

Smart Cities - A European Initiative

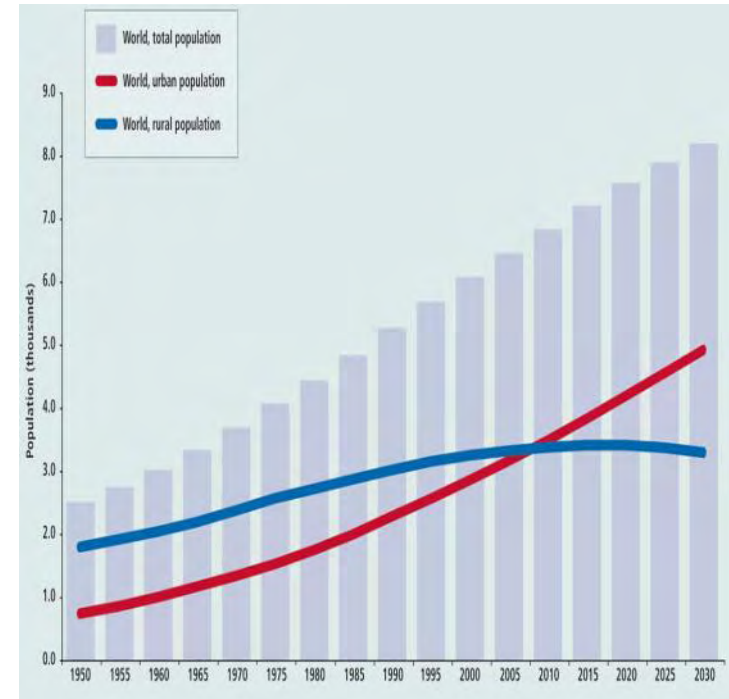
Österreichische Technologieplattform „Smart Cities“
Meeting 11 March 2011

Reinhard Schütz

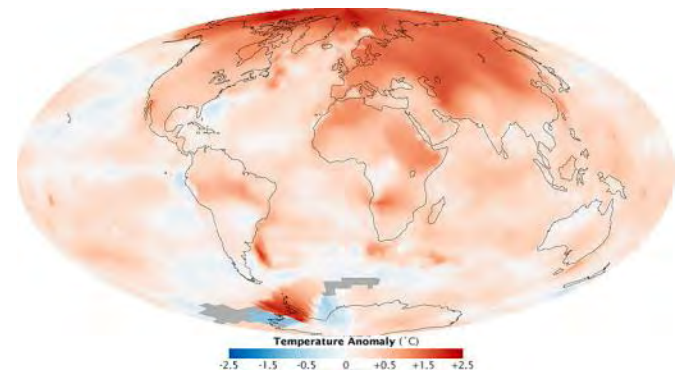
Energy Department, Austrian Institute of Technology (AIT)

Drivers and challenges

- Climate change – CO₂ Reductions
- Increasing energy demand
- Dependency on fossil energy sources
- Strong coupling of CO₂ emissions to GDP
- Increase in population
- Worldwide urbanisation

