

The Urban Challenge

Demography – Complexity – Technology - Policy

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Hans-Günther Schwarz,

Austrian Ministry of Transport, Innovation and Technology

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- Issues, making up the grand challenge of urbanisation
 - demography, mega cities, ageing, competition for the „best brains“, Smart Cities concepts
 - Complexity
 - the roadmap to the vision 2050, management tools, radical innovation, integrated planning, Smart Cities concept
 - Technology
 - systems integration
 - Policy
 - SET-Plan EII SC, EERA JP on Smart Cities, Smart Cities MS Initiative

The Grand Challenge of Urbanisation

Demography

Migration

Economy

Social Cohesion

**Urban areas as hubs of
cultural and economic
dynamics**

Sustainability

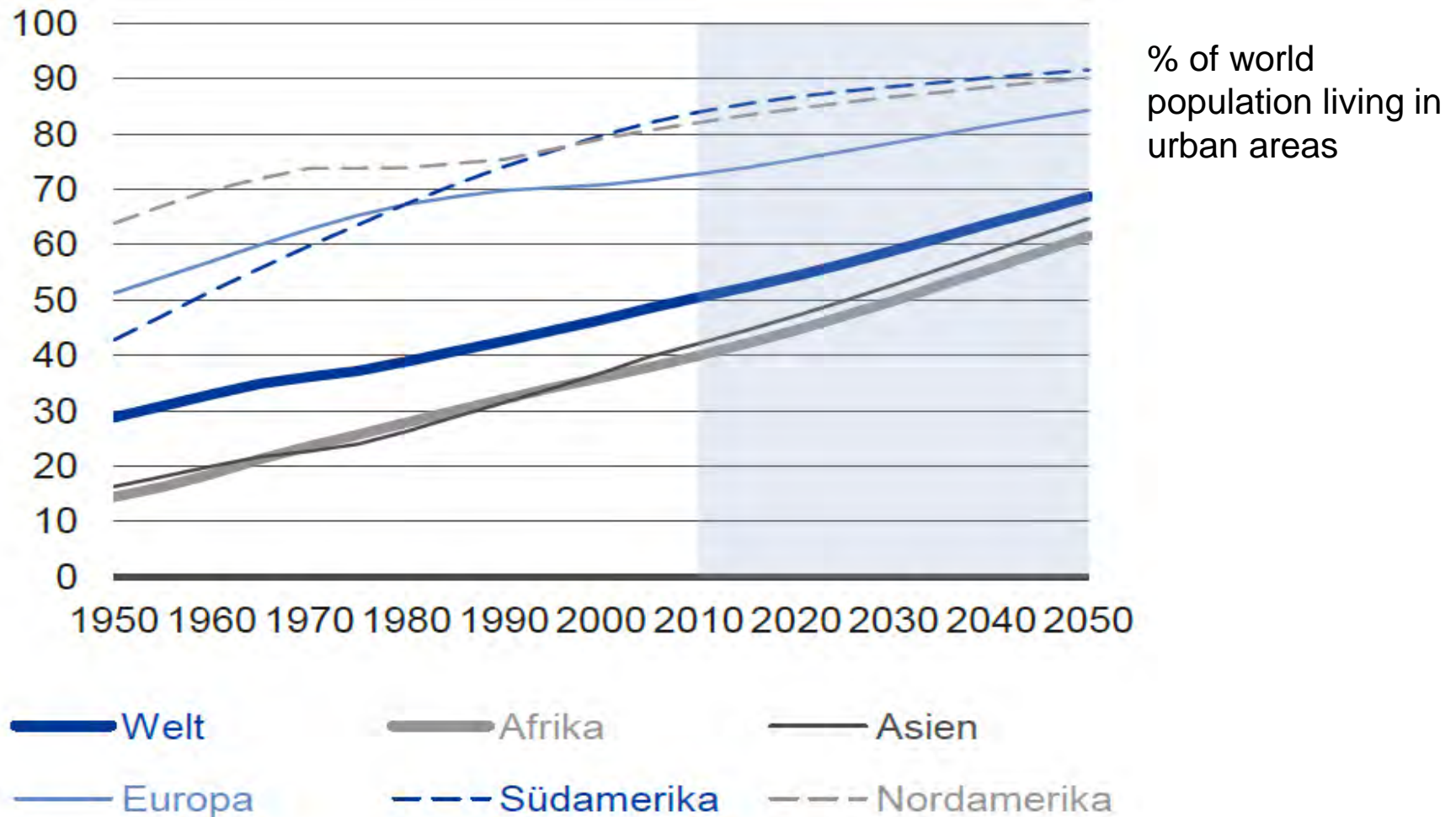
Security

Transport

Resources

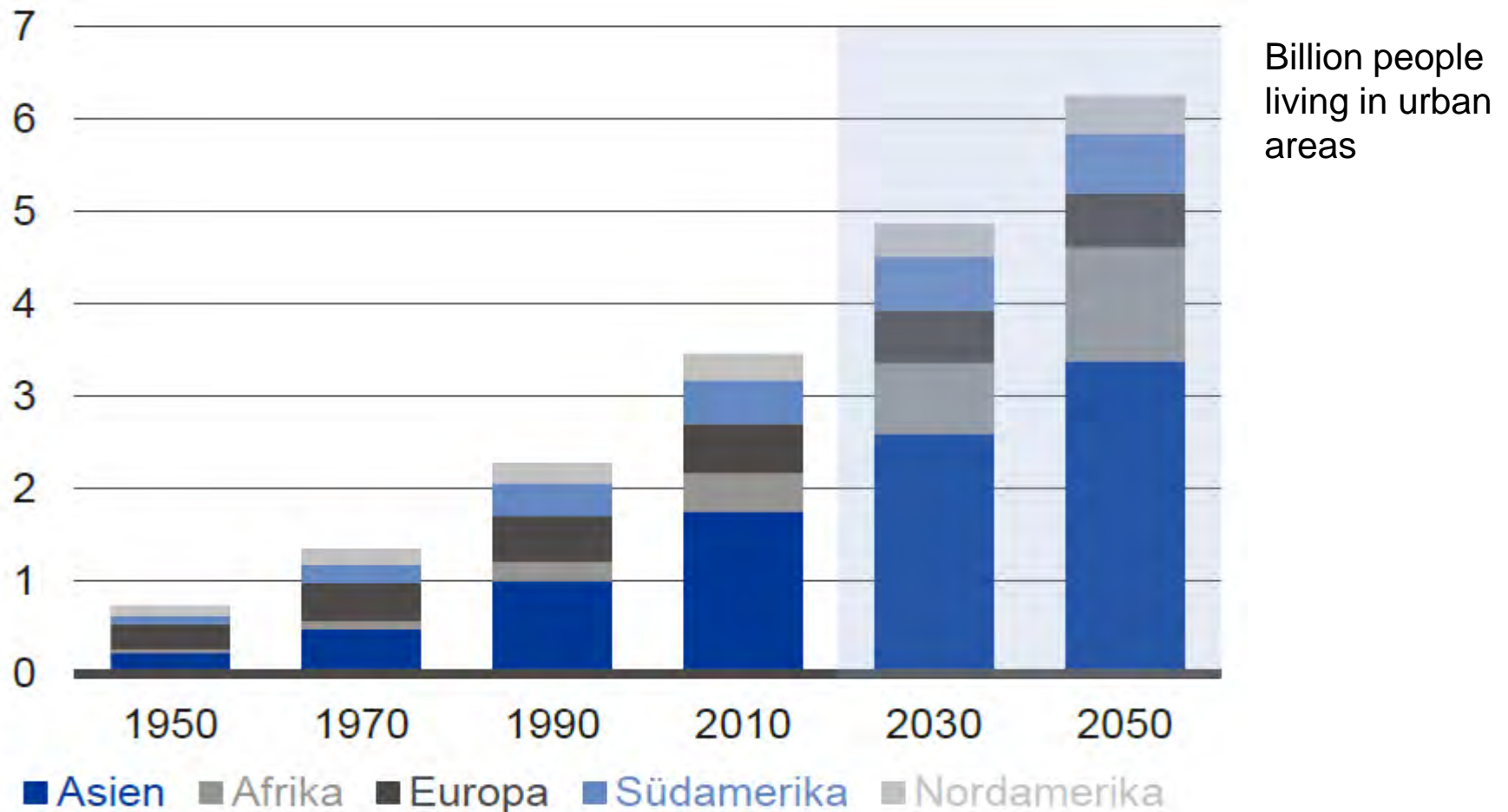


Urbanisation as a Grand Challenge



Quelle: UN Population Division

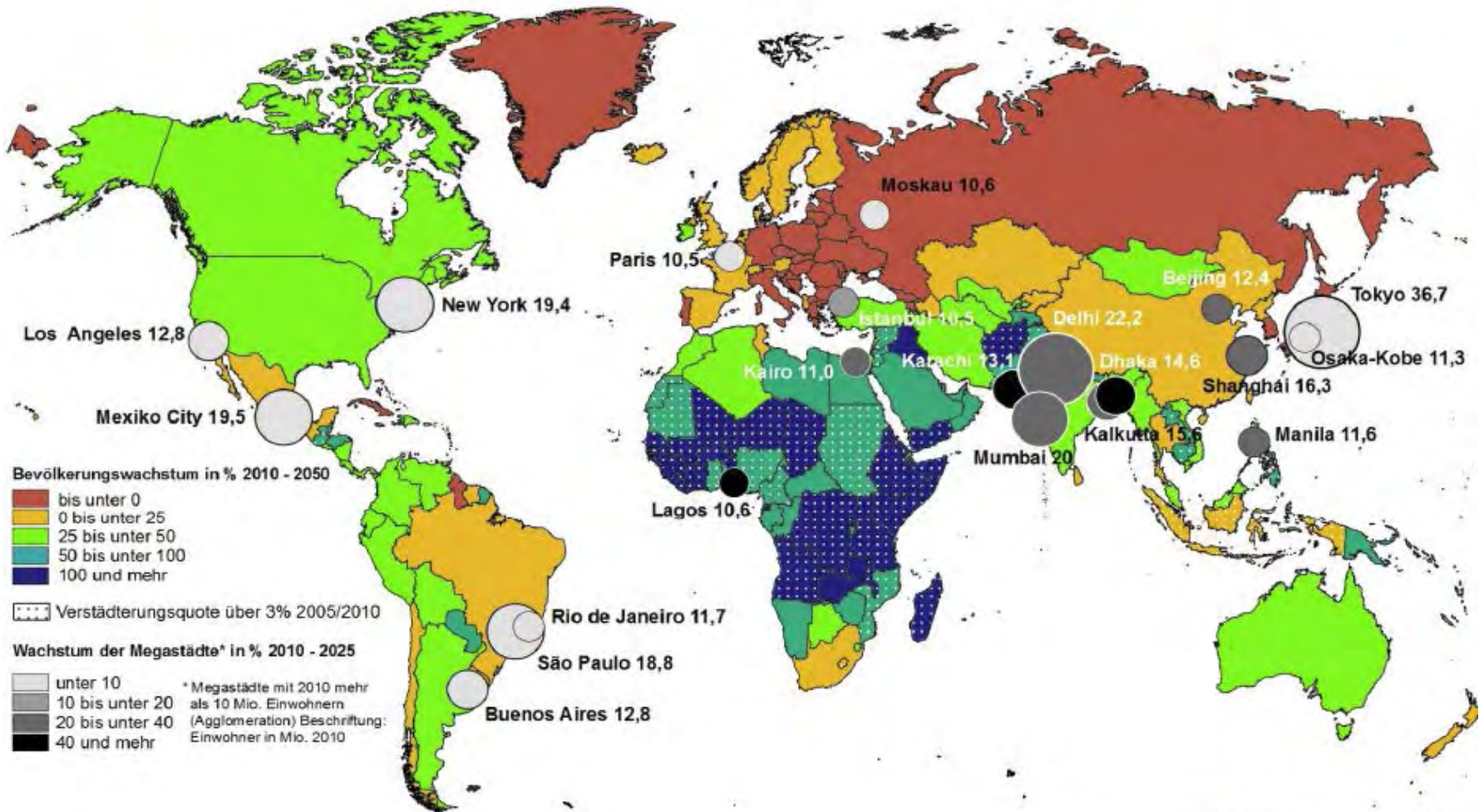
Global Distribution of Urbanisation



Quellen: UN, DB Research

