Energeticky úsporná výstavba v Rakúsku

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University of Natural Resources and Life Sciences

Záverečná konferencia ingREs 2018
8.02.2017, Hotel Tatra, Bratislava

TENTO PROJEKT ZÍSKAL FINANČNÉ PROSTRIEDKY Z PROGRAMU EURÓPSKEJ ÚNIE PRE VÝSKUM A INOVÁCIE HORIZONT 2020 NA ZÁKLADE DOHODY O GRANTE Č. 646128 - INGREES

Vienna population development

1914: 2,2 Mio. inhabitants

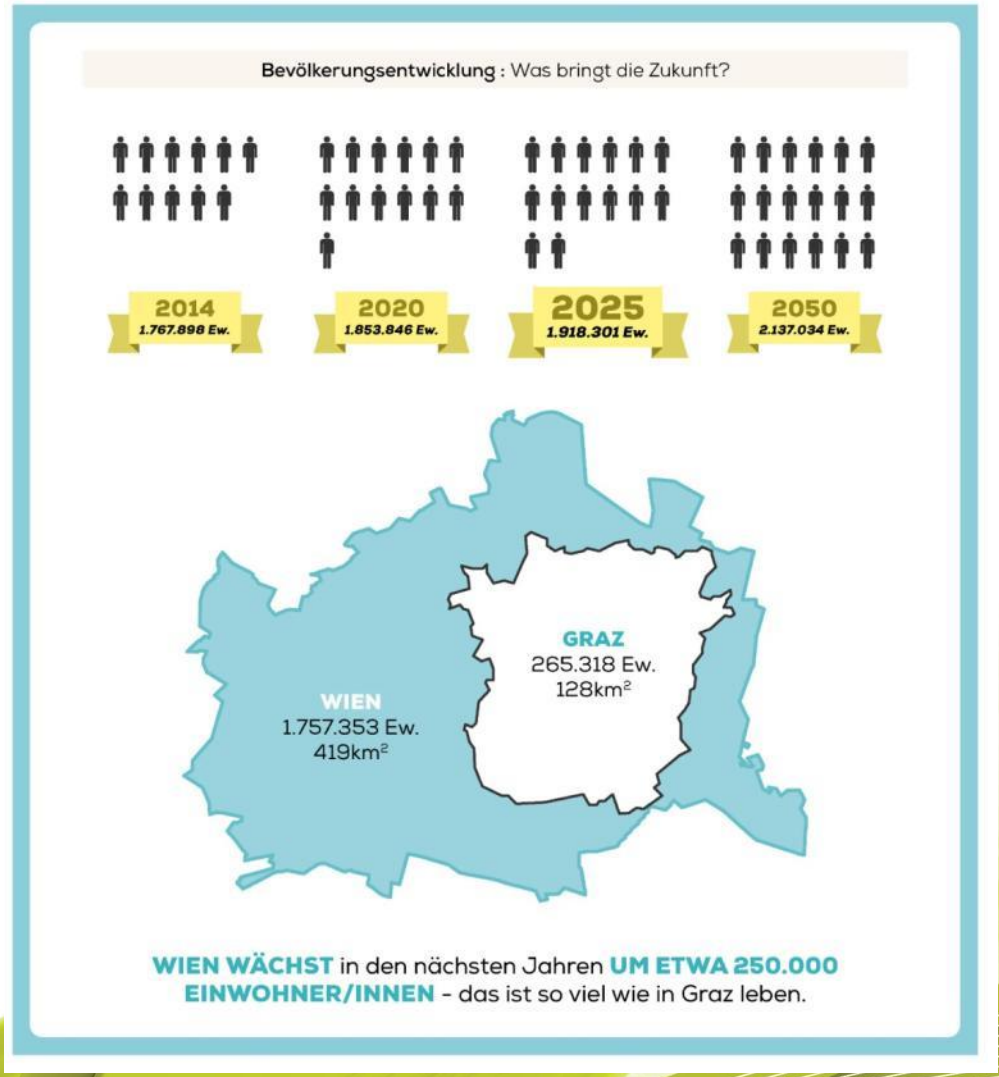
1960: 1,6 Mio. inhabitants

2013: 1,75 Mio. inhabitants
+ 26.117 inhabitants (+ 1,5 %) / year

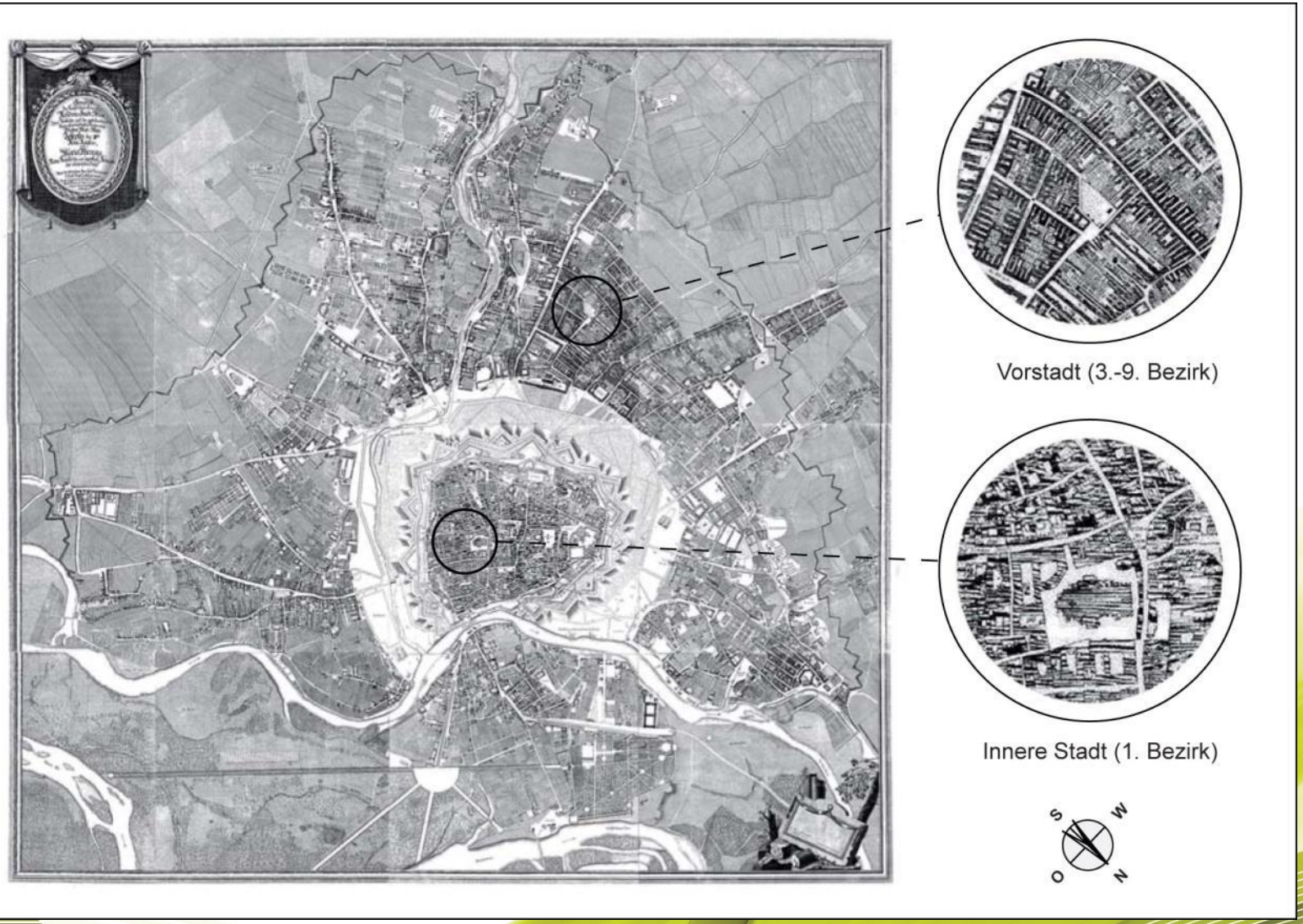
2017: 1,87 Mio. Inhabitants

2030: ~ 2 Mio. inhabitants
Vienna must to find room
to include Graz in it's urban area.

