

Joshua Bar-Lev of BrightSource Energy presents the Ivanpah project at the Solar Power Economics Forum in Washington DC. Photo: Anja Limperis

Longing for a stable support

When assessing the current US solar market it becomes clear that the industry is becoming the fastest driver in closing the gap to the leader Germany with the most solar installations worldwide. But, still, when looking at the real numbers, Germany – with a sun radiation about as high as in Alaska – just registered another annual record growth of 5.8 GW installed capacity by October 2010. The US in 2009 had finally reached the 1 GW benchmark of annual growth.

Nevertheless, the US is setting its sights high. With a solar vision of 20 % by 2030 presented by Solar Programme Manager John Lushetsky from the US Department of Energy at this year's Solar Economic and Financial Forum in Washington, solar should

become a serious contender to existing energy sources. The DOE's vision describes two scenarios to produce 10 or even 20 % of the US electricity demand by 2030 from solar power. Although noting, the numbers are still not final, Lushetsky stated that the goal is technologically feasible; the 10 % goal within the existing infrastructure, but the 20 % goal only with a "significant transmission expansion and grid-operation advancements", said Lushetsky. In the DOE projection the biggest producer of solar electricity will be utility PV between 70 and 110 GW (cumulative), followed by rooftop PV between 30 and 65 GW (cumulative) and CSP with 30 to 50 GW (cumulative). Under these two scenarios the US solar workforce is expected to grow from 14,000 in 2009 to 260,000

(in case of the 10 % scenario) or 450,000 (in case of the 20 % scenario).

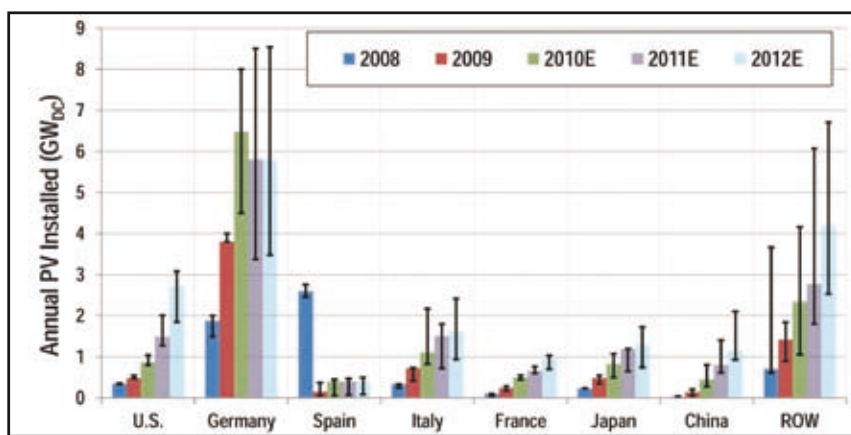
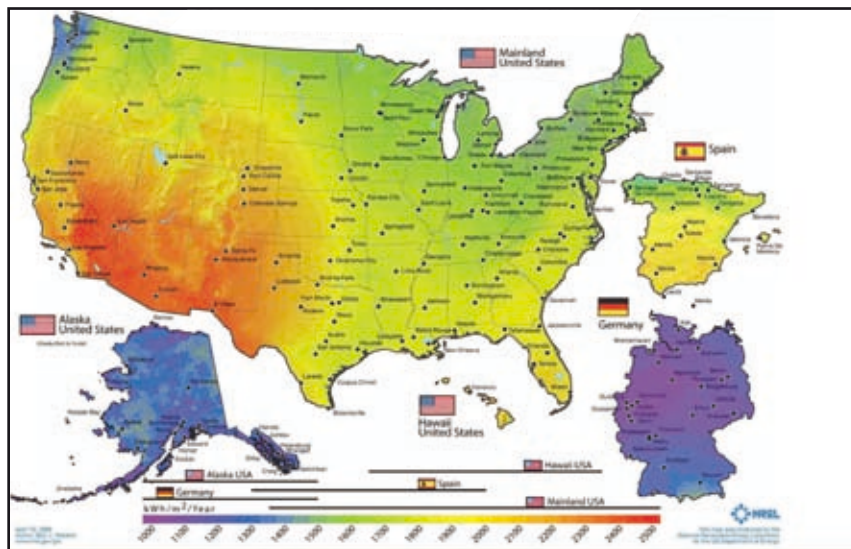
But even without this vision in place yet, the US is expected to move up to number two in the world passing by Spain, Italy and France by 2011 according to data from Barclay, Bloomberg and Goldman Sachs*. Under the American Recovery and Reinvestment Act of 2009 (ARRA) so far US\$ 5.1 billion have been awarded as grants in lieu of tax credits by mid-August 2010 as well as US\$ 2.5 billion of loan guarantees supporting an estimated US\$ 25 billion of loans for the renewables sector; US\$ 4.5 billion (88 %) went to the wind industry and US\$ 311 million (6 %) to solar electricity. Expressed in installations, 1,467 solar systems and 160 wind mills were connected to the grid. When looking at the manufacturing tax credit, solar panel production is clearly the winner, taking half the share with US\$ 1.1 billion.

