

# **Smart City MSI Workshop**

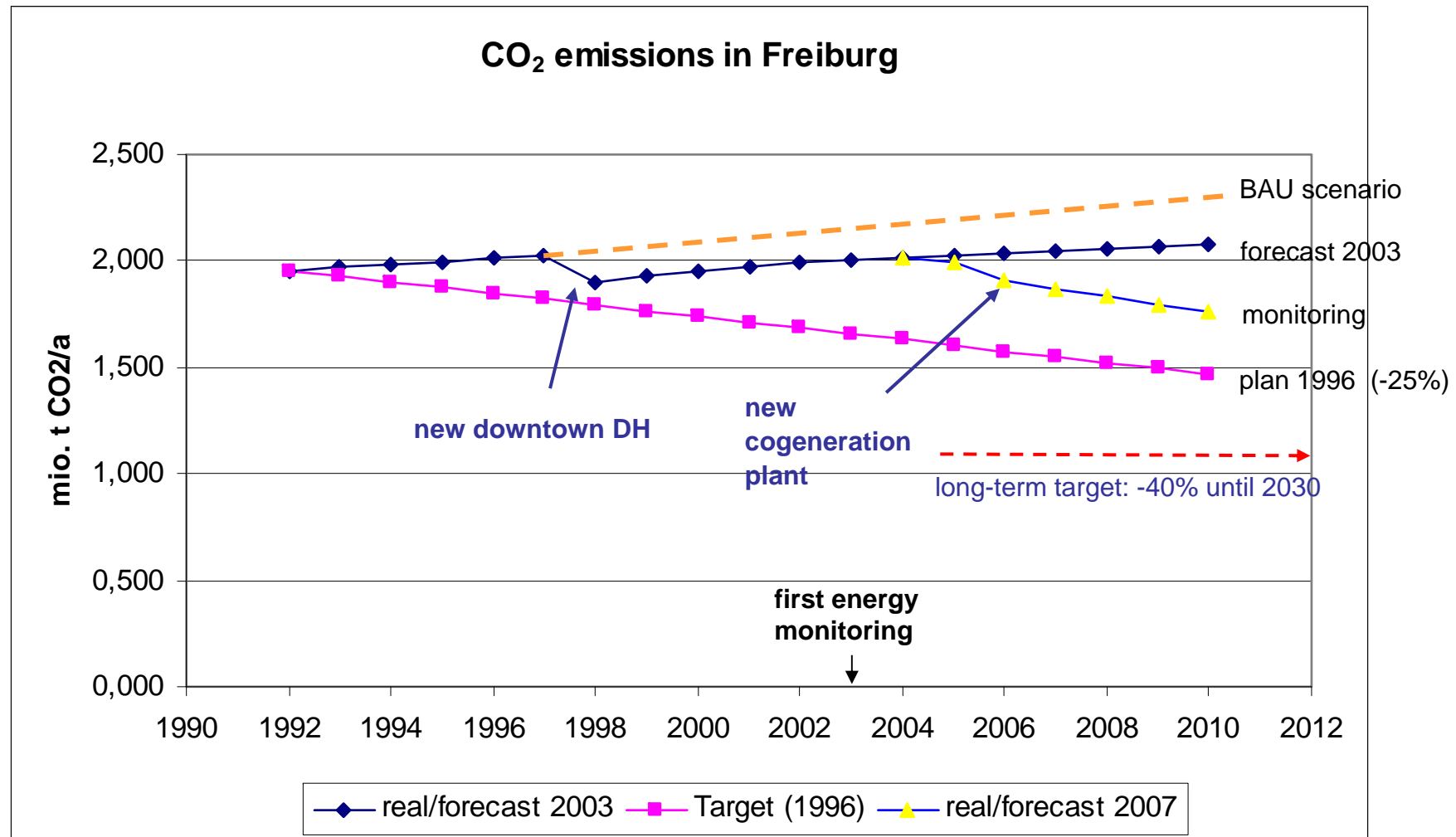
## **– Transnational City Co-operation: D A CH –**

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**Background** <

- „Smart City“ discussion:**
  - 1-dimensional ??
- Municipal energy policies:**
  - big targets – big gaps

## Local energy policy in Freiburg: *wish and reality*





→ Target: – 80 % GHG? →

- Building stock → Cities!
- Renewables



Stuttgart downtown

22/04/2011

## Investment costs of „city energy transition“?

- building energy retrofit ~ 300 €/m<sup>2</sup>
- DH infrastructure ~ 80 €/m<sup>2</sup>

→ City of 300.000: ~ 11 mio. m<sup>2</sup> (e.g. Karlsruhe)

→ **3,6 billion €** total investments over ~ 30 years (120 mio. €/a)  
(> 12.000 €/cap.)

