Solar Thermal Heating & Cooling and Buildings

Experiences, Chances, Hurdles

Christian Holter
S.O.L.I.D. GmbH
S.O.L.I.D. Activities

Large solar thermal systems (>500m²)

- Project Development
- Reasonable approved concepts
- Master engineering- system KH
- Construction supervision
- Operation and Maintenance
- Project Financing (ESCo)

- Research & development
- Consulting, Training
S.O.L.I.D. Group

Headquarter in Graz, Austria
Subsidiaries in USA & Singapore
Partners in many other countries
Recent reference plants around the world
• Peak Demand on cooling meets solar Peak
• Cooling creates expensive peak demand
• Cooling is the biggest single user of electricity in buildings
Why solar air conditioning?

- **Electric Energy Savings**
  - Electric COP Solar Cooling System incl. recooling ~10-40
  - Electric COP Compression Chiller Syst. incl. recooling ~2-6
  - reduced electric consumption by 70-80%

- **More stable energy expenses**
- **CFC Free Chillers** – No Ozone Depleting Potential
- **LEED certification** - up to 10 additional points possible
- **Quiet operation** – no vibrations
- **Reliable operations** – no wear and tear on pistons or screws as there are no such stressed parts
Office building - EAR Tower Pristina, Kosovo

2 LiBr absorption machines, total capacity of 70 kW / 20 tons

Solar Panels: 226 m²

4 m³ storage tank

Operating since Feb. 2003

13th operating season, 0% unforeseen down time
Solar cooling - Digicel, Kingston, Jamaica

Office space: 13,685 m²
Solar Panels: 982 m² / 680 kW
Single stage LiBr chiller: 600 kW
Hot storage: 2 x 5.5 m³
492 MWh cooling energy per year
In operation since 2012
Realised in partnership with RED, Jamaica

Energy Globe Award 2014
Solar Cooling via concrete core activation of a desert museum

Cooling power: 400 kW
Collector area: 1108 m²
Expected Solar yield: 825 kWh/m²/year

Commissioning: 2012
UWC Tampines, Singapore

Solar Cooling & Hot Water for School Campus

Solar Panels:
3900 m² / 2.73 MW

LiBr absorption chiller:
1470 kW

Operation started: 2011

Enlargement actually under discussion

World‘s most powerful Solar Cooling System until 2013
UWC Tampines, Singapore

Live visualization: http://www.uwc.heizwerk.at/?email=frei&pw=frei
Managua Hospital, Nicaragua

Almost completed

- Collector area: 4,450 m²
- Cooling load: ~1023 kW = 291 RT
- Peak heat power: 2600 kW
- Annual solar production: ~3 GWh heat
- Yearly energy savings:
  - 140 tons of gas,
  - 435 MWh electricity,
  - 500 kW of connected load
IKEA; Singapur

- Solar Cooling System IKEA Singapur, Alexandra Road.
- Under construction now
- 2600 m² solar collectors
- 900 kW cooling