

DEBT GAINS GROUND IN RESIDENTIAL SOLAR

THE US RESIDENTIAL SOLAR MARKET ARRIVED IN 2008. THAT YEAR, SOLARCITY AND MORGAN STANLEY CLOSED THE FIRST RESIDENTIAL TAX EQUITY PORTFOLIO FINANCING IN THE UNITED STATES. BY **DAN SINAICO**, A PARTNER IN **AKIN GUMP'S** LOS ANGELES OFFICE.

The financing was backed by a portfolio of customer leases, whereby SolarCity owned the solar equipment and leased it to the energy consumer. This third-party ownership (TPO) structure was critical to the success of the SolarCity financing model for two reasons: first, by leasing the equipment to the end-user, it enabled customers to go solar for little or no upfront cost; second, it enabled a financial investor to own the equipment and thereby capture the tax credits that facilitate tax equity financing.

Since that initial financing, the residential solar sector has experienced robust growth. No fewer than six residential solar installation finance companies have been built around the TPO model. SolarCity, SunRun, OneRoof, Sungevity and others have collectively closed over US\$3bn in project financings.

SolarCity recently completed the first distributed generation installer initial public offering and asset-backed securitisation transactions. Installed cost has fallen from over US\$8.40 per watt in 2008 to near US\$5.00 per watt. Net metering policies have been expanded to 40 states and the District of Columbia. Renewable energy credit (REC) markets have opened in 29 states, including New Jersey, Massachusetts, New York and Pennsylvania. These advances have largely been achieved on the back of the TPO model that supported the first tax equity transaction back in 2008.

Amidst the cacophony of TPO-backed residential solar, a new voice is emerging. In 2013, the residential solar lending market surfaced as a viable alternative to TPO. Sales organisations like Sungage and commercial banks like Admiral's Bank are deploying debt products that are shifting industry focus away from TPO. This pivot, if it is not yet a sea change, is being caused by numerous market factors, some seeds sown by the success of the TPO model, and others endemic to the shortcomings of the TPO model.

A victim of its own success

The achievements of the TPO model have ripened the market for residential solar debt products. Residential solar has effectively reduced installed costs, created a favourable policy environment and made the sector credible.

- *Cost reduction* – The remarkable decrease in the installed cost of residential solar systems has driven the robust market penetration of residential solar in the last five years. Since 2008, the installed cost of solar has fallen by almost 40%. This is due in part to equipment vendors aggressively slashing costs and margins, but it is also due to process improvements achieved in large part by TPO proponents. Reduced installation costs (a) make tax credits, which are based on installed system cost, a smaller piece of the value puzzle, compared with the value of energy and RECs, and (b) due to lower per system tax credits, increase the number of customer installations required to achieve a portfolio of sufficient aggregate value to merit a financing.

- *Policy improvements* – The success story of residential solar has created jobs and allowed customers to reduce their carbon footprints. High unemployment and increased climactic volatility have led state and local governments to undertake policy initiatives designed to cultivate the green economy locally. From net metering programmes to renewable energy certificate markets, solar developers have created a favourable policy environment for residential solar installation. All of these benefits have facilitated the deployment of residential photovoltaic generation, be it through leases and PPAs or customer ownership.

- *Industry gravitas* – The more than US\$3bn in solar financings that have closed since 2008 have given the concept of solar finance credibility. The first five years of TPO residential solar have established a strong asset class. In 2012, Clean Power Finance reported that default rates in residential solar portfolios were lower than those of AAA bonds. Consequently, residential solar now looks ripe for institutional investment.

A different mousetrap

As impressive as the rising tide of residential solar has been, the TPO model has not overcome all the financing challenges it faces. The TPO

model presents significant advantages to end-users: low up-front customer costs; ability to capture the value of equipment depreciation; and energy price certainty.

At the same time, TPO integrators have struggled with a number of issues, including a shortage of tax equity financing sources; a high cost of tax equity capital; limited ability to lever tax financing structures; ability to pass on REC value to customers; home sale liquidity; familiarity and simplicity; and financier system priority.

Third-party debt financing may present an opportunity to overcome some of these difficulties. End-users, developers and financing providers take a different view on which structure best addresses these issues. The following summary in Table 1 analyses whether a TPO or debt structure is better suited to resolve a particular residential solar finance challenge from the perspective of end-users, developers and financiers (or whether that party is neutral to the issue):

- *Financing sources* – The growth of residential solar through the TPO model has not been unbridled. No factor has limited residential solar deployment more than the availability of tax equity investment, and the consequence short supply has on cost. This investment is predicated on the existence of taxable income. For a time, this need was alleviated by “1603 cash grants”, which were offered in lieu of tax credits under the American Recovery and Reinvestment Act. Even at its most robust, the bench of residential tax equity investors has never run deeper than a dozen providers. Given the extensive universe of asset-based lenders that need no offsetting tax liability, the market for debt finance on solar is potentially much larger.
- *Financing costs* – Residential solar issuers have made it worth the while of willing tax credit investors. At times, after-tax yields for tax investors have been as high as the mid-teens (though they are lower now). Even as the cost of capital trends lower, the rates being offered by solar lenders are more favourable, with published rates as low as 6%. At some point, the lower cost

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of capital associated with debt financing, coupled with the end-user’s ability to retain solar tax credits and residual value, becomes more economically compelling than the customer’s ability to defer costs and monetise depreciation.

