

SOLID's ESCo Experiences



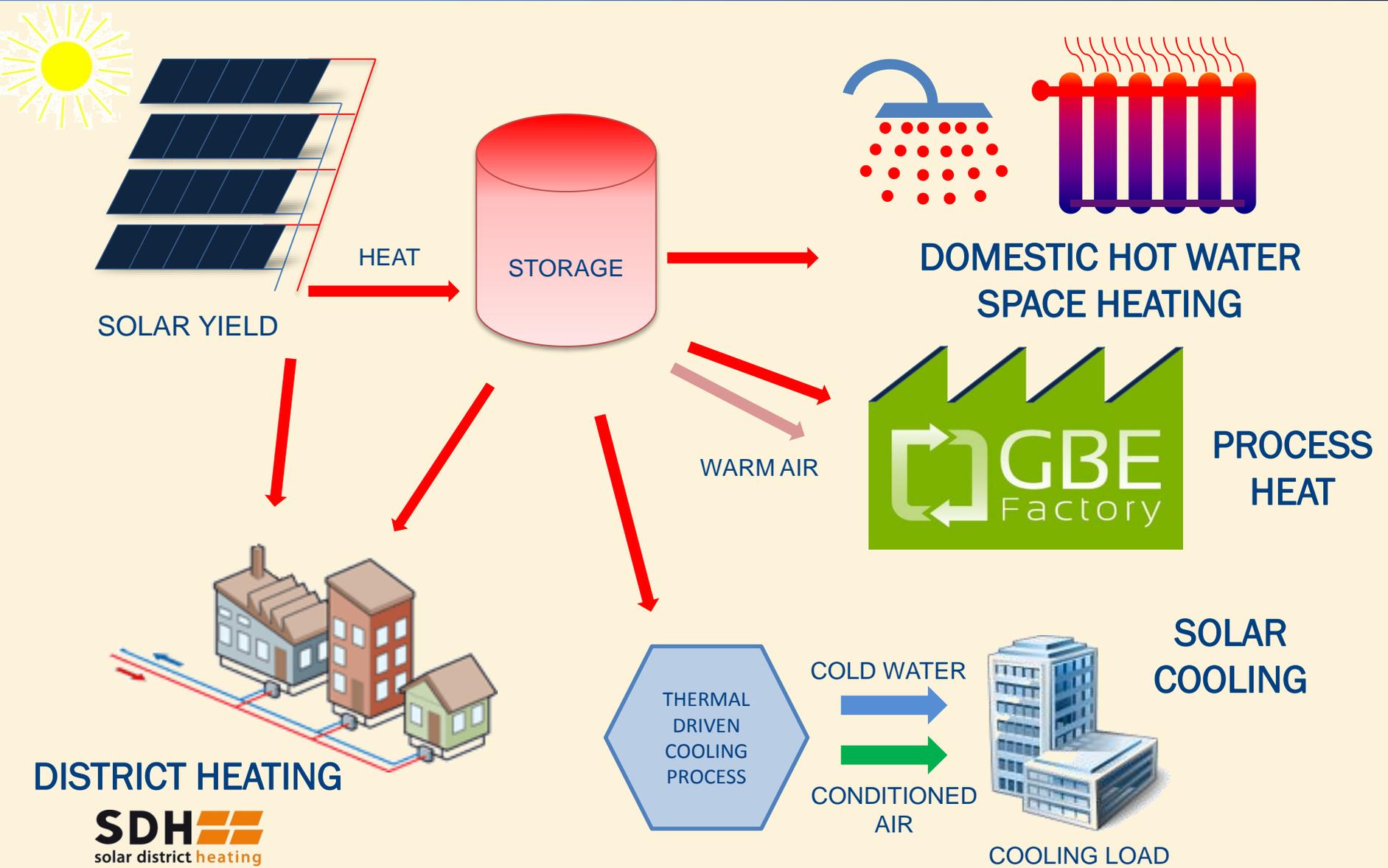
Desert Mountain High School. AZ, US, 500 ton solar cooling

Large solar thermal systems (>350 kW)