### Energy costs of private households?

- Thermal energy: ~ 150 mio. €/a
- Electricity: ~ 80 mio. €/a

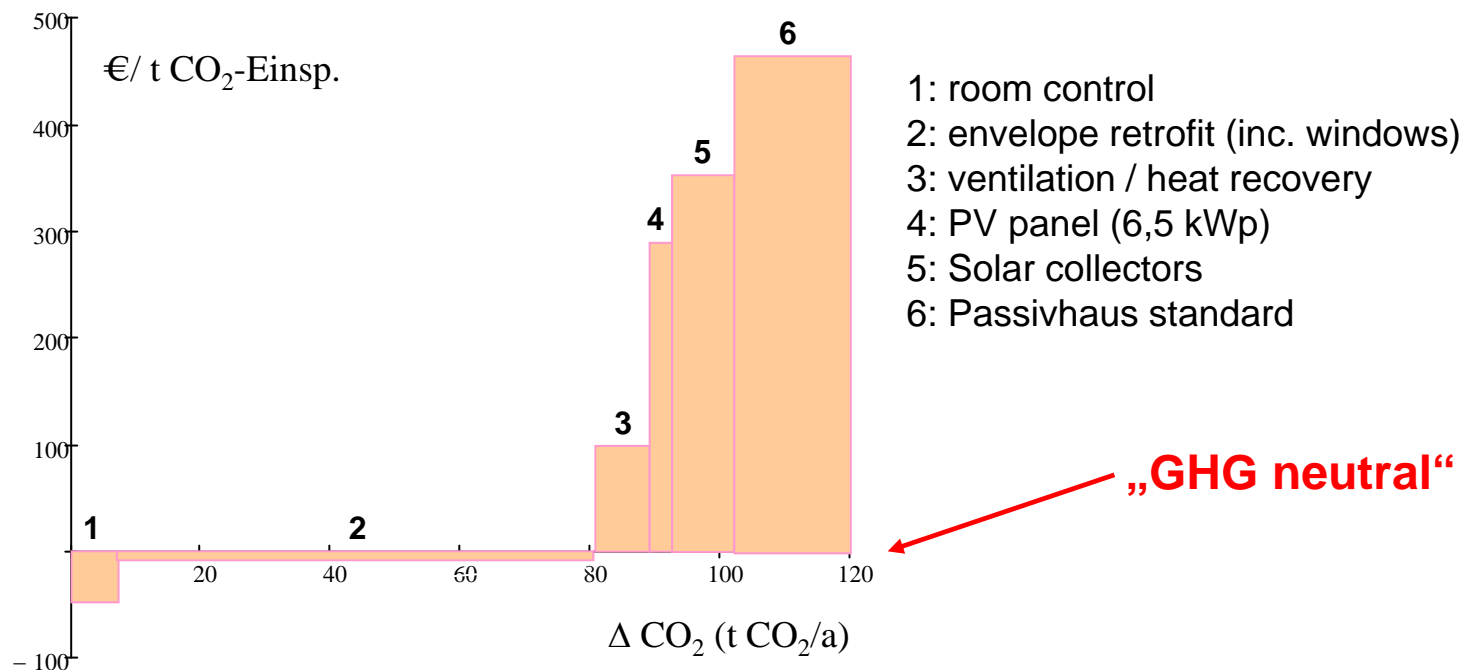
**Conclusion: System optimization!!**



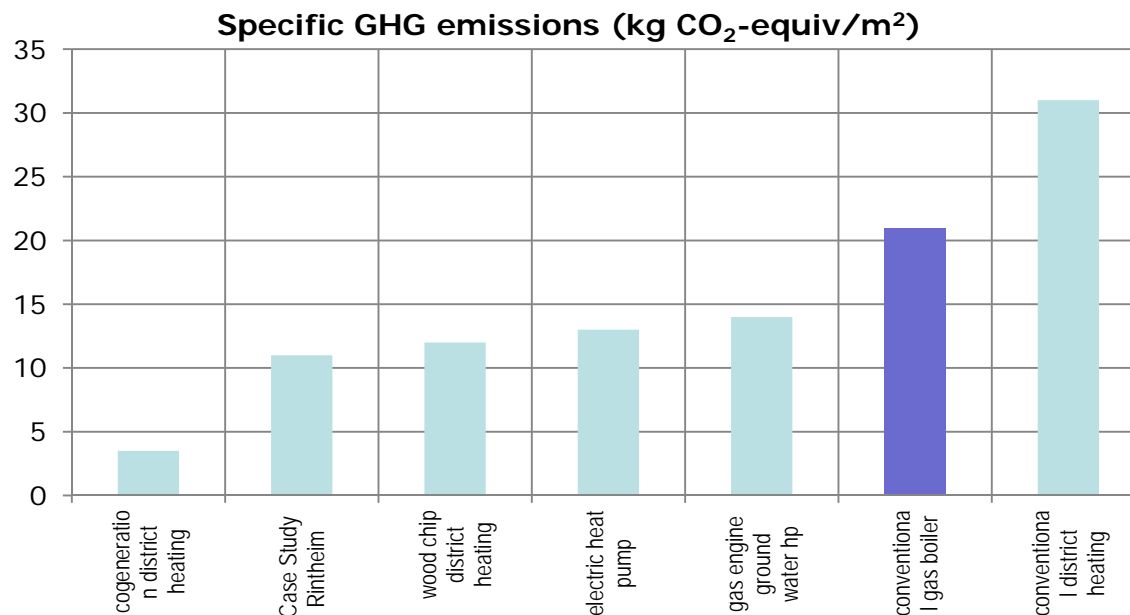
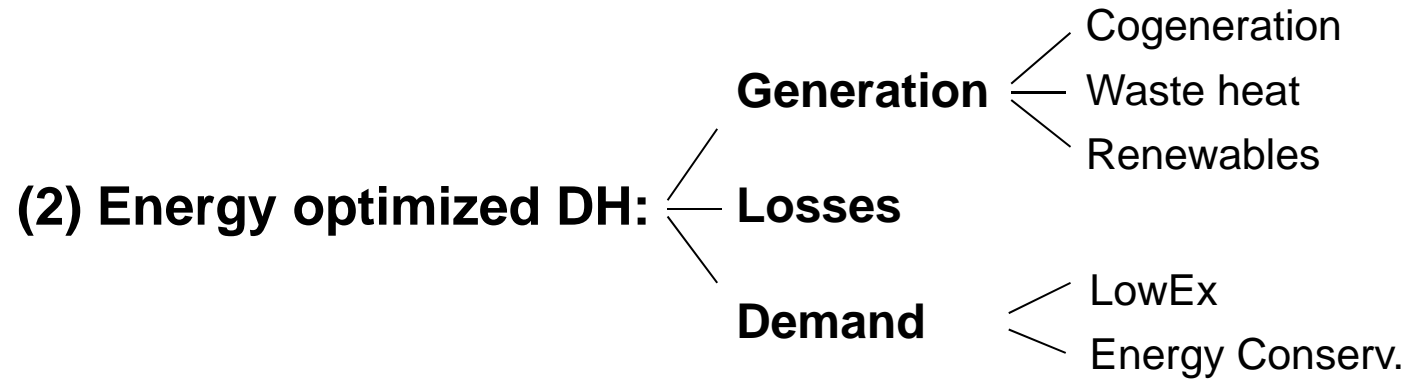
# (1) Energy optimized buildings:

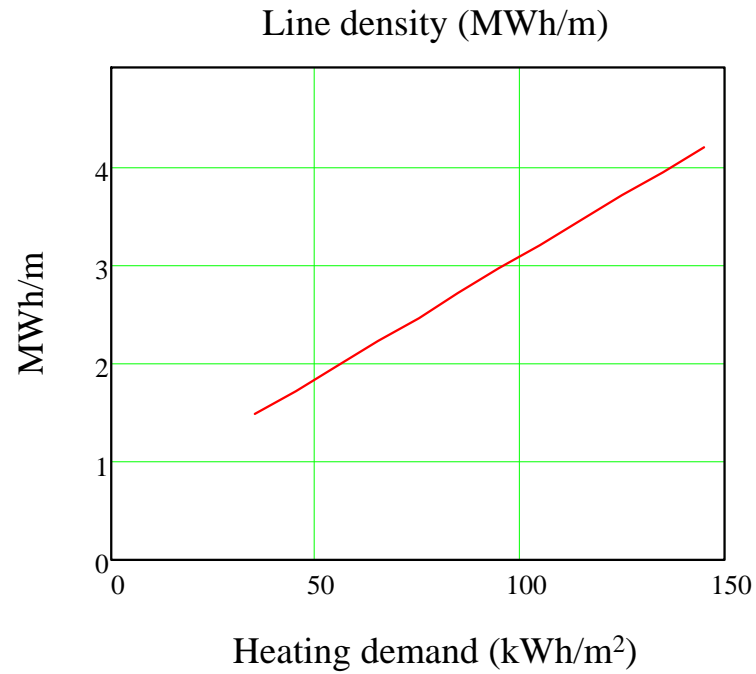
- Envelope
- Ventilation / HR
- renewables
- user behaviour

