Advancing Communities
towards low-Carbon Energy Smart Systems

Amersfoort
Scaling grid friendly solutions for neighbourhoods with batteries and stakeholder coordination

Context

The Challenge for Amersfoort

To achieve their goal of carbon neutrality, Amersfoort needs local renewable generation. But grid congestion is becoming a serious problem within the municipality. Without intervention, the City of Amersfoot could face delays in new residential areas as fully electrified new builds and retrofits exceed the existing capacity of installed wires.

Objective of the ACCESS Pilot

Amersfoort joined ACCESS to tackle grid congestion in the residential sector. They focused on two problems – the need for electrified heating in individual homes, and the challenge of maintaining a balanced grid when renewably powering large multi-family apartment buildings.

ACCESS

Total Budget: €4.540.864
ERDF Contribution: €2.270.432
Duration: 2019-2023

Description
As part of the Interreg North Sea Region project ACCESS, 4 frontrunner cities piloted innovative solutions for decarbonising local energy systems. ACCESS found that local authorities can lead the renewable transition in their area through support for grid balancing, energy trading, efficiency and other smart methods.

VITO
Lead partner

MECHELEN West Suffolk Council
Amersfoort City of Malmö
City partners

Johanneberg Science Park IfM Education and Consultancy Service
vito AARHUS UNIVERSITET
Knowledge partners

BAX & COMPANY
VALUE FROM SCIENCE AND TECHNOLOGY
Project Management partner

Amersfoort tested the future of energy storage in different types of residential buildings with innovative battery setups

Approach

Installation of PV and batteries in multiple residential contexts

Through ACCESS, Amersfoort tested two solutions to congestion in parallel, tackling the congestion challenges typical in residential areas. In collaboration with its local housing provider, Amersfoort installed a 160kW battery into the electricity system of a 150-unit apartment complex. Connected to 302 installed PV panels on the roof, the battery stores excess generation on the rooftop and can dispatch it during the night or on less sunny days. Early estimates sugest this will save the housing provider €2,000 a year on their energy bill for the common spaces in the building.

Amersfoort also piloted the installation of 10 heat batteries in individual homes, to test technological solutions to sustainable heat. To overcome challenges recruiting residential participants, Amersfoort partnered with local housing renovation specialist Klimaatmissie to install the batteries and control the demand and response of energy.

Designing innovative contracting models to offer grid services

The 160kW apartment building battery will also serve as an innovative Storage-as-a-service solution, with excess energy from the grid stored in the battery at peak times. Amersfoort had to design an innovative contracting model to enable this service model, typically not allowed for housing providers as a non-core service. The solution was to establish the housing provider as owner, and a third party – energy service company Petawatts – as the operator and flexibility solution provider.

Taking the role of an energy market coordinator

By collaborating with local actors such as housing cooperatives, renovation specialists and battery providers, Amersfoort took on the role of an energy market coordinator, bringing the right actors together and even subsiding the purchase of a battery in order to realise the storage-as-a-service solution.

Pilot Impact

15 %

Reduction in energy bills for De Alliantie's tenants

The apartment building battery will save De Alliantie an estimated 15% on its energy bill by storing more of the rooftop solar energy and offering grid services. These savings will passed on to tenants.

10 %

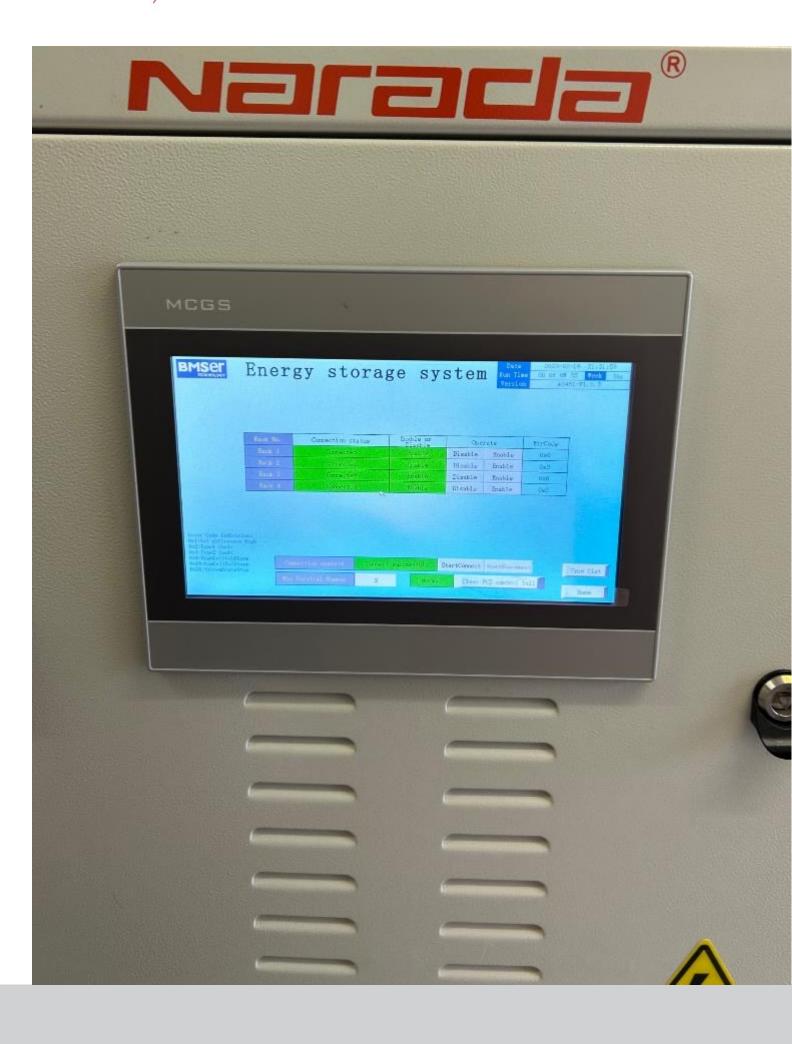**Boost to captured solar generation through co-location**

By co-locating the apartment building battery with 302 rooftop solar panels, the battery will increase the amount of energy captured for building self-consumption by 10%.

327 €

Monthly energy bill saving recorded after total home renovation

In partnership with Klimaatmissie, Amersfoort was able to reduce household energy bills for residents by €50-€327 a month, depending on gas consumption before the renovation. This will make a meaningful impact for families struggling to keep up with their energy bills.

Amersfoort's work improved energy affordability for housing providers, tenants and homeowners

Amersfoort found that working with organised groups was more scalable than direct citizen engagement

Lessons Learned

Working with organized groups proved more scalable

Amersfoort found that working with organized groups was more effective way to scale flexibility solutions than directly engaging residents. In both pilots, working with delivery partners was an important decision to overcome the time costs of individual citizen engagement. Working with a local housing provider led to more promising results based for the Storage-as-a-Service model, and partnering with Klimaatmissie enabled the successful installation of heat batteries in individual homes.

Not every building is suitable for piloting

Not all buildings are suitable to battery storage, and Amersfoort had to rule out several candidates during the pilot process for not having the correct dimensions or through finding the heatpump's controller wasn't suitable for the building. Ensuring that buildings are surveyed by experts before investing time and resources in a particular site will save time and resources.

Grid congestion is increasingly urgent for local authorities

During the ACCESS project, Amersfoort validated grid congestion as one of the most important issues in their energy agenda, and one that is poorly addressed in residential settings. Local authorities should expect to find grid congestion becoming increasingly central to their energy strategies, especially as they promote local renewable generation.