

BUILDSPACE

Enabling Innovative Space-driven Services for Energy Efficient Buildings and Climate Resilient Cities

PROJECT OVERVIEW

The EU-funded BUILDSPACE project aims to support the Green Deal objectives by **developing innovative applications to support buildings' energy efficiency and cities' resilience and sustainability**.

The project offers **5 decision support tools** through a **Core Platform** to enhance building and urban sustainability.

These services help cities become more **sustainable and resilient to climate risks**. Drones and satellite data are integrated to improve building energy efficiency and climate resilience, as well as advanced technology is used to help cities better prepare for the impacts of climate change.

BUILDSPACE services will be validated and assessed in **four European cities with different climate profiles**:

- **Pilot 1:** Energy Building Construction (Poland)
- **Pilot 2:** Energy Demand Analysis, Forecast and Climate Change (Latvia)
- **Pilot 3:** Urban Heat Analysis and Resilience (Greece)
- **Pilot 4:** Urban Flood Analysis and Resilience (Slovenia).



BACKGROUND

Buildings account for 40% of the EU's energy consumption and almost **97% of the EU's building stock is not considered energy efficient**.

But 75-90% of those buildings standing today will still be in use in 2050, given that the **construction rate is overall low**, with low demolition rates (0,1% per year), low renovation rates (1.2% per year), and an EU building stock inexorably ageing.

Due to the above-mentioned issues, BUILDSPACE is designed to **reduce the carbon footprint of the building stock, address the challenges of energy poverty** in the context of climate change, and **support the resilience of buildings in urban environments to climate change and natural hazards**.

The adoption of leading-edge ICT solutions combined with publicly available satellite data (from EGNSS and Copernicus services) open up new opportunities for the creation of **beyond-state-of-the-art solutions that can track buildings in real-time and from different perspectives or scales** (building and city/urban scale), as well as identify environmental hotspots and provide notifications and recommendations for action.



PLATFORM & SERVICES

BUILDSPACE aims to develop a **Core Platform**, in which added values services (SE) at building and city scale are offered:

- The services at **building scale (SE1 and SE2)** will enable the Digital Twins (DTs) generation of buildings and its semantic enrichment with thermography data collected by drones to support building construction as well as building renovation and monitoring.
- The services at **city scale (SE3, SE4 and SE5)** rely on a mix of Copernicus and IoT data to infer visualisations related to energy demand, urban heat and urban flood analysis and assessment at urban scales, facilitating decision-making for increased resilience to climate change of the building stock.



1. DIGITAL TWIN GENERATION



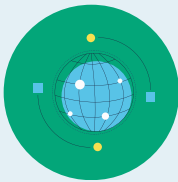
SE1 creates detailed 3D digital twin of buildings using locally sourced data, integrating methods to detect and classify building elements.



2. DIGITAL TWINS ENRICHMENT



SE2 integrates thermal imagery from drones and AI-driven analysis to enhance digital twins with critical data on building envelopes.



3. BUILDING ENVIRONMENT CLIMATE SCENARIOS



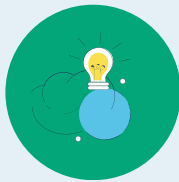
SE3 estimates current and future building energy demand under different climate scenarios, while promoting retrofitting strategies and solar PV deployment.



4. URBAN HEAT ANALYSIS AND RESILIENCE



SE4 analyses urban heat islands with high-resolution data and combines demographics to assess urban heat risk and social vulnerability.



5. URBAN FLOOD RESILIENCE



SE5 predicts and visualises flood risks and damages under different climate scenarios, supporting cities in planning retrofits and blue-green infrastructures for flood resilience.

IMPACT

As a cutting-edge project, BUILDSPACE utilizes advanced technologies such as **satellite data analysis, digital twins, virtual and augmented reality (AR/VR), and drones equipped with thermal cameras**. BUILDSPACE is different to existing offerings since it offers a **combined solution for analysis** at building and city scales.

Thanks to its services, the project will help **stakeholders learn about future scenarios, make informed decisions and develop new strategies** for the resilience and sustainability of the cities.

Moreover, BUILDSPACE technologies will provide great benefits to **scientific and industrial partners**, both in their day-to-day activities and in their business agendas.

By evaluating different measures for improving the energy performance of buildings, the benefits in terms of energy savings and associated costs will be evident.

