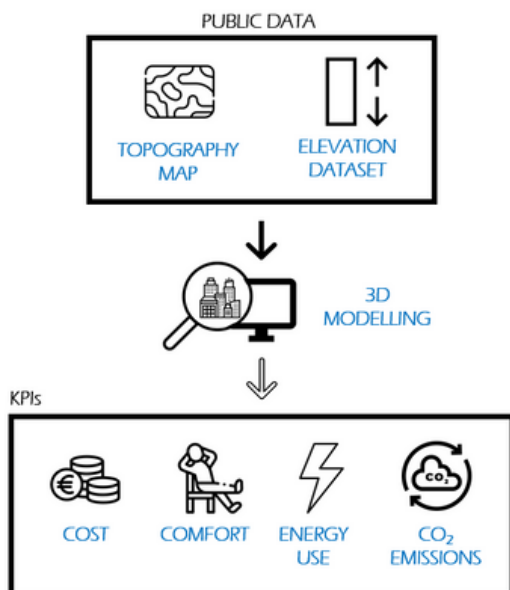




3D MODELLING OF URBAN AREAS

METHODS AND TOOLS TO PLAN CLIMATE NEUTRAL DISTRICTS

THE CONCEPT



ADDED VALUE

- Based on OGC standard CityGML
- Procure for automatic generation of windows
- Potential expansion of calculation modules

TRL

6-7



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PRODUCT DESCRIPTION

- Methods and tools designed to **generate 3D models** of **large urban areas**
- Uses a large amount of **publicly available data**, such as **topographic maps** and **elevation datasets**
- Adapted to the **Spanish cadaster**
- Can predict the **impact of urban actions** taking energy efficiency, environmental, economic and social factors into account
- Capable to deliver and visualize **key performance indicators** to support **decision-making processes**, such as primary energy, CO2 emissions, economic and consumption balance, LCA, energy certificates or comfort

APPLICATIONS

- Help decision-makers in urban regeneration
- Residential retrofits at district scale
- Energy transition planning
- Environmental impact assessment
- Generation of digital twins for urban areas and cities

DESIRED PARTNERS

- Town councils and public companies
- Urban planning companies and promoters
- Environmental and energy consultants

EXPECTED BENEFITS

- Personalized outputs
- OGC standard format
- User friendly
- 3D visualization

technical details

INNOVATION SOLUTION

A set of methods and specific own produced software tools allows obtaining 3D geometries of neighborhoods in CityGML standard, developed by Open Geospatial Consortium. The CityGML standard defines a conceptual model and exchange format for the representation and exchange of virtual 3D city models. It facilitates the integration of urban geodata for Urban Digital Twin.

The virtual representation of cities is used for various purposes, in the context of planning urban actions. In addition, the 3D models can connect to customizable calculation modules that offer insights on energy and environmental performance, as well of economic costs at district level.

TECHNICAL DETAILS

- Through public data (2D cadastre in .shp format + LIDAR in .las format) the 3D model of the buildings is generated with the open-source software 3dfier in .OBJ format. The own specific code developed in Python stores the geometric data of buildings (walls, roofs and floors) from .OBJ format in PostgreSQL database with postGIS extension in a specific form in order to be exported later through the 3DCityDB in CityGML format
- The generated code works as input with the .OBJ format, which allows flexibility in the definition of the geometry because many 3D generation and modelling software can work with it
- 3D geospatial visualization of data using CesiumJS

IMPLEMENTATION

This technology is being tested and is under refinement in several urban areas, as for example the Districte Innovació Llevant in Palma (Spain).

