Sustainable Urban Development

Practical Examples

European Union – Sustainable Energy Week, Brussels 11.2. 2009
Event: Benchmarking Local Climate Policies – Climate Alliance

Freiburg – Facts and Figures

- Inhabitants: 220,000
- Surface area: 150km², of which 40% forest. Maximum altitude above sea level: 1,285 m
- Has been a university town for 550 years; currently 30,000 students
- Job situation: 57% in service sector; unemployment rate: 6%
- Tourism: 1 mio. overnight guests per year, of which 1/3 from abroad
Freiburg – Facts and Figures

- Electricity supply: 50% from combined heat/power generated in Freiburg itself
- Annual CO\textsubscript{2} emissions per capita in 2005: 9.3 t
- Number of passenger cars per 1000 inhabitants: 450, downward trend

Introductory Remarks
Rising Energy Prices...?

OPEC crude oil production and crude oil price development

Why (local) acting would make sense...?

Groucho Marx:
What did future generations ever do for me?
The Role of Municipalities

Federal Congress on National Urban Development, April 2008:

"Our municipalities are our future"
"Only together can we meet these challenges"
"Urban development relies on an equal partnership of everybody who is involved "

from: ZfK April 2008
Leading by example

- “Municipality” as a stakeholder in its own companies
- “Municipality” as a developer and planner
- “Municipality” as a consumer
- Municipal council: Political decision-making body

= “Municipality” as a trendsetter, role model, motivator and coordinator

Sustainability in Freiburg
Energy Efficiency and Climate Protection Concepts

- **1986 Energy Supply Concept**
  - Conserve resources
  - Lower emissions
  - Withdraw from nuclear energy
  - Contribute to worldwide climate protection

- **1996 Climate Protection Concept**
  - Climate protection target: -25% CO₂ until 2010
  - E³ = save energy, produce energy efficiently, use renewable energy

- **2007 Climate Protection Strategy 2030**
  - Climate protection target: -40% CO₂ until 2030
  - Action plan, financing

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**CO₂ Emissions, Targets and Monitoring**

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<tr>
<td>Traffic</td>
<td>2000</td>
<td>-25%</td>
<td>-5%</td>
<td>-7%</td>
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<td>Energy</td>
<td>1500</td>
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<td>-13% / inh.</td>
<td>-1.5%</td>
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in 1,000 t CO₂ Equivalent p.a.
Climate Strategy 2007: Four Scenarios

Greenhouse Gas Emissions - Comparison of Scenarios

<table>
<thead>
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<th>Year</th>
<th>Basis</th>
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<th>Focus City</th>
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Emission Reduction 2030 compared to 1992

- Basis
- Ideal Cond.
- Focus City
- Reference

Climate Strategy 2007: Fields of Action

- Traffic: 20%
- Household: 22%
- Commerce: 16%
- City of Freiburg: 3%
- Trade: 10%
- Industry: 21%

in % of total emissions
Benchmarking

Which Initiatives in Particular?

- Energy Savings
- Energy Efficiency
- Energy from Renewable Resources
Why are Buildings so Important?

- Weak Spot Analysis = Losses of Energy

Promotion Program for Energy Efficient Building Rehabilitation (Insulation, solarthermal installations, CHP...)
- Promotion of energy efficiency initiatives in more than 700 buildings
- 1.2 mio. Euro in grants; total investment 13 mio. Euro
- Business contracts for regional economy and craftsmen
- CO₂ reduction per year: 2,500t (2008)

Give your house a thick skin.
Old Becomes New

Rehabilitation into a passive house

Which Initiatives in Particular?

Energy Savings

Energy Efficiency

Energy from Renewable Resources
Local Heating Supply

District of Landwasser: 7,000 inh./3,500 hh

Natural gas and landfill gas CHP power plant
- Landfill gas: 5.3 mio. m³/a *downward trend*
Which Initiatives in Particular?

Energy Savings

Energy Efficiency

Energy from Renewable Resources

Only Renewables?
Urban Development
Building Standards
SETTLEMENT DEVELOPMENT
NEW DISTRICT OF RIESELFELD

- 4,200 new flats in low-energy construction for 10 to 11,000 people
- 1,000 jobs
- Since 1997 connection with city railway

SETTLEMENT DEVELOPMENT
DISTRICT OF VAUBAN

- New flats for ~4,300 people have already been completed
- Multiple social infrastructure facilities
- Since 2006 connection with city railway
Instruments of Climate Protection in Urban Land-Use Planning

- Early consideration of energy aspects in target definition for new building areas
  - Consideration of passive solar aspects in draft plan
  - National Standard –30% in all new building areas
  - Energy concepts
- Development of consistent procedure
- Implementation on the basis of agreements on urban development
- Resolution in municipal council (= binding character both internally and externally)

New Energy Building Standard in Freiburg

- Step-by-step towards energy efficient buildings
- Cooperation between environmental department and planning/building department
- Freiburg Philosophy
  1. Reduce energy consumption
  2. Provide efficient technology and renewable energies
New Energy Building Standard in Freiburg

- Existing buildings
- New buildings national standard 1995
- New buildings national standard 2002
- Freiburg standard 1992
- Freiburg standard 2005
- New buildings national standard 2009
- Passive houses Freiburg 2009
- Passive houses Freiburg 2011
- Zero-, Plusenergy Houses
- Average energy demand per kWh/m²a
- Heating energy consumption in kWh/m²a - excluding electricity used to produce warm water and run technical and household appliances

Which Instruments Lead to the Target?

"push"  "pull"
Energy Efficient City Planning?

Visions

Masdar City, Abu Dabi

Quelle: www.spiegel-online.de
Energy Efficient City Planning

What could we do if everyone said what will we do and nobody stepped forward to see what might be done if only we do. So, let us step forward.

Kurt Marti

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