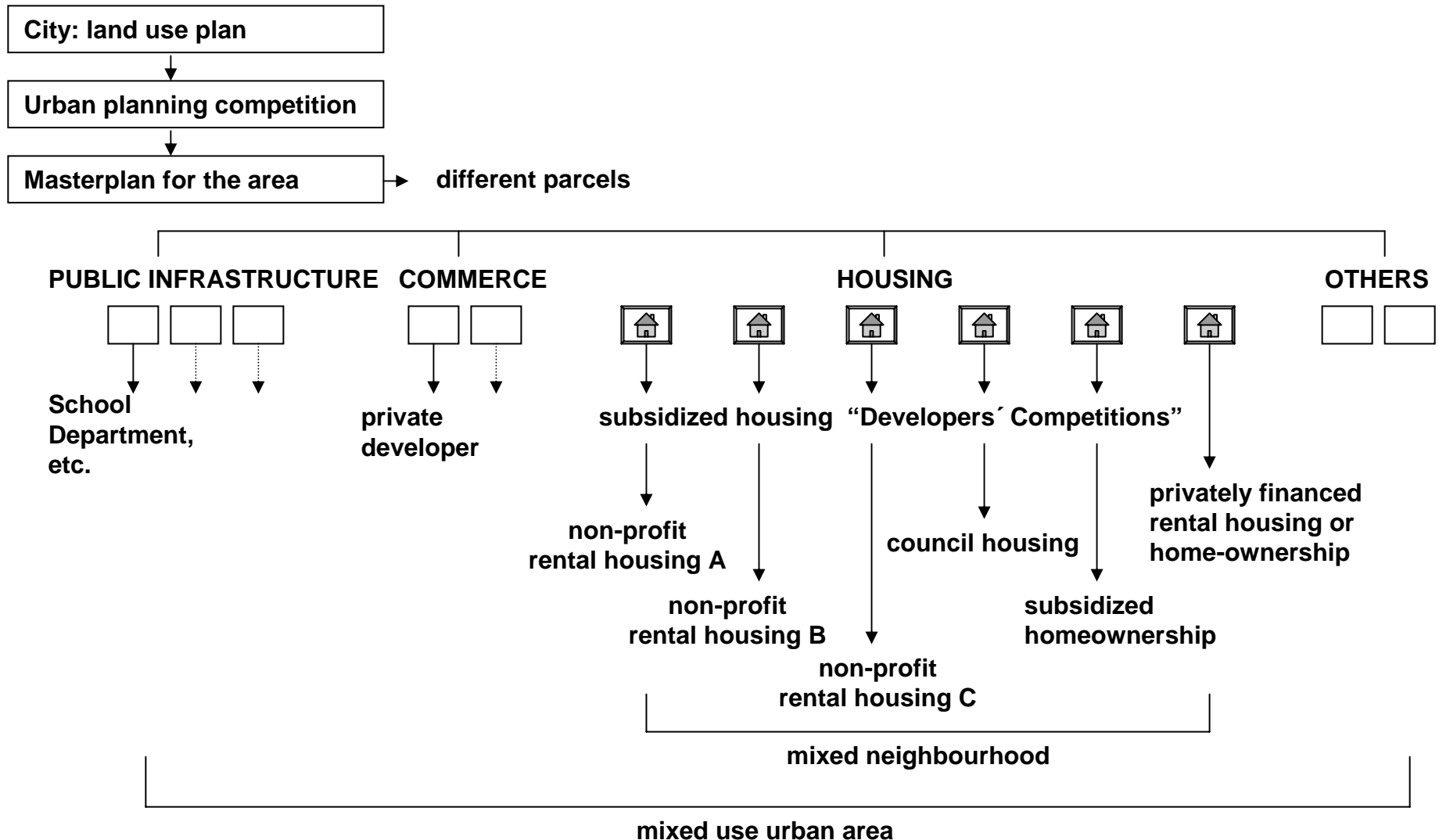


VIENNA: FROM LOW ENERGY BUILDINGS TO PASSIVE HOUSING ESTATES





MIXED NEIGHBOURHOODS BY DIVERSIFICATION OF SOCIAL HOUSING



HOUSING DEVELOPERS' COMPETITIONS

PLANNING

COSTS

ECOLOGY

Quality of

staircases,
corridors, etc.

ground plan of flat

estate, green
areas, etc.

