



REGIONAL INVENTORY for the Region of Upper Austria

1) The regional context

Introduction of the region

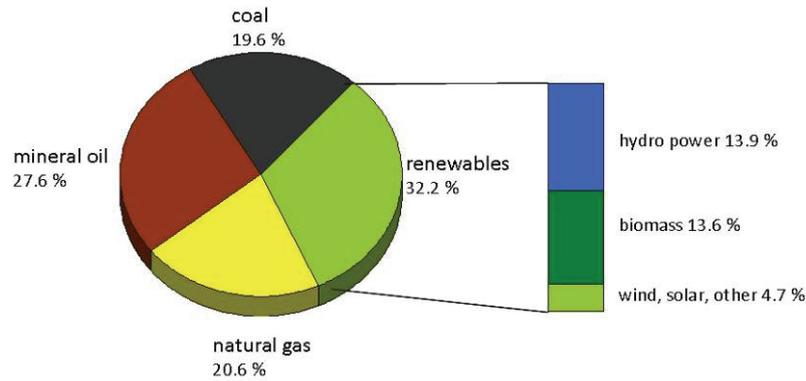
Upper Austria is one of the nine Austrian regions, situated in the northern part of Austria, bordering Germany and the Czech Republic, with 1.4 million inhabitants. It is a highly industrialised region (with more than 25 % of the industrial exports of Austria), with steel, chemical and machinery industries. The service sector, tourism and the agriculture are other industrial sectors of importance.

Key figures	
Population	1,377 million inhabitants (17 % of Austria's population)
Population density	115 inhabitants/km ²
Households	543,500 households (average of 2.5 persons)
Area	11,982 km ² (14.3 % of Austria's total area)

Source: Land Oberösterreich, Statistik Austria

In Upper Austria, renewable energy sources have a high political priority. The first energy strategy and action plan was passed in 1994, leading to an increase in the share of RES from 25 to 30% and to a reduction of energy consumption in housing (private sector) of 30% in the year 2000. Currently, the energy strategy 2000-2010, is being implemented which again sets ambitious targets, for example doubling biomass and solar thermal installations, which was already achieved in 2009! In November 2008, the regional government decided that by 2030 all electricity and space heating will be covered by renewable energy sources.

Structure Gross Energy Consumption Upper Austria 2008

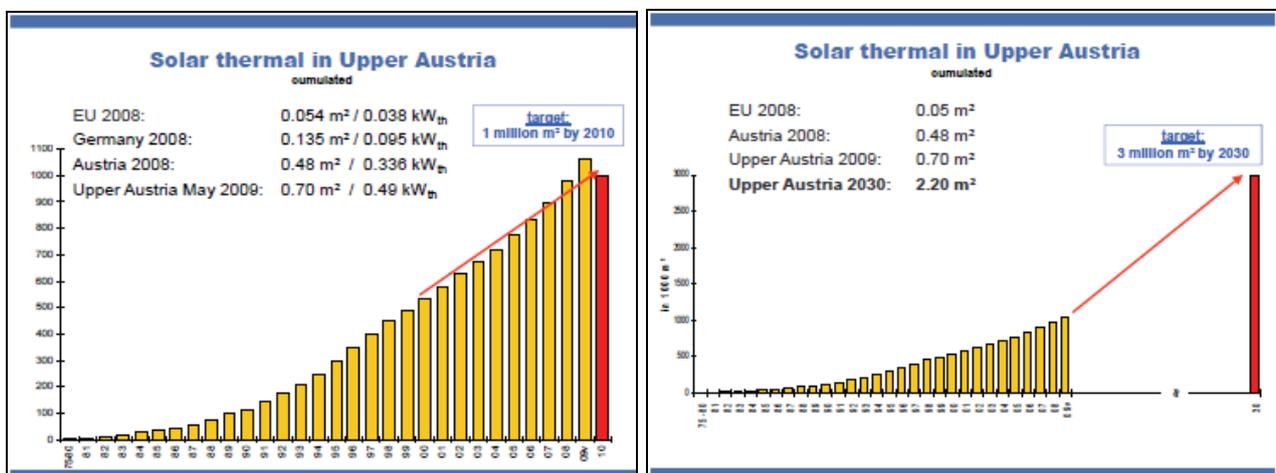


Source: O.Ö. Energiesparverband

Current solar thermal market development

In 2008, 93,000 m² of solar thermal panels were installed in Upper Austria, in total the collector surface amounts to more than 1 million m², yielding an annual heat output of 335 million kWh and saving about 100,000 CO₂.

