



FACTSHEET

Demonstration building

Housing complex– via Brescia, Bolzano

Note: the content of this document will be subject to changes until the end of the Sinfonia project (May 2020)

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SINFONIA stands for "Smart INitiative of cities Fully cOmmitted 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	Europa-Novacella Quarter Via Brescia 1-3-5; via Cagliari 10-10/A
Map	 <p>Images ©2017 Google, Cartographic Data ©2017 Google</p>



Description	The building is located in the so-called 'semi-rural' district and delivered to the tenants in 1978. There are 106 apartments and 120 garages; the surface of the apartments varies from 45m ² to 102m ² . The building is divided into 5 staircases. The smallest block counts 7 floors and 21 apartments. The bigger has 8 floors and 24 apartments.	
Ownership	IPES-WOBI Social Building Institute of the Autonomous Province of Bolzano	
Gross volume	Circa 31.700 m ³	
Gross surface	9.402,54 m ²	
Number of dwellings	106	
Energy performance		
	Energy consumption excluded RES contribution	
	BEFORE	220,78 kWh/m ² yr
	AFTER	61 kWh/m ² yr
	Energy consumption included RES contribution (Total Building Energy Use)	
	AFTER	48,53 kWh/m ² yr




1 - Description before refurbishment

<p>Detailed characteristics of building</p>	<p>The building has a traditional structure with reinforced concrete pillars and beams, a roof with prefabricated sheet panels with weight reduction polystyrene and concrete casting in place, basement retaining walls in reinforced concrete and continuous foundation beams.</p> <p>The five staircases (named 10, 10A, 5, 3, and 1) are together 106 meter long. The last one (number 1 in the picture) is the smaller with only 7 floors, the other are all 8 floors high but the total high of each one is a little bit different. For these reasons, the roofs have different altitude and orientation.</p>
<p>Plot map</p>	 <p>Images ©2017 Google, Cartographic Data ©2017 Google</p>
<p>Building envelope</p>	<p>The external walls are built in masonry, with a structure composed by 10cm wall tiles, 6cm air layer, and 10cm wall tiles. The estimated U value of these walls is $U=1,44 \text{ W/m}^2\text{K}$</p> <p>Therefore, the "predalle" roof structural type has an estimated value of $U=1,12 \text{ W/m}^2\text{K}$</p> <p>Windows are double glazing panels with the following thermal values: double panel glass: 6+12+6 $U_g = 2,7$; wood frame: $U_f = 1,4$; aluminum spacer. The estimated U_w value is $U_w = 3\text{W/m}^2\text{K}$.</p> <p>This type of building structure can be assumed as quite typical on the 70es, the period of construction.</p>

