

## Introduction



In between high apartment buildings and family houses the Sagedergasse project with nine dwellings, one office and a shop was realised. The dwellings are for rental in the social sector. The narrow shape of the area asked for typical architectural solutions. The project has the character of individual dwellings, while on the other hand it makes benefits of being one building block. This means that facilities are shared: collective energy systems, waterhousehold and parking.

The housing company started this project to have proven information on the use of ecological measures. The monitoring was for that reason financed by the housing company itself, without other public sources. The energy-saving measures are being monitored on costs and savings; no results are yet available. The housing company wants to use the results for future projects.

The project was nominated for Eurosolar competition in 1998.

<b>Clients</b>	<i>Gemeinnützige Siedlungsgenossenschaft Altmannsdorf und Hetzendorf Gen.m.b.H., Vienna</i>
<b>Architect and contact</b>	<i>Georg W. Reinberg, Lindengasse, Vienna architekt.reinberg@aon.at</i>
<b>Publications a.o.</b>	<i>HISE, December 1999, Georg W. Reinberg in Njegovo Ustvarjanje na Mejah ekologije in Arhitekture. L'Architettura Naturale, 6/99. Intelligente Architektur, 17. Mai 1999. Architektur und Bauforum, 3. 99.</i>
<b>Physics Websites</b>	<i>Ökoplan, Vienna and Patrick Jung, Cologne www.reinberg.net www.dbz.baunetz.de</i>

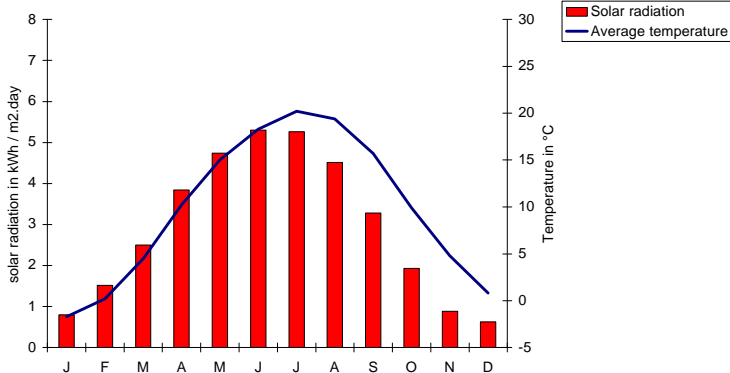
## Regional and Urban Context



The Sagedergasse project is situated between high rise housing and an area with family housing. Its fills up an empty space in this area.

The project has a central energy system from solar collectors, heat recovery and an earth tunnel for ventilation purpose. Although the orientation of the building is east-west, specific roof shapes gives optimal use of passive solar energy.

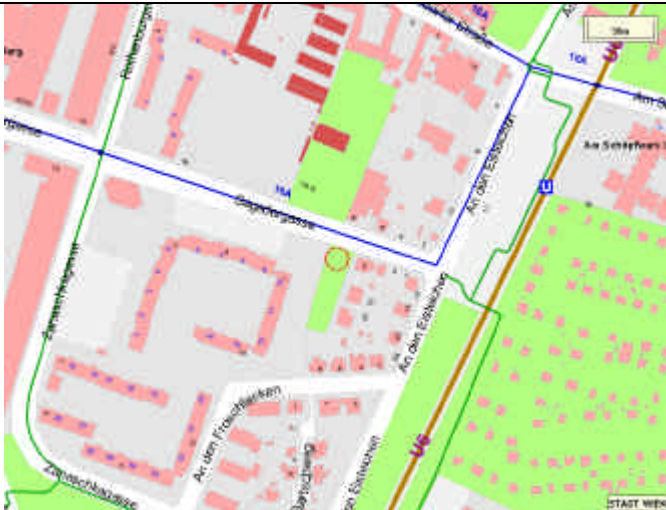
The dwellings are entered from a central walking corridor. Since each dwelling has its individual entrance, small garden, and terras on the roof, the building has the character of family houses. But the total building mass has to be a counterweight to the high buildings in the surroundings.