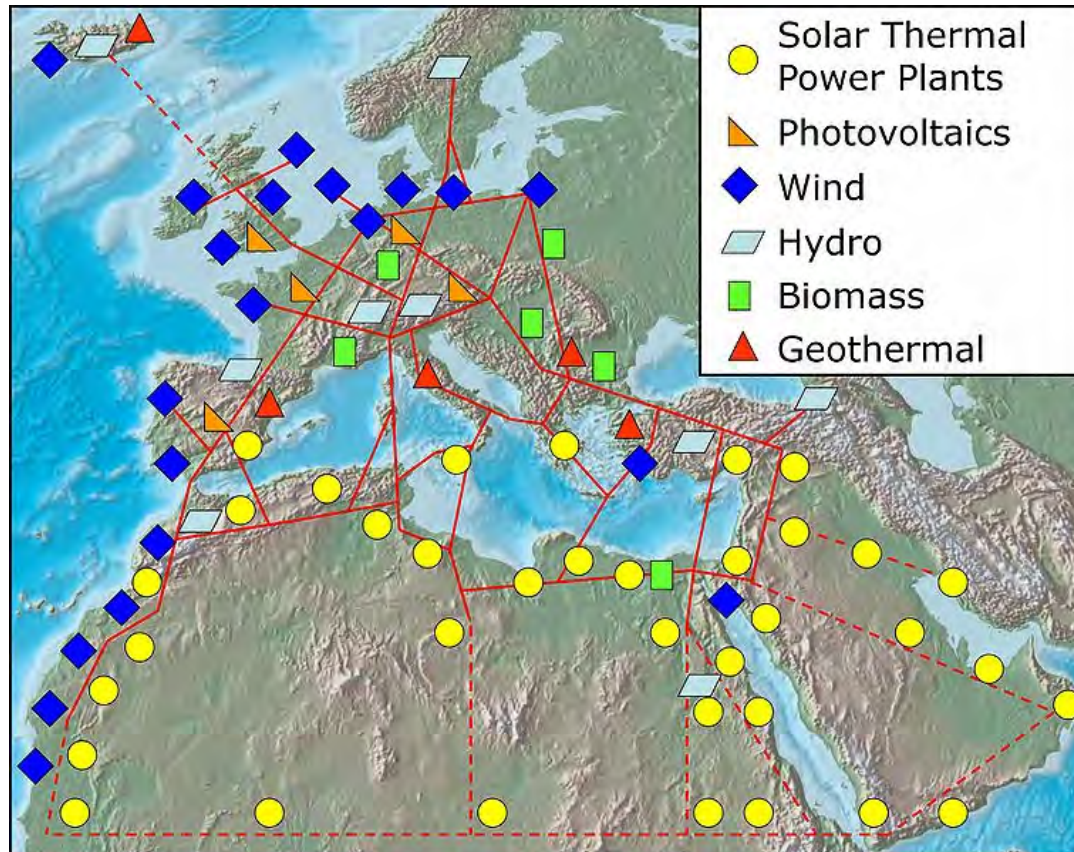


→ Cities at the forefront of EU energy and climate policy!



