
# REGIONAL INVENTORY

## Project Partner: SAENA

## Content



## The regional context

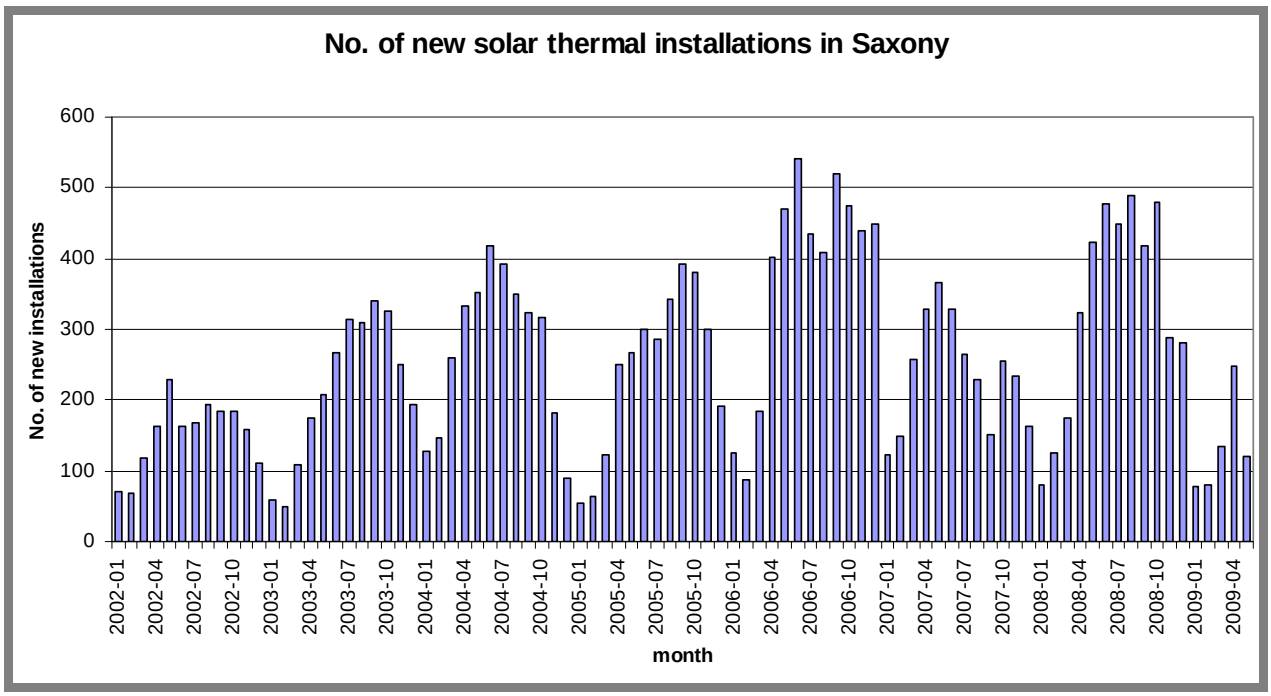
### Short introduction of the region

The Free State of Saxony is the most eastern state of Germany, bordering Poland in the east and the Czech Republic in the south. Saxony has an area of 18,415 km² and about 4,183,404 inhabitants (Dec. 2008). The population density is 227 inhabitants per km². Saxony's state capital is Dresden with 508,398 inhabitants (Dec. 2008). Saxony has a long tradition as business location. 2000 - 2008 Saxons economy grew about 15,7%. The industry density is 70 employees subjected to social insurance contribution per 1.000 inhabitants (Dec. 2008). The investment rate has been 12,9% in 2008.

