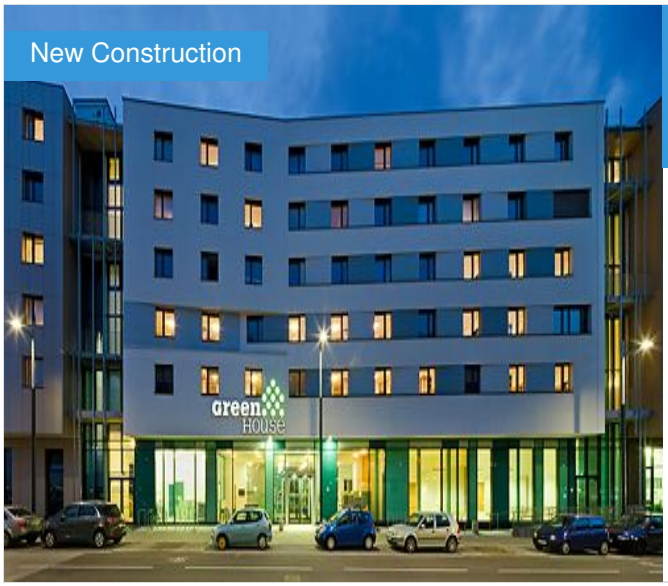
GreenHouse Student Dorm

by Martina Feirer / 2018-06-13 13:36:49 / Allemagne / 11395 / DE



Primary energy need :

136.4 kWhpe/m².year

(Calculation method : Other)

ENERGY CONSUMPTION

Economical building *Building*

< 50	A
51 à 90	B
91 à 150	C
151 à 230	D
231 à 330	E
331 à 450	F
> 450	G

Energy-intensive building

Building Type : Student residence
Construction Year : 2015
Delivery year : 2015
Address 1 - street : 1220 WIEN, Österreich
Climate zone : [Dfb] Humid Continental Mild Summer, Wet All Year

Net Floor Area : 9 860 m²
Construction/refurbishment cost : 14 000 000 €
Number of Dwelling : 256 Dwelling
Cost/m2 : 1419.88 €/m²

Certifications :

DGNB

Certifiée Maison Passive Passivhaus Institut [classic | plus | premium]

Proposed by :

General information

Data reliability

3rd part certified

Stakeholders

Contractor

Name : Porr Wien

Construction Manager

Name : Porr Wien

Stakeholders

Function : Others

OeAD-Wohnraumverwaltungs GmbH

Mag. Günther Jedliczka, Geschäftsführer, Ebendorferstrasse 7, 1010 Wien - housing@oead.at

https://housing.oead.at

Owner approach of sustainability

Already in 2005 there were first discussions with Mag. Christoph Chorherr (planning spokesman of the Green Vienna), DI Josef Lueger (Federal Real Estate Company) and Mag. Günther Jedliczka (managing director of OeAD-WohnraumverwaltungsGmbH) concerning the construction of a student dormitory in the seaside town of Aspern. An important prerequisite for the location of a new home in this largest urban development area of Vienna was the proximity to the subway and thus a connection to the universities within 30 minutes. After it had been ensured that there will be a subway connection to Aspern already in the construction phase, the OeAD-WV was looking for partners for this pioneering project. In July 2010, 6 architecture firms were invited on the basis of a competition to present ideas for a student residence with the minimum standard passive house. The project was chosen by aap.architekten ZT-GmbH, which had developed a convincing concept with the goal of zero energy standard. Furthermore, aap.architekten had already carried out student surveys in the course of their design planning, how attractive Aspern's location would be for young people and what they would expect from a student hostel. aap.architects have convinced with their experience in participatory processes and their knowledge in the field of ecological and energy-efficient construction.

Architectural description

Three home users, the Austrian Exchange Service Housing Administration (OeAD-WV), the Austrian Youth Movement (ÖJAB) and the Housing Association for Private Employees (WBV-GPA) have come together for the first time to jointly realize a forward-looking project in a new district - a highly efficient passive house for the Austrian and international students.

The architecture should visualize this ambitious project.

Design idea. The energy sources of the future for the urban development area are at the time of the design of solar energy, the energy from the air, which is recovered by the comfort ventilation with heat recovery in passive house construction and geothermal heat from the earth.

