

# Research Project “Energy Region Factor 10”

in the Metropolitan Region of Nuremberg

Erich Maurer, 29.11.2007, Hamburg

# The Metropolitan Region of Nuremberg



- 3,5 million inhabitants
- 150.000 companies
- 103 billions € revenue

10 years of energy competence

organized together with the following partners

**EnergieRegion Nürnberg e.V.**

Business Unit



**EnergieRegion**<sup>N</sup>GmbH

Business Unit



# Factor 10 research perspective

**Improving the refurbishment activities of multi-unit dwellings in the Metropolitan region of Nuremberg with factor 10 technology/components to reduce CO<sub>2</sub>-emissions;**      **→**      Regional housing associations

- Identifying the existing obstacles and analysing ways to remove them.
- Achieving market-aligned prices for Factor-10 components through:
  - New components,
  - Improving existing components,
  - Improving the essential coordination during factor 10 refurbishment;
- Developing a software program to support the decision-making process,
- Improving the network between component manufacturers, architects and general contractors.

# Obstacles

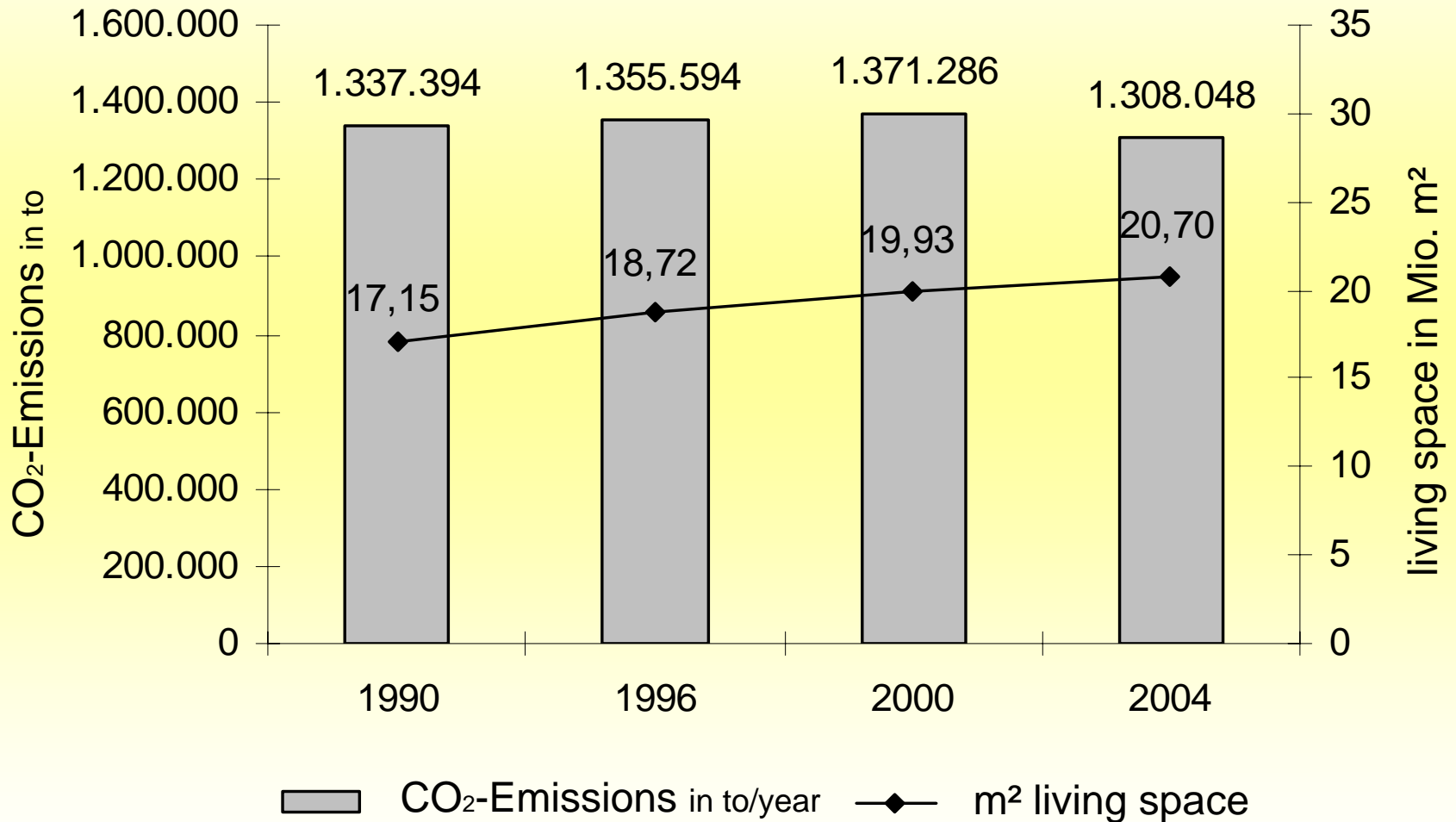
- Owner – Tenants dilemma: Additional costs to investors (dwelling owners, developers and housing associations) can often be passed on to tenants only on a very limited scale.
- Investment in individual components in many cases is too high, making project realisation not financially viable for the investor ;
- cost efficiency often suffers as a result of the coordination necessary between individual orders;
- economic calculation is very difficult and causes complex situation funding schemes;
  - Investment, operation and maintenance;
  - funding scheme;
    - grants;
    - low-interest loans;
  - tax related issues;