Redensification is needed
→ Attics
→ Urban development areas



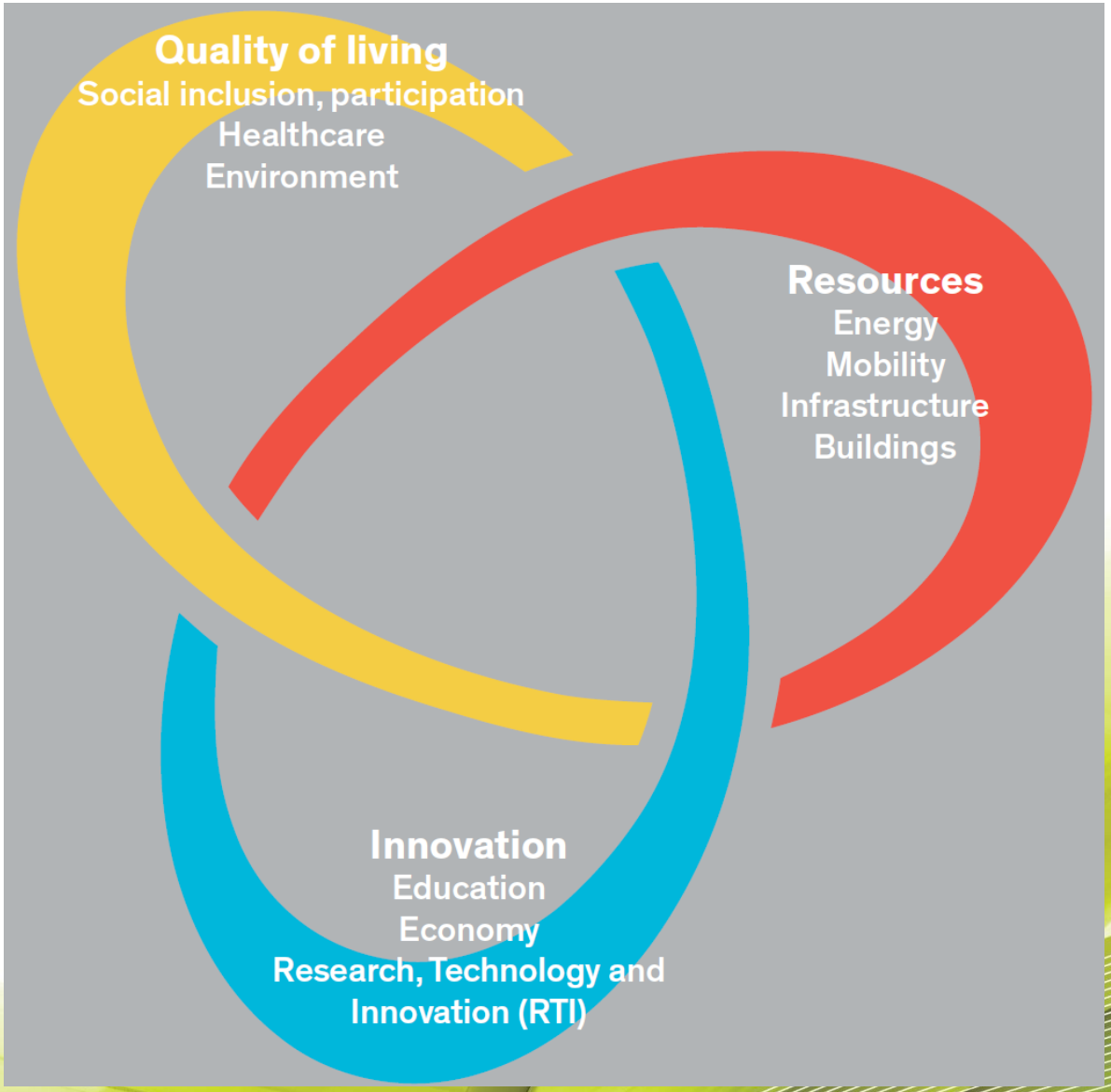
City of Vienna, 18th century



Joseph Nagel u.a. [Viennaer Stadt- und Landesarchiv, Kartograph. Sammlung 5]

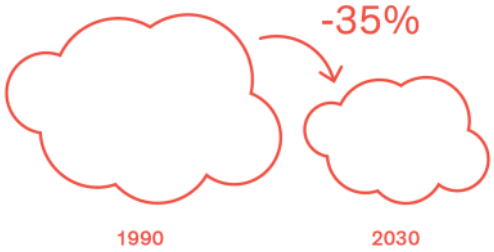
City of Vienna, 20th century

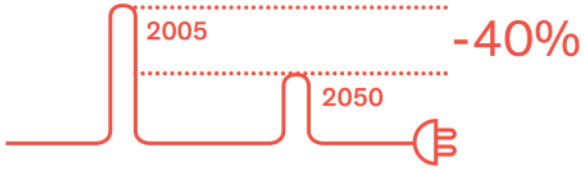
Vienna Smart City Vienna Framework Strategy



Objective
Resource preservation

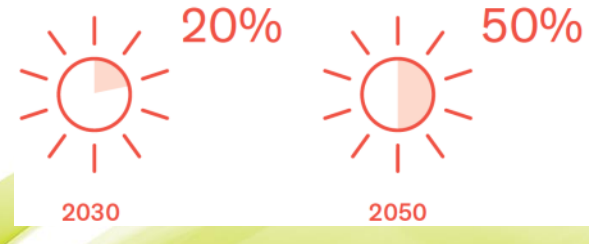
Reduction of per-capita CO2 emissions by 35% until 2030

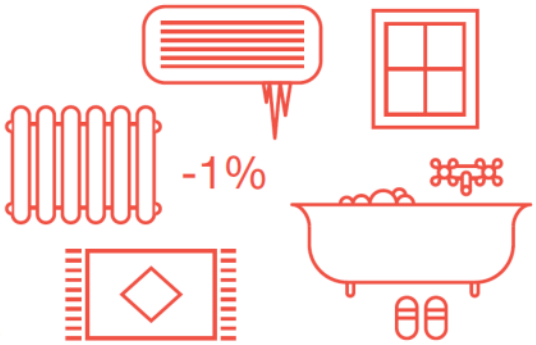




Per-capita primary energy input should drop from 3,000 watt to 2,000 watt

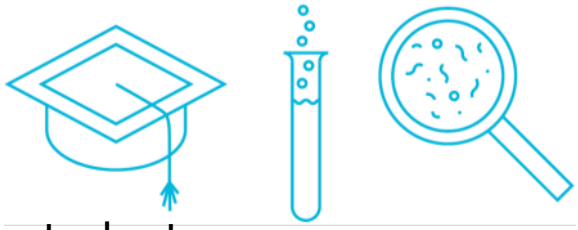
Increase renewable energy sources to 50% until 2050





Promote rehabilitation activities and reduce energy consumption of existing buildings for space heating/cooling/hot-water by 1% per capita and year

Objective
Innovation Leader

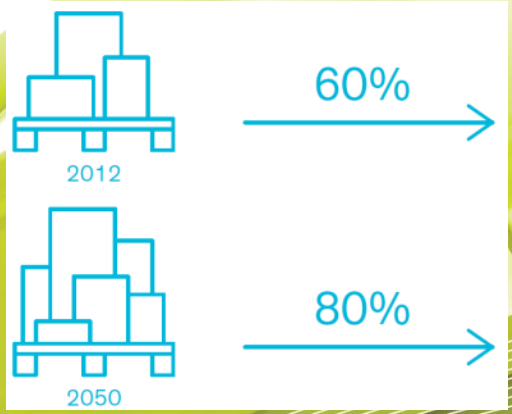


By 2030, Vienna

- Attracts additional research units
- Is a magnet for international top researchers & students
- Vienna-Brno-Bratislava becomes a innovation triangle

- Vienna further strengthens its position as preferred company headquarter city
- The direct investment flows from and to Vienna have doubled as compared to 2013

- The share of technology-intensive products in the export volume has increased to 80% by 2050
- A highly differentiated subsidy policy should ensure that future-oriented enterprises can find their niche in the market



Objective
Quality of Living

Strengthening of health-promoting conditions of life and health literacy of all population groups.

- Safeguarding of medical care at the highest level due to demand-oriented and efficient supply structures
- Vienna Hospital Association and its facilities will remain a publicly-owned enterprise.

- Vienna as a city of diversity where all people enjoy good neighbourhood
- High-quality, affordable housing and an attractive housing environment are made accessible to the largest possible share of the population.

