Sustainable Mobility and Urban Development

Prof. Dr. Engelbert Lütke Daldrup

Prof. Dr.-Ing. Engelbert Lütke Daldrup

- born in 1956, degree in urban and regional planning
- 1982-1995: Civil servant and Research assistant in the field of urban development in Frankfurt and in Berlin
- 1995-2005: Deputy Mayor with responsibility for urban development, building and transport in Leipzig
- 2006-2009: State Secretary at the Federal Ministry of Transport, Building and Urban Affairs
- Since 2010: Head of “Agentur für Stadtentwicklung GmbH“ (Urban stakeholder Consulting) in Berlin
- Professor for Urban Development at the Technical University Berlin and for Territorial Cohesion at the University of Leipzig

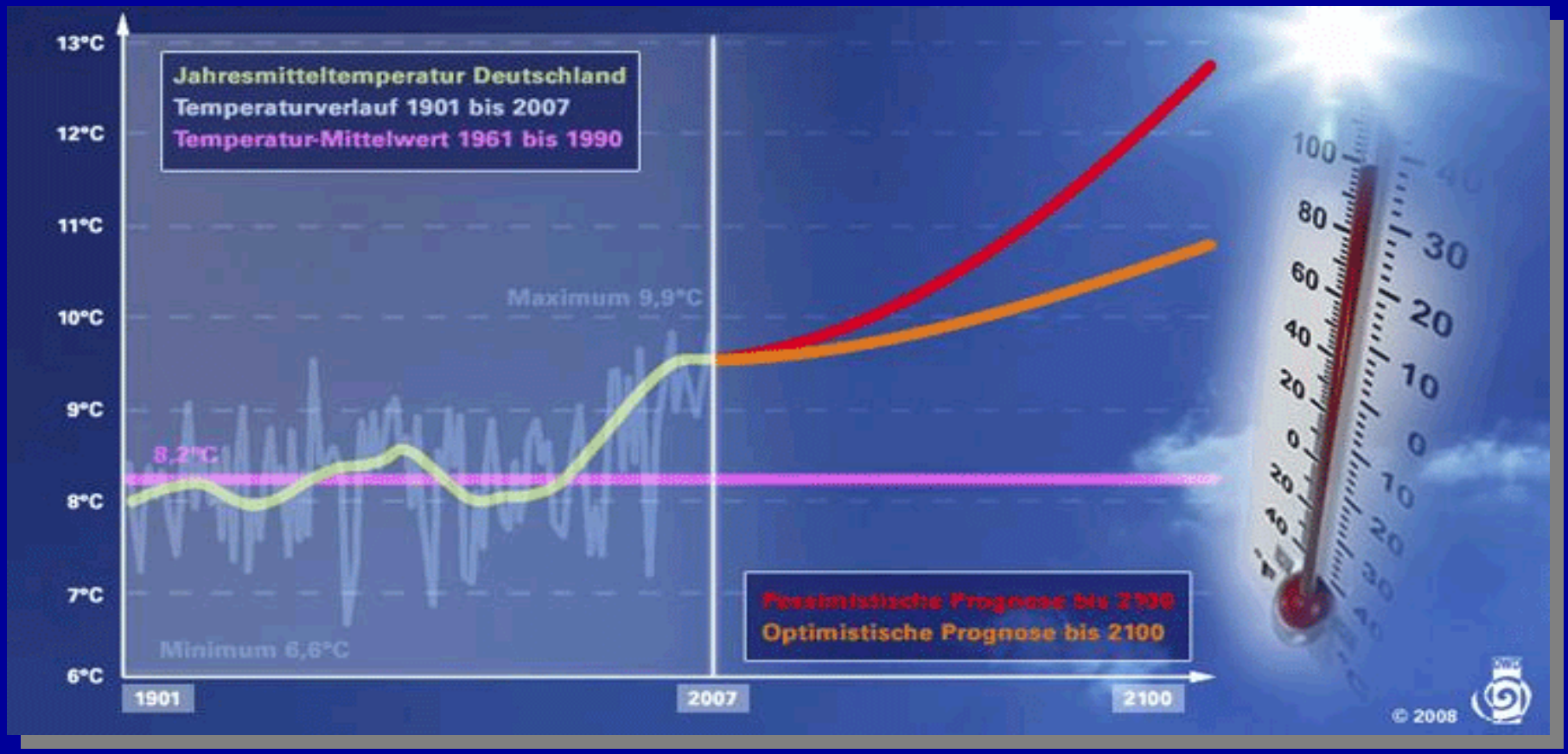
Sustainable Mobility and Urban Development

- Climate Change
- Climate Change and Urban Development
- Climate Change and Urban Mobility
- Climate Change and Building Sector

Rising energy consumption worldwide ... climate change

Climate change and its consequences

Climate change scenarios for Germany: temperature

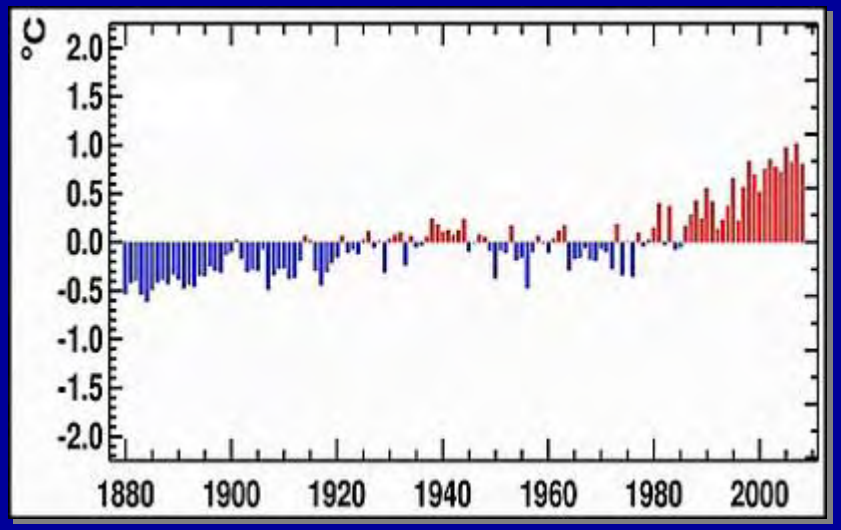


Source: German Meteorological Service, 2008

Rise in annual average temperature to 2071/2100 by 2 – 3.5˚ C

The challenge of climate change

- **Goal: global warming not to exceed 2˚ C.**
- Stabilize the atmospheric CO_2 concentration at the 1990 level
- Reduce CO_2 emissions worldwide by 30% by 2030 (by 80% by 2050).