3 home users = 3 houses - Sun (OeAD-WV), Air (WBV-GPA), Earth (ÖJAB)

The connecting element in aspernist the sea - water. The three houses are connected by the transparent ground floor in the middle component and the main transparent staircases.

Building users opinion

Due to the wide variety of different forms of living and communal areas, every resident can individually design their living environment. The intermingling of international and Austrian students provides the opportunity to make new contacts beyond the borders of Austria and international students, who often spend only a short time in Austria, communication and meeting places throughout the house. The home management on site is available as a contact point for all wishes and suggestions. There are regular barbecues, parties and in the winter common biscuit baking. In addition, the immediate living environment of the seaside city offers many recreational opportunities and the city center and the university is not far away by metro.

Energy

Energy consumption

Primary energy need : 136,40 kWhpe/m^2.year

Primary energy need for standard building : 200,00 kWhpe/m^2.year

Calculation method : Other

Final Energy : 70,96 kWhfe/m^2.year

Breakdown for energy consumption :
HEB (heating energy demand): 54.54 kWh / m2a
HHSB (Household Electricity Demand): 16.43 kWh / m2a
And PEB (primary energy demand): 136.40 kWh / m2a

Envelope performance

Envelope U-Value : 0,23 $W.m^{-2}.K^{-1}$

More information :

Carried out Blower Door test for single and total building
Blower door test n50 = 0.24

Building Compactness Coefficient : 0,06

Indicator : EN 13829 - n50 » (en 1/h-1)

Air Tightness Value : 0,24

Users' control system opinion :

Blower Door Test n60=0,24

Renewables & systems

Systems

Heating system :

- Urban network
- Water radiator

Hot water system :

- Urban network

Cooling system :

- No cooling system

Ventilation system :

- Double flow heat exchanger

Renewable systems :

- Solar photovoltaic
- Other, specify

Environment

GHG emissions

GHG in use : 11,80 $KgCO_2/m^2$/year

Life Cycle Analysis

Eco-design material :

Use of products with ecolabels, linoleum, wooden floor

Water management

Use of water saving valves with extended cold water range in order to reduce the above-average WW consumption in dormitories.

Indoor Air quality

Use of chemicals management in tendering, awarding, planning and construction to avoid air pollutants by building materials used. Air quality measurement prior to occupancy of the building.

Products

Product

Trox air handling unit

BPS Engeneering in Zusammenarbeit mit der Fa. Trox

office@bps.co.at

http://www.bps.co.at/content/bps/

Product category :

Central ventilation unit with 2 parallel rotating heat exchangers, with heat and moisture recovery, CO2 controlled. The parallel rotating heat exchangers and the use of special pocket and pleated filters (F9) reduce the flow resistance of the ventilation system and thus reduce the energy consumption of the system.
• Ventilation unit Trox X-Cube with 2 rotary heat exchangers
• Air volume flow 6,000m³ / h per rotation exchanger
• Reverse heat number (EN308) 90.58%
• moisture content 73.14%.

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power storage

ASCR (Aspern Smart City Research) und Siemens

office@ascr.at

https://www.ascr.at/

Product category :

In order to reduce the surpluses that would have to be fed into the grid, a battery storage system was installed in the 2.UG as part of a research project. By an electrical power measurement at the root of the house, the excess can be measured and buffered in the battery system. At times of an energy deficit at the root, the battery can be discharged into the home network.
• Battery system AC-coupled
• lithium iron phosphate cells
• permanent maximum power: 150kW
• Energy storage size: 170kWh

Costs

Urban environment

Urban design and building structure. The GreenHouse is located at one of the most important intersections of the seaside city, with the main entrance on Sonnenallee, the ring road of the new district and on Maria Tusch Street, the future commercial street. The building structure was precisely defined by the master plan, a block perimeter building with continuous space forming edges along the business and ring road and a 4m high set back ground level zone on the sun avenue. By means of building regulations, the built-up area and the gross floor area and thus the usability of the individual building blocks were determined.