### Current solar thermal market development

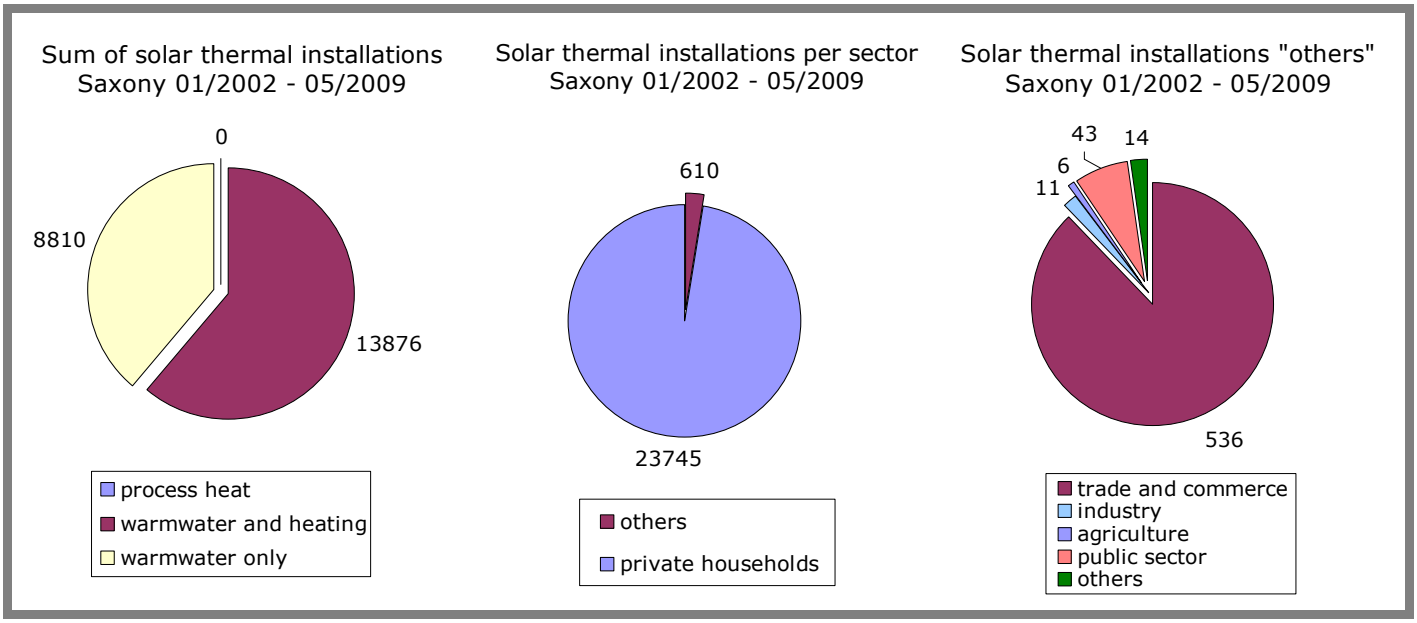
Actually the main focus of the solar thermal business activities in Saxony lays on solar thermal installations for heating and warm water supply of buildings and district heating systems. The market for solar thermal process heat systems in Saxony is not developed yet. There is little interest within the companies that could use solar process heat, because of long pay back periods, the big effort for the integration of solar systems and a lag of know how. The interest within the solar industry is much higher. But up to now the existing activities are not linked yet.

The total installation of solar thermal systems between 01/2001 and 05/2009 in Saxony is about 303.000m² (in Germany about 9.3 Mio. m²). These installations are mainly hot water and heating systems for buildings.




