

# ENERGY COMMUNITY REPUBLICA IN AMSTERDAM AND THE POSITIVE ENERGY DISTRICTS

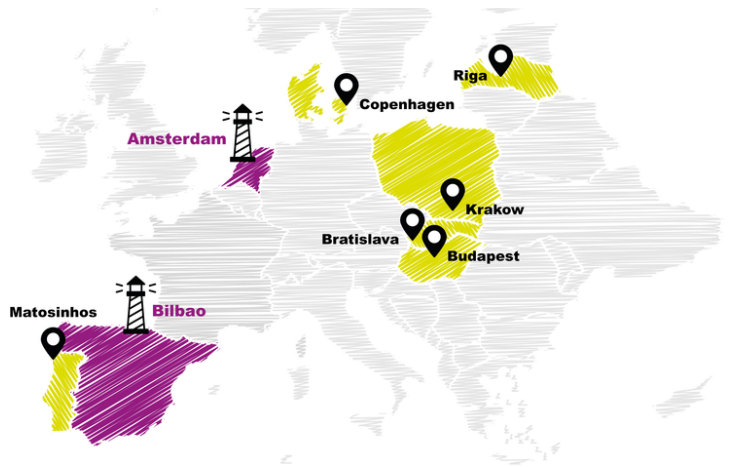


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# THE OBJECTIVE

The EU ATELIER project aims to contribute to the realization of a climate-neutral society and energy transition by creating and replicating Positive Energy Districts (PEDs) in two Lighthouse Cities and six Fellow Cities. For this purpose, a framework to foster the early replication of ATELIER PED concept in the Fellow Cities is created in this document.



## OUR APPROACH

A Positive Energy District (also known as PED) is an urban area with clear boundaries, consisting on buildings of different typologies that actively manage the energy flow among them, as well as the larger energy system to reach an annual positive energy balance (in total or non-renewable primary energy terms).

Uncertain supply and price volatility of energy markets are features that have been central in public debates for the past year and have drastically impacted the lives and livelihoods of citizens, businesses and communities. Energy communities can be part of the solution, by creating local and robust sources of energy for its members, shielding them from market pressures and creating economic, social and sustainable benefits such as CO2 reduction. This flyer describes the energy community Republica located in Buiksloterham, Amsterdam North in the Netherlands.



ATELIER G.A. n° 864374







# What is the project this community is connected to?

The Republica energy community is part of the EU Atelier project (AmSTERdam BiLbao cltizen drivEn smaRt cities), which aims to foster innovations in Positive Energy Districts. In recent years, energy communities have been officially defined in the Renewable Energy Directive (shortly RED 2018/2001) and the Electricity Market directive (shortly EDM 2019/944). Both directives are part of a larger legislative package, called the Clean Energy Package, which aims to put citizens at the centre of European energy policy.

One ambition is for energy consumers to be able to actively participate (individually or collectively) in the production of energy. As a collective, citizens can organise themselves as an energy community and provide environmental, economic and social benefits to its members, shareholders or to the local areas where it operates. The directives define how the energy community should be designed in terms of organization and governance.

The community is described as a legal entity based on voluntary and open participation that is effectively controlled by its members or shareholders. These shareholders or members can be individual persons, small enterprises and local authorities.

Activities that an energy community might (or have the right to) engage in include sharing, delivering and producing electricity. These aspects together constitute a broad understanding of what an energy community can be. Republica is such an energy community. The organization, governance, purpose, members and activities this particular energy community engages in are described below.

## Key Insights

EU-funded Smart City project ATELIER

Creating and replicating Positive Energy Districts in 2 Lighthouse and 6 Fellow Cities

30 partners from 11 countries within 8 European cities

Develop a City Vision 2050 that constitutes the roadmap for upscaling solutions in the long term



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# What is the Republica energy community?

The Republica energy community was initiated by housing Developer Banlieu and co-developed with Vink Bouw, with the ambition to realize an energy system (a microgrid) with production installations for the local generation and supply of electricity and heat. Its mission is to supply energy to its members under favourable conditions, through a sophisticated system of PV panels, heat pump technology, smart grid system and battery storage (detailed description below).

