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Sunrun: “ESG” is for Everybody Screws the Government

Intro: RUN Rests on Three Shaky Pillars on a Foundation of Dubious Models

Muddy Waters is short Sunrun Inc. (RUN) because we see it as an uneconomic business built on three shaky pillars: The equity story of exaggerated "Subscriber Values" and "Gross / Net Earning Assets", funding growth through abusing tax incentives, and issuing ABS that could be exposed to a RUN bankruptcy. These pillars, in turn, are built on a foundation of dubious financial models. If one of these three pillars wobbles, RUN would likely face a funding gap and would require equity issuances to continue growing. Insiders have already become ultra-wealthy, having net sold shares since July 2020 for $205.9 million.[1] RUN is on its third CFO since January 2020.

Shaky Pillar One – The Pot of Gold at the End of the Rainbow

To create an equity story, RUN builds models that appear significantly divorced from reality. The below comments on the modeling are from a former finance employee at RUN (who worked with its models):[2]

> "That $3,000 [per customer] of renewal value is not real value. You should be very skeptical there… and you know, I would say there's significant creative license taken in calculating those renewal values. They're nowhere near what they should be; they're not being conservative… and in those numbers, in fact, it's the opposite. They've been quite aggressive, right?"
>
> "Now the in terms of the non-GAAP metrics like Subscriber Value that are used to basically explain to the Street and to investors, what are the underlying economics at a customer level… those numbers are completely, I wouldn't say they're made up numbers, but there's no validation… You should be highly skeptical."

We believe that a realistic range for Net Earning Assets is $426 million to $1.0 billion, an adjustment downward of between -77.5% and -90.4%. We explain our assumptions, and why we believe they are far more realistic than RUN's, herein.

Shaky Pillar Two – Bamboozling the IRS to Finance Growth

RUN has bamboozled the IRS by inflating the tax bases of its Power Purchase Agreements. Working with pliable appraisers, it turns systems for which arms length buyers claim tax bases of $3.38 / watt into approximately $5.00 / watt. We believe that this inflation is impermissible, especially considering that part of the basis inflation comes from including the value of the anticipated tax benefits *in the basis itself*.

[1] Bloomberg data
[2] Interview with Former RUN Executive A, October 2021

> "Appraisers, they usually discard the comparable sales method, on the theory that it's hard to find good data, which is a little hard to believe in the solar rooftop market, since most of these same companies make direct sales to consumers."[3]
>
> "Then when you get IRS audited, there's nothing much they can say. Of course, they do not have the solar expert[s] to do it."[4]

A whistleblower filed a complaint with the IRS in 2018 detailing this abuse, and apparently has provided significant evidence to the IRS. Were RUN's basis inflation disallowed on a go forward basis, we estimate that it would have an approximate $0.50 / watt funding gap to fill, which would imperil its ability to grow. With one of RUN's partnerships subject to a recently concluded audit pending a final determination from the IRS, we estimate that RUN could be liable for as much as $948 million – excluding interest and penalties. This could be well in excess of the amount insurers would contribute.

The below table summarizes our estimates of RUN's actual PV System values across the three IRS Methods for Q1 2022, as well as our adjustments:[5]

Fair Market Value Decomposition ($/watt)	Company	MWC	Overstatement
Income Approach	4.99	2.96	68.9%
Cost Approach	4.93	3.93	25.7%
Similar Transactions	3.38	3.38	
FMV	**4.85**	**3.65**	33.0%

Shaky Pillar Three – Issuing ABS that Could be Exposed to a RUN Bankruptcy

RUN relies on ABS issuances to finance its growth – we estimate that RUN's securitizations fund approximately $2.00 per watt. We believe that the ABS are exposed to bankruptcy risk because RUN has not created a reserve to remove or service customers' solar systems. RUN effectively purports to have transferred the assets of its PPAs to limited liability companies without reserving for associated liabilities. In a scenario in in which RUN files for bankruptcy (which could result from an IRS claw back of inflated tax incentives in excess of insurance contributions), we believe the ABS could bear the cost of ongoing O&M (and other unreserved) liabilities to RUN's solar customers, including for the removal of the PV systems.

The concept of a cash-burning company tapping the capital markets on the back of "mark to model" isn't new. RUN is more exposed though in that it is just as dependent on abusing government subsidies with its unduly aggressive models. The Annals of Corporate Failures are replete with companies whose dependence on MTM led to their rise, and ultimately, failure. RUN is vulnerable to skepticism about its models – which is entirely due – in both the capital markets and tax incentive funding channels, which seemingly gives it a larger vulnerability

[3] Interview with Renewable Energy Legal Expert D, October 2021
[4] Interview with Former Novogradac Executive E, November 2021
[5] We estimate that the direct sales price approximates the Market Approach valuation of the system. There are certain differences between direct sales and the PPAs / leases, such as the warranties and guarantees, but we believe that these are not material contributors to system value.

surface versus the run of the mill model-based failure. In our view, ABS investors should reassess both the risk of bankruptcy and their remoteness from it.

How RUN Builds Reality Intolerant Models

RUN utilizes two different sets of models to significantly manipulate values for investor and tax incentive purposes, respectively the "Investor Models" and "Tax Models." The Investor Models and one of the Tax Models, the "Income Approach" use a discounted free cash flow analysis. The net result of these models is to value RUN Power Purchase Agreements ("PPAs") at ~$4.75 to $5.00 / watt. We believe that a far more realistic approach would yield a value of approximately $3.65 / watt. After subtracting RUN's back leverage, the adjusted number leaves very little value for equity holders. Both the Investor and Tax Models are discounted free cash flow models that largely use common model drivers, albeit with slightly different assumptions. (There is an additional Tax Model, the Cost Approach, discussed infra.) Regardless, these assumptions are aggressive, and yield valuation results that, in our view, are significantly exaggerated.

To understand the assumptions underlying RUN valuations for both Investor and Tax Models, we analyzed four solar industry appraisals. While we were unable to obtain any RUN system appraisals, we were able to gain additional insight through conversations with former RUN finance employees. We were able to tie to RUN's published financial releases by using the techniques in the other appraisals and company statements.

We understand that the Investor Models, which produce the metrics of Subscriber Value and Gross / Net Earning Assets, utilize the below drivers – we discuss the bases for our assumptions infra:[6]

> *Renewal Rate*: RUN assumes that 90% of subscribers renew after the 20- / 25-year contract period through 30 years, at which time they will pay for electricity the panels produce at a 10% discount to utility prices.[7] This appears aggressive, and we sensitize churn rates from 20%-34% in Year 21; from 5%-10% in Years 22-25; 21%-36% in Year 26; and 12%-23% in Years 27-30.[8]
>
> *Panel Removal Cost*: RUN assumes zero cost from removing panels from customers' roofs, despite being contractually obligated to do so. We estimate the NPV of this cost at $668 million.
>
> *Maintenance Cost*: RUN assumes maintenance costs of $15 / kW. $24 per kW seems more realistic.

[6] RUN claims its Net Earning Assets represent the company's proportional claim on PPA cash flows, including cash flows past the contract period, net of payments to lenders & securitization holders and ongoing costs associated with the solar assets. RUN's Total Value Generated is its Net Subscriber Value in a period, which is a DCF-based number, less its own estimate of costs called Creation Costs, multiplied by subscriber additions in that period.
[7] RUN 2021 10-K, p. 59.
[8] We forecast higher churn in Years 21 and 26 as RUN has both 20- and 25-year contracts in its customer pool, which will experience elevated churn the year after they expire.

Panel Degradation Rate: RUN assumes an annual panel degradation rate of 0.5%. We believe that 0.75% is in line with industry norms.

Contract Default and Cancellation: RUN assumes no customer defaults or cancellations. We believe that a 3.75% default rate over the contract period is more realistic.

The tax incentives RUN's projects generate are based on two valuation approaches, weighted roughly equally to produce the final basis value. For tax purposes, RUN uses pliable appraisers to value the PPAs, rather than the actual equipment. The appraisers reportedly rely on management assumptions. Unlike outside auditors at large firms with substantial D&O, E&O and general liability insurance, legal and ethical obligations to clients and massive training programs, valuation firms tend to be small. They seemingly compete on their ability to provide the highest valuations, and operate with minimal IRS oversight. The first approach RUN's appraisers use is the "Income Approach", which is a DCF that utilizes substantially the same drivers as the Investor Models, albeit with slightly different assumptions. Some of these assumptions skew a bit more conservative than RUN's Investor Model assumptions; however, they make up for this by using the highly aggressive maneuver of adding the anticipated value of the tax benefits to the value of the PPAs. We estimate that this recursive approach to valuing the tax benefits adds approximately $.40 / watt, or 13.5%, to the Income Approach component of the tax basis. We believe that valuing the tax credit is an absurd interpretation of the statute, and is not what Congress intended.