*Number of solarthermal installations in Saxony; Source: www.solaratlas.de*

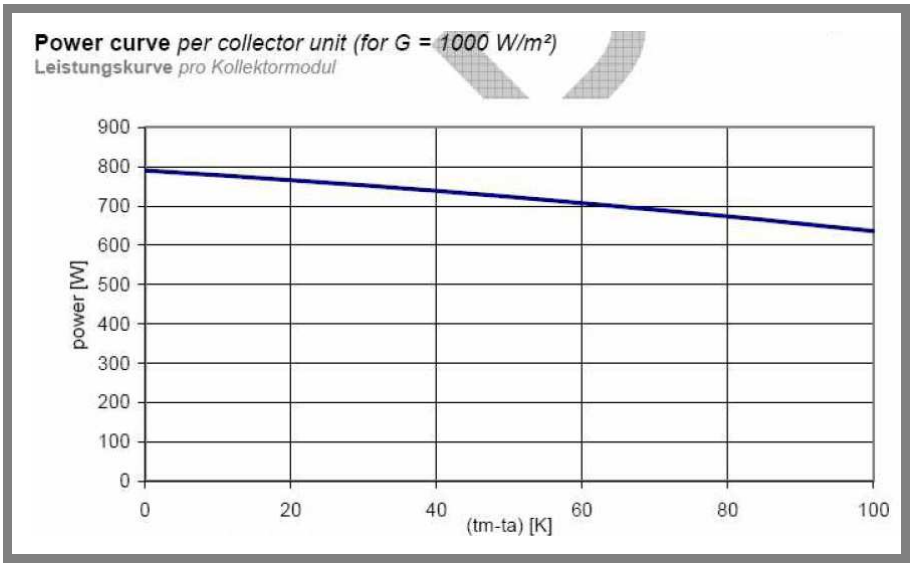
Data from the Federal Office of Economics and Export Control (BAFA) show zero solar process heat installations out of more than 20,000 solar installations between January 2002 and May 2009. Only 610 out of 23,745 installations are found in other sectors than the private household sector. Currently there are no installations that use solar contracting and only 11 installations in the industry sector.




*Solar thermal installations in Saxony; Source: www.solaratlas.de*

**Important market players and stakeholders for solar process heat in Saxony**

One of the most important players for solar process heat in Saxony is NARVA Trade Solartechnik GmbH. Founded in 2007, but with 40 years experience in manufacturing of fluorescent light tubes NARVA is now producing around 1 million high efficient evacuated tubes for collectors per shift and year. Those tube collectors are very suitable for collecting solar energy for systems with high temperature demand because of their very low negative temperature gradient.




*Power curve of NARVA vacuum tubes; Source NARVA: Trade Solartechnik GmbH*

NARVA developed a new and highly robust glass-metal connection for the vacuum tube. The aim of the R&D work was to avoid the susceptibility to breakage. This has been achieved by designing a glass-metal connection that is not under any tensile load. The new glass-metal connection resists strong axial and shear forces.

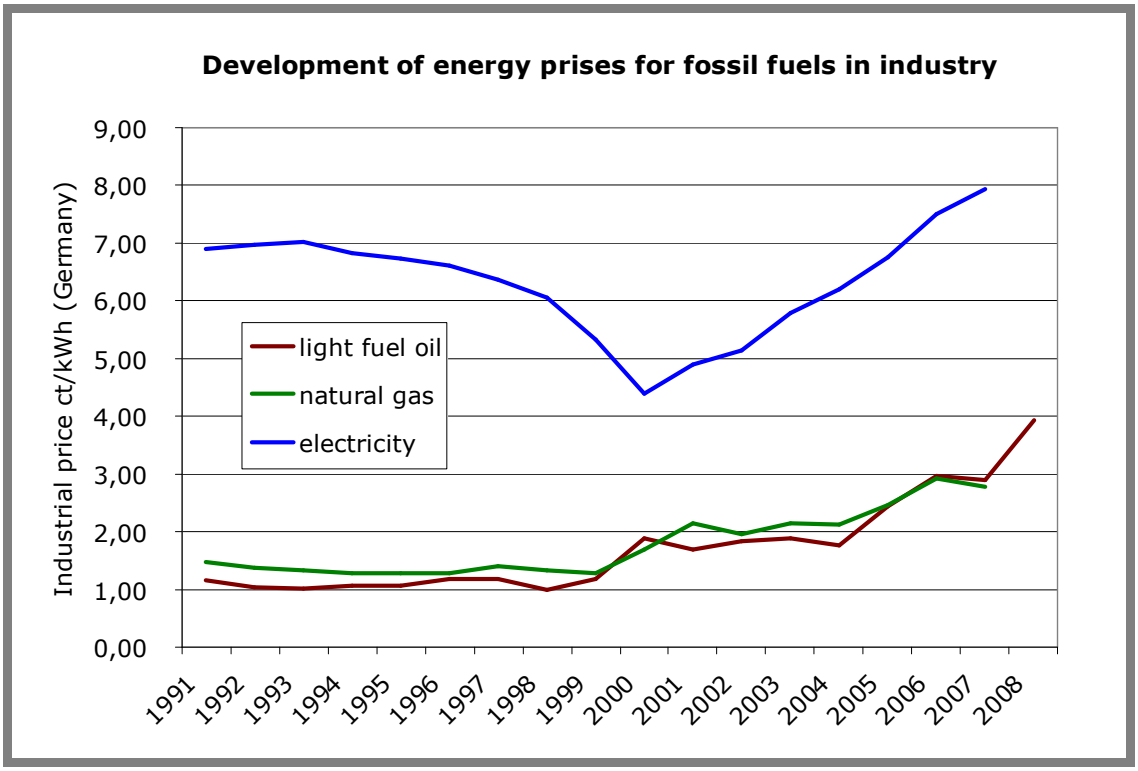
Other relevant solar companies in Saxony are STI Solar-Technologie-International GmbH (standard collectors) and Solarhybrid AG (standard collectors and "hybrid-collectors", mixing photovoltaic and solar thermal usage). Beside regional companies some nationwide operating companies like Paradigma Germany GmbH and SMP Solartechnology have local offices in Saxony. There are also some Saxon companies specialised on big storage systems (heat and cold) and engineering companies and planners with experience in large scale solar systems, but mainly for non process applications. All together more than 40 solar companies have been detected.