architecture,
urban planning

total scores for
quality criteria

(max.50)

construction (incl. land
costs and planning

costs for user (rent,
down payment)

running costs,
maintenance

contract conditions

total scores for
cost criteria

(max.50)

technical equipment,
energy consumption

ecological construction
and materials

environmental qualities
of flats

environmental qualities of
estate

total scores for
ecology

(max.50)

total scores of project

(max.150)

New housing construction

- Minimal standard required by building regulations: low energy building ($29 \div 38 \text{ kWh/m}^2 \text{ a}$)
- * Future standard: passive housing (12 bis $14 \text{ kWh/m}^2 \text{ a}$)
- District heating (primary energy from waste incineration, max. 30% from fossile energy sources)
- Renewable or alternative energy (solar energy, photovoltaic, earth heat, heat recovery from used air, ground water use, automatic ventilation, grey water recycling)

Other ecological measures

Reduction of electricity consumption

- naturally lit staircases and corridors
- Avoidance of stand-by losses by switch-off of wall-sockets
- Hot water connection for washing machines and dishwashers, energy-saving light bulbs

Reduction of drinking water use

- Grey water use for watering of green areas and for toilet flushing, rain water use

Environmental-friendly construction materials

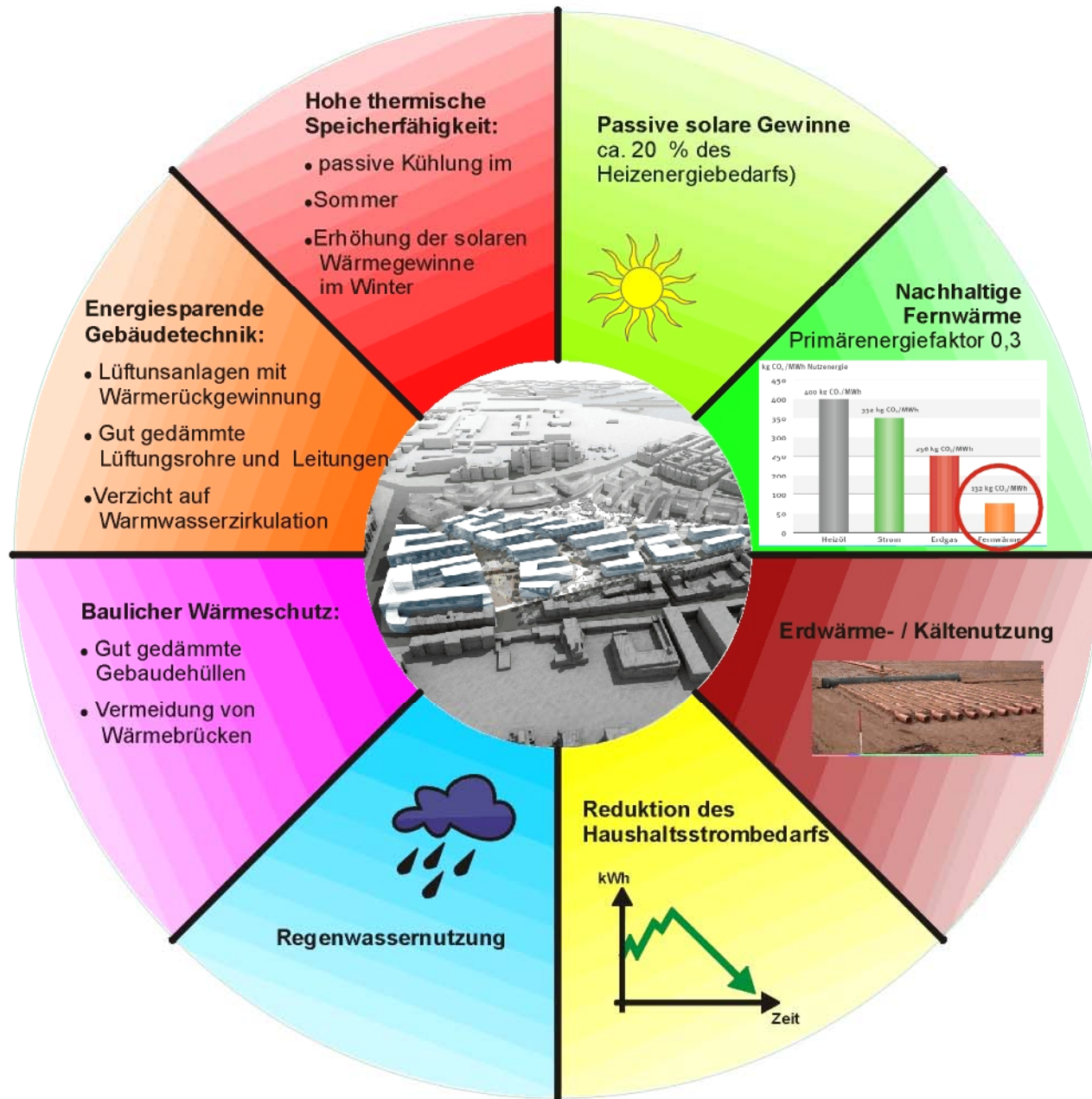
- Materials free of HFKW and HFCKW, recyclable, low primary energy use for production, timber

