



## WP7 – Policy recommendations

### Background

In principle, there is an 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.

The benefits of using solar thermal process heat for industrial processes are manifold:

- supporting the energy, climate and environmental goals of the European Union, the Member States, the regions and cities
- supporting companies in long-term cost stability of their hot water provision and thereby contributing to their competitiveness
- contributing to the European leadership in sustainable energy solutions

However, in order to use the potentials and to deliver these benefits, the significant existing market barriers for solar process heat must be overcome. The two main barriers are:

- the economic viability of solar process heat installations which is - among other reasons - due to often very low prices for fossil fuel in industry and the short pay back periods for investments expected in many industrial companies. Also, in an early phase of a market development, costs for planning and set up tend to be high due to the lack of experience of the companies involved.
- the "no interest - no know-how - no market" problem - there is a great lack of information across the value chain:
  - solar companies often lack an understanding of the complexity of industrial processes and system integration as well as the skills for successful marketing to industrial companies
  - specialists in industrial energy systems know generally very little about solar thermal technologies, they tend to overestimate the costs and underestimate the energy production and have therefore no experience in system integration



- management in industrial companies is not aware of the possibility of using solar thermal for industrial process and therefore do not ask planners to include this option in their offers
- there is a lack of standardised solutions and communication among these groups
- policy makers on European, national and regional levels are generally not aware of solar process heat.

The SO-PRO project, which was supported by the Intelligent Energy Europe programme, aimed to tackle these information barriers and 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). The following approach was used:

- bringing together know-how from industrial processes, solar thermal and regional market development
- taking a trans-sectoral approach (not limiting the activities to specific industrial sectors/branches)
- carrying out targeted awareness raising and information activities
- identifying and supporting pilot projects

The information and promotion activities made it very clear that a faster market uptake of solar process heat needs dedicated policies and programmes, otherwise, there is a risk that the market will continue to be small and very fragmented and that the development will be too slow to allow for the learning curves and to bringing down costs through larger numbers.

In technical and practical terms, solar process heat is more linked to energy efficiency measures in an industrial process than to the generation of renewable electricity. Therefore, policy support to solar process heat can also be taken in connection to other measures that support energy efficiency in industry, and not only in the context of general renewable support instruments. For this reason, the following text makes reference to a range of energy efficiency policy measures.



## Policy approach

In principle, the following policy instruments to support solar process heat could be for example considered:

- solar thermal policy targets (e.g. in quantitative terms) and action plans with a concrete emphasis on solar process heat
- support to solar process heat R & D as well as demonstration programmes (e.g. the first 100, the first 1000 installations)
- financial support through general or dedicated funding programmes, either through subsidies or tax incentives, also any measure that supports the consideration of life cycle costs in industrial investment decisions instead of very short pay-back periods
- support to promotional measures (e.g. training, information campaigns, publications, information exchange, networking etc.)
- legal requirements, e.g. solar/renewable obligations for new sites
- standardisation and quality instruments (e.g. requirements to meet certain quality criteria)

In all support measures, the option of using solar thermal contracting should be taken into consideration: with this instrument, not the industrial company itself but an ESCO (energy service company) invests in and operates the solar thermal installation at the site of the industrial company and sells the heat to the industrial company at an agreed price.

In order to be effective, the promotion and support of solar process heat should be embedded on different policy levels:

### The European level

Policy measures to promote solar process heat could be included in a range of policy fields, for example energy, climate, environment, innovation and R & D, regional, tax policies etc. The instruments could in principle encompass directives, funding through different European programmes or standardisation measures.

The approaches on European level could, for example, include the following:

- considering solar process heat in the analysis of National Renewable Action Plans and the feedback to Member States
- including solar process heat in the energy audit schemes for enterprises foreseen in Article 7 of the Proposal for the "Energy Efficiency Directive", currently under preparation
- quantitative targets for solar thermal on European level which could also include a specific target for solar process heat



- continued support for targeted R & D activities of the research framework programmes (considering the recommendations of the European Solar Thermal Technology Platform)
- specific support for the financing of large-scale process heat installations through European financing institutions (such as the EIB)
- support to information exchange, networking and training on European level, e.g. through the CIP programme and its successor programmes
- bringing solar process heat to the attention of European policy makers, including those in the industrial and research field, and systematically include it in all future relevant policy documents (e.g. on low carbon technologies, on emission trading etc.)

### National and regional levels

Depending of the political structure in each Member State, the following measures could be taken on national/regional levels:

- including solar process heat in national/regional energy action plans, setting specific targets for solar thermal and solar thermal process heat
- considering solar process as an option in all programmes which support energy efficiency in industry
- R & D programmes
- demonstration programmes which include scientific support, monitoring and dissemination of results
- financial support, either in the form of investment subsidies or tax incentives
- making financing solutions (e.g. dedicated funds) available for energy efficiency and renewables in industrial companies
- support to information exchange, networking, training on national and regional levels
- energy advice/energy audit programmes which motivate and support industrial companies in economic energy efficiency and renewable energy investment decisions.