The second approach is the "Cost Approach." RUN discloses (non-GAAP) customer "Creation Cost", which we believe roughly approximates the Company's Cost Approach valuation before the addition of a developer margin. For Q1 2022, RUN's reported Creation Cost was $4.11 per watt, to which we add a 20% developer margin to estimate RUN's claimed Cost Approach value at $4.93 per watt.[9] To calculate Creation Cost, RUN adds costs that we believe are ineligible for inclusion in a Cost Approach valuation, as well as unduly aggressive assumptions:

RUN includes construction in progress without adding associated capacity to the denominator.

RUN includes costs that we believe are ineligible, such as property taxes, call center costs, and billing costs.

RUN includes profit from acquired third-party systems, which leads to profit double-counting when a developer margin is added.

In addition, we believe a 15% developer margin is more appropriate, while we understand from a former RUN finance executive that RUN uses an approximate 20% developer margin.[10] A 15% margin is at the midrange of developer margins commonly used in Cost Approach valuations, per another executive, and thus is less aggressive.[11]

[9] Interview with Former RUN Executive A, November 2021
[10] Former RUN Executive A cited a developer margin for cost approach valuations of approximately 20%.
[11] Interview with Former RUN Executive B, November 2021

The common theme from industry experts is that the financings on which RUN depends to conduct its business are too complex for the IRS to understand. In the words of a former solar industry appraiser who now funds renewable energy projects:[12]

> "I don't think that the IRS has solar experts, so when they audit us, we [were] basically educating [them on] what's going on."

Why RUN's Investor Models and Income Approach Tax Model Don't Hold Water

RUN's Investor Models and Income Approach Tax Model are discounted free cash flow valuations. However, it is apparent that the assumptions used for renewal rates, system removal costs, operating & maintenance costs, panel degradation rates, and default rates are problematic. We believe that RUN and its appraisers assume at least 90% of PPAs will renew after the contract period for a total use period of 30 years.[13] This seemingly fails the laugh test when considering factors that cause churn, such as roof replacements, and system obsolescence. They also assume that there is no system removal cost because customers will forgive the removal obligation. We use a company favorable assumption that the NPV of the cost to remove a system is approximately $1,100. RUN assumes O&M costs of $15 / kW, whereas Kroll Bond Rating Agency and we assume $24 / kW.

Renewal Rate Overstatement

Both RUN's Investor Models and the Income Approach assume that no more than 10% of customers will terminate upon maturity at the end of the 20- or 25-year contract periods. We believe this is unduly aggressive because customers' roofs will need to be replaced, and the systems will be obsolete. Further, there is a significant risk that RUN's post-contract electricity rate assumptions are materially high.

The result of these renewal assumptions is to add approximately $3,000 in value for each PPA customer. RUN's business is too new for there to be any empirical evidence to support these assumptions, and we are highly skeptical that this value will materialize. A former RUN finance executive concurs:

> "That $3,000 [per customer] of renewal value is not real value. You should be very skeptical there… and you know, I would say there's significant creative license taken in calculating those renewal values. They're nowhere near what they should be; they're not being conservative… and in those numbers, in fact, it's the opposite. They've been quite aggressive, right?"

[12] Interview with Former Novogradac Executive E, October 2021
[13] RUN Q1 2022 Earnings Release; industry appraisals reviewed by Muddy Waters Capital

In the same conversation:

> "Now the in terms of the non-GAAP metrics like Subscriber Value that are used to basically explain to the Street and to investors, what are the underlying economics at a customer level… those numbers are completely, I wouldn't say they're made-up numbers, but there's no validation… You should be highly skeptical."[14]

The former finance employee is saying that RUN's renewal values fall into the category of highly speculative revenue with respect to aging and obsolete PV Systems. We therefore believe the IRS and the investing public should heavily discount and / or totally ignore them.[15]

Factors that Affect Renewal Rate: Roof Condition

Asphalt roofs are the most common roof type and typically last 25 years.[16] By the ends of their 20- or 25-year contracts, customers will be at the point of needing to replace their roofs, even if they were brand new at the start of the PPA. This makes the renewal assumptions uneconomic for homeowners if they need a new roof.

According to the RUN PPA, homeowners will have two choices as their roofs reach their replacement ages:

- If the homeowner needs to replace his roof and it is during the PPA term, he must pay RUN the cost of removing and reinstalling the existing system on his homeowner's roof.

- Once the PPA ends, if the homeowner needs to replace his roof, she could have RUN remove the PV System (at RUN's expense), but if she wishes for the same PV System to be reinstalled, the homeowner will have to pay those costs.

Factors that Affect Renewal Rate: Obsolescence

Once RUN removes the panels – at RUN's expense after the contract period – the homeowner can simply get a new, more efficient, and cheaper system installed with no legacy issues. The notion that a homeowner would pay to have 20+ year obsolete technology re-installed on his roof puzzles us. That seems equivalent to continuing to lease and repair a five-year-old iPhone, rather than accepting a free new iPhone with a two-year contact. The relative efficiency of monocrystalline panels, the type on RUN customers' roofs, improved by 37 percentage points from 2010 to 2020 alone:

[14] Interview with Former RUN Executive A, October 2021
[15] Evaluating Cost Basis for Solar PV Properties (treasury.gov)
[16] https://money.usnews.com/money/personal-finance/family-finance/articles/how-long-can-you-expect-your-roof-or-fridge-to-last

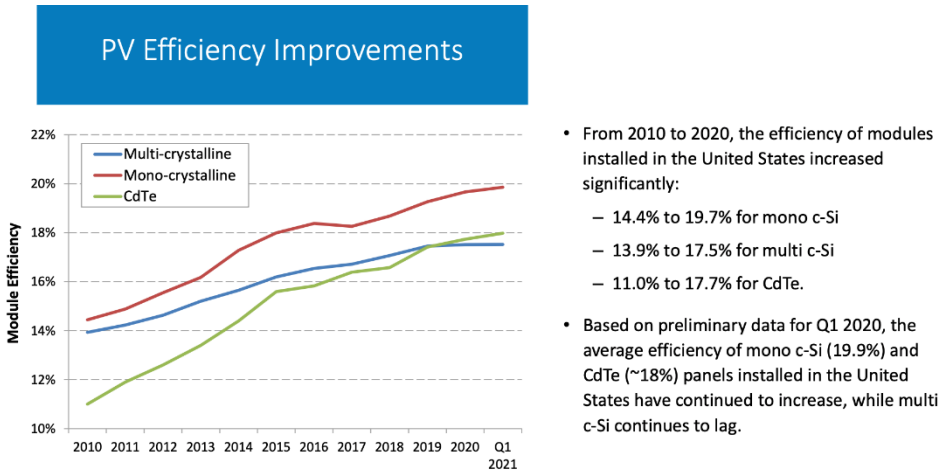


Figure 1: Solar Panel Module Efficiency Over Time[17]

Renewal Rate Aggression Conclusion

To believe RUN's 90%+ renewal assumption, you must believe that its homeowners are willing to pay a lot of money (20- to 25-years in the future) to put obsolete (and degraded) systems back on their roofs. That is an illogical argument unsupported by empirical evidence or common sense.

One former RUN executive we interviewed took a dim view of the company's renewal assumptions. Referring to the approximately $0.50 / watt value that RUN places on the renewal, he said,

> "The key distinction is that 50-cent delta [of Renewal Subscriber Value [per watt] is the reliance on renewals to create the full value. That 50-cent delta [per watt] … in the back of my head, I just took like a machete to that. No. The additional 50 cents of value creation is pretty suspect."[18]

To the extent a portion of RUN's ~589,000 PPA customers make the seemingly rational decision to end their contract after their initial PPA terms, the cash flows from those contracts will cease, decreasing Net Earning Assets. If RUN is forced to offer deeper discounts to retain business, that will also affect cash receipts and decrease modeled Net Earning Assets. Furthermore, if any customers cancel, RUN will be forced to cover the *undisclosed liability* of the removal expense, decreasing realized Net Earning Assets. In fairness to RUN, of its customer base, 101,000 own their systems outright, and thus RUN is under no obligation to remove their PV Systems. However, while it is good news for RUN to not have liability for that portion of its installed base, this significant number of arms-length purchases belies RUN's PPA valuations.

[17] https://www.nrel.gov/docs/fy21osti/80427.pdf
[18] Interview with Solar Executive C, October 2021

RUN's Models Ignore the Estimated $668 million Liability of System Removal

We adjust RUN's balance sheet and non-GAAP metrics due to its failure to reserve for panel removal liabilities, which we estimate are at present value $668 million. We believe that not including the cost of PV System removal increases the Net Earning Assets and Income Approach valuation by $0.11 / watt and $0.14 / watt, respectively.