The different assets are connected to a local energy network, termed ProjectNet, that connects all individual households and customers of the community. In addition, there is a collective heat network, with a connection to the larger District Heating network in Amsterdam. Heat is also produced by a large heat-pump and there is a heat storage functionality.

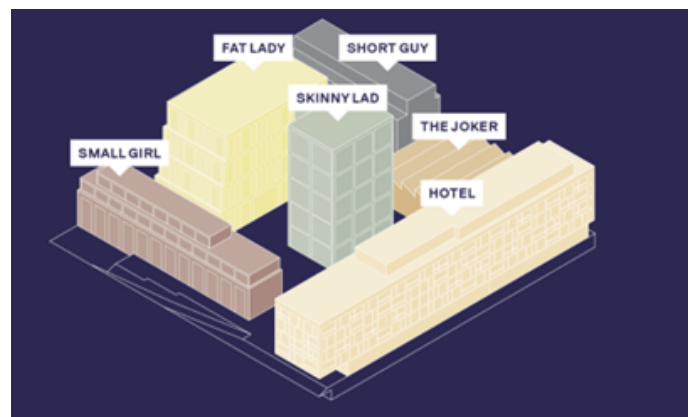
In the Netherlands, all electricity networks are owned by a publicly owned network operator. Therefore, the ProjectNet was created by gaining a legal exemption under a former regulatory sandbox . The network is owned by the energy community. This exemption has been granted for 20 years, after which the project, the network and its connection will be reviewed.

The new development is located in Buiksloterham in Amsterdam North (Fig. 1). The site of the community consists of 21.000 m<sup>2</sup> of buildings (including parking facilities of about 5000 m<sup>2</sup>). In total, it comprises of six building blocks and an underground parking garage. The buildings are a combination of residential, and mixed residential and commercial, with spaces for offices and a hotel (see Fig. 2). This mix developed is typical for many cities, making this case useful for others interested in replicating it.



Fig. 1 the location of the Republica energy community in Amsterdam North. Source Republica webpage

Fig. 2 the different buildings within the project. Source Republica webpage. Block 1 (fat lady), Block 2 (Skinny lad), Block 3 (Short guy), Block 4 (Hotel), Block 5 (Small girl) and Block 6 (Joker).





# Why is this project unique and what can be learnt from it?

This project is unique for two distinct reasons. First, energy communities typically emerge through 'bottom-up' processes, meaning they are created and developed by a group with a particular intention and goal in mind, for example an existing community. Conversely, Republica's community form, structure and governance are all set up before people buy or rent houses in the complex, and therefore become a member. This means there is a pre-defined structure for those moving in, including tenants, owners and others, who will become members of the community (see below). The governance and voting structures for the community is therefore set.

Second, the unique combination of energy technologies and software. These include PV panels, which are placed on the roof of each building, a smart grid, a battery for storage, and a heat pump (a summary of the assets and who owns what is provided below). There are a number of microgrids within the EU; one example close to Republica is the small community of residents named Schoonship; however, Republica consists of a combination of commercial and residential users and owners, which, in this context is unique. Furthermore, the entire complex of buildings has only one connection to the public electricity network. Excess energy will be fed into the grid and shortages will be purchased.



# What legal form and requirements does the community have to meet?

In the Netherlands, the Republica energy community is organised as a cooperative with Limited Liability (Coöperatie U.A. in Dutch). This organisation has received an exemption from RVO to set up an independent energy project net, usually not allowed under Dutch law.

For the internal organisation of the cooperative, every buyer, but also tenants, part-owners are connected to the ProjectNet and must (barring exceptions) be a member of the cooperative. The cooperative has control over the ProjectNet and the production unit, e.g., PV panels and the individual heat pumps. Not all connected assets fall under the control of the energy community (see below) For the project initiators, the cooperative model was the best means to account for the complexity of this project, due to the number of buildings and the fact it is a combination of residential and commercial all of which would use heat and electricity.