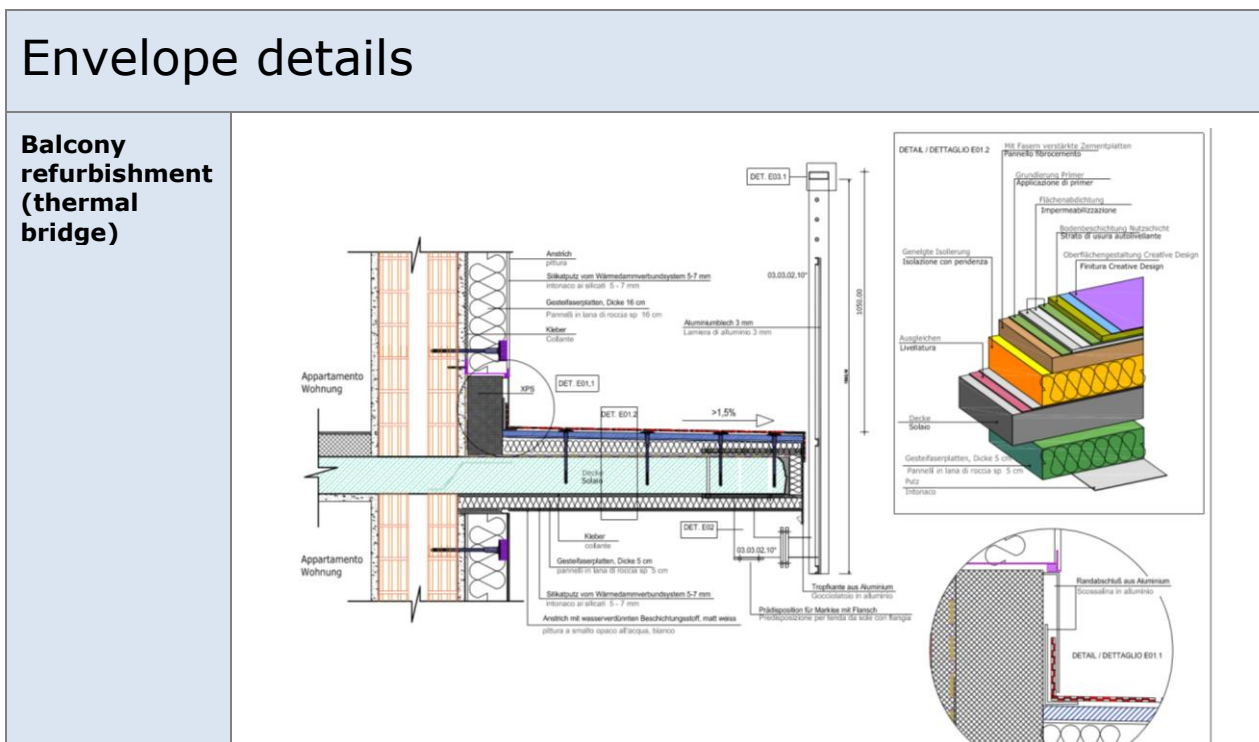


2 – Refurbishment Concept

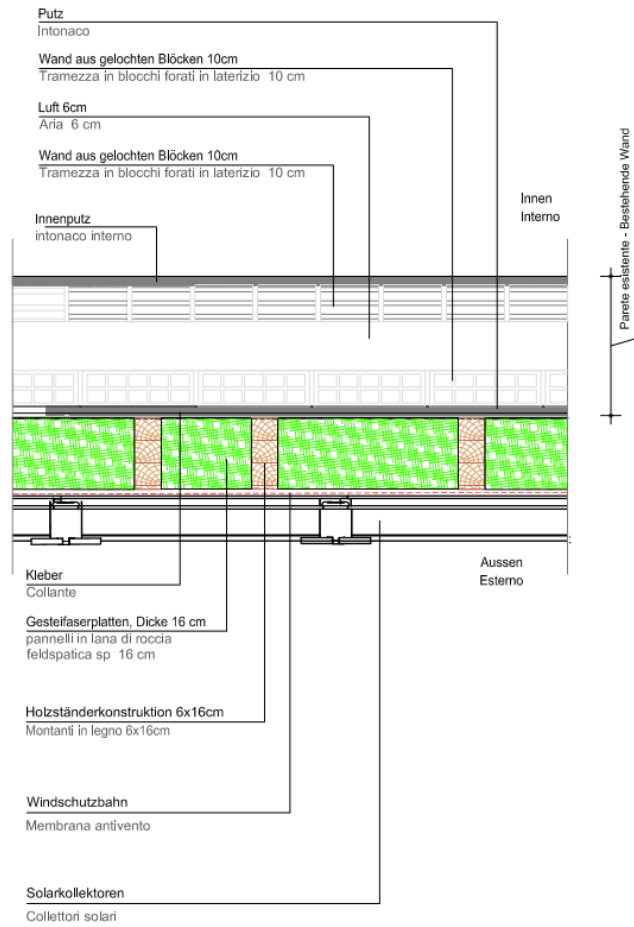
<p>Concept</p>	<p>The building needs to be refurbished in order to renovate the envelope within the replacement of external doors and windows, included the concrete frames to remove the thermal bridges; substitute the parapets of the balconies, degraded because weather-beaten, with new railings; restore the hydrothermal and the electrical systems; renovation of the roof by converting the roof space into new apartments.</p> <p>The insulation of the building facade will be a 16 cm rock wool layer, while the insulation of the cellar ceiling will be with 10cm rock wool layer, however 210 cm internal height will be granted; furthermore, the enlargement of the stairwell with glass and metal structures, to contain the new technical installation, is needed.</p> <p>The final aim is to improve the energy efficiency of the building to reach enveloping performances of at least 25 kWh/m²yr. Moreover, a 260m² solar-thermal system will be installed to cover at least 50% of the building's hot water demand. Finally, a 20kWh photovoltaic system will be installed</p>
	 <p>Images: © Studio Tecnico Vettori</p>
<p>Energy Solutions</p>	<p>The following solutions have been planned: a new thermal solar plant of a 354m² will be installed, but not totally on the roof, 144m² will be positioned vertically in south multifunctional façade; this will lead to</p>



