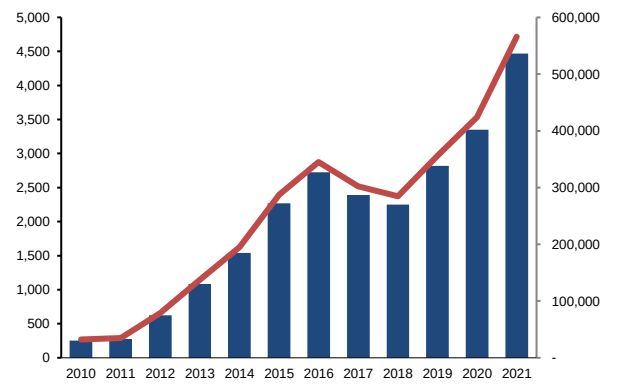
U.S. Residential Solar ABS 101

Introduction

Asset-backed securities ("ABS") secured by residential solar financing contracts continue to grow as a new sector of the U.S. securitization market with over $13.0BN of solar ABS issued since SolarCity's inaugural issuance in 2013. The key drivers of this expansion are the overall growth of the U.S. rooftop solar market and institutional investors' increasing comfort for this asset class. Solar ABS also benefit from the integration of Environmental, Social and Governance ("ESG") criteria in institutional investors' investment decisions.

The U.S. residential solar sector has experienced robust growth in recent years, with an estimated peak of more than 4.4GW of installed capacity in 2021, representing a 34% year-over-year increase from 2020. Despite the impact of the COVID-19 pandemic throughout 2020 and 2021, the residential market demonstrated its resilience and confirmed the strong fundamentals of solar energy. Installations were driven by California, which is historically the largest residential solar market, fast-growing states such as Florida and Texas, and also by stable installation growth in the Northeast.

Annual Residential Solar Installations
MW (left), Number of Households (right)



Source: GTM Research, Wood Mackenzie Power & Renewable, CACIB

Total solar capacity additions (utility-scale, residential and Commercial & Industrial ("C&I")) continue to grow and accounted for more than 54% of the total new generation capacity in 2021. However, solar power generation only accounts for about 4.0% of electricity generation, which underpins potential for significant growth in the coming years.

As solar equipment costs continue to decrease and battery storage technology improves, electricity from solar sources has become more competitive and will continue to support further growth in the coming years. These fundamentals are expected to hold steady as the proposed investment tax credit extension will further the growth of residential solar.

Solar Contracts

Given the up-front costs associated with installing solar rooftop and battery energy systems, homeowners typically obtain solar equipment through long-term contracts in the form of either lease agreements, power purchase agreements ("PPAs"), or solar loans. These contracts have tenors of 10 to 25 years, with options to renew. The solar developers offering these contracts are typically responsible for the installation and maintenance of the solar equipment throughout the term of the contract.

Leases

Customers pay a fixed amount per month, generally escalating every year and benefiting from the production of the panels installed by the developer providing the lease, regardless of actual production. The contracts typically include a minimum production guarantee to mitigate the risk of equipment underperformance. The minimum production guarantee payments are usually made by the developer to the homeowner and do not reduce lease payments (no netting). True-up payments at year-end may be required for over/under performance.

PPAs

Every month, homeowners pay for the actual solar energy produced with a cost per kilowatt-hour, typically escalating every year. In addition, PPAs may also include a production guarantee where the homeowner is compensated if production falls below a certain threshold.

Solar Loans

Homeowners enter into loans to finance the purchase, and installation, of solar equipment. Unlike leases and PPAs, the customer owns the equipment and can claim the associated federal and state tax credits. Loans are usually structured with the assumption that within 18 months after installation, the homeowner would have claimed the associated tax credits and would partly prepay the solar loan in an amount equal to the tax credit received. While less typical than under leases and PPA contracts, some developers include maintenance services, and even minimum production guarantees to their solar loans.

Under leases and PPAs, the customer does not own the solar equipment, which remains the property of the developer or of one of its affiliates. These contractual

arrangements, referred to as Third-Party Ownership ("TPO"), allow the Sponsor to monetize Investment Tax Credits ("ITC") and accelerated depreciation associated with the equipment. Current trends in the market suggests a shift from TPO contracts to solar loans. Wood Mackenzie estimated that in 2021, 60% of new solar installations would be financed by solar loans, and an estimated 70% by 2023.

Under all contractual forms, the fundamental nature of the arrangement is a long-term payment obligation from the homeowner that results in cash flow streams appropriate for securitization when aggregated in a sufficiently-diversified pool. In addition, TPO has allowed Sponsors to finance their portfolio with Tax Equity investors willing to monetize ITC and/or accelerated depreciation.

Tax Equity

In the U.S., Tax Equity remains a primary source of financing for leases and PPA-based solar portfolios. Market participants have become familiar with Tax Equity structures, and both warehouse facilities and Term ABS have been successfully structured on the back of these arrangements (i.e. "Back-Leverage").