## What is the governance structure of the cooperative?

Every customer of energy within the ProjectNet will become a member of the cooperative. The users of energy have a contract with a heat ESCo and electricity supplier. In addition, the connected customers pay for the ProjectNet.

There are four categories of members:

1. Owners of a building block, including common areas for energy and parking: both residential and commercial owners
2. Owners of a part of a building block: residents that bought an apartment
3. Tenants: that rent a commercial or residential part of the building
4. Other users: the battery operator

The building owners and residents are also part of an association of owners (Vereniging van eigenaren; VVE).

The cooperative will have a board (between 4 – 6 people), representing the different groups within the building. The board will negotiate, for example, with the contracted supplier on behalf of the cooperative, and other organisations with whom the cooperative will make formal agreements. Board members are voted in and out at the annual general assembly. At present, the core activities of the board consist of contracting parties to be in charge of managing the ProjectNet, including the network and PV panels, managing the relationship with the heat provider and battery operator and any other suppliers, such as the district heating network.

Residents, tenants and owners are automatically members of the cooperative. The cooperative is also their energy supplier. They have the right to withdraw at any moment from the cooperative. Also, they have the right to choose another energy supplier. However, each connected customer, also if they are not part of the cooperative or use another energy supplier will pay fees for the use of the infrastructure of the ProjectNet and metering costs.



# How is voting organised within the cooperative?

Usually within residents' associations (VVE), voting percentages are allocated based on square meterage of the property. However, in Republica, because of the size of some of the commercial buildings, this was deemed unsuitable as an overarching approach. Instead, the voting percentage is split roughly 50/50 between residential and commercial users/owners. However, the (sub)division of the 50% for residential users is based on square meters of their property.

## ***Governance and voting within the Republica Cooperative explained***

### ***Voting***

1. The homeowners/residential users and owners of commercial spaces (consumers) of building blocks 1, 2, and 3 together have 35% of the total number of votes within the Cooperative.
2. The owners/users of the hotel (building block 4 and part of building block 5) have 19% of the total number of votes within the Cooperative.
3. The owners/users of commercial units (part of building blocks 5 and 6), who act from a profession/company, together have 10% of the total number of votes within the Cooperative.
4. The VvE (association of owners) main split 15% of the total number of votes within the Cooperative.
5. The owner of the energy supply spaces has no votes within the Cooperative.
6. The energy service company Warmte (the operator of the hot/cold thermal exchange system (ATES)) has no votes within the Cooperative\*; and
7. The energy service company of the battery (the owner/operator of the battery) has 2% of the total votes within the Cooperative.

Voting: Within categories 1 and 2, the following principles apply. The percentage allocated to each category mentioned above will be divided among all owners/users who fall into that category. This division is based on the number of square meters they own/rent. This concerns the number of square meters owned by a specific owner based on the total number of square meters within that specific category in the project.

### ***How does this look in practice?***

Suppose the owner has a house of 100m<sup>2</sup>. The total number of square meters of living space within the Project is 2,000 m<sup>2</sup>. This means that this owner has  $100/2000 \times 100\% = 5\%$  of 35% of the total number of votes within the Project.

If the owners of houses/units in categories 1 and/or 2 give their property (partially) in use to one or more users, then 87.5% of the votes linked to that relevant house or unit will go to the user. In that case, the owner will keep 12.5% of the associated votes. If an owner gives his property to multiple users, those users will jointly receive 87.5% of the votes. These 87.5% votes associated with the property concerned will be distributed among the users in proportion to the number of square meters of the total area they occupy. If a specific renter/user departs, then the full number of votes (or at least the number of votes associated with the part that is not in use at that time) will fall back to the owner. This guarantees that there is always a customer/affiliated party in the longer term.

The distribution of votes is rather complex, but tries to give fair consideration to each member in the cooperative.

\*In the initial design the ESCo had 19 % of the votes. To increase the rights of tenants and residents the vote structure was reorganised. The board of the energy cooperative will decide how the remaining votes will be divided over the existing members.