Since the building block on which the dormitory was to be built was divided into 2 building plots, the site revealed two areas with different specifications, which, if the building regulations were complied with, would only allow unfavorable E-shaped development. It was therefore requested to grant a deviation in the area of the development plan, the max. permissible overall development, however, complied with. The U-shaped development allowed a more appropriate and timely use by:

• the emergence of an undeveloped inner courtyard with less shaded open spaces

• Better exposure of the building and neighboring buildings

• more compact structures with smaller exterior wall surfaces, making it easier to use as a passive house

• even larger living space and fewer development areas

The recessed ground floor is an extension of the boulevard but also meeting area for the students. The transparent ground floor zone allows views into the courtyard and thus forms the transition from public street to Gemeinschaftshof.Die arranged on the ground floor communal areas such as laundromat, music practice rooms, meeting and meditation room, fitness rooms and saunas are oriented towards the street area in order to make student life accessible from the outside.

Due to the three different home operators, an interesting mix of residents and thus an important impulse for the new district can be expected.

In the leafy courtyard there is a variety of seating and hammocks for the residents, a paved area provides space for exercise and celebrations.

The multipurpose room on the 1st floor can accommodate smaller and larger events. The room is also rented to residents of the Seestadt for various festivals and thus promotes the communication of the student dormitory with its neighbors. Thanks to the natural exposure of the lowered area, the "blue ribbon", there is even a free area in front of the multipurpose room. The room is gladly accepted. The lower part of the "blue ribbon" is linked to the garden via a staircase.

The central staircase houses are preceded by space-like zones facing the inner courtyard, which continue via a staircase or ramp to the higher part of the garden. The higher part of the garden is divided into a quieter and a more active part. Steel pipes with fixed hammocks and the possibility to attach slacklines and other

hammocks invite you to chill out. In the more active zone, a large, open-access, fortified garden section is provided. Here, BBQ parties with the neighbors, punch drinking before Christmas and summer parties take place. Wooden decks in both zones invite you to linger.

Between the "blue ribbon" and the higher part of the garden, terraced shrubs and grasses were planted, oriented towards the building. They act both in the community central ground floor and in the multipurpose room. The barrier-free living community on the ground floor in the component SONNE is preceded by a generous, protected, private terrace.

On the side of the building (ERDE) on the Spielstraße a covered communal terrace is offered on the roof.

When planting, attention was paid to the use of regional plants.

Land plot area

Land plot area : 3 820,00 m^2

Built-up area

Built-up area : 2 028,00 %

Parking spaces

Under the building collective garage for this and surrounding three further construction areas with 172 cars + 9 motorcycle parking spaces, garage with E-loading points, 213 bicycle parking spaces in the basement, accessible via ramp, 33 bicycle parking spaces roofed in front of the building,

Building Environnemental Quality

Building Environmental Quality

- Building flexibility
- indoor air quality and health
- comfort (visual, olfactive, thermal)
- energy efficiency
- renewable energies
- mobility
- building process

Contest

Reasons for participating in the competition(s)

RESSOURCHEN

For economic reasons, the building had to be implemented in concrete construction with a full thermal protection facade. By an alternative development proposal, deviating from the original requirements of the master plan, a more compact structure could be implemented, which reduces the built-up area, at the same time ensures better tanning of the occupant rooms on the courtyard side and offers more living space and less development areas for the same area.

The compactness of the structures and the clear structural design grid across all floors, the use of semi-finished parts, prefabricated elements and floor slabs in the shell construction as well as the space-optimized development system allow for moderate construction costs despite high equipment quality and excellent energy values. Professional quality assurance and process support in the execution planning as well as in the construction work by the project management contributed significantly to the sustainability.

The rainwater is seeped through infiltration baskets in a core of the earth at the site. The water consumption is reduced by flow restrictors and by fittings with extended cold water range, as the requirement for hot water in dormitories is above average, significantly reduced.

ENERGY CONCEPT

For more than 10 years, all student residences of the OeAD-WV have been built only in the minimum passive house standard according to the guidelines of the Passive House Institute Darmstadt.

A highly insulated, preferably thermal bridge-free and airtight building shell as well as a comfort ventilation system with heat recovery are the basic requirements for reaching the passive house standard.

