Federal Ministry of
Economics and Labour

Energy

„Priorities for National R&D Projects“

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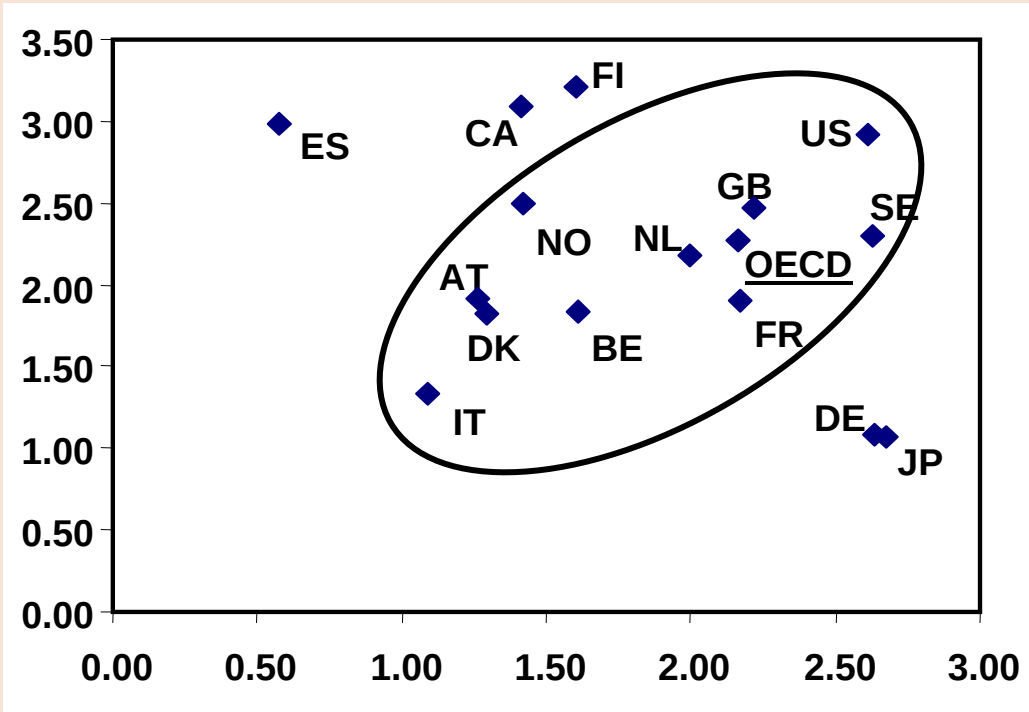
www.bmwa.bund.de

Berlin and Technology Developments

- **1885: one of the first power plants in the world**
- **1934: plans for a windpark of 5 machines with 5000-6000 kW to produce hydrogen**
- **1938: Otto Hahn indentified the principles of nuclear fission**

R&D Investments and Economic Activity

Increase GDP_{real} in % p.a. (1995-2003)



Average R&D rate in % of GDP p.a. (1981-1990)

Source: BMWA, OECD

Principle

„Whoever sows sparingly will also reap sparingly, and whoever sows generously will also reap generously“

