

# SOLAR THERMAL – LARGE-SCALE SOLAR PLANTS

A funding programme of the  
Climate and Energy Fund for the  
Heat Transition



“Renewable heat, such as solar thermal, is an essential factor in energy transition and a central part of our integrated climate and energy strategy #mission2030. We have therefore been supporting this sector with great commitment for many years.”

**Elisabeth Köstinger**  
**Federal Minister for Sustainability and Tourism**

“Energy transition means above all heat transition. Hence we are promoting this transition, among other things, by funding large-scale solar thermal plants. In this way, we are able to help companies in all sectors to phase out fossil fuels - from tourism and agriculture to industry.”

**Ingmar Höb Barth**  
**Managing Director of the Climate and Energy Fund**



# Large-scale solar plants - a world-wide unique funding programme

Solar thermal energy for heat and hot water supply is an important branch of industry in Austria. In addition to small solar systems for domestic hot water and heating, there is great potential for large solar systems and storage tanks that are still underused. The Climate and Energy Fund therefore launched the "Solar Thermal – Large-scale Solar Plants" funding programme in 2010 to open up this market. The funding improves the framework conditions for the implementation of large-scale solar thermal plants, set innovative impulses and

build up technological know-how in Austria.

In 2017, the funding programme was awarded the renowned SHC SOLAR AWARD of the International Energy Agency, which annually honors outstanding international achievements in the field of solar thermal. The funding programme is aimed at solar thermal systems with collector surfaces ranging from 100 m<sup>2</sup> to 10,000 m<sup>2</sup>; the funding rate is up to 50 % of the investment costs. Particularly innovative projects are being supervised and



# CENTRAL FACTS

2010

Start of the funding programme "Solar thermal – large-scale solar plants"

163

Large-scale solar plants implemented or in implementation since 2010

43 Mio.

Investments triggered by the funding programme

264.000 Euro

Average investment volume of projects

26.700 MWh

Usable solar heat generated per year

8.200 t CO<sub>2</sub>

Annual avoidance

2017

the "Solar Thermal – Large-scale Solar Plants" programme receives the SHC SOLAR AWARD

evaluated scientifically for one year by solar competence centres. The findings serve the further development of the technology and are continuously incorporated into the implementation of new large-scale solar plants.

The programme focuses on solar process heat, solar grid feed-in, solar thermal in combination with heat pumps and buildings with high solar coverage. New, innovative technologies for large-scale solar thermal applications are funded additionally. The aim of the programme is to improve the economic efficiency of the overall system through the intelligent use of solar thermal energy in combination with efficiency measures in order to foster heat transition. The programme builds a bridge between research and market, leading to the development of new materials, storage technologies, system solutions and

cost reductions. The reduction of costs for solar thermal systems is an essential factor for the long-term success of this climate-friendly energy technology.

Since 2010, 163 large-scale plants have been implemented or are currently being implemented. As a result, around 61,000 m<sup>2</sup> of collector area were installed and an investment volume of 43 million euros was triggered. With an annual CO<sub>2</sub> reduction of 8,200 tonnes, the programme is an important contribution to climate protection. The long-term goal of the climate and energy strategy #mission2030 is to completely replace fossil energy imports for domestic heat supply of around 9 billion euros annually with renewable energy sources. The funding programme provides the impetus to accelerate this development.

# How companies benefit from large-scale solar plants

The sun provides energy in abundance, many times more than we need to cover our energy needs. More and more companies are therefore relying on the sun to cover their energy requirements at low cost.

## Producing with the sun

A large industrial company that has been relying on the sun since 2014 is the Upper Austrian HABAU Hoch- und Tiefbau GmbH. In the course of the construction of four new production halls for precast concrete parts, a large solar thermal system with a thermal output of 980 kW (1,400 m<sup>2</sup> collector area) was installed. The solar heat covers over 90 % of the hall heating and supplies more than one third of the energy for the production process of concrete hardening. The solar plant is thus used all-season and supplies the company with 500,000 kWh of climate-friendly energy

annually. In this way, HABAU saves 50,000 m<sup>3</sup> of natural gas per year and 190 tons of CO<sub>2</sub> per year.

From April to October, the solar energy generated is used as process heat to heat the formwork for the hollow plank ceiling production and the drying chambers in the new circulation system. The solar plant was erected on a tight schedule, only twelve months passed between the planning and the official opening of the halls.

The solar system and thermal component activation were supported by the Climate and Energy Fund with 337,000 euros.



**Anton Karner**  
**COO HABAU**

"For the new construction of the production halls, we decided in favour of a solar heat supply. In this way, we ensure sustainable competitiveness and productivity at the site. The working conditions of the employees have also been significantly improved as a result."





**Helmut Wurm  
Innsbruck Airport  
Member of Management**

"The airport now has to buy 7,300 m<sup>3</sup> less gas a year."

## Solar energy in flight

The restaurant at Innsbruck Airport has been supplied with 145 kW (207 m<sup>2</sup> collector area) by a solar thermal system for four years. The management had decided to generate the necessary energy for the airport in the most environmentally friendly way possible and to reduce energy consumption by consequent efficiency measures.

The solar plant covers 70 % of the heat requirement for the hot water demand of the restaurant; 115,000 kWh of solar heat are generated annually.

Hot water used to be produced electrically or with

natural gas; since the solar system was installed, the electricity demand has fallen by 58,000 kWh and the gas demand by an impressive 57,000 kWh per year.

