



# Success and crisis close together

In many countries vacuum tubes are gaining ground.

Photo: Narva

The flat plate collector industry in Europe is under pressure. Over-capacities and price drops have resulted in mergers and production stops, so that the world map this year lists 5 % fewer flat plate collector manufacturers. The vacuum tube collector industry is establishing itself in Turkey, India and Mexico, where the first vacuum tube manufacture in Latin America is being built. The biggest fluctuations are in the field of air collectors, however.

**T**his is already the ninth world map of the solar thermal industry, but putting it together is still not a routine task. This is because collector manufacturers are mainly medium-sized businesses that only sell their products in their own country. They thus respond slowly to international surveys. So the Bielefeld agency solrico contacted the 500 companies on its database with questionnaires in 13 different languages, carried out an estimated 400 telephone calls to 40 countries around the world, checked 250 filled-in questionnaires and marked 321 factories on four maps. In total these maps of the world show 197 flat plate collector manufacturers from 44 countries, 92 vacuum tube manufacturers from 23 countries and 32 air collector manufacturers

from 18 countries. Greece was a positive surprise this year. The Greek collector manufacturers were able to make gains both inland and abroad in 2014 and increased the manufactured collector area by an average of 10 % over the previous year. Among the favourite export countries we are increasingly seeing countries such as Egypt, Morocco, Dubai and the United Arab Emirates.

## **Turkey: vacuum tube industry on the advance**

From **Turkey** meanwhile almost the same number of manufacturers of manufacturers of vacuum tubes as flat plate collectors, which has led to the vacuum

tube industry there being shown on its own detailed map for the first time (see page 31). The flat plate collector manufacturers had to accept an average drop of 9 % in their production volumes in 2014, which is related to both inland demand and exports. Some companies have meanwhile added solar thermal sets with vacuum tubes to their ranges and have thus been able to balance out the shortfall from the traditional flat plate collector field.

Two of the three vacuum tube manufacturers – Solarsan and Aslanlar Metal – took part in the survey, but the third, Lara Solar, did not fill in the questionnaire on the grounds of trade secrets. However, the General Manager of Solarsan, Cem Sapan, confirmed that their own manufacturing capacity in 2014 was 10,000 vacuum tubes a day, and approx. 3 million a year. At Aslanlar Metal the daily manufacturing capacity is 12,000 units, as Sales Manager Osman Bilen stressed. Extrapolated to a year this would be 4.4 million tubes. There is thus a certain overcapacity or room for exports in Turkey. According to market research by the Turkish company Eziñç there were gross sales of 837,539 m<sup>2</sup> of vacuum tube collector area in Turkey in 2014, which Eziñç says would require 6.5 million tubes.

To stay with the positive markets one then has to make the long trip to **Brazil**. There the industry has profited from the large public tenders in the social housing sector, and was able to grow by an average of 5 % – without any significant exports. The market is still largely in the hands of the local flat plate collector manufacturers. Initial attempts with imported vacuum tube collectors, as made by the company Solar Minas, for example, were cancelled because the Chinese collectors didn't pass the collector tests by Inmetro, as Vice President Ernesto Nery Serafini explained. The company Brassolar is the only participating Brazilian firm which imports vacuum tubes, and then manufactures and supplies solar hot water systems.

The trend is very different in **Mexico**. The share of imported vacuum tube technology in the yearly market volume has been rising there for years. The company Frantor in the western state of Jalisco wants to supply this growing sector and is currently building a vacuum tube plant: the first in the whole of Latin America. Frantor's Sales Manager Hector Franco has announced that production is to start in 2018 at a monthly rate of 80,000 tubes. But the established flat plate collector manufacturers can also be satisfied with 2014. Production volumes for home demand and exports rose by an average of 14 %.

## Germany and Austria: mergers and exits

Overcapacities and the associated drop in collector prices have made things hard for manufacturers in **Germany** and **Austria**. And the industry's reaction: mergers or production stops. In December 2014 the two Austrian collector manufacturers Gasokol and Sunwin announced their merger. Since the beginning

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### World map of flat plate collector manufacturers 2015

197 companies in 44 countries

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 Date: October 2015  
 Sources: Manufacturers' information, own research

#### Caption

- production site for flat plate collectors
  - production site for flat plate collectors and absorbers
  - production site for flat plate collectors, also as OEM products, and absorbers
  - production site for absorbers only
- "Absorber" means absorber plate and pipe system.

