The SO-PRO Project

Regional Market Development for Solar Process Heat

Christiane Egger

O.Ö. Energiesparverband

Solar Process Heat - Background

- In principle, enormous potential for using solar thermal systems in industry: about 30% of the total industrial heat demand is at temperature levels below 100°C which can be provided with commercially available solar thermal collectors

- However, the market in Europe and globally is very much in its infancy - a few hundred installations exist

- Many barriers: economic viability, lack of information across the value chain, unused industrial waste heat

SO-PRO - Solar Process Heat Project

Intelligent Energy Europe project: www.solar-process-heat.eu

Objectives

- triggering the starting up of markets for solar process heat in 6 European regions
- project activities:
  - targeted awareness raising for industrial decision makers
  - training of professionals
  - development of checklists and planning guidelines
  - support to pilot projects
- comprehensive European dissemination

Approach

- bringing together know-how from industrial processes, solar thermal and regional market development
- trans-sectoral approach (not limited to specific industrial sectors/branches)

So-Pro project partners & regions

	Partner	Region
	O.Ö. Energiesparverband (ESV)	Upper Austria (Austria)
	ESCAN	Regions of Castillas y Madrid (Spain)
	Energy Centre Ceské Budejovice (ECCB)	South Bohemia (Czech Republic)
	GERTEC	North-Rhine Westphalia (NRW, Germany)
	Sächsische Energieagentur (SAENA)	Saxony (Germany)
	Energy agency of Podravje (Energap)	Podravije region (Slovenia)
	Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung (ISE)	(Germany)

Activities 2009 and 2010

- regional inventories of solar process heat in each region
- energy screening of 91 companies
- checklists
- planning guidelines
- regional campaigns
- support to potential pilot projects
- project newsletters




K.O. and O.K. criteria

- **first step: "K.O. criteria"**
  - does the company need process heat below 100°?
  - is space available to install solar thermal collectors at company site?
  - is this space oriented towards south/south-east/south-west or on a flat roof?
  - does the company use fossil fuels for process heat during summer months?

  → if answered with "no", rather unlikely that solar process heat will be economically feasible

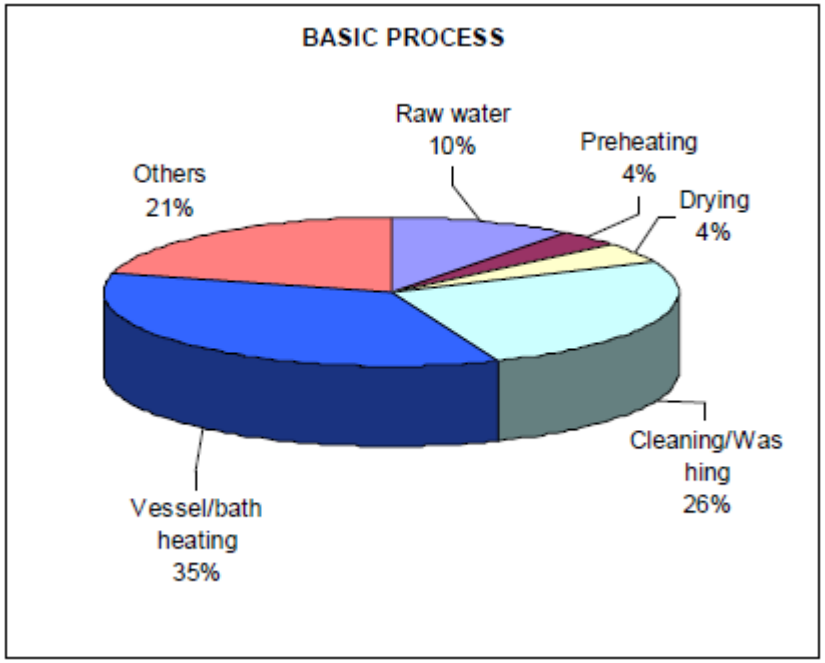
- **second step: "O.K. criteria"**
  - is process heat required from March to September? at least during 5 days/week?
  - is the temperature level of the process heat mostly below 50°C?
  - plans for reconstruction/expansion at the site for the next years?
  - is use of waste heat/heat recovery from other processes technically or economically not possible?
  - is a pay back period of > 5 years for energy investments acceptable?
  - is there a general interest in the use of renewable energy sources?