2 Corinthians 9,6

→ relevant for economic policy

→ relevant for energy policy

Germany‘s Energy Reseach Activities

5. Programme 2005 - 08

4. Programme 1996 - 2005

3. Programme 1990 - 96

2. Programme 1980 - 90

1. Programme 1977 - 80

Framework Programme 1974 - 77

Nuclear Research Programme 1957

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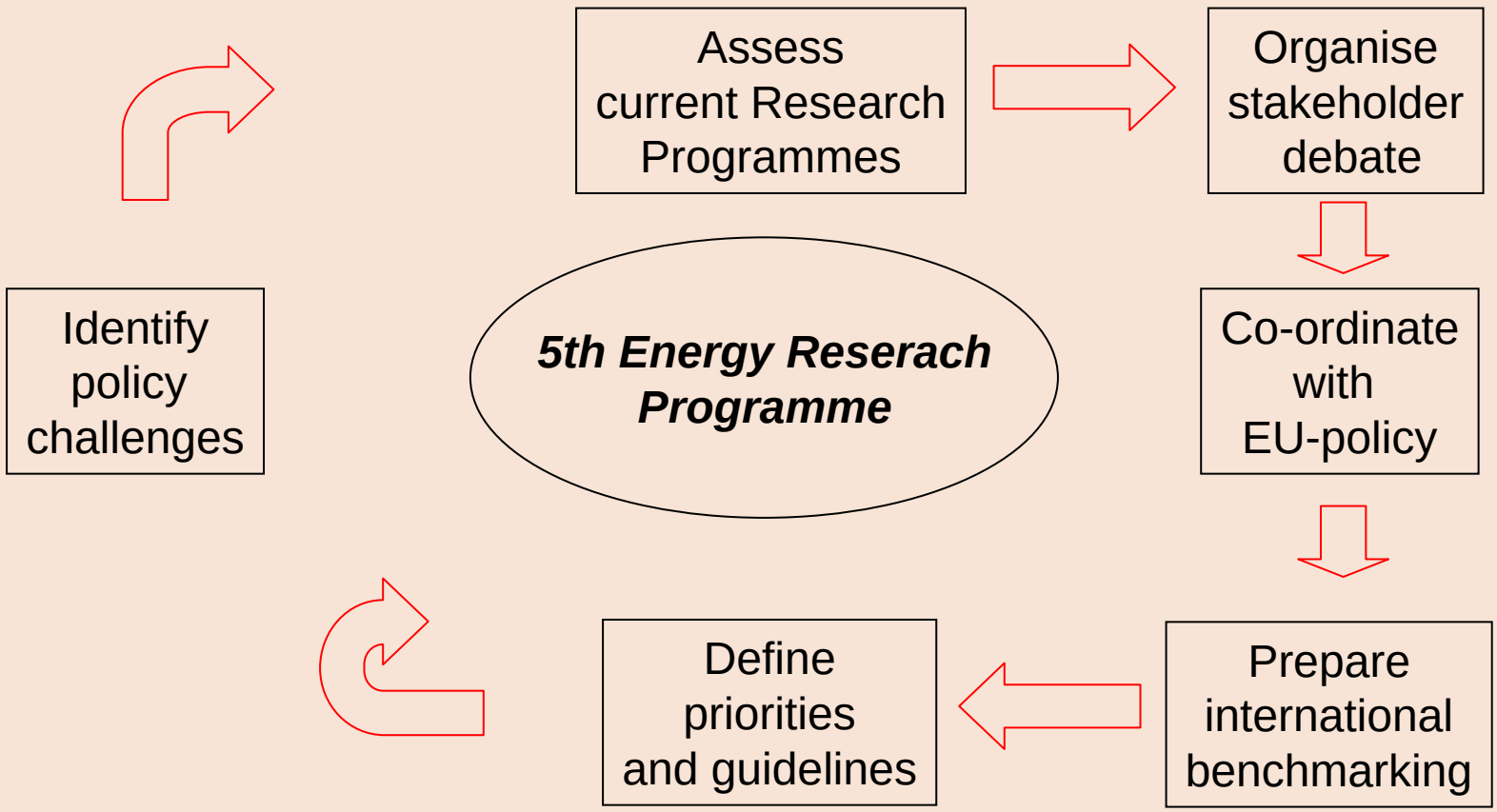
Six Steps to Develop Energy Research Programmes