Smart structures and efficient buildings

PH-RESIDENTIAL HOUSING ROSCHEGASSE

Pantucekgasse Roschegasse 20, 1110 Vienna

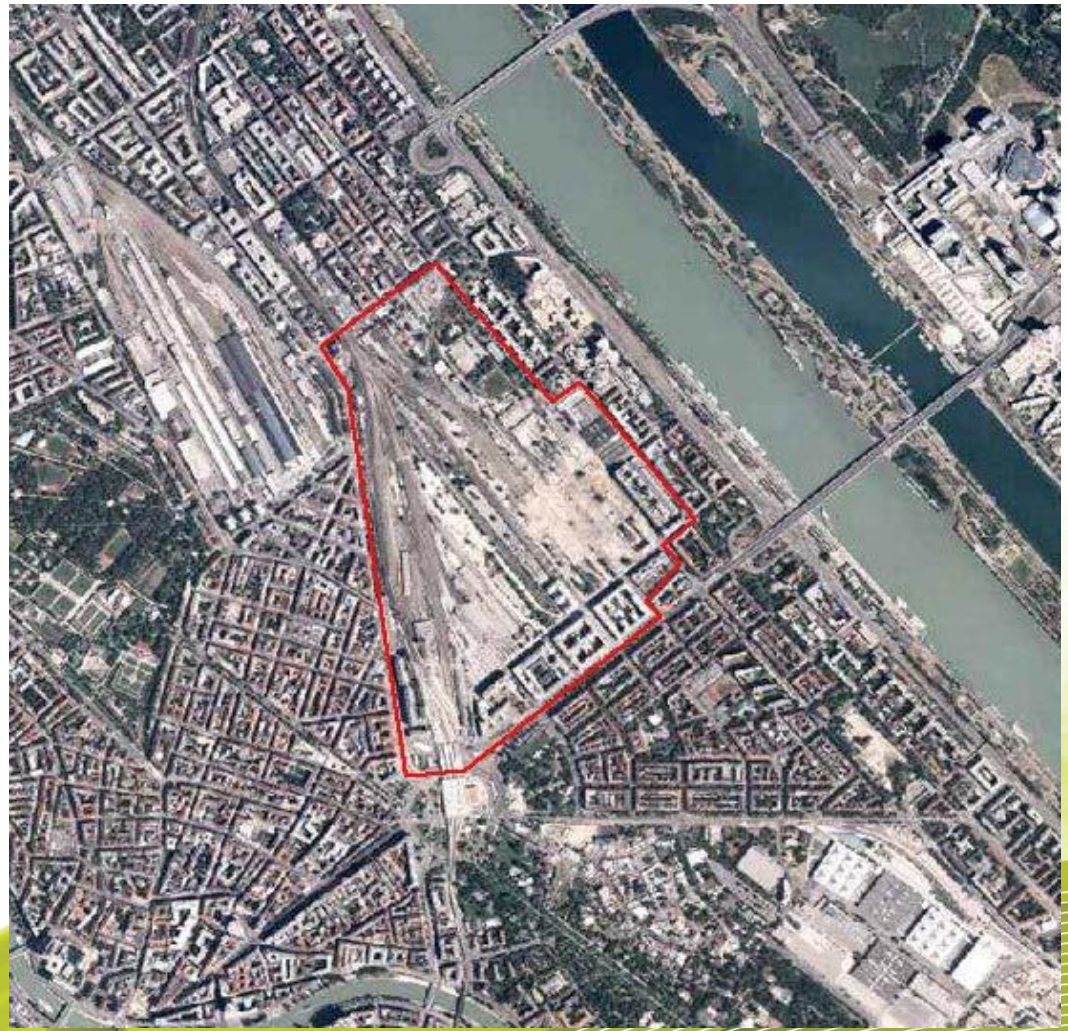
PH-RESIDENTIAL HOUSING ROSCHEGASSE

Pantucekgasse Roschegasse 20, 1110 Vienna

Developer:	a:h, gemeinn. Siedlungsgenoss. Altmannsdorf - Hetzendorf
Design&Planning:	Treberspurg & Partner Architekten ZT GmbH
Size:	9.900 m² living space, 114 apartments, common areas
Heating Energy:	7,3 kWh/(m²a) (PHPP); biggest social residential Passive House!
Netto building costs:	1.212 EURO/m² living space; 2006

City development Nordbahnhof Vienna

Brownfield Nordbahnhof, 65 ha, 2025: 20.000 Inhabitans, 10.000 jobs



City development Nordbahnhof Vienna

Statistically, each of the 1.9 million Viennese has 120 square meters of green space. Or: More than half of the city area are green spaces. This makes Vienna one of the greenest megacity cities in the world!

City development Nordbahnhof Vienna

PH-RESIDENTIAL HOUSING ‚YOUNG CORNER‘

Leystraße 157+159, Nordbahnhofgelände, 1020 Vienna

Developer:
Kallco Bauträger GmbH.

Architecture:
Treberspurg & Partner Architects ZT GmbH

Completion:
April 2011

Levels:
8 above, 1 below ground

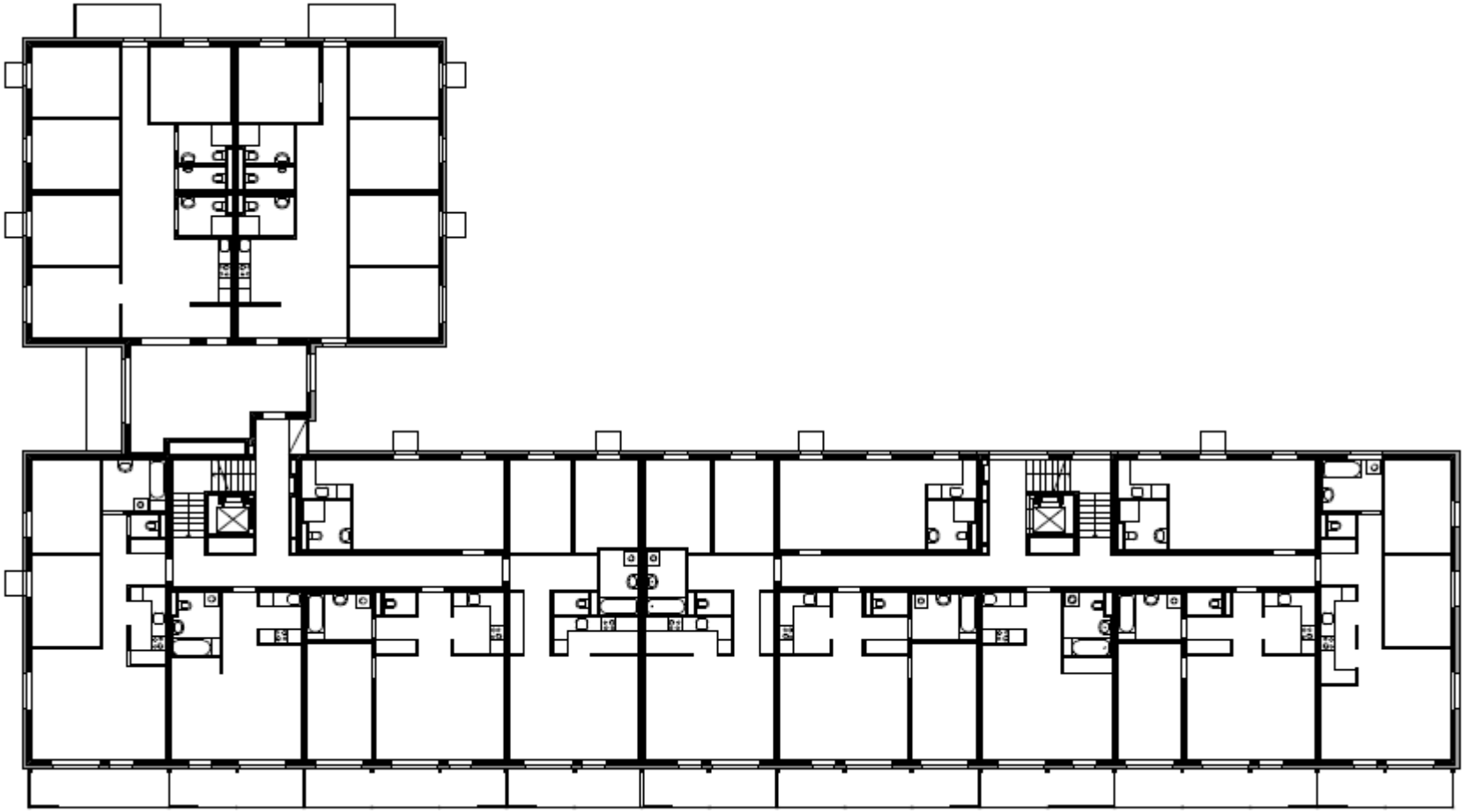
Useable Area:
6.965 m²

Size:
90 apartments, Kindergarden

Passive House:
Space Heating Demand
13 kWh/(m².a) per treated floor area according to PHPP
6 kWh/(m².a) per gross floor area according to OIB Directive + ÖNORM

Photo: R. Grünner

Floor plan


Treberspurg & Partner Architekten
REGELGESCHOSS - GRUNDRISS
0
5
10

Energy concept

Space Heating Demand: 13 kWh/(m².a) per treated floor area (PHPP)
6 kWh/(m².a) per gross floor area (OIB + ÖNORM)