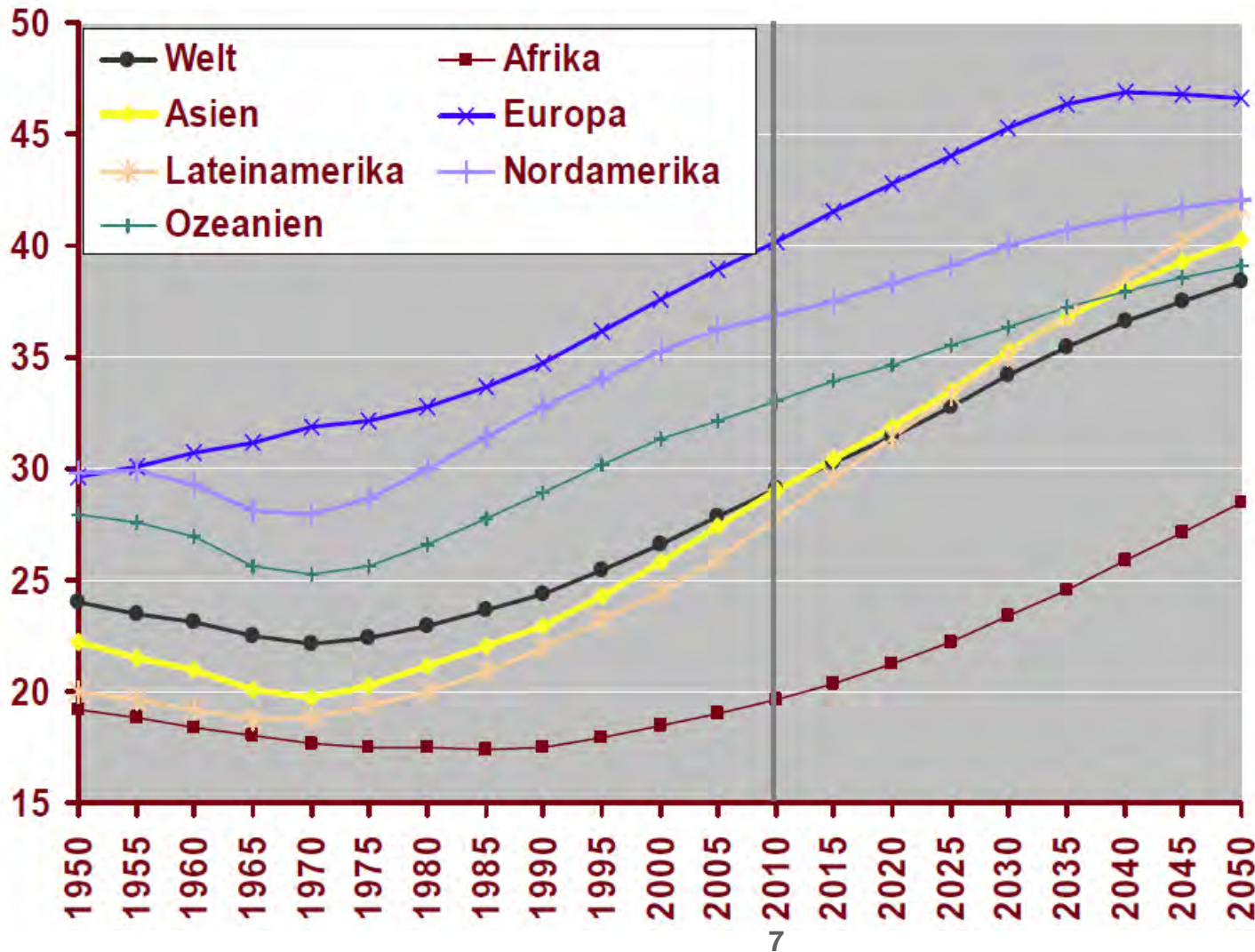
Already today, more than 50% of all urban dwellers live in Asia!

Urbanisation and Mega Cities



Source: UN WPP 2008 , WUP 2009

The Demography of Ageing



Median age of population

(Source: UN WPP 2008 , WUP 2009; J. Kytir, Statistik Austria)

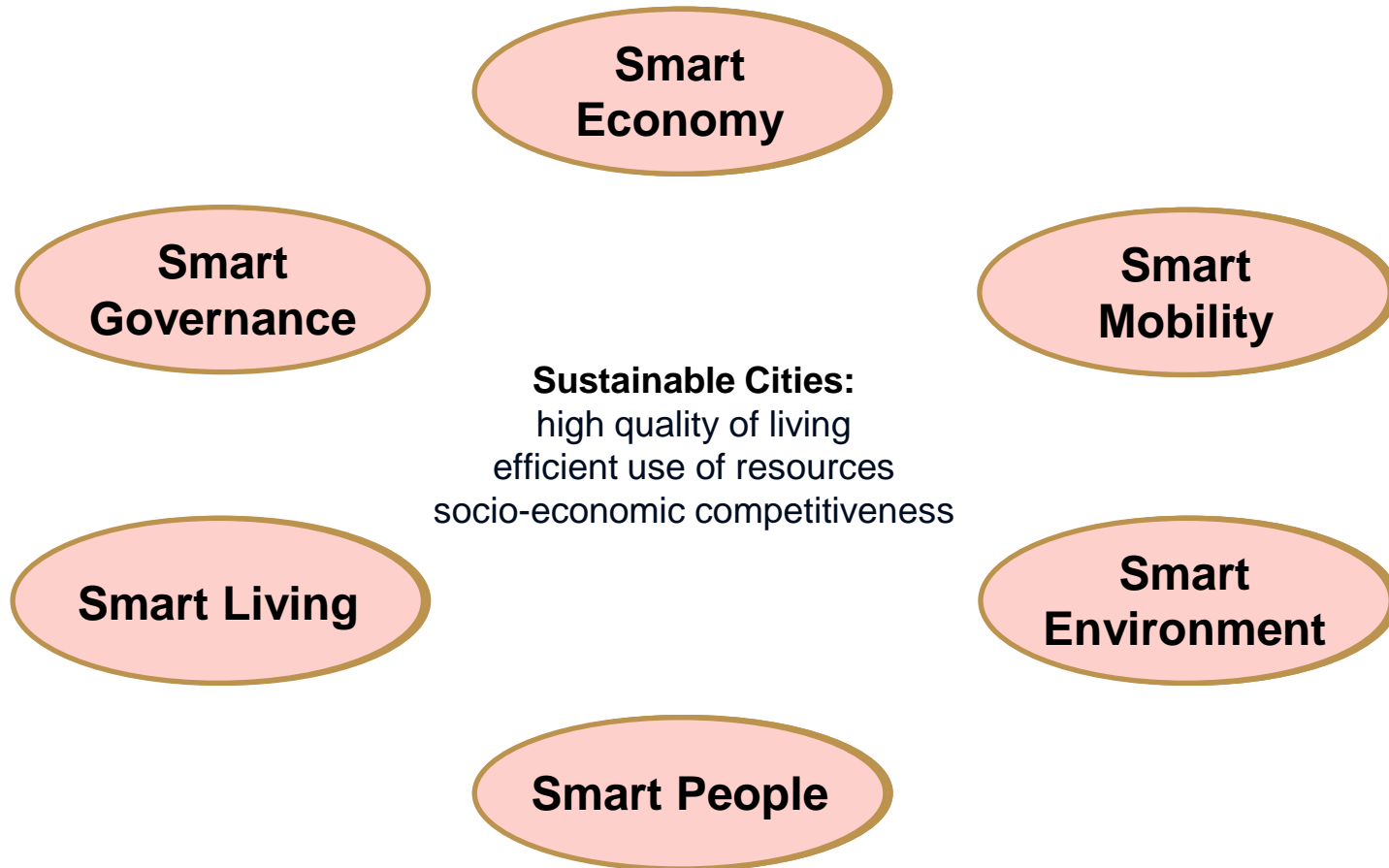
Attracting the Best Brains: Quality of Living

