

# ESCO financing options for solar cooling

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Solid



- ✓ ESCo - ?
- ✓ ESCo - Model
- ✓ ESCo - Service Criteria
- ✓ ESCo - Barriers and Solutions
- ✓ ESCo - Practise Examples
- ✓ ESCo - new funding approach



Olympic Sailing Village, China: Solar cooling

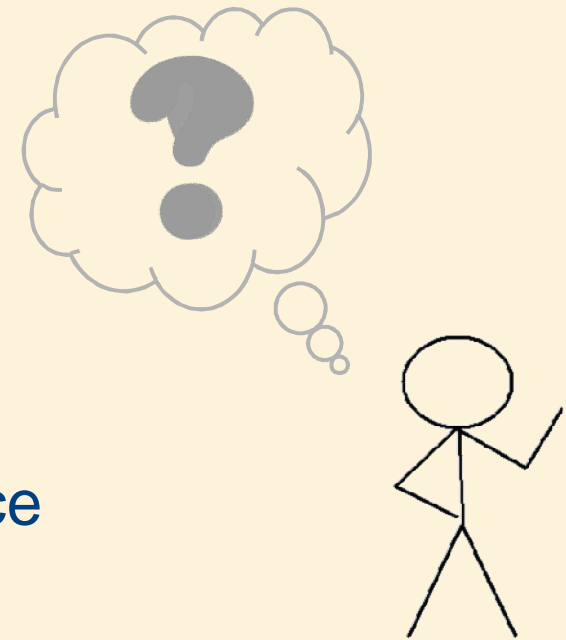
- Project Development
- Engineering
- Turnkey Solutions for several 1000m<sup>2</sup> → LST  
Solar Cooling, Solar Process Heat and Cold, SDH, DHW
- Operation & Maintenance
- Finance (ESCo)
- Research & Development

ESCo - ?

