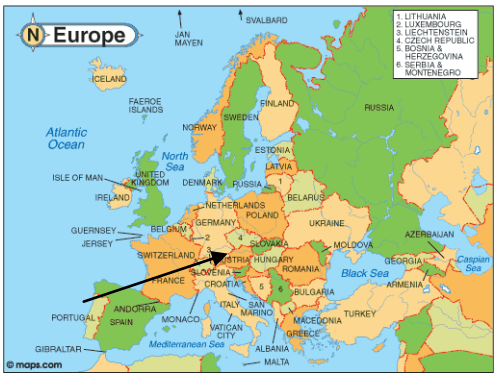

STEYR (Austria)

70 % energy saving
(estimated, exact number will be added later)
Breakaway of the balconies in an occupied building

Nearly free of thermal bridges

Project data

Location, address:	Kopernikusstraße 15, 17, 19, 4400 Steyr
Region:	Upper Austria
Surroundings:	North of the country; hilly landscape
Climate:	Continental
Heating degree days:	3653
Year of construction and renovation:	1962 (constructed); 2005 (renovated)
Typology:	Apartment building
No of dwellings:	36
Total floor area:	2,155.72 m²
Owner:	Styria – Gemeinnützige Steyrer Wohn- und Siedlungsgenossenschaft (social housing association)
Architect and Builder:	Styria
Costs of renovation:	€ 780,000 (incl. VAT)
Renovation financed by:	Loan and reserves by Styria, subsidies from Regional Government

Figure 1: Building after renovation

Objectives and Results

Approximately 30 – 40 years after the construction, the social housing association starts to renovate a building – it depends on the standard of the house and the wishes of the tenants. In this case, the association compared two different strategies in renovating the façade: The first option was the normal, well-known renovation approach and the second option was to demolish the old balconies, insulate the outside walls and then to construct completely new balconies.

The second option was chosen. The big challenge was to guarantee the security for the tenants, because they were living in the building when the balconies have been broken down and the new ones were built. They could not open their windows for some time, as this would have been too dangerous.

Renovation concept

Key renovation features

- Insulation of the façade
- Insulation of the top ceiling
- Insulation of the ground floor
- Exchange of the windows
- Breakdown and construction of new balconies
- New entrance doors
- New roof covering

State-of-the-art

Before renovation	After renovation
Constructions [U-values: W/m²K] • Top ceiling [4.41] • Ground floor [1.77] • Outside walls [0.79] • Windows [2.50]	*Constructions [U-values: W/m²K]* • Insulation of top ceiling [0.19] • Insulation of ground floor [0.42] • Insulation of outside walls [0.23] • Windows [1.2]
Installations • District heating • Some flats without balcony	*Installations* • District heating • Renovation of the roof • Mantelpiece • New entrance door • Completely new balconies for all apartments

Energy saving and monitoring

Energy consumption before renovation:
kWh/m²: will be added later
Energy Performance Indicator: will be added later

Energy consumption after renovation:
kWh/m²: will be added later
Energy Performance Indicator: 42 kWh/m²,a
Percentage saving 70 % (estimated)

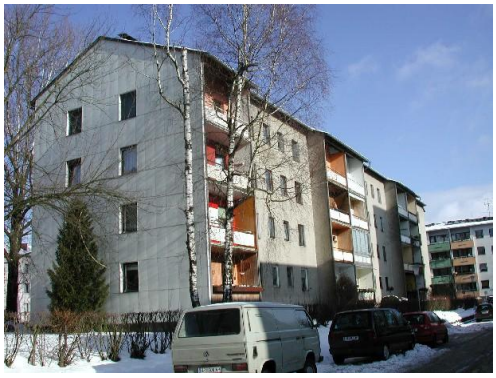

Figure 2: Building before renovation

Additional information

- Due to the demolition of the old balconies, it was possible to insulate the outside walls could be insulated very well and they are now nearly free of thermal bridges. After the façade was finished, the balconies were constructed free-standing in front of the building. Additionally, dwellings which had no balcony were provided with one – this means an important increase in living quality for the people living there.
- A very important point in this renovation project was the security of the occupants. They were very co-operative and watched the renovation without complaints, even though they had no sunlight for a certain period, because the balcony-door was obstructed by wooden boards. The new, larger balconies compensate these disturbances in every case.

Lessons learned and conclusions

- If the façade of a building is provided with a thermal insulation, normally the depth of balconies is reduced automatically. That is why they then cannot be used well any longer. In this case, this problem could be avoided – in the opposite – the depth of the balconies increased from 1 meter to 2 meters.
- The renovation of the façade with a simultaneous demolition of the balconies was a pilot project which was realised successfully. At the moment further projects in Wels and Schwanenstadt are carried out in the same way.

References

[1] STYRIA – Gemeinnützige Steyrer Wohn- und Siedlungsgenossenschaft, Preuenhueberstraße 3, 4400 Steyr, Tel.: +43 7252 52932, www.styria-wohnbau.at