PROJECT SUMMARY
Renovation of a historic building in Irdning built in 1567, with four flats and two shops. Complies with low energy requirement.

SPECIAL FEATURES
- Central mechanic ventilation system with heat recovery
- Activation of the thermal mass
- 8 m² solar panels for domestic hot water

ARCHITECT
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OWNER
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Private

Historic Building in Irdning - AT

IEA – SHC Task 37
Advanced Housing Renovation with Solar & Conservation
BACKGROUND
The enclosure of this two storey, 16th century building was in a poor condition. The massive exterior walls were not insulated and damp. The original windows were still in place. Space heating was supplied by a central oil furnace to meet the demand of 205 kWh/(m²a). Domestic hot water was heated by electricity. In 2006 the building was renovated, with attention to ecological issues and the heating demand was reduced to 38 kWh/(m²a). The renovation was done without subsidies.

OBJECTIVES OF THE RENOVATION
• Reduction of the heating costs to a minimum
• Attention to ecological issues and using renewable resources
• Optimised building performance meeting local "low energy standards"
• Preservation of the exterior appearance of the building

SUMMARY OF THE RENOVATION
• High insulation of the facade, roof and basement
• Renovation of the old windows, restoration of the doors
• Closing in part of the court space
• Construction of four flats
• Preservation of ceiling and walls with stucco ornamentation
• Central ventilation system with heat recovery
• Solar panels for domestic hot water preparation
• District heating with biomass
• Activation of the thermal mass
• Modernized electrical and sanitary installations
CONSTRUCTION

Roof construction  \[ U-value: 0.178 \text{ W/(m}^2\text{K)} \]
(interior to exterior)
- plasterboard  15 mm
- boarding  24 mm
- cellulose insulation  220 mm
- boarding  24 mm
- ventilation space
- lathing  40 mm
- roof covering
Total  323 mm

Wall construction  \[ U-value: 0.245 \text{ W/(m}^2\text{K)} \]
(interior to exterior)
- lime plaster  15 mm
- solid brick  500 mm
- mineral wool insulation  140 mm
- lime plaster  20 mm
Total  675 mm

Basement ceiling  \[ U-value: 0.285 \text{ W/(m}^2\text{K)} \]
(top down)
- slab  15 mm
- floor screed  60 mm
- cork insulation  130 mm
- reinforced concrete floor  100 mm
- crushed brick  150 mm
Total  455 mm

Activation of thermal mass

Renovated box-type window

Mildew in the ground floor

Removing the existing floor
**BUILDING SERVICES**

A new central ventilation system with heat recovery (efficiency > 95%). A ground-air heat exchanger preheating cold incoming air. Space heating is provided by a biomass fired district heating. Heat is delivered by activating the thermal mass from the building and a few radiators. Domestic hot water is heated by solar panels and backed up by the central district heating, instead of a central electric boiler.
**Summary of U-values W/(m²·K)**

<table>
<thead>
<tr>
<th></th>
<th>Before</th>
<th>After</th>
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<tbody>
<tr>
<td>Attic floor</td>
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<td>0.18</td>
</tr>
<tr>
<td>Walls</td>
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<td>Basement ceiling</td>
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<td>0.29</td>
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<tr>
<td>Windows</td>
<td>ca. 2.7</td>
<td>1.35</td>
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</table>

**ENERGY PERFORMANCE**

Space + water heating (primary energy)*
Before: 331.7 kWh/(m²a)
After: 24.64 kWh/(m²a)
Reduction: 93% * according to OIB Richtlinie 6

**RENEWABLE ENERGY USE**

8 m² solar panels for domestic hot water preparation are installed on the southeast-oriented roof. High use of ecological material.

**INFORMATION SOURCES**

Hegedys & Ull Gebäude und Naturraum Projektierung GMBH Mitterfassnitzberg 31 8302 Nestelbach bei Graz www.hegedys-ull.at

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PROJECTS in AUSTRIA

PROJECT SUMMARY

P1  Apartment building in Kierling
P2  5 story apartment house in Linz
P3  Enhancement house Wimmer in St. Valentin
P4  Single-family house in Pettenbach
P5  Old people’s home in Landeck
P6  Housing in Purkersdorf
P7  Historic building in Irdning
P8  Enhancement in Mautern
P9  Attic conversion in Innsbruck
P10 House Schilchegger in St. Martin
P11 Single-family house Kraiger in Kufstein
P12 Apartmentbuildings in Dornbirn

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