



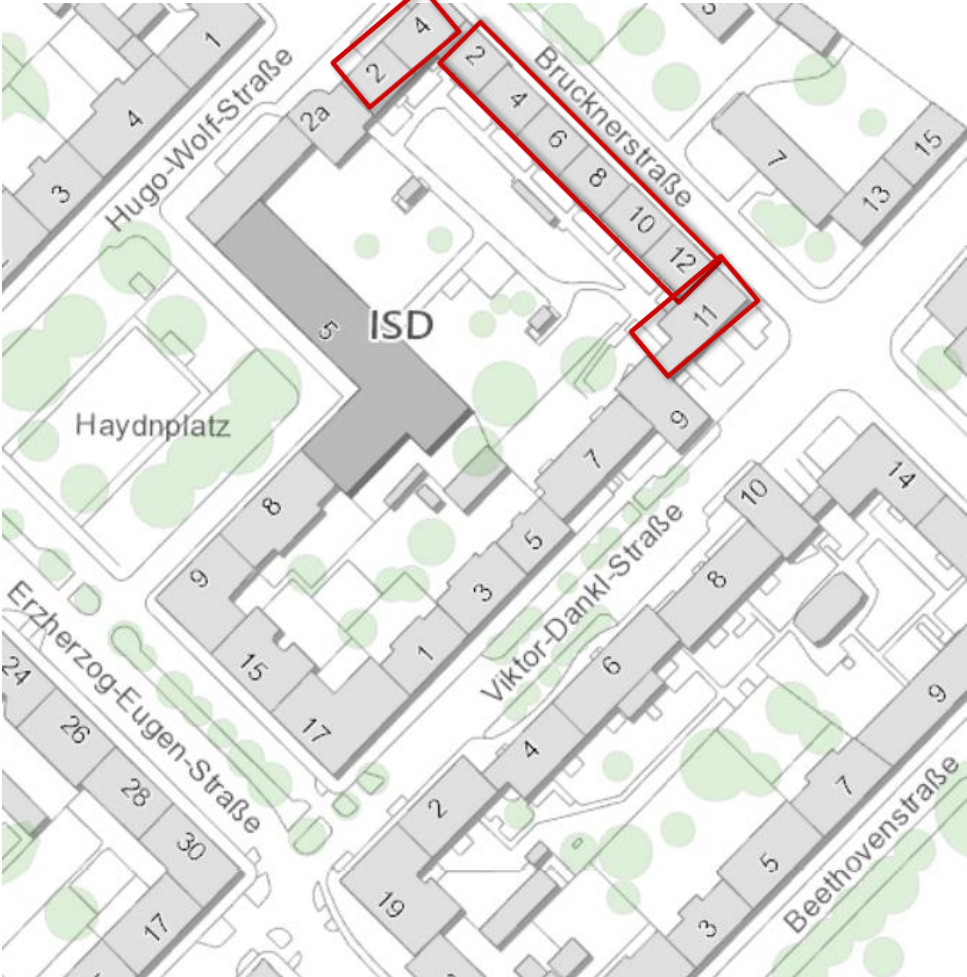
Factsheet

Brucknerstraße 2,4,6,8,10, 12 /
Hugo-Wolf-Straße 2,4 / Viktor-
Danklstraße 11
6020 Innsbruck, Austria



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

Name and address	<p>Name of the demo site: <i>NHT IN13</i></p> <p>Address of the demo site: <i>Brucknerstraße 2,4,6,8,10, 12 / Hugo-Wolf-Straße 2,4 / Viktor-Danklstraße 11 in 6020 Innsbruck, Austria</i></p>
Map	<p>City map highlighting the surface occupied by the demo site</p>  <p>Source: http://city-map.innsbruck.gv.at</p>
Description	<p>NHT already finished the innovative overall building renovation, consisting of the thermal renovation of walls, ceiling and windows with triple-glazing. The thermal bridges of the balconies will be eliminated by insulating the floor of the balconies from below. 20% of all flats have been equipped with a decentralised, flat-specific ventilation system with heat recovery. The rest of the flats will be equipped with these systems progressively. New gas boilers are already partly installed.</p>



Ownership	<i>NEUE HEIMAT TIROL (NHT)</i>		
Gross conditioned floor area	5,710 m ²	Treated floor area (TFA¹)	5,197 m ²
Number of dwellings	92		
Heating demand (EPC²)	<i>BEFORE RENOVATION</i>	107 kWh/m²*a	
	TARGET/AFTER RENOVATION	16 kWh/m²*a	
Heating demand (PHPP³)	<i>BEFORE RENOVATION</i>	110 kWh/m²*a	
	TARGET/AFTER RENOVATION	20 kWh/m²*a	
Overall savings	Current state (before completion of ventilation & heating system)	77 %	
	After completion of ventilation & heating system	85 %	



¹ Additional new area

² Energy Performance Certificate according to the Austrian Institute of Construction Engineering

³ Passive House Planning Package



1 - DESCRIPTION BEFORE REFURBISHMENT

Detailed characteristics of building	All objects are patched via 1 long and 2 short complexes of buildings.
Plot map	 <p>Source: Google maps</p>
Building envelope	 <p>IN13 is a typical building block constructed in the second half of the 20th century with related challenges in regards to insulation, electric cables, low performing windows, uninsulated roofs and cellars. The building block includes</p>




	newly constructed integrated apartments through expansion of the floors.
Technical system	Decentralised heating system
Energy performance certificate	Category D
Other relevant technical aspects	Not applicable

