

EERA JP Smart Cities

Research framework and current activities

Brigitte Bach, AIT Energy Department

What is EERA?



- European Energy Research Alliance
- Key instrument of the SET Plan for energy research
- Development of next generations of low-carbon energy technologies
- Strengthen, expand and optimise EU research capacities
- Joint Programming (JP)
 - Sharing of research facilities/capacities based on own funding/resources
 - Maximising complementarities and synergies
 - Avoid duplication, overcoming fragmentation
- Strong link to other EU platforms, bodies and initiatives
- Proactively engage with industry



EERA governance structure

- 15 members in Executive Committee (ExCo)
 - Chairman Erkki KM Leppävuori (CEO of VTT, Finland)
 - Strict criteria for membership
- EERA secretariat (based in Brussels)
 - Helmholtz, ENEA, ECN, CEA, DTU, VTT
- Research institutions participating on JP level
 - JP coordinators (JPC)
 - JP management board (JPMB)
 - JP Steering Committee (JPSC)
 - Full participants and/or associated partners
- Other bodies: general assembly, advisory committee

Current EERA Joint Programs

- Since June 2010 (SET Plan Conference Madrid):
 - JP Smart Grids
 - JP Photovoltaics
 - JP Geothermal
 - JP Wind

- Since November 2010 (SET Plan Event Brussels):
 - JP Materials for Nuclear
 - JP Bioenergy
 - JP Carbon Capture and Storage

- Since November 2011 (SET Plan Event Warsaw):
 - **JP Smart Cities**
 - JP Energy Storage
 - JP Concentrated Solar Power
 - JP Ocean Energy
 - JP Advanced Materials and Processes for Energy Application (AMPEA)
 - JP Fuel Cells and Hydrogen

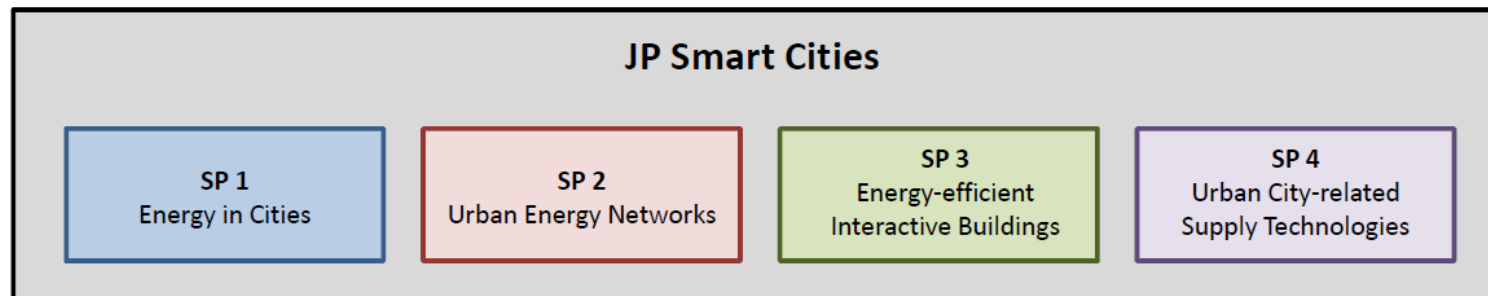
JP Smart Cities - Aims and objectives

- Key instrument for supporting SET Plan Smart Cities and Communities Initiative
- Develop necessary scientific instruments and methods for
 - Unlocking full potential of cities regarding energy-efficiency
 - Massive renewables integration in urban areas
 - Demandside Management
- Enable radical change in urban energy systems
 - Adopt multi-technology perspective and system approach
 - Understand complexity of future energy systems in cities
 - Focus on “energy” covering entire chain (urban generation – distribution – consumption)
 - New scientific methods for city-wide integrated energy planning, design and management
 - Support cities in their transformation towards Smart Cities (Low carbon cities)