## GHG savings vs additional costs:

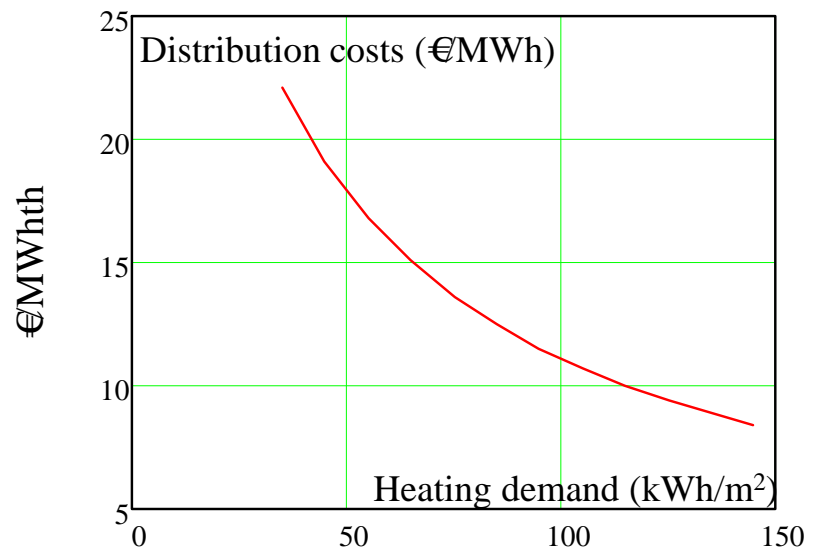


**Multi-family residential building: 50 years, 230 kWh<sub>PE</sub>/m<sup>2</sup>**  
(36 flats, 9 floors)



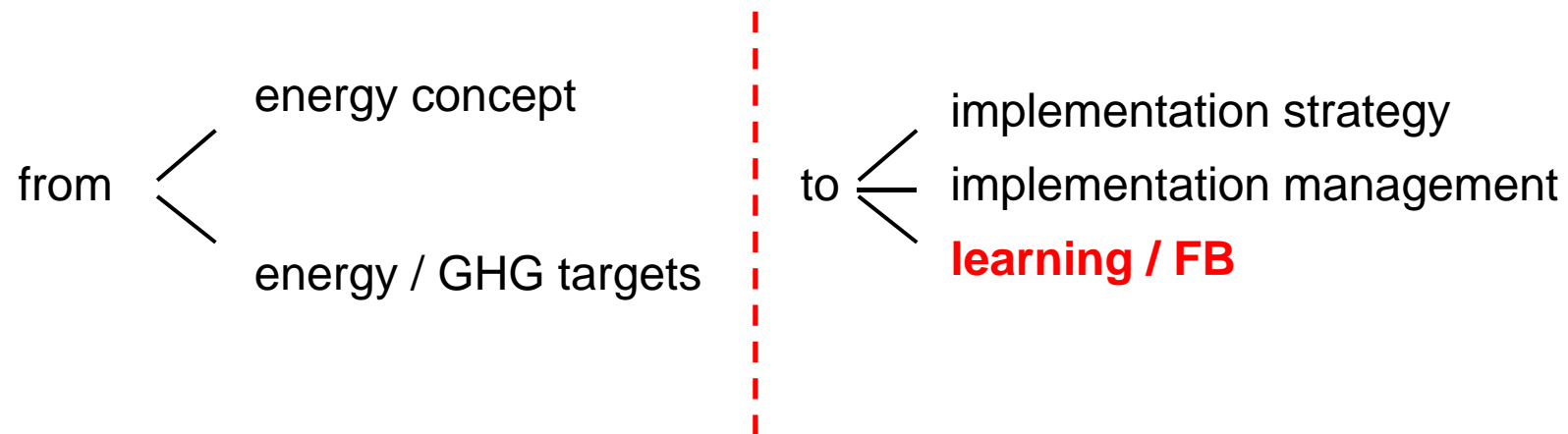


## DH scheme Rintheim: Impact of energy conservation on distribution costs

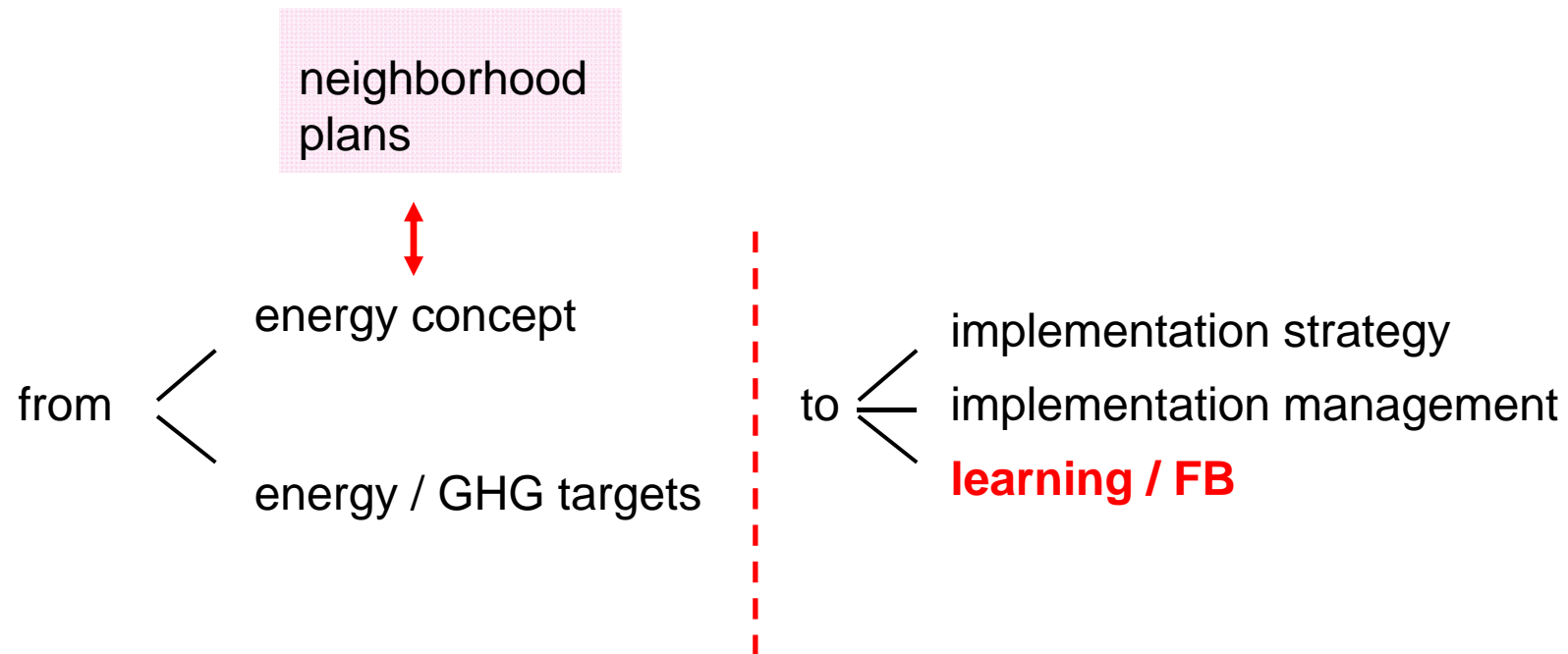




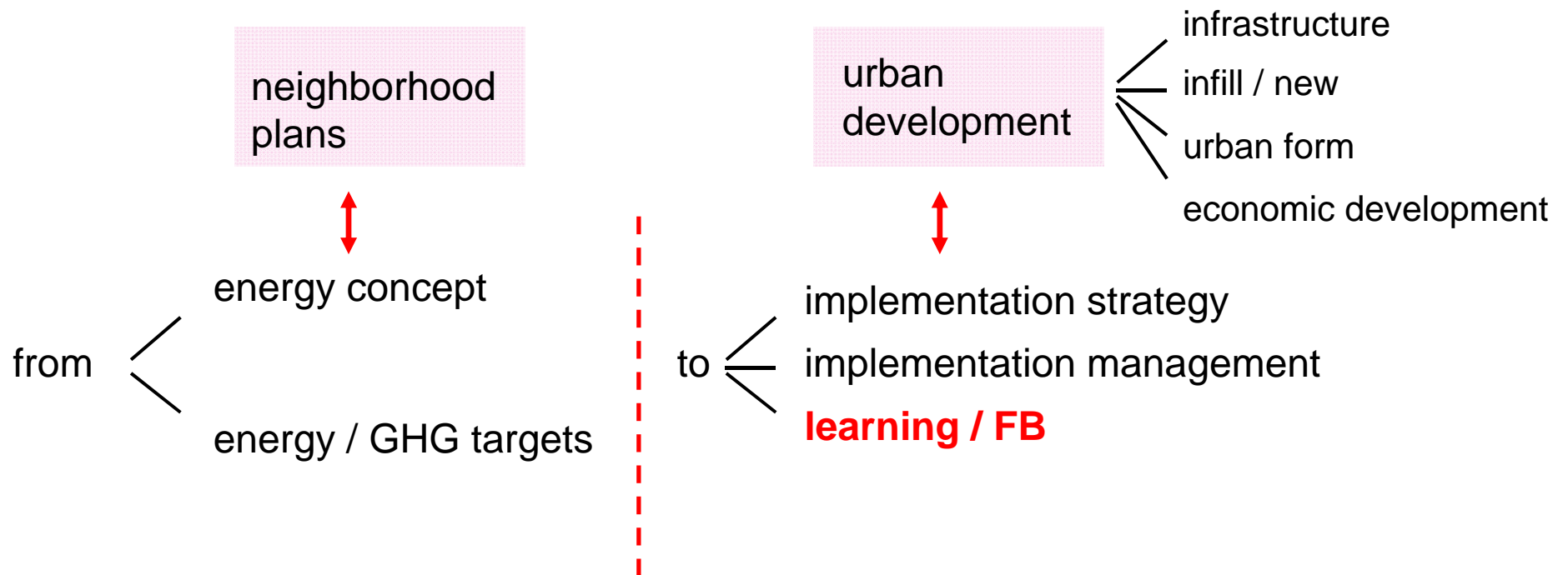
... where is the gap?