- Other ecological measures (cont.)
- Greening of roofs and facades
- Surfaces allowing seepage of rain water
- High quality common infrastructure directly connected to housing estates (e.g. pools, saunas, gyms, indoor and outdoor playing facilities) in order to avoid car traffic

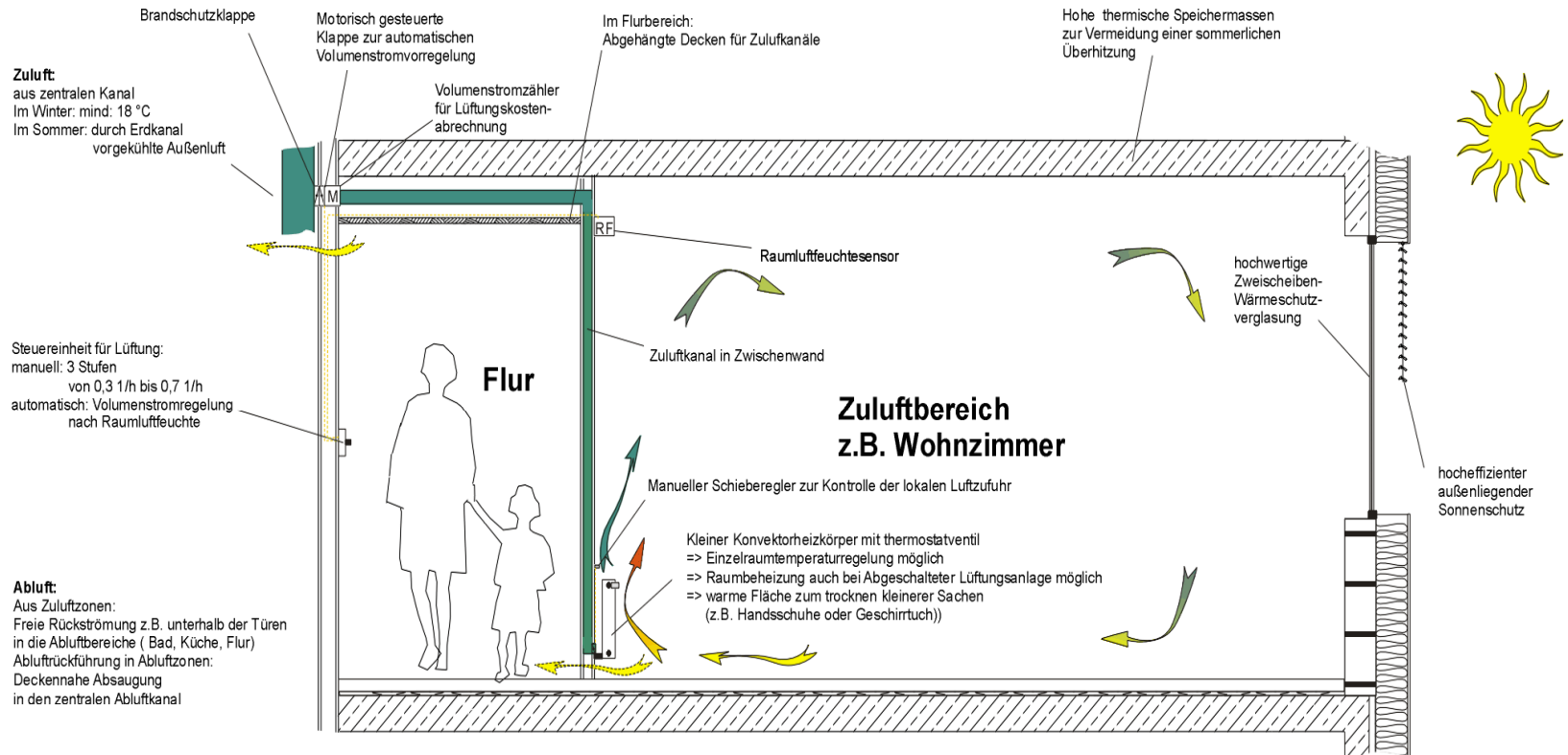




Passive house energy concept



Scheme: passive housing technology



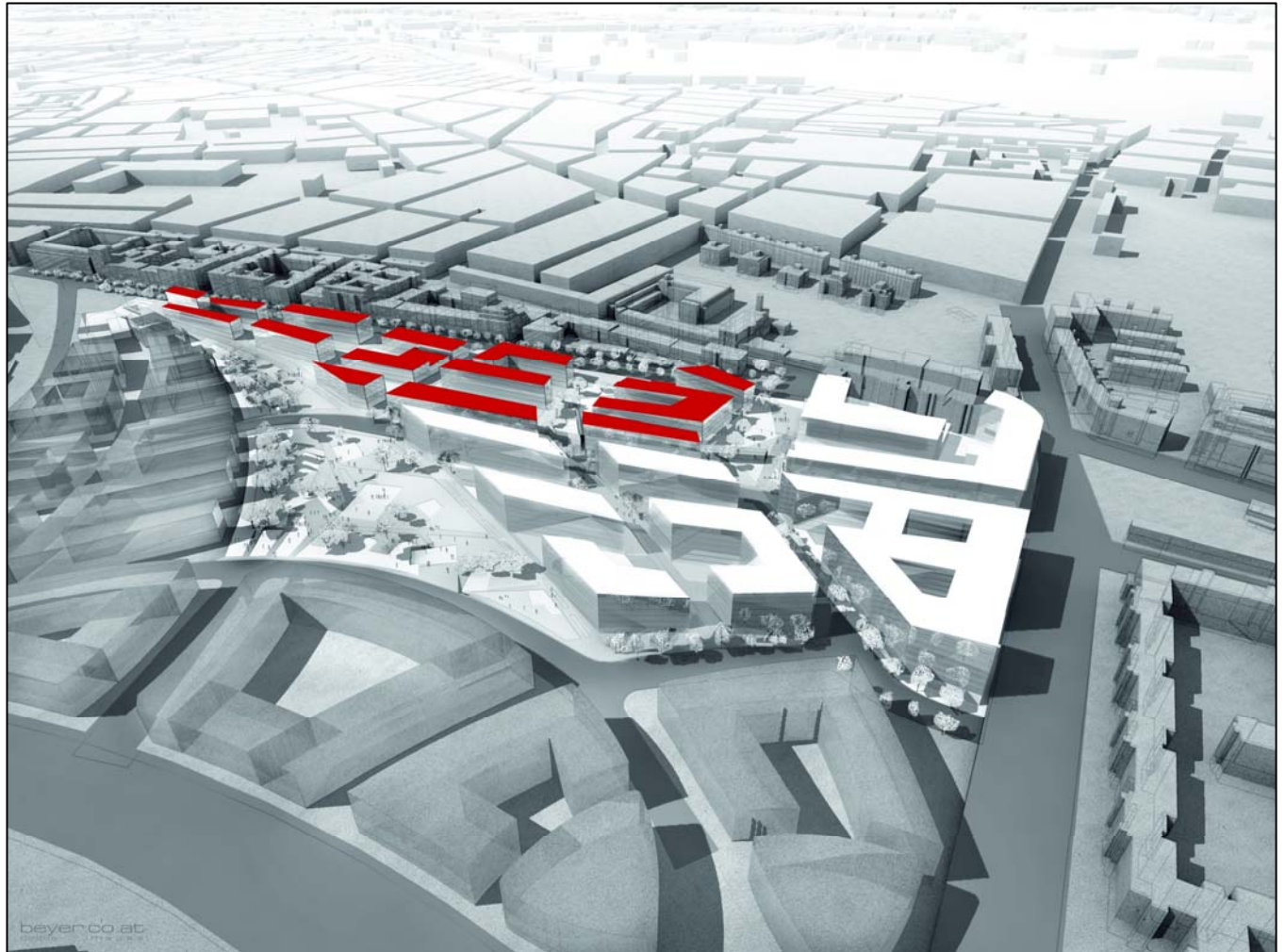




Eurogate

1030 Wien, Aspanggründe

rund 3,8 ha