Top 5 cities: Quality of living ranking	Top 5 cities: Personal safety ranking
Vienna, Austria (1st)	Luxembourg, Luxembourg (1st)
Zurich, Switzerland (2nd)	Bern, Switzerland (tied 2nd)
Auckland, New Zealand (3rd)	Helsinki, Finland (tied 2nd)
Munich, Germany (4th)	Zurich, Switzerland (tied 2nd)
Vancouver, Canada (tied 5th)	Vienna, Austria (5th)
Düsseldorf, Germany (tied 5th)	

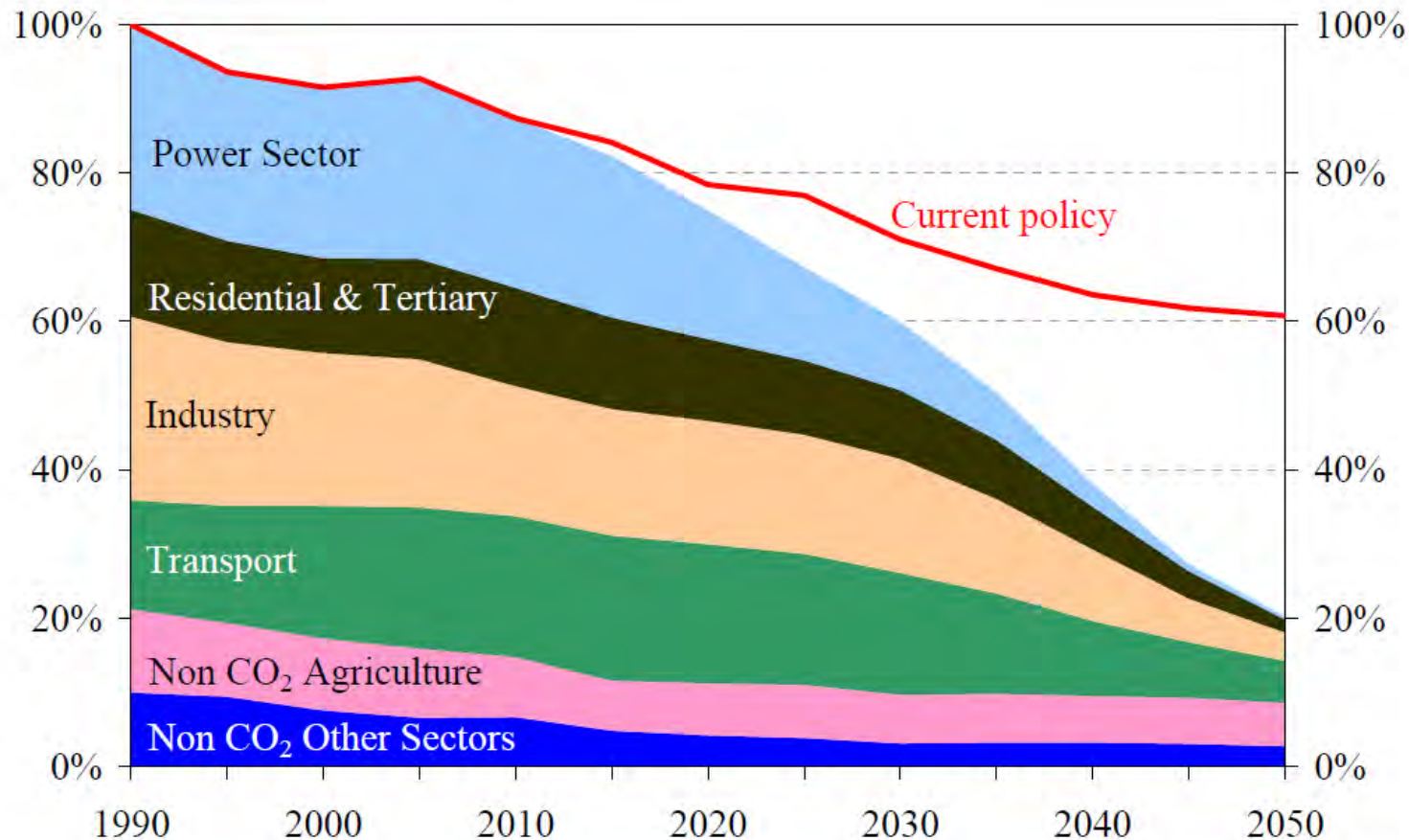
Americas	Asia Pacific	Europe	Middle East & Africa
Vancouver (5th)	Auckland (3rd)	Vienna (1st)	Dubai (74th)
Ottawa (14th)	Sydney (11th)	Zurich (2nd)	Abu Dhabi (78th)
Toronto (15th)	Wellington (13th)	Munich (4th)	Port Louis (82nd)
Montreal (22nd)	Melbourne (18th)	Dusseldorf (5th)	Cape Town (88th)
Honolulu (29th)	Perth (21st)	Frankfurt (7th)	Johannesburg (94th)

