




Zero-Emission-Campus – Successes and experiences of the Environmental Campus Birkenfeld

Prof. Dr. Klaus Helling
Prof. Dr. Tilman Cosack

Panel 'Institutional greenhouse gas reduction strategies'
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Environmental Campus Birkenfeld (ECB)


ECB – Facts and Figures

Year of foundation:	1996
Total area:	10 ha
Effective area/buildings:	17.000 qm
Bachelor Courses:	10
Master Courses:	8
Students in 2007:	2.100
Students dormitories in 2007:	500
Professors and lecturers:	51
Scientific and administrative staff:	80
Research Income in 2006:	2.700.000 €



Ecological Campus Conception

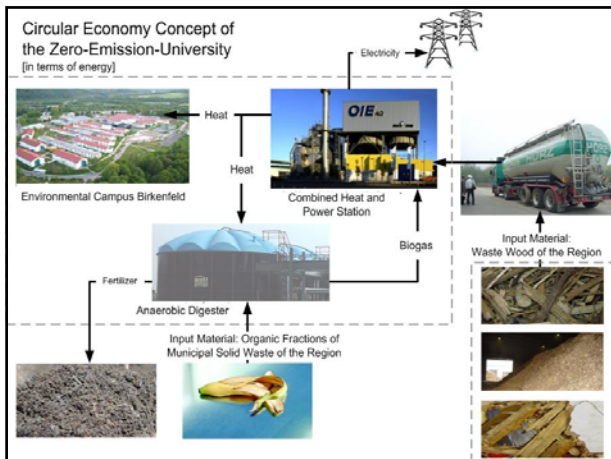
- Zero-Emission Heat and Energy Concept
- Energy Efficient Building Conception
- Active and Passive Utilisation of Solar Energy
- New: Zero-Emission Water Concept
- Educational Aspects and Programs




Neighbouring Eco-Industrial Park

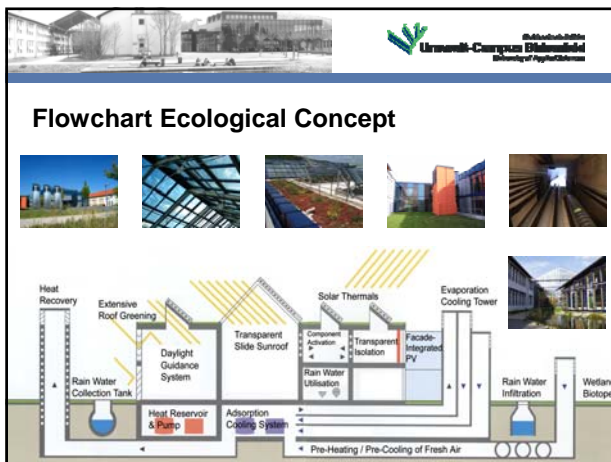


Labels in image:
 - Train Station to Frankfurt Airport
 - Biomass Heat and Power Station (Woodchips)
 - Biogas Plant for Municipal Solid Waste (Organic)
 - District Heating System
 - ECB



Zero-Emission Heat and Energy Concept

- Heat and Electricity demand is covered by neighbouring Combined Biomass Heat and Power Station
- Electricity Demand: 1.000 MWh/a
- ➔ Abatement Potential per anno: 550 t CO_{2e}
Based on the German Energy Mix: 550 g/kWh CO_{2e}
- Heat Demand in total: 2.000 MWh/a
- ➔ Abatement Potential per anno: 500 t CO_{2e}
Based on the German Heat Generation Mix and 250 g/kWh CO_{2e}
- Heat Demand Adsorption Cooling: 142 MWh/a
– Covered by Solar Thermal : 21 MWh/a



Active Solar Energy Utilisation

- Adsorptions Cooling System supported by Solar Thermal Installations (roof and facade-integrated)
- Daylight Guidance System
- Facade Integrated Photovoltaic [P=19 kW_{peak} / 6-7 MWh/a]
- Roof top PV [UCB Facility Management Ltd]

Solar Energy Utilisation

Photovoltaic: Facade-Integrated & Art



Solar Thermal Applications

Solar Thermal supporting Adsorption Cooling System

Solar Thermal Warm Water Application






Other Innovations

- Zero-Heat-Energy Student Dormitory [Passive House Standard]
- Modular Boarding House [Timber frame – less embedded energy]

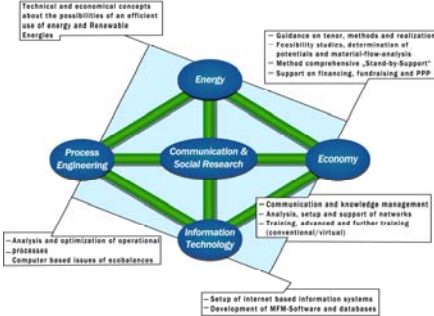



Key Ideas of the ECB

- Interdisciplinary Education for Sustainable Development based on a sound knowledge in the specific study courses
- Applied Research for Sustainability
- Project based Learning in Small Learning Groups
- International Research and Education Networks
- Residential Campus: Living, Learning, Working

Institute for applied Material Flow Management





Technical and economical concepts about the possibilities of an efficient use of energy and Renewable Energy

Guidance on tender, methods and realization
 - Feasibility studies, determination of potentials and material-flow-analysis
 - Method comprehensive „Stand-by-Support“
 - Support on financing, fundraising and PPP

Communication and knowledge management
 - Analysis, setup and support of networks
 - Training, advanced and further training (conventional/virtual)







- Setup of internet based information systems
 - Development of MFM Software and databases

- Analysis and optimization of operational processes
 - Computer based issues of ecobalances

Educational Aspects and Programs

- Environmental Technologies are part of the curricula
- Web-based performance monitoring
- Information-Displays in the central buildings
- Student are working hands-on [e.g. EMS]

Scope of studies in Birkenfeld

Environmental Technology	Environmental Management and Law
• Mechanical Engineering	• Environmental Management and Business Administration
• Process Engineering	• Business and Environmental Law
• Environmental Planning	• European Business Law
• Applied Computer Science	• Material Flow Management
• New Media	






German Degree
 Master of Science in International Material Flow Management (MSc) at ECB

German-Japanese Dual Degree
 Master of Engineering in International Material Flow Management (MEng) at ECB combined with
 Master of Science in Co-Operation Policy (MSc ICP) at APU, Beppu Japan

Info: www.imat-master.com

Thank you for your attention

Contact:
k.helling@umwelt-campus.de
t.cosack@umwelt-campus.de