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



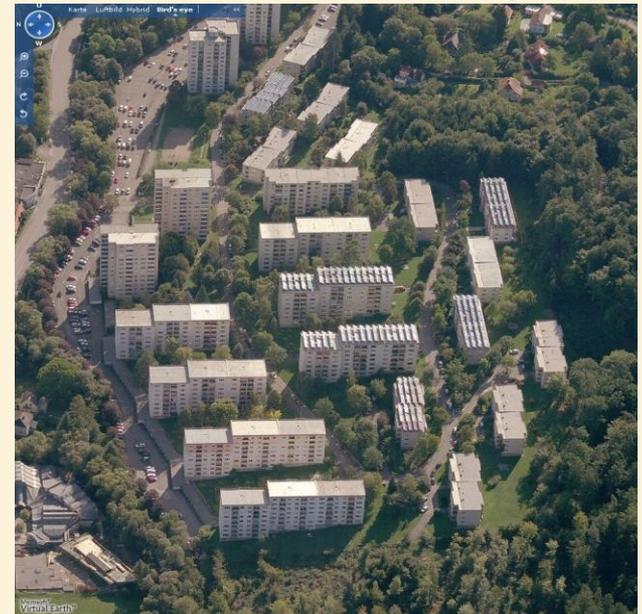
Technical Solutions by SOLID



- App. 20 Solar Thermal ESCo contracts in Austria, Germany, Singapore, USA with app. € 35 Mio
- First projects in 1998, „big“ projects since 2002 - today contracts up to 10,000 m²/ 100,000 sq ft solar array.
- Customers range from District Heating, Multi-family housing, selected industry, education institutions
- Services provide solar cooling, process heat, hot water, space heating



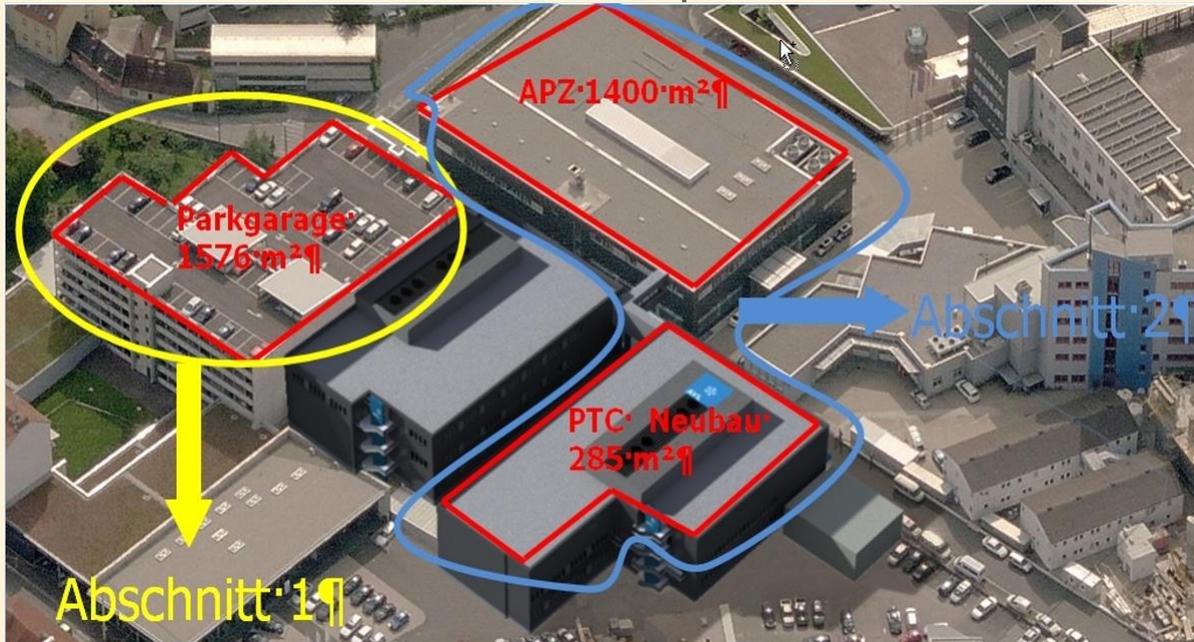
District Heating Plant, Graz, AT, 3500 kW,



Berliner Ring, Graz AT, 1200 kW

SOLIDs ESCO Experiences

- Currently app. 50 ESCo projects (including third parties investments) under O&M contract
- Currently 6 Mio € new projects under contract or in construction
- Sister company *Nahwaerme.at* 60 Biomass/Solar ESCO projects with 200 Mio € investment under operation