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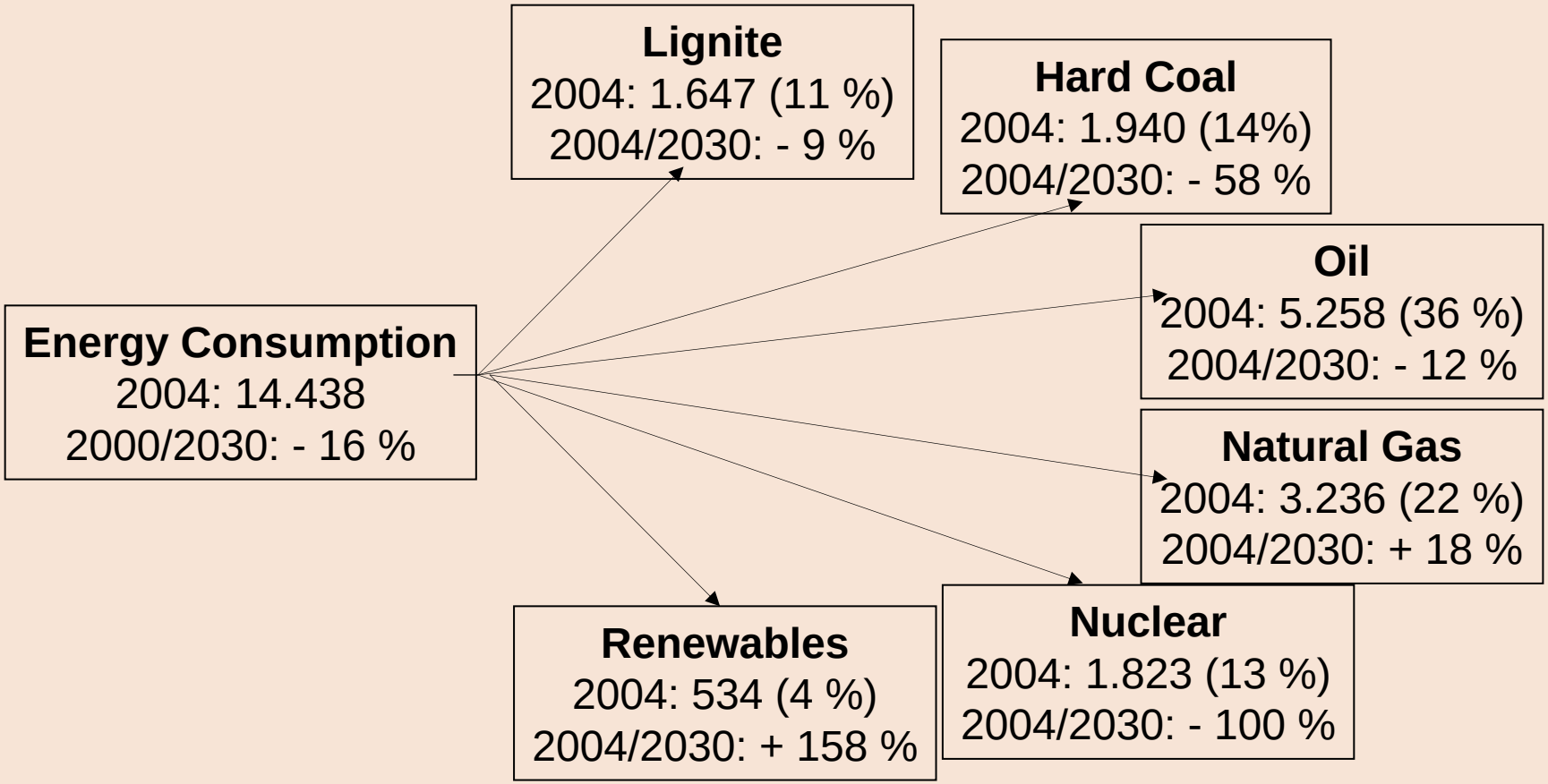