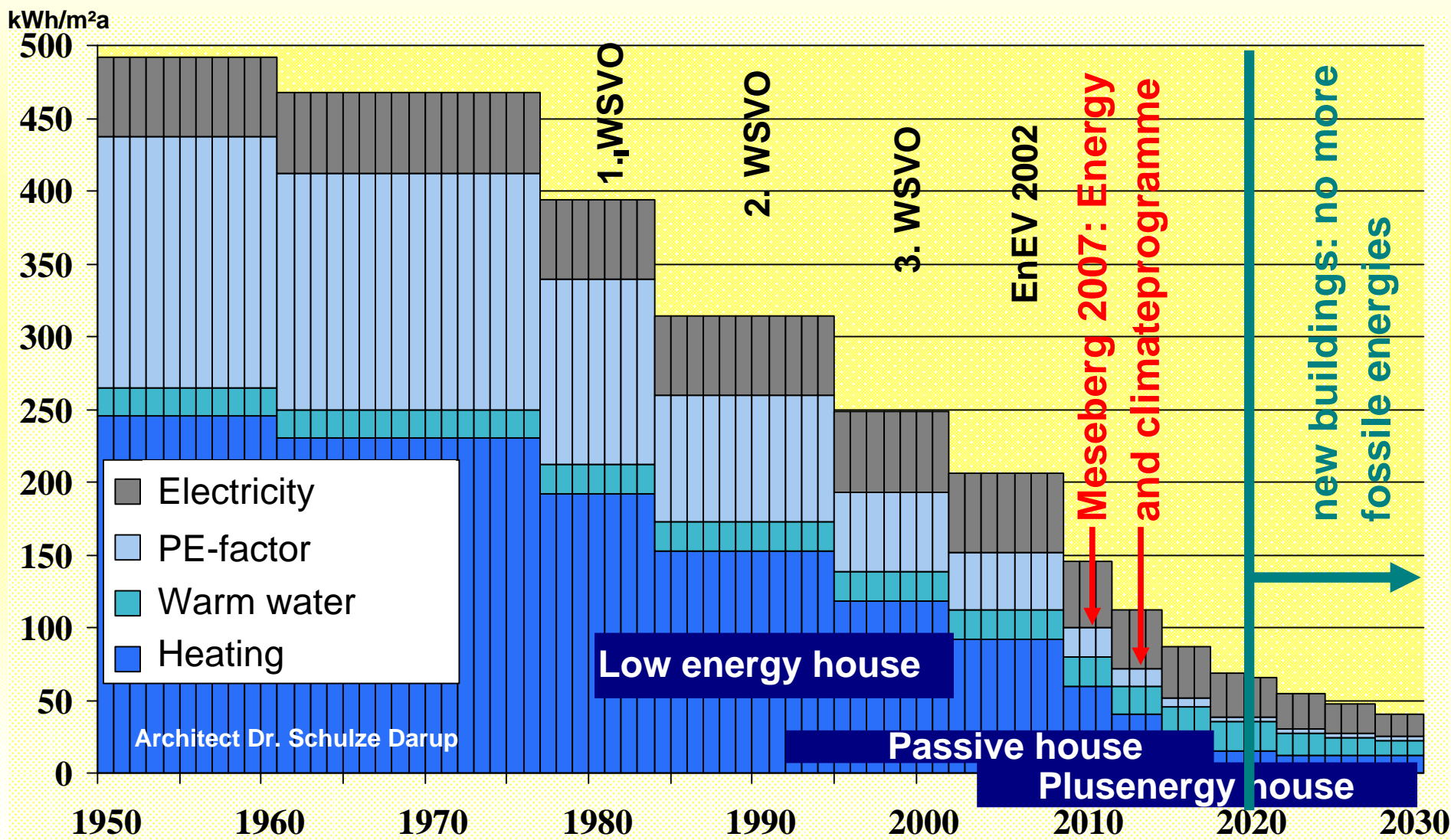
Software tool

# CO<sub>2</sub>-Emissions in the building sector in Nuremberg

## Based on the CO<sub>2</sub>-emissions inventory

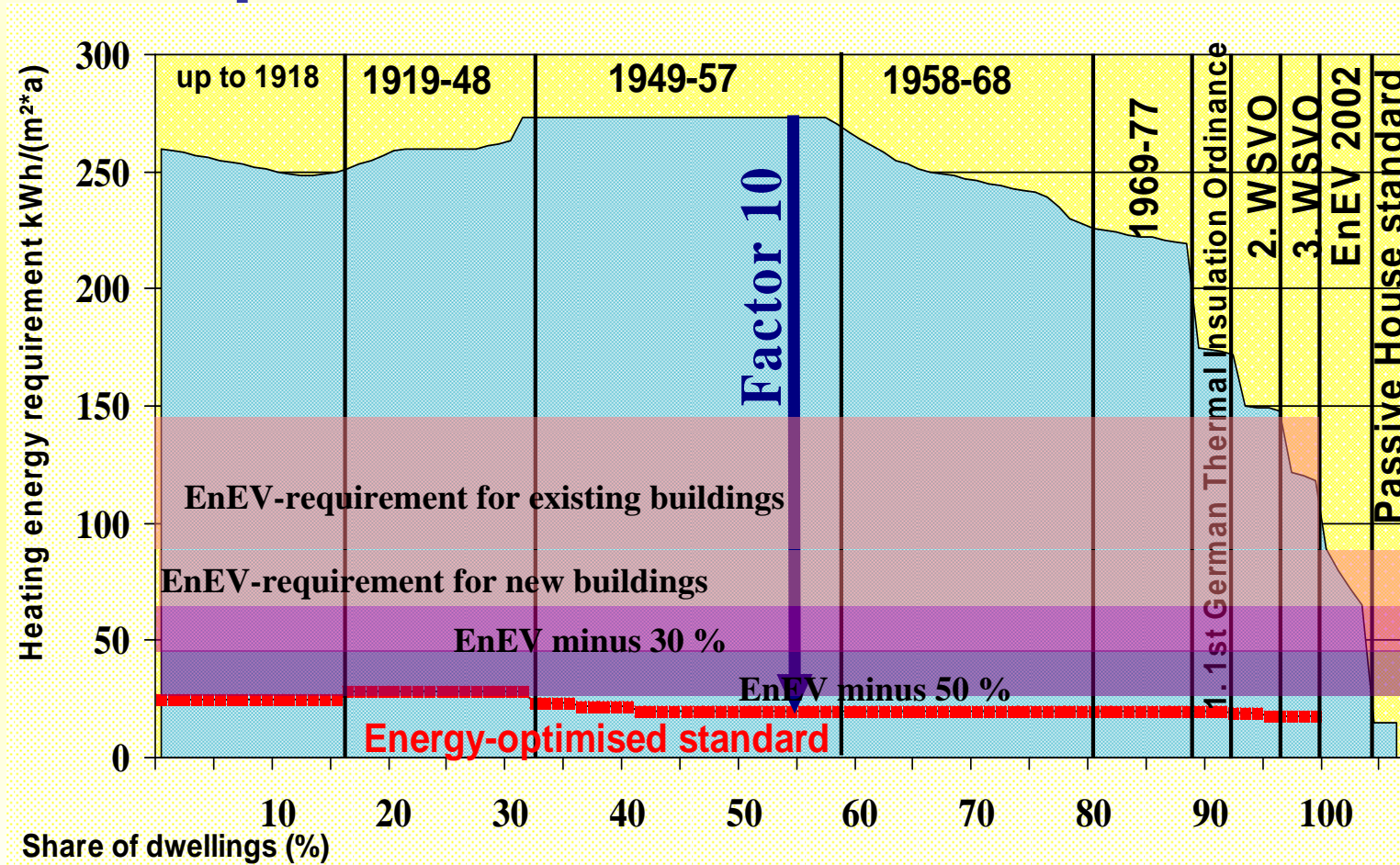


# Energy-standards in Germany for buildings



# Factor10 research project

## Initial point



ARENHA 1993, IWU 1994, Bundesarchitektenkammer 1995, Schulze Darup 1998/2000

# Factor 10 funding application

- Project proposal: Seven industrial partners, architect Dr. Schulze Darup and the Energy Technology Centre Nuremberg