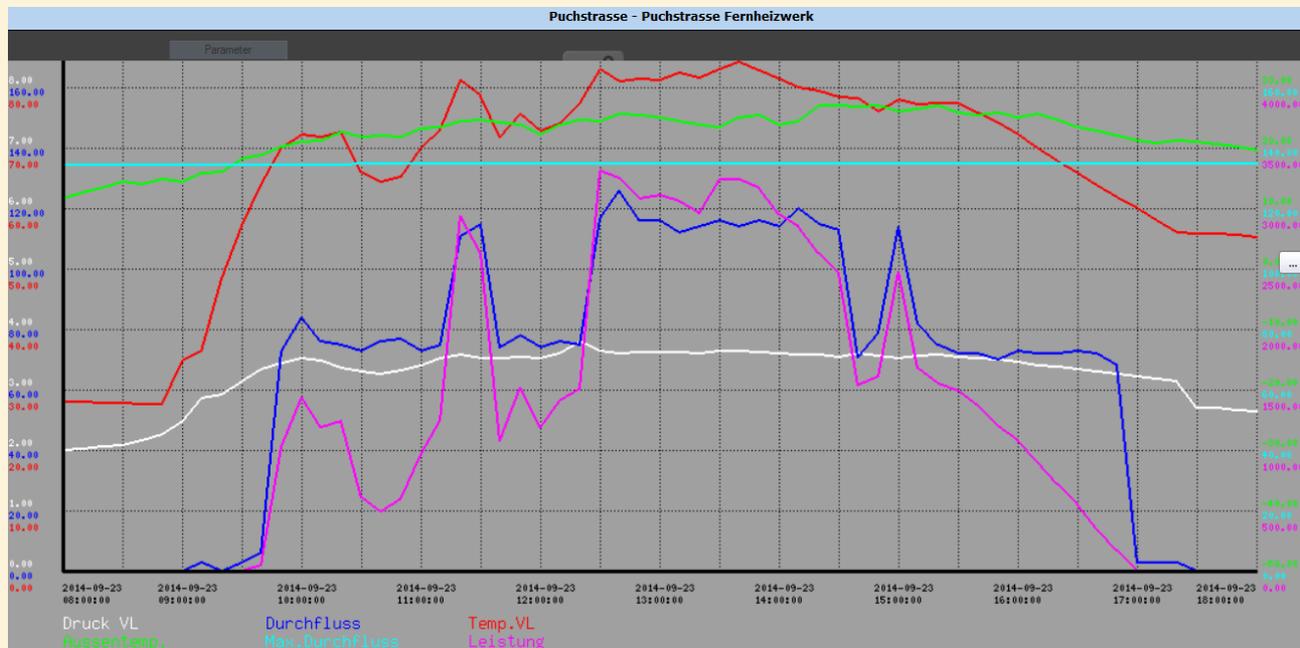
AVL, Industry, Graz, AT, 1500 kW Heat + 600 kW Cooling

Why did we start this?

