

Energy & Resources Insider

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Our Favourite Solar Play



Our Favorite Solar Play

The most recent downturn in oil prices has resulted in some serious selling in oil & gas markets.

As oil stocks have seen a modest correction, it makes sense for investors to look to diversify their portfolio with alternative investments outside of conventional fuels. The solar energy space is an interesting opportunity in that the industry is growing tremendously, many equities in this space, however, have been poor performers.

There are two choices for investors in solar – *high risk* players that could pay off massively if new technologies like perovskite work out, or *lower risk* firms that should be able to weather whatever storms come their way. For this month, we are recommending a lower risk stock, though we include a list of higher risk potential investments at the end of this report for investors who are so inclined to invest that way.

Digging through the area, we found a company that we like which also throws off an attractive yield creating income for investors. That stock is NRG Yield – a firm associated with a traditional utility company, but well positioned to benefit from new developments in the solar market including the “super crystal” perovskite technology.

NRG Yield (NYSE:NYLD) has been a forgotten stock since the renewables industry blew up in 2015. Sector giants such as SunEdison and Abengoa (NASDAQ:ABGB) both filed for chapter 11, and the stocks of TerraForm Power (NASDAQ:TERP) and TerraForm Global (NASDAQ:GLBL) both fell by 75%+. The model of issuing tons of equity at 4-5% FCF yields to purchase assets at 6-7% IRRs was a tenuous one at best, and NYLD also suffered. At the peak, NYLD traded at \$27.50, and then fell 50% to the \$12-13 range.

The good news is that EBITDA and cash flow have continued to grow at NRG Yield, even amidst the industry’s woes. NYLD has a portfolio of renewable and wind projects, plus a portfolio of natural gas-fired power plants, which are fully contracted for 17 years on average (with A3/A- rated customers). The business generates huge, predictable margins, and has virtually no maintenance capex. Industry-wise, there should be plenty of organic growth over the next 10-20 years. Even in a Republican run administration, several states continue to push for more renewable power.

At an estimated \$1.15 dividend by year-end 2017 (from \$1.00 today), the dividend is well covered too. Cash Available for Distribution (aka CAFD) is expected to be \$1.38 (fully diluted), and \$1.57 (using basic share count) in 2017. Coverage looks to be 1.6x on a TTM basis, and 1.4x assuming 15% dividend growth. Management continues to forecast “at least 15%” dividend growth through 2018 without needing a public equity raise.

On a valuation basis, NYLD trades at a 6.1% dividend yield today, and an 8.5% FCF yield (using CAFD). Should NYLD get back to 4-5% dividend yields, the stock would trade to the \$24 to \$29 range implying upside of roughly 40-70%. Looking out another year, even at a conservative 6% dividend yield on 2018 figures, NYLD would trade to \$24, upside of almost 50% in 12-24 months.

On a CAFD/share basis, at a 7% FCF yield, NYLD would trade at \$20.75 in a year, representing an upside of 25%.