- Research grant from the Bavarian Ministry of Economics:
  - Time frame: 15.05.2005 to 31.05.2007;
  - Volume of the project 490.000 €, no investment for refurbishment;
  - Research grant 35 %, 175.000 €;
  - Co-financing 65 % paid by the industrial partners;
  - 10 partners, seven Bavarian and three companies from [Baden-Württemberg](#);

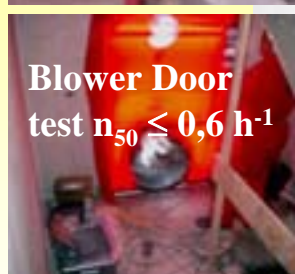
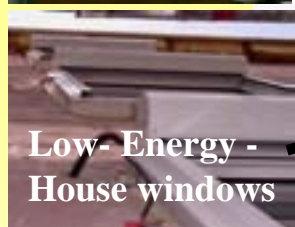
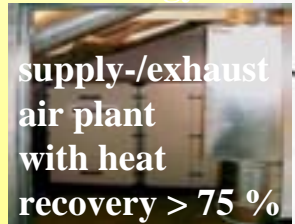


# Factor 10 partners

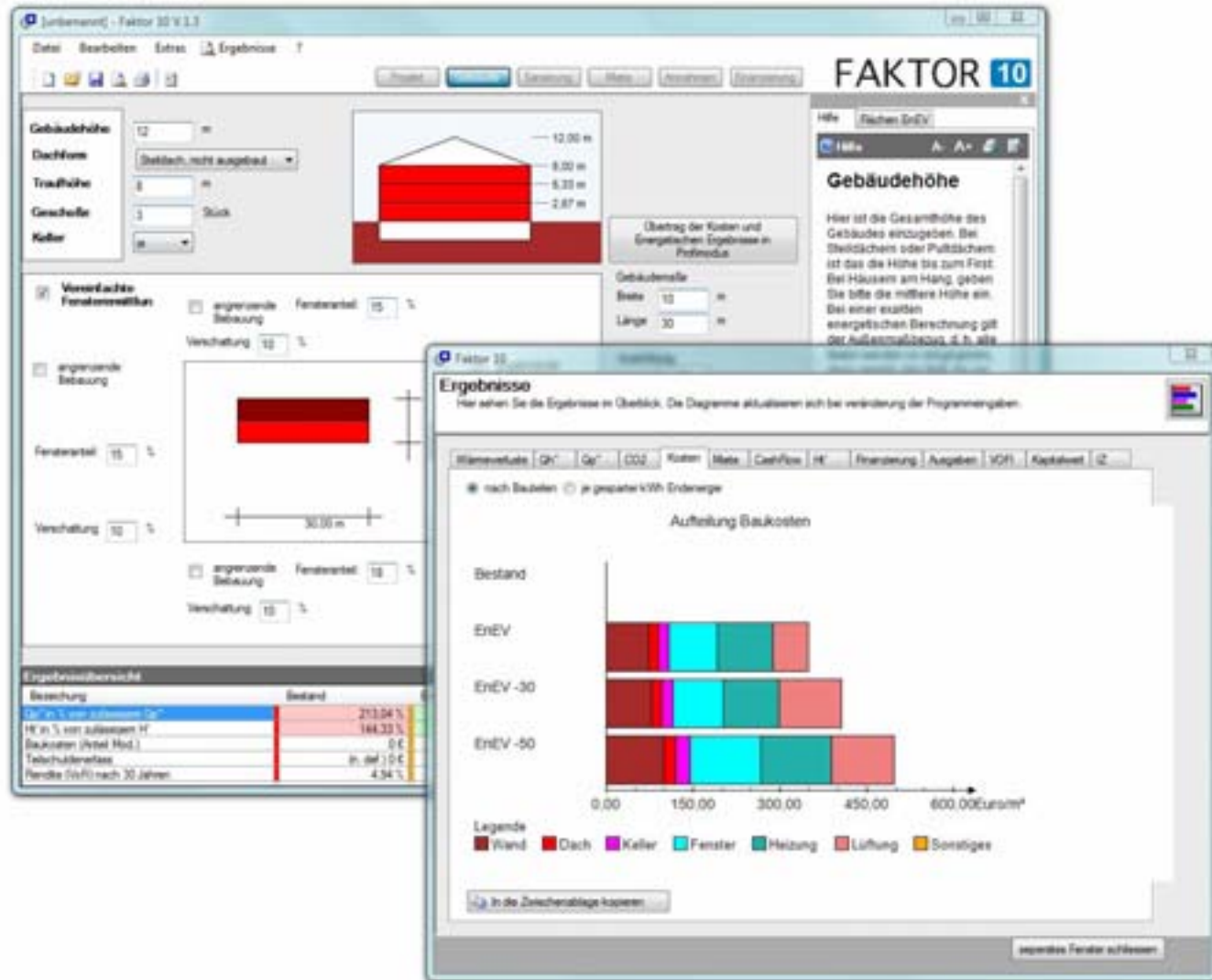
- Maico-Aerex, component manufacturer,
  - Knauf-Marmorit GmbH, component manufacturer,
  - Knauf Gips KG, component manufacturer,
  - Rehau AG, Erlangen component manufacturer,
  - Mauss (GU), Erlangen, general contractors,
  - Glöckle (GU), Schweinfurt, general contractors,
  - IngSoft GmbH, software company,
- 
- Dr. Schulze Darup, architect,
  - ebök, technical advisor,
  - Energy-technology Centre Nürnberg, technical advisor and project manager.

