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*by Paul Hockenos, Berlin*



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Author: Paul Hockenos  
Design: Anna Liesa Fero  
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**Heinrich Böll Stiftung**  
**North America**

1432 K Street NW  
Suite 500  
Washington, DC 20005  
United States  
**T** +1 202 462 7512  
**F** +1 202 462 5230  
**E** [info@us.boell.org](mailto:info@us.boell.org)  
[www.us.boell.org](http://www.us.boell.org)

# Germany's PV Branch: The Once-Mighty Solar Industry in Germany is Straining to Reinvent Itself

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Not all so long ago, Germany's PV industry was the precocious star of Germany's manufacturing sector. At the height of the eurocrisis, it shone brightly while most of Europe's economy struggled with recession. Installed capacity in Germany shot up from just [2.9 GW in 2006](#) to 32.6 GW in 2012, the lion's share of it Made in Germany. Much of the new industry was located in eastern Germany, which picked up its beleaguered regions after decades of stagnation. The wunderkinder of the branch – firms like SolarWorld, Q-Cells, Solan, Aleo Solar, and Conenergy – dominated the European market and exported German hardware and technology around the world.

But those giddy days are long gone. Rock-bottom Chinese prices, a flooded market, and dwindling incentives across the EU have cast much of the branch into an existential crisis. With Germany reigning in the feed-in tariff, demand for PV capacity in Germany has fallen off this year after three record, seven-GW-plus years in a row.

It seems like every couple of months another German PV denizen falls into bankruptcy or is sold to foreign competitors. Whereas [120,000 people](#) worked in the branch in 2011, by the end of 2012 it had fallen to 87,000. In the same year, [turnover fell](#) from 11.9 billion euros to 7.34 billion – and the free fall hasn't been stopped. Siemens and Bosch, two giants presumably outfitted to ride out such storms, stunned the market by bailing out of the business entirely with losses of around a billion euros apiece.

Earlier this year, the branch received more devastating news: Germany and the EU came to an agreement with China that stopped well short of slapping serious anti-dumping duties on Chinese PV cells, wafers, and modules. Desperate German producers had lobbied fiercely for steep tariffs on what they claim is illegal competition. But the new agreement will have little

impact on Chinese sales in the EU or the possibility of the Germans recouping some of their former market share.

This gloomy result was followed by the near meltdown of SolarWorld, Germany's biggest panel maker. It staved off insolvency only by agreeing to part with about half of its investments, while ordinary shareholders had their stock holdings boiled down by 95 percent. Qatar Solar of Doha, Qatar, now owns a third of the company. These measures helped pare down SolarWorld's debt from €900 million to €400 million.

The question now is whether Germany's remaining PV industry can reinvent itself, innovating in ways that restore its place as market leader. It did this once – to win its place in the sun – but can it do it again?

Although there are some bright spots in the business, most observers argue that the manufacturing chapter of the Germany solar industry is over and that it will be extremely difficult for companies hanging by a thread to move quickly enough to innovate in such a dynamic market.

"The mass manufacturing of the hardware, like modules and cells, is most probably going to take place somewhere else," explains Katarina Umpfenbach of the Berlin-based think tank [Ecologic Institute](#). "We've seen this happen in many other manufacturing branches in Germany over the years, so it's not a complete surprise."

Yet those companies still standing are in the process of regrouping. SolarWorld, for example, has shed assets and presented a new business plan. But it is not abandoning the crux of its traditional operations, namely producing the length of the value chain from R&D to module manufacture to installation and after-sale service. Its ostensible restructuring, say critics, is a downsizing rather than a new beginning. ("SolarWorld has

averted an imminent insolvency and secured time until Christmas," [one analyst told](#) pv magazine.) SolarWorld will now, it says, concentrate increasingly on exports to international markets and forego the German market.

SolarWorld isn't the only one in the branch looking to international markets. After all, global installations are booming, growth predicted to reach 6.6 GW this year. The U.S., Latin America, Asia, and South Africa are all viewed as interested customers. The export ratio of German solar companies grew from 50 percent in 2010 to 60 percent in 2012, a trend that shows no sign of slowing. Some German products, like German open-field PV installations as well as solar inverters, are still competitive on the world market.

