



## FACTSHEET

# Demonstration building IN28


Fennerstraße & Oswald-Redlichstraße  
Innsbruck, Austria

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SINFONIA stands for "Smart INitiative of cities Fully cOmitted to iNvest In Advanced large-scaled energy". This project has received funding from the European Union's Seventh Programme for research, technological development and demonstration under grant agreement No 609019

# PROFILE

<b>Name and address</b>	<p>Name of the demo site: <b>NHT IN28</b></p> <p>Address of the demo site:  <b>Fennerstraße 4,6,8,10,12,14 &amp; Oswald-Redlich-Straße 7,9,11</b>  <b>6020 Innsbruck, Austria</b></p>		
<b>Map</b>	 <p>Source: Google maps</p>		
<b>Description</b>	<p>The demonstration buildings consist of two blocks or residential buildings located at Fennerstraße 4,6,8,10,12,14 and Oswald-Redlich-Straße 7,9,11, in Innsbruck, all built in the second half of the 20th century. Similar interventions to increase the comfort and energy performance have been implemented by owner NHT in all buildings. These included both process and technical innovations (e.g. tenants involvement process, implementation of ventilation system, insulation, PV on the rooftop, etc.). All in all, both NHT and the tenants are fully satisfied with the completed refurbishment of IN 28.</p>		
<b>Ownership</b>	<b>NEUE HEIMAT TIROL (NHT)   <a href="http://www.neueheimattiro.at">www.neueheimattiro.at</a></b>		
<b>Gross volume</b>	7.691,03 m <sup>2</sup>	Gross surface	6.994 m <sup>2</sup>
<b>Number of dwellings</b>	84		
<b>Energy performance</b>	BEFORE	211.34 kWh/m <sup>2</sup> *a	
	AFTER	72.12 kWh/m <sup>2</sup> *a	



# 1 - Description before refurbishment

<p><b>Detailed characteristics of building</b></p>	<p>All objects are patched via 2 long complexes of buildings and 2 small ones.</p>
<p><b>Plot map</b></p>	
<p><b>Building envelope</b></p>	 <p>IN28 is a typical building block constructed in the second half of the 20th century with related challenges with regards to insulation, electric cables, low performing windows, non-insulated roofs and cellars, etc.</p>
<p><b>Technical system</b></p>	<p>The buildings were all equipped with decentralized heating systems.</p>
<p><b>Energy performance certificate</b></p>	<p>Category C</p>





## 2 - Refurbishment concept

### Concept



### Energy solutions

The main interventions relate to insulation:

- Thermal renovation of the walls, the ceiling, the roof and the windows with triple-glazing.
- Thermal bridges of the balconies will be eliminated by insulation of the floor of the balconies.
- The attics will be insulated with 30 cm, the walls to the stairways with 10 cm Tektalan (mineral wool).

Other technical solutions include:



	<ul style="list-style-type: none"> <li>• Partial installation of new gas boilers.</li> <li>• VAV controlled central ventilation system placed in the cold attic.</li> <li>• DHW via electric de-central water heater</li> <li>• New LED lighting in common areas.</li> <li>• The PV system will be installed as a full feed system, so that the generated energy will be feed in the public grid and get the power compensated by the Austrian agency for green electricity oemag.</li> </ul>
<b>Performances targets</b>	The objective is to achieve a calculated energy consumption per m <sup>2</sup> of total used conditioned floor area of about <b>24 kWh/m<sup>2</sup>*a</b> . In addition electricity savings between <b>30 – 40%</b> should be realised.
<b>Financing model</b>	The refurbishment is financed via a mix of reserves as well as local/ regional /national/ EU funding.