Checklists

- self-assessment checklists to make a first preliminary analysis whether solar process heat could be an option for a company
- K.O. and OK criteria
- available in English, German, Spanish, Czech, Slovene
- English version included in conference bags
- download at www.solar-process-heat.eu

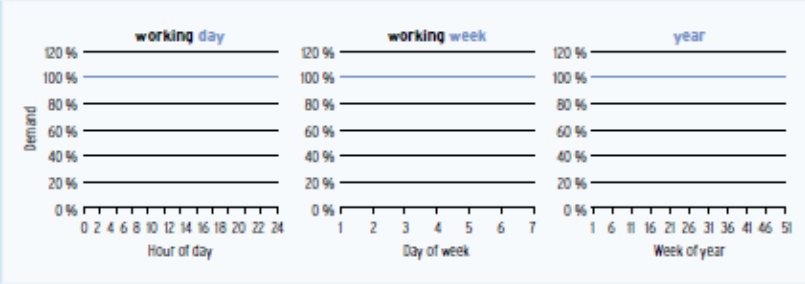
Relevant industrial processes

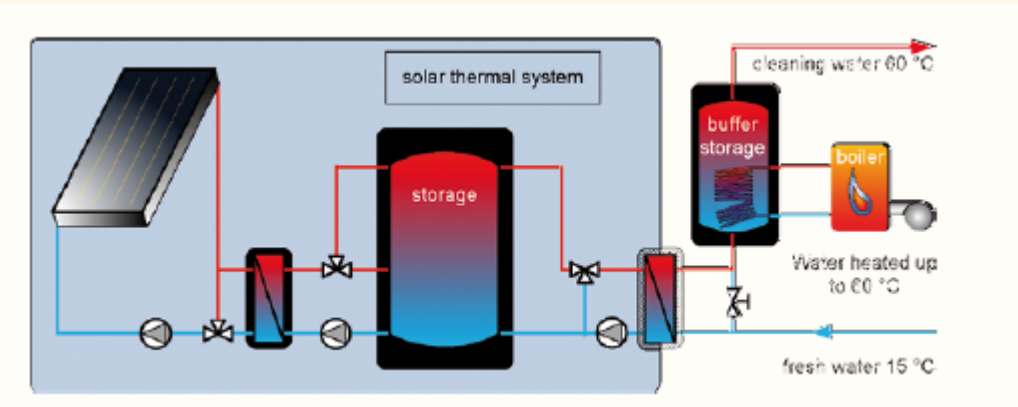
- heating of hot water for washing or cleaning
- heating of make-up water for steam networks
- heating of baths or vessels
- convective drying with hot air
- hot water as "raw material"

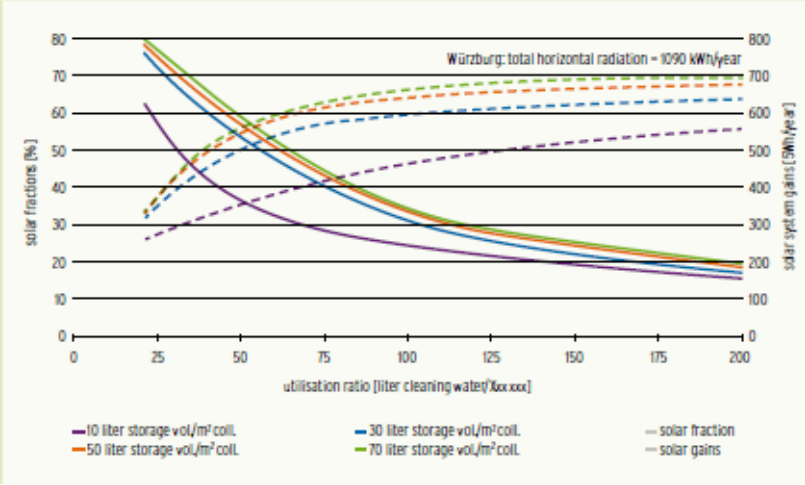


Planning Guides for Solar Process Heat

- load profiles / nomograms /system concepts
- available in English, German, Spanish, Czech, Slovene
- download at www.solar-process-heat.eu







Some lessons learnt...

Economic viability more likely if:

- low temperature process heat is required throughout the year
- no waste heat from other processes can be used
- heating oil is the main fuel
- dedicated funding schemes are available

A wide range of industries

Processes such as cleaning/washing, hot water as "raw material", low temperature baths etc. can be found in a range of industry sectors

Major information gaps

Significant awareness raising, information and training needed (for solar companies, planners, industrial companies)

Oberösterreich – Upper Austria

Capital:	Linz
Population:	1.38 mio
Area:	12.000 km²
Renewable energy:	34 % of total primary energy demand (15 % hydro, 15 % biomass, 4 % solar & other r.)

