SO-PRO

# The SO-PRO Project

## Regional Market Development for Solar Process Heat

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INTELLIGENT ENERGY EUROPE

www.solar-process-heat.eu

## 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

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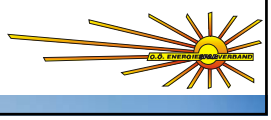
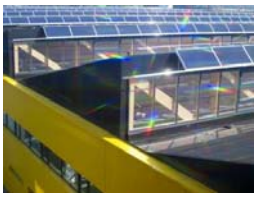


# SO-PRO - Solar Process Heat Project

**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

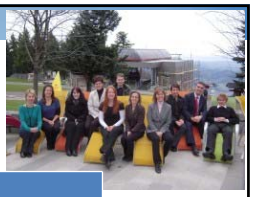


## Approach

- 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 | ESCAN | Regions of Castillas y Madrid (Spain) |
| ECCB | Energy Centre Ceské Budejovice (ECCB) | South Bohemia (Czech Republic) |
| GERTEC | GERTEC | North-Rhine Westphalia (NRW, Germany) |
| saena | Sächsische Energieagentur (SAENA) | Saxony (Germany) |
| energap | Energy agency of Podravje (Energap) | Podravije region (Slovenia) |
| Fraunhofer ISE | 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?

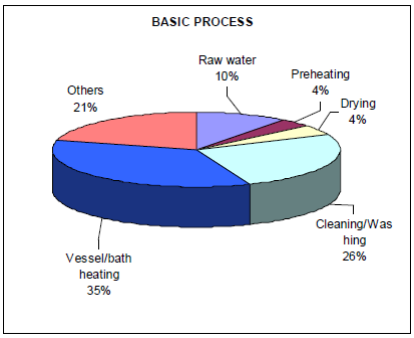
## Checklists

- 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



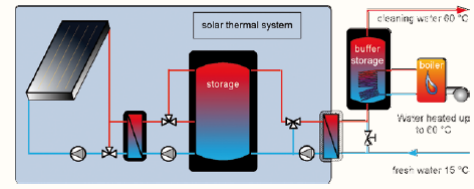

## Relevant industrial processes

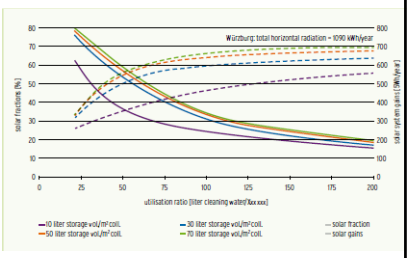
- heating of hot water for washing or cleaning
- heating of make-up water for steam networks
- heating of baths or vessels
- convective drying with hot air
- hot water as "raw material"



## 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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## 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)

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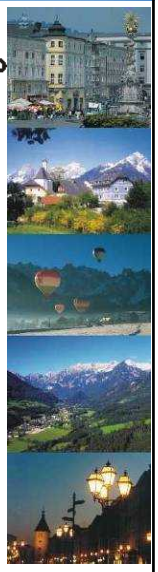
## Oberösterreich – Upper Austria

| | |
|---|---|
| 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

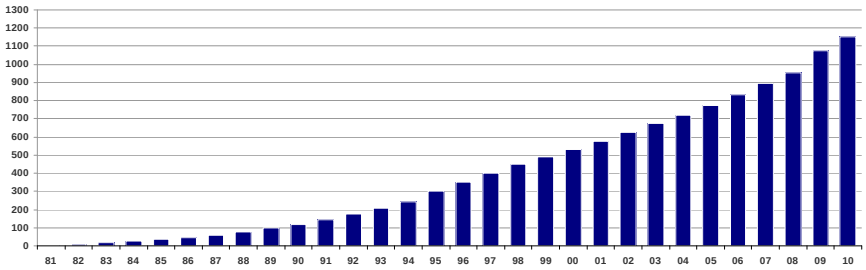
OEKOENERGIE OEC CLUSTER

- **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** |

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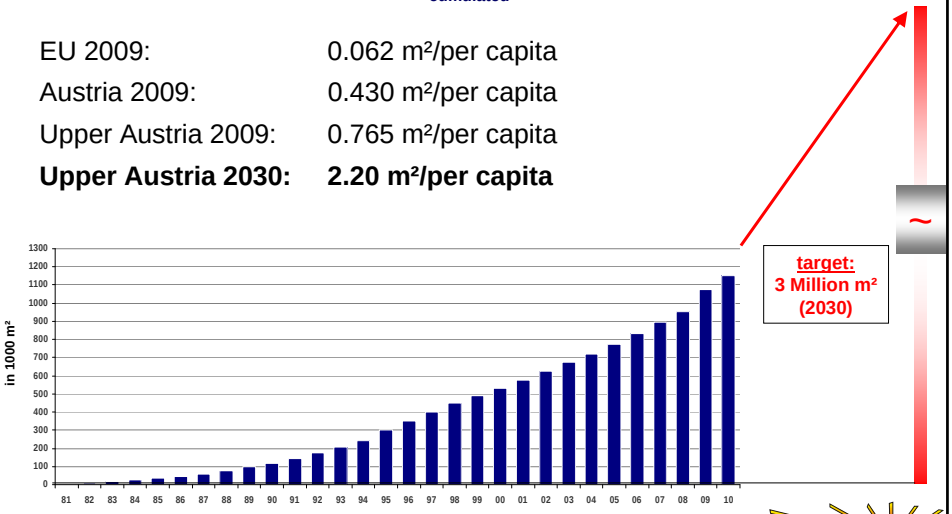
## Solar thermal in Upper Austria

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** |

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## 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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