Solar Thermal Cooling in MW Scale

World’s Most Powerful Solar Cooling Systems in Singapore and the USA
SOLID Activities

Large solar thermal systems

- Project development
- Design & engineering
- Construction
- Operation & maintenance
- Financing (ESCo)
- Research & development
SOLID Group

Headquarter in Graz, Austria
Subsidiaries in USA & Singapore
Partners in many other countries
Recent reference plants around the world
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

10th operating season, 0% unforeseen down time
Two large projects…
both built on ESCo agreements!
UWC SEA - EAST Tampines, Singapore

Campus area: 76,000m²/ 820,000ft²

Students: approx. 2700

Solar Panels: 3900 m²/2.73 MW_{therm}

Chiller size: 1500kW/420 tons

Storage:
For Cooling 60 m³
For Hot Water 7 m³

World's most powerful Solar Cooling System today
UWC – Collector areas

3900 m² gluatmugl HT
On 4 buildings
Standard flat plate < > HT-collector

HT-collector has 2 air chambers, separated by a Teflon® foil
- better insulation
- higher performance at high temperatures
LiBr absorption chiller
1575 kW
UWC – Storage tank

2 * 30 m³ tank
Experiences of UWC construction

- Key Equipment out of trusted sources
- Local Supply pipeing, steel work, tanks, ...
- Be careful on technology transfer issues !!!
- Solar standards versus local standards and norms
- Significant time and effort and local presence needed to get it done properly
Experiences of UWC operation

• Bad climate year
• Electric COP 6-13 ...but don't kill part load operation only to optimize this!
• Clear vision how to improve electric COP even more
• Interesting load profiles with south and west facing collectors
• Ongoing optimisation process...huge improvements
• Chiller operates down to 60°C
• Be careful in losses in pipeing (gravity, valves, expansion joints)
Experiences of UWC Part Load
Experiences of UWC operation
Desert Mountain High School, USA

Scottsdale, Arizona, USA

Cooling, Heating and DHW for Middle School and High school

500 tons /1750 kW\textsubscript{th} of Cooling, 50,000 ft\textsuperscript{2} collector area
DMHS – Covered Parking
Thank you for your attention.

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Further presentations:
- Poster E02 Solar Process Heat
- Financing of large scale Solar Thermal Systems (WED-1C)
- Evaluation of the prototype IP Solar (WED 1A)