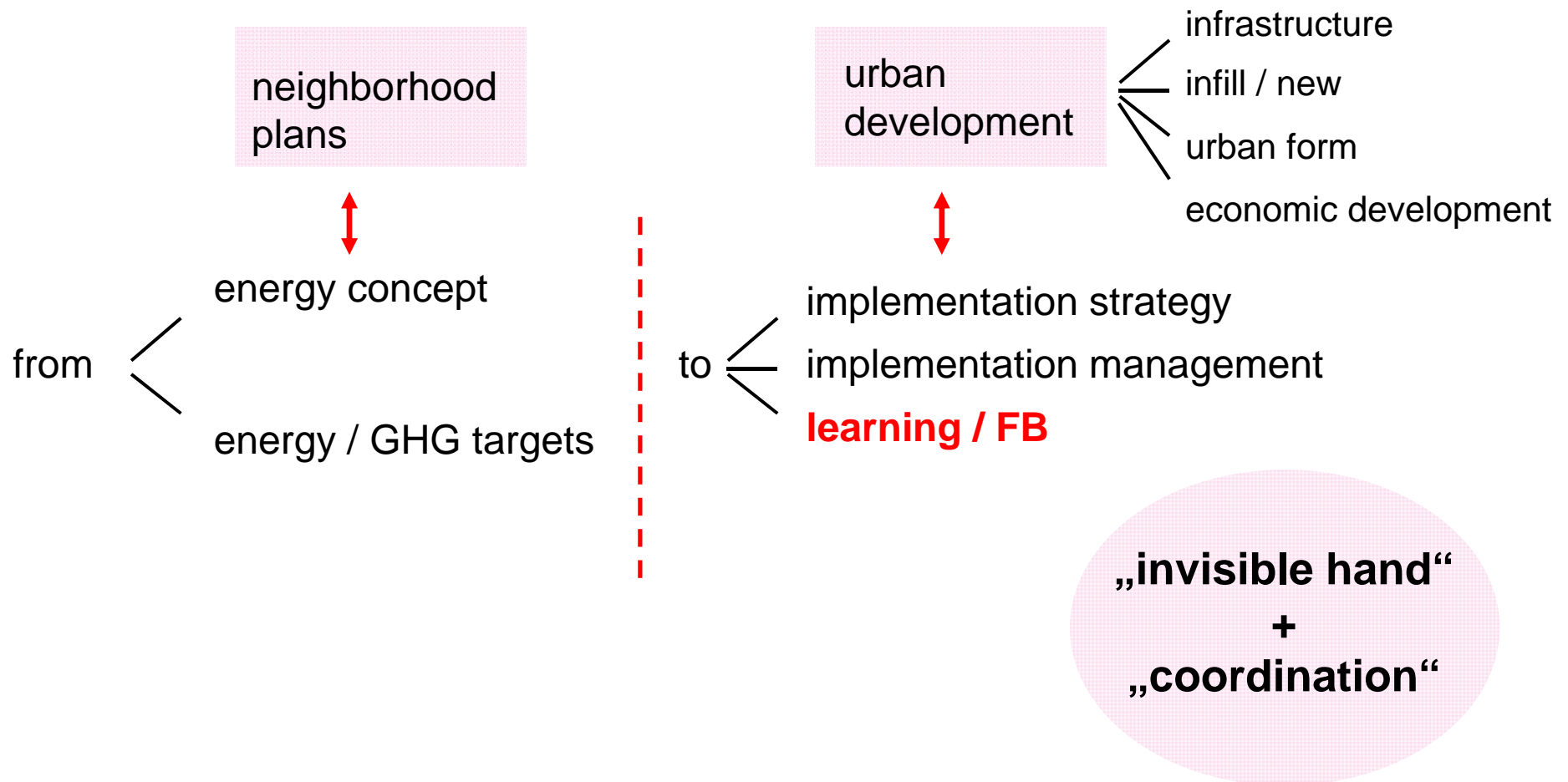
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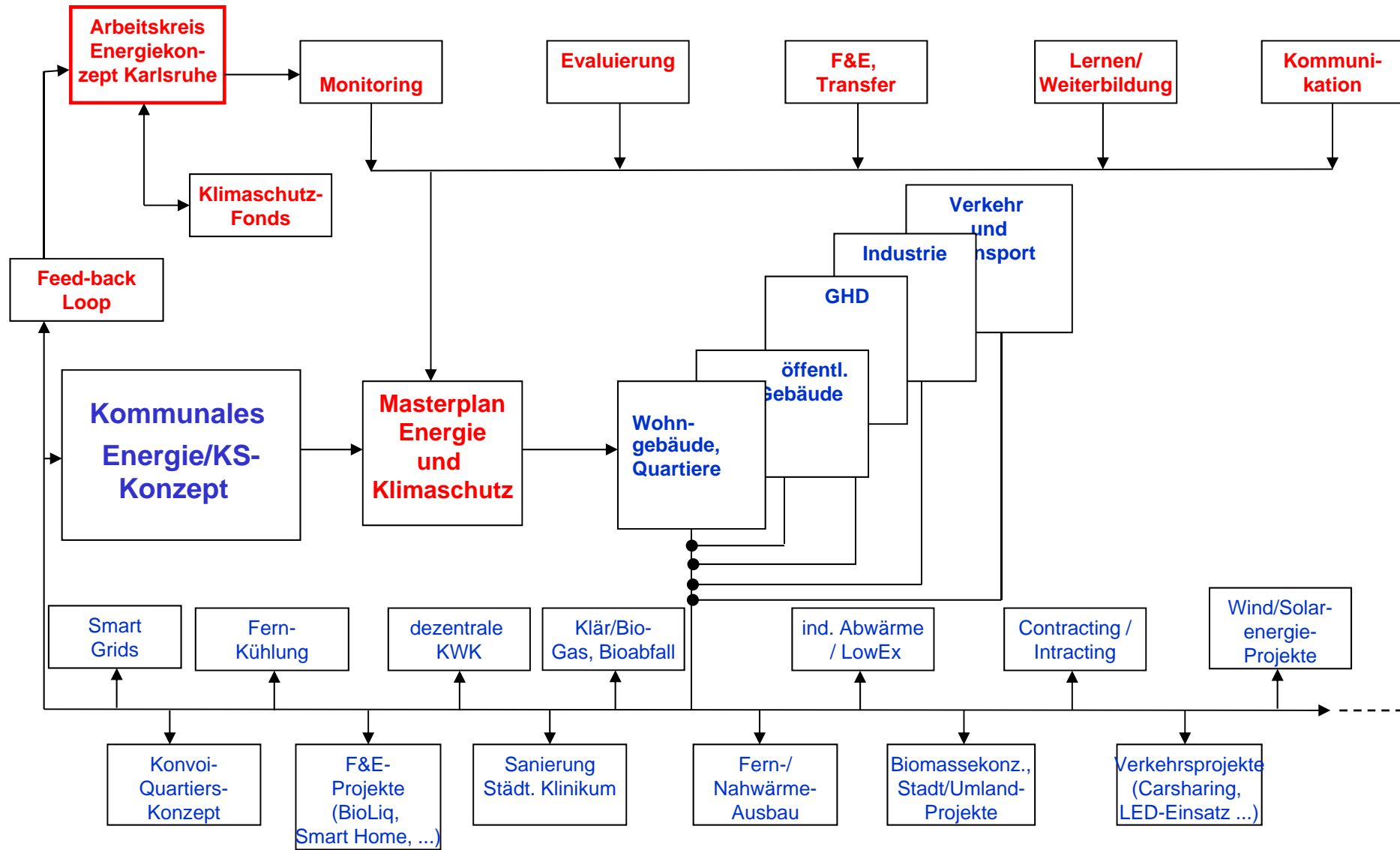