Renewable Energy Generation

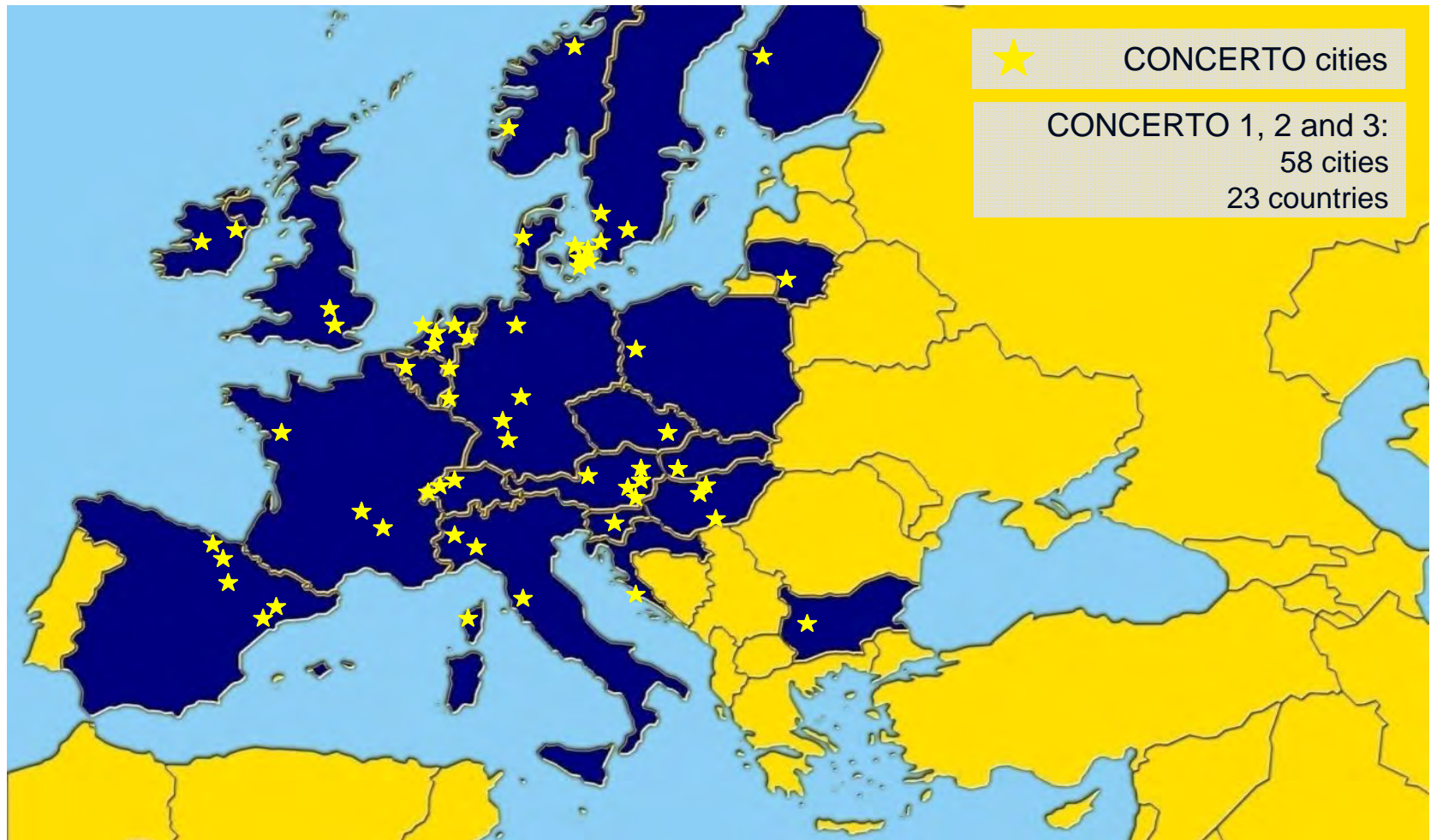
Future Developments in Europe



Targets

- Changing Europe's Energy System according to Climate Policy Needs
 - Energy efficiency
 - Renewable Integration
- Safe, secure and affordable energy supply (*)
- Europe's leadership in energy technology and innovation (*)
- Strengthening the role of cities
 - High living standards for citizens
 - Sustainable environment for next generations
 - High competitiveness of the cities

CONCERTO – knowledge base for new approaches



Stakeholders

- Mayors, politicians
- City administration
- Utilities, energy service companies, grid operators (electric, thermal)
- Developers, architects, planners
- Construction companies
- Component manufacturers (windows, facades, HVAC components, ...)
- Renewable energy industry (PV, solar thermal, heat pumps, ...)
- ICT companies
- Financial Institutions
- R&D institutes and universities
- Inhabitants



→ Different strategies, competences,
aims and time-horizons!

CONCERTO and Smart Cities Initiative



CONCERTO Initiative

Scope: Community (<10,000 pop.)

Innovation:

- holistic approach for urban districts
- consider socio-economic aspects
 - planning and implementation

Technologies:

- Existing technologies for:
- energy efficiency (thermal)
 - renewable energy generation

Smart Cities Initiative

Scope: City (> 50-100,000 pop.)

Innovation:

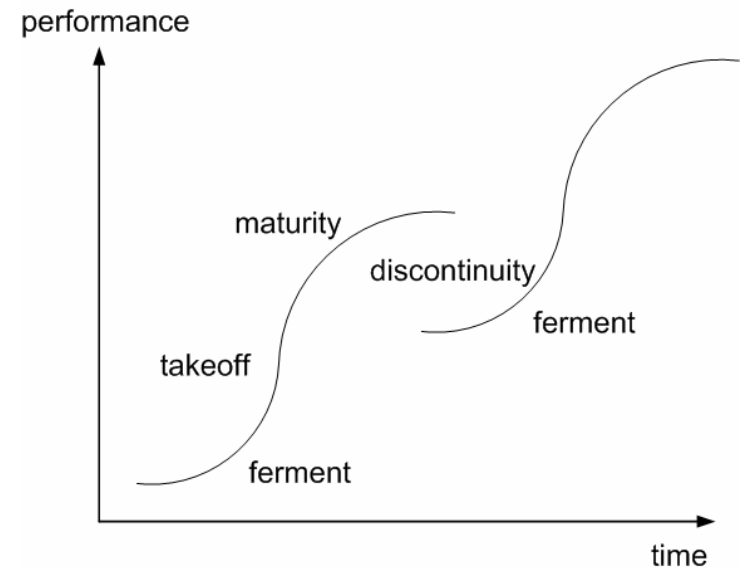
- integrated approach for the city as a whole
 - energy management at a city level
- role of the city within the EU energy network
 - “active buildings”
 - “smart infrastructure”