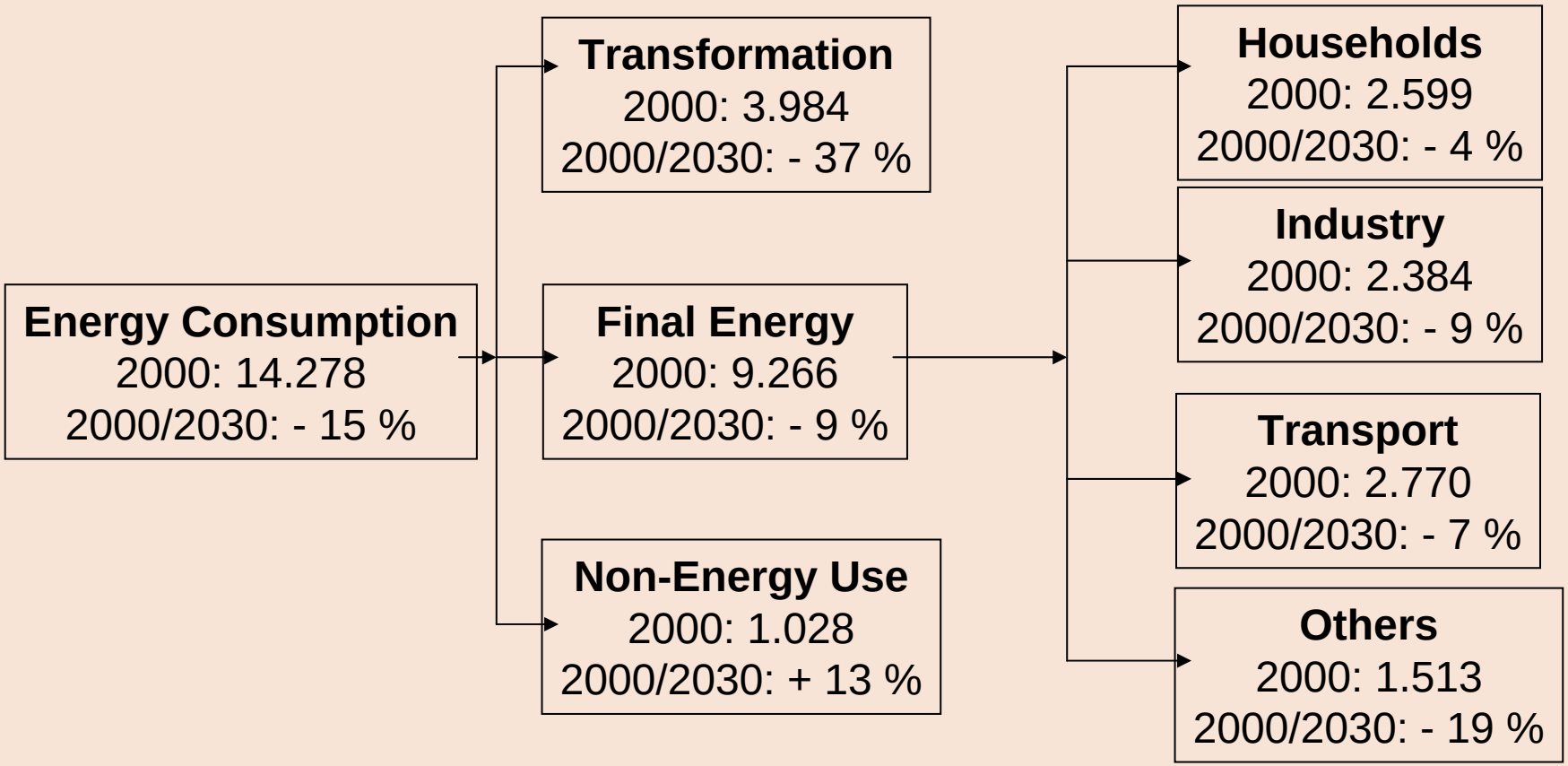
A Simple Model of Germany‘s Energy Supply System (PJ)