Scientific work is done by universities as well as by institutes like the Fraunhofer Institute for Machine Tools and Forming Technology IWU (Fraunhofer Institut für Werkzeugmaschinen und Umformtechnik IWU) from Chemnitz or the ILK Dresden (Institut für Luft- und Kältetechnik Gemeinnützige Gesellschaft mbH). The Fraunhofer IWU developed a new production method for forming processes by the use of over pressure. It can be used to produce optimised flat plate solar thermal collectors or connecting elements of solar thermal systems. The ILK Dresden developed a new storage material for high temperature latent heat storage.

**Costs and subsidies**

The price for solar process heat applications vary significantly, because different collector systems, different buffer storage strategies and different costs for implementation must be considered as well as different sizes of the system. Average prices for "high end" collectors for big solar thermal applications vary around 300-400 Euro/m², costs for large buffer storage systems amount around 800-1.000 Euro/m³.

The typical price for natural gas for industrial customers (1,000,000kWh/a) in 2009 was 3 ct/kWh (excl. VAT). The typical price for electricity for industrial customers (100,000kWh/a) in 2009 was 8-10 ct/kWh. For small enterprises energy costs are significantly higher.




*Development of energy prises for fossil fuels in industrial companies in Germany;*

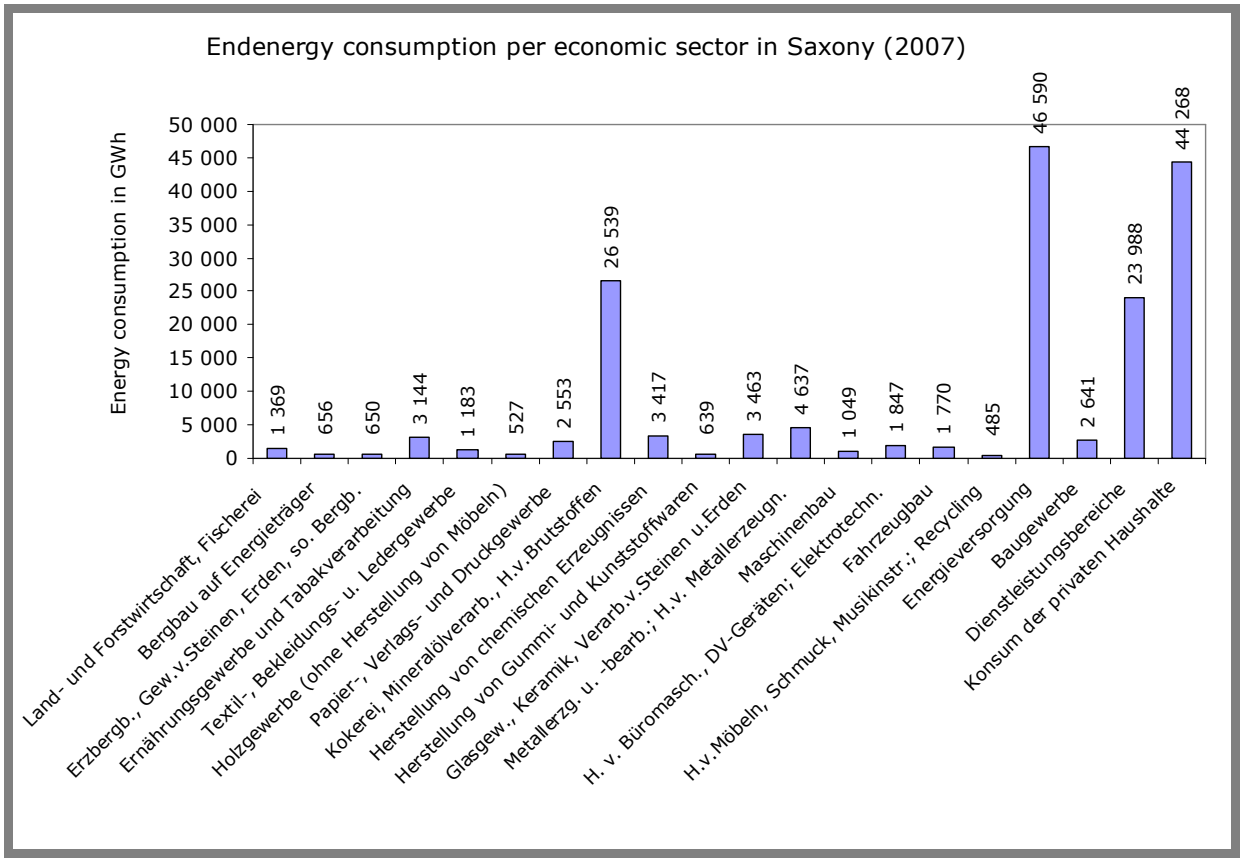
*Own illustration, data source: BMWi*

In Germany solar thermal installations are promoted by the Federal Office of Economics and Export Control (BAFA) and KfW Bank Group (KFW Bankengruppe). Within the BAFA programme solar thermal process heat is promoted with 105€ per new installed m² collector area up to 40m² gross collector area. Large solar fields with more than 40 m² of gross collector area are promoted within the KfW programme in terms of long-term, low-interest loans with several grace years and up to 30% grant for repayment.

