

# Adaptable and adaptive RES envelope solutions to maximize energy harvesting and optimize EU building and district load matching

## The project

Europe is boosting the reduction of the EU building stock energy demand by 80% by 2050 through renovation and in particular the residential sector holds the biggest potential representing the most of the built floor surface area among all EU building stock typologies.

The renovation challenge leads to the need for novel approaches to conceive buildings and their energy supply. Buildings are more than just stand-alone units taking energy from the grid. They are becoming increasingly active elements of the energy network by consuming, producing, storing and supplying energy, thus transforming the EU energy market and shifting from centralised, fossil-fuel based national systems towards a decentralised, renewable, interconnected and variable system

**EnergyMatching aims at maximizing the RES (Renewable Energy Sources) harvesting in the built environment by developing and demonstrating cost-effective active building skin solutions as part of an optimised building energy system**, being connected into local energy grid and managed by a district energy hub implementing optimised control strategies within a comprehensive economic rationale balancing objectives and performance targets of both private and public stakeholders.

[www.energymatching.eu](http://www.energymatching.eu)

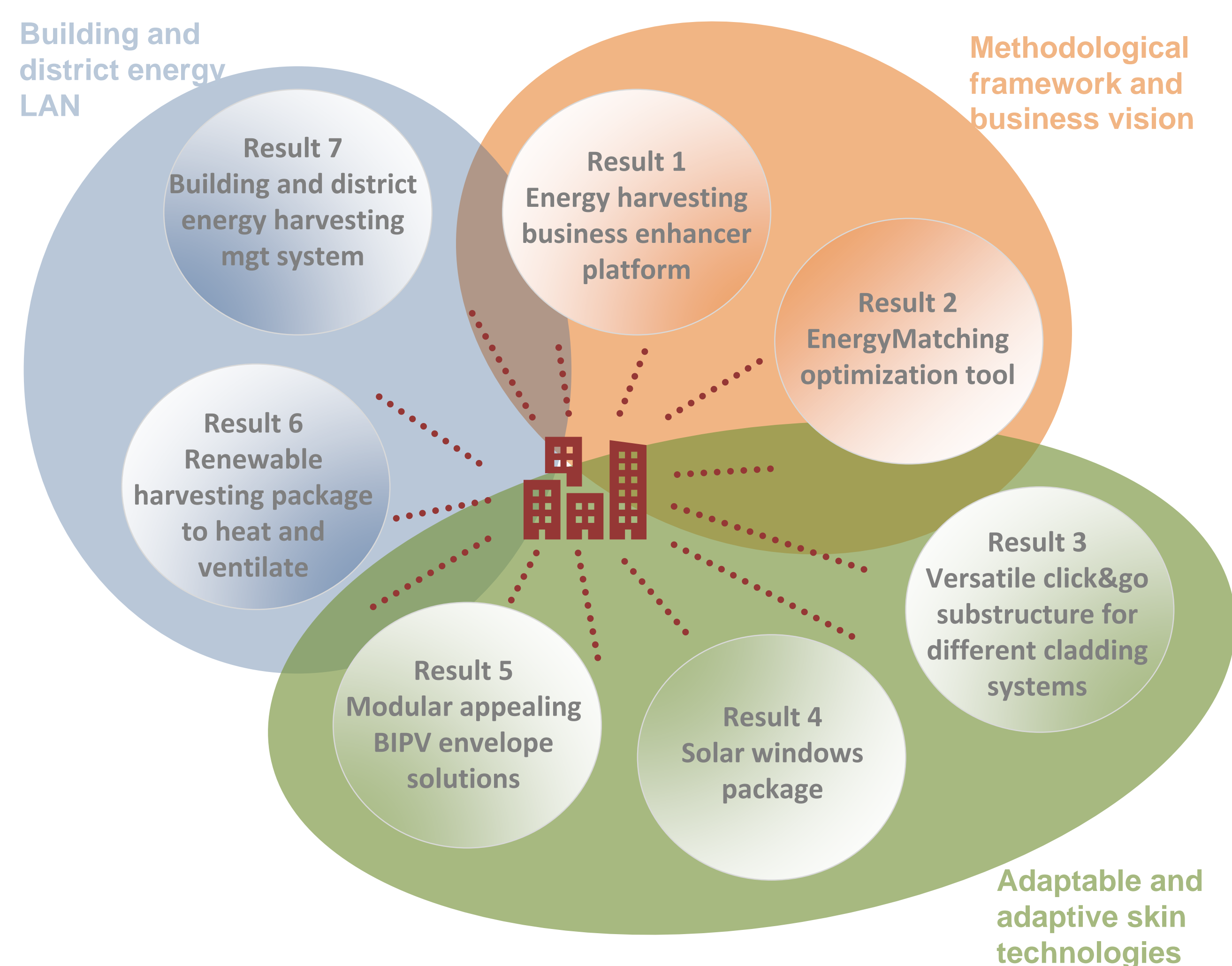
## Objectives

- Definition of adaptive envelope solutions** to maximize exploitation of solar energy at building level.
  - Focus on the renovation of EU residential buildings.
  - Flexible and adaptable technologies/solutions (active skin solutions) as envelope components.
  - Production renewable energy for heating, cooling, electricity, domestic hot water.
  - Reduction the energy demand and building environmental impact.
  - Hight replication and exploitation potential at EU level.
- Integration of the energy harvesting solutions into the building and district energy concept** for developing load match aggregation strategies, energy harvesting management systems, optimization tools to maximize the potential for integration and optimisation of renewable energy sources and to connect buildings with various entities like suppliers and distribution system operators through different networks.
- Geocluster solutions and replicate their potential** by developing tools and strategies to ensure applicability and optimal use of solutions in different geographical areas tailoring the general solutions for each technology result, and evaluating both technical and economic viability.