Global emmisions by sectors (Year 2004)

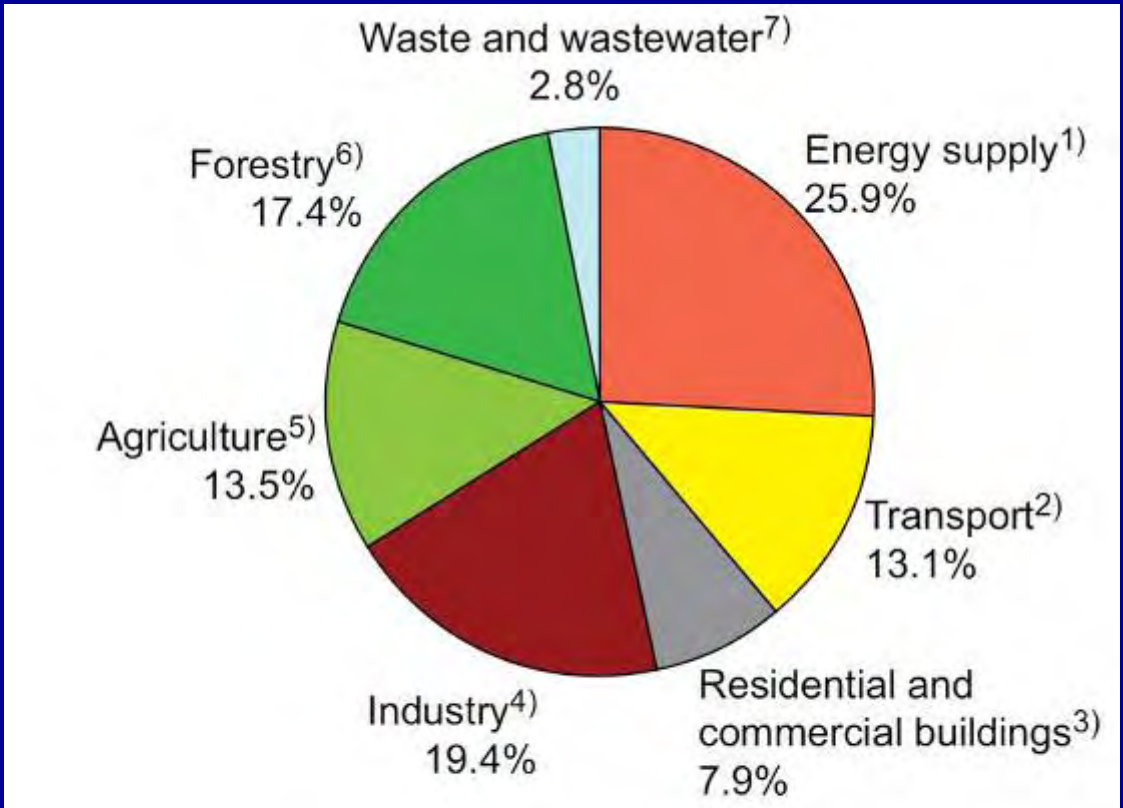


Figure 1.3b: *GHG emissions by sector in 2004.*

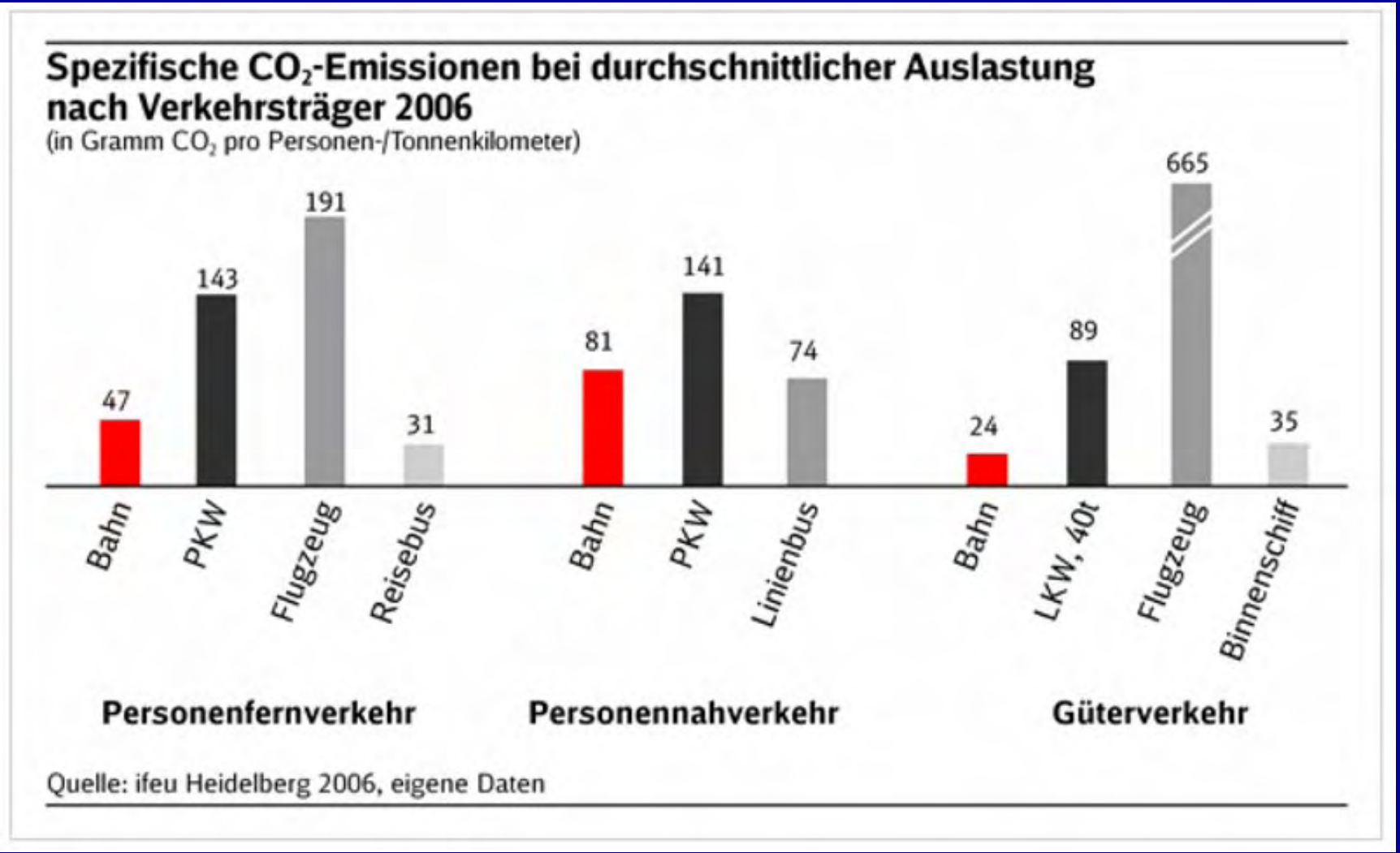
Source: Adapted from Olivier et al., 2005; 2006.