## Assignment of Tasks in Faktor 10

### Optimising the Low- Energy- House- Components & the execution of the construction work



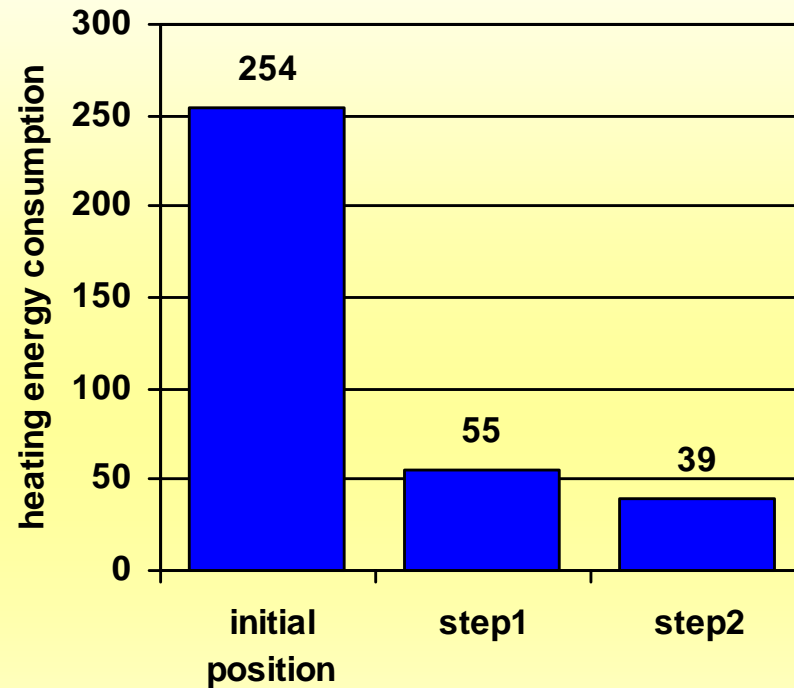
# Factor 10 Software Tool



# Factor 10 refurbishment examples



Architect Dr. Schulze Darup