Indeed, some players in Germany's solar industry have been faring well of late in foreign markets – even if they're floundering at home. Two Bavaria-based companies, the solar system providers Phoenix Solar and S.A.G. Solarstrom, turned profits in the first half of 2013 by tapping into markets abroad. This year Phoenix Solar achieved its first quarterly operating profit since 2010 by targeting Thailand, the U.S., and Saudi Arabia. The company recently shut down its trading and project business in Germany, and now markets abroad account for 74 percent of its sales. As for S.A.G. Solarstrom, while Germany had been its primary market even as late as last year, now it is the U.K. where it designs and builds large PV plants. It is currently in the process of closing deals in Africa, Latin America, and Turkey.

Some export niches haven't been hurt at all. Germany, for example, still produces the machinery that make solar panels and their components. Much of the polysilicium used in solar panels worldwide is made in Germany, as are the inverters that connect to the panels as well as the specialty glass that covers them.

But observers like Wolfgang Hummel of the Berlin-based consulting firm Center for Solar Research are skeptical that German companies can depend on these foreign markets for long. "It's not a question of adapting but of reinventing," he said, referring to the PV industry. "Ultimately they have to leave the hardware manufacturing behind and go into software and energy management systems, creating higher-value customized products. They have to think in terms of the needs of the smart grid, finding a place in a new market at the interface of the grid, decentralized producers, prosumers, and smart households."

Umpfenbach is of much the same opinion. "One option

is offering a whole package for the households taking advantage of self-production and potentially storage. And there's still a need for technology that helps integrate ever higher volumes of solar energy into these grid."

Indeed, one criticism of the Germany PV lobby has been what some critics say was its two-pronged strategy of pushing for tariffs and fighting reductions in the feed-in tariff. The latter was no more successful than the former: the FiT is currently decreasing by 1.8 percent a month and will soon be at market parity. Perhaps the branch should have been looking ahead much sooner, rather than fighting a rear-guard battle. (This lesson could have been learned from Germany's nuclear sector, which fought fiercely to keep the nuclear option alive rather than invest in renewables....)

But the way forward, namely the kind of cutting-edge innovation that made the sector the world leader in PV production, is now clear to many of Germany's solar firms – even if it's easier said than done. "The technology race isn't over," says David Wedepohl of the German Solar Energy Association (BSW). "The demands placed on solar power systems are becoming increasingly complex. Germany's photovoltaic companies have answers to these new challenges."

Self-consumption, for example, is a niche that Wedepohl argues will require plenty of German ingenuity, as will solar battery storage systems, intelligent energy management systems, thin film technology, power electronics, and direct marketing. "Increasingly homeowners and entrepreneurs want to utilize the solar power they generate themselves," says Wedepohl. "Falling costs make the consumption of self-generated solar power a lucrative option for commercial enterprises. New business models are creating new sales opportunities."

Decentralized, small-scale battery storage and self-consumption are on the table right now in Germany. With electricity prices so high, the cost of photovoltaic hardware so low, and the feed-in-tariff fading away, self-consumption is an increasing lucrative option. Battery storage, which enables prosumers around-the-clock access to their self-generated power, is part of the new model.

As of May, small-scale producers are eligible for low-interest loans and a rebate for solar power storage systems through a new German development bank (KfW) program funded to the tune of €25 million (by the fed-

eral environment ministry). It pays about a third of the unit's total cost. The interim storage technology helps adjust sunlight-dependent solar power supply to individualized electricity demand.

But even with the rebate they're not cheap: A 4.5-kilowatt-hour storage system would cost 7,000 euros while one can expect to pay about 11,500 euros for a 10-kilowatt-hour system. If one adds up the cost of producing and storing a single kilowatt hour, it totals about 36 cents a kilowatt hour. In the program's first three months, KfW has received 940 applications for the loans.

Though KfW says this interest is encouraging, it is in no way enough to revive an entire market. Moreover, the paperwork to take advantage of the loan/rebate is apparently extremely cumbersome.

"The issue with storage is not all that different from the problem with modules," explains Hummel of the Center for Solar Research. "Germany has no real comparative advantage here. There are two dozen foreign battery makers all ready to enter the German market. The Chinese also produce storage capacity."

One company, among others, often praised for combining storage and smart energy management is the medium-sized German firm Sonnenbatterie. It has designed software that integrates PV modules, its own lithium-ion batteries, and a home energy management system. Another such firm is the Dresden-based Solarwatt, which has shifted from module production to more complex intelligent energy solutions. Since fighting off bankruptcy last year, it has teamed up with the Bavaria-based PROSOL Invest, which specializes in storage systems, to offer an innovative, solar-power storage system for households and SMEs.

"I'm convinced German engineering has the ability to make and profit from high-tech solutions in solar energy," says Umpfenbach. "The big question is whether these German companies will survive long enough to make it happen."

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