RUN is contractually obligated to remove the PV System from the homeowner's roof and recycle the panels. Yet, the RUN party line is that customers will not want to remove the panels at the termination of their contracts.[19] RUN justifies its lack of panel removal reserves by stating that if customers do decide to remove or replace panels, they will enter into a new contract with RUN. Furthermore, the new contract will supposedly augment the Net Earnings Assets by an amount greater than the removal costs.[20] Apparently the Gross and Net Earning Assets of today contemplate contracts to be signed 20 or more years in the future to avoid booking liabilities today.

RUN ignores this contractual liability in its financial statements by assuming all customer relationships stretch to 30-years (even though their contracts end in 20 or 25 years) and then these homeowners evidently forgive RUN's obligation to remove the system. We estimate that the NPV of an average roof removal is roughly $1,100, which we believe is company favorable.

Our base case estimate for the cost of removing all RUN's PV Systems within its PPA / lease channel (where the Company is contractually obligated to do so) is a present value of $668 million if the homeowners exercise their non-extension options. We use a company friendly undiscounted assumption of $1,700 (NPV ~$1,100) per system removal, although estimates typically fall in the $1,800-$3,000 range with one industry expert believing the cost is about $5,000. We use 2022 dollars, inflated by 3% per annum and discounted back at 5%.

In contrast to RUN, Sunnova recognizes an Asset Retirement Obligation that applies to ~50% of its installed PV Systems.[21] According to Sunnova, "The liability is initially measured at fair value based on the present value of estimated removal costs… corresponding asset retirement costs are capitalized as part of the carrying amount of the solar energy system and depreciated over the solar energy system's remaining useful life."

Understated O&M Expenses of $15 / kW vs $24 / kW

We estimate that by understating operating & maintenance expense assumptions, RUN increases the Net Earning Assets and Income Approach valuation by $.07 / watt and $0.10 / watt, respectively. RUN is contractually required to provide operating and maintenance services to its PPA customers. According to the Kroll pre-sale reports, RUN claims its base annual O&M

[19] Communication with RUN Investor Relations, November 2021
[20] Conversation with RUN Investor Relations, December 2021
[21] Source: NOVA 202110-K, p. 88

expense cost is $15 / kW. RUN bears the risk of O&M cost overruns.[22] Kroll uses $24 / kW. Based on our conversations with industry experts, we believe that an arms-length cost should be $24 / kW.

Understated Annual Panel Degradation Rate of 0.5% vs 0.75%

We estimate that by understating the panel degradation rate assumption, RUN increases the Net Earning Assets and Income Approach valuation by $.07 / watt and $0.10 / watt, respectively. The Panel Degradation rate is the expected annual decrease in the capacity of the panels to generate electricity. RUN assumes a panel degradation rate of 0.5% per year. Kroll Bond Rating Agency commissioned a report from an independent engineer at Leidos Engineering. The engineer stated that a panel degradation rate assumption of 0.75% is appropriate.[23] Kroll assumes an even higher 1.3% degradation rate in its rating analysis. To be company favorable, we assume a 0.75% rate.

Understated Default / Cancellation Rate of 0% vs 3.75%

We estimate that by understating future customer defaults, cancellations, and contract renegotiations, RUN increases the Net Earning Assets by $0.05 / watt and Income Approach valuation by and $.06 / watt. We assume .25% of customers default, cancel, or renegotiate their contracts per year from Year 6 to Year 20. This sums to a rate of 3.75%, and is lower than the base case default rates of 4.2% to 6.5% used by Kroll Bond Rating Agency for RUN securitization ratings.

Double Counting the ITC

The most absurd example of RUN's aggression on the tax side is that its partnerships claim a tax basis for ITC purposes *that includes the value of the tax credit itself*. This also inflates RUN's Subscriber Value, which includes the value of the Membership A interest that is held by the tax equity investors. In other words, RUN essentially argues that U.S. taxpayers should give RUN a tax credit on the value of the tax credit the taxpayers are already giving RUN. This turns the statutory 26% ITC into a 35% ITC. We estimate that this tactic increases the Income Approach valuation for tax and collateral purposes by $0.40 / watt.

This feature of the RUN appraisal methodology treats tax credit proceeds as cash flows for valuation purposes. Solar developers including RUN include the amount of the ITC as eligible property for the purposes of calculating the FMV, which itself serves as the basis for an ITC, a practice we believe is absurd. The eligible portions of the cashflow for determining the ITC basis are detailed by the IRS, and the ITC is not included on that list.

The net result of RUN taking an ITC on an ITC is that a 26% ITC credit calculated against the Income Approach valuation becomes a 35% credit on the underlying eligible property:

[22] RUN 2020 10-K, p. 26
[23] KBRA Rating Report for RUN Vulcan Issuer 2021-1, LLC p. 5

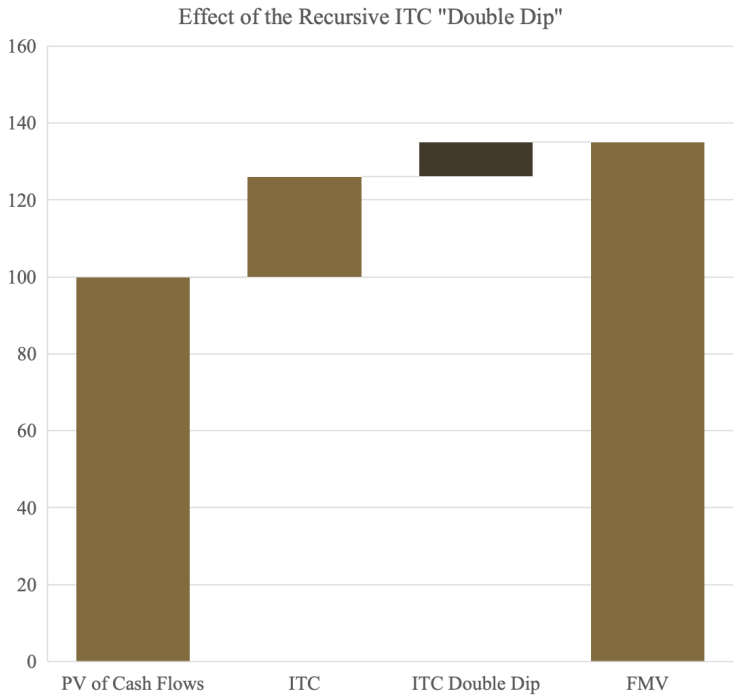


Figure 2: The Two-Stage Impact of Including ITC Proceeds in the Tax Basis

We believe that calculating ITCs in a recursive manner contradicts the intent of the legislation that created the ITC. ITCs are meant to subsidize or help offset equipment value, not increase it. Three solar executives explained to us that even if eligible property should not include the value of the ITC, solar financing vehicles have simply evolved this way with no IRS challenge to date. (We suspect that a challenge is coming.)

The chart below depicts our view of how RUN takes tangible equipment, splits the value between PPA cash flows and associated tax losses, and the ITC sold to a Tax Equity Investor. RUN's appraisals then combine both ineligible property and eligible property alike in the DCF and call it eligible equipment for purposes of calculating the ITC.

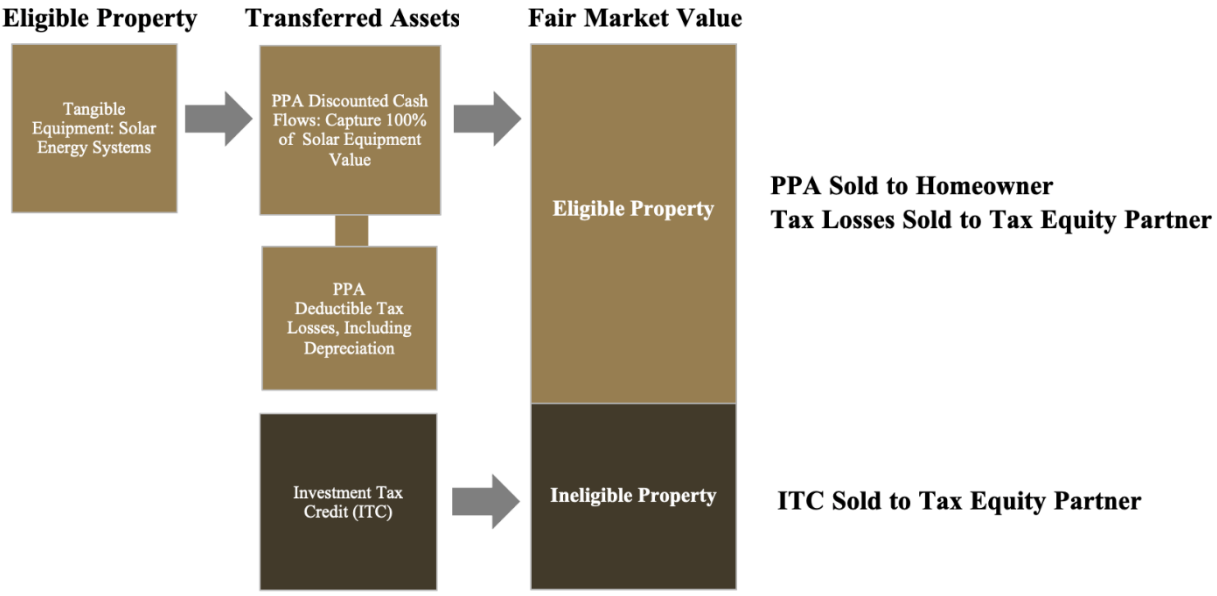


Figure 3: How ITC Proceeds End Up in Income Approach FMV

Some industry practitioners defend the use of ITC proceeds in calculating the ITC, but we do not believe their arguments hold water. As discussed supra, their main argument is that the IRS has never challenged the practice. We understand that their justification is that the Income Approach DCF uses the Partnership Flip fund's after-tax cash flows to calculate the ITC's tax basis, and the ITC is one such cash flow. In our view, this tortured construction defies common sense, and, at a minimum breaches the spirit of the law.