The energy consumption in the transport sector is still increasing every jear.

In residential and industry Germany we have a reduction in energy consumption, the GDP-growths is no longer combined to the increase of enery consumption

Quelle: IPCC 2007 (TS WG III, S.5)

Specific CO_2-Emissions of different transport modes



Quelle: www.deutschebahn.com

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Sustainable Development
Urban Planing, Energy, Mobility, Buildings

Challenges for the Cities:

- Reduction of energy consumption (transport and buildings)
- Reduction of urban sprawl and of land consumption
  -> „City with short distances“
- Promotion of public transport and non-motorised transport
- Energy saving modernisation of buildings
- Ecological re-development of urban areas

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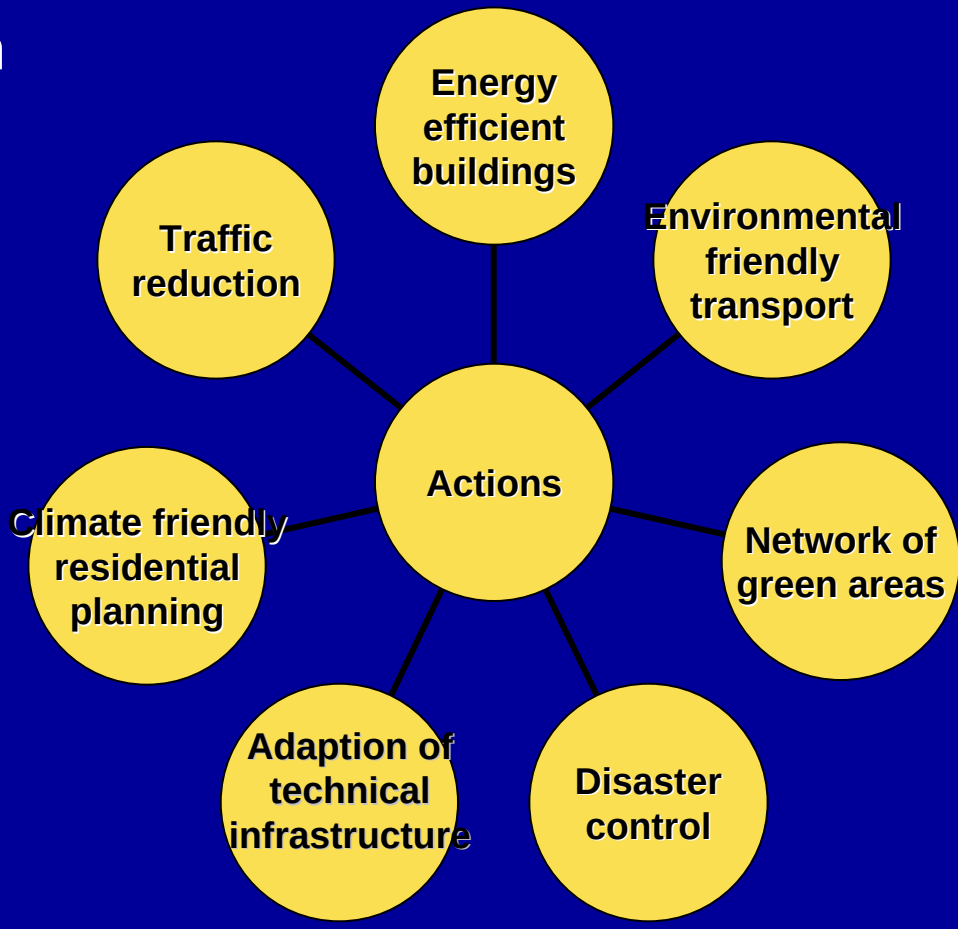
Climate friendly city development

Climate change requires in urban areas a three-level programme:

- The development of strategies to protect us from climate change (Mitigation)
- The adaption to climate change
- The co-ordination with other sustainable development programmes in the city



Climate change mitigation in cities – integrated urban development is necessary

- Compact cities, reduce urban sprawl
- New culture of mobility:
  environmentally friendly modes of transport
- Energy-efficient building and urban structures

Climate change: a key area of the National Urban Development Policy

"Building the city of tomorrow – combating climate change and assuming global responsibility"

- Renewable energy and energy efficiency
- Promoting a sustainable, healthy and compact city
- Collaboration with civil society and private sector players

Model project for a sustainable city development:

Vauban in Freiburg: Energy efficiency, car free quarters, street trams, ...

The cities use the opportunity of conversion:

French quarter in Tübingen: Residents as investors, City with short distances

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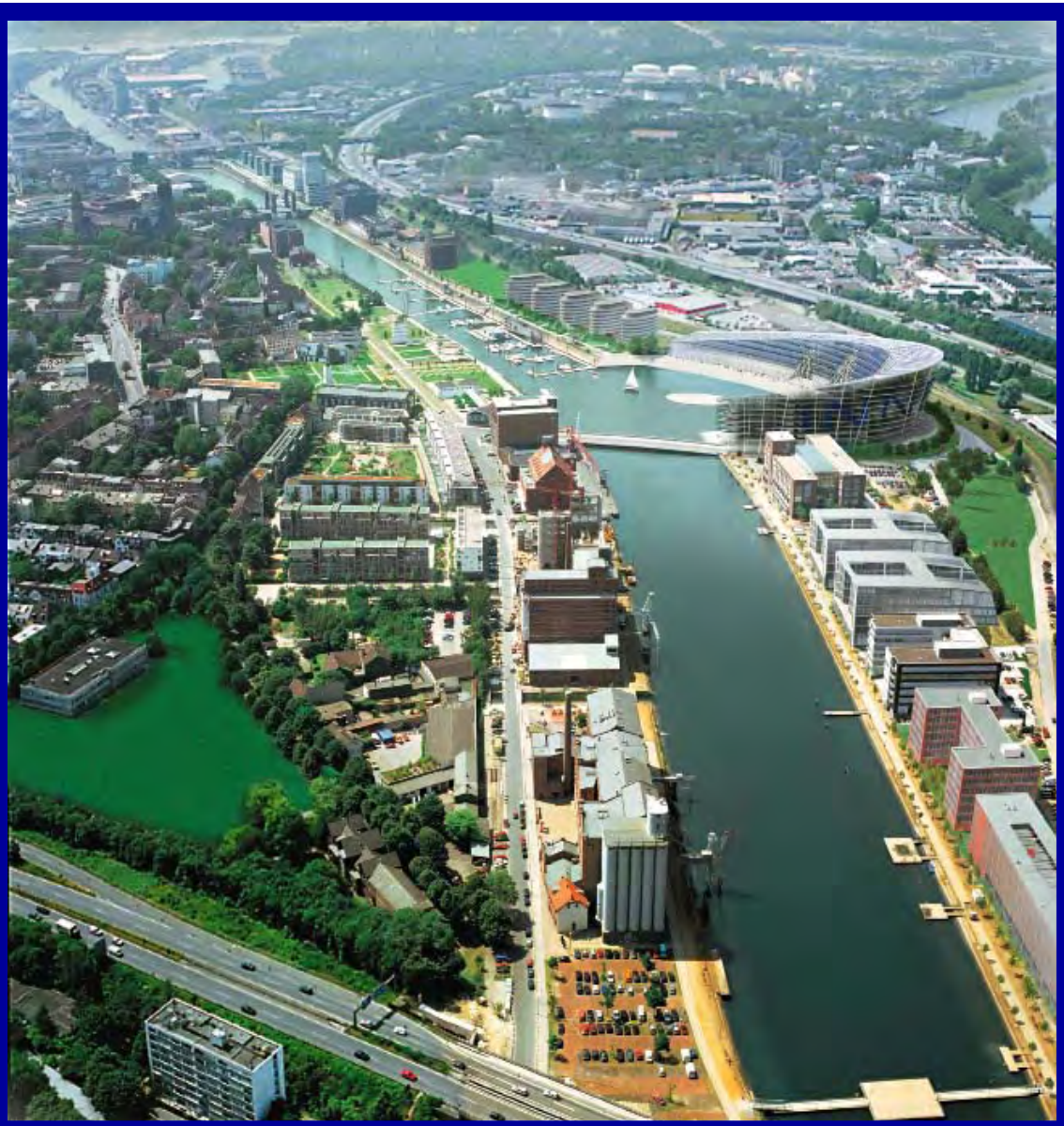
The cities use the opportunity of structural changes:

Inner harbour area in Duisburg: Recycling of fallow land, mixed use, ...



Consequent inner city development of dense structures and good PT (Metro): Harbour-City Hamburg – mixed use city quarter

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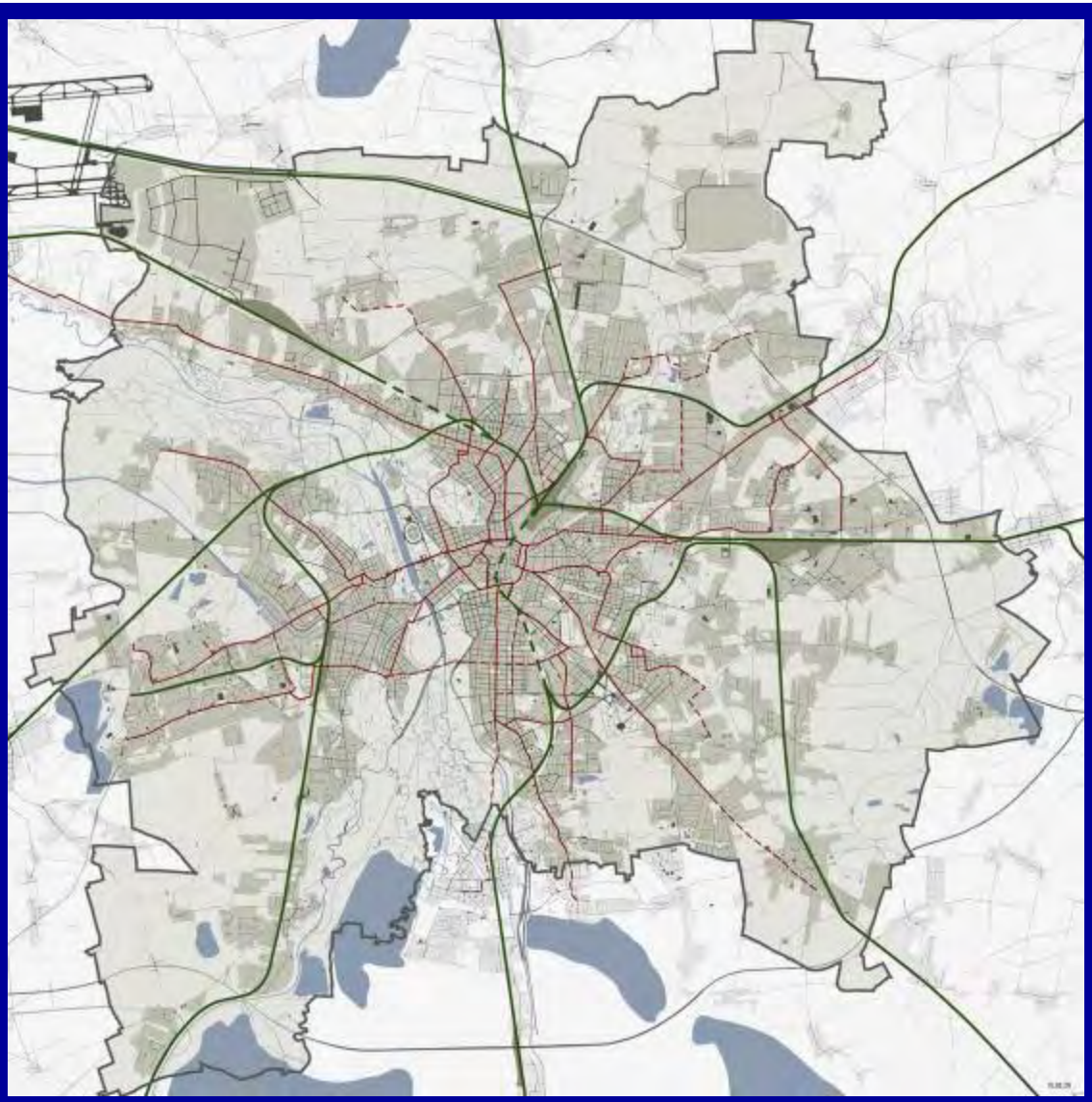
Compact City Structure provides short distances ...
(City of short ways)



Urban development is inner city development!