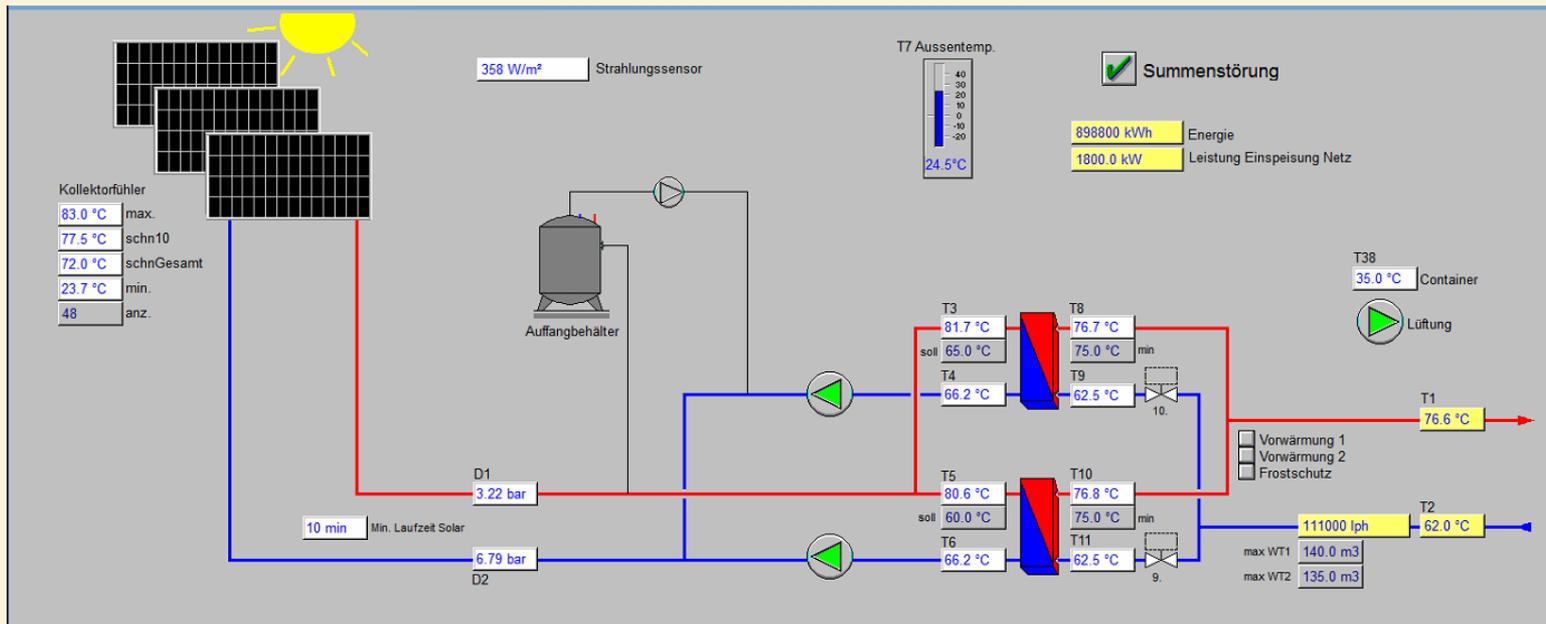
- Customers are adverse to invest their own money
 - Risk of unknown technology
 - Missing experience of real benefits, savings and O&M
 - Customer canceled investment for the benefit of other expense
 - Competition with available budgets for core business
- First, this was a sales supporting strategy
- Finally, this is add on business
 - Long term O&M contract
 - Revenue after reaching ROI
 - Learning experiences through ongoing responsibility and interest of maximized benefit



- Solar systems easy to handle and maintain
- Potential of optimization during start up period can increase revenue by up to 20%
- Proper and save engineering reduces risk of interrupted operation
- Most troubles result out of faults/deviations out of the scope of the solar system after the interface



- Regular supervision through telemonitoring is essential
 - central telemonitoring through experts with regular interval for system check
 - automatic alarm messaging
 - Early recognition of faults before loss of revenue
 - Diagnosis of underperformance often not recognized
 - Reporting to management of client on performance
- Simple problems can reduce performance significantly



- Projects can be financed over 10 to 15 years and are save investments
- All our projects have proven their economic performance
- Dependency from single customers/Payers requires adequate legal provisions and risk management
- O&M expenses are lower than all expectations/calculations

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- Bank financing got significantly more difficult over the last years
- Renewable investment funds want to diversify their portfolio beyond PV and wind
- Project finance is offered by many but there is
 - A lot of scam around
 - People knowledgeable in renewable energy are not educated in solar thermal
 - Solar thermal projects are (too) small compared to many other RE investments

- O&M and F&A costs are nearly independent from system size
 - Fixed costs for supervision, administration, insurance, reporting, customer care, metering, legal
 - Small system with revenues under \$10,000 are a challenge in covering their ongoing costs and cannot cover repair costs
 - Cost effective high quality O&M requires big portfolio of projects
 - Transaction costs are almost independent from project size
- ➔ All indications promote large systems

What financiers want to see?



Financiers say

- “Put real equity into the deal”
- “Show a multi-year track of performance”
- “Leverage all risks (performance, system loss, ...)”
- “Keep financiers out of complicated grant regulations”
- “Pledge us not only the specific project values but whatever is valuable”

FIND

- Mid-sized financiers that allow personal access to decision makers where key persons have both personal trust and understand the technology and the customer related risks

Some markets offer good opportunities for solar thermal ESCo

- Good solar irradiation
- Energy prices
- Grant system
- Stable and reliable legal situation

California	systems up to 120 tons cooling/1 MW heating
Germany	district heating
Austria	systems sized up to 2000 m ² collector area

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