Ventilation units

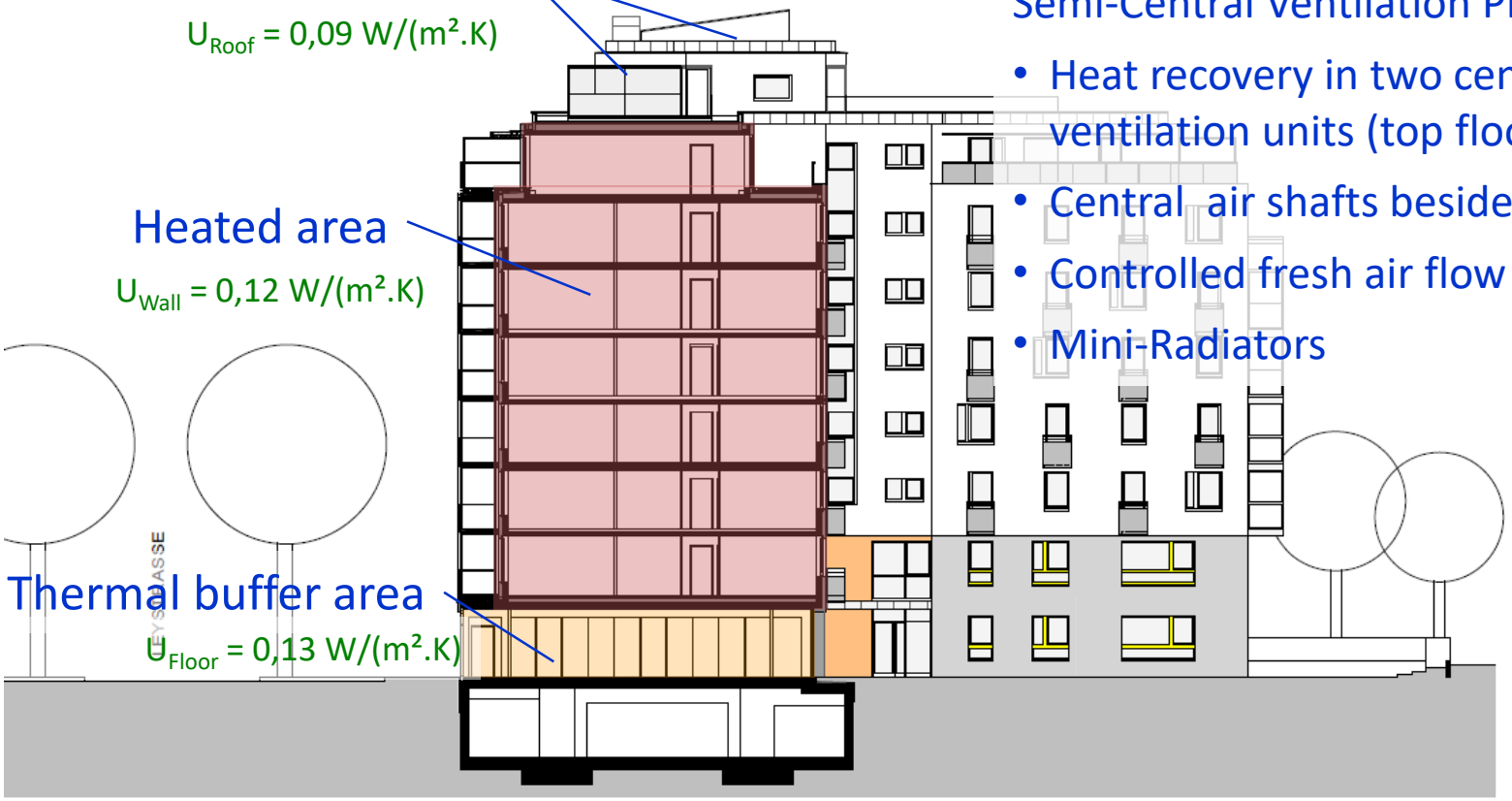
U_{Roof} = 0,09 W/(m².K)

Heated area

U_{Wall} = 0,12 W/(m².K)

Thermal buffer area

U_{Floor} = 0,13 W/(m².K)



Semi-Central Ventilation Plant:

- Heat recovery in two central ventilation units (top floor)
- Central air shafts beside staircase
- Controlled fresh air flow > 18 °C
- Mini-Radiators

Energy supply: District Heating Vienna

Treberspurg & Partner Architekten

Flexible Housing

City-Loft for 2 persons

60 m², 3450 € own capital, 300 € monthly rent

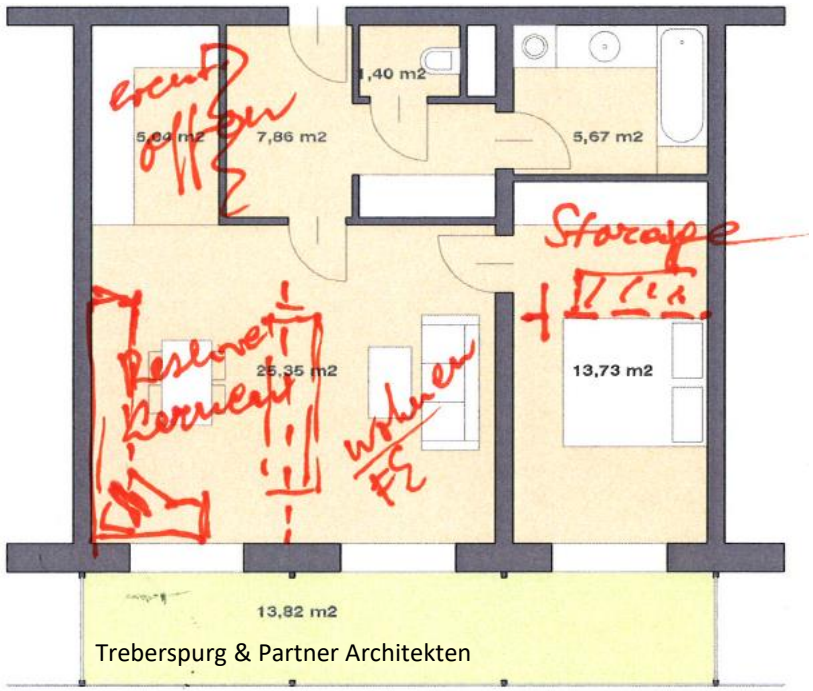


Foto: R. Grünner

Foto: R. Grünner

Stadlau


McDonald's
HOFER Wien 22., Donaustadt
Energie AG Oberösterreich Umwelt...
Wiesenthal Donaustadt
Avanti Tankstelle
Stadlau
Apotheke
Wien Stadlau Bahnhof
Softwarehändler
Donaustadtstraße
Südosttangente
Neuhaufenstraße
Raabweg
Gofrangasse
Keilersmühlenstraße
Erich-Fried-Weg
Fahngasse
Sekowitschweg
Mühlgrundgasse
Zieritzgasse
A23

Stadlau


Stadlau
Apotheke
Crazy Sun
Softwarehändler
Tabak Trafik Biber
Wien Stadlau Bahnhof
Kaisermühlenstraße
Kaisermühlenstraße