- Integrated city development is the basis for a sustainable city
- Development of existing structures is the main task because of
  - demographics,
  - sustainablity and
  - economics

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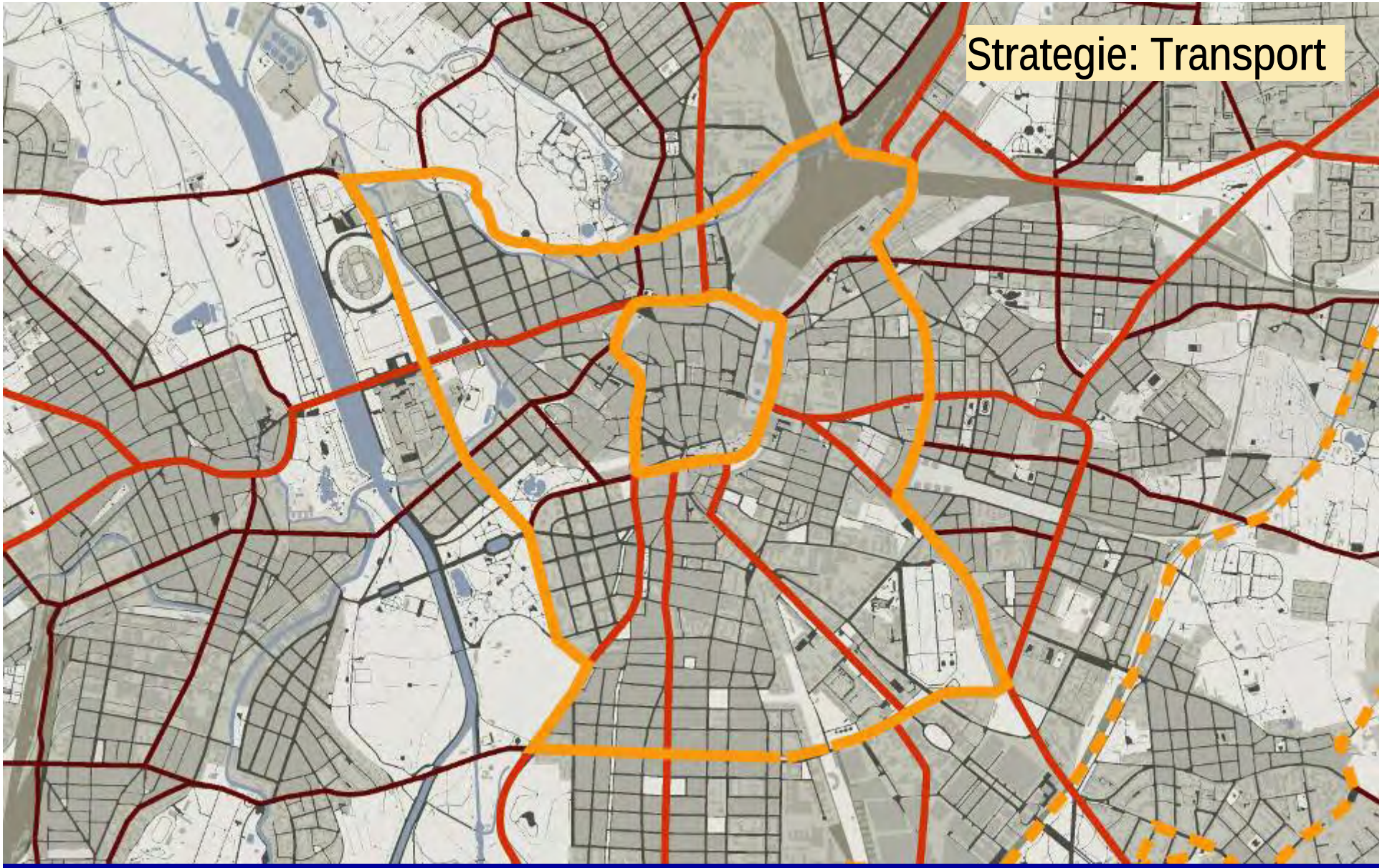
A strategic approach: Urban Development Plan „Leipzig 2015+“

Strategie: Transport



Magistralen / Radialen

Ringstraßen / Tangentialen

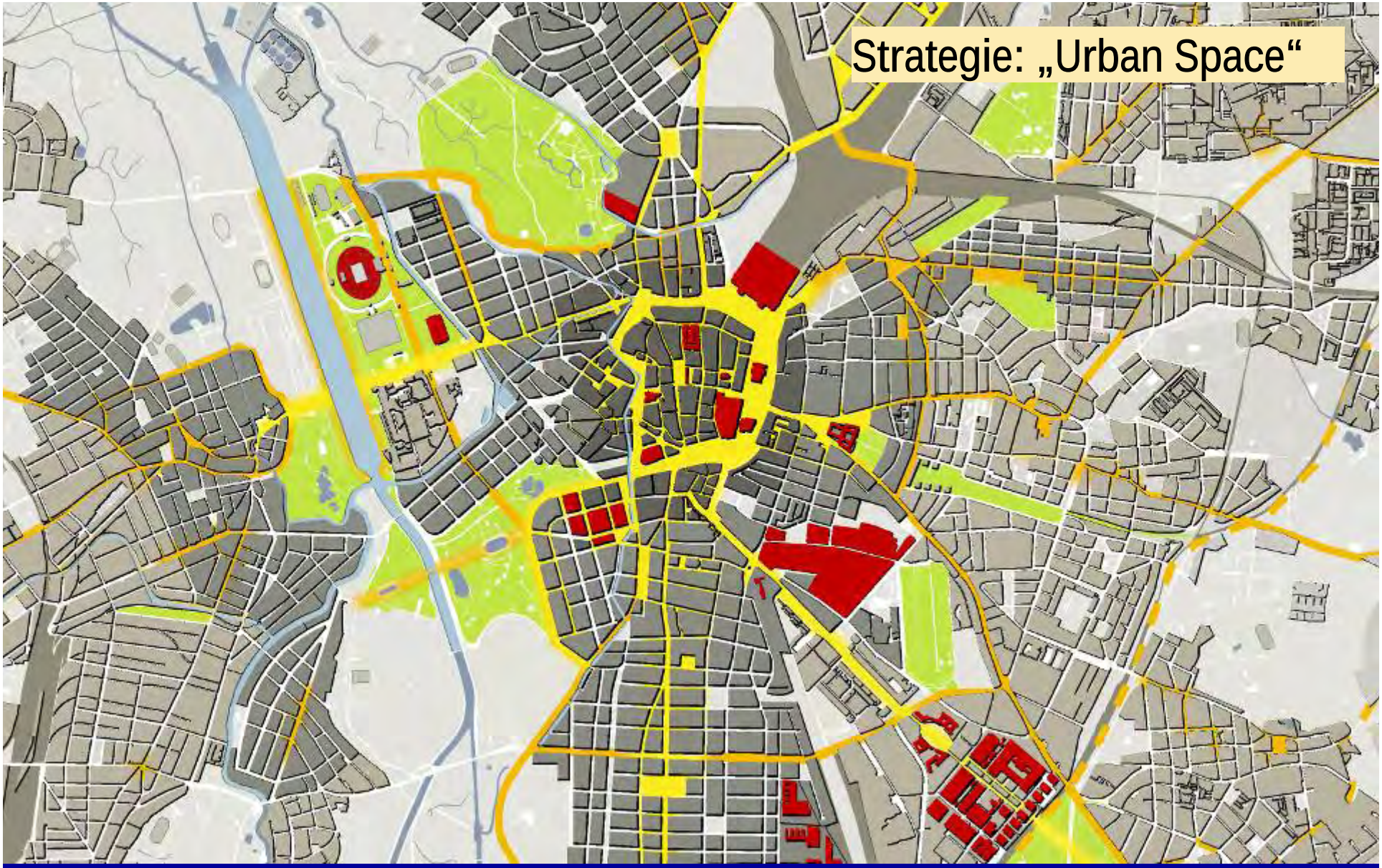
Sonstiges übergeordnetes Straßennetz

Untergeordnetes Straßennetz

Stadt Leipzig
Dezernat für
Stadtentwicklung und Bau
Stadtplanungsamt

cbb
Conradi, Braum & Bockhorst
Stadtplaner und Architekten

Strategie: „Urban Space“



Holistic strategies and co-ordinated actions

An integrated urban development policy is the main requirement to carry out a sustainable strategy. The sectoral political fields have to be coordinated better.