Tax Equity structures can be fairly complex, but usually rely on one of the three structures below:

Partnership Flip

A partnership is formed between a Tax Equity investor and the Sponsor in which the underlying solar portfolio's cash flow allocation varies over time. The partnership is structured such that the Tax Equity investor receives the majority of cash flows, and the ITC and accelerated depreciation benefits, for at least the first five years of the transaction. The five-year period is the typical minimum recapture period. After this period, once the tax benefits have been fully monetized, the partnership "flips" and the Sponsor receives the majority of the cash flows.

Inverted Lease (Lease Pass-Through)

The simplest explanation is that the TPO provider leases the system to the Tax Equity investor, which then subleases the system to the homeowner. The TPO provider is able to pass through the ITC benefits to the Tax Equity investor, which provides the majority of the upfront capital and receives the ITC benefits and initial years' customer cash flows, while the TPO provider receives customer cash flows in the out years.

Sale-Leaseback

In this structure, the Sponsor sells the solar systems in their entirety to the Tax Equity investor and then leases back the systems. The Tax Equity investor can fully monetize tax benefits associated to the systems, since it is the actual owner of the equipment. The Sponsor then leases back the systems to the consumer.

Given the relative complexity of the structures and the legal costs associated with them, Tax Equity investors usually require a minimum investment size between $50MM and $100MM, which makes this source of financing unsuited for smaller portfolios. The majority of Tax Equity investors include banks and large corporations.

Solar ABS

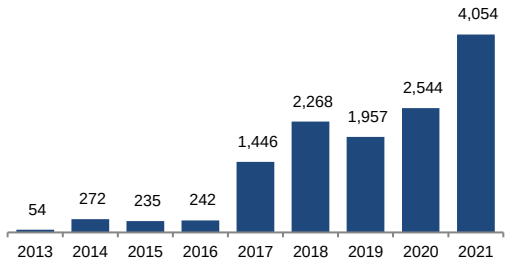
$4.1BN were issued for solar ABS in 2021, the best year on record. Solar ABS continues to establish itself as a reliable source of debt financing for the residential solar industry. As of December 2021, 56 solar ABS transactions have been successfully closed since 2013, for an aggregate issuance volume of over $13.1BN across offerings of different sizes, tenors and ratings. Market highlights include:

- Transaction sizes in the $50-550 million range.
- Senior tranches rated in the BBB to AA range.
- Subordinated tranches rated in the BBB+ to B range or even unrated.
- Mostly-residential portfolios with average FICO scores in the range of 730-770.
- Credit enhancement provided by a mix of debt subordination, overcollateralization, and reserve accounts, resulting in an average over-collateralization of 34% for senior tranches.

Below we discuss the above overarching trends in further detail.

Of note, many Sponsors have executed transactions in the private placement market and/or through bi-lateral transactions, that are not included in the analysis shown in the following pages.

Solar ABS
(Volume in $MM from 2013 to 2021)

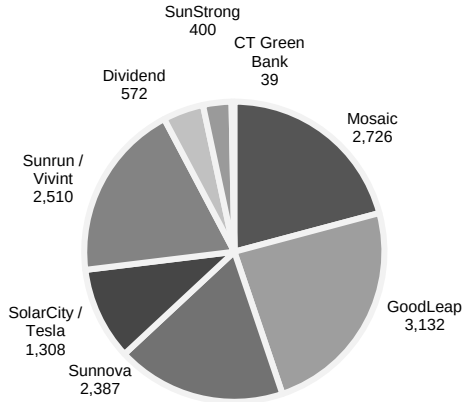


Source: CACIB and Kroll

Transaction Originators

92% of the overall solar ABS volume ($12.1BN) has been backed by pools originated by 5 solar companies. These leading originators include GoodLeap (fka Loanpal), Mosaic, Sunrun / Vivint, Sunnova, and SolarCity / Tesla.

Solar ABS by Issuers (Aggregate Volume in $MM)



Source: CACIB and Kroll

Portfolio Composition by Underlying Asset Type

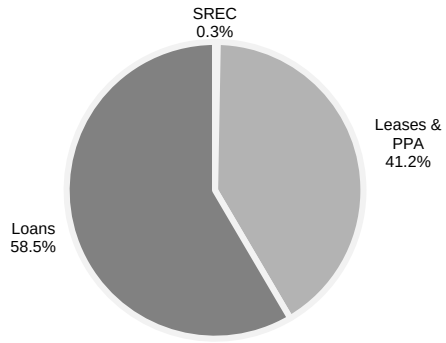
There are two main types of solar ABS, securitized by lease/PPAs or securitized by solar loans. From 2013 to 2017, solar ABS securitized by lease/PPAs accounted for almost 60% of total solar ABS transactions. Solar loans, have recently become the largest source of financing for residential solar installations, and are supporting more recent solar ABS, accounting for 74% of volumes in 2021. Considering the overall volume issued to date, solar loans now represent more than 58% of issuances.