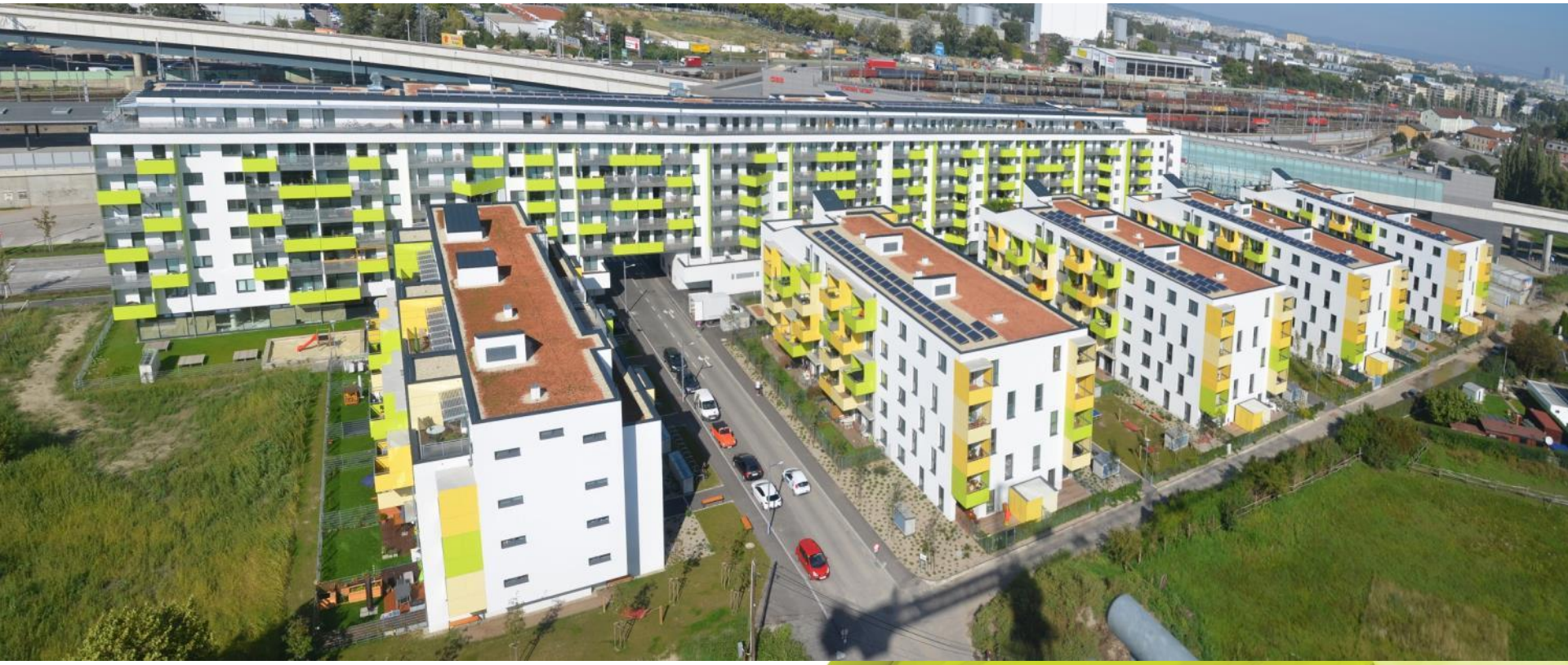
22 KAISERMÜHLENSTRASSE, 1220 Vienna

Passive-house residential building

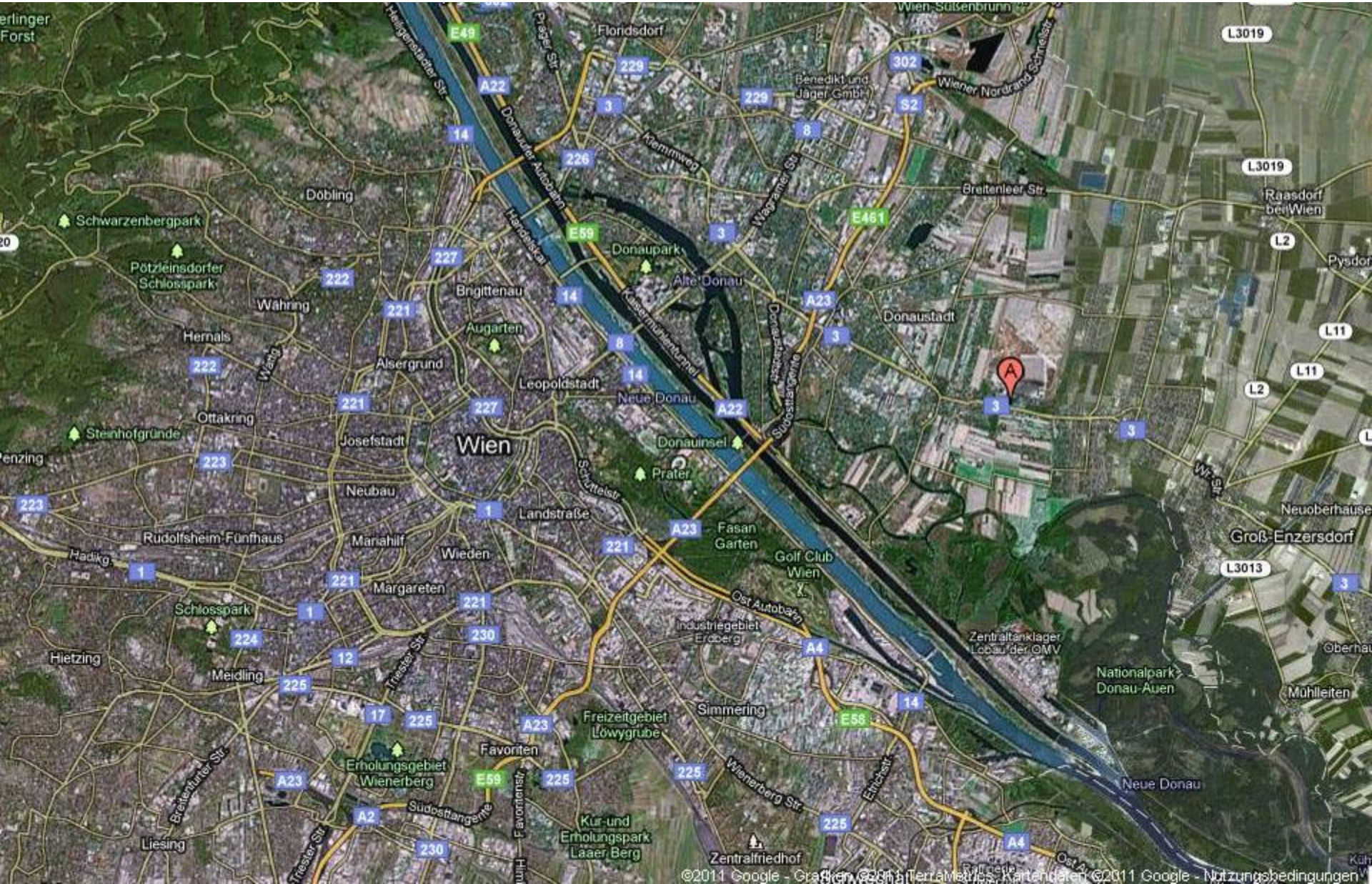
OBJECT DATA

Investor:	BWS Gruppe
General Planning:	Treberspurg & Partner Architekten ZT GmbH
Building physics:	Technisches Büro Hofbauer
Completed:	2014
Area:	24.500 m²
Capacity:	264 Appartments, 4 offices, 4 business units
Netto Building Costs:	34,8 Mio. EURO
Energy performance:	13 kWh/m²a

Heavy Traffic



Seestadt Aspern




Badeteich Hirschstetten
302
S2
Süßenbrunner Straße
Friedhof Hirschstetten
Quadenstraße
Schloßpark
Hirschstettner Straße
Stadtauer Straße
Aupark
Ostbahnbegleitstraße
Ostbahnbegleitstraße
Donaustadt
Aspernstraße
Erzherzog-Karl-Straße
Aspernstraße
Hausfeldstraße
Teleforweg
Teleforweg
Schaffelhofstraße
Himmelteich
General Motors Austria
Sozialmedizinisches Zentrum Ost der Stadt Wien - Donauspital
Friedhof Aspern
Groß-Enzersdorfer Straße
Eßlinger Hauptstraße
Eßlinger Hauptstraße
Kirschenallee
Biberhaufenweg
Unteres Mühlwasser
Brockhausengasse
Grohmannstraße
Ultzmanngasse

Meilensteine - Auszug

1912
Errichtung des Wiener Flughafens, der größte und modernste in ganz Europa.

1. und 2. Weltkrieg
Luftwaffenstützpunkt

Ab 1945
Flugplatz für zivile fliegerische Zwecke genutzt

Ab 1977
Schließung des Flugplatzes durch fortschreitenden Ausbau von Schwechat.
Danach dienten die Pisten noch dem Flugsport, der Pilotenausbildung sowie Autorennen.

1982
Ansiedlung des General Motors Werk

1992
Erstes Stadtentwicklungsprojekt durch starkes Bevölkerungswachstum und Ostöffnung (Architekt Rüdiger Lainer)

2002
Entwicklung neuer Stadtteil am Flugfeld Aspern aufgrund steigenden Bedarfs an neuen Wohn- und Betriebsstandorten. Das ehemalige Flugfeld ist derzeit die größte Stadtentwicklung Wiens und eines der größten Städtebauprojekte Europas. Die Grundstückseigentümer einigten sich mit der Stadt Wien auf eine gemeinsame Projektentwicklung mit anspruchsvollen Zielvorgaben.

Meilensteine - Auszug

2004
Gründung der Asperner Flugfeld Süd Entwicklungs- und Verwertungs AG (heute: Wien 3420 Aspern Development AG)

2005
EU-weiter 2-stufiger städtebaulicher Wettbewerb für die Masterplanung

2007
Genehmigung des Masterplans des schwedischen Architekten Johannes Tovatt

2008
Internationaler Wettbewerb zur Erstellung von Gestaltungsstrategien für den öffentlichen Raum. Gewinner: Gehl Architects aus Dänemark

2009
Spatenstich für die U2

2010

Wettbewerb Technologiezentrum Aspern, 1. Preis: ATP Architekten

voraussichtlich 2011
Bauträgerwettbewerbe für Wohnbau, Wettbewerb Schulcampus

2013 bis 2028 (in Planung)
Fertigstellung der Seestadt Aspern, für 20.000 Bewohner/Innen

