IEA SHC TASK
NG Solar Cooling and Heating
Proposal of Contribution

DI Tim Selke

2nd Definition Workshop
Paris, October 22nd, 2013
Austrian Partners

History/ Team / Contribution

- Already contribution to SHC TASKs
  - SHC TASK 25 ‘Solar-Assisted Air-Conditioning in Buildings’ (finished)
  - SHC TASK 38 ‘Solar-Assisted Air-Conditioning and Refrigeration’ (finished)

- Austrian Team: AIT, AEE INTEC, UIBK

- National research projects
  - SolarCoolingMonitor (End Oct 2011)
  - SolarCoolingOpt (End 2013)
  - Technical Roadmap (End Oct 2011)
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OVERVIEW - Intended contribution to Subtasks and Activities

SUBTASK A Components, Systems & Quality

- A1 Reference system (for heating/cooling) (AEE INTEC Contribution factor +0)
- A2 Adapted chillers and heat pumps including heat rejection (AEE INTEC CF+0)
- A3 New generation solar production for cooling (PV and others) and heating (DHW+ambient) (AEE INTEC CF+0, AIT CF+0 PV related)
- A5 Systems integration into buildings, microgrid and central Grid (AIT CF+0 PV related)
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OVERVIEW - Intended contribution to Subtasks and Activities

SUBTASK B Control, Simulation & Design

- B2 Grid access and load management
  (AIT is willing to share /corporate with ATISYS CF++)

- B3 Building/grid Load and weather forecast
  (AIT is willing to lead CF++)

- B5 System simulation and validation +
  Control strategy analysis and optimization (ST and PV)
  (AIT CF0+; AEE INTEC CF++; UIBK CF++)

- B6 System inter-comparison (cost/ performance/reliability)(between systems and with conventional, solar thermal, gas, etc.)
  (AEE INTEC CF++)
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OVERVIEW - Intended contribution to Subtasks and Activities

SUBTASK C - Testing and demonstration projects

- **C1** Monitoring procedure and monitoring system selection criteria
  (AEE INTEC CF++)
- **C2** Definition of energy performance indicators
  (AIT CF+0 PV related interest to lead)
- **C3** System description for field test and demo project
  (AIT 0+)
- **C4** Monitoring data analysis on technical issues & on performances
  (AIT CF+0; AEE INTEC CF++)
- **C6** Testing method initiation for standards
  (AIT CF+0 PV related)
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OVERVIEW - Intended contribution to Subtasks and Activities

SUBTASK D Dissemination and market deployment

- D4 Road mapping and lobbying actions
  (AIT ++ and open for lead)
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AIT Expertise

B2 Grid Access
B3 Building/grid Load and weather forecast

AIT as a key research partner of
Smart Grids Modellregion Salzburg
(National Projects)

- **B2G - Building to GRID**
  Building as an active player of the electrical grid
  (shiftable loads, load shedding, duty-cycling, etc.)

- **Grid friendly buildings**
  (interaction between electrical and thermal grids)
  Demonstration building is constructed as flagship project, in order to investigate the possibilities and benefits of Smart Grids in connection with buildings.
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AIT Expertise

SUBTASK D4 Road mapping and lobbying actions

AIT activities

- **National Technology Roadmap for STC**
  (already published)

- **Co-Coordination SHC TASK 48 Roadmaps**
  (ongoing)
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AIT Expertise
Building Integrated Photovoltaics BIPV

- Multifunctionability of BIPV & comfort
- Decentralization
- Ultra light, affordable, lifetimes > 50 years
Cost-efficient Building Integrated PV

- Project target is to develop a BIPV-technology that allows a substantial cost reduction triggering BIPV to the price sensible mass market.

Role of AIT:

- Characterisation of innovative modules like e.g. the spherical solar cell
Multifunctional is …
Integration of existing technologies

Plug & play is …
full pre-fabrication and exchangable functions

Topics:
- Dezentralization (PV&shading, PV& cooling, dezentralized HVAC)
- Day light use vs. shading
- Solar heat production
- Combination of systems
- Thermal and visual comfort
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PROJECT HELILOSTAR
- Combination of PV & decentralized cooling in moving vehicles

Topics
- PV-roof-top element for trucks (ultralight and semi flexible)
- Adapted and useful loading electronics
- Optimized electrical circuits
- Ageing
IEA SHC TASK48

Willing to coordinate
- B2 or B3 Grid access / Building/grid Load and weather forecast
- Interest to coordinate C2 Definition of energy performance indicators related to PV
- D4 Road mapping and lobbying actions

Financing issue
- BMVIT Ministry accepted offer from AIT, AEE INTEC, UIBK
- Finished and ongoing National Research Projects
- New national submission planned for 2014