By 2030, 100 % of the space heating and electricity will come from renewables in Upper Austria

O.Ö. Energiesparverband

- regional energy agency
- energy efficiency, renewable
- main funding: regional government
- services to private households, companies, public bodies

The Oekoenergie-Cluster Upper Austria (OEC)

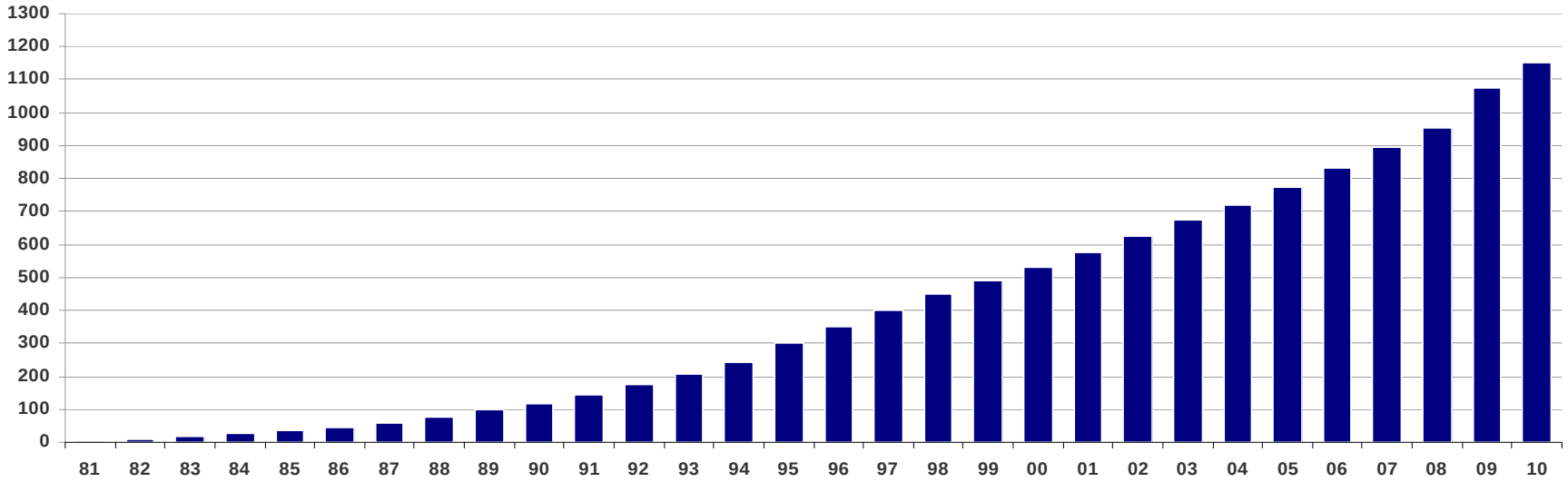
- network of renewable energy & energy efficiency companies in Upper Austria
- 160 partner companies
- since 2000, managed by O.Oe. Energiesparverband
- www.oec.at
- main business fields:
  - biomass heating
  - solar heating
  - energy efficient buildings

- **Turnover:** 1.7 billion Euro
- **Employees:** 6,260
- **Export share:** > 50 %

