Solar securitisation – growing global opportunities

Future solar finance | Securitisation is emerging as a promising new source of finance for the solar industry. Raymond Hudson looks at its potential for future growth and some of the considerations for developers looking to go down the securitisation route

Credit: SolarCity

One of the most exciting developments in the financing of solar is the application of the securitisation approach to portfolios of projects. Securitisation essentially refers to the process of converting a pool of illiquid assets into tradable securities [1]. In the case of solar PV systems, a portfolio of residential- and/or commercial-scale systems is assembled and asset-backed securities are issued and rated based on the portfolio of underlying cash flows.

Pooling assets in this way reduces credit risk as the rated bonds are linked to the combined solar PV system pool (rather than to the credit risk of an individual solar developer or single investment) and provide a liquid instrument that investors may easily trade in to and out of, which in turn enables access to lower-cost financial capital for solar plants. This approach is a state-of-the-art financing mechanism for solar and has the potential to significantly facilitate continued rapid growth of solar installations globally.

Securitisation trailblazers

The securitisation approach to raising capital for PV systems has been applied successfully in the United States and is expected to be used in other regions around the world. The initial securitisations were challenging to implement but the experienced gained is beneficial to the entire solar industry.

For example, SolarCity has completed a number of securitisations of solar portfolios and is an industry leader in this area with the first securitisation occurring in 2013. A number of other key players in solar in the US have also implemented securitisations. As a guiding example, a series of SolarCity securitisations are summarised in Table 1.

The confidence in the performance of PV securitised assets can be seen in the yield which has declined over time. This is consistent with increasing confidence in the financial performance and declining risk expectations. These rates of return are attractive to many investors (certainly when compared to present global bank account interest rates).

US installer SolarCity is one of the early exponents of securitisation.

These yields also represent a relatively low cost of capital for solar power plants when compared with many other financing mechanisms that are commonly employed. Technical due diligence is an important part of financing all solar power plants and in the case of securitisations, it is important to support the work of the rating agencies that provide a grading of the investment community view of the portfolio and its associated cash flows.

Beneficiaries

Companies that are benefiting from the solar securitisation financing mechanism include developers who are implementing

Round	Capital Raised	Size	Yield	Pricing Date (Month)	Maturity Date (Year)
1	US$54.4 million	44 MW, 5,033 PV systems	4.8%	Nov 2013	2026
2	US$70.2 million	47 MW, 6,596 PV systems	4.6%	Apr 2014	2022
3	US$201.5 million	118 MW, 15,915 PV systems	4.32%	July 2014	2022
4	US$123.5 million	Not publicly available	4.41%	Aug 2015	2022

Table 1. SolarCity's US securitisations.

relatively large quantities of PV systems at residential, and commercial and industrial scale. Additionally, aggregators who are acquiring multiple solar power plants can benefit from securitisations. Investors in solar securities benefit from this new mechanism by being able participate in the financing of solar projects. As the securitised assets are liquid in a manner similar to other asset-backed securities, the increased liquidity is appealing to investors. As noted above, the investment returns can be quite attractive to stakeholders.

There are also benefits that flow to the end users of the PV systems. This includes a lower levelised cost of energy (LCOE) of the solar-generated electricity. As the cost of PV system components has declined dramatically over time, especially during the last several years, the cost of financing has become a larger portion of the LCOE. Lower financing costs facilitated by securitisation methods directly help to lower the LCOE and make PV-generated electricity more competitive with other sources.

Having a geographic distribution of the PV projects included in a portfolio can support the success of a securitisation. It can help reduce the overall portfolio resource and energy production variability. Additionally, the use of a variety of PV components across systems can help reduce the technology risk. It is important that the components used in the systems included in a securitised portfolio are technically proven and provided by leading manufacturers.

Challenges and risks

DNV GL has supported the securitisations of portfolios of PV projects as the technical advisor, providing due diligence reviews. An important part of this due diligence is to support the ratings agencies who render an overall view of the risks of the portfolio performance and its ability to provide the expected cash flows. The ratings agencies render an opinion in the form of a graded rating, as is done for many types of bonds. Portfolios of PV projects have achieved investment-grade ratings, which help achieve a low cost of capital.

For example, Standard & Poor's assigned SolarCity's third issuance a BBB+ credit ratings [2]. While many investors may be unfamiliar with solar as an asset class, the use of recognised investment ratings approaches greatly helps to quantify the expected risks and facilitate the evaluation of the investments in PV portfolios.