Certain solar loan originators have expanded their product offering by allowing customers to finance both solar equipment and energy efficient home equipment (heating, ventilation, air conditioning, roofing, windows, etc.). This equipment is expected to translate into energy savings and reduce their carbon footprint. Usually the majority of proceeds are used to finance energy efficient equipment. In some instances, the loans are solely financing energy efficient products, in which case we observe shorter maturities, in the 10 to 15-year range.

There have been 5 ABS transactions that have been collateralized by loans used to finance energy efficient equipment solely. However, the energy efficient equipment loans remain a small portion of the overall pool supporting an ABS transaction, typically below 5%.

Further to the portfolio composition of solar ABS, in 2018, the Connecticut Green Bank issued a $39MM solar ABS backed solely by Solar Renewable Energy Credits (“SREC”). Of note, SRECs are part of the collateral of multiple Lease/PPA transactions.

Solar ABS Underlying Asset Type (2013-2021)



Source: CACIB and Kroll

Transaction Size

As solar installations accelerate and portfolios grow, transaction sizes of solar ABS have generally increased since the first transaction in 2013. Investors have also become more experienced with the asset class and larger issuances can now be placed in the Capital Markets. (See page 4 for graph).

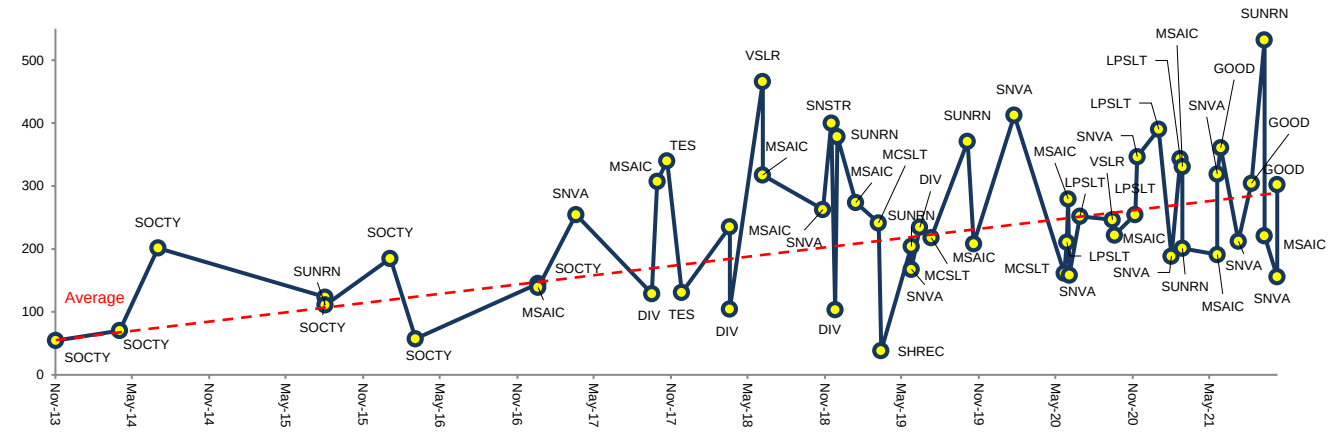
Advance Rate

The advance rate represents the total debt raised as a percentage of the underlying portfolio’s outstanding loan balance and/or net present value of the contracted solar cash flows, or aggregate discounted solar asset balance (“ADSAB”) for TPO contracts. It provides an indication of the credit enhancement. Issuers typically issue multiple tranches with different credit ratings to maximize aggregated advance rates. Since the first transaction in 2013, aggregate advance rates of solar ABS have generally increased. Aggregate average advance rates are also typically higher for loan vs TPO collateral. (See page 4 for graph).

Average FICO Score

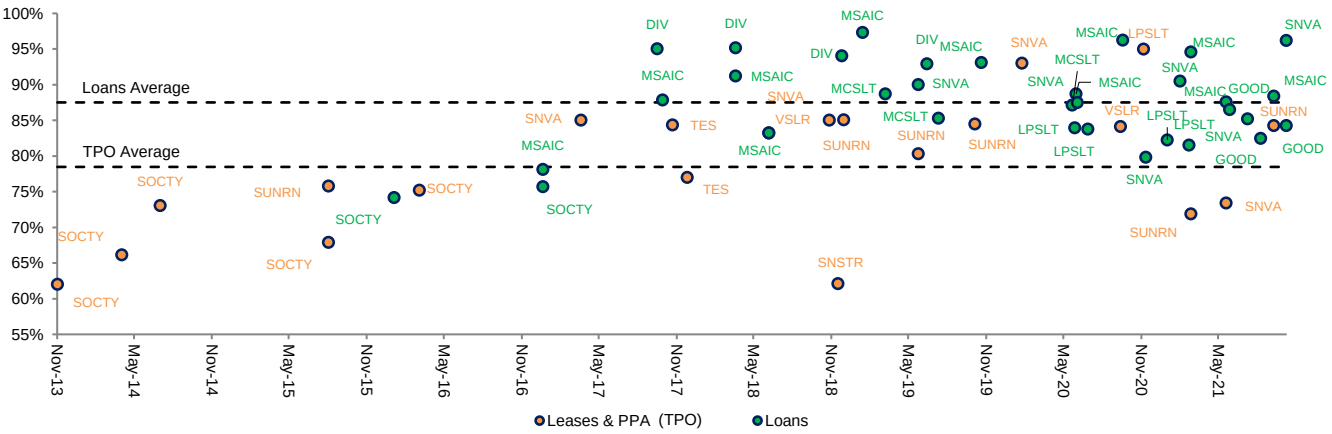
Strong underlying customer credit quality remains an important feature of solar ABS. Average FICO scores of 730-740 are typical, with most portfolios including only contracts with FICO scores of at least 650. Per traditional credit metrics, these customers would be classified as “prime”. (See page 4 for graph).