Technologies:

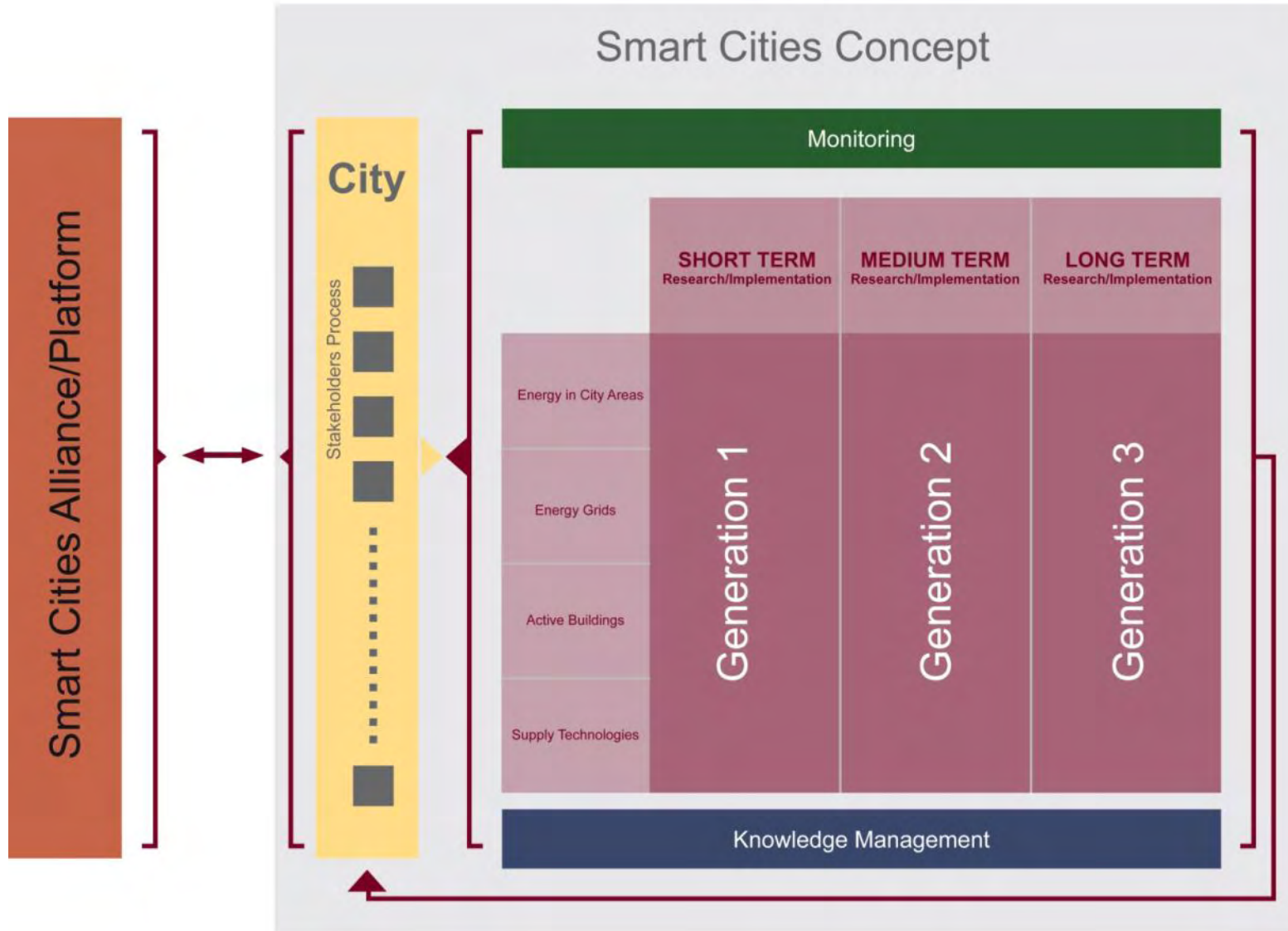
- Radical innovation in the fields of:
- ICT and buildings
 - urban renewable energy generation
 - energy management

