

China's biggest solar thermal installation

An attentive person travelling through China will not only see the omnipresent SWH (solar water heaters) but will frequently also notice systems of a larger scale. Especially in the hotel sector, word has got around that one can make a lot of money with such installations. Visitors to Sanya (on the resort island of Hainan) will be able to spot many installations on the hotels there. The Chinese market is clearly dominated by vacuum tube collectors. Just 10 % of the installed collector area is covered by flat plate collectors. In the distribution of the collector types there is a marked north–south gradient.

The city of Hangzhou is situated roughly equidistant from the cities of Shanghai and Ningbo, on the Yangtze river delta. The greater region around the triangle formed by these three cities probably has 80 million inhabitants – as many as Germany. It is important to realise that there is no heating in most households. In view of the last winter and the images that came from China at that time, this seems hardly conceivable. For obvious reasons, gas, oil, or even coal will never be used for room heating. The only option that really makes sense is the use of solar thermal energy. The highest number of installations, and the larger ones, can be found in the Yangtze delta.

13,000 m² of flat plate collectors

The most remarkable, a 13,000 m² installation is, unusually, a flat plate collector system. But even more unusual is its size. It is certainly the biggest in China (see page 61). It is probably also record-breaking that it has been completely installed on the roof of a textile factory. The system was installed by the company Shenzhen Quir Solar Technology Co., Ltd.

The cost of the system was CNY 13 million (CNY = Chinese Yuan, 1 CNY = 0.09210 €), including the storage tank and installation. The storage tank is a 900 m³ underground concrete tank lined with stainless steel. The system was completed before the winter and is now about to experience its first summer. The profit from the plant is said to amount to around CNY 38.66 million.

The operator of the system is the Daly dyeing factory. Daly (China) Ltd. is active in silk production, silk-screen printing, dyeing and further silk products. The mineral-oil-based production process requires enormous amounts of hot and warm water. In China, coal is usually used to provide the required heat. This means

China is the unchallenged number one in the field of solar thermal energy in terms of both domestic sales and its share of world production, but if the number of installed systems per 1,000 inhabitants is considered, China ranks only tenth, far behind Germany or Denmark. This means that the domestic market is by no means saturated. The major sales targets of the numerous manufacturers are the individual households.

high costs and of course CO₂. Therefore, Daly has made a simple calculation. The aforementioned 38.66 million profit is arrived at as follows:

13,000 m² of collector area are sufficient to heat up 265,000 m³ of water per year to 55 °C. This corresponds to a saving of approximately CNY 3.38 million per year compared with steam generation using coal.

The total cost of the system was around CNY 12 million. Therefore the system paid for itself after only three and a half years. This corresponds to a return on capital of 28 % per annum. The calculated lifespan of the system is 15 years. The total return on investment assuming static energy prices thus amounts to around CNY 38.66 million. If it is assumed that coal prices will rise over the next 15 years, profitability increases even further.

Even more important than the profit, however, is the saving of 84,000 tons of coal. Not far from the factory, there is the residential area for the workers. Here, collectors have been installed on the roofs as well. For each dwelling unit, there are around 3 m² of collector area – free of charge.

Large-scale PV projects

Baoding is the location of the »1.5 MW_p Power Valley Plaza BIPV and sewage heat pump renewable energy resource project«. The cityscape of Baoding is already characterised by solar lighting, solar traffic lights and the conspicuous solar thermal installations on most of the roofs. In terms of total installed capacity, photovoltaics seems to be rather insignificant, but the individual installations are quite interesting and could be model projects even in the EU and the U.S., especially as they use building-integrated photovoltaics (BIPV). The complete industrial park extends over an area of 14.4 ha. The building area alone amounts to 11.18 ha. The project is being realised primarily by the Baoding Yuansheng Investment Development Co. Ltd. Of course, the solar company Yingli Solar, which is based in Baoding, is closely connected with this initiative.

There are three parts to the project: the Power Valley Jinjiang International Hotel with 300 kW_p, an exhibition centre and commercial office with 500 kW_p, and finally an office building with a supermarket (700 kW_p). As yet, not much can be seen of the two latter project parts, but the Jinjiang Power Valley Hotel has already reached an advanced stage. It will be the first five-star hotel to be equipped with a BIPV capacity that is worth men-



A Yingli staff member at the southeast entrance of the Jinjiang Power Valley Hotel

Photos (3): Sven Tetzlaff

tioning. The modules have been integrated into the south-eastern and the eastern section of the building, but are also on the western façade, the canopy roof, and the roof of the hotel itself. Altogether, 20 different module types, ranging from 65 W_p to 175 W_p, have been installed in 7 different places.

The system has been specifically designed as a demonstration project, externally as well as internally. The investor points out the internal effect: »The main purpose of the PV installation is that all the clean electricity can be fed into the city power supply, at the same time the system can enjoy the subsidies offered by state policy. It is also a demonstration project in the domestic PV power generation market.«

The city of Baoding itself wants to use the project to become established as »Baoding Solar City«. Last but not least, Yingli Solar has created an excellent reference project for itself right on its own doorstep. This last aspect in particular represents a virtue that has almost been forgotten in the EU: He who is convinced of his product demonstrates this by using it directly on-site.



13,000 m² installation – the world's largest and a cash cow into the bargain.

In China, the middle class and the general standard of living are both growing rapidly, as is the propensity of »large scale investors« to invest in the green energy sector. So far, they have primarily invested in wind power, but projects such as the solar valleys, the street lighting projects, and also infrastructure projects, for example in the field of PV-powered mobile telephone systems, yield an attractive profit and thus stimulate investment. All this is necessary, because the EU and the USA are anything but certain markets for the Chinese manufacturers, and at the same time China needs an energy supply system of its own based on renewable energies. In the end, both aspects point to the establishment of a comparable PV market in China.

The examples demonstrate impressively that quite a lot can be expected from the Middle Kingdom with regard to renewable energies. Of course, solar thermal technology has been so successful in China because investors have focused on short-term return on investment. One can be quite confident that this route will also be taken in the field of PV – certainly somewhat later than most had expected and hoped for, but quickly and on a large scale.

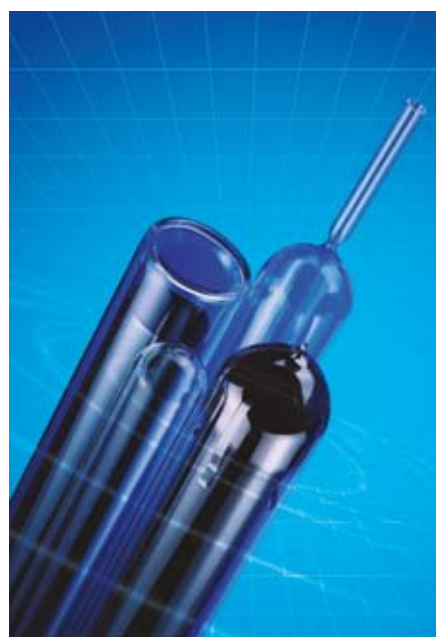
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Solar lighting in Baoding

Further information:

Shenzhen Quir Solar Technology: www.solarqueen.cn



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