

The ATELIER project

Citizen-driven Positive Energy Districts in Amsterdam, Bilbao and beyond

Smart city, Smart mobility, Horizon 2020, Lighthouse Cities

In November 2019, the Smart City project ATELIER has joined the ever growing family of Smart Cities and Communities projects funded by the European Commission's Research and Framework Programme Horizon 2020, which is now counting 17 members. Coordinated by the City of Amsterdam, ATELIER will focus during the next five years on developing citizen-driven Positive Energy Districts in its two Lighthouse Cities Amsterdam and Bilbao and its six Fellow Cities across Europe to showcase innovative solutions that integrate buildings with smart mobility and technologies to create rather than consume energy.

Bettina Remmele

As a Horizon 2020 Smart Cities and Communities project, ATELIER receives funding from the European Commission to develop innovative technologies and solutions in the fields of energy, mobility and ICT [1]. By combining the expertise and the commitment of 30 partners from 11 European countries, these innovations are then implemented in their two so-called Lighthouse Cities Amsterdam and Bilbao. The task of the six Fellow Cities Bratislava, Budapest, Copenhagen, Krakow, Matosinhos and Riga is to learn from these innovations through knowledge transfer and co-operations and to test these innovations for replicability and feasibility without the financial support of the European Commission.

In contrast to the earlier projects of the Horizon 2020 Smart Cities and Communities call, the focus of ATELIER and its four younger sister projects +CityXChange, MAKING-CITY and POCITYF, lies not only on the development of Smart Cities but has now further shifted towards the creation of Positive Energy Districts within Europe, with a strong involvement of the local citizens. With these Positive Energy Districts, ATELIER will thus generate an energy surplus of 1,340 MWh of primary energy and save 1,7 kilotons of CO₂ and 23 tons of NO_x emissions.

PED Innovation Ateliers

ATELIER therefore not only stands for "Amsterdam and Bilbao Citizen driven smart cities". The project also stands for eight "Positive Energy District (PED) Innovation Ateliers" that will be implemented as part of the project. The first two ateliers will be developed in the two Lighthouse Cities Amsterdam and Bilbao, with the six Fellow Cities following shortly afterwards. The aim of these physical ateliers is to provide a self-sustaining meeting place where different types of stakeholders, like industry and investors but most importantly citizens and local innovators, will be closely involved in the design processes and the implementations of the smart solutions in their homes and districts.

"Our vision is to create dedicated PED Innovation Ateliers to strengthen the local innovation ecosystem, and to remove legal, financial or social barriers to the implementation of smart solutions", says Frank Tazeelaar, Head of Sustainability at the City of Amsterdam. "The Innovation Ateliers will be self-sustaining, continuing for a long time after the project has ended, thus being engines for the upscaling and replication of solutions within the ATELIER cities and beyond (Europe and the World). Moreover, through an active learning programme, we will capture and pass along the lessons learned of our Innovation Ateliers", he adds.

Naturally, the ateliers are therefore also reflected in the ATELIER logo with two three-dimensional cubes representing the two Lighthouse Cities and one cube divided into six parts to represent the Fellow Cities (figure 1).

The physical ateliers with a strong focus on citizen engagement and social innovation are an important cornerstone of the ATELIER activities, aiming to reach as high an impact as possible on Europe and its cities. Another important part of the project will be the cooperation with other Smart City projects [2] and related initiatives like the Smart City Information System [3] or the European Innovation Partnership on Smart Cities and Communities [4] to learn from each other and to benefit from synergies and knowledge exchange.

Moreover, each city will develop its own bold City Vision for 2050: "With ATELIER, we really want to pave the way for more 'positive' cities in Europe", explains Eduardo Zabala of Tecnalia Research & Innovation, leader of the City Vision 2050 work. "Therefore, each of our eight involved cities will develop a City Vision 2050 that constitutes the roadmap for upscaling solutions in the long term. The main objective of this is to guarantee a seamless city transformation from planning to implementation and further upscaling and replication."