Thus, Upper Austria is the number one solar region in Austria and also has a leading position in Europe: 0.7 m² of collector surface per inhabitant compared to 0.135 m² in Germany or even 0.054 m² of average surface in the EU. The potential for the utilisation of solar thermal systems is by far not fully exploited yet – Upper Austria's goal is a total of 3 million m² of solar panels by the year 2030.



The large majority of the solar systems is installed in single-family homes, with a typical size of 12 m², many of them are also larger as combi-systems (providing space heating during spring and fall) are very popular. Increasingly, apartment buildings, public and commercially used buildings are also equipped with solar thermal installations. There are about 5 plants which use solar for cooling and one installation where a solar system is connected to a biomass district heating (300 m²/212 kW).

From its economic structure, the potential for solar process heat in Upper Austria is relatively high: Upper Austria is an industrial region with 34% of the total Austrian industrial production. Especially important industrial sectors, with interesting potentials for solar process heat, are for example: the machinery industry (26% of the Austrian production), textile industries (31% of the Austrian production) and food and beverages industries (18% of the Austrian production).

2) Important market players and stakeholders for solar process heat in the region

- **Solar companies**

Over the last few years, the production of solar collectors has grown into an important economic sector. Several of Europe's leading producers of solar collectors are located in Upper Austria. More than 10 % of all solar collectors installed in Europe in 2007 were produced by Upper Austrian companies. In 2008, Upper Austria's solar thermal industry produced more than 300,000 m² of solar collectors. The export share of these companies amounts to over 70 %, the total turnover is in excess of 125 million Euros per year and increased by 300% since 2002. The employment (production, sales, installation) - about 1,800 jobs in 2008 - increased by 200% since 2002.

- **Oekoenergie-Cluster (OEC / Eco Energy Cluster)**

The producers of solar collectors and all other relevant actors in the field of renewable energy and energy efficiency co-operate in the Oekoenergie-Cluster (OEC / Eco Energy Cluster), the network of the sustainable energy sector in Upper Austria which is managed by the O.Ö. Energiesparverband on behalf of the regional government of Upper Austria. More than 150 companies are partners of the network of green energy companies which employ more than 4,500 and have a turnover of more than 1.6 billion Euro.

- **ESCOs**

A number of "Energy Service Companies" (ESCOs) are located in the region and energy contracting is also supported by the regional government by the "Energy Contracting Programme" (ECP). Solar contracting could be a mechanism to trigger solar process heat. Despite the high number of contracting projects realised in the last years (over 100), so far no solar thermal contracting projects were implemented.

- **Energy advisers**

A number of energy advisers are specialised for (industrial) companies. Their know-how on industrial processes and the decision making mechanisms in industry are of great importance for implementing solar process heat installations.

- **Companies participating in the regional energy advice programme**

About 350 companies apply for energy advice at the O.Oe. Energiesparverband every year. These companies are possibly more interested in innovative renewable energy technologies. In addition, some information is already available on their energy situation.

- **HVAC companies**

Companies specialised in building services and HVAC engineering are also an important target group to trigger solar process heat installations. As they know about the industrial processes in detail, their awareness and know-how is important.

Economic considerations

Average costs for large solar thermal installations:

Component	Costs (€)
solar thermal collector	350-400 €/m ²
material costs (valves, pump, pipes, insulation, etc.)	180 €/m ²
buffer storage	750-500 €/m ²
heat exchanger	17-20 €/kW
manpower for installation	170 €/m ²

Prices of competing energy sources in industry (all excluding VAT):

- average price for electricity: 0.11 – 0.15 €/ kWh_{el}
- average price for oil: 0.5 – 0.6 €/ litre
- average price for natural gas: 0.44 - 0.7 €/m³
- average price for district heating: 60-75 €/MWh

Support programmes which could be used for So-Pro projects

Presently the following financial support for solar thermal systems for companies is available:

Support for solar thermal collectors in companies	
solar thermal installations ≤ 100 m ² :	national support programme: - 100 €/m ² (flat plate collectors) / 150 €/m ² (vacuum collectors) regional support programme: - 60% of the national support, max. 15% of the investment sum
solar thermal installations > 100 m ² :	national support programme: - max. 20% of the investment costs - minimum investment sum of 10,000 € regional support programme: - 60% of the national support, max. 15% of the investment sum