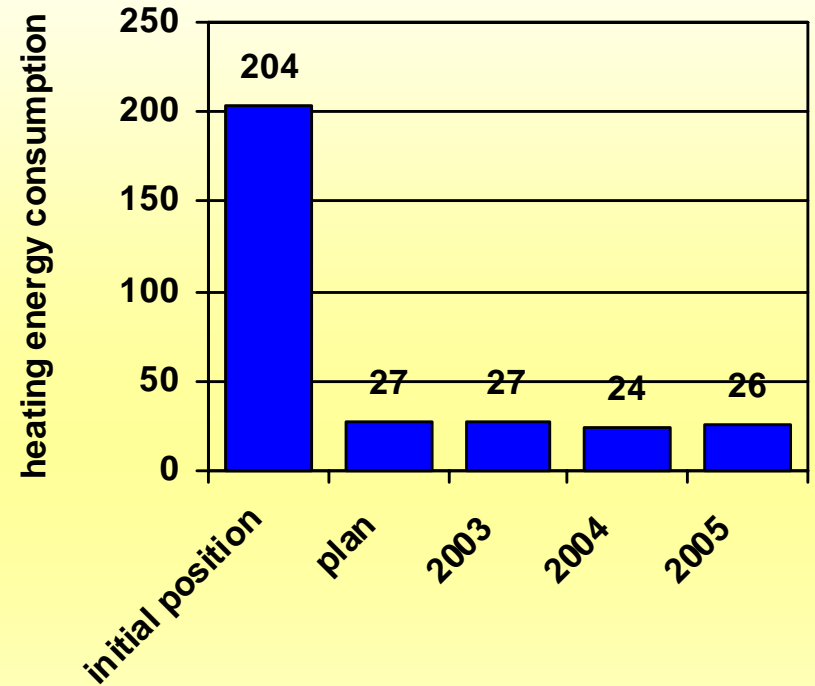


**Historical building  
with passivhaus-components  
Fürth**





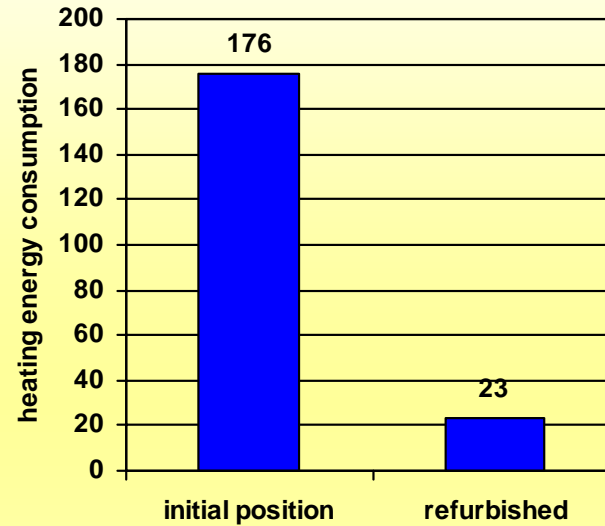
Architect Dr. Schulze Darup



**Jean-Paul-Platz 4  
WBG Nürnberg  
2002**



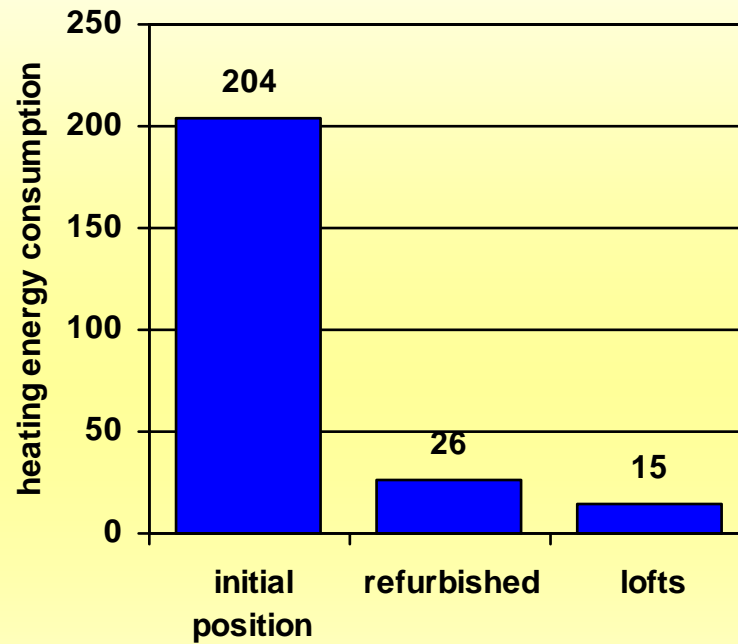