## Industrial sectors of special interest

Saxony has a long tradition as location for industry and trade. Especially the textile industry, the coal mining, the mechanical engineering, electrical engineering, vehicle manufacturing, chemical industry, wood-working industry and glass-working industry as well as agriculture have age long tradition in the region.

The main relevant sectors for solar thermal process heat include the chemical industry, metal working and the food industry. These branches have significant energy consumption on the one hand and temperature demand suitable for solar process heat on the other hand.




*Energy consumption in Saxon industrial branches (2007); Source: SAENA GmbH*

The biggest share of sales in the Saxon industry sector is done by fife branches: car industry, food and textile industry, electrical and mechanical engineering and metal manufacturing industry. During 2008 and 2009 a significant crisis affected the textile and car industry. New investments and growth are expected in the renewable energy sector.

Due the project approach the following branches have been detected as likely for solar thermal process heat: the food and beverage industry as well as breweries (diverse washing, sterilisation and substrate heating or cooling processes), the textile cleaning and textile manufacturing industries (diverse washing and drying processes), the plastic manufacturing and processing industry (pre-heating of plastic mixtures, cooling down of extrusion profiles in water bathes, shape forming processes, drying of glue bonds and acclimatisation of production halls), paint shops (painting and drying process), the galvanic industry (galvanic bathes) and metal working industry (washing processes).

**Regional approach to companies or screenings and for pilot projects including the selection criteria for companies**

For the investigation of relevant companies classified web based directories may be used. Beside the yellow pages and others a regional company database is available under www.firmen.sayony.de, published by the Free State of Saxony. The database contains 22,004 datasets. Companies may be investigated by postal code, field of technology, memberships in networks ore Saxon family brands.