Tax credits are not named as allowable assets for the purpose of ITC calculation. The Consolidated Appropriations Act of 2015, Code Section 25D, states that the tax basis for ITCs is equal to the project's "qualified solar electric property expenditure".[24] Eligible property consists of tangible assets related to the generation of electricity, including:

- Solar PV panels, inverters, racking, balance-of-system equipment, and sales and use taxes on the equipment
- Installation costs and indirect costs
- Step-up transformers, circuit breakers, and surge arrestors
- Energy storage devices (if charged by a renewable energy system more than 75% of the time)

We don't believe that Congress intended for major banks and large technology companies to receive a significantly larger percentage tax credits than do individual homeowners.

[24] https://www.energy.gov/sites/default/files/2021/02/f82/Guide%20to%20Federal%20Tax%20Credit%20for%20Residential%20Solar%20PV%20-%202021.pdf

According to a former Novogradac executive:[25]

> "I do not think that the IRS has solar experts. So, when they audit us, we basically educating them on what is going on."

He continued:

> "They [the IRS] do not have enough expert[ise]"

Should RUN be prohibited from inflating tax bases going forward, we estimate that it would face a major funding gap as its ITC basis on which it claims the tax credit would decrease materially. We presume RUN would have to fill this gap through equity issuances, if able, or cease to exist.

Adjusting RUN's Subscriber Value, Net Earning Assets, and Income Approach Tax Model

After stripping out aggressive assumptions from RUN's $4.99 per watt Subscriber Value as of Q4 2021, our adjusted Subscriber Value produces a value of $4.19 per watt before sensitizing for churn. Applying three different churn scenarios laid out supra, we estimate adjusted Subscriber Value of between $3.70 per watt and $3.89 per watt.[26] This reduces the company's Q1 2022 Net Earning Assets to $3.2 billion before sensitizing for churn, falling to between $426 million and $1.0 billion after including estimated churn. The tables below show the adjusted Subscriber Value and Net Earning Assets, which decline 24.0% and 85.4% at the midpoint, respectively:

We Adjust Down RUN's Subscriber Value by 24.0% at the Midpoint	
Stated Subscriber Value, Q4 2021 *($/watt)*	4.99
Less: ITC in Value & Depreciation	(0.40)
Less: Panel Removal Liability	(0.14)
Less: O&M Expense Adjustment	(0.10)
Less: Panel Degradation	(0.10)
Less: Contract Renegotiation & Cancellation	(0.06)
Adjusted Subscriber Value, Before Churn Adjustment	*4.19*
Adjusted Subscriber Value, Churn Sensitization (MWC Est.)	
Low (75% of Base Case Estimate)	**3.89**
Base Case Estimate	**3.79**
High (125% of Base Case Estimate)	**3.70**

[25] Interview with Former Novogradac Executive E, October 2021

[26] We sensitize annual customer churn rates from 20%-34% in Year 21; from 5%-10% in Years 22-25; 21%-36% in Year 26; and 12%-23% in Years 27-30. We arrived at these projections by averaging MWC research team churn estimates for those years.

We Adjust Down RUN's Net Earning Assets by 85.4% at the Midpoint	
Stated Net Earning Assets, Q1 2022 *($millions)*	4,454.0
Less: Panel Removal Liability	(462.4)
Less: Panel Degradation	(252.2)
Less: O&M Expense Adjustment	(294.2)
Less: Renegotiation & Defaults	(210.2)
Adjusted Net Earning Assets, Before Churn Adjustment	*3,235.0*
Adjusted Subscriber Value, Churn Sensitization (MWC Estimate)	
Low (75% of Base Case Estimate)	**426.0**
Base Case Estimate	**648.9**
High (125% of Base Case Estimate)	**1,002.0**

It is important to note that the Investor Models for Gross / Net Earning Assets and Subscriber Value differ slightly. Gross Earning Assets is effectively an estimate of the remaining value of existing contracts, which we believe are aged three to four years in RUN's calculations. For our calculations, we assume 3.5 years of aging. To be a bit more precise, Gross Earning Assets refers to the value of the "Membership B Interest" that RUN retains in the project companies – we detail how these interests are structured in Appendix A. Net Earning Assets adjusts Gross Earning Assets by subtracting the "back leverage" (ABS holders and other lenders) and other adjustments. Subscriber Value purports to show the lifetime value of a new subscriber at T=0. This value includes the tax incentives, and the value is divided between the Membership A (the Tax Equity Investor) and B interests.

The table below shows our adjusted per watt Subscriber Value versus RUN's value:

We Estimate Sunrun Overstates Its Income Approach FMV by 29% and Subscriber Value by 32%		
($ per watt)	**RUN Claimed (MW Est.)**	**MW Adjusted**
PPA cash flows	2.51	1.96
Depreciation tax benefits	0.95	0.72
Income Approach FMV (Equipment Value)	**3.46**	**2.69**
State & Local Incentives	0.27	0.27
ITC	1.26	0.83
Subscriber Value (Membership A + B Transfer Value, Q4 2021)	**4.99**	**3.79**

RUN has already taken on $5.5 billion of back leverage against its asset base. We believe that RUN's heavily levered capital structure wipes out almost all of the company's claimed residual Subscriber Value of $3,166 per subscriber, which is a conclusion echoed by a former RUN finance executive.[27,28]

For the Tax Model Income Approach, we further decrease the valuation by $.40 / watt by taking out the value of the ITC and other incentives, which we believe are ineligible costs for ITC purposes. We believe that an intellectually honest Income Approach valuation would yield approximately $2.69 / watt, versus its present value of approximately $4.99 / watt. This adjusted valuation recognizes that the valuation-enhancing features of the PPA are more than offset by the obligations enumerated above, yet are ignored by RUN's appraisals.

[27] Interview with Former RUN Executive A, October 2021
[28] RUN Q3 2021 Earnings Presentation, p. 6

Note that our adjusted Income Approach sits well below RUN's price of $3.38 / watt for systems it sold directly to customers in Q1 2022.[29] Because the Income Approach should yield this result lower than the direct selling price, as we show infra, to be company favorable, the Tax Models should average RUN's direct selling price with a (more intellectually honest) Cost Approach. (Averaging the $3.38 / watt direct selling price with our adjusted Cost Approach yields a tax basis of only $3.65 / watt.)

These figures are close to the figures and haircuts calculated by Kroll in its Athena 2018 pre-sale report. Our valuation is lower than Kroll's because Kroll does not appear to have reviewed a PPA that lays out all of the financial obligations running from RUN to the homeowner (e.g., PV System removal). Kroll applied a total haircut of 49.3% with no value placed on the non-contracted cashflows. With these non-contracted cashflows considered the haircut is 40.4%. While the figures may be slightly different from the figures we have calculated, the conclusion remains that RUN is significantly overstating the value of its PPAs.

Why RUN's Cost Approach Tax Model Doesn't Hold Water

RUN, in our view, uses similarly unrealistic figures to pad the Cost Approach Tax Model. We believe that RUN uses disallowed costs as part of its tax basis. Our Adjusted Cost Approach valuation suggests that RUN's Cost Approach Tax Model valuation is overstated by 25.7%. RUN discloses customer "Creation Cost", which roughly approximates the Company's Cost Approach valuation after the addition of a developer margin.[30] For Q1 2022, RUN's reported Creation Cost was $4.11 per watt, to which a 20% developer margin is added for an estimated claimed Cost Approach FMV of $4.93 per watt.[31]

RUN's permitted costs associated with creating a customer, in our view, include:

- Installation
- RUN-Built Systems
- Channel Partner Systems
- Sales & Marketing
- General & Administrative
- Platform Services Credit (netted out in the company's calculation)

However, RUN includes costs in Creation Cost that are seemingly not permitted by IRS guidelines for Cost Approach valuation: Construction in Progress, certain P&L Costs, and Profit from Acquired Systems. RUN, we understand, adds an inappropriately large Developer Margin of approximately 20%.

