

# Using Urban Building Energy Modelling tools to define energy communities

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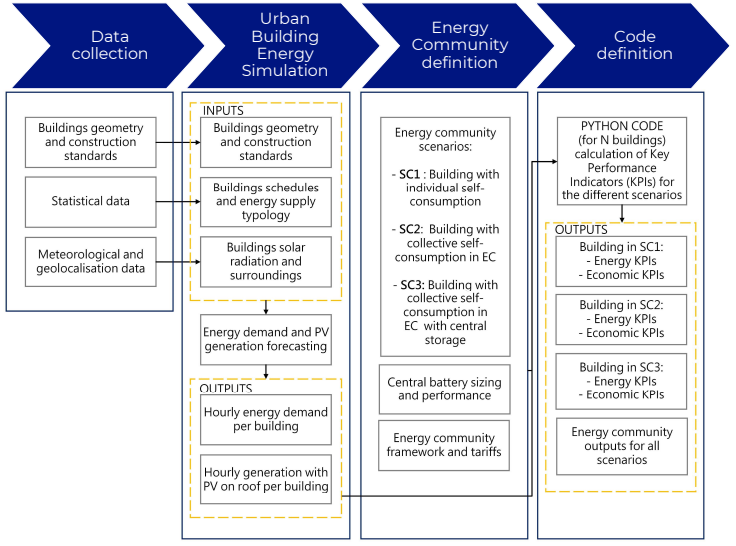
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## Introduction

This work focuses on the creation of a tool that obtains the main outputs parameters of energy communities to help decision making for its creation, by combining building's thermal simulation data and their potential of solar generation in its rooftops.

The model created allows to compare the performance of various building typologies in different energy communities' configurations. This work sets a precedent in the creation of a future dashboard to assess the creation of energy communities.

## Methodology



## Case studies

**Location:** Madre de Deus, Lisbon.

**Case 1: Single residential**

- SR\_1946-60 N: 19
- SR\_1961-70 N: 10
- SR\_1981-90 N: 1

**Case 2: Single and multi residential**

- SR\_1946-60 N: 10
- SR\_1961-70 N: 7
- MR N: 13

**Case 3: Single, multi residential and school**

- SR\_1946-60 N: 9
- SR\_1961-70 N: 6
- MR N: 10
- SCHOOL N: 5

**Building typologies are defined by:**

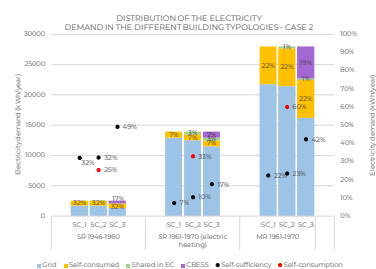
- Construction standards
- Profile of consumption
- Type of supply

## Results

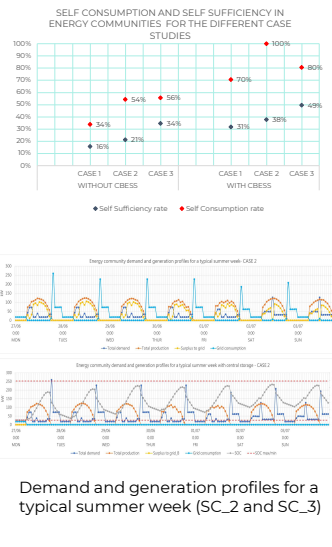
### Building level

Graphs show the results of each building typology in the different scenarios considered:

- SC1:** Individual self-consumption without being part of an energy community
- SC2:** Collective self-consumption in an energy community
- SC3:** Collective self-consumption with central storage (CBESS) in an energy community



### Energy community level



## Conclusions

- Buildings with higher demands get more benefited from being part of an energy community.
- Higher self-sufficiency when having more diversity of profiles in the energy community.
- When considering the scenario with central storage, self-sufficiency increases 16 percentage points on average for all cases.
- Collective self-consumption could be paving the way to achieve net zero districts in cities. All efforts should be put in the deployment of energy communities in urban areas.

## Future work

- Analyse new scenarios with real monitoring data, as well as adding new building typologies.
- Considerate different energy communities scenarios.
- Development of a dashboard to assess the creation of energy communities.

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