- *Up-front costs* – In a TPO structure, a customer has the opportunity to defer all up-front costs associated with going solar. There are “zero down” debt products in the market, though, at a minimum, the home-owner must be prepared to finance or advance the value associated with the investment tax credit.
- *Levered tax credit absorption* – The ability of the TPO model to defer end-user costs is compelling, but these costs must land somewhere for the system to be built. In the TPO model perhaps 50% of the value of a solar project can be funded tax credit and depreciation monetisation. However, due to an inability of lenders and tax investors to agree on their relative priority in a default, developers have been unable to create levered residential tax equity structures. Consequently, the developer winds up carrying the up-front costs in the TPO model. Recently, some developers have been able to mitigate this risk through back-levered portfolio financing, though the cost of back-levered debt is materially higher than an asset-backed loan. By contrast, the entire cost of a system can be removed from a developer’s balance sheet through customer debt financing. Further, this structure obviates the need to monetise tax credits, as the owner/end-user may claim them.
- *Depreciation absorption* – Consumer debt financing solves the issue of levered tax credit

TABLE 1 - TPO OR DEBT

Issue	End user preferred	Developer preferred	Financier preferred
Universe of Financing sources	Debt	Debt	Neutral
Finance cost	Debt	Debt	Neutral
Up-Front Cost	TPO	Debt	Neutral
Levered Tax Credit absorption	Debt	Debt	Neutral
Depreciation absorption	TPO	TPO	TPO
REC ownership	Debt	TPO	TPO
Energy price certainty	Debt	Neutral	Neutral
Home sale liquidity	Debt	Debt	Debt
Residual ownership	Debt	Neutral	TPO
Familiarity/simplicity	Debt	Debt	Debt
Financier priority	Debt	Debt	Debt

absorption effectively, though it is an imperfect solution. Unlike a consumer, a company in the business of leasing equipment to end-users may take a tax deduction for the depreciation associated with the equipment. Thus, customer debt financing strands value associated with the depreciation of the system that a TPO provider might be able to monetise. One way to view the relative economic superiority of debt and TPO models is evaluating whether the interest rate spread between debt and tax equity structures outweighs the value of equipment depreciation.

- *REC ownership* – An additional benefit for end-users that comes with customer system ownership is REC ownership. In jurisdictions with renewable portfolio standards, each MWh of energy that is generated by a solar system creates an REC for the owner of the system. A typical home may consume 11MWhs per year, perhaps half of which might be cost-effectively generated by a rooftop solar system. In the TPO system, RECs are typically reserved by the third-party owner. Moreover, developers and tax investors have historically been hesitant to pass the value of speculative residential RECs on to end-users in the form of lower lease or PPA payments. Debt financing enables the customer to own the system and the RECs it produces. As the REC markets mature, REC ownership will be a bigger piece of the value puzzle.

- *Energy price certainty* – Going solar is often seen as a way for end-users to hedge against rising electricity costs. This is partly true in TPO structures. Zero-down leases and PPAs will typically have rent/price escalators in the range of 2%–4% annually. The escalator can be “bought down” with a down-payment, though a down-payment partly undercuts one of the major selling points for the TPO model. Fixed-rate solar loans will ensure that the cost of the end-user’s solar power remains fixed for the entire term of the loan (until the loan is repaid, at which point solar energy costs drop to zero).

- *Home sale liquidity* – Most home-owners will live in their homes for between five and seven years. What happens to the solar contract when the owner moves? In the case of a lease or power purchase agreement, the end-user must either transfer the lease obligations to the new owner or make a buyout payment (which may include penalties for tax implications if the buyout occurs in the first five years). Will the presence of leased equipment, which may someday be removed, impair the value of the home? Can the lease or power purchase agreement be assigned? Uncertainty around these issues may result in discomfort about home sale liquidity for end-users.

- *Residual ownership* – While the TPO model creates short-term benefits for a home-owner by

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reducing the cost of electricity from lease signing, TPO customers build no equity in the systems they benefit from. End-users that debt-finance their systems may have higher up-front costs but, unlike TPO customers, they own the system when the financing is repaid. How important ownership is to a solar energy consumer is debatable – regardless, the all-in cost of ownership associated with debt financing is likely to be lower than that of TPO financing.

- *Customer comfort* – Another factor that has limited penetration of the TPO model is the perceived complexity of a lease or power purchase agreement. Consumers are very familiar and comfortable with car or mortgage loans that can be paid off at virtually any time. A solar lease is not dissimilar to an auto lease, though those products have their proponents and detractors. Whether perceived or actual, home-owners may have less comfort with a lease or power purchase agreement as a financing vehicle than a loan.

- *Financier priority* – One final concern tax investors harbour that lenders may not is how their interest in financed solar systems can co-exist with the rights of senior mortgage lenders. To the extent that a lender makes a secured loan, the liens of a mortgage lender attach to collateral fixtures. If a solar system is deemed a fixture to a mortgaged home, a tax investor could find that its interest in the system is subordinated to the rights of the mortgagee. Solar lenders have no such problems, as the Uniform Commercial Code, which has been adopted in every state, will permit a purchase of the money lender’s interest in a fixture to prime senior liens with an appropriate and timely filing. While the low solar default rate has made this more of an academic issue for tax equity financiers, it is not an issue that solar lenders have to worry about.

What’s next

Whether debt products will change the course of residential solar finance remains to be seen. With low up-front costs, strong market penetration and many purveyors, the tried and true TPO model promises to remain pre-eminent in the short run. Nonetheless, debt products are gaining ground on the establishment. If they don’t change the paradigm of solar finance, they have at least opened the discussion on the best value proposition for consumers. ■