Solar thermal in Upper Austria

cumulated

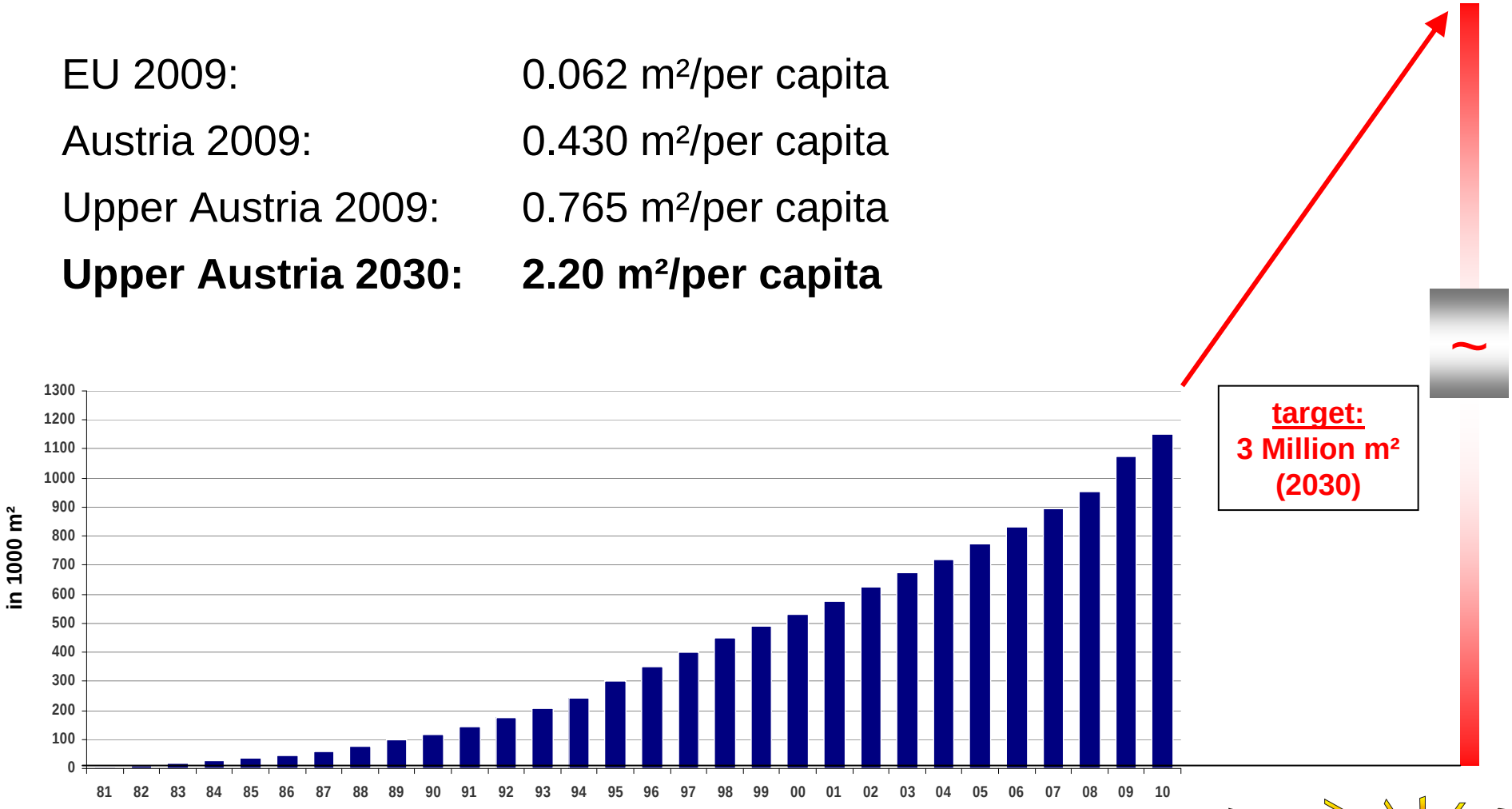
EU 2009:	0.062 m²/per capita
Germany 2009:	0.155 m²/per capita
Austria 2009:	0.430 m²/per capita
Upper Austria 2009:	**0.765 m²/per capita**
Upper Austria 2010:	**0,82 m²/per capita**



Solar thermal in Upper Austria

cumulated

EU 2009:	0.062 m²/per capita
Austria 2009:	0.430 m²/per capita
Upper Austria 2009:	0.765 m²/per capita
Upper Austria 2030:	**2.20 m²/per capita**



Solar thermal in Upper Austria

Solar thermal "carrots, sticks & tambourines"

- market development through:
  - financial ("carrots")
  - legal ("sticks")
  - information/training ("tambourines") measures
- policy packages

Solar thermal R&D

- Austria Solar Innovation Center (ASiC)
- Regional R&D Programme (Energy-Technology-Programme)

Main sectors of market development:

- residential & public & service sectors

Examples from Upper Austria

Leitl Beton, Hörsching
- production of concrete building components
- 315 m² solar thermal collectors

Eisvogel, Molln
- fish production & trade
- 44 m² solar thermal collectors

Hoval, Marchtrenk
- heating & ventilation systems
- 200 m² solar thermal collectors

Kölblinger, Nußdorf
- tanning of leather products
- 77 m² solar thermal collectors

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