Solar ABS
Transaction Size ($MM)



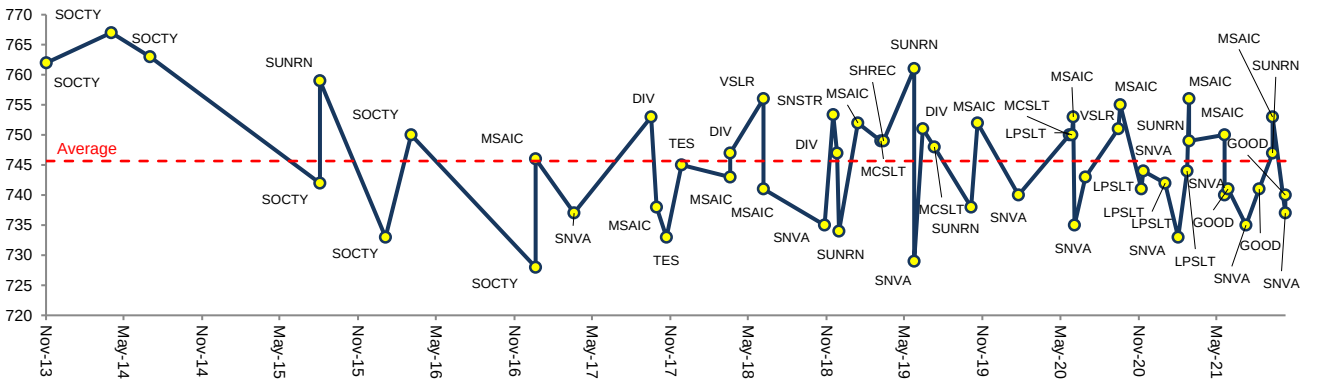
Source: CACIB and Kroll

Solar ABS
Aggregated Advance Rate



Source: Bloomberg, CACIB and Kroll

Solar ABS
Average FICO Score



Source: CACIB and Kroll

Structural Features

Credit Enhancement

Solar ABS transactions generally benefit from different types of credit enhancement. Credit enhancement consists of overcollateralization, subordination, excess spread, and reserves.

Overcollateralization

This credit enhancement seeds the Issuer with additional cash-generating assets that are used to cover potential shortfalls under stressed scenarios.

Excess Spread

The excess spread is the difference between the interest received on the collateral pool (interests on the loans) and the costs borne by the securitization structure (interest expense, servicing fees and other recurring fees).

The Excess Spread and Overcollateralization are coupled in solar loan securitizations with the notion of Yield Supplement Overcollateralization ("YSOC"), which denotes the difference between the loan cash flows discounted at their Annual Percentage Rate ("APR"), and the same cash flows discounted at a specific discount rate, approximating the cost of debt and servicing fee.

Subordination / Tranching

Most structures consist of the issuance of senior and subordinated securities, which are rated based on both overcollateralization and subordination of interest and principal payments. Structures can include a senior tranche (Class A), and one or more subordinated tranches (Class B, C, etc.). As per the structure waterfall and under certain conditions, subordinated tranches may receive interest only payments, or have interest deferred, until principal for the Class A is fully repaid.

Reserves

Solar ABS transactions typically include reserves to provide additional liquidity and to cover specific costs such as equipment replacement, insurance premium, or exercise of call options in relation to some Tax Equity structures (see below).

Transaction Structures

Solar ABS transactions may include the following structural features:

Priority of Payment / Early Amortization Period

Priority of payments is based on the seniority of the tranches. The following order is usually applicable: Class A interest, Class B interest, Class A principal, Class B principal, deferred interests. Priority of payments can be modified in case of lower performance, for instance when default triggers are met.

Early Amortization Period commences if the portfolio is performing below expectations. It can be triggered by minimum DSCRs, cumulative default levels triggers, and/or if the notes are still outstanding after the Anticipated Repayment Date (see below). Early Amortization is also triggered if the servicer and/or back-up servicer is no longer deemed able to fulfill their obligations. During an Early Amortization Period, all funds are usually applied to the repayment of interest and principal of the senior tranche.

