

Energy efficient refurbishment of a residential settlement

Smart solution 1 Energy retrofitting of buildings

Preliminary impacts

Up to 59%

of heating savings depending on the building

Up to 61%

of total final energy savings depending on the building

687

dwellings refurbished with energy efficiency measures



Cologne

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What is it?

Integration of energy retrofitting into the renovation of residential buildings owned by a public housing company. The scope of the energy retrofitting is very broad and stems from the combination of passive and active technologies to reduce the net energy demand of the settlement.

What did GrowSmarter do?

In Cologne, the public housing company Dewog has implemented this large energy retrofitting project in 16 residential buildings with 687 rented dwellings in the Stegerwaldsiedlung neighbourhood. Initiatives taken include insulation of the buildings, triple glazed windows, efficient LED lighting in common areas, lifts with energy recovery and installation of photovoltaics.

Within the project, the energy company RheinEnergie was in charge of installing the photovoltaic panels, efficient heating pumps

which are connected to the district heating network and monitoring equipment. Finally, all the buildings had a smart management system installed, which connects to RheinEnergie's Virtual Power Plant (see factsheet 17: Siedlungsmanagement).

In partnership with the City of Cologne, several events were held for the tenants with the aim of informing them about the impact of the energy retrofitting.

Lessons learnt


If rents are raised in order to finance the measure, good communication with the tenants is vital. Tenants may not appreciate the energy efficiency measures implemented in their homes until they experience a considerable reduction of their energy bills which is comparable to or more than the rental increase.

In the implementation phase it is also necessary to be ready for unexpected obstacles, such as the lack of labour force, in case a tight time schedule has been set to for the retrofitting.

Upscaling & replication potential

The replication potential is high for this intervention since housing owners have the capacity to quickly reach a very large number of dwellings with a single action. The investment per dwelling can be lowered by contracting large projects.

In terms of construction works, the presence of scale benefits seems to be less significant, as current margins in the construction sector are already very tight. However, it is worth noting the existence of potential scale advantages at a building level through the single allocation of materials or the use of the scaffolding when having to work on certain elements of the facade.



Intensive communication with the tenants is fundamental

How did the measure work?

Technical feasibility

Such large interventions require the nearly simultaneous recruitment of a wide number of contractors. A careful planning is crucial to guarantee minimal delays and ensure minimal impact on tenants' comfort.

Economic feasibility

Energy savings are enough to pay off the investment (high heating savings due to cold climate). However, the public housing company is not capturing the cost savings but dwellers do. Rents are raised due to the intervention according to legal limitations.

Replication potential

An ESCo (Energy Services Company) model could work to make the investment attractive for a private investor, as the tenants would be paying off the investment through a constant fee in their energy bills (the energy savings would be captured by the investor).