[29] RUN Q3 2021 Historical Model, available at https://investors.RUN.com/news-events/press-releases/detail/248/RUN-reports-third-quarter-2021-financial-results
[30] Conversation with RUN Investor Relations, December 2021
[31] RUN Q2 2021 Historic Financial and Metric Model

Construction in Progress Manipulates Results

RUN is constantly building PV Systems. There is a matching cost to revenue, or a matching cost to systems, problem. RUN does not match the costs to their system flow. When there is a growing pipeline, this pulls costs forward and has the effect of inflating the cost structure of RUN. RUN uses this to inflate its cost estimates and overinflate its tax basis for this FMV calculations.

Construction in progress inflates costs when the pipeline is growing, so we remove this bias to the cost structure. We do not include construction in progress in the completed system cost, which should instead be matched with completed system capacity. To add any costs related to construction in progress to the numerator of the cost per watt calculation would require the completed solar capacity in the denominator to be adjusted higher to make the costs and solar capacity apples to apples.[32]

Including Ineligible P&L Costs

We exclude certain costs associated with managing RUN systems, including property taxes, call center costs, and billing expenses. A solar industry executive told us that although these expenses are often lumped into the Cost Approach, they are not costs associated directly with the solar equipment and should be removed.[33]

Double Counting Profit From Acquired Third-Party Systems

Since we add a blanket developer margin at the end of our Cost Approach calculation, we remove RUN's profit from acquired third-party systems to avoid double counting the allowed profit. Third-party systems are PV Systems that are purchased on an arms-length basis from installers that rely on RUN for assistance monetizing their systems.

Aggressive Developer Margin of 20% vs 15%

We believe that RUN is applying an aggressive developer margin to its costs. Former RUN Finance Executive A stated that the company used a margin of approximately 20%. Another expert who also previously worked at RUN gave 15% as the midpoint of appropriate developer margins to claim. Accordingly, we apply a 15% mark-up to arrive at our adjusted Cost Approach FMV.

[32] Conversation with RUN Investor Relations, December 2021
[33] Interview with Solar Executive C, October 2021

Adjusting RUN's Cost Approach Tax Model to $3.93 / Watt

Adjusting for the above costs that we believe are prohibited yields an adjusted Cost Approach valuation of $3.93 / watt. Even this could be generous. RUN's cost structure seems to be significantly higher than the industry as a whole.

- Removing Construction in Progress from the completed system cost reduces RUN's Q1 2022 Creation Costs by $.19 / watt.

- Removing P&L Costs not available for tax basis purposes reduces RUN's Q1 2022 Creation Costs by $.34 / watt.

- Removing Profit from Acquired Third-Party Systems reduces RUN's Q1 2022 Creation Costs by $.16 / watt.

- Reducing RUN's Developer Margin from what we understand is 20% to 15% reduces RUN's Q1 2022 estimated Cost Approach valuation by $.31/watt.

After making the adjustments to RUN's reported Creation Cost, the cost to install a system begins to come in line with what one would expect: The cost of labor, materials, SG&A, and sales & marketing totaling to $3.41 per watt, and $3.93 per watt after adding in a 15% margin. Accordingly, we estimate that RUN's Cost Approach FMV is overstated by 25.7%.[34]

We Estimate that Sunrun's Cost Approach Valuation is Overstated by 25.7%	
Reported Installation Cost, Q1 2022 *($/watt)*	3.00
Profit Associated with Acquired Systems, Est.	(0.16)
Construction in Progress	(0.19)
P&L Cost Not Available for ITC Purposes	(0.34)
Adjusted Installation Cost	2.30
Sales & Marketing	1.15
G&A	0.15
Platform Services	(0.19)
Adjusted Creation Cost	**3.41**
Developer Profit Margin (at 15%)	0.51
Adjusted Sunrun Cost Approach FMV	**3.93**
Sunrun Stated Creation Cost	4.11
Developer Profit Margin (at 20%)	0.82
Sunrun Implied Cost Approach FMV	**4.93**
Sunrun Cost Approach FMV Overstatement (MWC Estimate)	**25.7%**

Note that RUN is selling these assets to homeowners for $3.38 per watt in Q1 2022 (its most recent quarterly report) while claiming that its costs to create that asset are $4.11 per watt. In our opinion, RUN has little interest in selling systems for $3.38 per watt, but that is the market price.

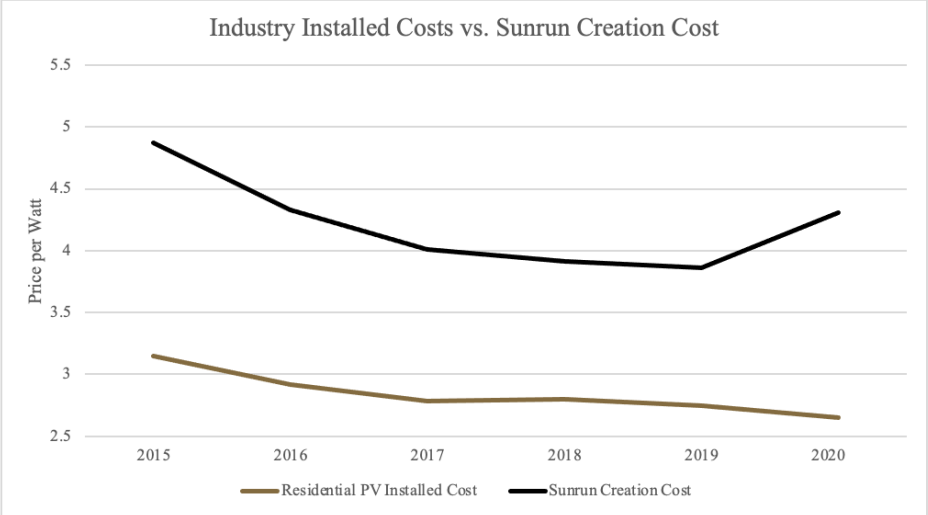
[34] The appraisals we reviewed had developer margins ranging from 15% to 20%. We believe a 15% margin is appropriate, and we assumed that RUN uses 20% as a developer margin.

RUN's business objective appears to be to enter into as many PPAs as possible and mark them at the inflated rates.

RUN's Hard Cost Structure Seems High Compared to the Industry, Implying an Even Lower Cost Approach Valuation

The Cost Approach is meant to measure the actual cost to build the PV System, and incorporates hard costs, certain soft costs, and a profit margin.[35] However, RUN's self-reported hard costs seem significantly higher than industry norms. We have no reasonable explanation for this differential other than gross inefficiencies or perhaps misreporting of disallowed SG&A costs as COGS.

Industry cost deflation highlights RUN's outlier status. Panels, inverters, and other solar components became cheaper over the period, declining 16%. However, RUN's Creation Cost decreased only 12% over the period from 2015-2020, exceeding industry costs by $1.66 per watt in 2020:



Sources: RUN Supplemental Cost Memos, FY2017-FY2019; RUN Earnings Press Releases, Q1 - Q4 2020; NREL U.S. Solar Photovoltaic System and Energy Storage Cost Benchmarks: Q1 2016 - Q1 2021.
Note: We align Q1 NREL benchmarks to the preceding calendar year and use 2020 dollars; Creation Cost assumes a 20% developer profit

Figure 4: RUN Creation Costs Have Fallen Slower than the Industry and Remain Elevated

35 https://www.treasury.gov/initiatives/recovery/Documents/N%20Evaluating_Cost_Basis_for_Solar_PV_Properties%20final.pdf

Earlier this year, we received the below cost breakdown from a residential installer based in New York.

Installation Costs for New York-Based Solar Company	
($/watt)	**Hard Costs**
Modules	0.42 to 0.99
Inverter	0.31
Monitoring	0.04
Racking	0.13
Balance of System*	0.04
Total Hard Costs	**0.94 to 1.51**
	Soft Costs
Labor	0.14
Commissions & Marketing	0.42
Permitting	0.28
Total Soft Costs	**0.84**
Total Costs	**1.78 to 2.35**

**Incidental costs of installing the PV System. This includes screws, wires and other minor expenses.*

This is about two-thirds of the amount of hard costs reported by RUN. RUN is one of the largest residential solar firms, and intuitively should have greater bargaining power with suppliers and economics of scale, versus those of a regional installer.

RUN is at Risk of a Funding Gap due to an Inability to Use Aggressive Valuations; it is also at Risk of a Claw Back that Could Reach $948 million

As a result of RUN's overstated FMVs, we calculate that the company has monetized $948 million in disallowable ITCs and tax losses since 2018. In a further demonstration of the company's aggression, we estimate that over half of the improper claims occurred in the last twelve months. This aggression could pose an existential risk to the company. RUN is incented to employ inflated appraisals, because the byproduct of those inflated appraisals is tax credits that it can effectively sell via partnership flip transactions.