Target Overcollateralization

Target overcollateralization ("Target OC") is commonly included in solar ABS to offer a minimum level of overcollateralization overtime. This ensures increasing the overcollateralization in a transaction after closing up to a certain level, effectively converting residual cash distributions into additional overcollateralization.

Reserves

Reserve accounts are funded at closing and/or during the life of the transaction. Reserves usually fall into the following categories but can also be aggregated into one reserve account in the financial documentation.

Liquidity Reserve: A liquidity reserve account is funded at closing to cover the equivalent of 3 to 6 months of interest on each tranche.

Equipment Replacement Reserve: This reserve covers costs for inverter replacement or other equipment associated with the portfolio of solar systems.

Supplemental Reserve: A supplemental reserve account can be funded at closing, and accumulating additional funds over time. Such reserve can cover funds for the purchase/withdrawal options associated with the related Tax Equity Funds and to cover the possible deductibles under to tax loss insurance policies.

Other Reserves: Solar ABS transactions can include reserves to provide additional liquidity if the collateral includes systems that have not yet achieved permission to operate ("PTO") or contracts with interest waiver and/or prepayment features.

Anticipated Repayment Date ("ARD")

ARD means the payment date when the Issuer expects to prepay the notes in full. The ARD is generally between 6 and 11 years after the closing date, while the final maturity is usually over 20 years. The failure of the Issuer to reduce the outstanding note balance to zero on the ARD will not be

an event of default, but usually triggers an Early Amortization Period.

Post-ARD Additional Note Interest

Post-ARD Additional Note Interest will begin to accrue during each interest accrual period on the notes at the related Post-ARD additional interest rate, if the outstanding note balance of the notes has not been paid in full on or before the Anticipated Repayment Date.

ITC Recapture Risk

The IRS may attempt to recapture a portion of the ITCs of a Project Company to the extent it concludes the claimed FMV of the PV Systems on the Project Company's tax return was overstated.

Tax loss insurance policies can be used to mitigate any reduction in the distributions associated with potential IRS recapture of ITCs. If a payment is required under a policy, the associated deductible can be paid by the Issuer via proceeds deposited in the Supplemental Reserve.

Backup Servicer

The Backup Servicer agrees to provide certain backup servicing services in the event the original servicer has to be terminated. The Backup Servicer will manage assets following termination of a servicing and/or maintenance agreement, as applicable.

Make Whole

The Issuer is typically required to pay a Make Whole if it decides to repay the notes in the first years of the transaction. The yield for calculating the Make Whole is generally equal to the yield on US Treasury securities having a remaining term to maturity that is closest to the weighted average remaining life of the notes plus 0.5%.

Rating Agencies

Rating agencies rely on dedicated rating methodologies, as well as on their generic consumer ABS and project finance methodologies to rate solar ABS. All solar ABS transactions executed in the 144A market to-date have been rated by at least one rating agency.

Standard and Poor's ("S&P") and Kroll have the most experience in rating Solar ABS with 7 and 51 transactions rated, respectively. In 2021, Fitch rated its first transaction for offerings backed by solar loans. Moody's has not yet publicly rated a transaction for this asset class, but has published specific reports and methodologies for solar securitization transactions.

Kroll has rated all recent public ABS for both PPA/Lease and Solar Loan portfolios. On the following page we recap the key stresses this agency applies on production estimates, O&M costs, default, renegotiation, and performance guarantee payments associated with PPA and Lease contracts. These estimates are presented assuming an underlying portfolio with prime credit metrics (i.e. average FICO in the 730-760 range) for different ratings. Most of the solar lease and PPA ABS include Tax Equity, which Kroll will also take into consideration in its analysis.

For Solar Loans, where the originator is usually not responsible for O&M and does not offer a performance guarantee, most of the concepts listed above are not applicable. For these transactions, Kroll estimates a Base Case Loss Range that is mainly driven by FICO metrics and historical performance of the originator (default, prepayment and recoveries). To assess the rating of each tranche, Kroll estimates the breakeven multiple that can be applied to its base case assumption until triggering a default.

Rating Agencies: Methodologies and Publications

	S&P Global Ratings	KBRA Kroll Bond Rating Agency	Moody's	FitchRatings
Applicable Methodologies & Publications	• "Global Methodology For Solar ABS Transactions" (May 2019) • "Key Credit Factors For Power Project Financing" (Sept 2014)	• "Global General Rating Methodology for Asset-Backed Securities" (Mar 2021) • "Global Structured Finance Counterparty Methodology" (Aug 2018) • "Global Consumer Loan ABS Rating Methodology" (Dec 2020) • "ESG Global Rating Methodology" (Jun 2021) • "Residential Solar Loan ABS: Sector Update" (Jan 2021)	• "Production-Dependent Solar Contract Securitizations Methodology" (Nov 2020) • "Approach to Rating Consumer Loan-Backed ABS " (Sep 2021) • "Generic Project Finance Methodology" (Jun 2021) • "Sector overview of solar lease and PPA Securitizations" (Apr 2018) • "Solar loans: a new ABS collateral type with familiar risks" (Jul 2017)	• "Global Structured Finance Rating Criteria" (Jun 2020) • "Consumer ABS Rating Criteria" (Mar 2021)

