



IEA-SHC Task 53 Kickoff Meeting Vienna, 18-19 March 2014

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EURAC Research

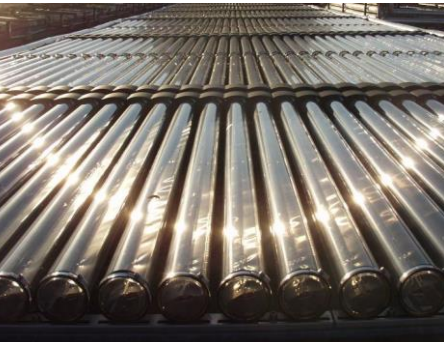
- is an institute for applied research and further education
- was founded in 1992 as a private non-profit organization
- has over 350 collaborators
- had 2012 a turnover of 18 M€, 50% of which is third party financed
- is currently involved in over 39 EU-funded projects of which 12 EU-FP7

Research areas



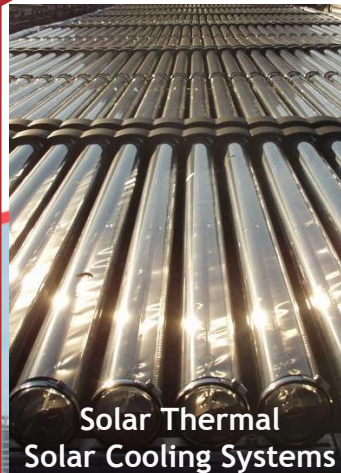
- Autonomies
- Health
- Mountains
- Technologies

Institute for Renewable Energy



- Foundation in 2005
- Main field of the activities:
Solar energy and buildings
- ~ 50 collaborators

Solar Energy for Buildings & Districts



Subtask B: Control, Simulation & Design

- **Task definition:**
to investigate the different control possibilities for the new generation solar cooling & heating systems for buildings so as to select the best strategies for given climates and countries and then develop modelling tools to predict performances and size/design systems. Besides, to manage a smart interaction with electric grid
- **Presentation objective:**
 - To start the brainstorming process... to be continued...
 - To define activities leaders
 - To define superimpositions with other tasks

Subtask B: Control, Simulation & Design

B1: Reference conditions (economic, climatic, reference building with thermal and electrical load, etc..)

- **Objective: to define reference conditions for analysis of performance:**

- Climatic → EU
- Building → residential, office,
- Applications → PV and ST

and Extra EU?

and hotel, commercial?

who decides which systems?

Industry? A1?

B2: Grid access conditions and building load management analysis

- **Objective: impact of a large number of solar cooling systems on the grid:**
 - Model of the grid needed

Subtask B: Control, Simulation & Design

B3: Model of components and system simulation

- **Objective: to define validated systems' components for simulation.**
 - PV panels
 - Heat pumps
 - Inverters
 - Batteries
 - Experience in ST in TRNSYS
- **Objective: to define which software for simulations**
 - TRNSYS
 - Polysun
 - INSEL
 - Modelica

Subtask B: Control, Simulation & Design

B4: Control strategy analysis and optimization for ST and PV

- **Objective: to simulate systems (new and reference)**
 - Sizing of the systems
 - Definition of control strategies
 - Simulations

B5: System inter-comparison (cost/performance/reliability)

- **Objective: comparison among simulated systems and with reference**
 - performance figures definition
 - data analysis (connection with C3)
 - Definition of a pre-sizing tool

Subtask B: Control, Simulation & Design

Deliverables

- D-B1: Technical report presenting the reference conditions for modelling
- D-B2: Overview on peak demand & demand side management possibilities
- D-B3: Technical report on components & system model validation
- D-B4: Technical report on optimised control strategies for solar cooling & heating systems
- D-B5-1: Technical report on system dimensioning
- D-B5-2: Design tool including a country- and climate-sensitive economical analysis

Subtask B: Control, Simulation & Design

Deliverables

D-B1: Technical report presenting the reference conditions for modelling

D-B2: Overview on **grid interaction** & demand side management possibilities

D-B3: Technical report on components & system model validation

D-B4-1: Technical report on system dimensioning

D-B4-2: Technical report on optimised control strategies for solar cooling & heating systems

D-B5-1: Technical report on simulations results and systems intercomparison

D-B5-2: Design tool including a country- and climate-sensitive economical analysis



Thank you for your attention

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