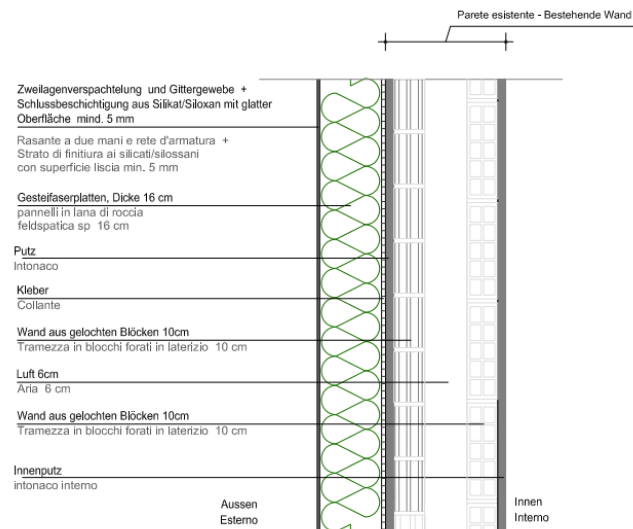
	<p>the dismissing of the residential gas plant. The massive power made available by the thermal system will require the installation of a large thermal accumulation. Therefore, the project will involve the construction of a special underground technical room capable of accommodating two accumulations for a total of over 40 m³.</p> <p>Furthermore, the renovation of the thermal power station will keep the heating and domestic hot water lines running during the construction site for residential flats; building of new lines of energy and sanitary water (cold) for new apartments and for those that will be renovated. They will all be equipped with a heat exchanger for domestic hot water production. The new apartments will be equipped with underfloor heating system; the renovated ones will be equipped with traditional radiators. A new of photovoltaic system, with a peak power of 20 kW to serve the common utilities.</p>	
Performances Targets	CasaClima A	
	Total Building Energy Use	48,53 kWh/m ² yr
	Global efficiency	15,91 kg CO ₂ /m ² yr
	RES contribution	54%
Financing Model	-	