22,000 produced square metres of collectors in 2014  
 (22,000) produced square metres of absorbers in 2014

\* Robin Sun in Germany produces a window integrated collector.  
 \*\* Aquatherm, USA, manufactures polymer absorbers and Magen eco-Energy, Israel, produces polymer collectors.  
 \*\*\* These companies stopped production temporarily.

#### Example

- **Inter Solar Systems**  
20,000  
Inter Solar Systems manufactured absorbers and flat plate collectors with an area of 20,000 m² in 2014. The Indian manufacturer sold parts of its production to other branded companies.
- **KBB**  
55,000 (200,000)  
Kollektorbau from Germany produced 55,000 m² of collector area and 200,000 m² of absorber area in 2014.



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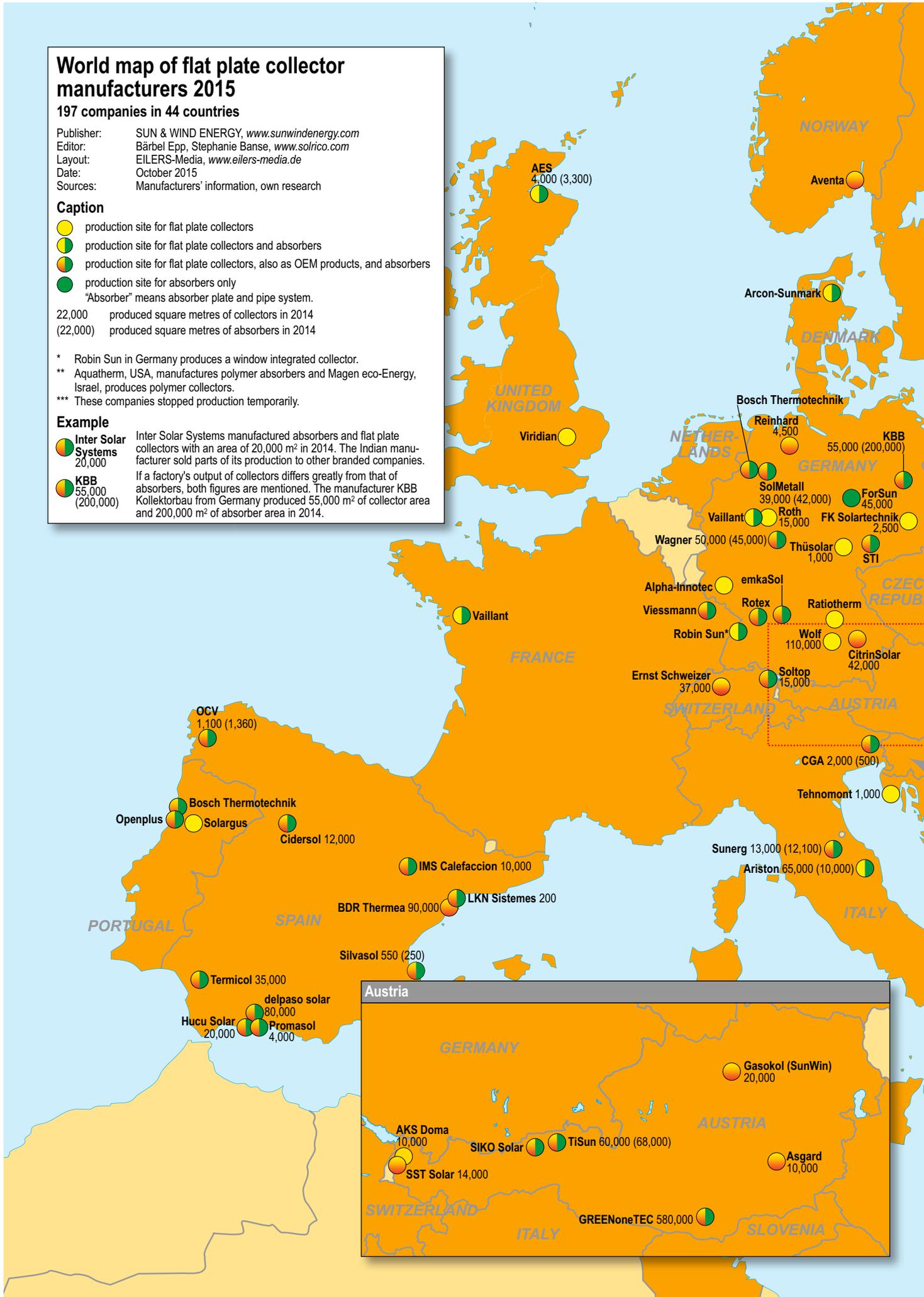
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 If a factory's output of collectors differs greatly from that of absorbers, both figures are mentioned. The manufacturer KBB Kollektorbau from Germany produced 55,000 m<sup>2</sup> of collector area and 200,000 m<sup>2</sup> of absorber area in 2014.