Eurogate

Europe's largest passive housing estate



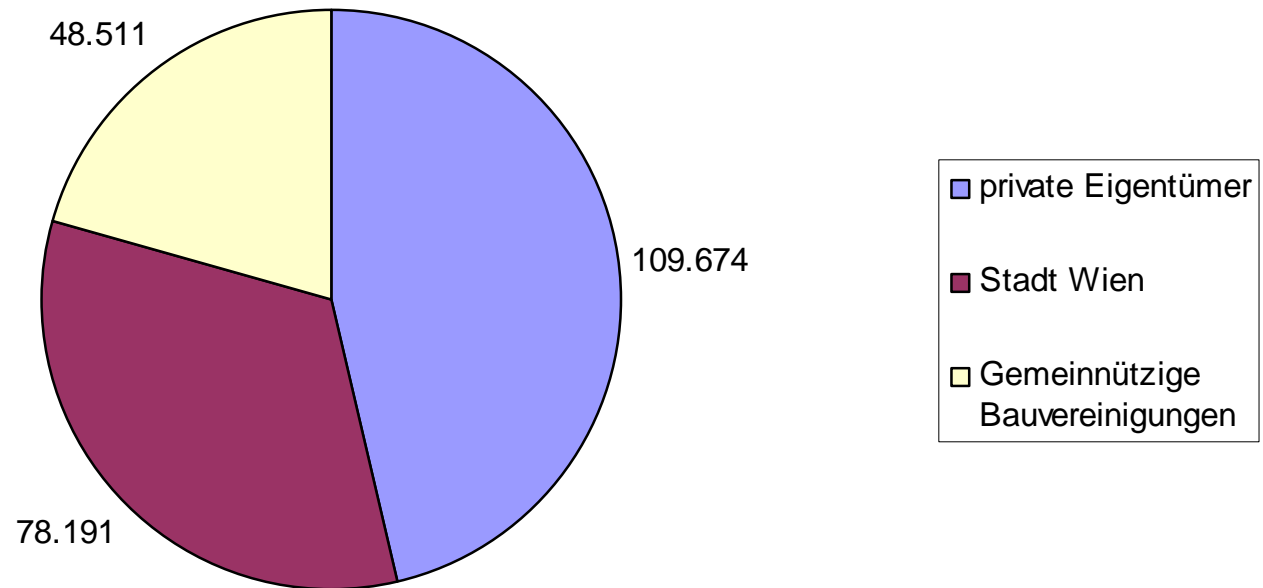






Potential units for thermal rehabilitation

Wohnungsbestand der Bauperiode 1961 bis 1980





Thermal Rehabilitation (THEWOSAN) since 2002: Reduction of CO2 emission

- Insulation of facades and roofs
- ecological optimizing of buildings
- renewable energies
- district heating from waste incineration



THEWOSAN – Förderungsstaffelung
pro m² Nutzfläche (max. 1/3 der Baukosten)

§ 6a (6) VO	Beitrag pro m² NFI:	Einsparung HWB_{BGF}:	Relation zu NEH unter:
lit. a	€30,00	50 kWh/m ² a	2-fach
lit. b	€45,00	70 kWh/m ² a	1,6-fach
lit. c	€60,00	90 kWh/m ² a	1,3-fach
lit d	€75,00	110 kWh/m ² a	1-fach

+ €20,00 pro m² NFI nichtrückzahlbarer Beitrag bei effizienten und umweltfreundlichen Anlagen / Energieträgern (auch hier gilt max. 1/3 der förderbaren Kosten)

+ LANDESDARLEHEN max. in Höhe des nichtrückzahlbaren Beitrages, wenn Förderhöhe über € 45,00 pro m² NFI (d.h. erst ab Stufe € 60,00)

