SOLAR PROCESS HEAT

While solar heat for domestic and service applications has increasing market shares across Europe, solar process heat is very much in its infancy. In principle, the potential is enormous: 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, only about 70 installations in Europe were identified by the IEA Task 33 "Solar Heat for Industrial Applications".

The SO-PRO initiative, a project supported by the Intelligent Energy Europe Programme, aims to trigger the starting up of markets for solar process heat in 6 European regions (Upper Austria, the regions of Castillas y Madrid/Spain, South Bohemia/Czech Republic, North-Rhine Westphalia and Saxony/Germany and the Maribor region/Slovenia).

Project activities include – among others – targeted awareness raising for industrial decision makers, training of professionals, development of checklists and planning guidelines and 12 pilot projects. Comprehensive European dissemination activities ensure that the know-how gained is applied around Europe.

Further information is available at: www.solar-process-heat.eu

Main project activities

- **Analysis of the market conditions for solar process heat:** This included energy screenings of 91 companies, the analysis of economic and technical requirements for solar process heat and the identification of priority applications for solar process heat.
- **Checklists and design guides** for solar process heat installations were developed, for both publications a European version in English and 6 regional versions (German, Spanish, Slovene and Czech) were printed.
- **Regional campaigns** included 16 round-tables with key stakeholders (with more than 400 participants), information events, training courses and media campaigns.
- **Identification and support to potential pilot projects:** One pilot project was triggered in Spain and a number of other promising candidates were identified and supported.
- **Solar contracting:** The market potential of solar contracting was analysed in each region, advice to companies interested in this instrument given and "FAQs" were developed.
- **European dissemination activities** include project newsletters, an international conference, an international training seminar and a stand at the "Hannover Messe".

INTELLIGENT ENERGY EUROPE

O.Ö. ENERGIESPARVERBAND

SOLAR PROCESS HEAT

Some lessons learnt from the SO-PRO project

- **Economic viability:** The main challenge in the implementation of pilot projects for solar process heat lies in the economic viability. It is more likely if:
  - low temperature process heat is required throughout the year (not only during the heating period), best below 50°C
  - no waste heat from other processes can be used
  - heating oil is the main fuel
  - dedicated funding schemes are available

- **Relevant industrial processes:** Solar process heat can be technically and economically viable in a range of industries where processes such as cleaning and washing, heating of baths & vessels, drying, pre-heating of make-up water for steam networks, raw material production with hot water are used.

- **A great need for information, awareness raising and training:** For a successful market development of solar process heat, a better understanding of industrial processes is required from solar companies and planners and industrial companies need more information on solar thermal solutions.

Checklists for industrial decision makers on solar process heat

Self-assessment checklists were prepared which allow decision makers in industry to make a first preliminary analysis whether solar thermal would be suitable for their processes.

In the first step, the following "K.O. criteria" are checked: If any of these questions is answered with "no", it is rather unlikely that solar process heat will be economically feasible:

- Does the company need process heat at temperature levels below 100°C?
- Is space available to install solar thermal collectors areas at the 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 production during the summer months?

In a second step, "O.K. criteria" are analysed: the more of the questions are answered with "yes", the better the economic and technical conditions for solar process heat are.





SO-PRO

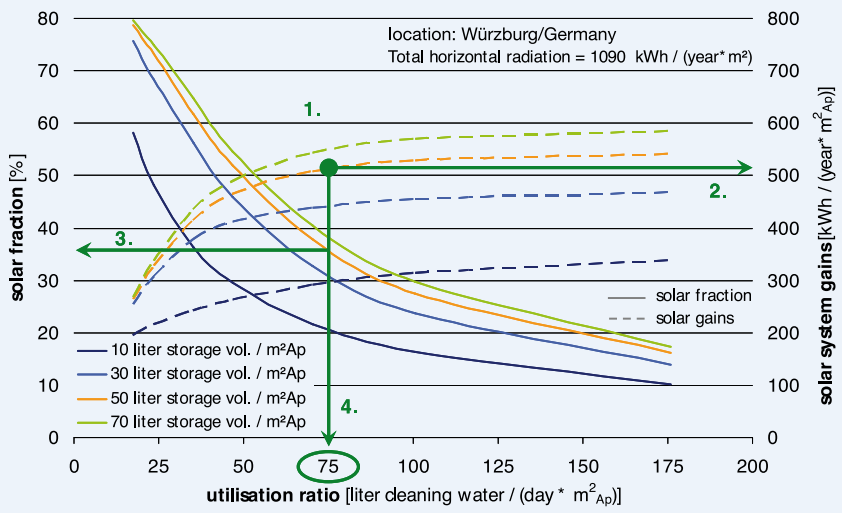
Solar Process Heat Generation: Guide to Solar Thermal System Design for Selected Industrial Processes

Due to their favourably low temperature level and their frequent occurrence in different industrial sectors, the following industrial processes were identified as highly relevant for solar process heat applications:

- 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

The publication provides information on the preliminary analysis to be done at a site and on general aspects of solar system design. The objective is to link industrial process engineering and solar thermal engineering by providing basic information for both of these groups. The system design for solar process heat installations for the four selected applications is presented as well as design and maintenance aspects. Typical load profiles, temperature levels and possible heat integration points are discussed. Exemplary solar system design schemes, load profiles and dimensioning nomograms are provided.

Both publications are available for download: www.solar-process-heat.eu



Example of a solar thermal system design nomogram for a cleaning process in a small company (with temperature lift 15 °C to 60 °C, flat-plate collector, collector slope 30 °, stratified storage)

Pilot project triggered by the SO-PRO project

The first pilot project triggered by the SO-PRO project is presently implemented in Spain. The company Montesano, located in Jerez de los Caballeros, Spain, employs a staff of about 120 and is active in the food industry (process and elaboration of meat products). Solar process heat is needed for hot water preparation of the washing system (raw product reception, first treatment, washing, second treatment, cooling, washing of vessels and machinery). About 290 m² solar thermal collectors and 23,000 l buffer storage are installed, thus covering 45% of the total heat demand. The annual heat production of the solar thermal plant is approx. 314,000 kWh.

SO-PRO

How can the SO-PRO project be useful for you?

The SO-PRO project aims at triggering the starting up of markets for solar process heat in 6 European regions.

- Self-assessment checklists for industrial decision makers on solar process heat
  Available in English, German, Spanish, Czech and Slovenian
- Design guides for solar thermal systems design for selected industrial processes
  Available in English, German, Spanish, Czech and Slovenian
- Project newsletter
  Register online to receive the project newsletter
- Regional training courses and information events in Austria, Spain, Germany, Slovenia and the Czech Republic

www.solar-process-heat.eu

SO-PRO project partners & regions

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

INTELLIGENT ENERGY EUROPE

O.Ö. Energiesparverband, Landstrasse 45,
A-4020 Linz, T: +43-732-7720-14380,
office@esv.or.at, www.esv.or.at, www.oec-en.at
ZVR 171568947