

Sonderborg: PV Cells with Battery Storage in Housing Associations

Overview

Solar cell plants have been installed onto roofs of housing association buildings in Sonderborg (DK). The excess of produced solar electricity has been sold to the public grid. But the price for selling solar electricity to the public grid is rather low, and so it is more sensible to use the solar electricity in the apartments themselves. Therefore, in Sonderborg a solar-cells-solution with battery storage in bigger apartment buildings (8-10) will be demonstrated instead of connecting the solar cells to the public grid. If the housing association sells the excess of produced solar electricity to the public grid, they will receive a price of maximum 0.05 Euro per kWh. On the other hand, if they store the electricity and use it at a later stage, they will save 0.28 Euro per kWh. In this way, the battery storage solution saves energy, money and helps to reduce peak load demands on the public grid.

Implementation

The demonstration battery project in Sonderborg is expected to involve 8-10 housing departments with 40 housing blocks and 800 apartments plus 100 townhouses. The solar cells + battery solutions will cover 50 % of the total electricity consumption in the apartments. The first of the 8 demonstration projects is expected to be running in August 2020 and the remaining projects will be installed before February-March 2021.

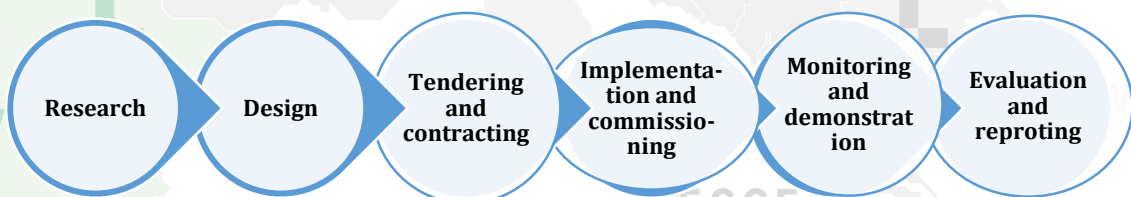
Business Models

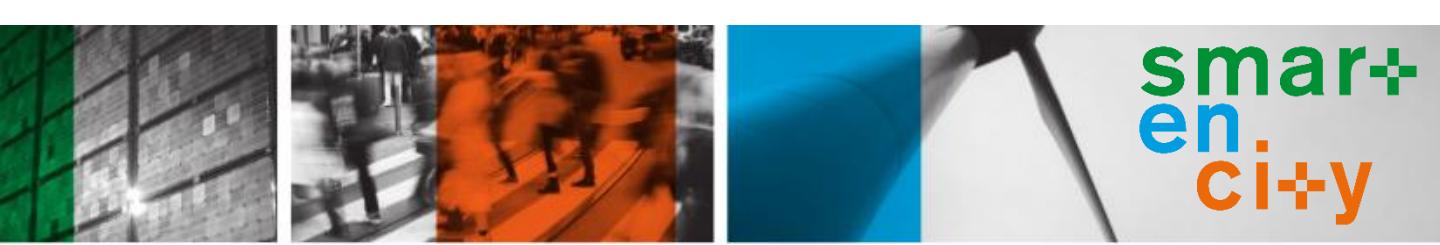
Roughly it can be stated, that the investment is 60-70% higher with a battery solution compared to solar panels connected directly to the grid. Whereas a grid connection is most feasible with 100 m² solar panels, a battery solution would be most reasonable with 150 m² of solar panels and to connect the panels with a local battery. The simple pay back period will approximately be the same with and without battery, but with the solution you save a lot more external energy and a lot more CO₂.

The payback period, of course, depends very much on the local electricity price. In Denmark the price is rather high (0.28 Euro per kWh) due to local taxes.

Normally investments in solar cells and battery storage plants can be financed by 20-30 years with external loans from banks or financial institutes.

Process





Sonderborg: PV Cells with Battery Storage in Housing Associations

Citizen Engagement

Normally, the tenants can decide if they would like to have a battery storage solution or not. The housing association together with consulting engineers prepare a conceptual plan and present measures and investment on an annual meeting. If the majority of attending tenants can agree on this investment, it is accepted, and then tender documents will be prepared. Normally, such an investment will be accepted if the simple payback period is less than 10-12 years.

Benefits

- Better use of solar electricity.
- More feasible investment
- Demonstration of new technology
- Expected Energy savings: 1.300 MWh per year
- Expected CO₂ reduction: 350 tons per year

Stakeholders

Owner(s)	The three housing associations: SAB, SOBO and B42
Service/Technology Provider	Not yet appointed.
Users	Tenants in 22 blocks with 352 apartments + 106 townhouses.
Investors	The three housing associations: SAB, SOBO and B42

Investment/Finance

Ca. 1,5 Mill.€

Replication Potential

Obviously, the battery storage solutions in combination with solar cells can be adopted in other cities and countries.

The technology can easily be replicated and the economic feasibility could be even better in other countries (e.g. if the local public grid administrators there do not allow solar cell systems to interfere with the public electricity grid). In many countries it is difficult to manage the input of solar electricity into the public grid, and therefore the public grid will not pay for this solar electricity. In these situations it would be a much better solution to install solar cells in combination with battery storage plants.

More Information

<https://smartcity.eu/about/solutions/pv-cells-with-battery-storage-in-housing-associations/>



Contact

Torben Esbensen M.Sc.
 Consulting Engineer
 Danish Energy Management A/S
te@dem-esb.dk



This project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No 691883.