## Ranking of the largest flat plate collector manufacturers 2014 worldwide



### Ranking of the world's largest flat plate collector manufacturers, based on manufactured collector area in 2014 according to company statements.

of 2015, production has only been carried out in Saxen, at the Gasokol site. The Sunwin product range, such as the PVT collector, continues to be on offer, however. ESC Energy Systems from Austria, as well as the two German manufacturers Wikora and REM, have stopped collector manufacturing completely. While the former now buys in OEM collectors and sells them together with its own storage, REM has sold its manufacturing to the German storage manufacturer Ratiotherm, which now appears on the world map for the first time as a flat plate manufacturer.

The German collector manufacturer Solvis filed for bankruptcy on 29 October 2015. "Since the bankruptcy filing was well prepared I was able to negotiate a purchase contract with the Austrian investor Andlinger within 24 hours," explains the German insolvency administrator, Peter Steuerwald. A newly founded company Solvis GmbH with Andlinger as the only shareholder took over all the employees and continued the business.

A new site is also listed in Germany on the tube collector map (see page 30). The company Bosch Thermotechnik reached an agreement at the beginning of the year with the German company Consolar that their collector technology would now be made at the Bosch site in Wetztingen, with Consolar labelling the collector as an OEM product. The start date for production at Bosch Thermotechnik was in October 2015. The company is thus entering new territory, as it had previously sourced in from the German manufacturer Ritter.

Despite the bad market conditions, the German industry still dominates the ranking of the world's largest flat plate collector manufacturers in relation to the collector area manufactured in 2014, with five companies from the heating sector present.

### Poland: success and failure close together

In no other country were success and crisis so close together as in **Poland** last year. The four market leaders – Hewalex, Sunex, Ensol and Watt – all manufacture in the province of Silesia in the southwest of Poland. While Hewalex and Ensol announced a strong growth in production volumes for 2014, Watt is in a deep crisis and stopped production several months ago.

"Although the trends in Poland aren't very good we were selling more in 2014 than we expected," explains Monika Kosmol, Sales Director at Ensol, on the 50 % growth to 30,000 m<sup>2</sup> of flat plate collectors. At Hewalex the Marketing Manager, Ireneusz Jelen, confirmed a rise of 80 % to 130,000 m<sup>2</sup> of flat plate collector production in 2014 with a "large investment in public orders in municipalities". The experiences with public tenders at Watt are not that promising. "We once did a tender with around 100 systems in a municipality, but the project was not profitable for us because the price was so low," says Robert Ziemniak, Sales Engineer at Watt, so that they didn't continue with this line of business.

Additionally, demand in the private housing sector has dropped considerably due to worsening conditions in the national support programme in 2015.

The company has drastically cut its staff to approx. 10 people and stopped production for the time being. According to Ziemniak the company is now going for exports and hopes to stabilise its business again next year and restart production. The company is run personally by the founder and owner Sebastian Paszek, but according to the company register he has not been the sole owner since January 2014.

Hewalex has certainly benefited from the collector production stop at Watt, and has thus got hold of a place in the ranking of the largest flat plate collector manufacturers for the first time (see graphic). The manufactured volume of 130,000 m<sup>2</sup> in 2014 does cause doubts, particularly, as it equates to a market share of almost 50 %, for the company has a low export share. After enquiries, Hewalex sent a certificate from the Polish Institute for Renewable Energy, EC BREC IEO, confirming the market share and the manufactured volume in 2014. IEO publishes a detailed market overview annually and balanced a market volume of 260,000 m<sup>2</sup> for 2014 – 5 % less than in 2013.

