

# Tracking the PVEP business model in the US

**PV energy business** | A number of the US' leading solar firms have been pioneers of the integrated PV energy provider model. Mark Osborne charts the evolution of the model and explains how it could be emulated as other firms look to capitalise on burgeoning end-market demand



Source: SunPower

The 'photovoltaic energy provider' (PVEP) business model was first developed a few years ago in the US, led by its two largest integrated PV manufacturers, First Solar and SunPower. The success of the model, initially devised to ring-fence module manufacturing operations from competition from China-based producers, has led to more US-based companies following suit. This article provides an update on recent US-centric PVEP developments and strategies including new entrants.

In simple terms, becoming a PVEP enables a module manufacturer to match production to internal end-market demand as a major proportion of demand is driven by the development of internal PV power plant projects. These can be solely utility-scale, or a combination that could include utility-scale and commercial rooftop, or also include residential and off-grid markets.

The three major US-based PVEPs, First Solar, SunEdison and SunPower, all had relatively different preferences as to the end markets they would serve. However, that is starting to change and all three are beginning to converge and address all major markets under the PVEP business model.

In geographic terms, what has been common amongst all the US PVEPs has been the clear focus on US projects and business opportunities, predominantly within North America. However, that has been changing, with growth and project pipelines increasingly becoming diversified and an increased emphasis on emerging markets in Latin America, Europe (UK in particular), Japan, MENA and Africa.

## Merging of PVEP business models

### First Solar

Being the largest thin-film producer, First

**Utility-scale projects have provided a steady supply of business for the US' integrated PV providers.**

Solar's major market has always been the utility-scale and commercial rooftop segments. Having initially supplied project developers in Europe and then the US with modules before becoming a major project developer and EPC, First Solar has been highly dependent on those markets under its PVEP model.

However, First Solar acquired TetraSun, a very small early-stage c-Si cell developer in 2013, announcing a few months later that it would start a 100MW manufacturing line for monocrystalline silicon cells in 2014, with production scaling from 2015 onwards.

The company made it very clear that the decision was to address the residential and small commercial-scale markets globally, an area it was not able to participate in with CdTe thin-film modules. The PVEP has already signed a distribution agreement through April 2015 to sell the TetraSun developed cells/modules in Japan to the residential market through JX Nippon Oil & Energy Corporation.

## SunPower

In recent years, SunPower has boasted the most powerful c-Si cells and modules with cell efficiencies well over 20%. This has enabled the company to focus primarily on the residential and commercial rooftop sector, via a vast network of distributors and installers. Emphasis shifted to utility-scale markets under its PVEP model, benefiting from levelised cost of energy attributes offered by high-performance modules in high-irradiance areas where the majority of its projects have so far been built.

The company is also tapping third-party finance for residential and commercial rooftop markets as it competes directly with SolarCity, the largest PV installer in the US in key markets such as California.

## SunEdison

The biggest business model change from the leading US PVEPs is that of SunEdison,

formerly dedicated polysilicon producer, MEMC. Having acquired PV project developer SunEdison the company has evolved rapidly into a major PVEP, tapping EMS subcontractor, Flextronics, and the entire supply chain to provide its own specified 'Silvantis' series modules for its utility and commercial rooftop projects.

Further changes to its business model are expected, with the company announcing feasibility studies earlier in 2014 on establishing a fully integrated PV manufacturing complex, including FBR polysilicon production through to module production, in partnership with the Saudi Arabian government. The plans called for an investment of US\$6.4 billion in a major complex that could potentially be started later in 2014.

Although the EMS route would be continued as it gives SunEdison manufacturing and CapEx flexibility, actual in-house manufacturing would seem to have strategic advantages that the company wants to embrace sometime in the future.

This would seem to fit with its aggressive PV pipeline expansion plans over the next five years as well as having recently started supporting smaller installers in the residential and commercial markets with its Silvantis series modules.

manufacturing plant based on the technology it acquired with the purchase of small US-based module manufacturer, Silevo, means the US-centric installer has big plans ahead to expand its business and change its business model.