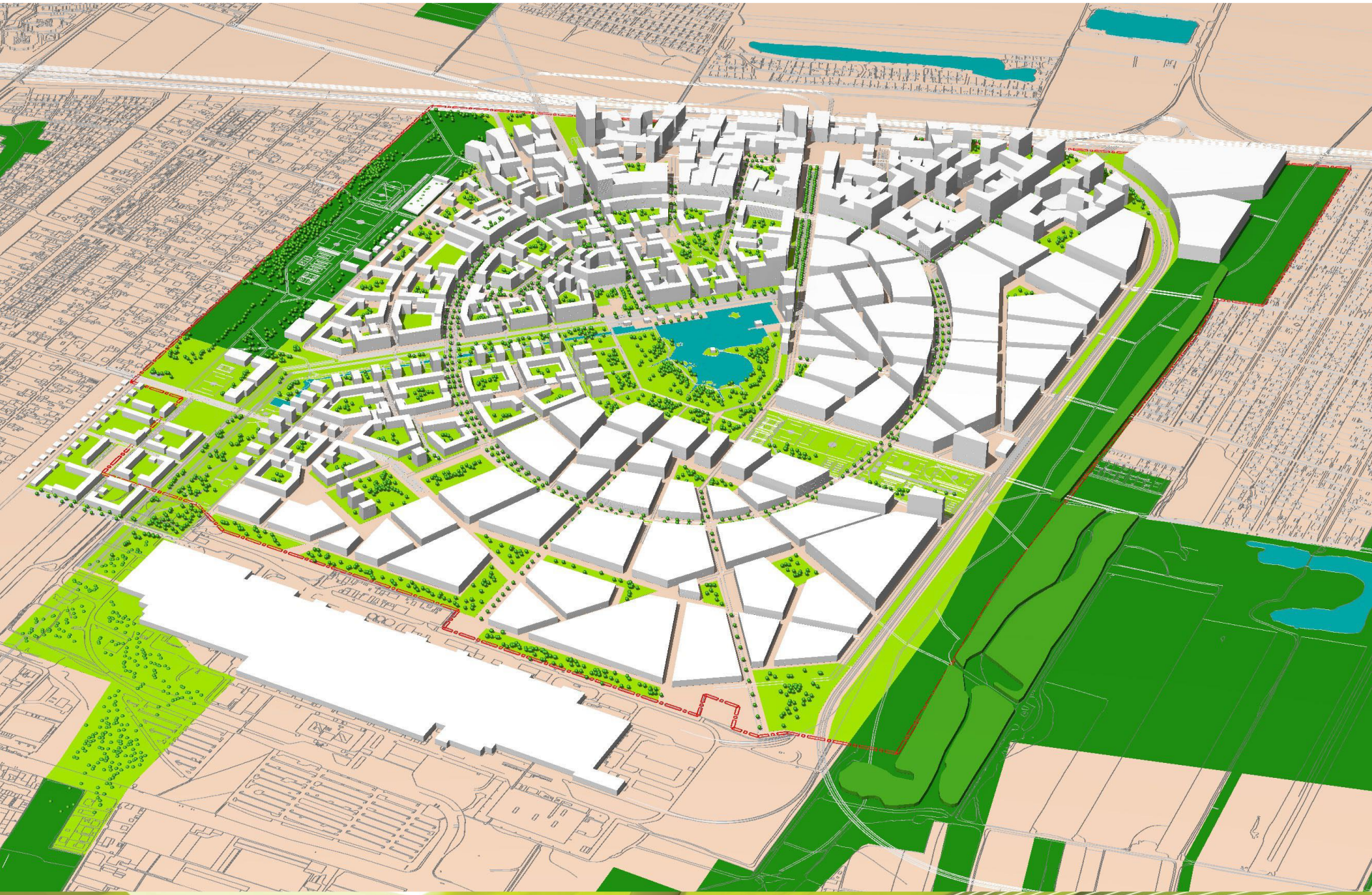
Zahlen und Fakten

- 2,4 Mio. m² Grundfläche
- 20.000 BewohnerInnen (bis 2028)
- 8.500 Wohneinheiten
- 20.000 Arbeitsplätze:
    - 15.000 Büros und Dienstleistungsunternehmen
    - 5.000 Produktions- und Gewerbebetriebe, sowie Wissenschaft und Forschung

- Naherholungs- und Freizeitgebiet:
    - 5 ha großer See
    - 9 ha großer zentraler Park

- Verkehrsinfrastruktur:
    - U-Bahnlinie U2
    - Schnellbahnanschluss
    - Buslinien
    - Rad- und Fußwegenetz
    - Autobahnanschluss A23

Luftbild Seestadt Aspern



[Quelle: Stadtentwicklung Wien, Wien 3420 Aspern Development AG]

Luftbild Seestadt Aspern

Luftbild Seestadt Aspern

Die große Einsparung in der Altbausanierung
Beste Strategie für Komfort und Ökonomie

Sanierung Mehrfamilienhaus auf EnerPHit-Standard
Rankweil / Vorarlberg
Heizwärmebedarf 16,3 kWh/m²a
Baujahr 1978 / 2007

Architektur Dipl. Ing. Andrea Sonderegger
Bauträger: VOGEWOSI

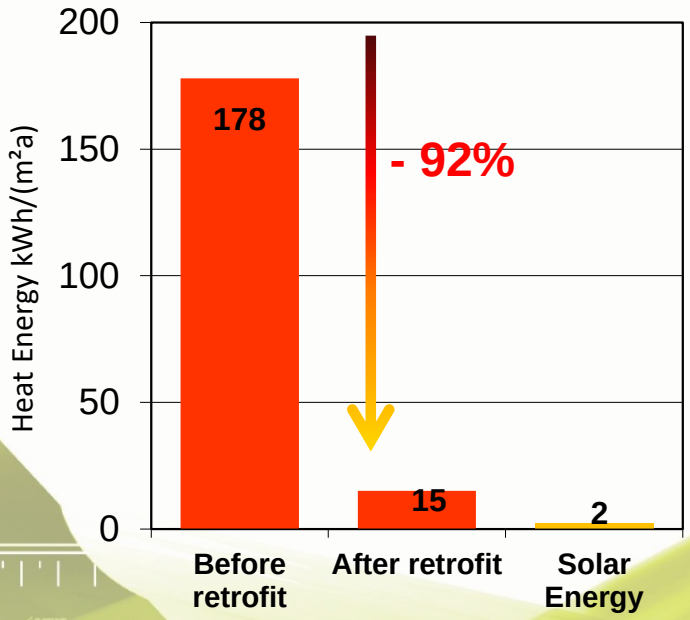
Foto Credits VOGEWOSI

+ Renovation of residential building Kapaunplatz 7

- Insulation with 20 cm Mineral wool
- New windows in passive-house standard: 0.78 W/m²k
- Surface infiltration of rainwater,,
- New laundry rooms with heat recovery
- Demolition and reconstruction of 650 new balconies
- Loft conversion with 79 contemporary living units
- Energy performance figures well under low-energy house standard
- Heat energy demand 143 > 34 kWh/m²a
- Improvement 76%

OBJECT DATA

Investor:	GSD Gesellschaft für Stadt- und Dorferneuerung, Wien
Architect:	Arch. DI Werner Rebernig
Completed:	2013
Area:	41.712,50 m²
Energy perf.:	34 kWh/m²a (143 kWh/m²a before)



Historic building Eberlgasse
Retrofit to Passive House

Net floor area 668.3 m²
Wall U-value 0.089 W/m²K

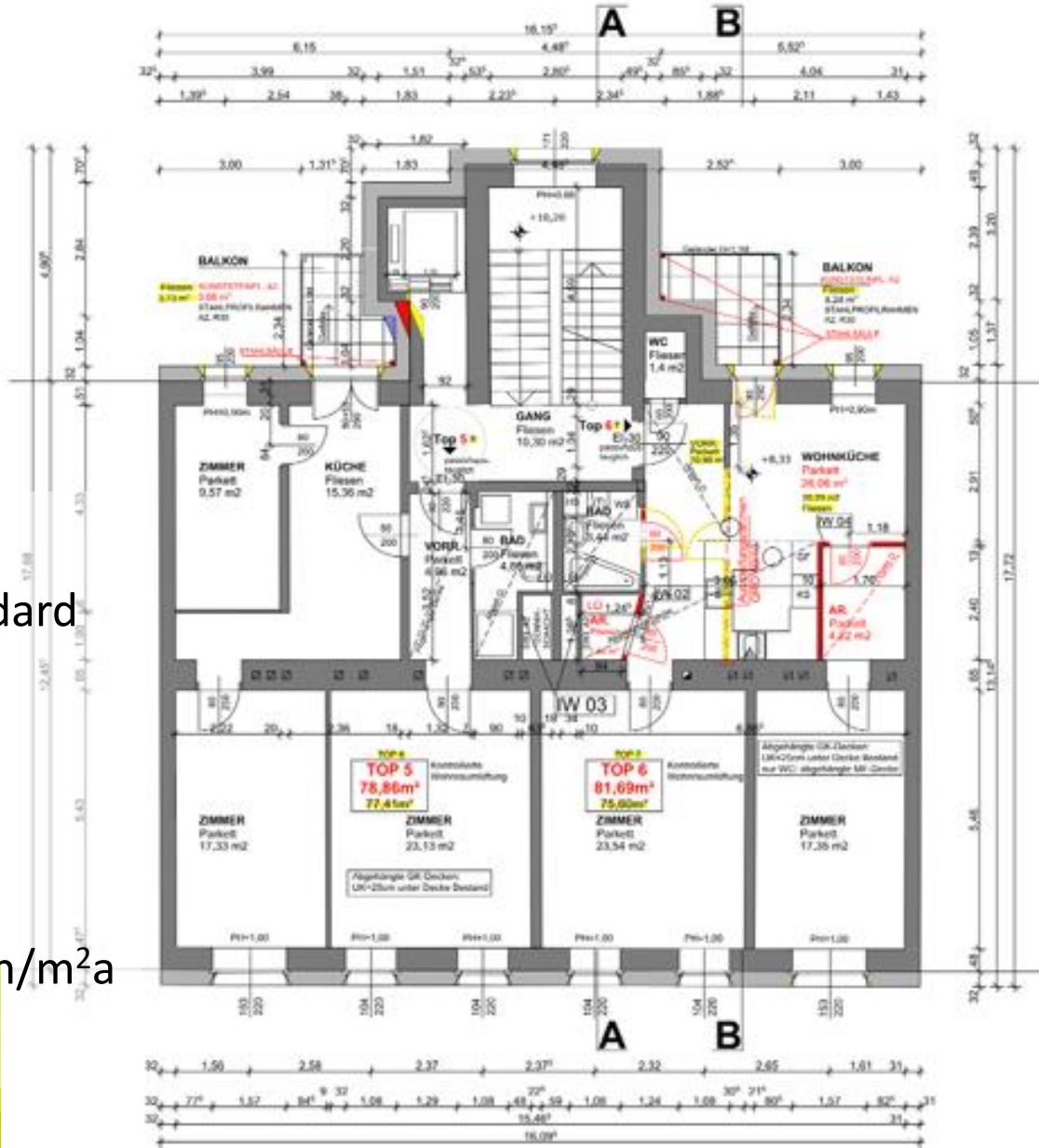
Heating demand from 178 kWh/m²a to 15 kWh/m²a
Primary energy demand: 108 kWh/m²a
for heating, hot water, household electricity