## Chile: production on standby

Just like Watt, the company Britec from **Chile** is also on standby with regards to manufacturing. The company founded in 2007 did not manufacture in 2014 and 2015 because the market collapsed due to tax credits for building new homes not being extended. Production Manager Javier Ferrada expects a new start of production next year, if the tax credits come back into effect as expected in the last quarter of 2015. This is not the case for the company THC, from the south. The Manager of Engineering there, Paulo Dessi, assumes that they will not restart production and that they will concentrate much more on the installation of systems.

The current market volumes and the bad forecasts in **Great Britain** mean that even going on standby is not enough. The Scottish manufacturer Sustainable Technologies has irrevocably stopped the production of flat plate collectors after only four years and now offers solar thermal systems with locally sourced collectors. Discrete Heat in Manchester

did not want to appear on the world map this year either. “Residential solar is dead and gas prices are cheaper than ever, oil too,” says Sean Bingham, Director of the system supplier Barilla, on the frustrating market situation. As a result, other importers are also just selling off their warehouse stock so that they can take solar thermal out of their ranges, such as Dimplex Renewables, for example. There is additionally a rumour right now that the British government wishes to stop the national Renewable Heat Incentive (RHI) programme altogether.

The only truly bankrupt collector manufacturer is from **Spain**, a country which should actually have been able to be happy about a slightly growing market in 2013 and 2014. The company Astersa in

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# World map of vacuum tube collector manufacturers 2015

92 companies in 23 countries

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## Caption

- production site for the assembling of vacuum tube collectors
- production site for vacuum tube collectors, which are also sold as OEM products
- production site for vacuum tube collectors and vacuum tubes
- production site only for vacuum tubes

## Example

- **Greentek**  
24,000  
Greentek, India, assembled vacuum tube collectors with a gross area of 24,000 m<sup>2</sup> in 2014 and sold parts of it to other branded companies.
- **Sunrain**  
5,400,000 (3,600,000)  
If vacuum tubes and vacuum tube collectors are produced in the same factory, both figures are mentioned. The Chinese manufacturer Sunrain produced vacuum tubes with a gross area of 3,600,000 m<sup>2</sup> and vacuum tube collectors with a gross collector area of 5,400,000 m<sup>2</sup> in 2014.

22,000 produced gross area of vacuum tube collectors in 2014 [m<sup>2</sup>]  
 (22,000) produced gross area of vacuum tubes in 2014 [m<sup>2</sup>]

**Himin** Companies which produce glass tubes in their factory are marked in bold.

\* These Chinese companies run several production factories and are listed at their main production site.

\*\* The Turkish vacuum tube manufacturers Solarsan and Aslanlar Metal reported the daily production output and not the annual one.