Capital Structure

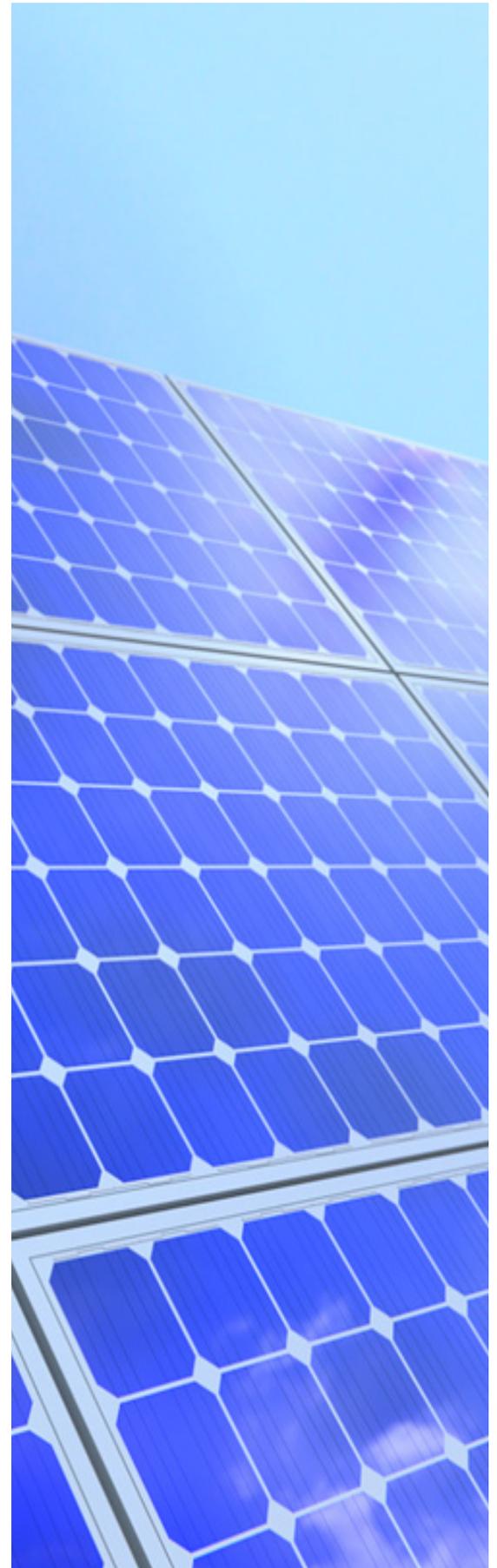
	9/30/2016	
Price NYLD	\$	16.50
Class A shares (NYLD/A)	23.62%	49 34.568mm shares basic, 1 vote per share
Class B shares	20.60%	43 NRG holds 100% - B&D shares together get them 55% voting control, 1 vote per share
Class C shares (NYLD)	35.18%	73 publicly traded shares, 63mm basic sharecount, 1/100 vote per share
Class D shares	20.60%	43 NRG holds 100% - B&D shares together get them 55% voting control, 1/100 vote per share
Total Shares	100.00%	207 No IDRs
Market Value		3,423
Corporate level debt	1,468	618mm owed to NRG
Subsidiary level debt	4,250	
Debt of unconsolidated subs	450	pro-rata share, held off B-S
Other (Cash)	(338)	BB rating
Total Debt, net	5,830	
Leverage	6.59	x
TEV	9,253	
TEV / 2016 EBITDA	10.46	x
TEV / 2017 EBITDA	10.36	x
Dividend	\$	1.00 up to 1.15 by year end
Yield		6.06%
Book Value	\$	2,468
Book Value / Share	\$	11.90

Business

NRG Yield Inc. went public in June 2013 at \$11 per share. The company does not develop renewable projects, but rather buys completed and fully connected solar/wind projects from utility company NRG (the parent), or other third parties. It is the parent NRG Energy, Inc. (NYSE:NRG) which is responsible for all aspects of developing the power projects, including sourcing, permitting, construction and contracting. Hence, over time NYLD should benefit from new solar technologies that get incorporated into projects such as perovskite.

Once completed, NRG sells them or drops down the projects to NYLD. Today NYLD operates 6,100 MW of power projects in 21 states with dozens of counterparties (mostly utilities).

NYLD Portfolio (~6 GW)



In addition, parent company NRG owns or is developing roughly 3,000 MW of power available for dropdowns over the next 2-3 years. Of the 3,000MW, NYLD has a 7-year ROFO contract (Right Of First Offer) on roughly 1,400 MW of NRG's owned power projects. Management states they can buy these at 9-10% type unlevered returns. Past deals appear to be fairly priced to NYLD.

On the thermal and renewable portfolio, NYLD has no feedstock costs. There is no commodity exposure here, and cash flow margins are high.

NYLD Market Cap¹: ~2.77 Bn	NRG Energy Voting Stake: 55.1%
Weighted Average Offtaker Rating²: A3/A-	Average Remaining Contact Life²: ~17 Years
2017E Adjusted EBITDA³: \$865 MM	2017E Cash Available for Distribution (CAFD)³: \$255 MM



Cash Available For Distribution

The typical industry metric is CAFD, which is essentially defined as proportionately owned EBITDA, less interest, maintenance capex, minority interests, taxes and debt amortizations. NRG Yield does not expect to pay taxes for at least 9 years given operating losses and other tax shields.

The company generally has 3 sources of CAFD: Renewables (wind farms/solar farms), conventional power plants (gas-fired power plants), and thermal projects (which provide steam and electricity to businesses and non-profits).

67% of CAFD is related to the renewable energy projects. Wind is 42% and solar 25% of that. Offtake contracts generally run for 20 years, and require the purchaser to buy all power produced by the project at a set price/KW. Output varies depending on weather conditions (i.e. wind speed, sun). Most are contracted until 2035 or later with large, investment grade utilities.

25% of CAFD is related to conventional power projects. Three plants in California comprise most of the capacity. Two were newly built in 2013, and one was entirely re-built also in 2013. All utilize the most efficient gas plant technology (CCGT) and have very rapid start up times (10 minutes) to capture peak pricing when demand spikes occur.

PG&E and EIX signed 10-year power purchase agreements (PPAs) on these 3 plants. Given their locations (one is near LAX, two are in Oakland, CA) and efficiency ratings, these are not only long-lived assets, but also ones with expansion potential. The shorter contract terms do not worry me given the quality and location of the plants.