Structure & organisation

- Overall JP coordination (AIT Energy Department)
 - Brigitte Bach and Reinhard Schütz
- 4 sub-programmes:
 - Energy in Cities (coordinated by AIT + VITO)
 - Urban Energy Networks (coordinated by ENEA + AIT)
 - Energy-efficient Interactive Buildings (coordinated by SINTEF + NTNU)
 - Urban City-related Supply Technologies (temporarily coordinated by AIT)



- Link to EERA secretariat (Massimo Busuoli)

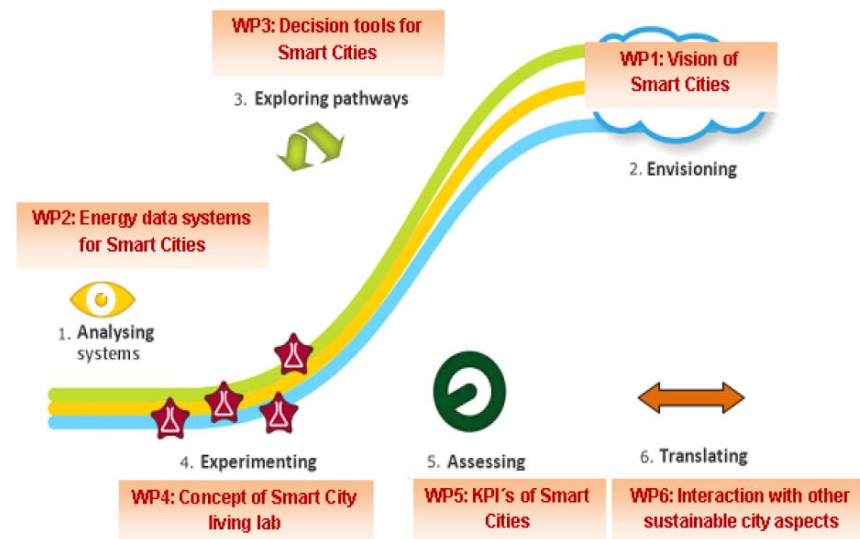
Partners on board

- 60 research institutions from 14 European countries
 - 18 full participants
 - 42 associated participants
- 2 umbrella organisations
 - UKERC (United Kingdom)
 - BERA (Belgium)
- 4 industry partners (ENEL, Ericsson, Telecom, Luccioni (all Italy))
- Total contributed human resources: **192.85 py/y**
 - SP 1: 34.60 py/y
 - SP 2: 57.90 py/y
 - SP 3: 77.45 py/y
 - SP 4: 22.90 py/y



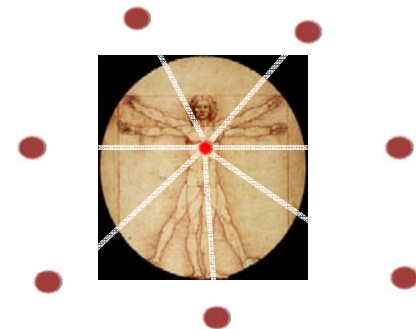
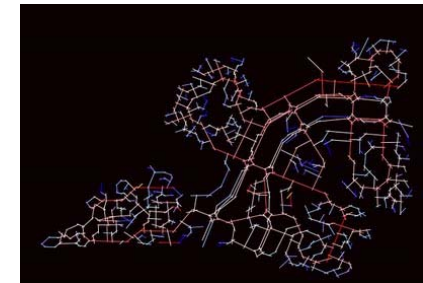
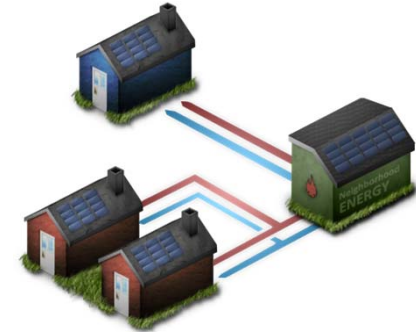
SP 1: Energy in Cities

- Smart Cities visions and transition processes
- Development of energy data systems for cities
- Decision support tools for energy roadmaps and action plans on urban scale
- “Living lab” concepts in the context of Smart Cities
- KPI’s and progress monitoring
- Interaction with other sustainable city aspects (water, waste, air,...)