UNITED KINGDOM

**Kingspan Renewables**  
30,000 (20,000)

UKRAINE

**Atmosfera** 1,250  
**Star Energy** 17,800

ITALY

**Turco Group** 19,000  
**CMG** 1,500

TURKEY

**Calpak-Cicero**

IRAN

**Solar Polar**  
1,500

GREECE

SYRIA

**Altawfeer**  
22,500

**Sangle\*** 75,000 (50,000)

**BTE Solar** 201,000 (312,000)

**Himin\*** 2,000,000 (1,300,000)

**Sunrain\*** 5,400,000 (3,600,000)

**Apricus** 35,764

**Dr. Xia** 2,000 (100,000)

**Wankang** 35,000

**Viessmann**

**Sunda** 45,000 (18,000)

**Eurosun** 7,000

**Linuo Paradigma** 830,000

**Apack** 2,500 (1,000)

**SOUTH KOREA**

**Ariston** 10,000

**Baoguang** (300,000)

**Sunshore** 1,000,000 (800,000)

**Oupairneng\*** 12,000 (60,000)

**Shentai** 50,000

INDIA

CHINA

India

CHINA

**Inter Solar**

**MG Rama** 30,000

**Redren Energy** 32,000

**Om Energy** 22,000

**Steam Power** 15,000

**The Standard Product** 1,000

**Bipin Engineers** 8,000

**Electrotherm** 20,000

**Kosol** 21,000

**Honeywell** 22,000

**Jain Irrigation** 20,000

**Sudarshan** 60,000

**Savemax** 2,500

**Kaushal** 2,000

**Jay Renewable** 2,442

**Greentek** 24,000

**Photon** 5,800

**Solar Hitech** 6,000

**Supreme Solar** 120,000

**Velnet** 6,500

**Sun Zone** 10,000

**Nuotech** 19,669

**Anu Solar** 26,000

**Eagle Technologies** 5,000

**V-Guard** 59,100

Turkey

**Anadolu** 50,000

**Eraslanlar**

**Mazaka Alternatif Enerji**

**Solarsan\*\*** 10,000 vacuum tubes per day

**Solidsun**

**Kuzeymak** 42,500

**Aslanlar Metal (Assolar)\*\*** 12,000 vacuum tubes per day

The photo shows one of the monitored Austrian installations, a field with 460 m<sup>2</sup> of vacuum tube collectors on the roof of the Austrian furniture fittings manufacturer Julius Blum. Photo: Ritter Solar



the northern region of Asturias filed for insolvency at the end of November 2014, when 20 employees were still on the books. Almost one year later, in September 2015, the official receiver, Manuel Arroyo Maria Lemus from the Spanish solicitors proAdcon, announced that all the employees were now redundant and that the assets were to be sold off to pay the debts. Astersa had been founded in 2007 out of the mining company Hunosa, which invested several million euros in a collector factory with an annual production capacity of 220,000 m<sup>2</sup> (154 MW<sub>th</sub>). At the Intersolar 2008 in Munich the company presented itself confidently and with big plans for exports and a production of 45,000 m<sup>2</sup>. Unfortunately this was the beginning of the financial crisis and things only went downwards on the solar market in Spain from there on in. The production volume thus sank to 20,000 m<sup>2</sup> in the following years, of which one third was exported.

2014 was a difficult year in **India** because the national grant programme was cancelled without

any replacement in August 2014. The manufacturers produced an average of 15 % less than in the year before. Symbolic of the switch from homemade flat plate collectors to imported vacuum tube technology is the exit of Tata Power Solar from the solar thermal business, which was just not profitable for the company. Tata, which in 2012 was amongst the largest flat plate collector manufacturers in the country, has now closed the collector factory in Bangalore and wishes to concentrate solely on its PV business.

## USA: overwhelming photovoltaics

Photovoltaics have also pushed solar thermal into the second row in the **USA**. "PV sales by the large system suppliers are so overwhelming that we cannot find any more installers in the northeast of the USA to put up our solar thermal systems," says Joerg Gaebler, owner of the system integrator Wagner Solar, on the difficult market situation. It is thus no surprise that some companies are also missing in the USA. SunMaxx in the state of New York has stopped the final assembly of collectors and now sources complete collectors from Greece and China. Randy Hagen, owner of the collector manufacturer Solar Skies from Minnesota, founded in 2007, sold his collector manufacturing to the storage manufacturer Heat Transfer Products (HTP) at the end of 2014 and since March 2015 production has been running in Massachusetts. "The market is tough, in contraction. So we are stronger together and can offer complete systems, as HTP is a tank manufacturer," reasons Hagen on the move, who has now become Head of Sales.

## China: rapid downswing

The industry in **China** has been strongly shaken by the downswing in the market from +12 % in 2012 to -18 % in 2014. One thunderbolt was the exit of the Linuo Group from tube manufacturing. The subsidiary founded in 1998, Linuo New Material, was the largest manufacturer in the world of glass tubes and vacuum tubes in 2010, with four factories and an annual output of 40 million tubes. "The company did not make money any more for the last few years because of the decreasing prices of the raw glass tubing," explains Edwin Ma, Sales Manager at Baoguang Solar Energy. The company from Haining had a joint venture with Linuo New Material starting in 2007 to produce raw glass tubing, which Linuo stopped in 2013. The manufacturing technology of the Linuo Group was outdated and large investments would have been necessary, explains Hongzhi Cheng. The well known market researcher and solar thermal specialist believes that there will be no shortages as a result of the production stop by Linuo New Material, as there are overcapacities for tube manufacturing in China. Linuo continues to supply tubes both inland and abroad, but now the company buys these in as OEM products.