## ... where is the gap?



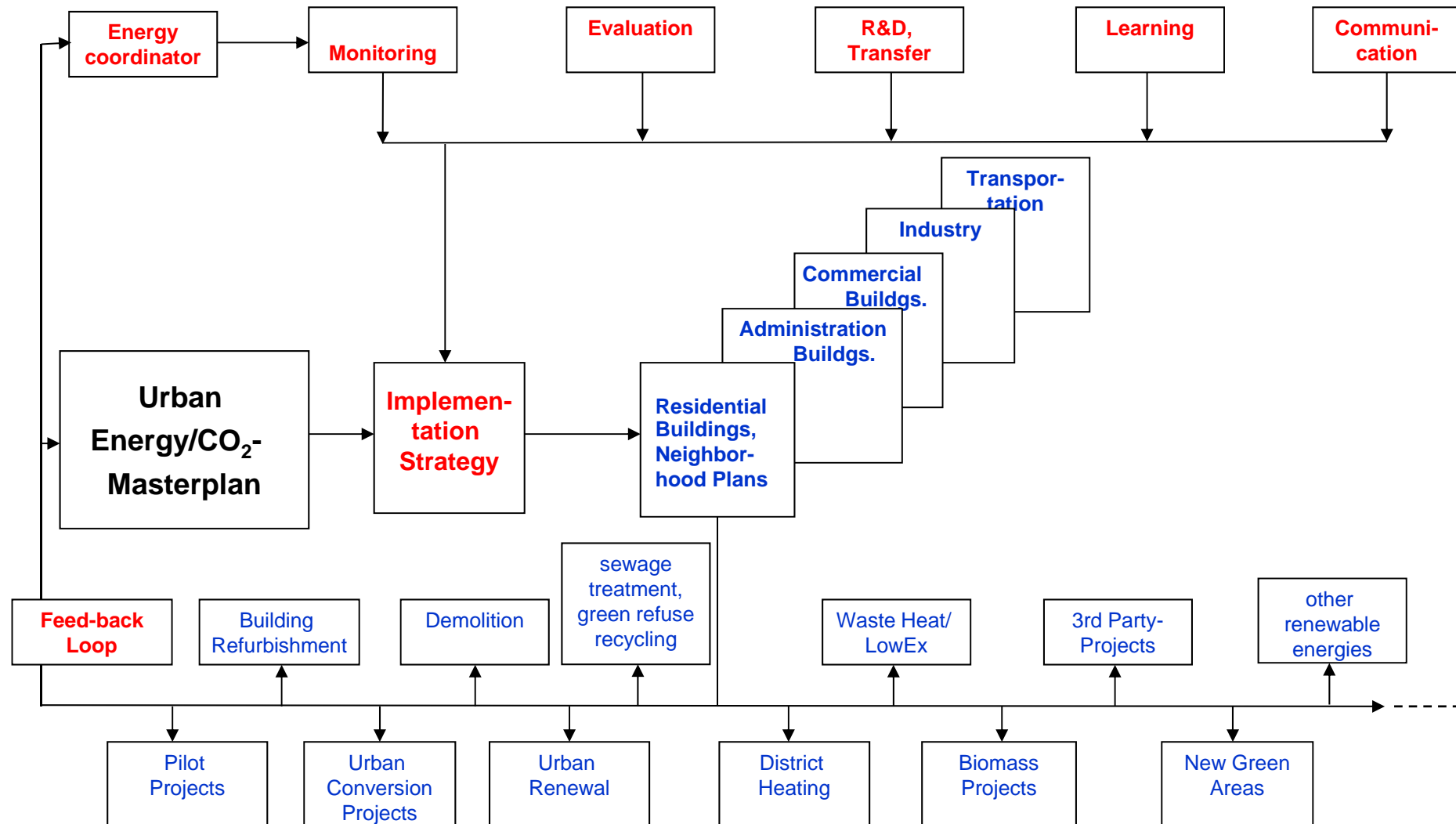
## ... where is the gap?