Radical Innovation for Urban Energy Supply

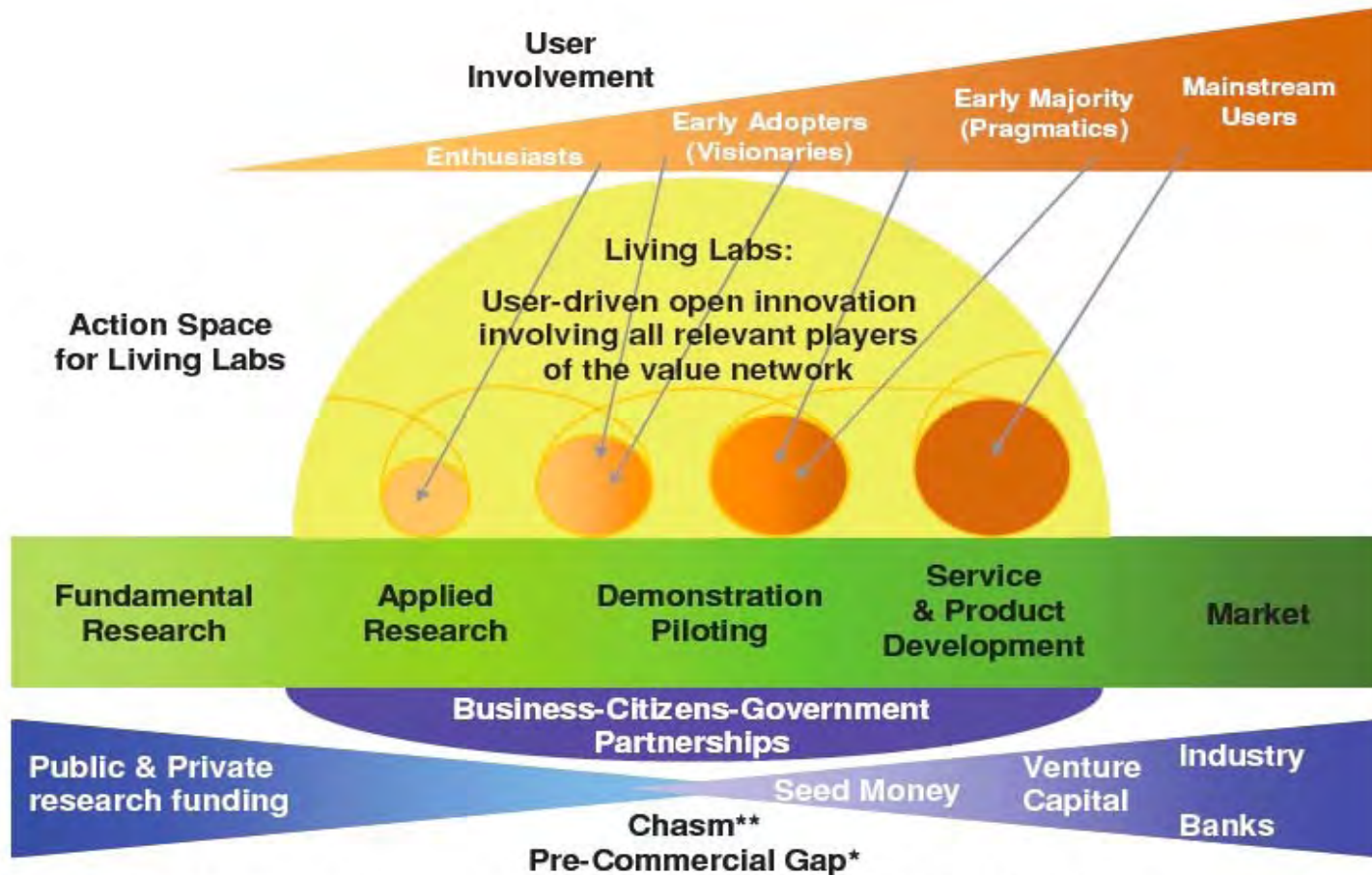
- **Smart Cities** require new approaches
 - Fully integrated designed and intelligent managed energy systems
 - From a single technology perspective to multi technology perspective