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Also widely discussed in 2014 was the takeover of the two state-run solar system suppliers Tsinghua from near Beijing and Sangle from the province of Shandong by state companies from outside the sector. Tsinghua was taken up by the state-owned humidifier manufacturer Yadu. Sangle is now part of the Tongya Group, which is also active in the building sector. The aim of the merger is the development of solar thermal technology for building integration and facade solutions in high-rise construction.

The changes in the ranking of the largest flat plate collector manufacturers are also a sign of the turbulent times in **China**. Prosunpro, the international brand of the Chinese company Pengpusang from Shenzhen in southern China, had to accept a strong reduction in its manufacturing volume and dropped from 3<sup>rd</sup> spot to 8<sup>th</sup>. Insiders suspect that the OEM supply contract with Haier Water Heater, a subsidiary of the white goods manufacturer Haier, led to financial difficulties. The increase in Haier's own manufacturing in Shandong had already reduced Pengpusang's sales in 2013. According to its own statements, Pengpusang is now stable again and production is running, thanks to the entry of the Sunrain Group, which bought 30 % of the company's shares in October 2013.

Sunrain's own flat plate collector factory in the northern province of Shandong produced 200,000 m<sup>2</sup> of collector area last year, according to company statements. "The demand for flat plate collectors increased and our output increased accordingly," explains Marketing Director Eddy Cheng on the sharp rise from 60,000 m<sup>2</sup> of manufactured flat plate collector area by the listed company in 2013. Because customers are becoming ever-more interested in flat plate collectors, the manufacturer BTE Solar from Dezhou, also in Shandong, is marketing this collector technology more strongly than vacuum tube collectors and also secured itself one of the lower places in this year's ranking for the first time. The XNE Group, however, which held one of the lower spots in the ranking of the largest flat plate collector manufacturers last year, has stopped manufacturing collectors altogether and now only sources collectors from OEM manufacturers.

## Fluctuations dominate in the air collector industry

In total, 13 companies which were present on the air collector map last year (sometimes as new entrants) stated that they meanwhile no longer manufacture air collectors, have temporarily stopped production due to a lack of demand or are busy developing new models. "We have stopped the project to develop and supply air collectors because the prospects for market development and sales were not as good as expected," says Harry Michalopoulos, Head of the Greek company Sammler Solar, for example, to explain their exit from air collector production. On the other hand, there are three new additions: Hanania in Jordan, EnergySolaris in Moldavia and Oupair-