Envelope details	
<b>Roof to wall insertion section (thermal bridge)</b>	<ul style="list-style-type: none"> <li>- Replacing windows with triple glazing, achieving about 70 % better thermal performance and in addition with building integrated PV</li> <li>- Insulation of the attic floor by adding 20 cm EPS in addition to the existing 10cm</li> </ul>
<b>Ground to wall section (thermal bridge)</b>	<ul style="list-style-type: none"> <li>- No additional thermal insulation is possible due to regulations</li> </ul>
<b>Wall to fenestration section (thermal bridge)</b>	<ul style="list-style-type: none"> <li>- Thermal insulation of façade (22cm EPS)</li> <li>- Thermal insulation of inner yard (12cm Polyurethan)</li> <li>- Perimeter Insulation between 6 -14 cm</li> </ul>

Technical system													
<b>Mechanical ventilation</b>	3 centralised ventilation systems will be installed and connected to 32 of the 84 dwellings.												
<b>Thermal renewable integration</b>	None												
<b>Electric renewable integration</b>	<table> <tr> <td>Nominal power of PV IN 28:</td> <td>41,08 kWp</td> </tr> <tr> <td>Mounting type</td> <td>Roof mounted parallel</td> </tr> <tr> <td>Elevation</td> <td>574 m a.s.l.</td> </tr> <tr> <td>Tilt</td> <td>25°</td> </tr> <tr> <td>Azimuth angle</td> <td>248 °/126°</td> </tr> <tr> <td>Financial model</td> <td>Feed-in-tariff</td> </tr> </table>	Nominal power of PV IN 28:	41,08 kWp	Mounting type	Roof mounted parallel	Elevation	574 m a.s.l.	Tilt	25°	Azimuth angle	248 °/126°	Financial model	Feed-in-tariff
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	Nominal power of Fennerstraße	27,82 kWp
	PV array area	178 m <sup>2</sup>
	Module type	Solarwatt Blue 60 P, 260 Wp
	Inverter type	1 x Fronius Symo 20.0-3-M 1 x Fronius Symo 8.2-3-M
	Nominal power of Oswald-Redlich-Str.	13,26 kWp
	PV array area	84,8 m <sup>2</sup>
	Module type	Solarwatt Blue 60 P, 260 Wp
	Inverter type	1 x Fronius Symo 12.5-3-M



## 3 - Implementation

### Stakeholders involved

<b>Contracting authority</b>	NHT Neue Heimat Tirol
<b>Project manager</b>	Gerda Maria Embacher
<b>Architect</b>	Arch. Hanno Vogl-Fernheim
<b>Envelope designer</b>	Arch. Hanno Vogl-Fernheim
<b>Master builder</b>	Firma Thomas Bodner, Kufstein
<b>Technical system designer</b>	Fa. Klimatherm, Zirl (HKSL) Fa. Obwieser, Absam (ELO)
<b>Windows supplier</b>	Fa. Alutherm, Innsbruck
<b>Safety supervisor</b>	Kopecky Karin
<b>Carpenter</b>	Hutter und Söhne, Innsbruck

### Costs and financing

<b>Refurbishment costs</b>	Total about € 2,5 Mio.
<b>Financial resources</b>	The renovation is financed by NHT with contribution from local, regional, national and EU funds. The works will lead to an increase of the monthly rent from 4.38 €/m <sup>2</sup> *month to 4.71 €/m <sup>2</sup> *month whilst reducing the average charge for operation, maintenance and other running costs from 1.25 €/m <sup>2</sup> *month down to 0.85 €/m <sup>2</sup> *month.

### Work progress

<b>Important points of refurbishment process and short description</b>	The challenges in the course of the refurbishment of residential buildings are complex and multilayered. On the one hand, monetary reasons to finance such projects, because the tenant has to co-finance parts of
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the renovation. Therefore a lot of persuasion and educational work are necessary. On the other hand also legal challenges have to be solved. The most intensive persuasion is to be done in the field of nearly zero energy house renovation and in particular the installation of the ventilation systems with building users living in the flats.





## 4 - Description after refurbishment

**Picture of building(s) after renovations**



<b>Envelope characteristics</b>	See above
<b>Technical system</b>	See above
<b>Renewable energy sources</b>	Prognosis of the yearly yield: 43,755 kWh/a
<b>Energy consumption</b>	72.12 kWh/m <sup>2</sup> *a



# Energy efficiency certificate

SPEZIFISCHER HEIZWÄRMEBEDARF, PRIMÄRENERGIEBEDARF, KOHLENDIOXIDEMISSIONEN UND GESAMTENERGIEEFFIZIENZ-FAKTOR (STANDORTKLIMA)

	HWB SK	PEB SK	CO <sub>2</sub> SK	fGEE
A++				
A+				
A				A
B	B	B	B	
C				
D				
E				
F				
G				

