

Concentrix recently finished this 1 MW CPV project on a brownfield in Questa, New Mexico. Photo: Concentrix



Everything is different, **state by state**

To be part of the expected growth of the PV market in the United States, Europeans met with US and Canadian solar companies at the 1st European-American PV Rollout conference in Boston last month.

If the US solar industry can continue to double its capacity as shown last year, market analysts are optimistic that the US will become the strongest global player by 2015, surpassing the leaders Germany and Italy, according to Shayle Kann from GTM Research. “We know there is a boom coming, but it will be up to us to not watch it from a distance,” said Benno Bunse, President of the German Chamber of Commerce, at the 1st European-American PV Rollout

this February. The conference, organized by OTTI, Ostbayerisches Technologie-Transfer-Institut, had the goal to set up US-European cooperation, to improve communication, leverage from experiences in Europe and learn about the obstacles when entering the evolving North American market. 110 participants from seven countries (USA, Germany, Canada, Denmark, Ecuador, United Kingdom, Iceland) followed the call.

Reaching grid parity

Conference chairman Eicke Weber, Director of the Fraunhofer ISE in Freiburg, who spent 23 years in research in the US, was excited to announce to finally “experience what we discussed for the last 10 years: reaching grid parity.” Weber, who has seen both markets grow, can’t wait to see the “economic miracle to spill over from Germany to the US” The renewables sector in Germany created 400,000 jobs so far. John Lushetsky, solar program manager at the US Department of Energy (DOE), found the conference “well timed.” “We have a lot to learn from Europe,” where costs per W are only half of those in the US. One way to stimulate efforts for costs savings among the US companies, Lushetsky introduced the SunShot initiative, with the ultimate goal of \$1/W for “large-scale solar energy systems” and to make them “cost competitive without subsidies by the end of the decade.” With a \$ 200 million budget per year the department in the first 2 to 3 years supports “horizontal” research and development (R&D) work focused on reducing PV modules, power electronics, and balance-of-system (BOS) costs. “This will be followed by 2 to 3 years of intense “vertically integrated” systems-level demonstration projects that will demonstrate the commercial viability of the \$ 1 per watt approach, just like president John F. Kennedy challenged the aerospace industry to send a man to the moon within a decade.

The lowest cost for installation in 2010 was at \$ 4.05 per Watt for utilities, according to the SEIA market report, costs for non-module parts already taking half of that. According to the DOE, the initiative will also focus on “steps to reduce installation and permitting costs, which are significant contributors to the total installed system price of solar electricity. This includes efforts to streamline and digitize local permitting processes and to develop codes and standards that ensure high performance over the approximately 20-year lifetime of residential solar products.

Streamlining of processes

Citing the German FIT system with a minimal amount of paperwork after establishing technology standards, Lushetsky said that the DOE is working on efforts to streamline the process, among them a software which will be made available to municipalities in the permitting process. Other ideas are discussed on a national level, among them a proposal of a group of 22 leading solar installers from across the country. The report was published by SunRun this January and revealed that “inconsistent local solar permitting and inspection processes add an average of over \$ 2,500 per home installation.” The group called on the DOE to streamline the permitting process and show in the paper how “local governments can save \$ 1 billion



The advertisement features a collection of various aluminum and stainless steel mounting hardware for solar panels, including rails, brackets, and clamps. The products are displayed against a white background with a green grassy hill and a tree at the bottom. The logos for FV Power (Innovation Systems) and Tecnosystemi are prominently displayed at the top right, along with a logo for SOLAREXPO 2011 (Hall 10 Stand H 2.2, 4-6 May 2011).