Source: Rating Agencies, CA CIB

Kroll Rating Scenarios: Lease/PPA

Category	Description	Base Case	A-	BBB	BB
Energy Production	*Production assumption for the portfolio*	P50	P90	P90	P75
Panel Degradation Rate	*Year-on-year reduction of the panel production*	0.64-0.75%	1.07-1.26%	0.60-1.00%	0.50-1.00%
Availability	*Availability assumption*	98.00-99.00%	94.00-98.00%	96.00-98.00%	97.50-98.00%
Permanent Default Rate	*% of defaulted customers. Customers never pay again*	3.00-6.00%	11.00-18.0%	8.00-10.00%	3.00-8.00%
Renegotiation Rate	*% of customers who resume payments at lower renegotiated rate*	5%, 10%, 15% customers on years 5, 10, 15	30%, 40%, 50% customers on years 5, 10, 15	22.5%, 30%, 37.5% customers on years 5, 10, 15	10%, 15%, 20% customers on years 5, 10, 15
Renegotiation Lag	*No cash collected during this period*	After 3 months downtime	After 12 months downtime	After 9 months downtime	After 6 months downtime
Renegotiation Haircut	*Assumes customers renegotiate based on their estimated utility rate*	~5% below prevailing utility rate in state	~20% below prevailing utility rate in state	~15% below prevailing utility rate in state	~10% below prevailing utility rate in state
O&M Expenses	*O&M assumptions*	$24-25 / kW DC increasing at 2% annually	$27 / kW DC increasing at 2% annually	$26.5 / kW DC increasing at 2% annually	$24-25 / kW DC increasing at 2% annually
Performance Guarantee Payments	*Payments estimated on production profile*	P50	P90	P90	P75
Inverter Replacement Frequency	*Inverter replacements schedule*	During years 10-13	During years 10-13	During years 10-13	During years 10-13
Inverter Replacement Cost	*Replacement cost assumption*	$1,000-1,100 per inverter	$1,325 per inverter	$1,275 per inverter	$1,150 per inverter
Flip Dates	*For IRR-based TE funds*	Flip dates occur as anticipated	Flip dates driven by stress scenario	Flip dates driven by stress scenario	Flip dates driven by stress scenario

Source: Kroll Pre-sale Reports, CA CIB

Green Rating

Solar ABS can be considered for green certification as the underlying assets securitized contribute to climate change mitigation. Obtaining a green rating label opens access to a broader investor base including investors with sustainable investment mandates. Green certifications also support issuers' communication surrounding their ESG strategy.

Conditions to be granted a certification are in line with the Green Bond Principles. Key criteria include use of proceeds to be dedicated to financing renewable projects, and independent periodic audit on impacts metrics related to the Environmental Social and Governance performance of the assets such as the CO2 emissions avoided.

Examples of green-labelled Solar ABS include the $400MM SunStrong 2018-1 offering, which was given the highest Green Bond Assessment of GB1 by Moody's. More recently, the $302MM Goodleap Sustainable Home Solutions Trust 2021-5 received a favorable green opinion from Kroll in line with market ESG practices.

Conclusion

The rise in residential solar installations has led to a growing securitization market for distributed solar assets. Market participants are now familiar with this asset class and large transactions have successfully been placed.

The U.S. residential solar market is expected to continue growing with extension support from the ITC incentive for residential solar. The residential solar mandate in California, making solar systems mandatory to new homes, is a good example of how local authorities can continue to support the solar energy market, while state and federal incentives continue to fuel stronger growth.

Market acceptance, the continued interest in renewable transactions (PACE, C&I, etc.), and the improved competitiveness of solar energy, should continue to support the solar ABS market.