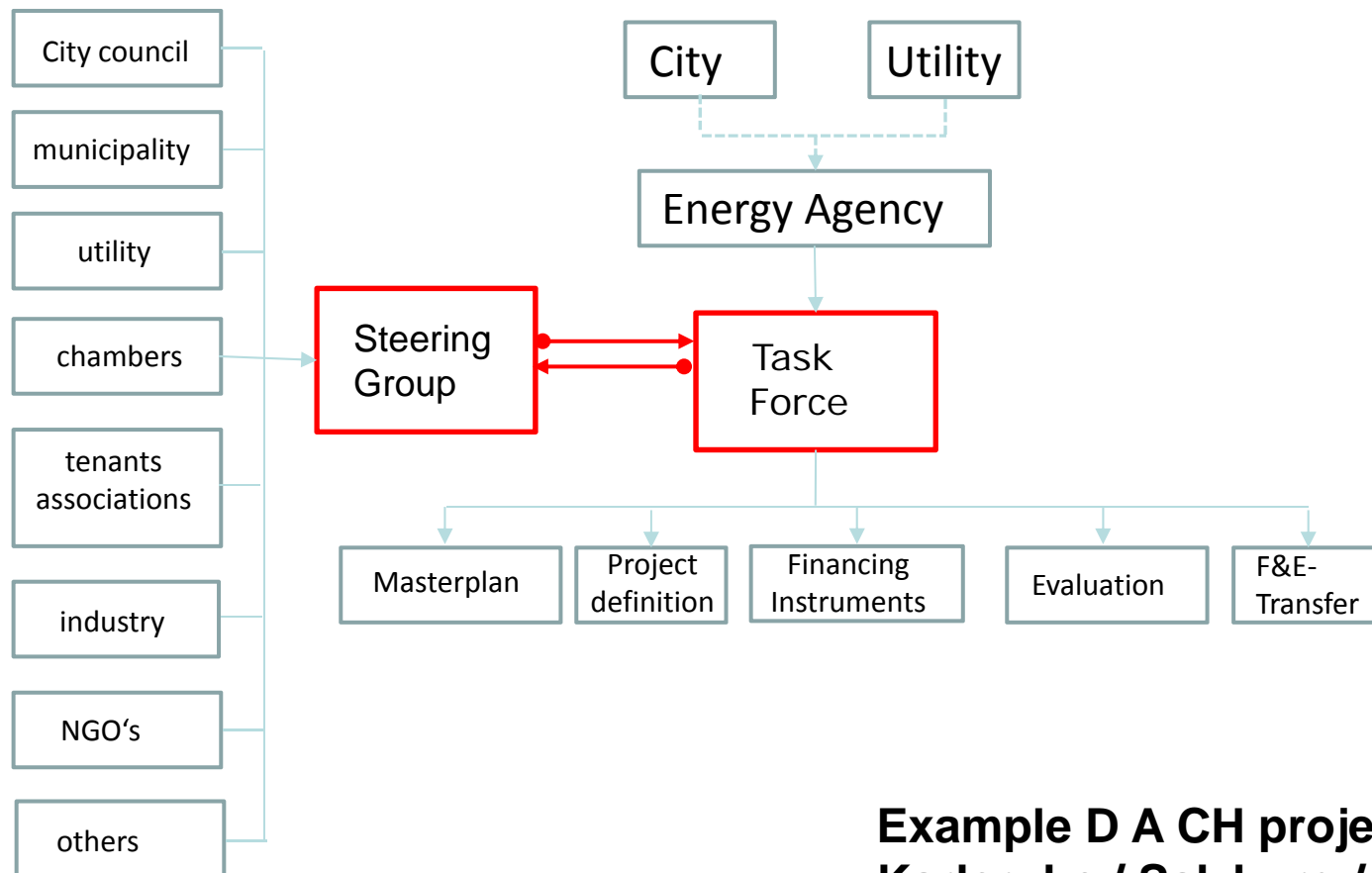




## → municipal energy transition?



## Implementation management:



**Example D A CH project:  
Karlsruhe / Salzburg / Basel**

## Basel (170.000 inh.)

- local utility with municipal shares
- municipal housing company
- „2000 W – society“ (Leitmotiv)
- DH:
  - cogeneration, BM
  - heat recovery, geothermal
- **Building retrofit programs:**
  - “energy coaches”
  - investment grants (cond.,  $\leq 30\%$ )
- **source: electricity tax (1983!)**
- **eea gold since 2006**

