Energy efficient refurbishment of public housing area

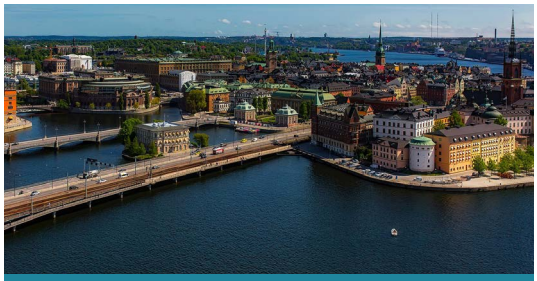
Smart solution 1
Energy retrofitting of buildings

Measured impacts

76%
in total energy savings in buildings with geothermal heat pump

61%
in average total energy savings in buildings without geothermal heat pump

Up to 78%
in heating savings



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What is it?

Integration of energy retrofitting into a full-scale renovation of residential buildings owned by a public housing company. The scope of the energy retrofitting is very broad and is an outcome of the combination of passive and active technologies. The tenants gets apartments with higher standards and better indoor comfort after renovation, while the property owner benefits from lower energy and maintenance costs.

What did GrowSmarter do?

Skanska AB (project development and construction group) has implemented energy efficiency measures in six buildings with a total of 323 apartments in the area of Valla Torg in Stockholm. The buildings are owned by the public housing company Stockholmshem. Overall, the measure aimed at lowering the total energy consumption of the buildings being retrofitted by 60%.

The refurbishment involved the upgrade of thermal envelope and a combination of district heating, geothermal heat pumps, exhaust air heat pumps, photovoltaic cells and heat recovery from waste water. A new smart building management systems and indoor temperature sensors were installed. Tenants were also offered to have a home energy management system installed *(see factsheet 12: Active Home)*. Tenants had to be evacuated during the refurbishment.

The business model for the refurbishment is to lower the energy and maintenance cost of the building. Low-energy retrofitting like the one done at Valla Torg are expected be part of an attractive market in the future due to the low energy consumption and carbon footprint of the building.

> It is important to use standardized solutions and to follow up on the building behavior in the evaluation phase.

Lessons learnt

In order to have the biggest impact of the energy renovation and to avoid barriers with tenants engagement and/or data privacy, energy measures at building level instead of the dwelling level are a good alternative. In this way, energy savings can be more easily quantified for the building owner. Information campaigns on being a climate-active-tenant by Stockholmshem also helped to get acceptance.

The main obstacle in this retrofitting was the tight schedule set for the project by both building owners and project managers. This is due to the fact that unforeseen obstacles often occur in large retrofitting projects. In this case, moisture and mould were found in apartments and more staff than planned were added to keep the schedule.

Upscaling & replication potential

In terms of replication, energy savings of 60% are a too ambitious target (the last 10-15% of energy savings are very costly). Interventions with the shortest possible evacuation of tenants should be pursued to enhance replication (very high cost and low acceptance).

How did the measure work?

Technical feasibility

The combination of active and passive technologies chosen for Valla Torg led to the ambitious goal of lowering the building energy demand by 60%.

Economic feasibility

The sum of all energy saving measures has a long payback time. However, some individual measures are very profitable. The value of the assets has increased after retrofitting, which significantly improves the financial analysis.

Replication potential

If the goal of a renovation is to reduce energy consumption and CO_2 emissions, Valla Torg is a good example. However, the last 10-15% of the energy saving measure can be a very high investment. Social approval has not been easy in this retrofitting project. In cases where the tenants must be evacuated, significant efforts are required for good communication between the housing company and the tenants.