Strategy for Realisation



Positioning Living Lab concept in innovation cycle



* MacDonald and Associates, 2004

** Geoffrey A Moore: Crossing the Chasm, 1999

Smart Cities

ICT & Energy Technologies are merging
Intelligent energy management on regional & city level

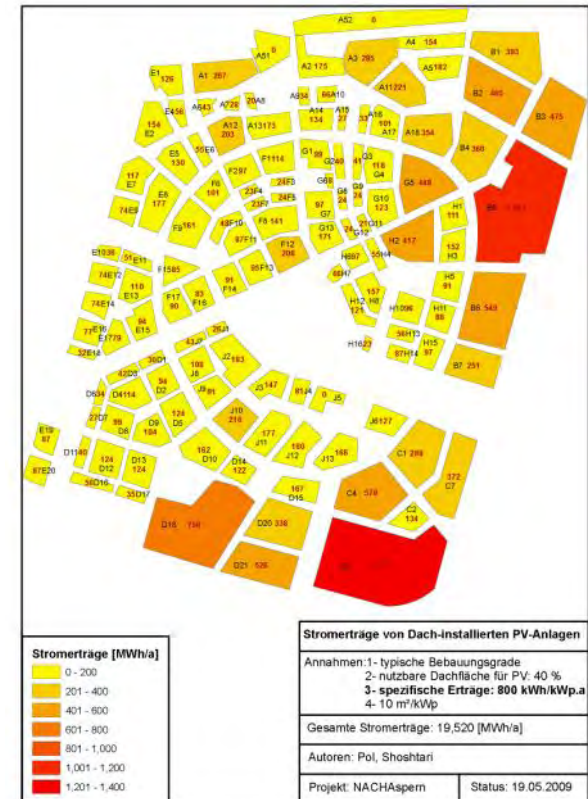
- **Urban Energy Planning**
- **Intelligent Urban Networks**
- **Active Buildings**
- **Optimised Supply Technologies**
- **Mobility**