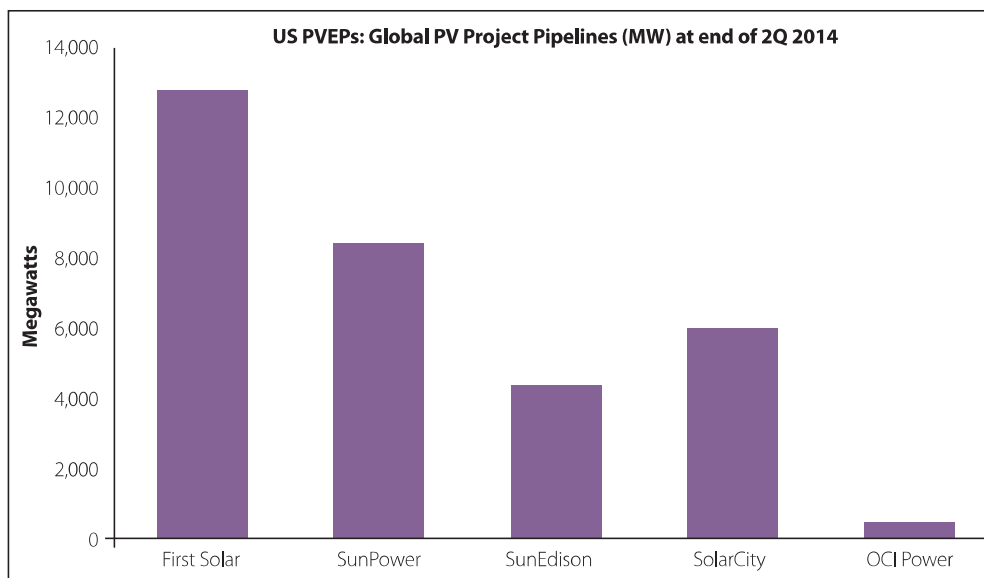
The company is well known as the largest US residential installer and pioneer of the third-party leasing model. SolarCity is also engaged in public/commercial rooftop projects. Though unclear at the moment, tapping in-house module production to build utility-scale projects in the future should not be ruled-out.

#### Mission Solar Energy/OCI Solar

Another new US-based PVEP is Mission Solar Energy, formerly known as Nexolon America, a joint venture with Korean-owned OCI Solar Power and partner of Texas-based CPS Energy. OCI Solar is a subsidiary of Korean polysilicon producer OCI.

The company started PV module production in June and expects N-type monocrystalline solar cell production to start in the early part of the third quarter of 2014. The San Antonio-based start-up is planning an initial 100MW ramp in support of OCI's PV power plant project plans, of which the bulk, 400MW, will be in Texas.

**US PVEPs' global PV project pipelines (MW) at end of 2Q 2014. SolarCity pipeline is 1 million customers in 2018, equal to 6GW installed.**



#### New PVEP entrants SolarCity

The PVEP model in the US may be dominated by First Solar, SunPower and SunEdison but that is not stopping new entrants embracing the business model.

Following a recent significant move, SolarCity is fully embracing the in-house production model. Technically not yet a PVEP, recent plans to build a 1GW integrated PV

Expectations are that OCI Solar and Mission Solar will expand projects and production to grow their project pipeline in other regions of the US.

#### Yield co model gaining momentum

Further to the development of the PVEP business model is the trend towards building and owning PV power plants under a separate publicly listed company. The

yield co financial structure enables PVEPs to extract greater overall earnings from PV power plants, compared to building and then selling them on completion.

The yield co financing model also enables investors to share in attractive annual income, while the PVEP gains access to low cost finance to further support the build-out of pipelines.

SunEdison has been the pioneer of this segment of the PVEP business model, recently undertaking a very successful IPO of its yield co under the name of TerraForm. SunEdison's TerraForm received initial net proceeds of over US\$500 million from the IPO, which was quickly followed by Internet giant Google providing US\$145 million equity finance to TerraForm.

And it looks as though the yield co financial structures look set to become a key low cost vehicle for PVEPs.

Although First Solar initially downplayed the benefits of the yield co model, more than likely due to its previous focus on US utility companies for business, the company is expected to announce future plans to adopt a version of the yield co model as soon as late September or sometime in October 2014.

It has also been rumoured that SunPower could announce a yield co strategy at its planned annual investment analyst event in November 2014.

In the middle of this year, Deutsche Bank Securities guided that as many as six yield cos could be publicly traded in the next 12-18 months, describing PV-based yield cos as "the most significant positive catalyst for the solar sector".

#### Future developments

Considering the different routes companies have taken to become PVEPs in the US, it stands to reason that more companies may be attracted to the business model, perhaps even more so now that a new way to access low-cost finance has been made available through the yield co model.

Whether this includes existing small-scale US-based manufacturers or others from the downstream sector like SolarCity, or a combination of both, has yet to unfold. However, there is no reason not to expect businesses from outside the sector to see the PVEP model as a route to access the market and potentially benefit from others' success. ■

#### Author

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