## Expected impact

- Reduced cost (by more than 20%) of manufacturing, installation and operation of energy harvesting technologies at building and district scale
- Demonstrated replicability that will result in the acceleration of the integration of RES into EU diversified residential buildings and districts
- Cost-effective solutions supported by advanced economic and business models for investors including payback period below 10 years
- Maximisation of RES generation, demand coverage and optimal integration of RES with the energy grids
- Market penetration of effective, modular, robust and easy to integrate energy harvesting Solutions
- Revitalization of the EU construction / energy harvesting sectors and reduction of GHG Emissions
- Improved IEQ with optimal control and natural sources exploitation

## Expected results



## Demonstration Sites



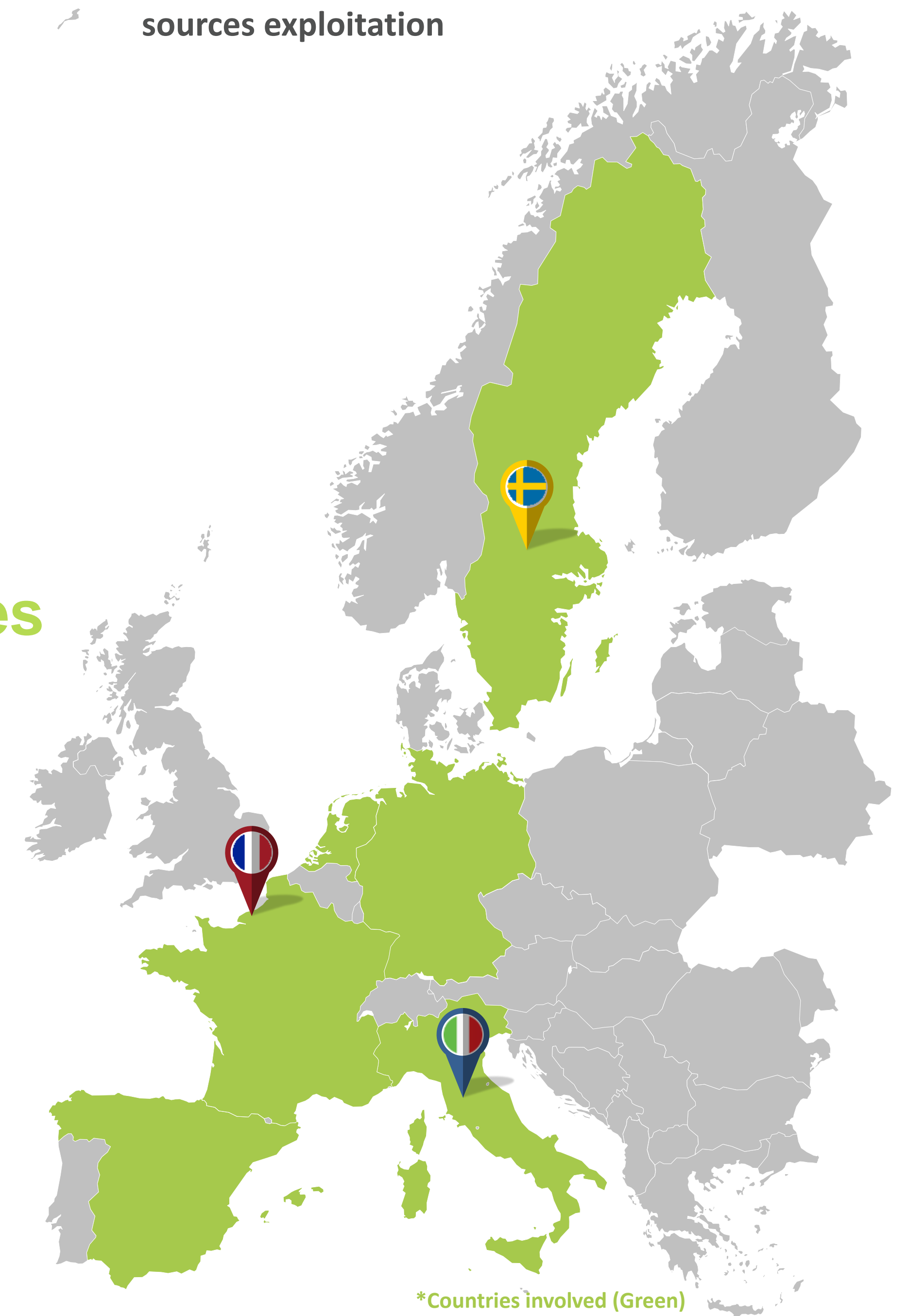
Résidence Emile Hauduc, France



Comune di Campi Besenizio, Italy



Ludvika, Sweden



	1. Résidence Emile Hauduc France (1969)	2. Comune di Campi Besenizio Italy (1984)	3. Ludvika Sweden (1973)
Lot size	1643 m <sup>2</sup>	2.800 m <sup>2</sup>	4.488 m <sup>2</sup>
Façade area	2.146 m <sup>2</sup>	1.100 m <sup>2</sup>	2146 m <sup>2</sup>
Roof area	528 m <sup>2</sup>	360m <sup>2</sup>	1750 m <sup>2</sup>
Estimated Energy Consumption	265 kWh/m <sup>2</sup> /year	145~175 kWh/m <sup>2</sup> /year	170 kWh/m <sup>2</sup> /year

## Project Partners



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