At present times, solar obligations for industrial companies do not seem to be an appropriate instrument for most European countries for two reasons:

- there are still too many significantly more cost-effective measures to be taken in a large number of industrial companies (e.g. use of waste heat, improvements in compressed air systems etc.) which - in case a legal obligation is considered as appropriate and realistic - should take precedence.
- in many Member States, the knowledge of market actors on solar process heat is too low which bears the significant risk of faulty installations carried out "just" to fulfil a legal requirement.



## Priority measures

Based on the findings of the So-Pro project, the following priority measures are proposed for the coming years to support market take-off which seem to be the most appropriate and also realistic in current political climate:

### Solar process heat in national and regional renewable action plans and policies

It would be helpful if some attention were paid to solar process heat by the Member States in their reports on the progress in the promotion and use of energy from renewable sources (foreseen in Article 22 of the Renewable Energy Directive 2009/28/EC) as well as in the analysis of these reports and the feedback given to the Member States by the European Commission. Such reports are due by 31 December 2011 and then every second year until 2021.

### R & D support

Continued R & D on European level (research framework programmes) as well as nationally and regionally is necessary. The priorities should include:

- mid & high temperature components (> 100°C)
- integration concepts of solar thermal systems into existing heat supply and consumption systems
- advanced control and operation strategies
- increase in efficiency and cost reduction

### Dissemination on European/national/regional levels

A lot of further efforts are needed to overcome the significant information gaps on solar process heat among stakeholders.

On European level, such a policy measure could include the support to a project ("So-Pro+") which extends So-Pro activities (information dissemination and exchange, the collection and dissemination of best practice examples, the media activities and the transnational learning process) to other European countries as well as to other application areas (e.g. mid-temperature heat applications).

Another option (in a next step) could be to support EU companies in exporting this solution to other parts of the world, thereby contributing to European technology leadership and export opportunities.



On national and regional levels, similar actions need to be carried out for the local and regional stakeholders. Here training and the promotion of best practice examples have a key role to play.

### Financial support on national and regional levels

The following principle approaches could be possible to overcome the economic barriers for solar process heat:

- investment subsidies for solar process heat installations through dedicated programmes
- including solar process as one of the potential measures to be taken in existing programmes which support energy efficiency measures in industry (which exist in many EU Member States)
- tax incentives which favour solar process heat, e.g. reduced VAT or foreseeing flexible depreciation periods for the investment
- any other measures which supports the consideration of life cycle costs in industrial investment decisions instead of very short pay-back periods (a solar thermal systems can provide nearly free hot water for at least 20 years whereas in many industrial companies pay-back periods in excess of 5 years are not considered as acceptable).

When designing a new support initiative, the following aspects should be taken into account:

- minimum support should be 25-30% of the investment costs, experiences shows that otherwise there is an imbalance of bureaucratic requirements and financial advantage (especially for smaller installations)
- subsidised energy advice/consulting programmes for companies have proven to be very effective in directing companies towards energy efficiency and renewable energy investments
- attention should be paid to quality and efficiency levels as well to the dissemination of results:
  - in young markets, the involvement of specialised scientific organisations can be beneficial
  - programmes should require monitoring of installations
  - only installations should be financially supported in which solar systems carrying the "Solar Keymark" are installed. The Solar Keymark is the first internationally recognised quality mark for solar thermal products
  - enough installations need to be funded to create a certain critical mass on the market
- should encourage (and not exclude) projects for which contracting is used



In countries where no or only a very small number of fragmented installations exist, demonstration programmes can be very useful ("the first 10/the first 100 installations"). Such programmes are characterised by higher funding levels, increased requirements for the planning process and for monitoring, for the publicity of results as well as an "organised learning process".

### Contracting

Solar contracting for industrial process heat has to overcome the combined market barriers for solar thermal process heat, for contracting in general and specifically for solar thermal contracting. Therefore, market introduction of this instrument represent a real challenge, even in countries with well-developed solar markets as well as contracting markets. However, once these barriers have been overcome, solar contracting could be an attractive instrument to overcome some of the economic barriers for solar process heat, especially the short payback periods accepted: industrial companies often only accept payback periods of up to 5 years and the economic consideration can then not take into consideration the nearly "free" hot water produced by the solar installation for 20 years.

Policy support to solar contracting could include:

- dissemination activities:
  - general information and awareness raising for contracting
  - promoting existing projects
  - identify companies that could become "Solar ESCOs"
  - training
- dedicated funding programmes for solar contracting or a "bonus" within existing funding programmes if contracting is used
- removing legal and administrative barriers for contracting