- Integration of transport planning in urban development,
- Inter-municipal co-operation (city and region),
- Co-operation with economy und civil society,
- Spacial, factual and temporal co-ordination

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Leading Principles of City and Regional Development

Sustainability through

- economic stability and development
- social justice and social responsibility
- ecological responisibility and efficiency

with consideration of

- the physical and psychic-emotional sensitivities of people
- the maintenance and further development of the cultural heritage
- the needs of future generations

Instruments of Promotion

- Leipzig Charta for a Sustainable European City (2007)
- Federal Ministry of Transport, Building and Urban Development BMVBS (2007) – Initiative for a Joint National Urban Development Policy
- Best practise in the National urban development policy (supporting the European city – compact, variegated, multifaceted...)
- Public funding of urban rehabilitation and development, urban renewal east/west, social city, urban preservation

Sustainable Mobility and Urban Development

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Climate Change and Urban Mobility

Energy efficiency in buildings and transport is the basis of a sustainable urban development policy

Urban Mobility – Challenges in Germany

- **Transport growth and globalisation**
  (old predictions before the crisis)
  - passenger transportation: + 19 % by 2025
  - transport of goods: + 71 % by 2025
- **Demographic change**
  - older, more variegated, less
  - intensification of regional differences
  - change in mobility requirements
    (barrier-free, safety, public transport)
- **Protection of environment and climate**
  - security of energy supply
  - climate change, land consumption
  - noise
- **Security of mobility**
  - affordability and participation
  - financing the infrastructure

Interdepency of Mobility and Quality of Life

- Cities "live on traffic", cities "suffer from traffic"
- Quality of life (increasingly) compromised by
  - environmental stress, area competition
  - dangers, uncertainties (traffic safety, social security)
  - (potential) climate changes and their impacts
  - social imbalance/tension/exclusion
  - design deficits, lack of „baukultur“

  ➔ Traffic is the main cause
- Potential danger of "insufficient mobility"
  - lack of accessibility in an appropriate time/at appropriate costs
  - limited physical abilities
  - lack of means of transport

  ➔ Social exclusion

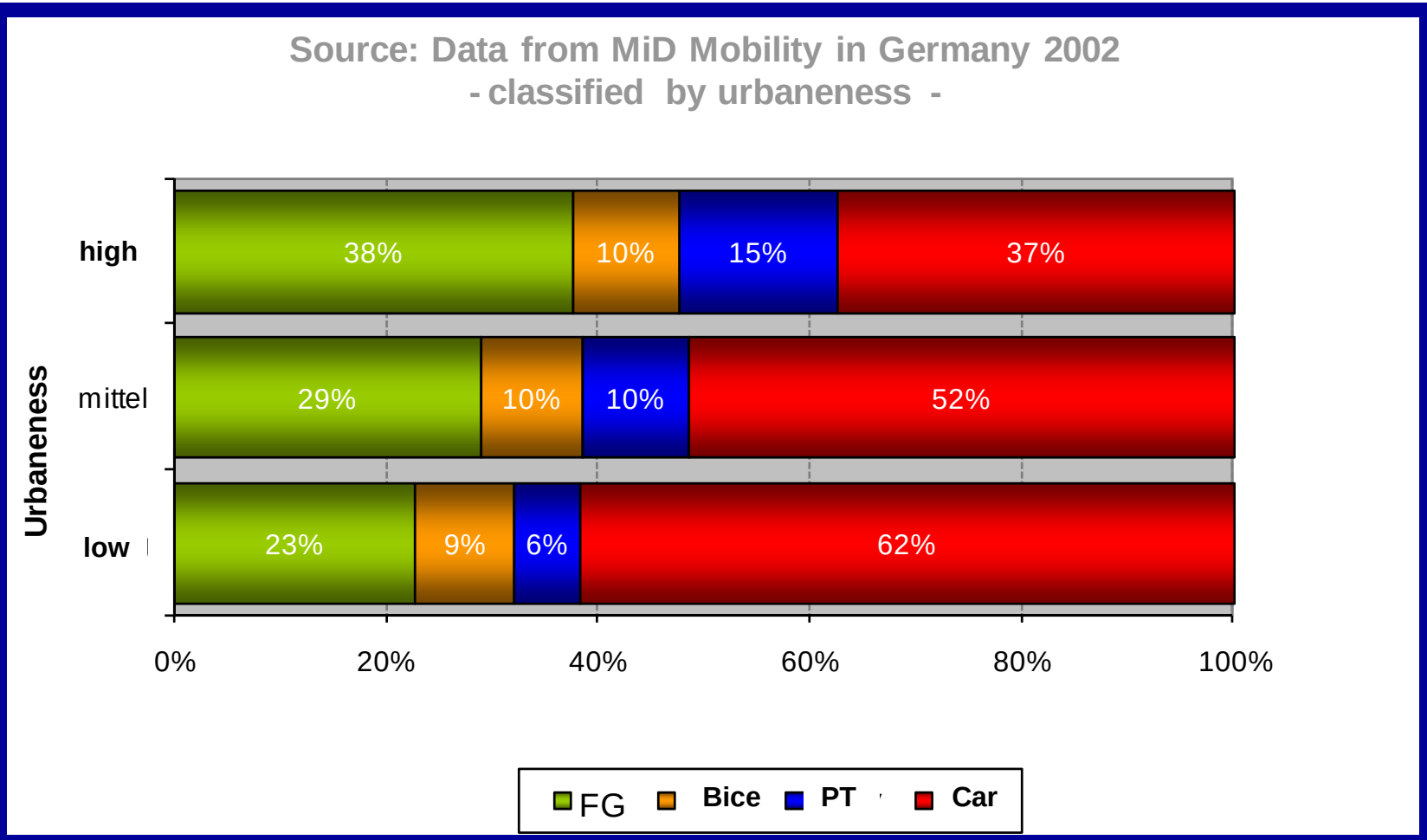
Visions of a Future Composition of Mobility and City