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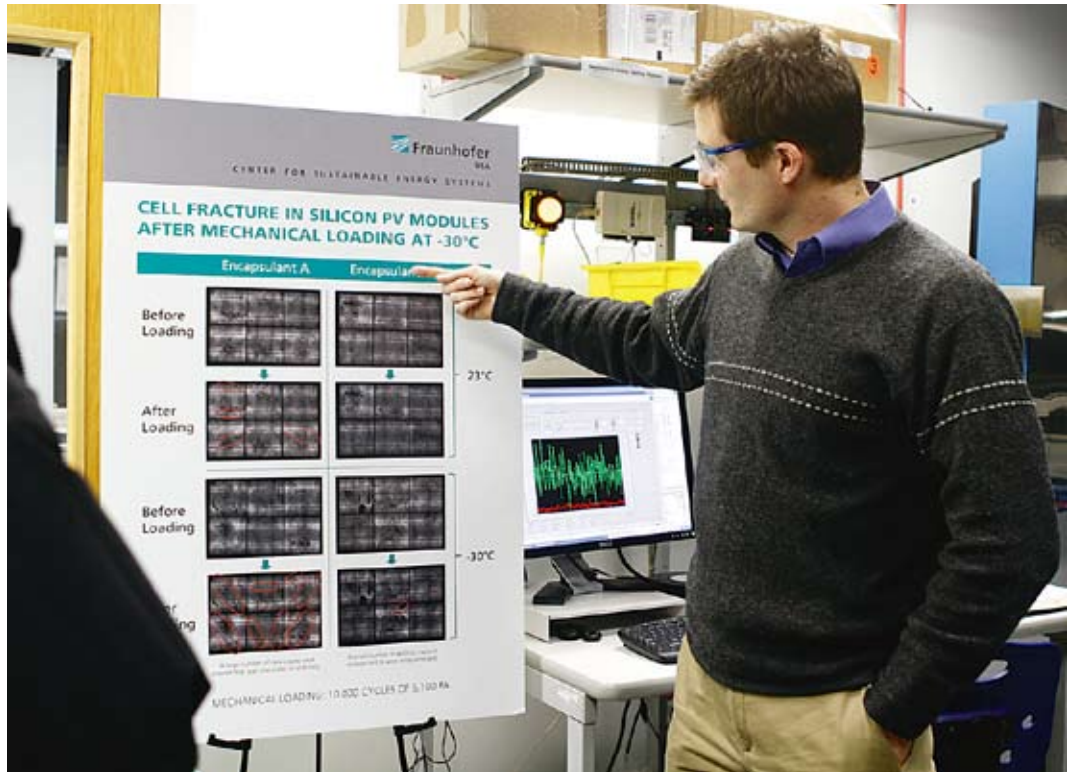
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The Fraunhofer Center for Sustainable Energy Systems (CSE) opened a US facility in Boston 2 years ago, and is conducting module and other part testing for clients in the US

Photos (2): Anja Limperis



over the next five years and make solar affordable for 50 % of American homes.”

Report author, Rob Cahill, Manager of Business Development, explains: “In Germany you do not need to fill out permitting forms if the system meets basic national criteria. SunRun’s report talks about this

idea of having certain standards for which, if met, no forms or time-consuming protocols are required. Germany, France, and Japan have all eliminated local permitting like this for basic residential installations. Not surprisingly, Germany has the lowest installed cost in the world, 40 % lower than the US” DOE manager, John Lushetsky, at the conference, showed great sympathy for actions to remove these barriers. He wants to take the best ideas and apply them “within our framework.”

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Local manufacturing?

Even though the majority of participants came from US companies (82 %), questions regarding Canada showed a slightly different picture of an emerging market. Paula Mints, market analyst at Navigant Consulting, one of the most critical market observers, says, “I see a strong and steady market growing in Ontario. It’s not booming, like people expected, but I never expected it. I am also optimistic based on the fact that they have adequate transmission.” Ontario set up a domestic content requirement to support local manufacturing, but Mints said, “It’s impossible. They have almost no technology existing there.” She expects in the near future an adjustment on the domestic requirement opening the market to add to the incomplete local supply chain.

GTM analyst, Shayle Kann, said only four companies so far announced to set up module manufacturing, which is not covering the demand yet. Among them, the Spanish PV manufacturer Siliken, with an announcement last summer. Siliken is currently setting up four production lines in Windsor, Ontario, 50 MW to be completed by the end of 2010. Production is scheduled to start in April according to Siliken. Also, Schletter Mounting Systems opened a Canadian

subsidiary company, who entered the US market with a few employees in 2008, opened a plant in Windsor, now counting more than 90 employees in North America. Still, analyst Kann sees hesitation among other companies to establish production in Canada, because of the “fear that the program will end.”