To achieve this investment-grade rating, the full spectrum of technical and operational risks must be evaluated. Developers of PV portfolios must go through a process

Function	Key Elements
Development process	Sales, system design process, construction
Component selection	PV modules, inverters, mounting, metering, balance of system
Energy production forecast	Solar resource, local conditions, components
Contract review	Local host contract, power purchase agreement, management agreement
Operations and maintenance	Approach, scope, cost
Evaluation of existing systems	Performance, quality
Financial model	Review of inputs and calculations

Table 2. Securitisation elements evaluated for risk.

of addressing the risks to both the ratings agencies and the technical advisor. A selection of the key items that must be evaluated from a technical basis in support of a portfolio securitisation are given in Table 2 above.

Securitisations can occur for both portfolios of existing solar projects or systems that will be developed in the future. In the cases where existing projects are included, their historic performance is an important item to be evaluated. For portfolios of projects that are to be developed in the future, the methodology of the development and implementation process is a focus of the review.

In the review of the development process, the system design methodology is a key aspect. The design approach must be consistent and rigorous, while appropriately taking into account individual site differences. The construction techniques must include a quality management process to ensure a reliably repeatable implementation of the PV systems.

The selection of components to be used in PV systems in the securitised portfolio is critical in minimising the risk associated with PV systems. The use of proven components can greatly increase the confidence in future system performance. This includes the PV modules, inverters and the mounting system, which represent a majority of the system component costs. The warranty and supply agreement conditions for key components can also be tailored to support the securitised systems.

It is important that the monitoring system employed is reliable and able to support the performance monitoring as well as the operations and maintenance (O&M) of the system. Securitised portfolios are typically not a good place to use new or unproven equipment. It is suggested that equipment that has been through a thorough technology review and appropriate testing be used in PV installations that are included in securitised portfolios.

The energy produced by each system in the portfolio drives the cash flow which supports the returns of the securitised investment vehicle. A key driver of the energy production is the expected solar resource for each system. This can be derived from nearby ground measurement stations or satellite data. High-quality data that is for an extended period (10 years+) is beneficial. It is important that a consistent and proven methodology and modelling tool is used to estimate the future energy production. A process for the evaluation of local conditions including shading and soiling losses should be employed to refine the energy estimate.

A review of the key contracts is important in evaluating the system risks. These include the contract with the local system host, the power purchase agreement (PPA) with the energy off-taker, and the management agreement that covers the operations and maintenance of the system. In some parts of the world, a standard feed-in tariff replaces the PPA. The O&M agreement should be comprehensive for the life of the projects. Details in each of these contracts should be reviewed to evaluate of both typical operation and all of the limitations.

The O&M plan for the projects being securitised is critical to give confidence that the systems will be supported to operate as expected. This must include the approach for both routine maintenance and also response to system issues. All costs should be covered including replacement parts and labour. A commitment to fast response time to issues helps ensure that systems are available and producing energy.

An inspection and review of existing system performance is very helpful in gaining confidence in the systems included in a securitised portfolio. An independent verification that the quality process utilised by the developer is consistently employed is important in evaluating risk. This is often done on a sample of systems in the portfolio. A review of both historic energy production and operations and maintenance activities provides additional confidence in the future system performance.

Growing global opportunities

It is expected that approximately US$150 billion will be invested in solar in 2015 globally and this amount will be increasing significantly in the coming years. Accessing the financial markets in new and more efficient ways helps support the global growth of the solar industry.

While the securitisation financing approach has been applied in the US to date, we believe that it will be used in many markets globally in the future. The historically consistent performance of PV power plants and maturity of the deployed technologies are driving factors that facilitate successful securitisation financing. Key market considerations for securitisation growth include:

- Increasing solar installations
- Experienced solar project developers
- Mature financial markets

Markets in Europe (especially the UK) and developed countries in Asia are expected to be well positioned to adopt securitisation financing of solar portfolios with emerging markets to follow. The ability to include local conditions and incentives in the overall securitised asset performance expectations is beneficial. This can be reflected in the yield and rating of the securitised investment vehicle.

As solar technology and manufacturing capabilities have advanced, the financing mechanisms are also evolving to support the rapid global growth of PV installations. Securitisation as a method of financing solar is an exciting development in the advancement and maturation of the PV industry. ■

Table 1 has been amended from the print version of this journal to incorporate additional data.

Authors

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References

[1] Bright Ideas: Global Trends in Solar Finance, DNV GL, 2014

[2] SolarCity Press Release, "SolarCity Completes Industry's First Securitisation of Distributed Solar Energy", November 21, 2013