Support beyond money

Besides the growth of the private sector, the government also took initiative in preparing federal land to be used for solar and other renewables. This summer, the Department of Energy announced the first solar technology test site within the so called Solar Demonstration Zone, turning a formerly nuclear weapons test area into a solar test lab; 17,000 acres (69 km²) at the Nevada National Security Site. Regarding health effects on workers, the department stated that the particular area, where systems will be installed “was never used for atmospheric or underground nuclear weapons testing.”, said Darwin Morgan from the Nevada Site Office. Until now, at this first test site, only tests for solar thermal power plants are planned. After a committee has been researching areas in the Midwest for more than a year, this fall the DOE will announce another 4 to 6 additional demonstration sites with an energy production capacity of up to 30 MW power. At those sites, it is also planned to test concentrating PV systems. The use of so called brown land such as either landfills or former superfund sites, as well as buffer zones around airports are also more and more moving into focus for solar deployment.

On top of that the Bureau of Land Management (BLM) just announced at the beginning of October the first three out of 14 final approval notices for large scale solar projects on public land which were all put on fast track within the American Recovery Act (see box). Actually, only one of the three is a photovoltaics project, the others are power plants based on solar thermal technology.

If all 14 projects are approved as planned by the end of the year, a total capacity of 4.5 to 6 GW (about 1 GW of which is PV capacity) can be added to the grid within less than 24 months. “For the first time the US market is where the growth is happening”, exclaimed Nancy Hartsoch, Director of the CPV Consortium and Vice President of SolFocus US, with much enthusiasm. All of the projects will receive economic stimulus funding.



John Lushetsky, Programme Manager of the Solar Energy Technologies Program at the US Department of Energy, showed some key figures: Even Alaska alone has as much land and sun as Germany, which still leads the world's PV market.

Source: Presentation of the US DoE

PV gets the cheapest rents

The BLM oversees 23 million acres (9.3 million hectare) of public land in the Western United States with a potential of 2,300 GW of solar power, said Ray Brady. Despite the fact that the US Congress did not commit to a Clean Energy Bill, Brady's office has been working under the presidential directive to “ensure 10 % of electricity from renewable energy by 2012 and 25 % by 2025”. All together 122 solar project applications are in process, using not only PV, but a wide variety of technology, from parabolic trough (about 60 % of the current applications) with the smallest land use footprint of 5 acres per MW (20,000 m²), to power tower (10 %) and solar dish (5 %) with 9 acres (36,000 m²) footprint per MW. Photovoltaics makes up 25 % of the current applications and has a 10 acres (40,000 m²) footprint per MW.

This June the BLM published its rental policy for solar energy production installed on public land. The final rate is based on a formula of a base rent and a MW capacity fee. The base rent varies by county depending on the land value “between 30 and a few hundred dollar per acre”, said Brady in Washington.

On fast track

Three of 14 fast-tracked solar projects on public land received final approval in October 2010 from the US Bureau of Land Management. The remaining 9 are awaiting approval before the year ends. Only 4 of the projects use photovoltaics, equaling 1 GW of installed capacity. PV projects are highlighted by a red dot. The other projects are solar thermal power plants. All 14 projects together will result in an installed capacity of 6 GW.

1. Chevron Lucerne Valley Solar Project ●

proposed by: Chevron Energy Solutions

Permission process started: 07/2009

location: San Bernardino County, California

size: 45 MW

equivalent to power: 13,500 to 33,750 homes.

technology: photovoltaic solar technology, when fully built would consist of up to 40,500 solar panels

footprint: 422 acres (1,7 km) of BLM-managed public land

jobs: 48 new jobs during the construction and operations phases

2. Imperial Valley Solar Project

proposed by: Tessera Solar

Permission process started: 10/2008

location: Imperial County, Texas

size: 709 MW

equivalent to power: 212,700-531,750 homes

technology: solar dish technology, when fully built would consist of 28,360 solar dishes

footprint: 6,359 acres (26 km²) of BLM public land

jobs: 674 during the construction and 241 jobs during operations phase

3. Ivanpah Solar Electric Generating System

proposed by: BrightSource Energy

Permission process started: 11/2007

location: San Bernardino County, California

size: 370 MW

equivalent to: power 111,000 and 277,500 homes

technology: solar tower, three 459-foot tall power towers and 173,500 heliostats (each holding two flat mirrors)

