



## SANKT FLORIAN (Austria)

**66 % energy saving potential**

**Better living quality**

**All owners are satisfied with the renovation**

### **Project data**

Location, address:	Ziegeleistraße 21, 23, 25, Saint Florian
Region:	Upper Austria
Climate:	Continental
Heating degree days:	3530 heating degree days
Year of construction:	1982
Year of renovation:	2005
Typology:	Apartment building
No of dwellings:	48
Total floor area:	4,172.86 m <sup>2</sup>
Owner:	Joint ownership of the apartment owners
Renovation design team:	WSG (social housing association) – Ing. Gert Foschum
Total costs of renovation:	€ 1,215,000
Renovation financed by:	Loan taken by WSG on behalf of the owners, owners, subsidies from Regional Government



Figure 1: Building after renovation

### **Objectives and Results**

Due to the poor condition of the building (windows and doors partly damaged), a renovation was necessary. The aim was to implement a comprehensive renovation and not only to exchange damaged parts of the building. As the building is jointly owned by the apartment owners, all of them had to agree to the renovation measures.

A reduction of the energy performance indicator from 110 to 34 kWh/m<sup>2</sup>m,a, corresponding to an energy saving of 66 % was achieved.

### **Renovation concept**

#### **Key renovation features**

- Insulation of façade
- Insulation of roof
- Insulation of ground floor
- New windows
- Renewal of the entrance areas (outside doors)
- In addition to the insulation of the top ceiling, the roof was renovated

## State-of-the-art

### Before renovation

#### Constructions [U-values: W/m<sup>2</sup>K]

- Outside walls [0.71]
- Outside doors [3.50]
- Top ceiling [0.50]
- Cellar ceiling [0.68]
- Windows [2.50]

#### Installations

- Gas heating system

### After renovation

#### Constructions [U-values: W/m<sup>2</sup>K]

- Outside walls [0.17 – 0.24]
- Outside doors [1.30]
- Top ceiling [0.11]
- Cellar ceiling [0.22]
- Triple glazing of windows [1.30]

#### Installations

- Gas heating system

## Energy saving and monitoring

#### Energy consumption before renovation:

kWh/a 509,000  
Energy Performance Indicator: 110 (estimated)

#### Energy consumption after renovation:

kWh/a: 171,300  
Energy Performance Indicator: 34  
Percentage saving: 66 %



Figure 2: Building before renovation

## Additional information

- The outside doors and window areas were old and partly damaged, so living in the building was not very comfortable anymore. That is why the owners requested a building renovation.
- However, the owners differed about the renovation measures. Some only wanted a “small renovation”, some owners wanted a comprehensive renovation of the building.
- The housing association organised a written survey where the apartment owners could choose between three options. As a result, the general, comprehensive renovation was implemented.

## Lessons learned and conclusions

- The energy saving potential is very high but depends also on the user behaviour. With the new windows and insulated outside walls, the owners have to learn new habits, e.g. in relation to heating, to airing and when to close the windows and sun blinds in summer. These are very important facts to fully realise the energy saving potential.
- The renovation phase is never easy for the people living in the building. There were problems with dust and dirt but in the end, when the renovation was finished, all owners and tenants were happy and satisfied with the “new” house.

## References

- [1] Gemeinnützige Wohn- und Siedlergemeinschaft regGenmbH (WSG), Ederstraße 9, 4020 Linz, Tel. 0732/66 44 71, [service@wsg.at](mailto:service@wsg.at)