Citizen and stakeholder engagement as the secret ingredient

The key ambition of ATELIER remains the creation of Positive Energy Districts with a strong and proactive involvement of citizens to increase their energy awareness and to invite them to more energy efficient behavior. With different activities, the pro-



Figure 1: ATELIER project logo with three-dimensional cubes representing the eight ateliers.

ject partners of ATELIER aim to empower their citizens, supporting them to play an active role in the energy system as a prosumer by consuming but also producing energy at the same time. Increasing the effectiveness of collaboration and systematically opening up knowledge between public and private partners is a crucial part of the citizen and stakeholder engagement strategy within ATELIER.

Ensuring that citizens are fully engaged in the project, ATELIER intends to involve and align with existing energy communities under a framework of social inclusion. Moreover, the ATELIER approach specifically considers the role of the citizens as local residents but also as co-deciders, complements and users of smart urban solutions in the PEDs. Specifically, ATELIER will organise project events and citizen engagement activities at local level to engage in a dialogue with citizens, residents and other interested stakeholders to showcase how the different ATELIER activities will have a positive impact upon its cities and its citizens.

Amsterdam and Bilbao: Two cities with experience

As part of ATELIER, Amsterdam and Bilbao build upon the practical experiences gained through previous smart city and smart energy initiatives. Both cities have been demo sites in previous Smart City projects such as CITY-ZEN, NEXT-BUILDINGS, ECOSTILER and STACCATO (Amsterdam) or BUILDSMART (Bilbao). ATELIER's planned interventions thus benefit from yearlong experiences and promise outstanding impacts on the climate of their cities and the lives of their citizens.

Lighthouse City Amsterdam

As a popular tourist spot and the capital of the Netherlands, Amsterdam continues to grow. The city reached a peak of more than 1 million inhabitants in 2019! Such an expansion inevitably comes with various societal and climatic challenges. For almost ten years now, Amsterdam has thus taken steps towards climate neutral developments, resulting in its own Sustainable Energy Action Plan (SEAP) that has been adopted by the Covenant of Mayors in 2015. For the coming five years (and hopefully beyond), ATELIER will contribute to this expected system transition and thus help Amsterdam in halving carbon emissions by 2030.

As part of ATELIER, one step along this transition process will be the Positive Energy District developed in six locations within Buiksloterham, in the north of Amsterdam. One of these six locations is De



Figure 2: Picture of Republica

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Figure 3: Impression of what Buiksloterham might look like in the future © Marc Koehler Architects

Ceuvel, an already existing energy community with a smart grid, participating in the energy trading activities of the project. Two locations are newly developed building groups, Poppies and Republica (see figure 2), with a total of 22,000 m².

In Poppies, for example, the positive energy performance will be reached by balanced ventilation with heat recovery and CO₂ controlled ventilation, low temperature heating, waste heat recovery from shower water and energy saving lighting. The four buildings locations will be a combination of tertiary (approximately 12,600 m²) and residential (approximately 15,900 m²) buildings, connected through a station for local (energy and resource) recovery of sewage waste streams and local renewable energy generation. The City of Amsterdam, Project Coordinator of ATELIER and City Coordinator of the Amsterdam demo site has got big plans: The PED within Buiksloterham will thus serve as a blueprint for the development of the entire area (figure 3).

Amsterdam – a world leader in electric driving and cycling

Regarding transportation, mobility currently causes about 9% of CO₂ emissions in Amsterdam. In the past ten years, the city has already been working on limiting car traffic to reduce these numbers. And with success! As a result, Amsterdam has become a world leader in electric driving and cycling, with 2,800 public charging points and the same amount of private e-vehicle charging points in the city. In the coming years, the city plans to further limit emissions from individual and freight traffic, to restrict the distances driven in the urban area and to make a part of the city nearly car-free. The ultimate goal is to create a city free of traffic emissions by 2025/2030. ATELIER will contribute to these goals with a shared electromobility hub that will be developed in the demo district to build, demonstrate and validate the functioning of a zero emission car sharing platform, including about 15 to 20 electric cars and facilities for sharing electric



Figure 4: Picture of Zorrotzaurre

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bikes and so-called Biro's (electric mopeds for disabled persons).