### climate

Type of climate	<i>continental</i>
Altitude (m)	190
Latitude	48°25' N
Longitude	16°37' E
Average ambient temp (°C)	10.2
January	2.0
July	19.1
Degree days (base 20/12°C)	3,413
Global irradiation (kWh/m²)	1,086
Sunshine hours (h)	

climate data Grossenzersdorf

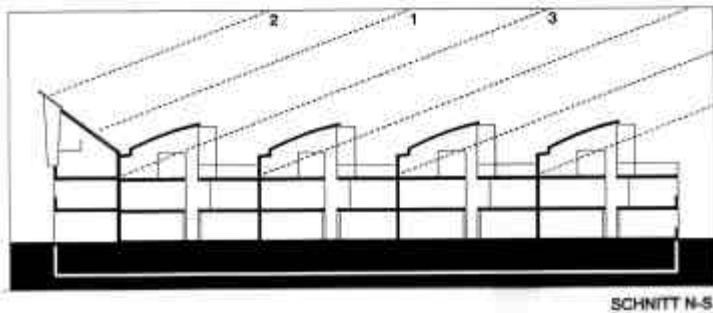
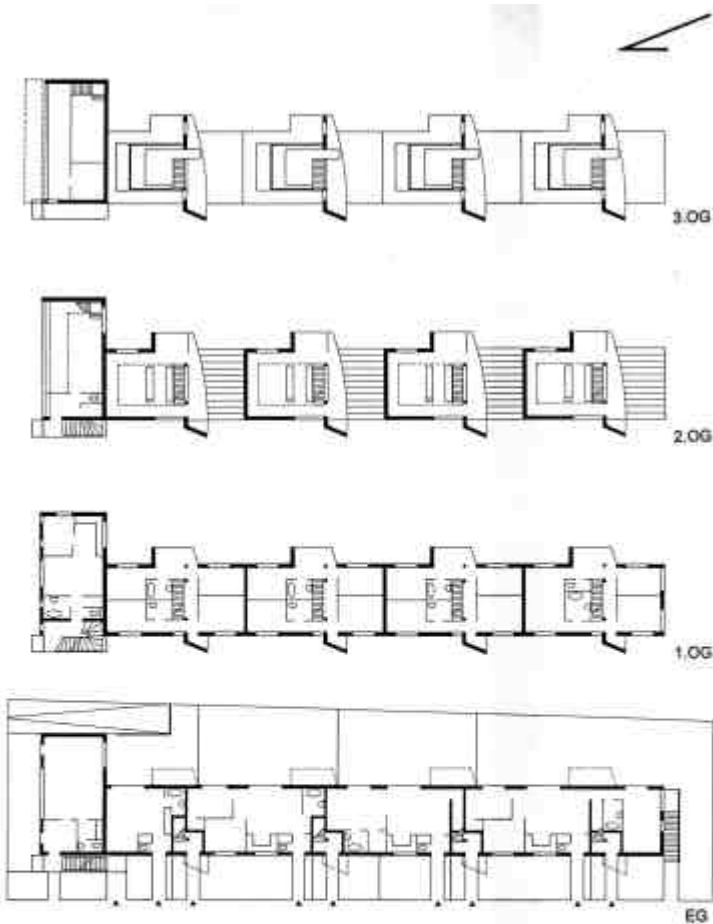


Situated in the city of Vienna the project has good connection to public transport (metro, bus) and bicycle routes



- Under the building block a central parking cellar is present.
- Rainwater is used both for the gardens as well as toilets.
- Waste management according to the Viennese regulations: separation of paper, plastic, metal, glass etc. and with containers on the side.

