

Sonderborg: Retrofitting Package

Overview

In Sonderborg, 7 different housing association departments with a total of 815 apartments and 1,400 tenants are involved in the retrofitting package. The measures include insulation of facades and roofs, airtight constructions, new low-energy windows and doors, new ventilation systems with heat recovery replacing traditional exhaust air ventilation systems, new indoor and outdoor LEDs, LED street lighting in the common areas, automatic heating control systems, improvement of the indoor climate, installation of a total of 4,950 m² of roof-integrated solar photovoltaic plants for electricity supply in six of the housing departments. The objective of the measures is to reduce energy consumption for the residents, to improve the indoor climate in the buildings and to assist Sonderborg with becoming a carbon neutral area in 2029.

Outcome/Successful Implementation

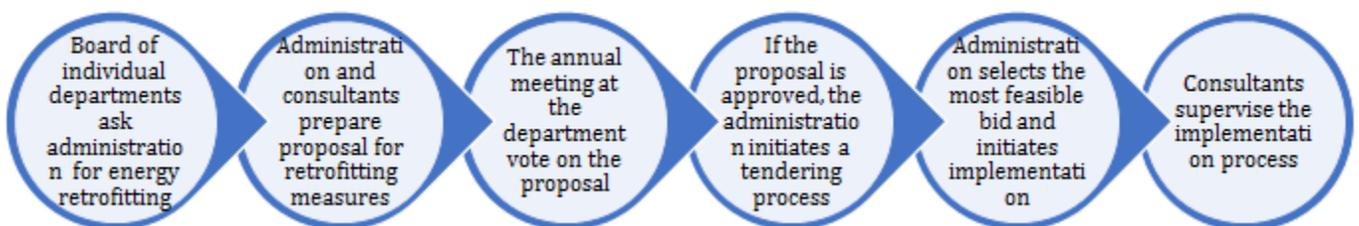
In addition to 4,950 m² of roof-integrated solar photovoltaic plants for electricity supply in six of the housing departments, one of the departments have furthermore installed 10 small battery systems in their buildings. The energy demand in the 7 departments before retrofitting varied between 114 kWh/ m²/year and 139 kWh/ m²/year. After retrofitting the energy demand was reduced to between 61 and 118 kWh/m²/year, a reduction between 21% and 47%. The installed solar photovoltaic plants produce 645.000 kWh electricity per year.

Investment/Finance: ca. 10 Million Euro.

Business Models

For the solar photovoltaic plants installed by most of the departments, the business model is to use the majority of the solar electricity in the apartments in the same period as the solar electricity is produced and submit the lowest possible amount to the public grid. The reason is that the solar electricity used immediately by the tenants themselves will save 0.30 EUR/kWh, while the solar electricity submitted to the grid will only be compensated with 0.11 EUR/kWh. Therefore, the solar systems are designed so that a minimum of 80% of the produced electricity can be used directly in the apartments, and a maximum of 20% will be submitted to the public grid. A part of the business model is, that the contractor/supplier provided provides the financing in addition to the delivery and installation of the energy retrofitting measures. The financing is paid back with the actual value of the obtained energy savings. This means that the residents do not get any savings on their energy bills until the investments have been repaid, but after that period, they will have a considerable reduction in their energy bills without having to pay a higher rent for their apartments.

Process





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Citizen Engagement

All individual departments have a separate board consisting of 5-8 residents. This board is elected by all the residents in the department at an annual meeting.

The administration of the housing associations together with their external consultants prepare a proposal for energy retrofitting of the individual departments. This plan will be presented and discussed with the residents at the annual meeting and it needs a simple majority to approve. Then, the administration initiate the implementation of the retrofitting measures.

Benefits

- Increased resource and energy efficiency
- Reduction of energy bills
- Reduction of carbon emissions
- Better (evidence-based) planning
- Stable long-term return on investment
- Increased comfort
- Social integration

Stakeholders

Owner(s)	Housing Associations
Service/Technology Provider	Consulting architects and engineers/ building contractors
Users	Residents
Investors	Housing Associations

Replication Potential

It is anticipated that the developed methods for building integration of solar photovoltaic panels and the simulation software for distributing the produced solar electricity for immediate use and selling it to the grid can be replicated in other cities. Also, the financing scheme provided by a contractor, that the exact measured energy saving is used to pay back the investment could be replicated. This means that the residents do not experience an increase in their rent and also do not get a reduction in their energy costs until the investment is paid back. The citizen engagement process in housing associations in Denmark is very rare in Europe and could be interesting for other cities and countries to replicate.

More Information

<https://smartcity.eu/about/solutions/retrofitting-sonderborg/>



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