Architect Dr. Schulze Darup



**Ingolstädter Straße 139/141  
WBG Nürnberg 2004**



Architect Dr. Schulze Darup

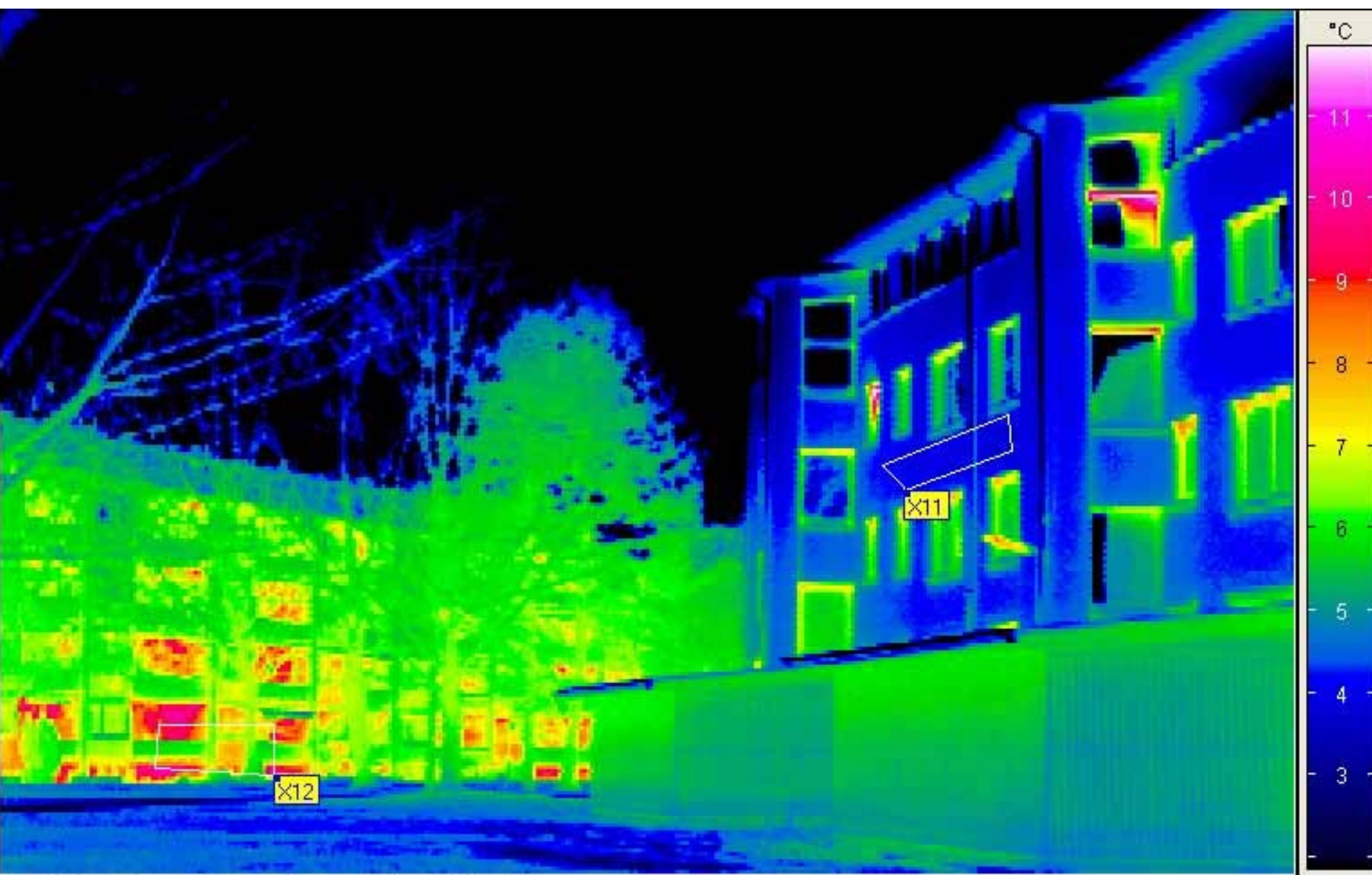


## Bernadottestraße 42 - 48 WBG Nürnberg





Architect Dr. Schulze Darup

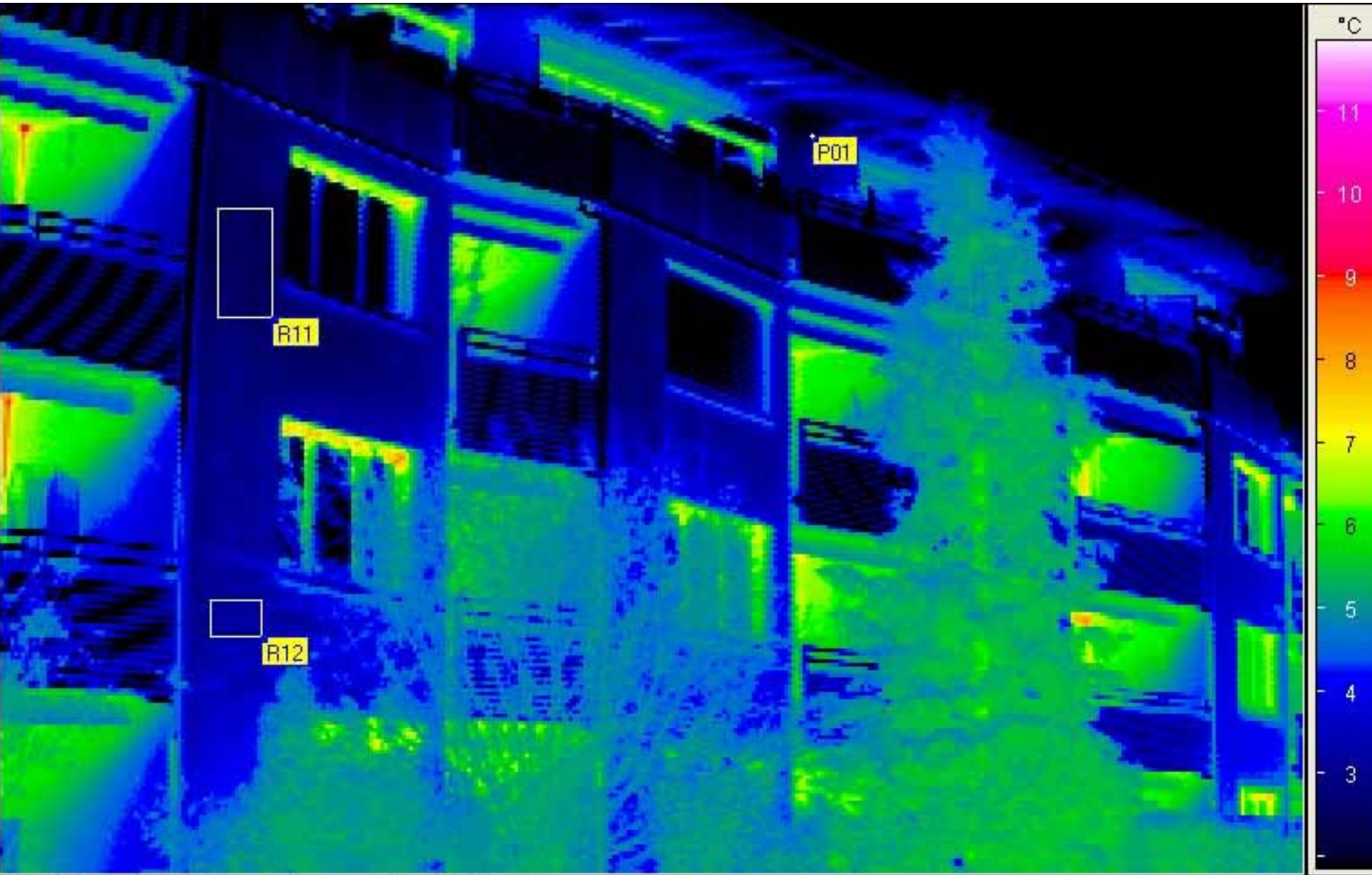


WBG Nürnberg, Bernadottestraße 42 bis 44

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Anlauff, KEM, Stadt Nürnberg im Auftrag der wbg Nürnberg





WBG Nürnberg, Bernadottestraße 42 bis 44

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