Source: Prognos/EWI, Energy Report IV (2005)

A Simple Model of Germany‘s Energy Demand System (PJ)

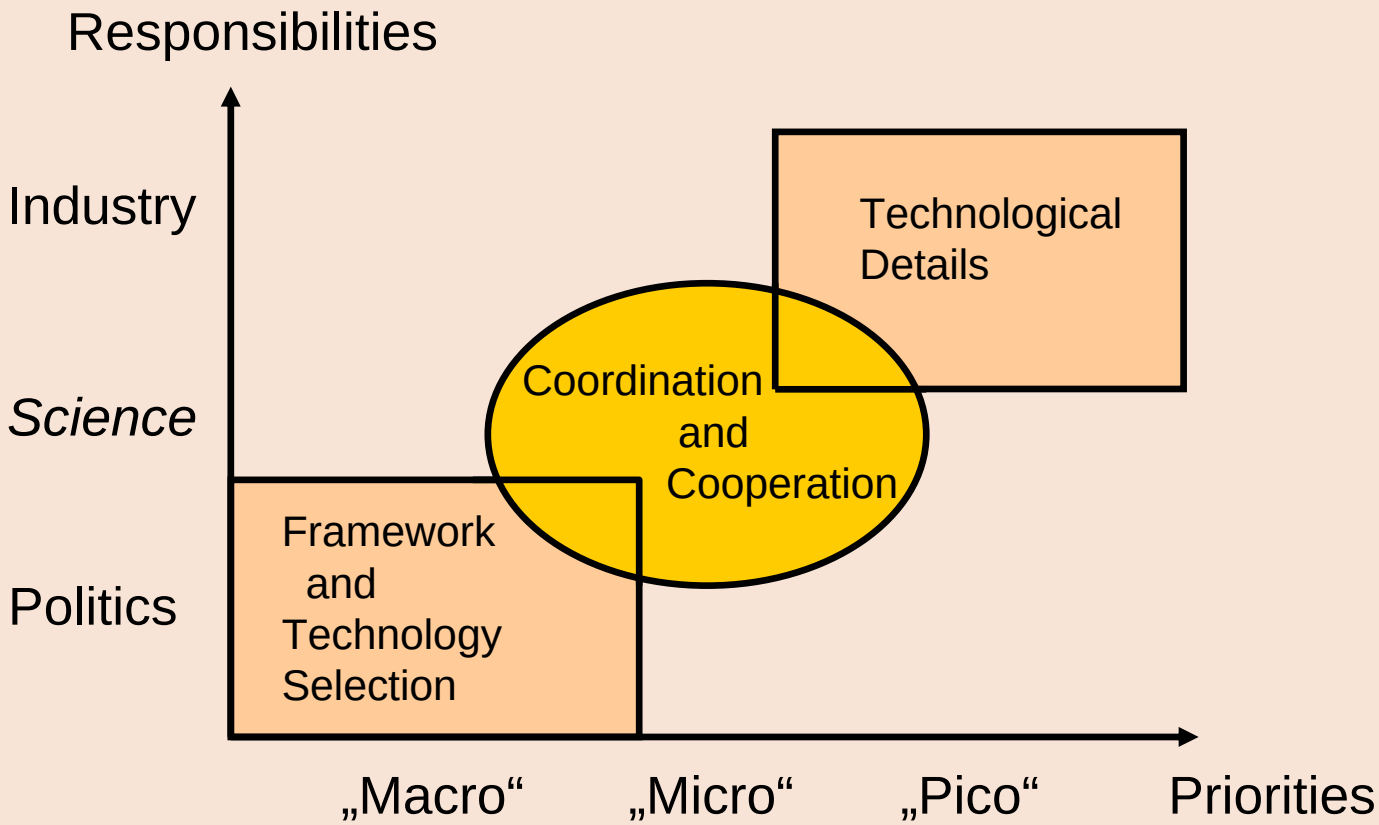


Source: Prognos/EWI, Energy Report IV (2005)

Three Fundamental Objectives

- **Contribute to fulfilling targets in energy policy**
  (balanced energy mix, significant improvements in energy efficiency, growing share of renewable energies, reduction of CO_2-emissions).
- **Improve the responsiveness and flexibility of Germany‘s energy system**
  (by maintaining and expanding the technological options).
- **Boost innovation dynamics and help to achieve more competitiveness, economic growth and employment in Germany and Europe**

Shared Responsibilities: The Process of Priority Setting



Priorities

- **Modern power plant technologies on the basis of coal and gas (including CO_2 capture and storage)**
- **PV and wind energy (offshore)**
- **Fuel cells and hydrogen as secondary energy carrier and energy storage systems**
- **Technologies and processes for energy-optimized construction (the energy-efficient building of the future)**
- **Biomass**

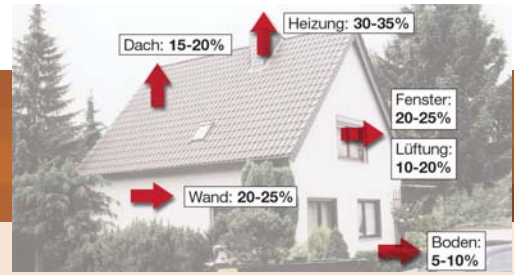
Ongoing Research Activities

- **Energy saving technologies in industry, commerce and services**
- **Other renewable technologies (solar heating, geothermal, hydropower)**
- **Nuclear safety and waste disposal**
- **Nuclear fusion**
- **System analysis**
- **Dissemination of information**

Energy Research Budget (Mill. €)

	2003	2008	2003/08
Energy Efficiency	106	120	14 %
Renewables	101	139	37 %
Nuclear safety	53	54	2 %
Fusion	115	115	+/- 0 %
Total	375	429	14 %

A New Priority: Energy Efficient Buildings



- **More than one third of final energy consumption in Germany is accounted for by private households (mainly used for space heating)**
- **Far more than 80% of the energy used in this segment consists of fossil energy carriers, in particular oil and natural gas**
- **Almost 90% of the building stock in Germany was constructed before 1990**
- **Residential buildings have a lifetime of more than 100 years with a renovation cycle of about 30 to 60 years**