HWB_{NEH} = HWB_{BGF,HGT 3400} von 20x(1+2/lc) gem. ÖNorm B 8110/Teil 5

UMSETZUNG IN DIE PRAXIS bis 30.09.2007

Thermal rehabilitation till 9/2007

- **1220 Förderungsanträge / 1220 buildings applied**
- **davon 713 Objekte zugesichert / 713 buildings approved**
- - € 630 Mio. Gesamtsanierungskosten/ total rehabilitation costs
 - € 180 Mio. Landeszuschuss / non-repayable grant
 - 62.000 Wohnungen / 62000 flats concerned
- **davon 487 Objekte fertiggestellt / 487 buildings completed**
- € 386 Mio. Gesamtsanierungskosten/ total rehabilitation costs
- € 113 Mio. Landeszuschuss / non-repayable grant
 - 42.200 Wohnungen / 42200 flats concerned

PLATTENBAUSANIERUNG Thürndlhofstraße, 11. Bezirk



THEWOSAN

Thermisch-energetische Wohnhaussanierung in Wien



1200 Wien, Lorenz-Müller-Gasse 2 - 6

THEWOSAN

2., Engerthstraße 232 – 238



~ 35.000 m² Nfl.
(572 Wohnungen)

GSK:	€ 7.800.000,00
LZ gesamt:	€ 1.541.000,00

THEWOSAN

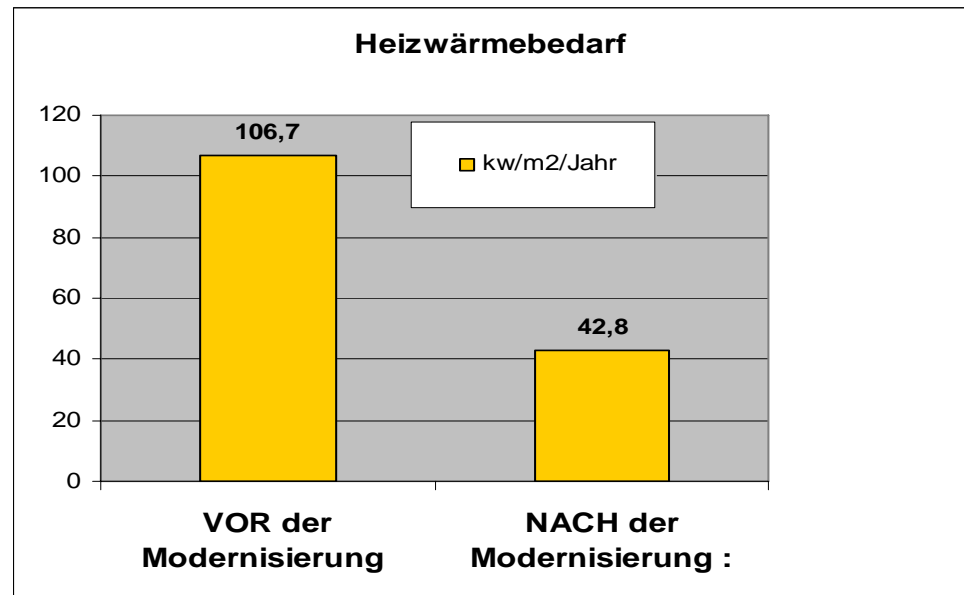
10., Puchsbaumplatz 6



GSK:	€	171.000,00
LZ gesamt:	€	57.000,00

Thermal Rehabilitation

**Average energy consumption
for heating
before and after
thermal improvement**



Reduction of energy consumption: 63,9 kWh/m²/year = - 60 %

RESULTS

- **Verbesserung von rund 60.000 Wohnungen mit fast 4 Mio m² Nutzfläche**
 - **60.000 flats improved, total surface 4 mio squ.m.**
- **Reduktion des HWB um mehr als 50%**
 - **Reduction of heat energy by more than 50%**
- **Best Practice UN-Habitat 2002**
- **Reduktion der CO₂-Emission um ca. 97.000 Tonnen pro Jahr**
 - **Reduction of CO₂-emissions by 97000t annually**
- **Energieeinsparung von rund 269 GWh pro Jahr**
 - **Reduction of energy consumption by 269 GWH annually**

WIE WERDEN 269 GWh pro Jahr ERZEUGT ?

How are 269 GWh annually produced?

... z.B. durch 27 Mio Liter Heizöl

Anlieferung durch rund 720 LKW Sattelzüge

...e.g. from 27 mio liters of oil

delivered by 720 big trucks



97.000 t CO₂ = 610 mio km/a = 61.000 cars...



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