ACTION OVERVIEW

Solar power plant and energy storage

This action was implemented by ENGIE in September 2020. A deliverable (D2.7) has been written and described in detail this action. The report is available at: https://mysmartlife.eu/publications-media/public-deliverables/

OBJECTIVES

- To accelerate the development of RES on the area
- To experiment a solution of energy storage by battery on a tertiary building
- To facilitate the development of electrical vehicles

IMPLEMENTATION

CHALLENGE

Urban areas concentrate the energy consumption needs and nowadays, it becomes necessary to implement a local and carbon-free energy supply. The development of renewable energies constitutes an important lever for reducing greenhouse gas emissions. But renewable energies raise the question of their intermittency and storage.

The action implemented here contributes to the commitments 11 and 12 of Nantes Metropole roadmap for the energy transition.

SOLUTIONS

Photovoltaics is one of the answers to the current energy challenges, notably in urban areas. Indeed, the building roofs constitute areas that are little or not used at all, and thus they can be easily mobilizable to implement solar power plants. The tertiary buildings mainly consume energy during the day, during office hours. This also corresponds to the time slots for photovoltaic production.

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An European urban transition project towards more sustainable cities through innovative solutions, in the fields of mobility, energy and digital.

Smart City

Global project

Coordination: Cartif
European grant: 18 M€
30 partners, 6 countries
Period: Dec.2016 - Nov.2021
Demonstrators: Nantes, Hamburg, Helsinki

@mysmartlife_EU
https://mysmartlife.eu/

Nantes demonstrator site

Coordination: Nantes Métropole
European grant: 4,5 M€
10 partners

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Energy

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ENGIE, in partnership with the CIC bank, developed a 107-kWp solar plant on the roof of the CIC headquarters in Nantes. A 50-kWh lithium-ion battery and a 22-kW charging station for electrical vehicles will also be installed.
The expected renewable production amounts to 110 MWh per year, which will allow a saving of 10,7 t CO_2 per year.

The energy produced is consumed directly on site. An energy management system makes it possible to direct the energy produced either in the building's electrical system for an instantaneous consumption or in the battery to store the energy (during weekends for example), according to the instantaneous consumption of the building.

MONITORING

This facility is closely monitored thanks to a data acquisition unit used to follow-up the performance of the installation :

› Collection of energy production data, distribution between storage, consumption, and supply of the charging station.

› Transmission of the main physics value (Power (W), voltage (V), intensity (A), AC frequency (Hz), AC voltage (V), inverter temperature (°C), battery charge status, sunlight and horizontal or in-plane collector temperature (W/m²).

› Opportunity to charge and discharge the battery on the internal LV network of the CIC building at defined time slots.

› Restriction of the inverter production to avoid any energy injection into the public power grid.

This data will be used to calculate key performance indicators, such as the electricity production of the solar plant, the building consumption, the rate of self-consumption, and the savings of greenhouse gas emissions. These indicators will be aggregated with those of all the actions of the Nantes-based demonstrator to give a consolidated result of the overall impact of the project.

► BENEFITS

Environmental

› Development of RES

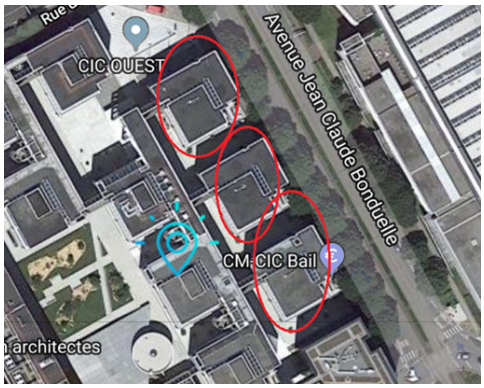
› Full-scale test of a storage battery in an urban environment, in a tertiary building

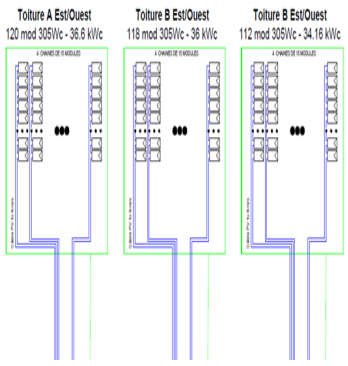
› Decrease in greenhouse gas emissions due to the energy consumption of the CIC buildings

Economic

› Decrease in the costs related to the purchase of energy

› Enhancement of the existing buildings and of the company's image





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