The collectors are mounted on the roof of a multifunctional hall and aligned in such a way that there is no glare from approaching aircraft. If the sun is not enough, a gas boiler and electric heater is used.

The solar plant was supported by the Climate and Energy Fund with 101,000 euros.

# Sun and home furniture combined

In 2017, the Salzburg residential manufacturer Kröll & Winkel installed a solar system with 74 kW heat output (105 m<sup>2</sup> collector area) during the construction of the new factory and production building.

The solar thermal system was integrated into the façade in order to make better use of the winter sun. The solar plant covers 80 % of the heat demand, 55,000 kWh of heat are generated annually with the sun.

The solar heat is stored in a water tank and thermal component activation on the ground floor, upper floor and garage, where the heat is slowly released

into the rooms. A heat pump with ground collector serves as additional heating. In summer, the ground collector is also used for passive cooling of the upper and lower floors of the building.

The summer cooling by the system was very pleasant for the staff, especially in the record summer of 2017. This advantage of component activation will increase in importance in the future when the climate warms up and the temperatures are rising.

The solar system including thermal component activation was supported by the Climate and Energy Fund with 56,000 euros.



**Andreas Kröll**  
**Managing Director of**  
**Kröll & Winkel**

"Thanks to solar thermal energy, we do not have to bear any energy costs for almost the entire year, and we can pass this operating cost advantage on to our customers."





## Gerald Moravi Managing Director Energie Steiermark

"The solar plant helps us to make the district heating supply in Graz even greener and more efficient".

## Solar heat on a power plant scale

How can the share of renewable energy in Graz's district heating system be increased while at the same time increasing security of supply? This was the central question when Energie Steiermark Wärme GmbH decided in 2007 to build a large-scale solar thermal installation on the site of a district heating plant in Graz.

The positive experiences with the solar system led to further expansion stages in the following years. By 2016, the system has grown to a thermal output of 5,730 kW (8,184 m<sup>2</sup> collector area) and is today the largest solar thermal system in Central Europe.

The plant delivers an annual solar yield of 3.5 million kWh, which is fed directly into the city's

district heating without storage. The plant is operated on a contracting basis and the heat is sold to the district heating operator; it covers almost a quarter of the summer demand in the city's district heating system. The plant is particularly important in the morning, when there is a high demand it can feed a very high output into the district heating system in Graz.

A special feature of the system is that half a dozen different collectors are installed, which are scientifically monitored. This large-scale plant is thus also a field test for increasing the efficiency of solar technology in the megawatt range.

The solar plant was supported by the Climate and Energy Fund with 535,230 euros.

# Sun reap for koala bears

For nurseries, the sun is the most important source of energy for plants, flowers and vegetables to thrive. But the sun can do even more, as the gardening company Bach shows.

Since 2016, a solar system with 88,2 kW heat output (126 m<sup>2</sup> collector area) has been supplying the company with energy for hot water and heating of the 1,200 m<sup>2</sup> building area and the 8,000 m<sup>2</sup> greenhouses. In addition to herbs and flowering plants, a variety of rare edible plants are grown on the 55,000 m<sup>2</sup> area of the nursery - including 13 different types of eucalyptus, which serve as food for koala bears in the Schönbrunn Zoo in Vienna.

A 20 m<sup>3</sup> water tank and thermal component activation on the ground floor with 199 m<sup>3</sup> volume

act as an energy buffer to prevent overheating of the greenhouses from April to October. The lack of energy in winter is supplied by two 250 kW gas boilers. In order to make better use of the winter sun for the solar system, the collectors are integrated into the façade.

The nursery has been saving 60 % of its heating costs since the installation of solar thermal. Every year, 47,000 kWh of heat are generated by the sun.

The solar system including component activation was funded by the Climate and Energy Fund with 135,000 euros.



**Mario & Eveline Bach**  
**Managing Director of**  
**Gärtnerei Bach**

For our new location, we wanted an environmentally conscious and self-sufficient heating system, which we achieved through solar thermal energy and component activation. At the same time, we have significantly reduced energy costs.



# The funding programme at a glance

The funding programme “Solar thermal – large-scale solar plants” promotes the implementation of large-scale solar thermal plants. Measurement data is collected, scientifically evaluated and the knowledge gained is made available to Austrian companies.

The construction of demonstration plants from 100 m<sup>2</sup> to 10,000 m<sup>2</sup> collector area is promoted in the following fields:

- Solar process heat in production plants
- Solar feed-in to grid-connected heat supplies (micro-grids, local and district heating systems)
- High solar coverage ratios (more than 20 % of total heat demand) in commercial and service companies
- New technologies and innovative approaches
- Solar thermal in combination with heat pump

In the field of innovative technologies and approaches, exceptional solutions are also supported, with a minimum project limit of 50 m<sup>2</sup> of collector area. The plants are assessed by a panel of experts and individual plants are selected for participation in a scientific evaluation. It collects data over a period of one year during plant operation, evaluates the data and draws conclusions for the optimisation of large-scale solar plants.

Information at [www.klimafonds.gv.at](http://www.klimafonds.gv.at) and [www.solare-grossanlagen.at](http://www.solare-grossanlagen.at)

## TIPP: Arrange a consultation

Before a project is submitted for funding, a consultation meeting with monitoring experts is mandatory.

For a timely registration for the consultation, please contact the **Infohotline AEE INTEC** at +43 (0) 3112 5886 0.



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