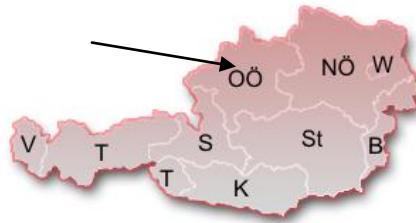




El-Education
Best practice example No 11 from Austria



**Wels
(Austria)**

55 % energy saving

512 m² thermal solar plant

Reduction of the total living expenses for the tenants

Project data

Location, address:	Traunaustraße 2+4, Fichtenstraße 14+16, 4600 Wels
Region:	Upper Austria
Surroundings:	North of the country, low hilly landscape
Climate:	Continental climate
Heating degree days:	3644
Year of construction and renovation:	1976 (constructed); 2002 – 2004 (renovated)
Typology:	Apartment building
No of dwellings:	296
Total floor area:	22,588.90 m ²
Owner:	Welser Heimstätte (social housing association)
Architect and Builder:	TB Öko Energie Greif (HVAC planer), Welser Heimstätte
Costs of energy saving measures:	Approx. € 6,240,000 (incl. VAT)
Renovation financed by:	Loan and reserves by Welser Heimstätte, subsidies from Regional Government



Figure 1: Buildings after renovation

Objectives and Results

Due to the age of the buildings and the developments of the technical standards of the last decade, the renovation of the buildings regarding thermal insulation, energy sources and façade was overdue for a long time.

An energy performance indicator of 40 kWh/a was calculated which reflects the renovation of the façades on new building standard, a refurbishment of the heating system as well as the integration of a thermal solar plant for domestic hot water production.

In summer 2002 the renovation of the first house started, 2004 the work on the fourth and last building was completed.

Renovation concept

Key renovation features

- Insulation of façade,
- Insulation of roof
- New windows
- Renewal of all lavatory cisterns due to high losses
- Installation of a thermal solar plant on each house
- Renewal of the gas heating system

State-of-the-art

Before renovation

Constructions [U-values: W/m^2K]

- Non-insulated roof [0.75]
- Non-insulated façades [0.82]
- Windows [2.5 – 2.8]

Installations

- Gas heating system

After renovation

Constructions [U-values: W/m^2K]

- Insulation of roof [0.16]
- Insulation of façades [0.24]
- Windows [1.60]

Installations

- Exchange of the old gas boiler – now high efficiency condensing gas boiler
- 512 m² thermal solar plant (128 m² on each building)
- Renewal of all lavatory cisterns due to high standstill consumptions

Energy saving and monitoring

Energy consumption before renovation:
kWh/m²

Energy Performance Indicator 87 kWh/m²,a

Energy consumption after renovation:
kWh/m²:

Energy Performance Indicator 39 kWh/m²,a

Percentage saving 55 %



Figure 2: Buildings after renovation

Additional information

- The concept for the renovation project was developed in co-operation with the O.Ö. Energiesparverband, the regional energy agency of Upper Austria. The aim of the project was an optimal insulation of the building and the installation of a thermal solar plant for the hot water supply.
- Lavatory cisterns with a function for reduction of water for flushing were installed in the toilets. With this measure a considerable reduction of water consumption was achieved.
- In the building partly socially very disadvantaged occupants are living, for whom the saving of heating costs and the profit in living comfort mean really very much.

Lessons learned and conclusions

- Two years after the renovation of the buildings, an increased satisfaction of the tenants and a larger appreciation regarding the apartments and the buildings could be actually determined.
- Due to the installation of the large thermal solar plants and the insulation of the façade, the energy and water costs were significantly decreased.
- The tenants readily agreed to the renovation measures because they understood that comprehensive renovated buildings mean better life and living quality.

References

- [1] Gemeinnützige Welser Heimstättengenossenschaft, Laahener Straße 21a, 4600 Wels, T: 07242-46494-0, welser.heimstaette@whg.at, www.whg.at