2 - REFURBISHMENT CONCEPT

Concept



	 <p>Thermal renovation of the walls, the ceiling, the roof and the windows with triple-glazing. Balconies were completely replaced by new thermal bridge-free ones. Decentralised, flat-specific ventilation with heat recovery was integrated.</p>
<p>Energy solutions</p>	<ul style="list-style-type: none"> • The facade is additionally insulated by 16 cm-thick EPS panels to the existing mineral wool of 6cm • Loggias are additionally insulated by 18 EPS-F panels to the existing mineral wool of 6cm • Replacement of windows with triple-glazing windows • Decentralised ventilation systems are placed in the bathrooms. The ventilation system is arranged under a cascade model. 19 of the 92 flats are already equipped with the ventilation systems, the rest of the flats is prepared to be equipped with these systems in the event of a change of residence • DHW and space heating is equipped with efficient, modern bio-gas driven gas-fired boilers with condensing technology • LED in all public spaces • The PV system is installed mainly for the self-supply of the building, feeding only the surplus of solar electricity into the public grid.
<p>Performances targets</p>	<p>Target is to achieve a calculated energy consumption per m² of total used energy per conditioned floor area of about 63</p>



	kWh/m ² *a (Heating and DHW according to the Handout Certificate).
Financing model	The refurbishment is financed via a mix of reserves as well as local/ regional/ national/ EU funding and includes an increase of the monthly rent.

Envelope details	
Roof to wall insertion section (thermal bridge)	<ul style="list-style-type: none"> Newly constructed apartments by expanding the floors according to the standards set by the Passive House Institute
Ground to wall section (thermal bridge)	<ul style="list-style-type: none"> Ceiling of unheated basements insulated with an additional 10-25cm-thick layer of cellulose
Wall to fenestration section (thermal bridge)	<ul style="list-style-type: none"> Thermal insulation of the façade (16cm EPS in addition to the existing 6cm-layer of wool) Loggias are insulated (18cm EPS-F in addition to the existing 6cm of wool) Replacement of windows with app. 70 % better thermal performance

Technical system															
Mechanical ventilation	19 of the 92 apartments are already equipped with ventilation systems and represent 20% of the building users. All other apartments will be upgraded in the event of a change of residence.														
Thermal renewable integration	None														
Electric renewable integration	<table> <tr> <td>Nominal power of PV IN 13:</td> <td>49,95 kWp, 330m²</td> </tr> <tr> <td></td> <td>SOLARWATT modules</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>10°</td> </tr> <tr> <td>Azimuth angle:</td> <td>225°</td> </tr> <tr> <td>Financial model:</td> <td>Feed-in-tariff based on maximising the self-supply of the building</td> </tr> </table>	Nominal power of PV IN 13:	49,95 kWp, 330m ²		SOLARWATT modules	Mounting type:	Roof mounted parallel	Elevation:	574 m a.s.l.	Tilt:	10°	Azimuth angle:	225°	Financial model:	Feed-in-tariff based on maximising the self-supply of the building
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3 - IMPLEMENTATION

Stakeholders involved	
Contracting authority	NHT Neue Heimat Tirol
Project manager	Gerda Maria Embacher
Architect	reitter architekten ZT GesmbH, Helmut Reitter, Innsbruck
Envelope designer	reitter architekten ZT GesmbH, Helmut Reitter, Innsbruck
Technical system designer	Opbacher Installationen GmbH, Fügen Alternativ Installationen, Innsbruck TKT Haustechnik GmbH, Rum
Construction company	Bodner Hans Ing. BaugesmbH & CO KG, Kufstein
Windows supplier	Farkalux GmbH, Kematen
Energy consultant, scientific support	University of Innsbruck and Passive House Institute – Department Innsbruck

Costs and financing	
Refurbishment costs	Total investment of app. € 4,1 Mio. (within seven elevators)
Financial resources	See financing model above



Work progress

Important points of refurbishment process and short description

The challenges in the course of the refurbishment of residential buildings are complex and multi-layered. Financial and social aspects and challenges need to be considered, because the tenant has to co-finance some parts of the renovation, which requires the implementation of persuasion and tenant engagement activities. Furthermore, legal challenges also have to be solved. The most intensive persuasion is to be done in the field of nearly zero energy house renovation and especially in cases where tenants are living in the flats during the time of ventilation system installations and other intrusive renovation activities

Within SINFONIA, NHT has pushed the installation of controlled ventilation with heat recovery in IN13. For the time being, 20% of the building occupants have agreed on this measure. Further extension is expected according to the fluctuations of the building users and corresponding rental contracts with the new tenants.



4 - DESCRIPTION AFTER REFURBISHMENT

<p>Photo to show architectonic concept</p>	
<p>Envelope characteristics</p>	<p>See above</p>
<p>Technical system</p>	<p>See above</p>
<p>Renewable energy sources</p>	<p>Prognosis of the yearly yield: 50,480 kWh/a</p>
<p>End-Energy use (EPC⁴)</p>	<p>Calculated with 63,2 kWh/m²*a</p>
<p>Energy efficiency certificate (EPC⁵)</p>	<p>Category A</p>
<p>EnerPHit pre-certificate for stepwise refurbishment (PHI⁶)</p>	<p>EnerPHiT certification is foreseen on short-term</p>

⁴ Energy Performance Certificate according to the Austrian Institute of Construction Engineering

⁵ Energy Performance Certificate according to the Austrian Institute of Construction Engineering

⁶ According to the rules of the international Passive House Institute

