ESCO financing options for solar cooling

Moritz Schubert
Solid
ESCo - model
ESCo - service criteria
ESCo - barriers and solutions
ESCo - practice examples
ESCo - new funding approach
• Project Development
• Engineering
• Turnkey Solutions for several 1000m² → LST Solar Cooling, Solar Process Heat and Cold, SDH, DHW
• Operation & Maintenance
• Finance (ESCo)
• Research & Development
Energy Service Company
• High investments
• Hesitations on user’s side
  • How long will the system work?
  • What about Operation & Maintenance
  • What about performance
• Lack of confidence and operational experience
ESCO - Model

Energy User

ESCO

Financial Institution/Investor

Return Deposit upon maturity date

Deposit

Monthly Consumption Charge + Fixed Charge

Energy delivery

Provide Financial Assistance

Repayment
Paybacks:

<table>
<thead>
<tr>
<th>Process heat</th>
<th>Solar cooling</th>
<th>DHW, SC</th>
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<td>5-10 a</td>
<td>8-13 a</td>
<td>7-15 a</td>
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Economy of scale >500m², for cooling even larger

**Often used business models @ S.O.L.I.D.**:

1. Customer pays only energy price, no ownership, energy serving for 12-15 years – no investment costs for the customer
2. Customer pays most of investment and gets a better energy price (contracts 3-5 years possible)
3. Possibility for customer to own solar plant after energy serving time
4. Theoretical possibility for a mobile solar plant
ESCo Service Criteria

- Energy analysis / management
- Financing by experienced partners
- Project design and implementation
- Monitoring procedure
- Maintenance and operation

>> special training programs for local partners

From one hand >> long lifetime >30a
- Size limitation of solar thermal plants vs. minimum investment amounts of banks and equity investors
- Low energy price of conventional energy source (e.g. gas for CHPC)
- Long term investments
- Availability of qualified staff for O & M
  - local infrastructure & competence
- Late detected malfunctions of solar plants in the past currently many failure detection systems under development, overview in Task 48, B6 with Dirk Pietruschka
ESCo challenges solar cooling

- less good practice examples, standards available then for solar thermal heat plants → main objective of Task 48
- performance of SC plant difficult to predict exactly, e.g. heat rejection
- many interfaces to be defined:
  - electricity supply, price
  - cold supply and return, temperatures
AEVG GRAZ
5.000 m² / 3.5 MW
SDH
Solar Panels additionally planned:
2.000 m² / 1.4 MW
United World College (UWC)

2600 students

Finish: Oct. 2011

3870m² Solar Panels

420 ton/1.480kW cooling, DHW

Payback: 10a

Funding: 11%

World’s largest Solar Cooling
DMHS, Arizona
(Desert Mountain High School)
5.000 m²
530 Ton/1.800kW Chiller
Payback: 11 years
Currently under construction
Current situation
• private persons: little revenues on savings (0-1% p.a.), mistrust in some financial institutions
• private companies (also ESCOs): difficulty to get loans from banks, also because of stricter rules on equity and other securities

New approach (please keep confidential):
• private investors invest in solar thermal plants by giving a loan for several years and get fixed rate of interest
• having private investors, the ESCo can get easier access to bank loans at more favourable conditions
• new for solar thermal, already working for PV, Wind power etc.
Thank you!

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