

# A new glass giant

Vetro Solar plans a GW-sized glass factory in Thalheim – for production and processing



A significant location: This will be the construction site of the world's largest solar glass factory in October.

Norwegian company Vetro Solar wants to build the world's largest factory for solar glass production and processing in Saxony-Anhalt, Germany. The facility will cost around €400 million (\$622 million) and is scheduled to begin production in as little as two years. With annual glass production for as much as 6 GW of solar modules, the company has thrown down the gauntlet to three other glass factory projects in eastern Germany.

Between the tiny town of Thalheim in Saxony-Anhalt and the A9 highway-stretching between Berlin and Munich, there is a field several acres in size. Today, it's peacefully inhabited by wildlife, but in October, it will all look quite different.

That's when construction is planned to begin on the world's largest factory for solar glass. Starting in 2010, the factory's 500 employees will produce more low-iron glass than was used in all-solar module production worldwide last year: depending on the thickness, the factory will produce between 40 and 50 million m<sup>2</sup> annually, which will require 1,300 tons of glass every day. That's enough solar glass to produce modules with a total power between 2.5 and 6 GW – depending on whether the glass is used for crystalline or thin-film modules. There's no better proof that Norway's Vetro Solar AS is absolutely convinced the explosive growth on the PV market will continue. It's also fairly clear that the company intends to expand at the cost of the other three solar glass factories currently in the planning or construction stages in eastern Germany (see PI 5/2008, p. 44). One company presentation shows that even in the most optimistic scenario, demand for solar glass in Europe will not exceed glass production levels at the Thalheim factory until 2012.

Vetro Solar is spending around €400 million (\$622 million) for the factory's construction, €50 million (\$77.8 million) of which is coming from the European Union, the company says. The rest of the costs will be covered by bank loans and investment funds. The funds will be used to buy two float glass lines, each 500 m long, and a system for cheaper rolled glass, which branches off from one of the float glass furnaces. Vetro Solar is also investing in glass processing capabilities. «Actually, we want to be a glass processor above all,» underscores Vetro Solar's managing director, Anders Gaudestad. The glass will be manufactured according to precise specifications from the company's customers in the PV industry. «We'll work together with the industry to establish what those specifications will be,» says Gaudestad. After all, he states, the PV industry is often unaware of the specific demands it is able to place on glass manufacturers – until now the industry usually had to live with simple, low-iron architectural glass.

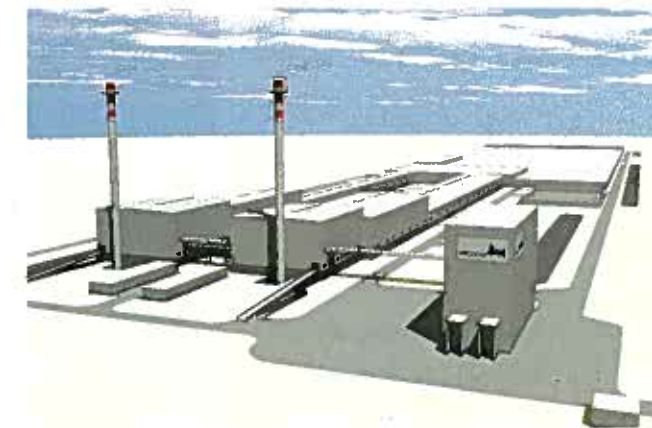
To increase module efficiency, while reducing production costs, Vetro Solar is cooperating with two Norwegian research institutes and will use the equipment from leading manufacturers of glass production machinery. But the company wouldn't provide details on who they've hired to actually build the factory and its production systems.

And it seems there will be no dearth of machinery for glass processing at the facility. The company wants to offer all three conventional processes for applying metallic coatings: sputtering, pyrolytic deposition and chemical vapor deposition (CVD). This is supposed to serve thin-film module manufacturers, which want glass panes that already have transparent conductive oxide (TCO) coatings. Furthermore, this equipment also allows for the deposition of antireflective layers, which increase the efficiency of crystalline modules. Vetro Solar's machinery will also include systems for glass hardening, edge processing and drilling. To develop all of these process steps and to train the personnel to operate the equipment in Thalheim, Vetro Solar is currently building a pilot plant in Norway. This plant will produce 1.5 million m<sup>2</sup> of glass annually and will begin operation in early-2009, reports Morten Hansen, who is responsible

for business development at Vetro Solar.