RUN is the subject of an IRS whistleblower complaint filed in 2018, and its partnership flip structure seemingly comes close to – if not crosses – the line of impermissibly selling the tax incentives. We believe that these factors mean that the risk of an adverse IRS action is not immaterial, and we think the insurance coverage could be insufficient to cover RUN's liabilities. RUN has repeatedly disclosed IRS audits in its quarterly and annual SEC filings. The most recent 10-Q discloses a recently concluded audit of what we believe is the Athena 2018-1 securitization, with a final determination yet to be issued:[36]

> "The IRS audited one of our investment funds covered by our 2018 insurance policy in an audit involving a review of the fair market value determination of our solar energy

[36] RUN Q2 2021 10-Q, p. 75

> systems. If this audit results in an adverse final determination, we may be subject to an indemnity obligation to our investor, which may result in certain limited out-of-pocket costs and potential increased insurance premiums in the future."

One of the industry experts with whom we spoke could have been referencing RUN when he discussed the ongoing audit of a major market participant:[37]

> "Yeah. Now to be sure, I have seen companies who I thought were very aggressive just in their tax basis. I couldn't name names, but I've seen some pretty aggressive stuff… I believe at least one of them, it's sort of an open secret in the industry that I've heard from a couple of tax lawyers, at least one of them is going through a whole series of audits right now."

There appears to be several possible outcomes from the recently concluded IRS audit, including:

- The IRS claws back RUN's historical ITC overstatements after a determination of fraud. We suspect the insurance is inadequate and insurers are unlikely to pay any claims in a timely matter. As RUN has indemnified its tax investors for such liabilities, this could result in an estimated $948 million liability due the federal government or other financing partners. We believe this could be an existential problem for RUN.

- The IRS claws back RUN's historical ITC and there is no determination of fraud. In this case the insurance companies will likely litigate this matter for a number of years and if they lose, then they will pay at the conclusion of litigation. We argue infra that the insurance policies could be insufficient to cover the tax liability. In the meantime, the ABS and the rest of the RUN financing chain could collapse as cash flows would be lower than forecast. We believe this could be an existential problem for RUN.

- If the IRS states that exaggerated FMVs are prohibited on a go-forward basis, RUN will have to fill an estimated shortfall of approximately $0.50 / watt, as its Tax Equity investors will not be paying as much for their partnership interest. We believe this is could be existential problem for RUN.

- The IRS determines that there is no issue. In this case, estimated Net Earning Assets remain massively overstated in our view, meaning that forecast cash flows will likely not materialize. Although slower, this is could also be an existential problem for RUN.

<u>RUN is at Elevated Audit Risk because of its Tax Equity Structure</u>

It is also important to note that where an arms-length relationship cannot be established, the entire concept of the FMV may be jeopardized. In 2011, the IRS noted that "a stated cost may be inconsistent with the eligible property's true tax basis "where a transaction is not conducted at arms-length by two economically self-interested parties or where a transaction is based upon 'peculiar circumstances' which influence the purchaser to agree to a price in excess of the

[37] Interview with Former RUN Executive B, November 2021

property's fair market value."[38] In our view, RUN's financings are exactly this kind of cautioned transaction: One in which economic parties with mutual interests come together to create the illusion of an elevated FMV, and where, RUN effectively never relinquishes control of the asset.

We find that the Partnership Flip is a convenient, non-arms-length conduit for overvaluation. RUN effectively transfers the vast majority of the value associated with the 20- or 25-year PPA to itself, while the Tax Equity Investor takes the ITC and tax losses and generally recoups its investment by the end of the first year. We believe that Partnership Flips are more of a financing than a sale, as the Tax Equity Investor's interests are structured primarily as guaranteed tax credits and deductions, not the project cash flows. There is no real downside to the tax equity investor's investment, either, and no real upside. Notably, the Tax Equity Investor's IRR is virtually locked in from the outset, because it is buying the ITC and tax benefits at a discount to face value.

A former RUN executive stated that the economics from the Tax Equity Investor's perspective look much more like those of a financing, while RUN referred to tax equity as "effectively debt."[39,40] We believe that such characterizations may pose a significant issue for IRS audit.

In a memo from the law firm Norton Rose Fulbright, the firm said the following about this issue:[41]

> "There has been an internal debate within the IRS for a number of years about whether the agency should issue separate guidelines for solar transactions. Some IRS lawyers have wondered whether the fact that the tax equity investor in a solar project is likely to reach its return much more rapidly than in a wind deal, through an upfront investment credit plus possibly a depreciation bonus and utility rebates, and the fact that these elements of the return are not tied to project performance, require that solar transactions be analyzed differently from wind deals. At the end of the day, the basic question is the same: is the tax equity investor a real partner with meaningful upside and downside risk of a business or is it a bare purchaser of tax benefits or a lender earning essentially a fixed return?"

[38] https://home.treasury.gov/system/files/216/N-Evaluating_Cost_Basis_for_Solar_PV_Properties-final.pdf. Although this document talks about the Section 1603 direct payment program, we believe the IRS's standard for tax basis does not change based on the type of monetary disbursement.
[39] Conversation with Former RUN Executive A, October 2021
[40] Conversation with RUN Investor Relations, December 2021
[41] https://www.projectfinance.law/publications/2015/july/the-partnership-flip-guidelines-and-solar/

Insurance Could be Insufficient to Cover an IRS Claw Back

As companies like RUN have become more aggressive with the ITCs they claim, Tax Equity investors have required increased protection. Because RUN is not a highly rated corporate credit, and the claw back is a major concentrated risk for RUN, tax equity investors and ABS investors have required insurance for potential IRS claw backs. As a result, Kroll and the tax equity investors have required RUN to procure insurance to cover the IRS's potential claw back of some of the ITCs and other tax benefits claimed in respect of RUN's PV Systems.

RUN indemnifies the tax equity investors should the IRS claw back some of the ITC benefits the tax equity investors have claimed. Given that the Tax Equity Investor is senior to the sponsor equity and the tax equity has the right to all of the cashflows from the PV System, RUN has indemnified the top of the waterfall and therefore, has essentially issued indemnification for all parties for the possible action of the IRS. Moreover, we believe that there is a material risk that any insurance covering potential claw backs may be void if there is a determination of tax fraud, which could subject RUN and the tax equity investors to significant liabilities, and ABS holders to reduced cash flows.

To understand the underlying exposure of the tax equity investors, we must take a closer look at the insurance for the tax claw back risk. We believe that if the IRS acts to claw back the excess tax benefits, the best the tax equity investor can hope for is protracted litigation preceding a resolution.

However, this likely does not capture the full exposure of the tax equity investor. Even if the insurance policy is honored in full in a timely basis, their full losses may not be covered, if the IRS choses to act.

The Sunrun Vulcan 2021-1 securitization, combined with RUN filings and our estimates, produces the following figures:[42][43]

- The ITC was grandfathered at 30% of the FMV;
- Insurance covers up to 36% of the ITC amount;
- Our estimate of RUN's claimed FMV for 2021 was $4.85 / watt;[44]
- RUN's 2021 direct sales price (which we view as equivalent to the Market Approach) was $3.16 / watt and our average adjusted Cost Approach valuation was $3.73 / watt, for an overall estimated adjusted FMV of $3.45 / watt;

With this information, we can calculate the total exposure of the Tax Equity Investor to claw back pre- and post-insurance.

[42] KBRA Rating Report for RUN Vulcan Issuer 2021-1, LLC.
[43] RUN 2021 10-K and Q1 2022 Historic Financial and Metric Model; MWC Estimates
[44] This is the average of quarterly Subscriber Values in 2021 in 2018, $4.94 / watt, and quarterly estimated RUN Cost Approach valuations of $4.75 / watt.

- The claimed ITC was 30% of $4.85 / watt, or $1.45 / watt;
- The ITC we believe to be supportable would be 30% of $3.45 / watt, or $1.03 / watt;
- The excess ITC claimed was thus $0.42 / watt, on an excess ITC basis of $1.40 / watt;
- The insurance was 36% of the claimed $1.45 / watt from above, or $0.52 / watt, only $.10 / watt larger than the excess ITC claimed.

The effect of the excess depreciation on the insurance exposure:

- The total depreciable basis equals 85% of the claimed ITC, or $4.12 / watt.
- The excess depreciable basis is 85% of the excess ITC basis, or $1.19 / watt.
- The assumed tax rate is 21% federal and 5% state, or 26% total, for $0.31 / watt in taxes.

Therefore, the total tax claw back exposure is:

- Excess ITC claimed of $0.42 / watt, plus depreciation tax benefits of $0.31 / watt, or $0.73 / watt.

This $0.73 / watt leaves a shortfall of $0.21 / watt after insurance coverage. In the event the insurance does not cover excess depreciation, then the shortfall becomes $0.31 / watt.