Source: Mercer 2011

Smart Cities – A New Quality of Urbanisation?



Vision 2050 – Low Carbon Economy Roadmap



Goal: 80% domestic reduction of EU GHG emissions by 2050 (100% =1990)

Source: COM(2011) 112/4, „A Roadmap for moving to a competitive low carbon economy in 2050”

Smart Cities – Commitment to 2050 Goals

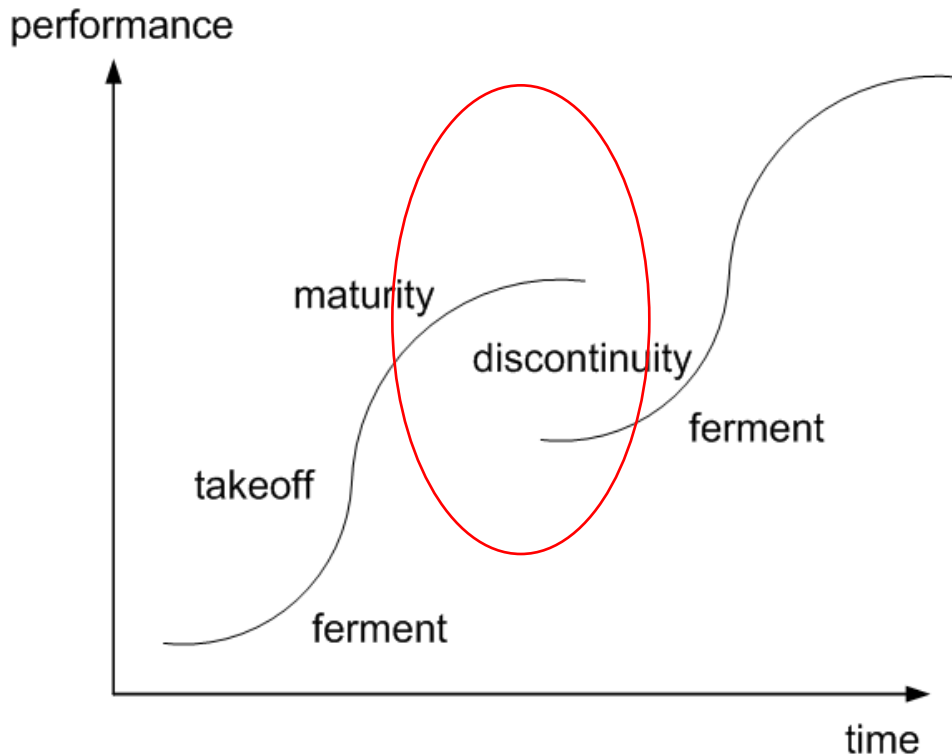
Energy efficiency

**Secure,
sustainable
and affordable
energy supply**

**Integration of
renewable energy**

Smart infrastructure

- use of radical innovation
- development of appropriate technologies
- expansion from technologies to systems
- design of smart systems
- adoption of integrated planning approach