- "City and region of short distances"
  - Choice between housing options in the quarter, in the city
  - Jobs and availability of apprenticeship positions in close proximity or with urban accessibility
  - Care and support in close proximity
  - Basic services arranged in hierarchical supply systems
  - Opportunity to spend time in the open space (streets and squares, parks)
  - Increasing accessibility in the area ("without a car", public transport)

➔ "Spatial structure is not everything but everything is nothing without spatial structure“

➔ Maintaining quality of life with the least possible amount of cars

Means of Transport Interdependent with Urban Density



➔ **High Urban Density = less motorisation and more local public transport**

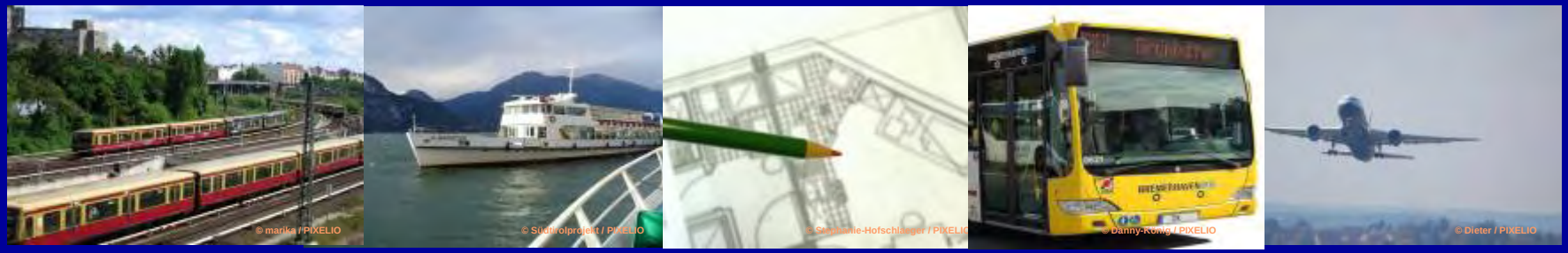
Source: Oeltze/Bracher/Difu, Mobilität 2050

Mobility 2050 based on MiD Mobility in Germany 2002

Urban Mobility – Priorities

- Integrated view of urban development and traffic planning – city of short distances
- Specifically promote traffic avoidance
- Improve performance of transport carriers according to their strengths
- Optimise interaction of transport carriers

Result: Improve chances to participate in public life



Sustainable and Tolerable Traffic in the Cities

Promote enviromental association

- Promotion of non-motorised traffic (bicycle, footpaths) as "local means of transport"
- Promotion of public transport as "metropolitan means of transport" with a high level of area, energy and environment efficiency
- Promotion of intermodality, multimodality, mobility management

Civilise car traffic

- Parking regulation
- Traffic routing/traffic control
- Pricing according to "real costs" (external costs, tolls, city toll)
- Promotion of low-emission and energy-efficient vehicles
- E-mobility for individual motorised vehicles

Urban Mobility

Environmentally and Climate Friendly Individual Transport

Measures taken in the last few years by the German Goverment:

- Binding CO_2 limits for cars in Europe (2015: 120 g/km; 2020: 95 g/km)
- Improved control effect through HGV toll
- Charging car tax based on CO_2 emission
- Increased use of bio-fuels
- Electrification of engines:
  - hybrid vehicles
  - fuel cell vehicles
  - electromobility (plug-in hybrid vehicles and battery-driven vehicles)

- **Integrated mobility concepts in 8 model regions**

Urban Mobility

Increase Attractiveness of Public Transport and Intermodal Utilisation

Facts about public transport:

- Approx. 29 m passengers every day (avoiding 19 m car rides)
- Climate protection partner: up to 90 % less CO_2 in public transport compared to cars
- Affordable mobility: monthly ticket costs about as much as a tankful
- Traffic safety: the risk of dying in an accident while riding in a bus or train is 20 times lower in comparison to driving in a car

The federal support of PT is limited, funding after 2013 is uncertain

Urban Mobility

Bicycle Traffic: National Bicycle Traffic Plan 2002 – 2012

Current priorities

- Sustainable transport and urban development
- Health promotion
- Mobility and traffic education

Concrete measures:

- Bike rental systems - Model projects €12.7 m in 10 Cities
- Promotion of beneficial projects (e. g. German Bike Prize etc.)
- Increased connection of bicycle traffic with public transport (e. g. by integration of public rental bike in public transport – current competition "Innovative Public Bike Rental Systems")

Nationaler Radverkehrsplan

Urban Mobility

Respect to the city initiates new mobility culture

Mobility is capable of destroying cities and landscapes:

We need a new urban compatible culture of mobility !

We have to work thoroughly and persistently on urban blunders !

Urban Mobility

A new culture of mobility means:

- To take full advantage of major infrastructure rehabilitation that is necessary anyway because it has been in service for many years
- To pay respect to the city structure and to the city design whenever setting up new transport facilities
- To strengthen the position of urban compatible, environmental friendly means of transport

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Energy efficiency in the buildings sector and climate change targets

Kyoto Protocol: Germany will achieve the targets by reducing greenhouse gases by **22 %** by 2010 compared with 1990 levels.

EU targets by 2020:

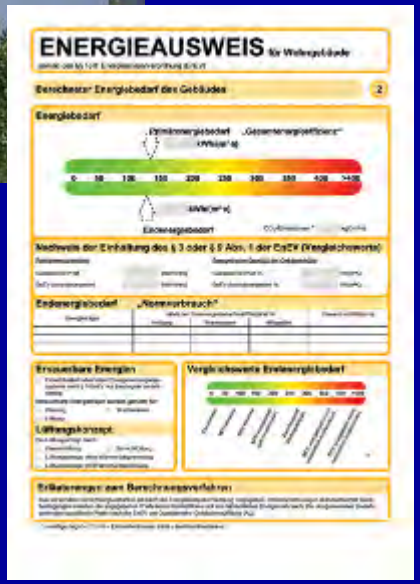
- Reduce greenhouse gases by a total of 20%
- Increase renewable energy to 20% (share of primary energy consumption)
- Reduce energy consumption by 20% (compared with the trend)

Germany's targets by 2020:

- **Reduce greenhouse gases** by **30 %** compared with 1990 levels
- Increase the share of renewable energy in the heating market to 14%

Integrated Energy and Climate Change Programme in Germany (adopted in 2007)

- Requirements of **Energy Conservation Regulations tightened** by 30% in 2009
- **Programmes** to assist energy-efficient building and refurbishment (programme to reduce CO_2 emissions from buildings) until **2011**



- Extend **combined heat and power** (25-30% share of electricity)
- Improve energy efficiency of federal buildings
- Other financial assistance programmes for climate change mitigation and energy certificates