RUN's ABS Investment Could be Exposed to Liabilities, Including Panel Removal in a Bankruptcy

Based on our reading of a RUN PPA agreement and our discussions with the company, we believe that RUN's ABS holders could be responsible for RUN's panel removal and other customer liabilities in the event of a bankruptcy.

Section 5b(1) of a RUN PPA we reviewed reads as follows:[45]

> "RUN may, without your consent, assign, lease, sublease, or transfer the Solar System and this Agreement, along with the rights and obligations hereunder, to any third party (each, an "Assignee") for any purpose, including without limitation, collection of unpaid amounts, financing of the Solar System's installation, or in the event of acquisition, corporate reorganization, merger or sale of substantially all of RUN's assets to another entity."

This is a remarkably anti-consumer and anti-ABS investor provision buried deep in the fine print. This provision permits RUN to offload all of its future responsibilities to the homeowner to an SPV, that is unlikely to be able to satisfy its obligations to the homeowner. These RUN

[45] RUN BrightSave PPA Agreement Dated November 2017, p. 12

obligations include the expense of removing the PV system, which we estimate to be $1,700 (undiscounted) per system. It is possible that RUN intends its financings to transfer this obligation to ABS investors or, failing recoverability there, the unsuspecting homeowner.

The Sponsor Equity that RUN pledges to secure a warehouse line is ultimately refinanced into an ABS. The ABS is designed to pay the bondholders until they are paid off, by which time we believe that the vast majority of customer value will have been distributed. The ABS investors receive the cashflows from the underlying PPAs or leases, leaving the homeowner with no recourse if cashflows do not the cover removal costs.

If RUN declares bankruptcy, there could be a larger liability for the ABS holders comprising servicing costs of the rooftop systems as well as removal.[46]

Key Players in RUN's Financing Model and their Economic Interests

For RUN to continue as a going concern it must finance its PPA / Leased PV Systems, because it does not have enough capital to pay for those systems without the financing. We provide a deep dive into the financing structure in Appendix A, but to summarize, RUN needs the following financing transactions and partners:

Key Financing Transactions

- *Partnership Flip* –a partnership structure that allows asymmetric allocations of cash flows, tax credits and other tax benefits among two or more partners, including a related party/sponsor. For more information, see Appendix A.
- *Asset-Backed Warehouse Line* – limited recourse asset-based financing whereby one or more lenders advances cash to a borrower based on the perceived value of pledged collateral.
- *Asset-Backed Securitization (ABS)* - term non-recourse financing transaction whereby bonds are issued to one or more institutional investors secured by one or more assets that have been deposited into an SPV.

Key Financing Partners

Tax Equity Investor

- A Tax Equity Investor purchases a partnership interest that is entitled to the ITC, depreciation and certain negotiated cashflows thereby providing cash RUN needs to fund its operations.
- Tax Equity Investors are generally large C-corporations that have tax capacity (owe federal income taxes on their earnings) and wish to obtain tax credits to offset some of their tax liability at a discount.

[46] KBRA Rating Report for RUN Xanadu Issuer 2019-1, LLC, p. 13

Warehouse Facility

- To fund its business and aggregate enough PV Systems to reach a critical mass to securitize them, RUN relies upon warehouse facilities provided by a syndicate of banks.
- Its warehouse facility provides cash to RUN secured by pledges of RUN's Sponsor Equity in Partnership Flip transaction.
- The warehouse lenders are paid interest on their loan amount and believe that their loans are secure due to the value of the pledged collateral.
- To protect themselves from the risk of IRS recapture and thus subordination to Tax Equity, the warehouse lenders require full indemnification from RUN and the procurement of an ITC insurance policy. However, we believe such insurance may not fully cover the amount of an IRS claw back, as illustrated supra.

ABS Investors

- The ABS investors have a similar position to the warehouse facility. Warehouse lines provide short-term financing to RUN, but the PPAs from RUN at 20 to 30 years, so RUN has an active securitization program that enables RUN to refinance its warehouse facility into term non-recourse ABS to finance the PV Systems for a generation.
- Typically, the sponsor works with a nationally recognized statistical rating agency (RUN uses Kroll) to rate one or more classes of ABS based on the characteristics of the underlying PV Systems and PPAs.
- The proceeds from the issuance of ABS go to repay the warehouse facility.
- Each month the payments made by homeowners with PPAs go to pay a host of associated expenses, with the remainder allocated to the principal and interest on the ABS.
- The Tax Equity Investor has a senior claim on the sponsor cashflows which means that the ABS investor is even further down the credit stack. If RUN is not able to pay a possible ITC claw back, then ABS investors seemingly will be impaired before Tax Equity Investors.

Insurance Providers

- RUN provides indemnification to its warehouse and also purchases insurance for this risk. We suspect that if there is possible tax fraud, the insurers will likely litigate. This could stress the ABS and the warehouse facility.
- We believe that if the insurance companies contest the loss or are unwilling to write new policies, RUN's capital structure could collapse.

<u>RUN's Funding Network Appears Fragile</u>

If any of these deal participants chooses not to participate in these transactions and RUN is unable to replace them, then RUN's money to fund its business activity will be cut off. Just to put this in perspective, RUN outright sells 15% of the PV Systems that it creates, and does so below its reported creation cost. The vast majority of the rest are PPA transactions that are

vulnerable to financing disruptions for reasons explained in this report. That means that RUN would be a company that can sell its product, but it cannot get paid.

Appendix A: How RUN's Partnership Flips Work

RUN procures tens of thousands of PV Systems every year for its PPA channel. Because RUN does not have sufficient capital to pay for all these PV Systems, it finances the systems in captive subsidiaries that elect to be taxed as partnerships. The partnerships sell Tax Equity interests to unrelated third parties (large C-corporations) and the Sponsor Equity is retained by RUN and pledged to secure warehouse facilities and ABS.

The RUN Partnership Flips are designed to allow RUN to monetize multiple tax benefits of owning PV Systems even though RUN does not have any taxable income. The Partnership Flip transaction is one in which a US partnership has asymmetric allocations of cash flows, tax credits and partnership taxable income / losses to different partners at different periods in the partnership's life. RUN's partnerships do this, selling partnership stakes to C-corporations at a price that provides the buyer a negotiated return for essentially risk-free allocations (i.e., tax credits and depreciation).

Below is a simplified diagram of the Partnership Flip mechanics:

- First, RUN transfers the equipment and the PPA to the partnership.
- Then, as part of the transfer, RUN contractually separates the PPA cash flows from the ITC.
- RUN buys substantially all of PPA cash flows from the fund, while the Tax Equity Investor buys a partnership stake that is allocated substantially all of the ITC and other tax benefits.

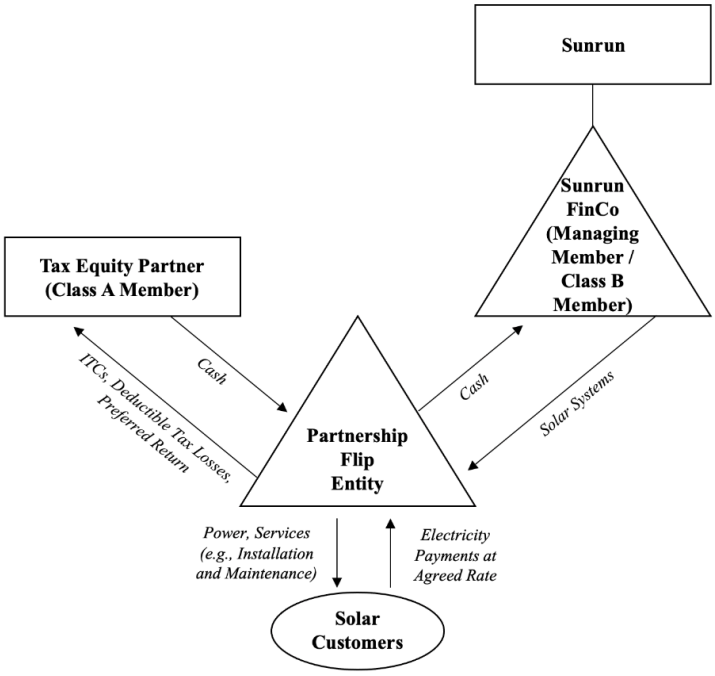


Figure 5: Mechanics of a Partnership Flip

We believe that in RUN's structure, the Company is effectively selling the PV Systems to itself at inflated prices using a financing partner, even though selling ITCs is not permitted. We believe RUN conducts this transfer at an inflated FMV to maintain the façade of an arms-length price for IRS audit purposes.

The non-cash items represent the primary value to the Tax Equity Investor, and Tax Equity Investors typically allocate them as follows:

- Before the flip date, 99% of the ITCs associated with the project go to the Tax Equity Investor; the Sponsor receives 1%.
- Before the flip date, the Tax Equity Investor also receives the right to 99% of the five-year MACRS depreciation tax loss, equal to ~87% of the tax basis of the project; the remaining 1% goes to the Sponsor[47].
- After the flip date, 5% of the non-cash items, which are typically depleted, go to the Tax Equity Investor, while 95% go to the Sponsor Equity.