Solar ABS Issuances

US Issuances Until Year End 2021

Name	Originator	ADSAB or Pool Balance ($MM)	Aggregated ABS Size ($MM)	Underlying Asset Type	Residential / C&I	Capacity (MW)	Average FICO Scores	Aggregated Advance Rates	Coupon (Class A)	Pricing (Class A)	Ratings Agency	Ratings (Class A)	Date
GOOD 2021-5	GoodLeap	358.9	302.4	Loans	100% / 0%	N/A	740	84.25%	2.31%	95 bps	S&P / Kroll / Fitch	A / A / A	Oct-21
SNVA 2021-C	Sunnova	162.0	155.8	Loans	100% / 0%	N/A	737	96.17%	2.03%	80 bps	Kroll	AA-	Oct-21
MSAIC 2021-3	Mosaic	250.0	221.0	Loans	100% / 0%	N/A	753	88.38%	1.44%	75 bps	Kroll	AA-	Sep-21
SUNRN 2021-2	Sunrun	631.9	532.4	Leases & PPA	100% / 0%	244	747	84.25%	2.27%	120 bps	S&P / Kroll	A- / A-	Sep-21
GOOD 2021-4	GoodLeap	369.3	304.5	Loans	100% / 0%	N/A	741	82.45%	1.93%	95 bps	S&P / Kroll	A / A	Aug-21
SNVA 2021-B	Sunnova	249.3	212.4	Loans	100% / 0%	N/A	735	85.20%	1.62%	80 bps	Kroll	AA-	Jul-21
GOOD 2021-3CS	GoodLeap	417.4	361.0	Loans	100% / 0%	N/A	741	86.50%	2.10%	115 bps	Kroll	A	Jun-21
SNVA 2021-1	Sunnova	434.6	319.0	Leases & PPA	100% / 0%	149	740	73.40%	2.58%	140 bps	Kroll	A-	Jun-21
MSAIC 2021-2A	Mosaic	218.2	191.1	Loans	100% / 0%	N/A	750	87.55%	1.64%	80 bps	Kroll	AA-	Jun-21
SUNRN 2021-1A	Sunrun	279.6	201.0	Leases & PPA	100% / 0%	111	749	71.89%	2.46%	135 bps	Kroll	A-	Mar-21
MSAIC 2021-1A	Mosaic	350.0	331.0	Loans	100% / 0%	N/A	756	94.57%	1.51%	90 bps	Kroll	AA-	Mar-21
LPSLT 2021-2GS	Loanpal	421.3	343.4	Loans	100% / 0%	N/A	744	81.50%	2.22%	115 bps	Kroll	A	Mar-21
SNVA 2021-A	Sunnova	208.4	188.6	Loans	100% / 0%	N/A	733	90.50%	1.80%	120 bps	Kroll	A-	Feb-21
LPSLT 2021-1GS	Loanpal	474.3	390.1	Loans	100% / 0%	N/A	742	82.25%	2.29%	180 bps	Kroll	A	Jan-21
LPSLT 2020-3GS	Loanpal	434.5	346.7	Loans	100% / 0%	N/A	744	79.80%	2.47%	200 bps	Kroll	A	Nov-20
SNVA 2020-2A	Sunnova	268.2	254.7	Leases & PPA	100% / 0%	104	741	94.97%	2.73%	200 bps	Kroll	A-	Nov-20
MSAIC 2020-2A	Mosaic	230.6	222.0	Loans	100% / 0%	N/A	755	96.25%	1.44%	125 bps	Kroll	AA-	Sep-20
VSLR 2020-1A	Vivint	293.1	246.5	Leases & PPA	100% / 0%	160	751	84.10%	2.21%	175 bps	Kroll	A-	Sep-20
LPSLT 2020-2GF	Loanpal	300.7	251.8	Loans	100% / 0%	N/A	743	83.75%	2.75%	240 bps	Kroll	A	Jul-20
SNVA 2020-A	Sunnova	181.1	158.5	Loans	100% / 0%	N/A	735	87.50%	2.98%	180 bps	Kroll	A-	Jun-20
MSAIC 2020-1	Mosaic	315.1	275.2	Loans	100% / 0%	N/A	753	87.35%	2.10%	175 bps	Kroll	AA-	Jun-20
LPSLT 2020-1-GS	Loanpal	250.8	210.6	Loans	100% / 0%	N/A	750	83.96%	3.78%	N/A	Kroll	A	Jun-20
MCSLT 2020-1	Loanpal	185.5	161.6	Loans	100% / 0%	N/A	750	87.11%	3.59%	N/A	Kroll	A	Jun-20
SNVA 2020-1	Sunnova	443.5	412.5	Leases & PPA	100% / 0%	173	740	93.01%	3.35%	180 bps	Kroll	A-	Feb-20
MSAIC 2019-2	Mosaic	224.0	208.5	Loans	100% / 0%	N/A	752	93.08%	2.88%	N/A	Kroll	AA-	Nov-19
SUNRN 2019-2	Sunrun	439.2	371.0	Leases & PPA	100% / 0%	209	738	84.47%	3.61%	215 bps	Kroll	A	Oct-19
MCSLT 2019-2A	Loanpal	255.6	200.3	Loans	100% / 0%	N/A	748	78.36%	3.69%	190 bps	Kroll	A	Aug-19
DIV 2019-1	Dividend	252.5	234.6	Loans	100% / 0%	N/A	751	92.90%	3.67%	195 bps	Kroll	A-	Jul-19
SNVA 2019-A	Sunnova	186.0	167.6	Loans	100% / 0%	N/A	729	90.12%	3.75%	190 bps	Kroll	A	Jun-19
SUNRN 2019-1	Sunrun	254.1	204.0	Leases & PPA	100% / 0%	88	761	80.28%	4.00%	200 bps	Kroll	A-	Jun-19