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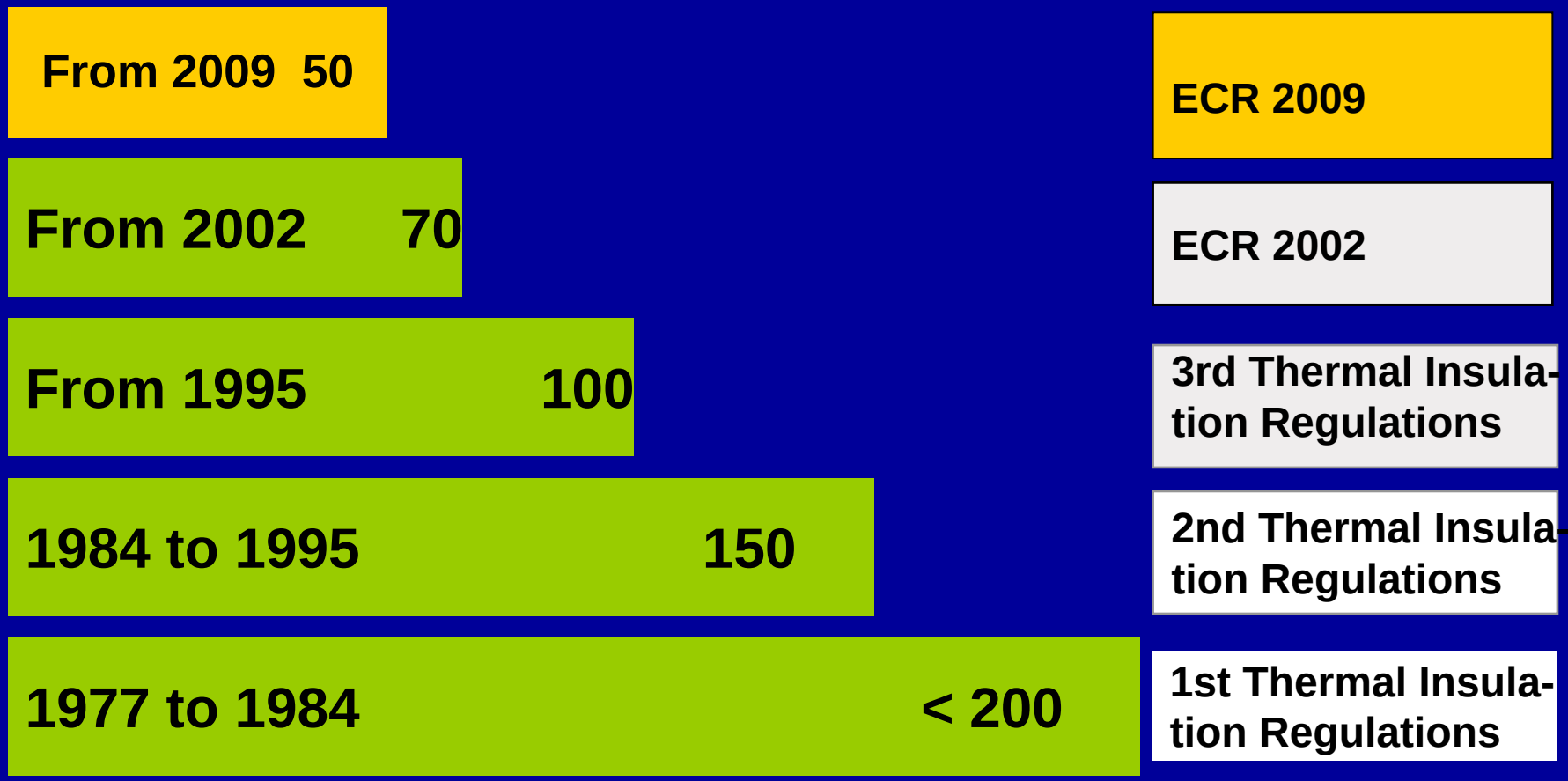
Energy Conservation Regulations: towards the passive house

Energy required for heating in [kWh / m² x a]



Financial assistance to home owners –
Programme to reduce CO_2 emissions from buildings

Aims of the assistance:

1. Reduce climate change impact of cities
2. Reduce CO_2 emissions
3. Reduce heating and hot water costs
4. Create new jobs

In Germany, buildings account for 40 % of energy consumption

Energy-efficient building and refurbishment
(Programme to reduce CO_2 emissions from buildings)

Aid tackles climate change, creates jobs and stimulates the economy!

Success stories (2006 to 2009):

- **€ 5.5 bn public funding for loans**
- **Loans and grants** totalling more than € **26 bn**
- Around **1.3 m dwellings refurbished** or **constructed** since 2006
- **CO_2** emissions reduced by **3.6 m t** a year
- **€ 1.3 bn** of heating costs saved
- Each year, between **180,000 and 250,000 jobs** are safeguarded or created

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Certification of building quality
German Sustainable Building Quality Label

- Since 2001, the design, construction and use of buildings in Germany have been guided by ecological considerations.
- Aim: holistic approach to costs beyond the entire useful economic life of the building.
- The introduction of a German Sustainable Building Quality Label in 2009 serves this purpose.
- A “building mark” and a “location mark” are awarded

German Sustainable Building Quality Label

German Sustainable Building Quality Label
Complex assessment system

Ecological quality	**22.50 %**
Economic quality	**22.50 %**
Social & functional quality	**22.50 %**
Technological quality	**22.50 %**
Process quality	**10,00 %**
Overall assessment (property)	**100.00 %**

Gold

Silver

Bronze

More than just regulating and funding - setting examples of good practice

Competition:
Energy-efficient refurbishment
of large housing estates
on the basis of integrated
neighbourhood development plans

WETTBEWERB
ENERGIEEFFIZIENZ UND GUTE ARCHITEKTUR
Effizienzhaus

Housebuilder competition:
Efficiency house –
energy efficiency and good architecture

The future of living:
The Ministry's plus energy house

Efficient houses and good architecture
Examples from the regions of Germany

Oldenburg
Built: 1890
Savings: **95%**

Nuremberg
Built: 2004
Savings **90%**

Munich
Built: 1954
Savings: **85%**

Freiburg
Built: 2003
Passive house

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Efficiency house competition
Good practice in Germany

WETTBEWERB
ENERGIEEFFIZIENZ UND GUTE ARCHITEKTUR
Effizienzhaus

Kiel
Clients: Schütt / Marroni, Kiel
Architect: Harald Krüger, Kiel

Speyer
Client: Klemens Osika, Ludwigshafen
Architect: Osika & Schäfer, Ludwigshafen

Berlin
Clients: e3 bau-gbr, Berlin
Architect: Kaden Klingbeil Architekten

Neo Rauch: Landscape with transmitter tower, 1996

Thank you for listening to me