Uncertainty in the US too

Also the US manufacturing market is described as “having seen turbulences” in 2010, according to the SEIA market report. Three plant closures were announced in the East, and production is instead moving to China. Fraunhofer Director Weber said the preference for China is not lower cost of labour, which makes up only 7 % of the product costs, but easily available investment capital. To scale up to gigawatt size production, so module costs go down, companies need investment capital. Only the Chinese government makes it easy to get investment capital, not the US and Germany neither, where plant closures were seen as well. “The DOE has realized that we need loan guarantees for investments in these industries, and this will actually allow cost effective production right here in the US,” said Weber. Otherwise, the domestic supply chain will stay underdeveloped and clean jobs will not profit from the growth in the renewables sector. According to Lushetsky, the DOE will focus on “increasing US manufacturing and looking at new technologies, like BIPV.”

How to act in a quandary?

Juris Kalejs, CTO at American Capital Energy, added another obstacle which utility companies face. To support the local job market, state policies mandate a preference of local companies, but at the same time force to award the contract to the lowest bid, which often drives utility companies in a quandary. When National Grid signed a contract with Cape Wind to buy 50 % of the wind power, supporting locally generated green energy, rate payer groups started a lawsuit, according to Kalejs. The green electricity from Cape Wind is estimated to add \$ 1.25 on the monthly electricity bill in Massachusetts, a minimal amount. “In Europe the rate payers don’t sue their providers, in the US they do. That’s a huge problem for us,” said Kalejs.

“Almost anyone in the global PV industry is currently turning an eye towards the US market, either developing a strategy or trying to understand the complexity of the US market: again everything is different, state by state,” said Shayle Kann. He sees an upside to the many different incentive and funding programs, developed state by state, which makes the market appear confusing: “We are not beholden to an individual incentive program,” as in countries with a feed-in tariff. “Everything is driven at the state level, and as a result, you can maintain more flexibility. If an incentive disappears, it’s not the end of the market, as we have seen in 2009.” He sees this diversity as a value. Kann doesn’t think that the US has

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to “move to a national feed-in tariff, nor will we. You want to be in a situation where you have 50 viable individual markets.”

The developing variety among the different states shows most when looking at California's market share. In 2005 California accounted for 80 % of the national PV installations, but in 2010 its market share fell to about 40 %, but still growing strong with almost twice as much installed capacity as the No. 2, New Jersey. In at least 22 different states the solar growth could be called significant.

New business models, new states

The other opportunity Kann pointed out were new business models, like third-party financing, which are not that common in Europe. In tandem with the California Solar Initiative, companies like SunRun, SolarCity or Sungevity started to offer installations with no upfront costs to residential and commercial customers. In 2010 one quarter of the residential systems in CA are financed like that, according to the GTM report, and third-party financed installations are now offered in seven states.

While in most of the South Western states residential systems made up for half of the installations and more, on the East Coast the share for residential systems is often less than a quarter, and instead utility companies became the most active players taking up close to three quarters of installed power with big scale solar farms put in the ground. One factor, which steers this development, is a cap on the incentives per year for solar installations enacted in certain states, but not everywhere, which causes preferential developments.



Technical tour organized at the conference to Boston's industrial water front where National Grid filled a brownfield with 750 kW Solon panels.

One of the new up and coming states is Massachusetts, where the governor signed the Green Communities Act in 2008, which guarantees residents net-metering for small private solar and wind generators at a favourable rate with systems size up to 2 MW. The act also allows utility companies to install and own up to 50 MW solar installations on customer's roofs.

"The policy in Massachusetts allows anybody to step in to the market place and compete, win and build projects," said Tom Hunton from American Capital Energy (ACE). His company has been focusing on turning brownfields into green fields, by installing solar farms on industrially contaminated land. "Every air force space has one, this is the history of this country." There are an estimated 425,000 brownfields in the US, among them 1,767 land fills, where the ground is sealed. They are generally located close to cities where energy is used – which makes distribution very easy. These sites could hold a capacity of 1,600 GW of solar power.

Clark Crawford from Concentrix, a CPV company, introduced a recently finished 1 MW CPV project on a brownfield, a former Chevron mine, in Questa, New Mexico. Questa's solar resources were ideal for CPV, said Crawford, with a high Direct Normal Irradiance (DNI) and relatively low temperatures. The 27" wide modules are tracking the sun during the day, and do not create any permanent shade. When it rains, the modules flip horizontally. But to not contribute to soil erosion, and keep the capped field intact, the tracker performs a "rain dance" imitating a sprinkler movement to evenly distribute the water.

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