footprint: 3,471 acres (14 km²) of BLM public land

jobs: 1,000 jobs during the construction and 86 jobs during operations phase

4. Blythe Solar Power Project (CA): 968 MW (parabolic trough)

5. Calico Solar Project (CA): 633 MW (dish Stirling)

6. Desert Sunlight Solar Farm Project (CA): 550 MW (thin-film PV) ●

7. Genesis Solar Energy Project (CA): 250 MW (parabolic trough)

8. Palen Solar Power Project (CA): 500 MW (parabolic trough)

9. Ridgecrest Solar Power Project (CA): 250 MW (parabolic trough)

10. Sonoran Solar Energy Project (AZ): 375 MW (parabolic trough)

11. Crescent Dunes (NV): 180 MW (power tower)

12. Amargosa Farm Road (NV): 460 MW (parabolic trough)

13. Silver State South (NV): 267 MW (PV) ●

14. Silver State North (NV): 140 MW (PV) ●

Source: BLM, http://www.blm.gov/wo/st/en/prog/energy/renewable_energy/fast-track_renewable.html

The second component, the MW capacity fee, is applied per technology group; the more potential MW produced per acre, the higher the fee (PV: US\$ 5,256; CSP: US\$ 6,570; CSP with storage: US\$ 7,884 per MW per year). In the discussion Kevin Smith from Solar Reserve, a large scale CSP developer, commented on the approach to define the MW capacity fee by technology, saying it appears “counter intuitive”, penalizing the more efficient producers with a higher rate. To Smith’s surprise, a CSP plant that includes solar storage will be charged the highest rent. Brady countered that the decision was based on a formula to not give any technology a preference. He added: “There is a lot of discussion on the Hill, converting our rent structure to a royalty approach. But if we go to a royalty approach, those technologies which produce the most will pay the highest rent.”

Feed-in tariffs wanted

Since the early 1990ies the US solar industry has been looking jealously at the high German feed-in-tariff which served as the pivotal driver of an underdeveloped industry and awards the most efficient photovoltaic systems with the highest payback. Craig Lewis from the FIT coalition, who wants to bring feed-in-tariffs to all states in the US, presented his arguments in Washington. “86 % of the world’s solar PV deployments in 2009 were driven by FITs, and the percentage is increasing.” FITs, according to Lewis, are not only the most effective policy for getting cost-effective renewables online in a timely fashion, it also solves critical issues like financing, procurement, and interconnection. A FIT system “avoids any type of solicitation process with its parasitic costs and time”, like auctions in California, where 97 out of 100 submitted projects fail due to a bidding process, said Lewis. FITs will raise the supply on demand, same feed-in prices will reduce developer’s risks and drive more volume.

Lewis also calculated when applying all existing tax credits and the higher solar resources to systems in California, the roughly 30 US-ct/kWh paid for solar power fed into the grid in Germany equals about 18 US-ct/kWh in California. Existing US policies are a mix of short- or mid-term government grants, tax rebates and state incentives, which support installers by cutting upfront costs, but they do not promote the most efficient systems with the highest output, as feed-in-tariffs do by paying per electrical output instead of installed capacity. And, as frustrated investors and business owners complain, the two biggest drivers – the cash grants and manufacturing tax credit – are running out by the end of 2010. “We tend to be on an ‘on-again-off-again’ cycle. A constantly changing regulatory landscape makes the market unpredictable”, said Brian Robertson from Amonix, a CPV company.

If solar power is subsidized, should the government not make sure that the money stays in the US? Like many other countries with powerful renewable policies, the US does not require projects to use

products from the domestic market when using tax credits or state incentives. Al Buckham from SunDurance Energy strongly supports this policy. He warned of too much protectionism for local manufacturing, because it can raise the prices and that means fewer solar projects and fewer jobs are created. "We have to ask: What is the goal?", said Buckham. "A small, profitable US solar manufacturing industry or more solar projects built to maximize overall industry employment and increase energy independence?"

Protectionism is not the goal

Brian Robertson recalled that his company Amonix was researching the advantages of manufacturing overseas to save labour costs. But since many production lines are now fully automated, there was no advantage. Including the 30 % manufacturing tax credit and high shipping costs, Robertson said, his company was better off to stay local. This supports Buckham's argument that in order to raise PV manufacturing in the US, policies need to be continued to help establish manufacturing capacity at a lower cost instead of just protecting the domestic market.