Lighthouse City Bilbao

The Basque city Bilbao developed its Sustainable Energy Action Plan for 2020 through a participatory process that has been conducted already in September 2012. It brings together various ambitions that have been developed by the City Council on topics like energy efficiency, public transport or cycling and electrification of vehicles. Regarding mobility interventions, as part of ATELIER, Bilbao thus aims to replace its waste collection and cleaning

vehicles with electric vehicles and to implement 3,500 electric vehicles in the city by 2020. Moreover, Bilbao plans to provide the municipality with a vehicle recharge infrastructure, as well as an online electric vehicle promotion platform.

The dedicated demo district of Bilbao will be Zorrotzaurre, an industrial area during the 20th century with lots of heavy industry coming from the Port of Bilbao that was originally part of the mainland and was transformed into a peninsula during the 1960's to accommodate more space for docks. This peninsula has only recently in October 2018 become an island, a fact that has lowered the flooding risk of the northernmost part of the City of Bilbao as it prevents a bottleneck in the estuary (figure 4).

Accessible by zero-emissions vehicles only

According to Bilbao's Strategy for Sustainable and Integrated Urban Development, Zorrotzaurre shall turn into a residential and business district where the deployment of new sustainable concepts, principles and solutions will be tested. The aim is to develop 5,500 new homes, 150,000 m² of office spaces, 154,000 m² of citizen spaces and 93,500 m² of social and cultural facilities. The island will be accessible by zero-emissions vehicles only. The idea is to implement a zero emissions energy supply scheme and 100% electric public transportation. Amongst other implementations, interactive bus shelters will provide information on the energy flows, storage and local renewable generation, a seating area with weather protection, and many other functionalities for citizens.

As part of ATELIER, Zorrotzaurre will be home to three Positive Energy Districts that will be connected via a geo-exchange

loop, a system that will use geothermal and hydrothermal renewable energy to cover the thermal demand of the PED locations and to export the surplus to the rest of the island and, eventually, beyond. The core focus of the ATELIER demonstrations in Bilbao is thus the development of the geothermal system, an e-mobility hub, smart storage, local renewable energy production and the development of a smart grid and demand/response offers.

Replication and upscaling in six ATELIER Fellow Cities

Positive Energy Districts are quite a new approach. So far, there are only few real-world examples to learn from. The design process of the ATELIER PED's is thus essential for replication across other cities with different geographic, climate, economic and social scenarios. ATELIER will address extensive replication and upscaling activities to disseminate best practices and effective solutions based on two different actions: first, replication of PEDs in previously identified areas within the six Fellow Cities, and second, through the development of individual Replication Plans in the Fellow Cities and Upscaling Plans in the Lighthouse Cities. The main pillars of the Replication Plans will be the creation of PED Innovation Ateliers to coordinate city council departments, to integrate strategies and to engage the respective stakeholders.

From now until October 2024, when the five year duration of ATELIER will have ended, the project has planned a lot. The two Lighthouse Cities have ambitious plans and the six Fellow Cities are eager to learn and replicate the most successful approaches in their own environments. The ATELIER project partners are looking forward to taking all interested stakeholders along this journey and is excited about the many new Positive Energy Districts to come. ■

ATELIER AT A GLANCE

The activities and outcomes of ATELIER will regularly be shared with the public via the website [5], the social media channels on Twitter and LinkedIn (AtelierH2020), and via the newsletter (coming soon). Everyone can follow the project virtually and come talk to its partners at national and international events to learn more about how ATELIER will improve the life of its citizens and the livability in its cities.

Steinbeis-Europa-Zentrum [6] is a project partner within ATELIER and responsible for dissemination, communication and exploitation of the project activities and results. Steinbeis-Europa-Zentrum is an experienced partner in several other Smart City projects such as Remourban and Triangulum (both projects were part of the first generation of Smart Cities and Communities projects, completing their five year duration in 2020), SmartEnCity, mySMARTLife, as well as the two initiatives by the European Commission Smart Cities Information System and European Innovation Partnership on Smart Cities and Communities.

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LITERATURE

- [1] <https://ec.europa.eu/inea/en/horizon-2020/smart-cities-communities>
- [2] <https://smarcities-infosystem.eu/scc-lighthouse-projects>
- [3] <https://smarcities-infosystem.eu>
- [4] <https://eu-smarcities.eu>
- [5] www.smartcity-atelier.eu
- [6] www.steinbeis-europa.de/en/



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