Solar ABS Issuances

US Issuances Until Year End 2021 (Continued)

Name	Originator	ADSAB or Pool Balance ($MM)	Aggregated ABS Size ($MM)	Underlying Asset Type	Residential / C&I	Capacity (MW)	Average FICO Scores	Aggregated Advance Rates	Coupon (Class A)	Pricing (Class A)	Ratings Agency	Ratings (Class A)	Date
SHREC 2019-1	CT Green Bank	45.9	38.6	SREC	100% / 0%	109	749	84.13%	5.09%	285 bps	Kroll	A-	Mar-19
MCSLT 2019-1	Loanpal	272.2	222.4	Loans	100% / 0%	N/A	749	81.70%	4.34%	190 bps	Kroll	A	Mar-19
MSAIC 2019-1	Mosaic	281.3	259.7	Loans	100% / 0%	N/A	752	92.32%	4.37%	175 bps	Kroll	A	Jan-19
SUNRN 2018-1	Sunrun	547.2	378.5	Leases & PPA	100% / 0%	249	734	72.36%	5.31%	265 bps	Kroll	A-	Dec-18
DIV 2018-2	Dividend	N/A	103.5	Loans	100% / 0%	N/A	747	94.04%	3.72%	75 bps	Kroll	AA	Dec-18
SunStrong 2018-1	SunPower	586.0	400.0	Leases & PPA	100% / 0%	318	753	62.07%	5.68%	265 bps	Kroll	A	Nov-18
SNVA 2018-1	Sunnova	309.0	262.7	Leases & PPA	100% / 0%	108	735	85.02%	4.87%	175 bps	Kroll	A-	Nov-18
MSAIC 2018-2	Mosaic	381.6	317.5	Loans	100% / 0%	N/A	741	83.22%	4.20%	135 bps	Kroll	A-	Jun-18
VSLR 2018-1	Vivint	466.0	466.0	Leases & PPA	100% / 0%	N/A	756	83.22%	4.73%	175 bps	Kroll	A-	Jun-18
MOSAIC 2018-1	Mosaic	255.5	235.3	Loans	100% / 0%	N/A	743	95.15%	4.01%	N/A	Kroll	A	Apr-18
DIV 2018-1	Dividend	111.3	104.7	Loans	100% / 0%	N/A	747	92.06%	2.61%	N/A	Kroll	AA	Apr-18
TESLA 2017-2	Tesla	170.1	130.9	Leases & PPA	100% / 0%	96	745	76.96%	4.12%	185 bps	Kroll	A-	Dec-17
TESLA 2017-1	Tesla	403.2	340.0	Leases & PPA	100% / 0%	249	733	84.33%	4.33%	200 bps	Kroll	A-	Nov-17
MOSAIC 2017-2	Mosaic	343.7	307.5	Loans	100% / 0%	N/A	738	89.48%	3.82%	185 bps	Kroll	A	Oct-17
DIV 2017-1	Dividend	135.7	129.0	Loans	100% / 0%	N/A	753	95.00%	4.05%	N/A	Kroll	A	Sep-17
SNVA 2017-1A	Sunnova	299.6	254.8	Leases & PPA	100% / 0%	94	737	85.03%	4.94%	293 bps	Kroll	A	Apr-17
MOSAIC 2017-1	Mosaic	177.9	139.0	Loans	100% / 0%	N/A	746	78.11%	4.45%	255 bps	Kroll	A	Jan-17
SOCTY 2017-A	SolarCity	191.6	145.0	Loans	100% / 0%	55	728	75.67%	4.97%	290 bps	Kroll	A-	Jan-17
SOCTY 2016-1	SolarCity	76.4	57.5	Leases & PPA	100% / 0%	36	750	75.20%	5.25%	N/A	S&P / Kroll	BBB / BBB+	Mar-16
SOCTY 2016-A	SolarCity	249.5	185.0	Loans	100% / 0%	64	733	74.15%	4.80%	N/A	S&P / Kroll	BBB / BBB	Jan-16
SUNRN 2015-1	Sunrun	146.5	111.0	Leases & PPA	100% / 0%	56	759	75.77%	4.40%	230 bps	Kroll	A	Aug-15
SOCTY 2015-1	SolarCity	182.0	123.5	Leases & PPA	100% / 0%	108	742	67.86%	4.18%	230 bps	Kroll	A	Aug-15
SOCTY 2014-2	SolarCity	275.9	201.5	Leases & PPA	86% / 14%	118	763	73.04%	4.02%	180 bps	S&P	BBB+	Jul-14
SOCTY 2014-1	SolarCity	106.2	70.2	Leases & PPA	87% / 13%	47	767	66.12%	4.59%	230 bps	S&P	BBB+	Apr-14
SOCTY 2013-1	SolarCity	87.8	54.4	Leases & PPA	71% / 29%	44	762	61.99%	4.80%	N/A	S&P	BBB+	Nov-13

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