To achieve the zero energy standard, a centralized ventilation unit with 2 parallel rotary heat exchangers with heat and moisture recovery and special filters has been developed to reduce energy consumption. In the course of the research project, the ventilation could be carried out on demand and the energy consumption could be reduced. The residual heat requirement is covered by Fernwärme Wien.

The water heating is also provided by Fernwärme Wien.Mittels Wasserpararmaturen with an extended cold water range (cold water in the middle position), the hot water consumption, which is in the houses of the OeAD-WV from experience above average, be reduced.

On the flat roofs, the largest possible PV system was installed. In order to reduce the surpluses that would have to be fed into the grid, a battery storage system

was installed in the 2.UG as part of a research project. By an electrical power measurement at the root of the house, the excess can be measured and buffered in the battery system. At times of an energy deficit at the root, the battery can be discharged into the home network.

SPECIAL INNOVATIONS

Three home users, the Austrian Exchange Service Housing Administration (OeAD-WV), the Austrian Young Worker Movement (ÖJAB) and the Housing Association for Private Employees (WBV-GPA) have come together for the first time to jointly realize a forward-looking project in a new district - a highly efficient passive house for 313 Austrian and international students. Due to the three different home operators, an interesting mix of the residents and thus also an important impulse for the new district can be expected. The WBV-GPA has also taken on the role of developer and installer.

At the time of its opening, GreenHouse was the world's first certified Passive House Plus (PHI) student dorm, accompanied by a research project on electricity storage and monitoring energy consumption.

In 15 reference rooms, 5 in each component, an extended monitoring with various measurements takes place. For precise control of the energy balance of the building, calibrated heat meters, energy meters, electricity meters and water meters, temperature sensors, window contacts, humidity sensors, etc. are used distributed throughout the building. The meters are equipped with bus modules and communicate directly with the building management system (BMS). The research project is being carried out by ASCR (Aspern Smart City Research) and Siemens.

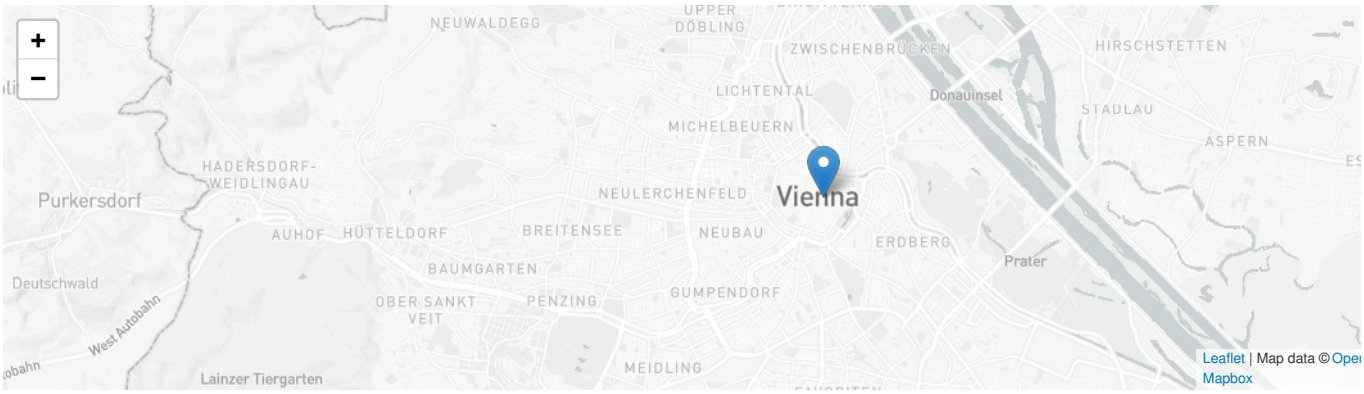
FLEXIBILITY

All forms of temporary living are possible. Due to the variety of space (single apartments, double rooms, shared apartments for 2 - 4 people in different equipment categories) usable for almost all user groups. The arrangement of the 3 buildings and the distribution of common areas on all buildings a mix of user groups is possible. The entire development in the building and the majority of all room units are barrier-free usable therefore a conversion as a senior apartment or assisted living is conceivable.

Building candidate in the category

Energie & gemäßigtes Klima

Abstimmung der Internet-Benutzer



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