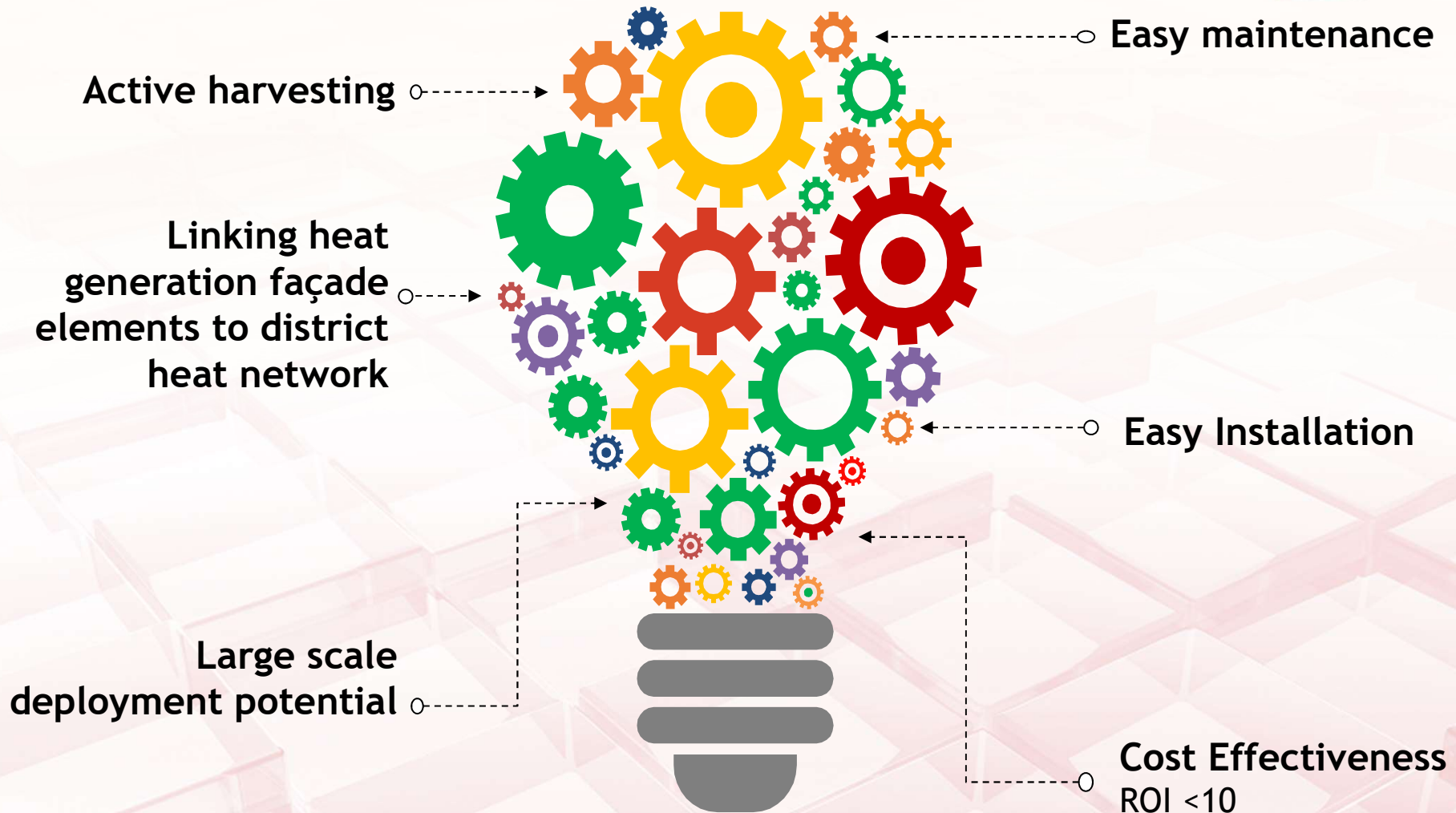
ENVISION uses the invisible part of solar radiation (the near-infrared (NIR)), roughly 50% of the solar energy spectrum.



Keeping the aesthetics

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

Objectives



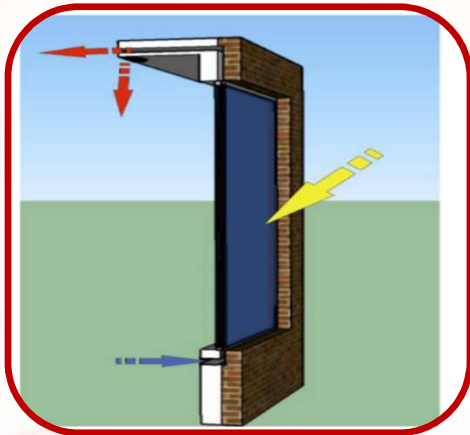
Technologies - Opaque surfaces



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

 www.tno.nl

The logo for bam, featuring a green stylized house icon with a white '7' inside, followed by the word "bam" in a bold, green, sans-serif font.

 www.baminternational.com

The logo for seac, featuring four orange icons: a gear, a house, a house, and a circle with a plus sign, followed by the letters "seac" in a bold, orange, sans-serif font.

 www.seac.cc

The logo for RINA, featuring the letters "RINA" in a bold, blue, sans-serif font, with a stylized blue and white graphic element to the right.

 www.rina.org

The logo for EMERGO, featuring the word "EMERGO" in a bold, black, sans-serif font, with a red horizontal line underneath.

 www.emergohout.nl

The logo for PILKINGTON, featuring a green circular icon with a white cross, followed by the word "PILKINGTON" in a bold, black, sans-serif font.

The logo for NSG GROUP, featuring the letters "NSG" in a bold, blue, sans-serif font, with "GROUP" in a smaller font below it.

 www.pilkington.com

The logo for EDF, featuring an orange stylized flower icon, followed by the letters "edf" in a bold, blue, sans-serif font.

 www.edf.fr



 www.tpg.unige.it

The logo for VESTIA, featuring the word "VESTIA" in a bold, black, sans-serif font, with a stylized graphic element to the left.

 www.vestia.nl

The logo for AkzoNobel, featuring the word "AkzoNobel" in a bold, blue, sans-serif font, with a stylized blue figure to the right.

 www.akzonobel.com

Innovative facade solutions

BGTec Sp. z o.o.

Innowacyjne rozwiązania fasadowe

 www.bergamo-tecnologie.eu

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Thank you for your kind attention

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