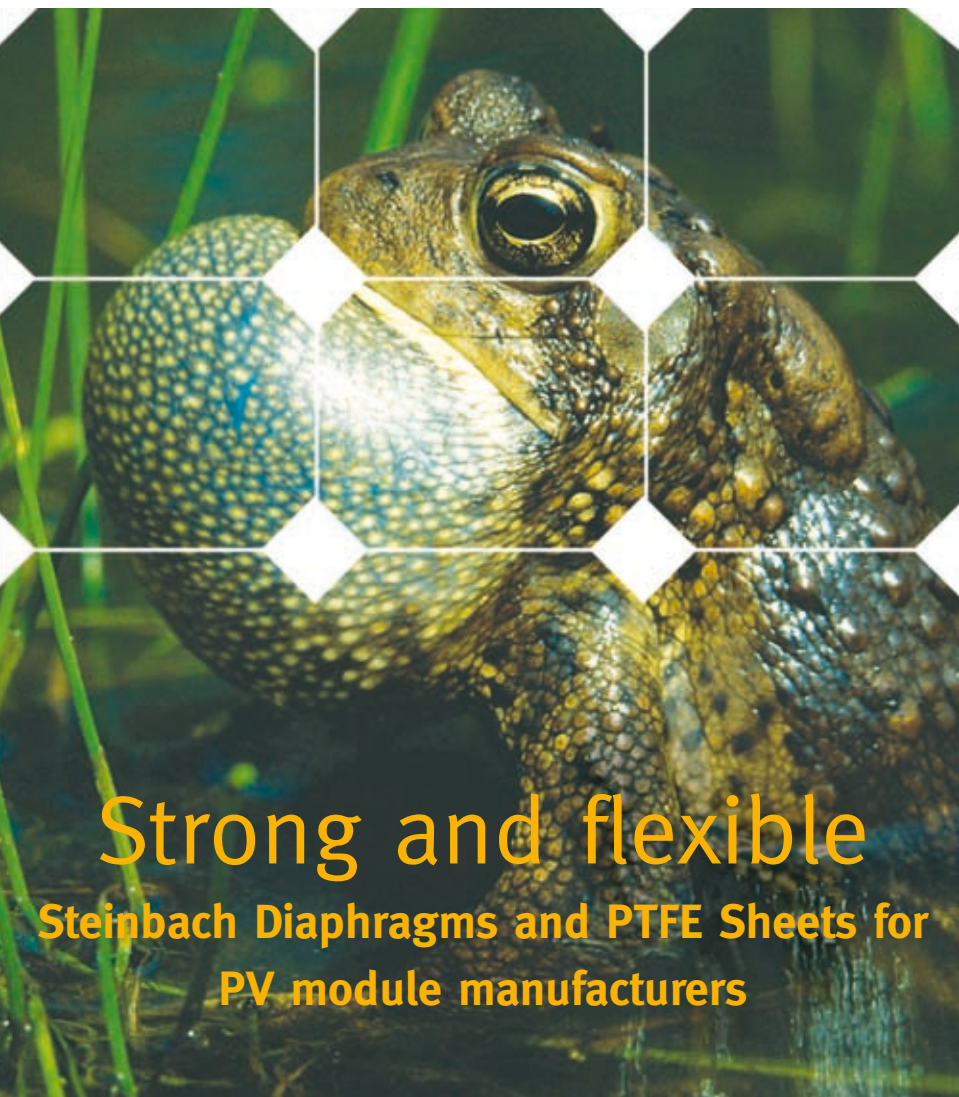
One of the few countries that does require domestic products in the support scheme is Canada: Canada started a feed-in-tariff last year combined with a requirement to having to use locally sourced photovoltaic systems; 40 % for residential and 50 % for commercial systems. It has already demonstrat-

ed a big impact; manufacturing capacity and solar deployment are growing vastly; the later so fast that manufacturing can't even keep up with the demand to fulfill the goals set by the Canadian policy for next year.

In the frame work of funding from the Recovery Act, the US government does give preference to local products by applying the Buy American policy to projects owned by public entities. Materials, like iron, steel or manufactured goods, have to be produced locally. To protect the policy from overpricing, it offers waivers when the overall costs increase by more than 25 %. Shanker Singham from Squire Sanders & Dempsey pointed out before the Recovery Act the costs had to be only higher than 6 % to grant a waiver. He expressed high doubts that allowing 25 % higher prices for US products will help the companies to compete internationally, "this is really a disciplinary mechanism", said Singham, also Chairman of the International Roundtable on Trade & Competition Policy. With reference to very low prices from overseas he claims, instead, "we need a policy where we encourage foreign competition on the basis of business merits and discourage foreign competition on the basis of market distortion."

Anja Limperis

* Sources: Barclays (6/28/10), Bloomberg NEF (7/30/10), Goldman Sachs (6/27/10), Lazard (7/26/10), Stifel Nicolaus (7/16/10), UBS (7/29/10)



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