Cash items are allocated as follows:

- Before the flip date, the Tax Equity Investor receives a 2% cash preferred return on its capital account; and the Sponsor Equity Partner receives 100% of the cash flow after the preferred return.

47 https://www.energy.gov/sites/prod/files/2021/02/f82/Guide%20to%20the%20Federal%20Investment%20Tax%20Credit%20for%20Commercial%20Solar%20PV%20-%202021.pdf

- RUN then uses the residual cash flow to pledge to lenders, which provide it with additional "back leverage" loans.[48]
- Once the Tax Equity Investor has received its target IRR, the sponsor exercises a call option on the class A interest resulting in an additional cash payment to the Tax Equity Investor.

The Sponsor / Class B Member acts as the Partnership's managing member—so the Sponsor Equity controls the Partnership— and has a cheap call right to the Tax Equity Investor / Class A Member following Year 5. A RUN investor relations representative told us that the company typically exercises its call option during Year 6 of the Partnership.

After the flip date, which is either time-triggered or triggered by economics, such as the Class A Member hitting its target IRR, the Class B member has the right to buy out the Class A member. The Sponsor almost always exercises this right to buy out the Tax Equity Investor. In our view, that RUN retains a call option to buy back the Tax Equity Investor's stake indicates RUN does not truly intend to sell the asset as part of the Partnership Flip.

The Tax Equity Investor's resulting yield is guaranteed by RUN, as it consists almost entirely of tax credits and tax losses, whereas the projects themselves have an appraised WACC of 5% to 6%. The Sponsor, RUN, also indemnifies the Tax Equity Investor for any ITC and tax loss claw backs.

RUN implicitly argues the transfer of the PV Systems to the partnership and sale of the Tax Equity validates its valuations. However, because RUN never really relinquishes the project cash flows, while the key assets transferred to a third party are the ITC and tax benefits associated with the depreciable tax base, we do not believe the Tax Equity Investor's purchase of its partnership interest validates the valuations. On the contrary, we find that the Tax Equity Investor depends on the valuation for the magnitude of value it receives; yet the Tax Equity Investor is not exposed to much, if any, risk associated with the respective valuations of the solar assets themselves.[49] In fact, RUN investor relations referred to tax equity as "effectively debt", which underscores our concern that RUN is, in essence, selling the ITCs or using them as collateral for financing.[50]

Based on our conversations with solar industry experts, we believe that the economics to the Tax Equity Investor are as follows:

1. Pays approximately $.80 - $.90 on the dollar for the ITC and depreciation tax benefits, which it claims almost immediately;
2. Receives approximately 100 cents on the dollar of ITC and depreciation tax benefits, which it usually captures within the first year. The amount of the depreciation tax benefits it receives is a function of its capital account balance, which is largely

[48] Conversation with RUN Investor Relations, December 2021
[49] We understand that serial Tax Equity Investors, which are generally large banks and other corporates, will not take part in deals below a certain size. This constitutes a further reason to have large FMVs on offer.
[50] Conversation with RUN investor relations, December 2021.

recovered by the ITC benefits. It uses losses to offset dollar for dollar gains in its actual operating business;
3. Receives approximately $.02 per year on the dollar of cash in each of the first five years based on its initial capital account balance; and
4. Receives $.02 - $.05 on the dollar in cash on the call payment when it is bought out in year five.

In other words, on an after tax-basis, Tax Equity receives back most of its initial subscription value in tax credits and depreciation before the end of Year 2, in addition to an IRR of 10-15%.[51]

The economics of the transfer and rights associated with the Tax Equity Investor's Class A interest and the Sponsor Equity interest demonstrate that the Tax Equity Investor is, in substance, acquiring the ITC and the depreciation tax loss. The economics of Tax Equity interest do not fluctuate once the face value (e.g., the ITC, depreciable tax base and capital account balance) is established. The PPA retains all other economics associated with the solar equipment electricity generation, and the Sponsor Equity, in turn, captures almost all of the economics of the PPA. Thus, even though the Sponsor claims it is transferring equipment value to the Tax Equity, when one looks through the economics of the transaction, we believe it becomes clear that RUN is mainly selling assets that are not dependent on the homeowner's purchase of electricity once the FMV has been established.

[51] Interview with Former Tax Equity Buyer at Major Bank, December 2021. NB: RUN Investor Relations estimated an 8-9% return to us.

Appendix B: Athena 2018-1 Transaction

One of the ways RUN finances its business is by using securitization to borrow against future cash flows in respect of their PPAs. RUN contributes its sponsor equity from the partnership flips described supra into trusts and then issues ABS that are entitled to the cash flows allocated to RUN's sponsor equity from thousands of homeowners around the country.

To make its ABS more marketable and to reduce the interest rate on the ABS, RUN hires a nationally recognized statistical rating agency to provide a rating for their ABS. To date, this has been Kroll Bond Rating Agency. To rate a transaction, we understand that Kroll receives a spreadsheet containing expected cash flows of the PV systems in a transaction, after which Kroll applies various stresses to those cash flows, ultimately providing a principal balance of bonds it is willing to rate at a given ratings grade that allows for sizing of the ABS issuance.

With RUN's Athena transaction, the aggregate FMV (i.e., to RUN's numbers) of the collateral was approximately $1,033.0 million. This was obtained from the aggregate system size of 249.9 MW and our estimated 2018 RUN FMV of $4.13 / watt.[52]

Kroll then has to get to their value for the Sponsor Equity by removing the value of allocated to Tax Equity from the SPVs. For that period, the figure is approximately 38.5%.

Next, Kroll removes the value of the non-contracted cash flows (estimated value of the PPAs post maturity) from its calculation. Kroll's figure on that number is 19%. This figure is very close to the $547.2 million that Kroll describes as the "balanced PPA".

Kroll then makes a number of other adjustments to the $547.2 million, including credit losses, renegotiation, and additional degradation, which sum to an Aggregate Discounted Solar Asset Balance (ADSAB) of $445.4 million. This figure is Kroll's estimate of the present value of the future cashflows in respect of the PV Systems discounted back at Kroll's discount rate of 6%. This can also be viewed as the Income Approach less the non-contracted cashflows.

However, RUN is only able to issue $378.5 million of total bonds and $322 million of rated bonds. Why the extraordinarily large haircut for an asset that we estimate RUN told the tax authorities was worth $1,033.0 million? Kroll is looking at the underlying cashflows of these assets and they fall short of RUN's representations to the IRS and the investors. This is a third-party, but not independent, assessment of the FMV of the Sponsor Equity portion of the partnership.

The reason for Kroll not estimating a larger amount of a cashflows is seemingly that Kroll does not expect those cashflows to materialize.

Let's just do some simple arithmetic: from $635.3 million of contributed Sponsor Equity, Kroll only rates $322 million of investment grade securities. This is an advance rate of 50.7%, with an additional 8.9% of non-rated securities. Well, what happened to the rest of the $635.3 million?

[52] This is the average of RUN's 2018 quarterly Project Value (later renamed to Subscriber Value), $4.36 / watt, and the estimated 2018 Cost Approach valuation of $3.91 / watt.

Kroll seemingly disagrees with RUN's cashflows and will not rate bonds supported by cash flows that it does not believe will materialize. See table below.

Kroll Applies a Significant Haircut to Sunrun's Athena Cash Flows		
Sunrun Claimed FMV (MW Estimate, *$millions*)*	1,033.0	*100%*
Less: Tax Equity (38.5%)	(397.7)	*38.5%*
Subtotal: Sponsor Equity	635.3	*61.5%*
Athena Calculated Sponsor Equity	635.3	*100%*
Less: Contracted Cash Flows	(547.2)	*86.1%*
Non-Contracted Cash Flows**	88.1	*13.9%*
Kroll Reported ADSAB	445.4	*70.1%*
Less: Rated Bond Issues	(322.0)	*50.7%*
Less: Non-Rated Bonds	(56.5)	*8.9%*
Unexplained Missing Value**	66.9	*10.5%*

Source: Kroll Bond Rating Agency New Issue Report, Athena Issuer 2018-1

** Estimated Sunrun 2018 FMV of $4.13 / watt multiplied by Athena's 249.9 MW*

*** This represents either cash flows that Kroll did not find or dismissed as having no value for a securitization.*

It appears that Kroll, hired by RUN, does not find enough cash flows in the pool of collateral to meet the claimed FMV for ITC basis purposes.

If Kroll is not able to find the underlying cash flows associated with the inflated FMV, and there are additional costs that Kroll did not consider in its valuation calculation as they are outside of the rating mandates, this would suggest further overstatement in the Net Earning Assets that RUN touts.