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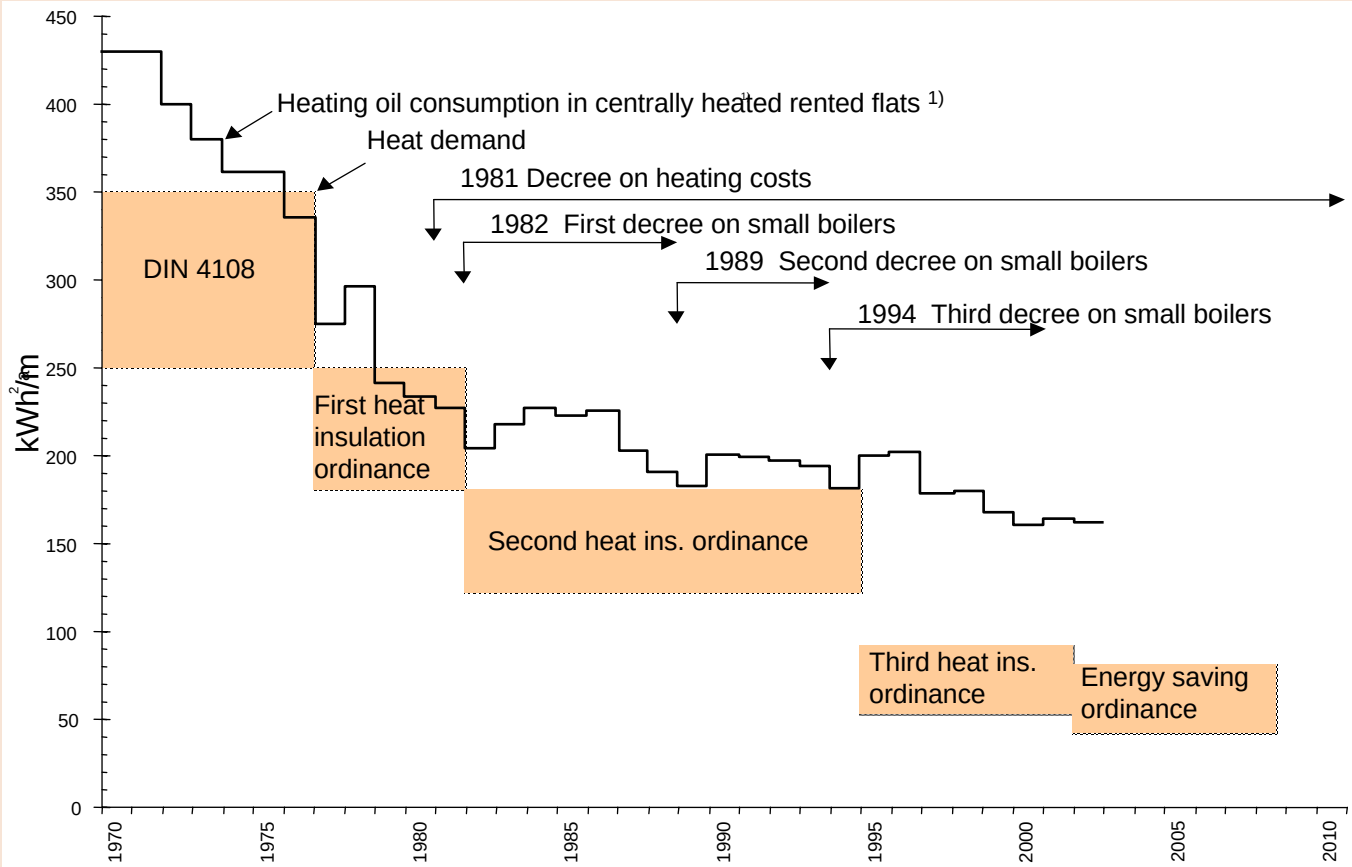
Visible Progress: Specific Heating Energy Consumption of Rented Flats



1) Former West Germany, not corrected for outside temperature; *Source*: Techem AG, 2004; BMBF, 1996; ISI, 1999

Future Activities

- **Implementation of the results of R&D in demonstration projects**
- **Continuation of R&D work on promising materials, components and systems**
- **Further development of the “distributed” supply of buildings with heating and cooling services from local heat and district heat**
- **Development and testing of promising techniques for short- and longer-term heat and cold storage systems**
- **Optimization of the associated measuring and control technology for efficient plant operation**
- **Transfer of suitable techniques to applications in the refurbishment of old buildings**

Challenge

Meet the Maximum

of the „Research-Euro“!