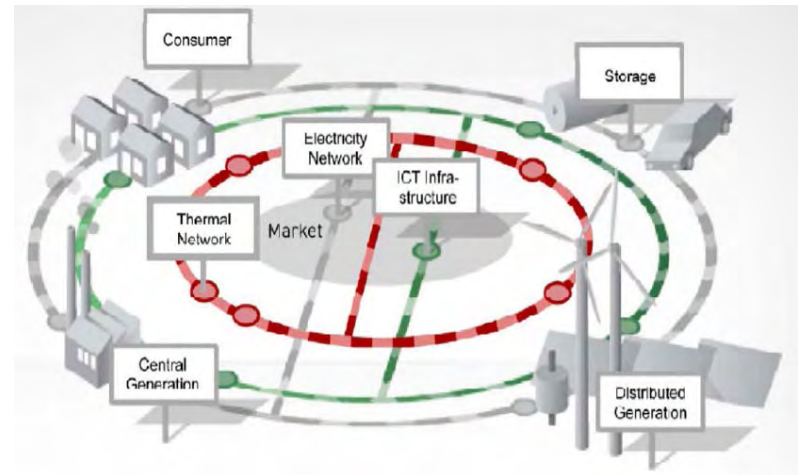
Radical innovation

- passive → active
- static → dynamic systems
- local → urban wide implementation
- single technologies → integrated approach

Source: AIT, B. Bach

Smart Cities require new approaches:

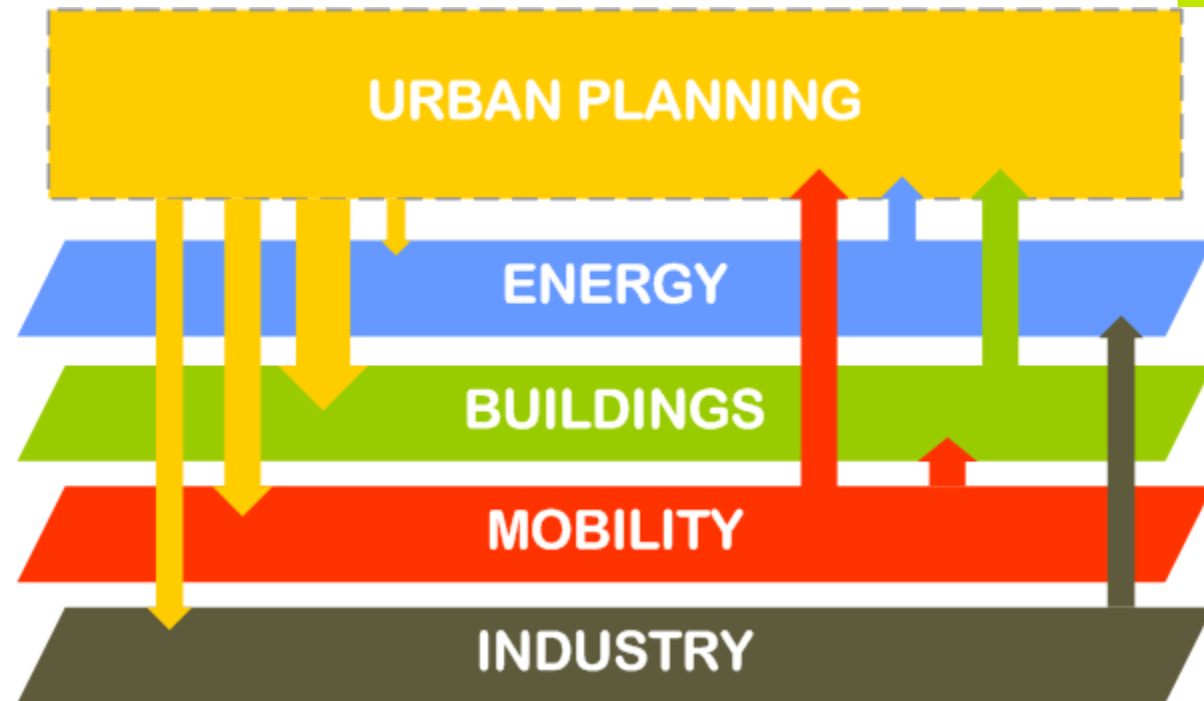
- Fully integrated design and intelligent management of energy systems
 - From a single technology perspective to a multi technology perspective
 - Multi-stakeholder involvement
 - Transdisciplinary approaches
-
- Paradigm shifts in the sectoral innovation system required!
 - Transformation of energy innovation system to gain a competitive advantage for the realisation of Smart Cities



Source: AIT, B. Bach

Urban Planning Structures: Status Quo

- Diverging planning tasks / goals / time dependencies
- Inhomogeneous stakeholder processes
- Optimisation of single technologies



Source: AIT, B. Bach

- Integrated planning tasks
- Heterogeneous Stakeholder-Processes
- Common Goals
- Common time dependencies
- Intensive and continuous communication
- Optimisation of the overall 'system' of the city



Source: AIT, B. Bach

ICT & energy technologies are merging
Intelligent energy management on regional & city level

New integrated planning approach

- Energy Planning
 - Smart Grids
 - Active Buildings
 - Supply Technologies
 - Mobility
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- New Business Models
 - New innovation processes (test beds, stakeholders dialogues, etc.)