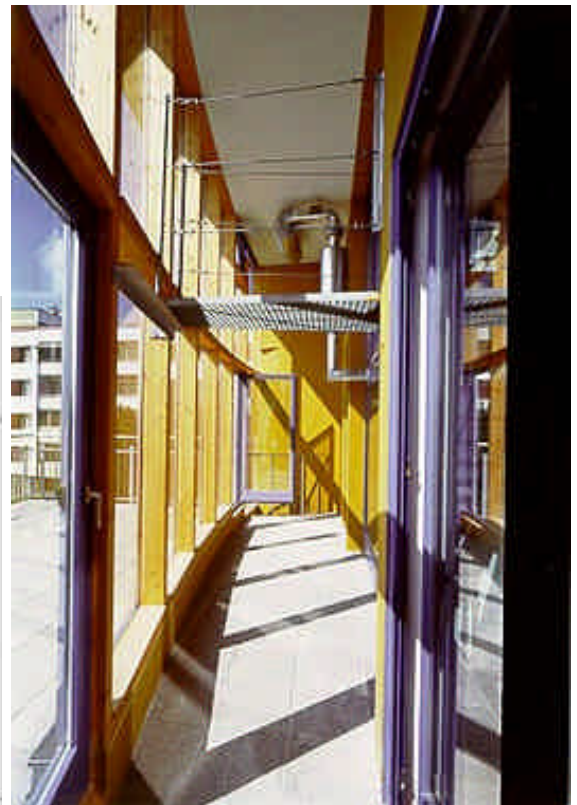
## Block and Building



### Green building aspects of the building

These aspect cover a wide range of environmental issues:

- Built within the good infrastructure of the city (good public transport etc.)
- Use of resource-efficient materials (brick, wood)
- Minimisation of energy and materials waste throughout the life cycle.
- Design of the building shell for energy efficiency.
- Site planning using natural resources: solar, rainwater.
- Indoor environmental quality - natural materials like wooden door frames and doors, wooden floor etc.
- Occupant health and productivity.
- Operation and maintenance systems to support waste reduction and recycling.
- Public transport, teleworking and bicycle provisions: subway station nearby (about 100 meters), bicycle route passing nearby (about 100 meters), bicycle area in the underground garage, bus passing by (see also: map including public lines).
- Water supply management: rain water collection.





Project Data	Project case		Reference case	
Construction Construction costs (€/m <sup>2</sup> )	1997-1998 1,300 (220 extra due to the area shape and size)		1,100	
<b>Urban plan</b> Area (ha) Floor Area (m <sup>2</sup> gross floor area) Floor Area Ratio (m <sup>2</sup> gross floor area)	0.125 with 0.424 built area 940 (net) 0.82			
<b>Transport</b> Distance to car park Distance to public transport Frequency of public transport Bicycle storage Telecommunication	garage 100 m 5 minutes within the garage phone			
<b>Waste separation</b> Construction and demolition waste Household waste Design for deconstruction	according to the Austrian law according to the Austrian law according to the Austrian law			
<b>Building Materials</b> Facades  Roof Window frames Internal walls Recycled materials	hollow bricks 10 cm isolation covered with plaster tin sheeted iron, glass (warm water collectors) wood gypsum board on wood frame		bricks, plaster  tiles wood, plastic brick, gypsum	
<b>Insulation</b> Ground floor area (m <sup>2</sup> /bldg) Roof area (m <sup>2</sup> /bldg) External wall area (m <sup>2</sup> /bldg) Window area total [m <sup>2</sup> /bldg South [m <sup>2</sup> /bldg]	<b>area (m<sup>2</sup>)</b> 390 433 708 485	<b>U-value (W/m<sup>2</sup>K)</b> 0.298 0.144 0.309 1.1 1.7	<b>area (m<sup>2</sup>)</b>	<b>U-value (W/m<sup>2</sup>K)</b>
<b>Ventilation system</b> Infiltration Exhaust Heat recovery Air exchange rate, heating season	ventilator through earth channel controlled through central ventilator yes, collective 0.5 per hour (can be adapted by the users)			
<b>Back-up systems</b> Space heating  Domestic hot water Cooling  Electricity production Ventilation	<b>system</b> district heating (city of Vienna) solar collectors earth to earth heat exchanger	<b>energy source</b> from cogeneration, trash burning and sim sun earth  public grid	<b>system</b> central heating or gas	<b>energy source</b> natural gas  natural gas
<b>Energy data</b> Space heating Space cooling Domestic hot water Electricity (total) Lighting Fans + pumps Small power	<b>(kWh/m<sup>2</sup>)</b> 18.4 - 10		<b>(kWh/m<sup>2</sup>)</b> -	
<b>Solar systems</b> Passive Active PV	wintergardens 56 m <sup>2</sup> none but foreseen			
<b>Water</b> Supply: Toilet system (4, 6, 9 litres) Shower Bath Sewage: Rainwater collection Grey water system	yes for garden and toilets public grid			