## Salzburg (150.000 inh.)

- local utility with municipal shares
- municipal housing company
- **Masterplan „Smart City“ (2011)**
  - 25 sub-targets
  - organis. structures
  - energy monitoring
- **DH:**
  - cogeneration, BM
  - heat recovery
  - ... steam to hot water DH
- **Solar thermal energy in MF resid. buildings**
- **neighborhood CONCERTO project S-Lehen**
- **bike program**
- **eea preparation**

## Karlsruhe (300.000 inh.)

- local utility with municipal shares
- municipal housing company
- **2 comprehensive energy plans: (“GHG neutrality 2050”)**
  - municipality
  - industry/commercial sector
- **DH:**
  - cogeneration, BM
  - heat recovery
- **neighborhood vitalization programs**
- **concerted citizens action**
- **PV/wind energy**
- **inclusion of**
  - local industry
  - local research capacities
- **2 local energy agencies**
  - consumers
  - town / hinterland interaction
- **transportation**
- **eea since 2009**

## Common topics and learning issues

- Continuous energy planning and monitoring
- DH: waste heat utilization, BM
- neighborhood vitalization programs
- Smart homes
- "Deep Contracting"
- transportation
- industry participation
- R&D pilot projects
- eea municipal energy management approach

## **D A CH** **project implementation:**

### **(1) Establishment of local coordination group**

#### **→ Tasks:**

- implementation management
- exchange → partner towns
- evaluation and learning processes
  - local
  - partner towns
  - outreach

### **(2) 1st year:**

- activity planning / project definition / organization

### **(3) 2nd – 5th year:**

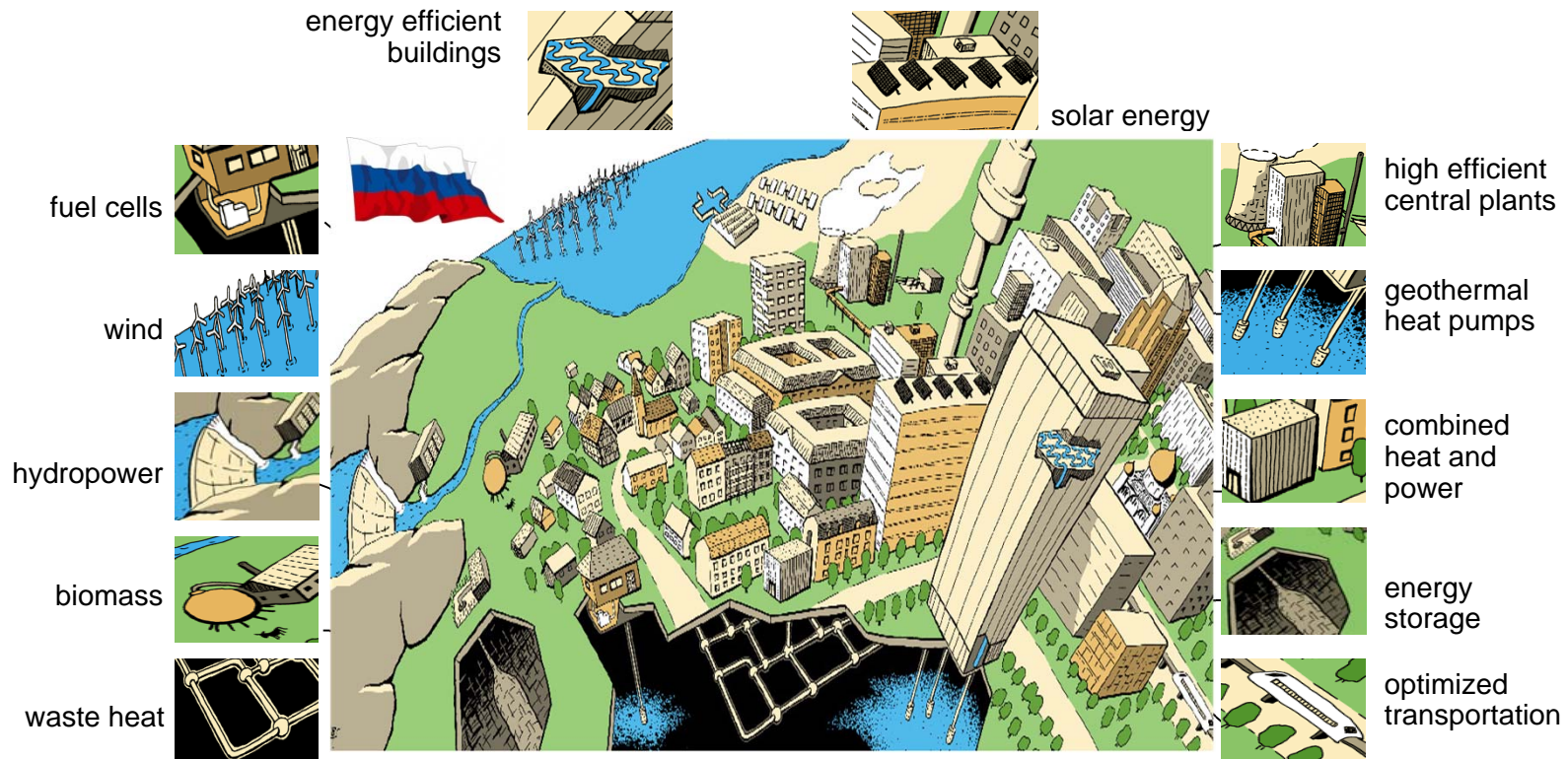
- capacity building
- financing issues
- project implementation
- exchange/learning
- Evaluation / monitoring
- long-term strategy
- communication



## **... most successful cities in Europe ??**

- Aalborg**
- Herhugowaard**
- Güssing**
- (Zürich, Heidelberg, Freiburg)**

## „energy-efficient city“ ...



Source: EnBW AG, Karlsruhe



**economic efficiency by integrated system optimization**