Furthermore the following regional partners support the project approach:

1. Industrial Network Renewable Energies Saxony (EESA)
2. Chamber of Industry and Commerce (IHKs)
3. Chamber of Crafts (HWKs)
4. Network Initiative Mechanical Engineering Saxony (VEMAS)
5. Business development Saxony (WFS)
6. Institute for Energy Leipzig GmbH (IE Leipzig)
7. Energieberater
8. Planer und Hersteller

Screening candidates are selected by the following criteria:

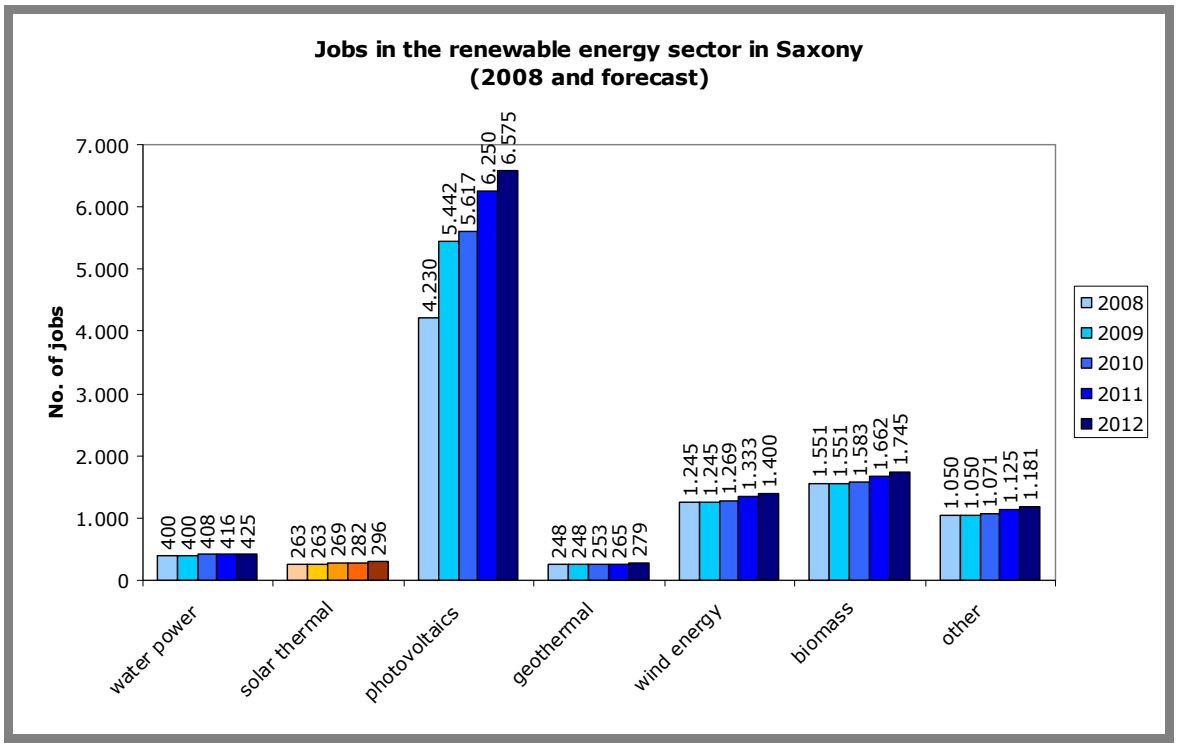
- process heat demand with temperatures around 100°C or cooling demand
- interest in the project / in the use of solar thermal
- diversity of sectors
- availability of waste heat from other process steps
- processes with direct heat input, not only per electricity
- availability of roofs without shading

To motivate industrial companies with process heat demand to participate in energy screenings and pilot project the following aspects are communicated:

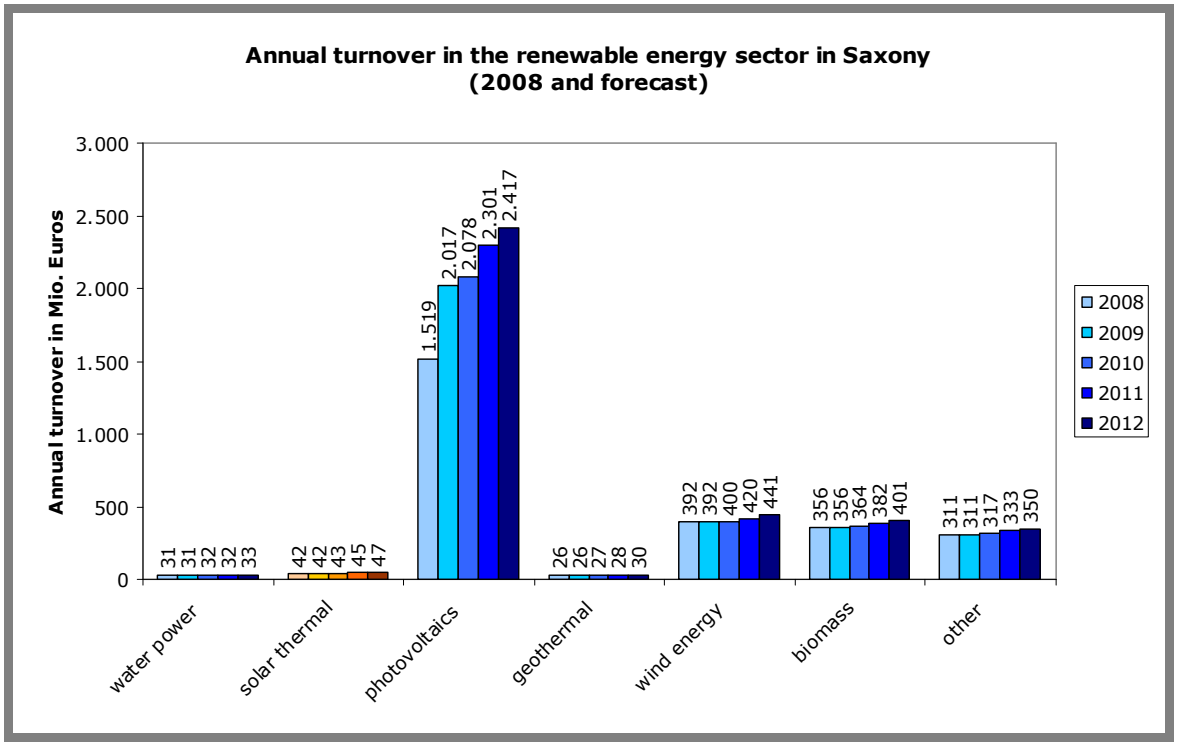
1. promotion "innovative company" > demonstration as best practise on regional and European level (internet platform, brochures, campaign etc.)
2. energy screening free of charge
3. possibility of a following detailed energy consulting with existing instruments (SäGEP, KfW "Sonderfonds Energieeffizienz")
4. experience from existing model projects or out of the project results
5. know how transfer
6. financial support for pilot projects via promotion directives

## Market development - Outlook

Currently the photovoltaic marked is the most promising renewable energy marked in Saxony, with the highest employment rate and highest annual turnover. For the solar thermal marked 296 jobs and an annual turnover of 47 Mio. Euros are expected till 2012 under the current conditions.




*Jobs in the renewable energy sector in Saxony; Source: SAENA GmbH*




*Annual turnover in the renewable energy sector in Saxony; Source: SAENA GmbH*

A barrier fort he use of solar thermal process heat in Industries are the long pay back times, missing practise examples and a lag of know-how with solar thermal process heat installations.

Significant cost reductions are not to be expected in short term. The main driving force for solar process heat would be a significant rise in energy costs and costs for $CO_2$ emissions. Hence within the project guidance for a solar contracting will be developed in order to support the investment in solar thermal process heat applications.

Small and medium sized enterprises (SMEs) will be of special interest for the marked development of solar thermal systems. In comparison to big industries SMEs have significant higher energy prices, so they will be very affected by growing prices for fossil fuels.

In Saxony the project activities of SO-PRO will be linked to the following initiatives and existing activities in order to profit from synergies:

1. Saxon energy certificate for companies
2. Competence centre east for big solar thermal installations
3. Cooperation with existing networks
4. Link to other existing SAENA activities