- **New Business Modells**



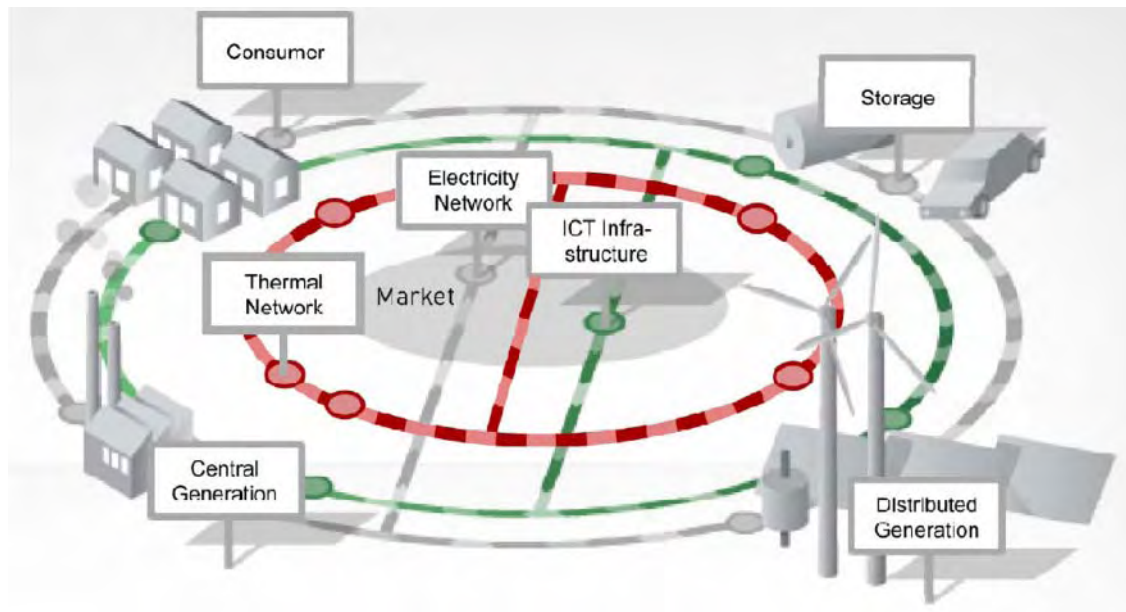
Energy in city areas

- Understand energy characteristics of cities
- Urban Morphology (density, topography, height,...)
- Spatial planning in the context of energy
- End-use mixes (industry, households, commerce,...)
- Decision tools for urban energy master-planning
- Dynamical simulation tools for the design and management of city-wide integrated energy systems
- Extension to socio-economic aspects



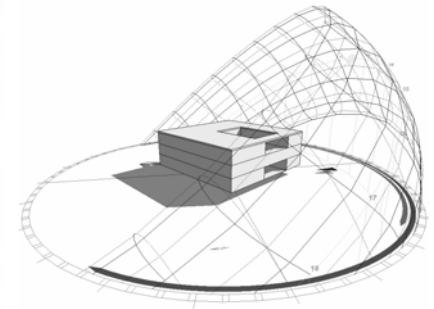
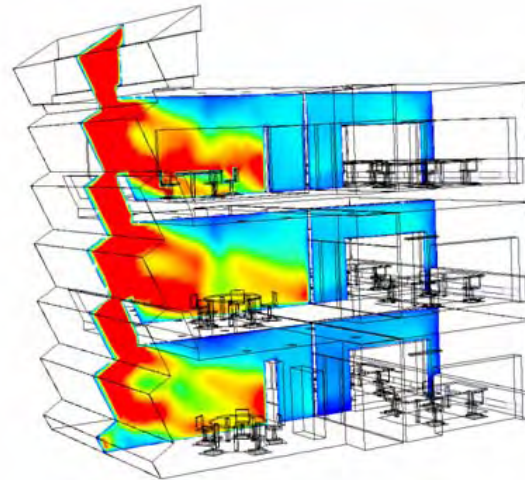
Smart energy grids

- Smart electric grids (including optimised load management)
- Smart thermal grids (including low temperature heating)
- Use of potential for shift between thermal and electric load
- Planning and operation
- Demand-side management
- Integration of decentralised RES
- Thermal + electrical storage



Active buildings

- Low energy building with on-site energy generation
- Active demand side node in network-management („building to grid“)
- Building automation
- Innovative building design concepts (architecture, shape, envelope,...)
- Retrofitting of existing buildings
- Building as energy storage



Supply technologies

- On-site renewables
- Polygeneration and use of waste heat
- Optimised HVAC
- Cascade use of resources
- Energy storage
- Tools for the integration of supply systems



Further important „smart cities“ topics

Transport / Mobility

- Improve public transport system in cities
- Modal split
- Include non-motorised transport (walking, cycling)
- Passenger and freight logistics
- Share of alternative fuel vehicles
- Traffic concepts related to urban energy planning



Socio-economic aspects

- New business models and financial schemes
- New regulations and legal frameworks
- Aiming for increase in quality of life
- Technology acceptance by user
- Organisational innovation (stakeholders, companies, institutions,..)



Current Smart Cities activities

SET-Plan:

- Public Consultation DG Energy (March 2011)
- Early 2011: Establishment of Stakeholder Platform
- 2011: Launch of Industrial Initiative “Smart Cities”
- July 2011: First call for Smart City proposals (open till March 2012)
- EERA: Joint Program Smart Cities to be launched in Nov (lead AIT)

Austria:

- Klimafonds Call – Fit4Set
- Prepare Austrian cities for European Call
- Longterm vision and roadmap development → Sustainable implementation
- 2nd Call Demonstration

AIT Austrian Institute of Technology

your ingenious partner

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