

Energy efficient refurbishment of private residential buildings

Smart solution 1

Energy retrofitting of buildings

Measured impacts

39%

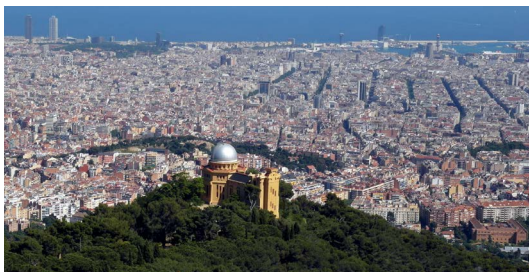
cooling energy savings at Canyelles building

22%

heating energy savings at Ter building

38%

cooling energy savings at Lope de Vega building



Barcelona

Technical partners

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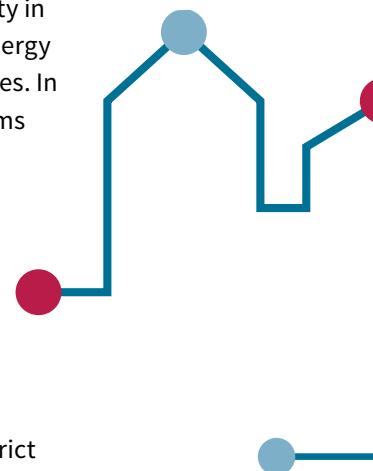
What is it?

Energy retrofitting of private residential buildings with active and passive solutions. The buildings can be of different sizes, types and be located in different places in a city. The work can be done by a private Energy Services Company (ESCo) through both public-private and private-private agreements.

What did GrowSmarter do?

The Spanish energy company Naturgy retrofitted almost 20.000 m² of residential property in Barcelona. The aim was to lower the energy consumption through different measures. In total 83 dwellings and 500 student rooms were retrofitted.

Four buildings were chosen for the retrofitting; Canyelles, Ter, Lope de Vega and Melon District. The three former all had passive solutions implemented and Canyelles also had active solutions implemented. Melon District was connected to the local district heating network.



Passive measures included façade insulation, roof insulation, new windows with less air leakage and blinds installation. The active measures included replacing old boilers, connecting to district heating and installing efficient water taps and a smart Home Energy Management System.

In some cases, Naturgy partnered with the public administration by participating in existing retrofitting programmes with the goal of reaching higher energy efficiency through a co-financing approach.


Lessons learnt

Awareness campaigns with the tenants concerned before, during and after implementation, explaining the benefits of energy savings and higher comfort were found to be very important. These help reduce the so-called “rebound-effect”, where expected gains are not achieved due to a change in the behaviour of residents.

Low heating demand in mild climates such as the Mediterranean (compared to theoretical demand ratios) might lead to less significant energy savings compared to other climates. In this case, the combination of private investment by the ESCo and public funding from the Municipality has been the solution. There is a strong need for execution of the works in full coordination with the tenants, especially if they remain on-site during the refurbishment. When implementing energy retrofitting works in existing old buildings, structural problems may appear, which lead to delays on the energy retrofitting works.

Upscaling & replication potential

Subsidies from funds outside the municipal funding schemes are important to upscale this solution. In terms of replication, the approach of the private ESCo will be to partner with specific contractors in public energy retrofitting projects acting as the energy expert that controls and guarantees that the energy savings are achieved.



It is important to find low interest rate financing options to upscale the solution, as well as provide an insurance to the financing entity via for example the tax collection procedure.

How did the measure work?

Technical feasibility

It is important to evaluate the impact with real energy consumption data (and use it as the base for subsidies), as it has been found that real demand is commonly lower than the theoretical ratios (existence of non-heated dwellings in mild climates).

Economic feasibility

The measure could increase its revenues by identifying everyone benefitting from the positive impacts. If residents change consumption habit (likely, as the cost of achieving better comfort levels is lower) and consume more energy, the energy savings (revenues) are lower than first calculated.

Replication potential

Economies of scale, i.e. the combination of structural and energy retrofitting works or large scale refurbishment (community scale) is seen as a very good option to explore for replicability. Shared costs reduce the investment costs and prepares tenants for the possible disturbances.