Source: AIT, B. Bach



Smart Cities = Systems Integration

- Smart energy grids
- Heating and cooling networks
- Intelligent energy management, load transfers, demand side management
- E-Mobility and integration into grid
- Active buildings, plus-energy-buildings
- Energy harvesting, renewable energy
- Polygeneration
- New innovation processes and business models



SMART CITY ASPERN - LEITPROJEKT

Decentralised energy production

Dezentrale
erneuerbare Energie
Photovoltaik
Solarthermie
Micro Wind



Mobility concepts

Public lighting

LED Strassenbeleuchtung



SMART INTEGRATION

Mobilitätszentrale



Interactive buildings

Smart Grid
Steuerung & Balanzierung
Steuerung Wärmepumpe
Gesteuertes Laden E-Fahrzeuge

Energiespeicher



NutzerInneninteraktion
„Consumer to Grid“
Home-Automation



DRAFT

Smart energy grids

Onsite energy storage

User interaction

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- Strategic Energy Technology Plan (SET-Plan)
 - European Industrial Initiative on Smart Cities and Communities
 - European Smart Cities Stakeholder Platform
 - Smart Cities Member States Initiative (currently 21 MS + AS)
 - European Energy Research Alliance joint programme on Smart Cities
 - in-kind contributions of approx. 180 person years per year from more than 40 RTOs

 - Joint Programming Initiative Urban Europe
 - currently 16 MS + AS
 - 2 joint calls planned for 2012 and 2013
 - thematic focus beyond energy

Specific Nature of SET-Plan Collaboration

- Energy – its availability and its use – can be considered one of the grand challenges of our time
- SET-Plan was launched as a first opportunity for joint programming on a European level
 - on the level of European Industrial Initiatives (no success?)
 - on the level of the EERA (success story)
- Strong need for partnership and collaboration
 - among MS / AS (new ambition of EIRs Smart Grids and Smart Cities)
 - between MS and EC

The European Industrial Initiative on Smart Cities

- Addressing technologies and solutions for
 - energy efficiency
 - integration of renewable energy sources (on-site and off-site)
 - demand side management
 - Connection between CO₂ emissions and urbanisation
- ⇒ Main challenges:
- complexity of technological interactions
 - national diversity of administrative situations
 - subsidiarity as a European policy issue

The Smart Cities Member States Initiative

- Kicked off in December 2012
- Currently 21 countries participating (MS+AS)
- Aiming at creating policy and funding support on the level of the participating countries
- Meant as a vehicle for partnership with the EC and the EII on Smart Cities

Objectives of the Smart Cities Member States Initiative

- Common vision for Smart Cities and related national and European activities
- Screening of national Smart Cities programmes and best practice projects („stock-taking“)
- Better understand national differences in funding and administration of cities
 - ⇒ to create a joint approach of national governments
 - ⇒ to design a unified process of contributions to the Smart Cities EII from the part of the participating countries

Process of Smart Cities MS Initiative

Dec 2011

Dec 2012

Process management

**Kick-off workshop
with MS + Visioning**

Screening of:

Programmes

Projects

**General overview
about ongoing smart
cities activities**

**Gap+potential
analysis**

Recommendations for:

Programmes

Demonstrators

Collaboration

**Initiate first joint
implementation**

Communication with EC, SETIS, EERA, Stakeholders, etc.

Proposed Outcomes of Smart Cities MS Initiative

1. Joint technology vision & SRA
2. Proposal for a roadmap of joint R&D funding
3. Streamlining of the innovation process
4. Integration of actors

World café:

- Question 1: What should be the vision for the EUWP for the next term from 2013-2015?
- Question 2: Life in a smart city - how to get civil society involved?
- Question 3: Whom to mobilise for the “Smart City” implementation (local governments, investors, etc.)?
- Question 4: Energy technologies in a smart city – How to achieve systems integration?

Hans-Günther Schwarz

Energy and Environmental Technologies

Austrian Ministry of Transport, Innovation and Technology



*Bundesministerium
für Verkehr,
Innovation und Technologie*

Tel.: +43 - 1 - 71162 - 652932

E-Mail: hans-guenther.schwarz@bmvit.gv.at