Sustainability Approach in Large Real Estate Developments

The examples are taken from projects grant-supported by the Austrian Ministry of Transport, Innovation and Technology and/or the Austrian Climate and Energy Fond.
The innovations shown in the following slides are mainly taken from two projects:

- aspern plus Vienna’s Urban Lakeside
- Smart City Areas in the City of Graz
aspern plus - Vienna‘s Urban Lakeside

- An urban district of 240 ha for 20,000 residents and 20,000 additional jobs to be created over the next two decades
- Open space and microclimate connected to district development
- Energy supply and consumption cross-linked within small districts
- Demonstration buildings as ”lighthouse projects”, e.g. aspern IQ
- Quality monitoring at planning stage, and central monitoring of energy consumption during operation
- Development and use of simulation tools for district planning

Most slides about ASPERN have been thankworthy provided by Mr. Peter Hinterkörner

www.aspern-seestadt.at
Projects „Waagner Biro“ and „Old Reininghaus“

- Location of the Smart City Quarter near the main station (West of Graz)

- Current use: Industrial and commercial land, undeveloped land and residential areas

- Demonstration project: First time of implementation of new urban technologies for a liveable and intelligent „Zero Emission District / Quarter“
How „Graz West“ looked like when it was an industrial zone
Sustainability Approaches in Cities

- Resource Efficiency
  - Energy
  - Materials
  - Water
  - Space

- Diversity
  - Nature
  - Economy
  - Population

- Integrated High Quality of Life
  - Living
  - Working
  - Education
  - Leisure

- Substitute with Low-Carbon resources
- Efficient use of carbon sources / increase energy efficiency
- Reduce demand without reducing quality of life / from products to services
## Smart Cities are Zero Emission Cities

The Austrian approach for Smart Urban Districts compared to conventional planning:

<table>
<thead>
<tr>
<th>To be decreased</th>
<th>To be increased</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distances</td>
<td>Economic productivity</td>
</tr>
<tr>
<td>Buildings- and traffic space-usage</td>
<td>User density</td>
</tr>
<tr>
<td>Greenhouse Gas emissions</td>
<td>Interaction</td>
</tr>
<tr>
<td>Material streams with ecological effects</td>
<td>Biodiversity</td>
</tr>
<tr>
<td>Ecological footprint</td>
<td>Living quality</td>
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<tr>
<td>Additional costs</td>
<td>Development potential</td>
</tr>
</tbody>
</table>

Workshop "Green Building & Smart Cities,,
UAE + Oman 28.02. – 02.03.2016
Efficiency Resources: Building standards

- Office, production and commercial space, seminar suite, restaurant with 6,600 sqm of lettable space
- "Building of Tomorrow"; Klima:aktiv passive-energy house gold award (1000 out of 1000 points); ÖGNB award (974 out of 1000 points)
- Energy-plus standard / passive energy standard (energy requirement six times lower than that of a conventional building)
- Green building methods (eco-concrete, avoidance of PVC and substances harmful to the environment)
- Intelligent control of domestic engineering installations
- Energy production via photovoltaic installation, heat recovery over 90%
- Six beehives located on the roof of the technology centre aspern IQ
Research tower in Smart City Waagner Biro Graz

- dye-sensitized solar cell (Grätzel-Zelle)

Abbildung: Markus Pernthaler Architekten ZT GmbH
Building integrated energy technology:

a 24 V DC grid
Smart City Project Graz West, Project “Old Reininghaus”

Technologies for reduction of energy demand for heating and cooling

- green facades and roofs reduce heating and cooling demand


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Energy production within the city

- Photovoltaics
- Solar thermal
- Bio-waste processing
- Urban wind
- Geothermal
- Industrial waste heat
Smart Industries in Urban Areas

Energy Efficiency in Business

- Almost 30% of final energy consumption in Austria is attributable to manufacturing
- A significant contribution to reaching the EU-target of improving efficiency by 27% by 2030
- Approaches:
  • Standards for equipment
  • Training of consultants
  • Granting awards
  • Creating networks of consultants, technology suppliers and businesses
Quality of life: Cultural activities

- easy access
- social inclusion
- identification and identity

Examples:
- “Crane Lake”
- Aspern Nord event space
- Art in the public space
  - KÖR project on U2 station forecourt
  - KÖR project at Aspern Nord
- Hubsi Kramer theatre performance
- Open-air cinema
- Poetry slam
Smart City Wien – Innovation

In 2050 Vienna is "innovation leader" through focus on top-level research, a strong economy and education

- Research, innovation, technology (RIT):
  - Among Top 5 research cities by 2050
  - Promotion of Vienna-Bratislava-Brno Innovation Triangle

- Economy:
  - Share of technology-intensive products in exports raised to 80% by 2050
  - Strengthening of position as preferred location for corporate headquarters for Central and South-East Europe

- Education:
  - City-wide introduction of full-day comprehensive schools
The challenge: a multidisciplinary & participatory approach is necessary

- city planning, including all groups of society, also the vulnerable
- housing at all price levels
- mobility, traffic
- economy
- ecology, green & blue back to the cities
- dialogue with future residents and users on urban development of the district
- energy
- urban metabolism
- social life
- …