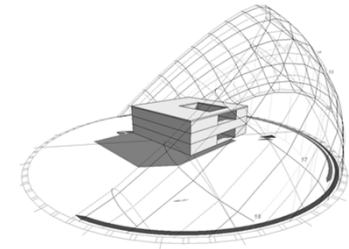
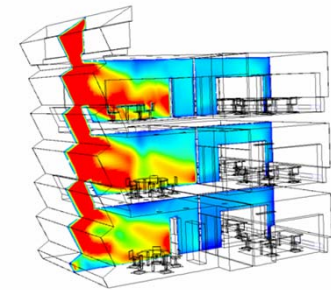
SP 2: Urban energy networks

- Smart Energy Districts
 - Building cluster interaction
 - District heating & cooling management
 - Multi-sources energy management/balancing (thermal + electric)
 - Connection of building cluster to smart grid
- Urban network integration
 - Urban sensor networks, data-energy transmission networks
 - Data management
 - ICT architectures of smart streets/districts
 - Integration of smart services in urban networks
 - Energy-mobility network integration
- Human factors: the city-citizen interaction
 - Interaction between citizen and urban networks in public space
 - End-user grid interface



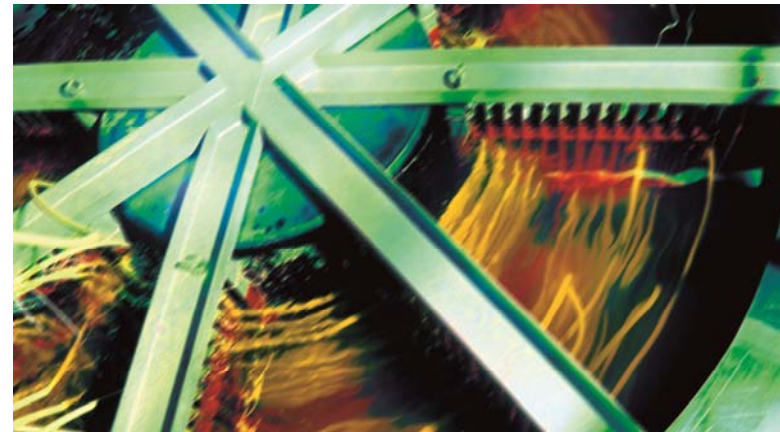
SP 3: Energy-efficient interactive buildings

- Building design
 - Design concepts for various types of boundary conditions
 - Modelling and simulation (BIM)
- Innovative building envelope solutions
 - Systems, advanced materials, components, RES integration
- Energy management and grids interaction
 - Building services, smart building management, B2G
- User interaction
 - End/professional users and indoor environment requirements
- Support strategies
 - Policy and market instruments, case studies, dissemination