Owner: Andreas Kronberger Unternehmensberatung
Building physics: Schöberl & Pöll GmbH

Eberlgasse 3, 1020 Vienna

Eberlgasse 3, 1020 Vienna

- Build in 1888
- Renovation in passive-house standard
- Ventilation with heat recovery
- Insulation: EPS-F 32 cm
- Groundwater heat pump 32 kW
- PV array with 50 m^2 and 7,8 kWp.
- Heat energy demand 178> 15 kWh/m^2a



CASE STUDY 5 > RESIDENTIAL BUILDING VIENNA (ETHOUSE Award 2015)

Project: Breitenfurterstrasse 242 | Built / Refurbished: 1928/2014

Architect: Treberspurg & Partner ZT GmbH | Client: Wiener Wohnen

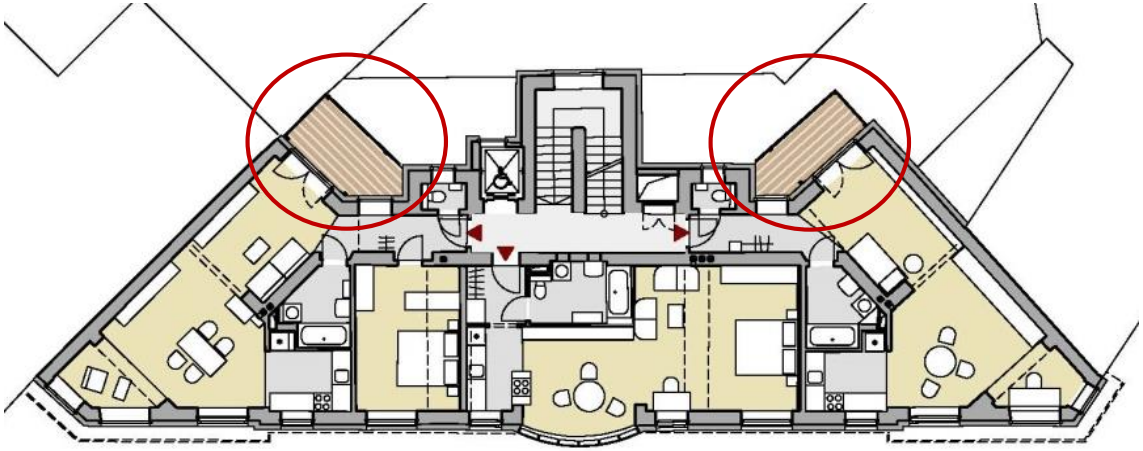
HEB before / after: 204 / 22 kWh/m^{2}a | Improvement: 92%

Before refurbishment

During refurbishment

After refurbishment

Additional balconies in the courtyard:

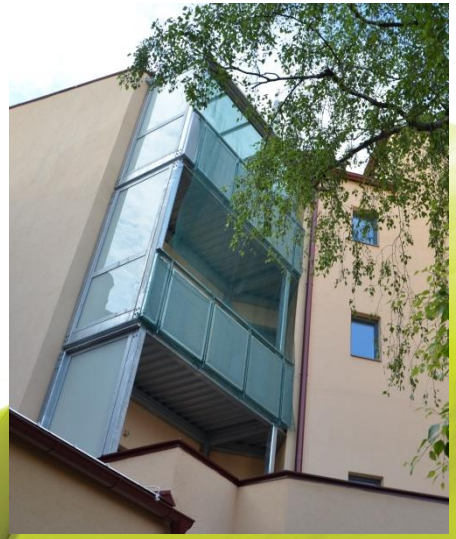


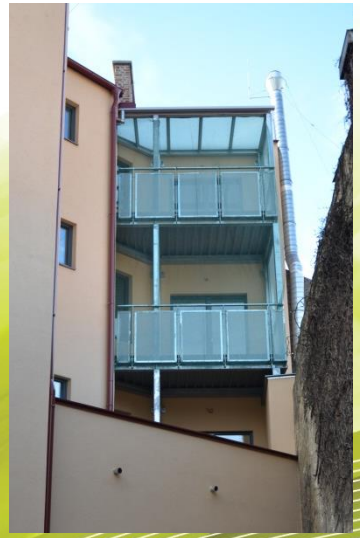
Steel construction

Thermally separated

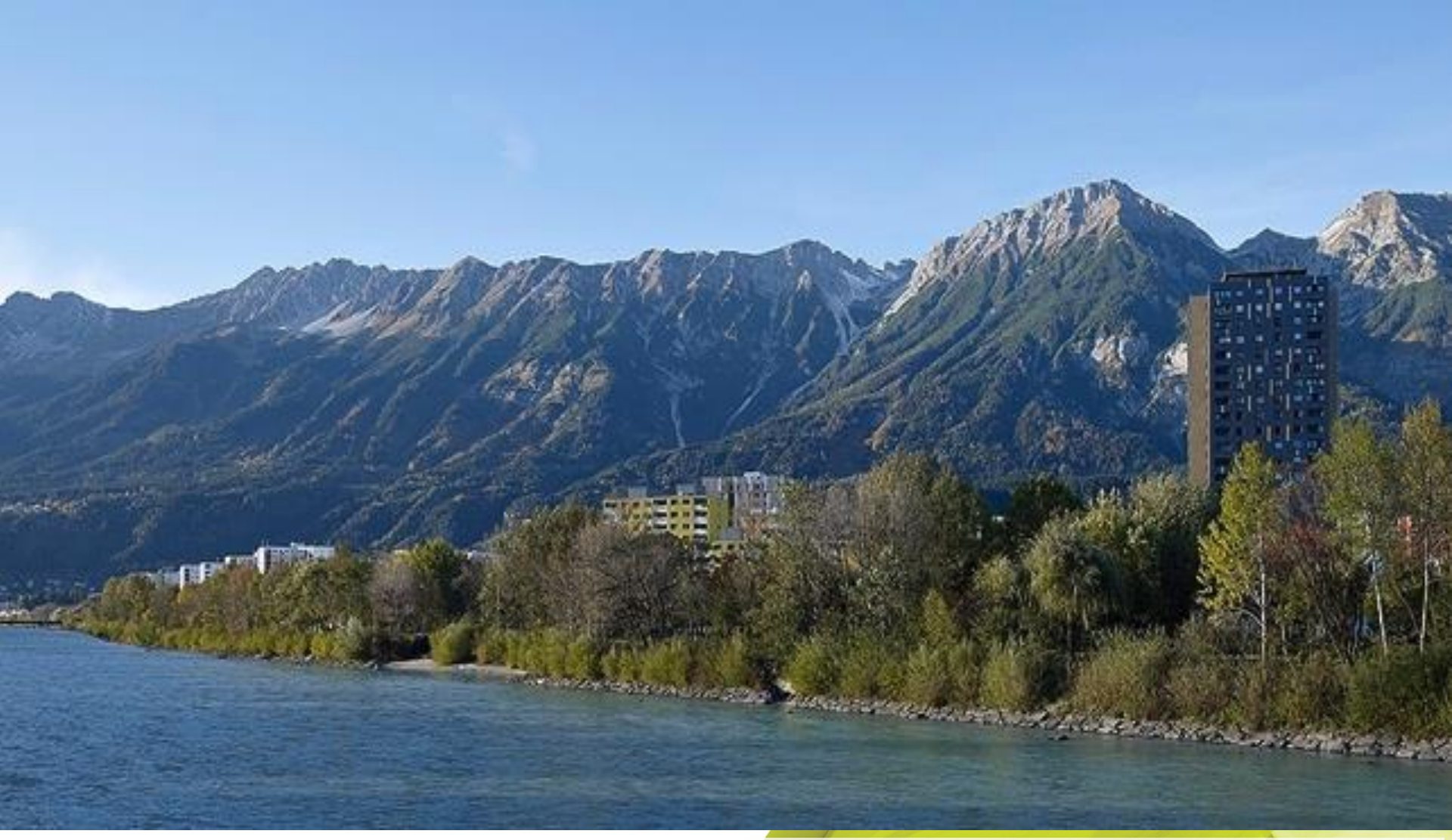
Glazing at the side of the balconies

Before refurbishment





After refurbishment



CASE STUDY 3 > RESIDENTIAL BUILDING

Project: Hochhaus Kajetan-Sweth-Straße 54, Innsbruck | Built / Refurbished: 1976/2011

Architecture: Gsottbauer Architekten | Client: WEG Kajetan-Sweth-Straße 54

HEB before / after: 77 / 20 kWh/m^{2}a | Improvement: 74%

Photos: Markus Bstieler

Before refurbishment

After refurbishment


Foto: Markus Bstieler

CASE STUDY 4 > RESIDENCE AND OFFICE OF (ETHOUSE Award 2013)