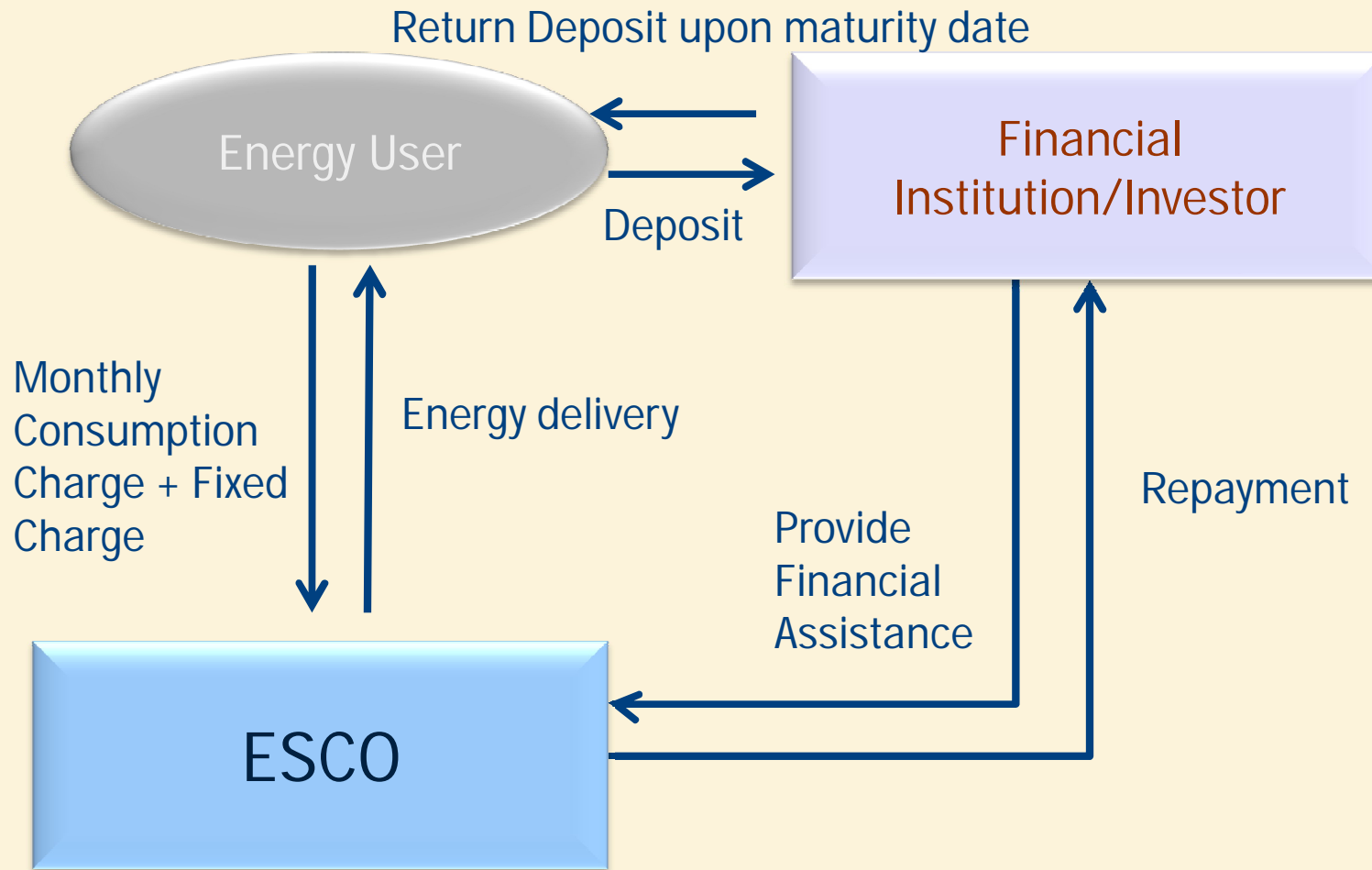


**Energy Service Company**

- 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



Paybacks:

Process heat	Solar cooling	DHW, SC
5-10 a	8-13 a	7-15 a
Economy of scale > 500m <sup>2</sup> , 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

- 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

- 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

# ESCo Practise Examples



## **AEVG GRAZ**

5.000 m<sup>2</sup>/ 3.5 MW

SDH

Solar Panels  
additionally  
planned:

2.000 m<sup>2</sup> / 1.4 MW

# ESCo Practise Examples



## United World College (UWC)

2600 students

Finish: Oct. 2011

3870m<sup>2</sup> Solar Panels

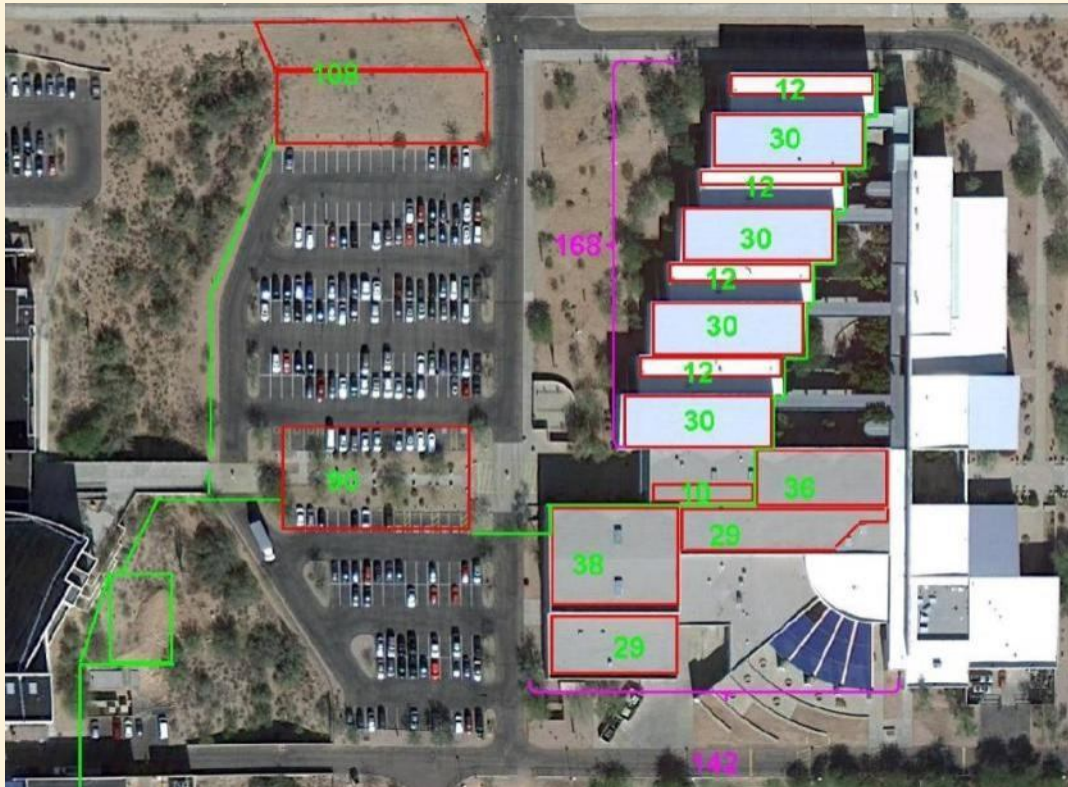
420 ton/1.480kW cooling, DHW

Payback: 10a

Funding: 11%

**World's largest Solar Cooling**

# ESCo Practise Examples



## **DMHS, Arizona**

(Desert Mountain High School)

5.000 m<sup>2</sup>

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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