8% of CAFD is related to thermal projects, again with dozens of counterparties (typically not utilities here) and secured by long dated PPAs.

Here is a list of plants/customers:

	Percentage Ownership	Net Capacity (MW)(a)	Offtake Counterparty	PPA Expiration
	100%	150	Southern California Edison	2035
	100%	150	Southern California Edison	2035
	100%	150	Southern California Edison	2035
	100%	102	Southern California Edison	2035
	100%	168	Southern California Edison	2035
	100%	137	Southern California Edison	2038
	100%	90	Southern California Edison	2038
	100%	19	Western Farmers Electric Cooperative	2033
	100%	80	Nebraska Public Power District	2031
	100%	55	Maryland Department of General Services and University System of	2031
	100%	101	AEP Energy Partners	2029
II (c)	90.1%	29	Platte River Power Authority	2039
III (c)	90.1%	25	Platte River Power Authority	2039
	100%	130	Oklahoma Gas & Electric	2031
Yieldco (c)	75%	613	Various	Various
		1,999		

Conventional				
	Percentage Ownership	Net Capacity (MW)(a)	Offtake Counterparty	PPA Expiration
	100%	550	Southern California Edison	2023
	50%	95	Connecticut Light & Power	2040
Stowton	50%	95	Connecticut Light & Power	2041
	100%	700	Southern California Edison	2035

Projects	Percentage Ownership	Net Capacity (MW)(a)	Offtake Counterparty
Alpine	100%	66	Pacific Gas and Electric
Avenal	50%	23	Pacific Gas and Electric
Avra Valley	100%	26	Tucson Electric Power
Blythe	100%	21	Southern California Edison
Borrego	100%	26	San Diego Gas and Electric
CVSR	100%	250	Pacific Gas and Electric
Desert Sunlight 250	25%	63	Southern California Edison
Desert Sunlight 300	25%	75	Pacific Gas and Electric
Kansas South	100%	20	Pacific Gas and Electric
Roadrunner	100%	20	El Paso Electric
TA High Desert	100%	20	Southern California Edison
		610	

Distributed Solar				
Projects(b)	Percentage Ownership	Net Capacity (MW)(a)	Offtake Counterparty	
AZ DG Solar Projects	100%	5	Various	
PFMG DG Solar Projects	51%	4	Various	
		9		

Thermal				
Projects	Percentage Ownership	Net Capacity (MW)(d)	Offtake Counterparty	

Industry

Given construction cost deflation, the renewables energy story has finally become compelling this decade after a lifetime of excessively high costs for solar and wind. Utility scale solar power used to run at some \$5000/KW to build, now costing under \$1000/KW today. Compare that to coal at \$2000/KW+, gas plants at roughly \$1000/KW, and nuclear at \$4000-5000+ per KW. These also are assets with zero feedstock costs and long lives.

As the renewables/yieldco industry (TERP, GLBL, ABGB, RNW CN, PEGI) became hot, hedge fund investments, these names ran up to nosebleed valuations in 2014 and 2015. Management teams became very aggressive in seeking out acquisitions, and multiples became borderline uneconomic. Pitched as alternative energy utility-like stocks, valuations reached 2-3% dividend yields, and 20-30x CAFD (the industry term for FCF, but also factors in debt amortization given the finite lives of the projects).

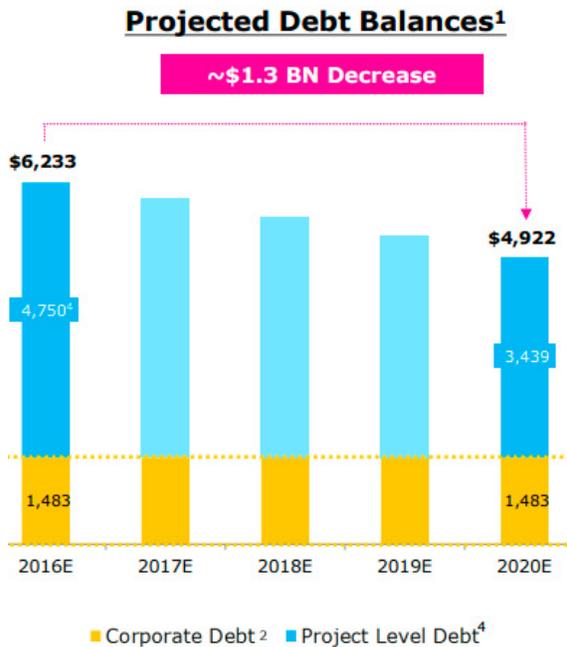
In the end, these companies all carried significant leverage - 6-8x EBITDA, and relied on issuing equity to fund growth via dropdown acquisitions. Leverage at parent sponsors was similarly high. When stock prices began to fall, concerns emerged that growth would slow, followed by fear of overleverage/bankruptcy risk. While hedge fund ownership is 31% at TERP, it has dropped to 12% at NYLD.