Energy Contracting Programme

In addition to the subsidy for the actual thermal system, companies and public institutions in Upper Austria are eligible to a subsidy through the "Energy Contracting Programme" (ECP) which is managed by the O.Ö. Energiesparverband on behalf of the Upper Austrian government. The "Energy-Contracting-Programme" supports the financing of renewable energy installations – meaning that a subsidy is granted to cover a part of the costs from financing the investment by the ESCO. The programme covers both energy efficiency investments as well as those in renewable energy systems and amounts to up to 13.5 % of the investment costs for solar thermal contracting. Complementary to the funding programme, ESV carries out comprehensive information and advice activities, making sure that the instrument is well-known and supporting the quality of the project.

Regional R&D Programme

Furthermore, a regional R&D programme supports research and product development in the fields of energy efficiency and renewable energy sources. Especially the companies offering RES products and services have profited from this programme in developing a more competitive product portfolio.

Regional energy advice programme

Another important instrument to support companies is the energy advice service. Besides free energy advice for homeowners, ESV carries out an energy advice service for companies where about 350 advice sessions per year are held. 75% of the costs covered by the regional government, companies only have to pay 25% of the costs which is between 150 - 300 €.

Existing (if any) solar process heat installations in the region/the country?

So far, one installation is known and was presented at the "So-Pro round-table event" to stakeholders. The installation provides process heat for the production of pre-fabricated concrete components. 315 m² solar thermal collectors are installed, the total heat demand of 530,000 kWh/a is covered by the solar thermal collectors and the wood-chip heating plant.

Industrial sectors of special interest

In the course of the first months of the projects and based on the research and analysis carried out in the preparation of the project, it seemed that metal industries and food industries might be among the most relevant business sectors.

However, it turned out that in general those industries which need basic processes as washing, raw material production with hot water and heating in low temperature baths are of particular interest for solar process heat. Economic implementation of solar process heat application can be done, if low temperature process heat is required throughout the year (not only during heating season), less waste heat is available and oil is the main fuel. Of course space availability (for the buffer storage and the solar thermal collectors) has to be taken into account.

Based on the experiences gained from the screenings, it turned out that these factors are probably more important than the industry sector. The first pilot project for example was implemented in an industry company producing prefabricated concrete components, a sector which was not identified in any of the scientific studies carried out previously.

Main stakeholders & regional approach to companies or screenings

The stakeholder groups approached were the solar thermal companies, HVAC planners, ESCOs, energy advisers, solar R&D organisations and networks of industrial companies. These were informed about the project in bilateral meetings, in the course of other events and also by inviting them to the first regional workshop.

This workshop was the first time that in Upper Austria stakeholders from different sectors came together to discuss solar process heating. One important aspect of the meeting was to understand the role of different actor groups and to try to identify ways to interest them in solar process heat.

The approach for the screenings included the following mechanisms:

As described above, O.Ö. Energiesparverband is in charge of an energy advice programme for companies - in the course of the last years, more than 2,000 companies (from very small SMEs to the largest industrial companies) were advised by the specialised team of energy advisers. These companies represent a large fraction of the overall economy of the region and include most of the larger industrial companies. Also, these are in general companies more interested in energy issues and energy innovation and therefore potentially more interested in solar process heat. An analysis of the advice reports was done and from them, companies were filtered which seemed to be interesting for solar process heat applications. These were contacted to verify the current conditions (as some of the reports date back several years) and their interest in the subject.

Additionally, the project and the possibility of screenings was made known through networks of companies and respective events to make this possibility known to other companies as well.

3) Market development - outlook

Implementing solar process heat is a potentially interesting solution, however, there are significant barriers, as for example:

- economic barriers (low prices for fossil fuel in industry, comparatively high investment costs for solar thermal);
- lack of awareness about using solar thermal in industrial processes (ST is a well established solution for domestic hot water) including the lack of pilot projects;
- technical reasons (availability of waste heat, high process temperatures, available space for buffer storage)

Therefore, the project activities will focus on the following:

- doing a wide information reach out: awareness levels and know-how about solar process heat are nearly non-existent, therefore, an effort needs to be made to reach potentially interested companies along the value chain.
- building up skills in the relevant products and service provider companies
- identifying and triggering pilot projects which would help to demonstrate economic viability and help to gather planning and operation experience. At this stage of the project, it seems that pilot projects will not come from one economic sector but from individual companies depending on the matching of the very specific conditions.