

AIMING TO IMPROVE THE ENERGY EFFICIENCY OF APARTMENT BLOCKS

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## Klosterweiher, Aachen, Germany

### Background

Klosterweiher is a residential complex in Aachen (Germany). Built in 1964 it is comprised of 60 privately owned apartments. Some of the apartments are rented and there are several 'major owners' who own two or three dwellings.

There is large potential for improving the insulation in this property as the roof, basement ceilings and walls are un-insulated. There are also large glass block walls in the stairwells which are an area of great heat loss.



*Front view of the case study buildings*

### Motivations for retrofit

When the LEAF project first presented the idea of energy efficiency retrofit at an owners meeting, the response was very positive. The main reason for this was the potential to improve the level of indoor comfort for residents and increase the property value and rental potential for 'major owners'.

By installing measures in the stairway, attic and neighbouring dwellings it was also hoped that the comfort in both apartments and communal areas would be improved.



*Side view of the buildings*

### Results

Loft insulation was installed throughout the blocks. This reduced the height of the loft space by 10cm, but significantly enhanced the energy efficiency. Residents who live in apartments immediately below the attic ceiling have reported considerably improved comfort. High performance doors have also been installed in communal areas to reduce draughts and heat loss; with the additional benefit of improved fire safety.

It was recommended that the stairwell glass brick façade be replaced with double-glazed PVC-frame windows, however residents are yet to reach a decision on this. It has also been recommended that the external walls and the stairwell walls are insulated. However fire regulations will not allow this work as the stairwell would become too narrow. Residents are yet to reach a decision about the external insulation.



*Glass-brick façade in the staircase*

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Measures installed/ recommended	Details	Reasons for installation/ recommendation	Projected annual savings for whole block		
			Kilowatt hours (kWh)	CO <sub>2</sub> (t)	Fuel bill (€)
<b>Loft insulation</b> (installed)	Rigidur DBE 031 TF 100 (flats) and Isover Ultimate Integra AP Supra-032 (stairwell)	Installed above flats and stairwell to improve indoor comfort and energy efficiency	10,400	30	990
<b>High performance insulating fireproof doors</b> (installed)	Ringo Type 4.1 – installed in the loft and staircase	Fire protection and reduced heat loss			
<b>External wall insulation</b> (recommended)	Rigidur DBE 031 TF 100	Increase comfort in the apartments by reducing heat loss.	No data available	No data available	No data available
<b>High performance double glazing</b> (recommended)	Stairwell	Replace glass brick windows in the stairwell to reduce heat loss	No data available	No data available	No data available

Table 1: Details and associated savings of the measures installed and recommended

### Challenges

The owner community of Klosterweiher has a complex social structure, which influenced the entire negotiation and energy retrofit process. Due to internal conflicts arising between different parties of owners, the decision-making process was highly complicated.

One of the main challenges in the communication and engagement process was to distinguish issues of energy efficiency from issues relating to maintenance and service of the residential complex. The owners' decision process was further hampered by a staff change at the property-management company that takes care of the facility.

### Successes

Joining together the efforts of the high-profile building management company and the legal and technical support from Fraunhofer IBP helped to support and encourage the owners to successfully install energy efficiency measures. These two teams worked together from the outset of the project, leading to increased engagement and ultimately an agreement between owners pursuing different interests. To date, approximately 180,000 Euros have been invested in energy efficiency measures; the first significant step for these owners towards reducing the energy consumption of their homes.

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