Multifunktional Façade and wall section



Wall section



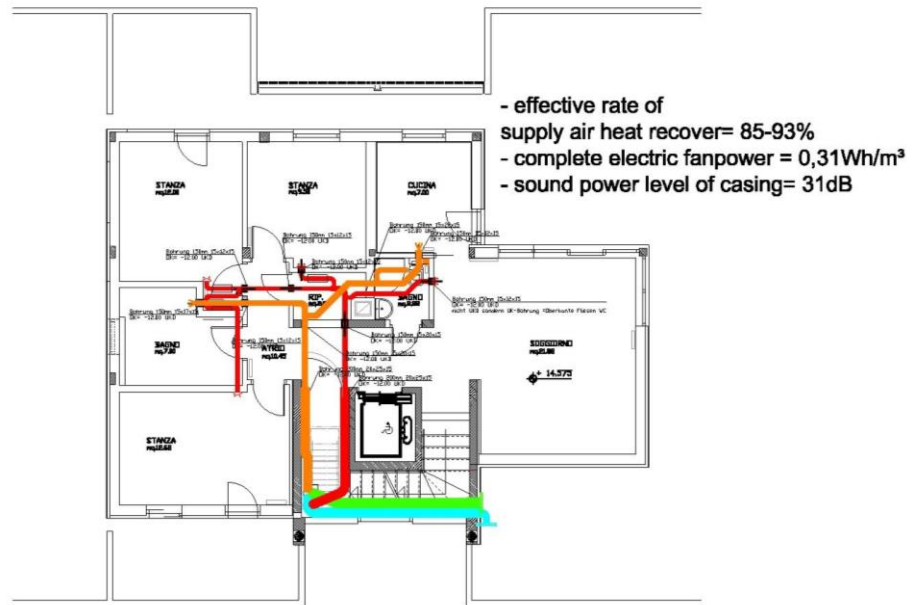
Images: © Studio Tecnico Vettori



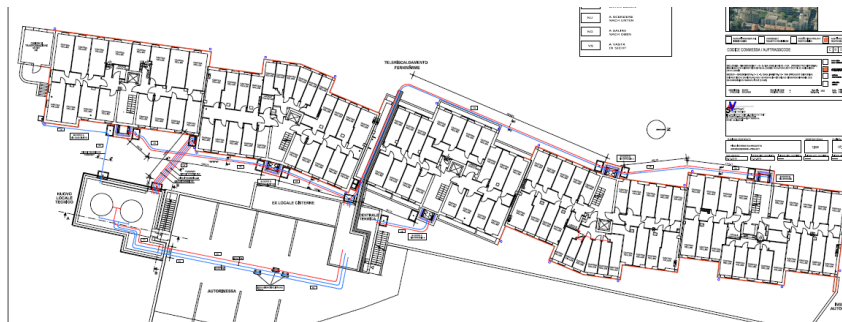
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Technical system

Mechanical ventilation



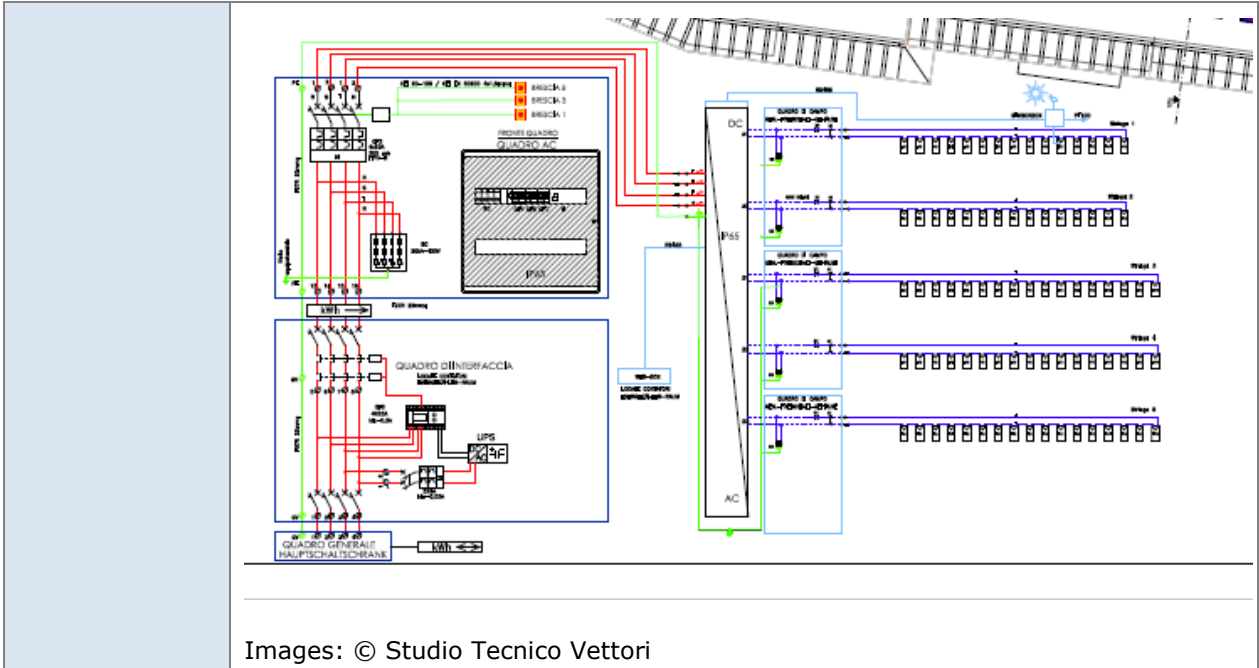
Hot water distribution



Electric renewable integration



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