Hansen and his colleagues say the customers for the glass manufactured in Thalheim will mainly come from the German PV industry, although Vetro Solar hasn't signed any delivery contracts yet. In fact, this project may develop entirely new forms of logistics: after all, the production halls of Q-Cells AG and its thin-film subsidiaries are not far from the glass factory's construction site. These companies may actually be able to receive glass directly from Vetro Solar's conveyor belts. «We haven't defined the logistics yet, but it would be possible, and that would reduce costs,» says Bjørn Glenn Hansen, marketing head at Vetro Solar.

The company, however, won't say who exactly is investing in the project. As of now, the partners include, among others, Norwegian investment banks ABG Sundal Collier ASA and Otium Finans AS, which

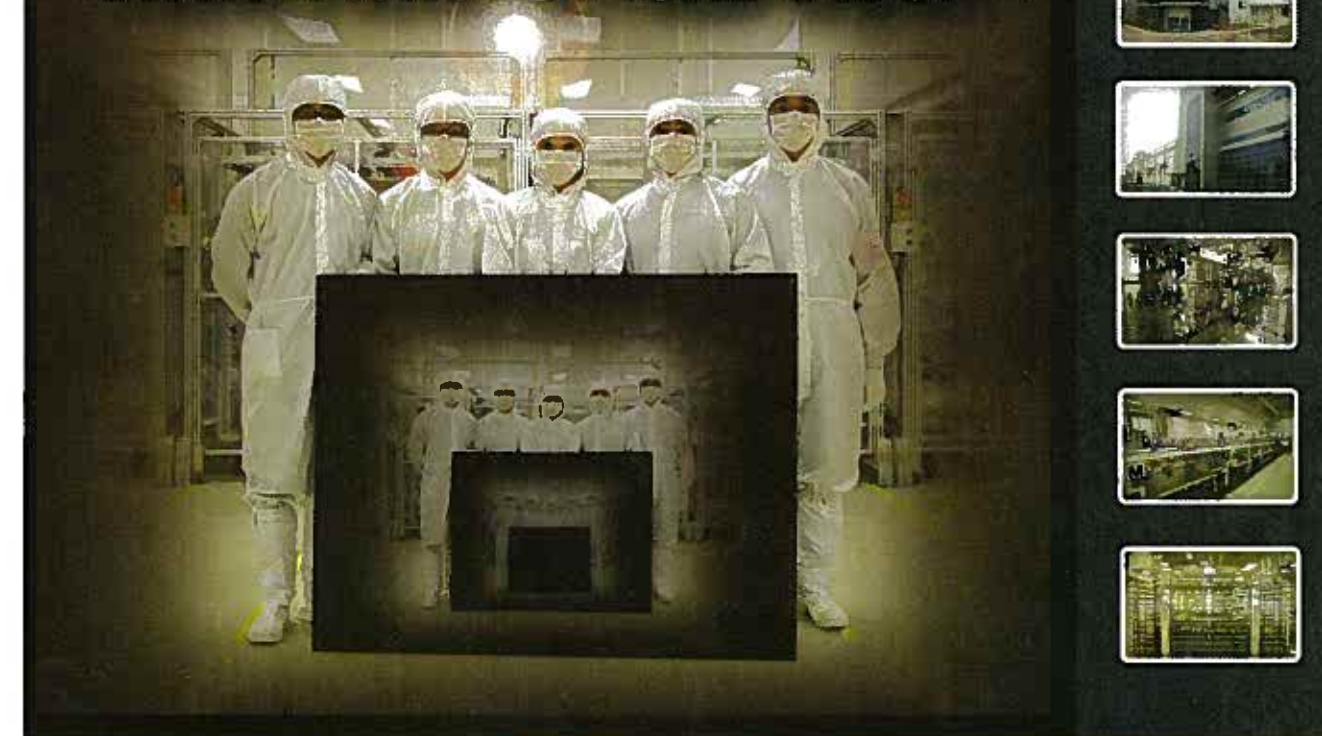


The factory will be more than 1 km long with its two float glass lines and glass processing capabilities.

are also represented on the company's board of directors. Moreover, there is also some connection with silicon manufacturer Elkem Solar AS regarding personnel. Still, once the factory is complete, these investors are planned to only own a small portion of the venture. The lion's share of the investment will come from Norwegian and international investors, says Gaudestad. It's also unclear where Vetro Solar intends to get its low-iron raw materials – quartz sand, soda and feldspar. The company has only mentioned that it has a source somewhere near the German border.

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## Thin Film Is NexPower



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