The City of the Future

Research and technology development

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World Sustainable Energy Days
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Background

- Urbanisation as global megatrend
- Grand challenges have to be solved in the urban environment
- Challenges:
  - Energy supply and security / Scarcity of resources
  - Complexity of the socio-technical system 'city'
  - Dynamic development, need for solutions
  - Integral planning and implementation of all affected areas
- Development of sustainable and attractive city systems
  → Chances for Austria
Vision of the City of Tomorrow

- High attractiveness for residents and economy
- Safe energy supply and highly resilient systems
- Maximal conservation of resources
- Minimising impacts of greenhouse gases
- Use of renewable resources from the city and its surrounding
- Smart grids (thermal, electric, gas)
- Combination of energy, mobility and information technologies
- Integral energy and mobility planning
- Energy efficient interactive buildings and mobility systems
Aims of the new BMVIT research and innovation programme “City of Tomorrow”

- Development of resilient cities and districts with high resource and energy efficiency, increased use of renewable energy and high quality of life
- Optimisation and adaptation of the urban infrastructure and extension of urban services
- Strengthening Austrian technology leadership and international competitiveness
Special features of the programme

- Focus on neighbourhoods, districts and cities
- Strategic choice of key areas and topics
- Technologies and parts of technological systems
- Development of contributions to planning and processes
- Interdisciplinary methods and ways of working
- Connectivity: national (Climate and Energy Fund, aws,…), international (SET-Plan, JPI Urban Europe,…), thematic (mobility, ICT, …)
Time horizon and budget

- Duration: min. 5 years
- budget 40 Mio. EUR
- about 8 Mio. Euro per year
- Spectrum of technology and technological systems, enhancement of topics (eg mobility)

1. Call for proposals:
- Start: 26. September 2013
- Deadline: 30.01.2014, 12:00 h
- budget: 9,8 Mio EUR
Topics

- Multitude of topics for the city of tomorrow
- System technologies and necessity of development in regard to energy
- 3 thematic areas for 1st call:
  • System design and urban services
  • Built infrastructure
  • Technologies for urban energy systems
- Participation and inclusion of residents and users
Area 1: System design and urban services

1. Integrated energy concepts and system design
2. Energy und resource oriented urban planning
3. Methods for developing smart technology-service-systems and innovative business models
4. Accompanying research for urban management
Area 2: Built infrastructure

1. Optimisation and modernization of buildings, settlements and quarters
2. Optimised development of settlements
3. Assessment and design of urban metabolism
Area 3: Technologies for urban energy systems

1. The city as 'energy sponge'
2. Energy management in districts
3. On-site conversion technologies for renewable energy in the urban context
Results of the R&D-Programme 1999–2012

- 8 calls for proposals
- 63,3 Mio EUR project funding
- More than 450 research projects:
  - Basic research on socio-economic issues
  - Applied research, technology and components
  - 62 demonstration projects
- International cooperation within ERA-Net Eracobuild and IEA -EBC
solarCity, Linz

- Seven apartment houses with 93 flats in solarCity in three different versions: low-energy (five buildings), Passive House with five flats and a near Passive House with ten flats to investigate which combination of innovative building envelope and service components yield the best overall results.

Source: Martin Schweighofer

Architect: Martin Treberspurg, Treberspurg & Partner ZT GmbH
Renovation Makartstraße, Linz

Renovation of a multi-storey-building from the 1950s to passive house standard

- use of prefabricated wall units
- central element of the facade system is a special solar comb, which is mounted on the outside wall in form of a panel (gapsolar)
- controlled ventilation with single room ventilators

Source: Robert Freund

Architect: Ingrid Domenig Meisinger, Gerhard Kopeinig, Arch+More ZT GmbH
Renovation Fronius, Wels

- Overall energy consumption reduced by a factor of 10
- Use of local renewable sources of energy (insulation, wind power, geothermal probes)
- Simulation-based integrated planning of the renovation measures
- Daylight and artificial light management

Source: PAUAT/Luttenberger

Architect: Heinz Plöderl, PAUAT Architekten ZT GmbH
„Energy Plus“ Office / Vienna

Refurbishment to energy plus standard of the University of Technology Vienna

- Drastically reduced energy demand
- Biggest façade integrated PV facility in Austria

Project Manager: Helmut Schöberl, Schöberl & Pöll GmbH
Energy plus renovation, Kapfenberg

- Renovation of a residential building with prefabricated façade elements, concept and technology development, demonstration
- Works ongoing until April 2014

Project Manager: Karl Höfler, AEE Intec
Innovative Gebäude in Österreich
Innovative Buildings in Austria

Osterreichische Forschungsgebäude und Leitprojekte aus dem Förderprogramm „Haus der Zukunft“

Österreichischer Forschungs- und Regelprojekte im Rahmen des förderprogramms „Building of the Future“

Bundesministerium für Verkehr, Innovation und Technologie
Smart City Project Graz Mitte

- Areal of 400 hectares close to train station
- Retrofitting-Area
- Solar cooling
- Solar updraft tower
- Smart City Coaching
- Smart heat grids
- Integrated façade technologies

Project Manager: Ernst Rainer, TU Graz
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