Project: Energieautonomes Stadthaus Wels | Built / Refurbished: 1965/2013

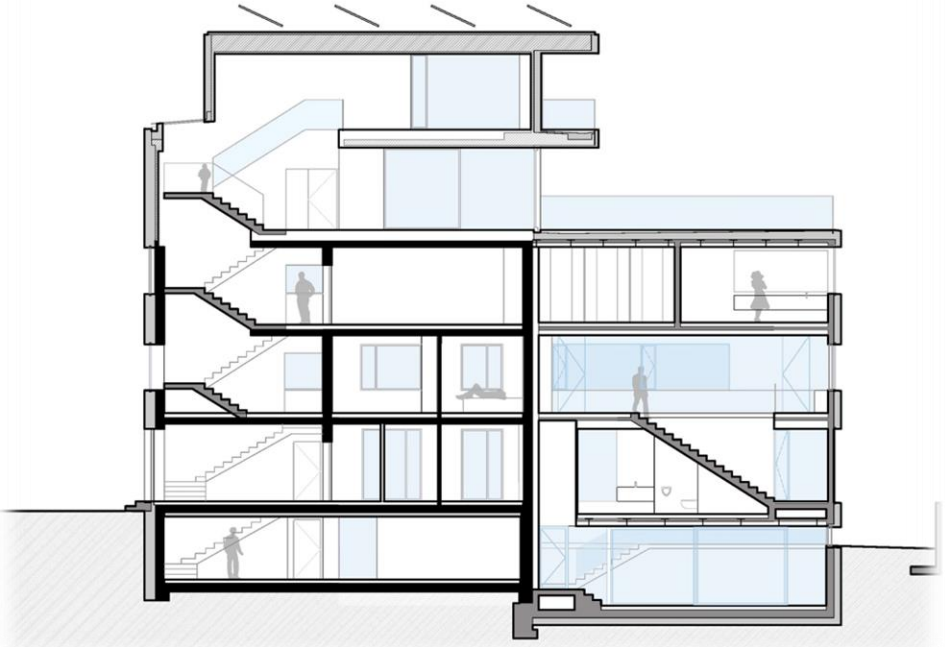
Architecture: PAUAT Architekten ZT GmbH | Client: Private

HEB before/after: 150 / 8 kWh/m^{2}a | Improvement: 95%

Before refurbishment

During refurbishment

After refurbishment



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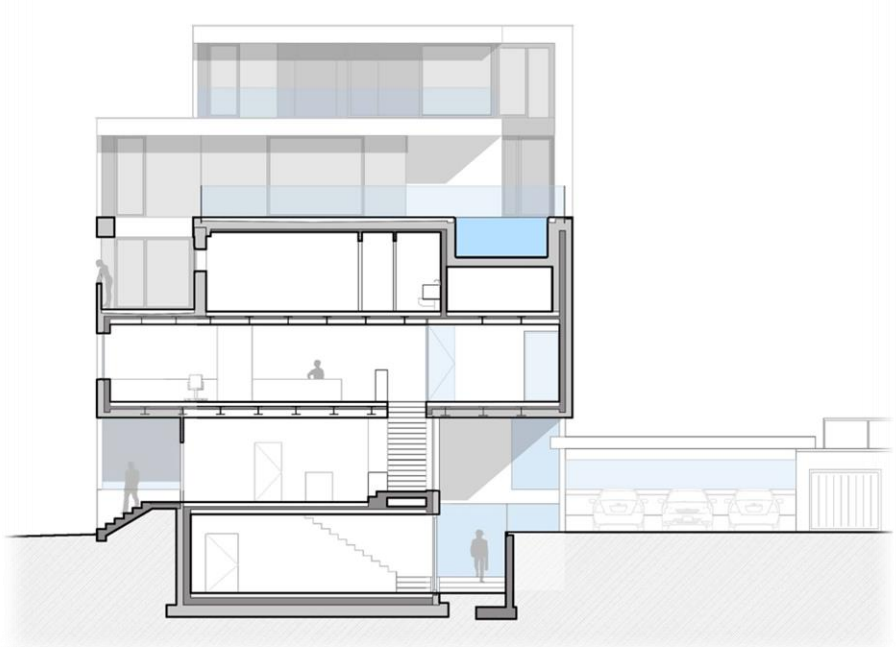


Section [Source: PAUAT Architekten]

STUDENT HOME (ETHOUSE-Award 2015)

Project: Trientlgasse 44, Innsbruck | Built / Refurbished: 1960/2013

Architecture: U1 Architektur, Innsbruck | Client: Ärztekammer Tirol

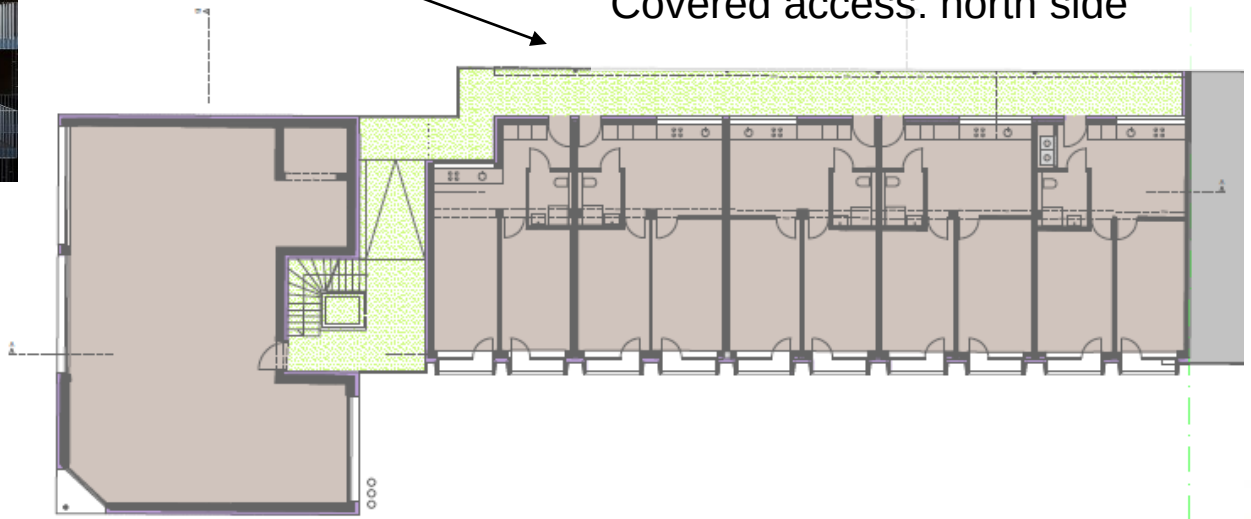
HED before/after: 354 / 21 kWh/m^{2}a | Improvement: 94%

Before refurbishment

After refurbishment

Covered access: north side

Floor plan regular floor



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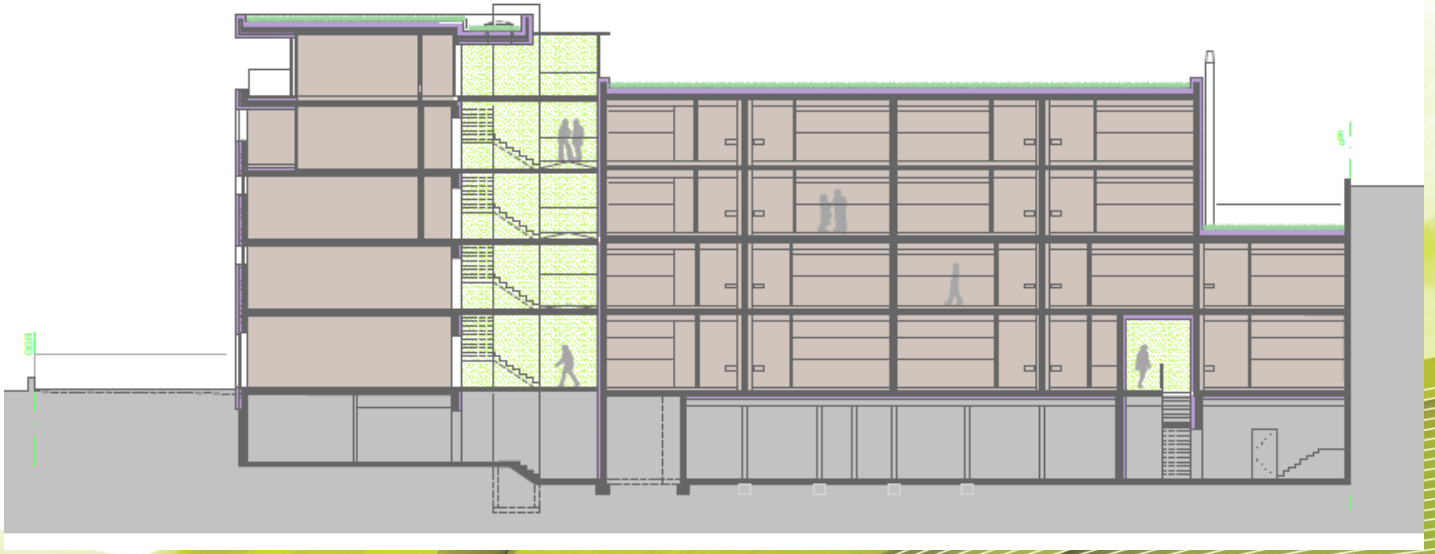

THANK YOU FOR YOUR ATTENTION!