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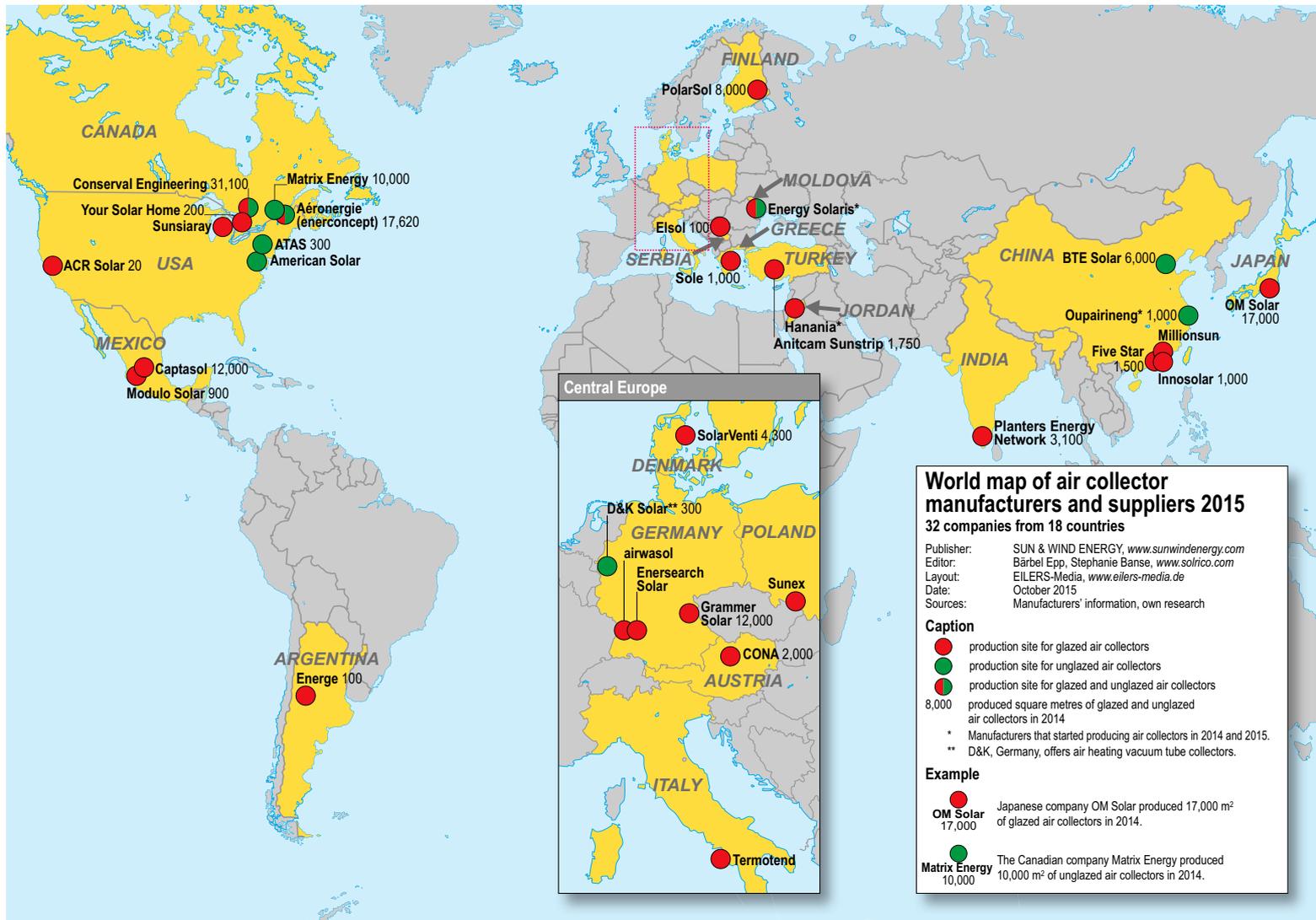
  
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**Air collectors: a retreat after the test phase**

ineng in China, which started manufacturing air collectors in 2014 or 2015. 14 out of the 32 companies on the air collector map only manufacture air collectors. The remaining 18 companies also manufacture

water-based systems in parallel. The map differentiates between glazed collectors (red) and unglazed cladding systems (green). The production centres lie in Canada, the USA and Europe.

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## Great expectations from the change of government in Canada

Even during the survey in September, several manufacturers from Canada expressed great expectations from the now implemented change of government and the new Liberal Prime Minister Justin Trudeau. "There is also a possible change of government on the federal level in October 2015 – maybe the return of favorable policies for solar thermal," forecasts Christian Vachon, founder of the company Enerconcept, for example. Trudeau's Conservative predecessor Stephen Harper faced growing criticism in the Canadian population for, amongst others, his anti-climate policies and his closeness to the oil and gas industries. "The price of oil and especially natural gas are at an all-time low," explained Vachon in September: in his opinion the biggest hurdle for the Canadian air collector industry. Brian Wilkinson, Head of Matrix Energy, furthermore criticised the continuing ignorance towards solar air collector technology, and John Hollick, CEO of the Canadian market leader Conserval Engineering, complained about the current lack of support programmes for the field of solar thermal.