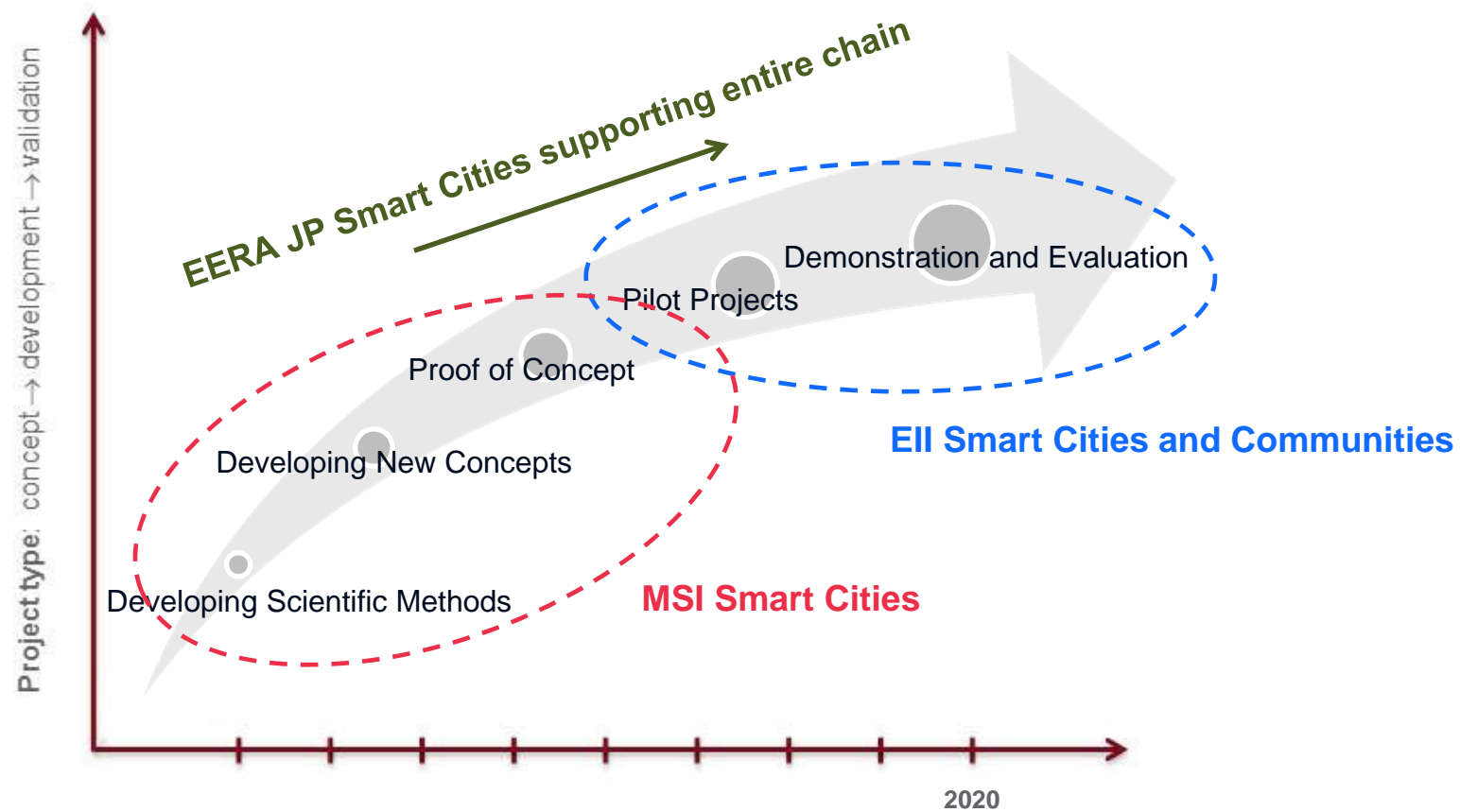


SP 4: urban city-related supply technologies

- Focus on solarthermal energy, heat-pumps and thermal energy storage
- Large-scale urban integration
- Development of modelling & simulation framework
 - Numerical component oriented models
 - Design and validation on technology level
- Large-scale test infrastructure, standards and procedures



Driving Innovation for Smart Cities



Current activities

- Strategic Update of Description of Work (DoW)
 - Deepening the scientific activities
- Kick-off of Taskforce on „Simulation Platform Development“
 - Meeting, 11 October 2012, University of Nottingham
- Inclusion of new partners
 - Under discussion: Fraunhofer IBP, EPFL, Wuppertal, etc.
- First interaction with partners beyond Europe
 - EU-China Urbanisation Partnership
 - Indo-European Research and Innovation Partnership
- Preparation of common research proposals (FP 7)
- Preparation of JP evaluation in spring 2013 (EERA Congress)

- Next workshop 18/19 December 2012 @ ENEA, Rome
 - Steering Committee Meeting
 - Thematic working groups
 - Progress reporting

AIT Austrian Institute of Technology

your ingenious partner

Brigitte Bach

Brigitte.Bach@ait.ac.at