# What technologies are being used and what assets does the cooperative have?

Republica will feature a private smart microgrid for both electricity and thermal energy. The microgrid has maximal roof coverage with PV panels (219 kWp), integration of (191) PVT panels, large, centralized battery system (1,4 MWh), 25 – 50% smart EV chargers (out of 90 parking spots), centralized heat pumps coupled to an aquifer thermal energy storage system (ATES), heat recovery systems, and additional thermal storage buffers for flexible control of heat pumps. The residential apartments and restaurants within Republica will also be connected to the Buiksloterham Resource recovery station, which will extract energy and nutrients from the waste streams.

The cooperative owns and manages the grid and connected assets. For grid management and operating the network they work together with an energy service company (ESCO). The PV panels are placed on all roofs, with an agreement that they are to be exclusively used for PV panels that are owned by the cooperative. This agreement is in all residential and commercial contracts.

The battery is currently owned by the RE-developers, due to the upfront capital costs needed to purchase and install it. It will be operated by an external company (an energy service company) The cold and hot exchange system is currently owned by the RE-developer but will be run by an external company. The battery will provide flexibility to the energy community, and particularly the larger connected customers. The capacity of the battery is primarily used to balance and remain under the connection and transport capacity limitation for energy to the main connection momentarily. Due to grid congestion in the area, the energy company [BJ(1)] will have to deal with a limited transport capacity. For more information about the challenges on developing a PED in an area with grid congestion, read the [Dutch report](#) on alternative group connection and transport agreements in times of congestion.

The battery will also be used for balancing, smart trading on wholesale markets and Frequency Containment Reserve (FCR).





# What are some of the key challenges for this project?

Members of the cooperative can leave at any time (legal right to withdraw). There are no binding ways new residents can be required to join the cooperative, they can only be incentivised. There is uncertainty about how this might affect the project.

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The governance structure is being created before members move in. It is therefore unknown how members will react and respond to the voting rights and responsibilities when they move into the building, and whether it will function effectively or harmoniously.

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Because of the use of flexible assets, the transport limitation and the ambitions to use as much renewable energy on site an ESCo will need to assist the energy community. For the ESCo to be able to provide these different services, the connected customers need to be willing to share consumption data with the ESCo (data dependency).

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There is a local energy congestion issue. This means that the cooperative on the main connection to the public network has a transport capacity limitation that is lower than the requested capacity. Fortunately, the flexible assets connected to the grid seem to be able to provide sufficient flexibility to meet the demand of the connected customers. However, the connected customers need to be willing to work together to stay under the limitation.



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# What are some of the key motivations for joining the cooperative and making this project?



- The business model for the cooperative has the possibility to offer unique benefits to its members. Because there is only one connection to the local grid network, it is expected the cooperative can negotiate favourable tariffs for its members.
- The energy community can introduce a tariff structure that contributes to optimal use of local produces renewable energy. Also, the buildings are highly energy efficient, and the connected assets are largely owned by the energy community. Both will benefit the connected customers.
- The flexible assets in the community can help to steer towards low price hours.
- The set-up of the project offers many chances for interaction between owners and residents. The mixed commercial and residential aspect will make the area a vibrant area from morning to evening. For members, there is the possibility to be part of, build and be active in a shared community.
- For the project more broadly, there is the opportunity to be a part of a unique development and providing several learning lessons for setting up a cooperative before the members have joined. The success of this project could provide a unique basis for aspiring other energy communities and cooperatives to learn and develop from.

*The Republica energy cooperative, in collaboration with ATELIER, is supported by the following organisations: Spectral, Amsterdam Metropolitan Solutions, Gemeente Amsterdam and Banlieu.*

This flyer was prepared by TNO and Steinbeis Europa Zentrum on behalf of the ATELIER project partners.

For more information on TNO see [here](#).

For more information on Republica see [here](#).

For more information on the ATELIER project see [here](#).

Sources: Republica webpage, accessed 12-12-2022: [Home](#) — [Republica](#)





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