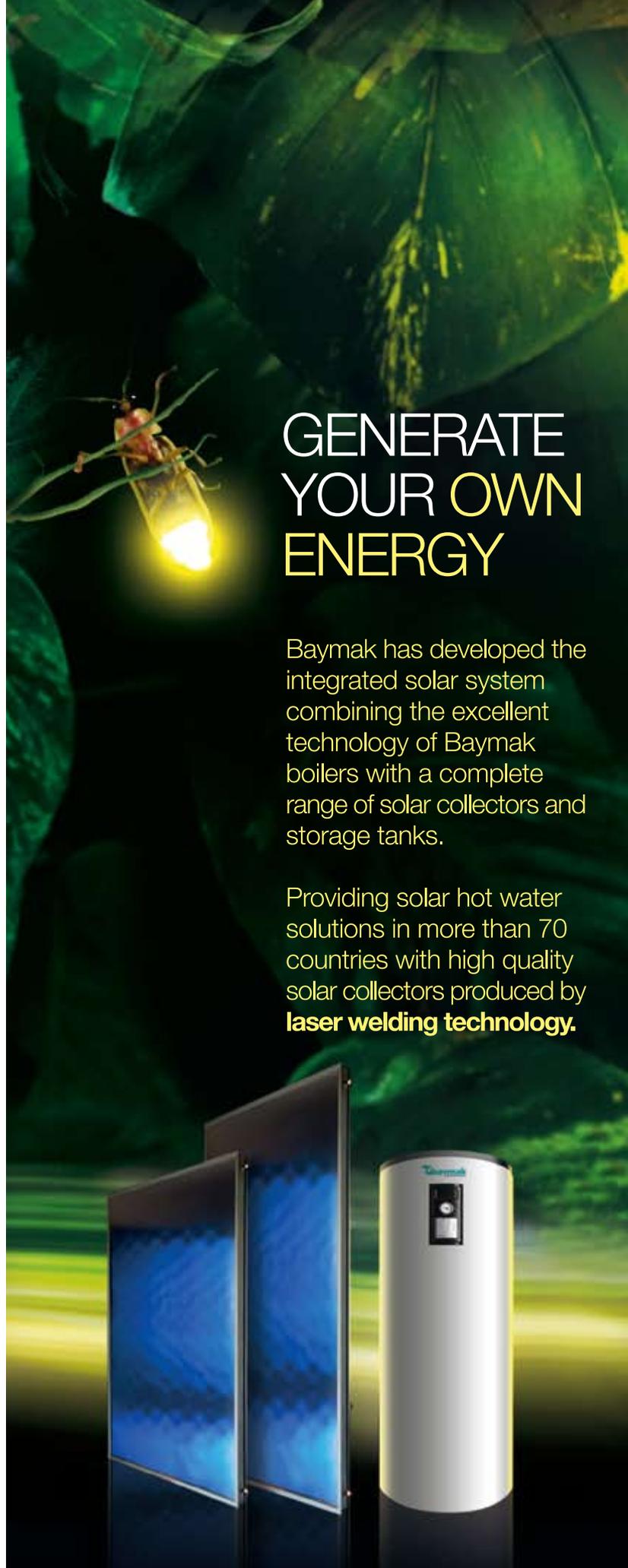
While these hurdles are linked to a decrease in production at Conserval Engineering and Matrix Energy in 2014, Enerconcept was able to increase its manufactured area by approx. 20 % last year. Vachon also wants to maintain this upward trend for 2015. Already since October 2014, Enerconcept has been part of the Canadian heating technology specialist Aéronergie – a connection which has evidently had a positive effect on their manufactured area.

The European market leader Grammer Solar from Germany also achieved a growth of almost 10 % in 2014. "We are currently experiencing positive market growth for air collectors," says Rudolf Ettl, Head of the solar air technology section at Grammer Solar. "There is a good support situation right now for larger objects and process heat applications thanks to the process heat and innovation support by the Federal Office for Economic Affairs and Export Control," he continues. However, Ettl says that there is currently more of a negative mood towards solar technology in Germany overall.

Hans Jørgen Christensen, Head of the Danish manufacturer SolarVenti, is also fearful of the mood of consumers, for low quality imports have tempted them with low prices in Denmark, but do not provide the promised performance and the required throughput of air.

The mood at Planters Energy Network PEN in India is good, a company which has already been supplying air dryer systems for 25 years. "Industries have more faith in solar thermal systems due to an ROI of less than 3 years – many successful performances of earlier installed units are creating more demand," stresses PEN Head C. Palaniappan. Now wouldn't it be good if you could say that for the whole world of solar thermal!

*Bärbel Epp, Stephanie Banse*



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