It is important to distinguish the TerraForm Yieldco's (TERP and GLBL) from NYLD. TerraForm was so focused on growth for growth's sake, that sources suggest they had 7 different M&A teams operating at the firm. At one point, 4 of them were unknowingly competing with each other over one potential acquisition. Poor management also led to low asset utilization levels, compounded by sub-par equipment.

NYLD was far less aggressive in issuing equity, and runs the portfolio far better. They also intend to focus only on North America.

Debt and Liquidity

NRG Yield does carry a high level of debt, at 6.6x Debt/EBITDA. But management has vowed to reduce overall debt levels from \$6.2BB today to \$4.9BB by 2020:



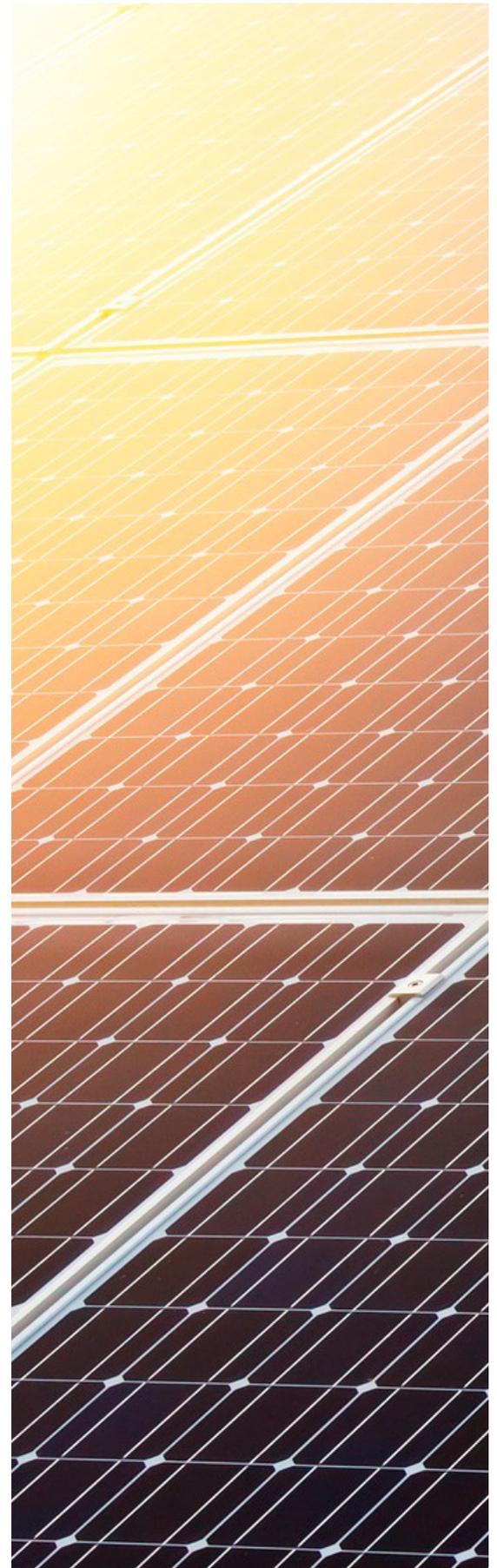
By 2020, Debt/EBITDA should fall below 5.0x. While today's levels do seem elevated by conventional measures, it is worth noting that EBITDA to FCF conversion is very high, and liquidity is very strong. The company anticipates not paying cash taxes for 9 years, and there is almost zero capex associated with their cash flows. Recall also that CAFD factors in debt amortization payments.

Overall, the company has \$280mm of unrestricted cash post a corporate bond offering in September (10-year paper priced at 5%, trading now at 97 and yielding 5.4%) and a 3.55% project financing done with a 2031 maturity.

There is \$430mm available under their revolver, and another \$150mm of equity they could issue under their At The Market (ATM) program.

That totals \$860mm of liquidity. This offers NRG Yield plenty of capital expenditure capacity for growth.

Management intends NOT to issue equity at current prices, and would perhaps consider a private financing (maybe a convert?).



Cash Flow and Valuation

	2012	2013	2014	2015	2016	2017
EBITDA	-	318	619	758	885	893
MI		(20)	(23)	(7)	(33)	(39)
Interest Exp	(28)	(52)	(191)	(238)	(265)	(280)
Interest Income	-	-	-	-	-	-
Maint Capex	-	(22)	(22)	(22)	(27)	(23)
Acquisitions		(331)	(11)	(7)	(77)	(280)
Growth Capex	-	-	-	-	-	-
Pretax FCF	(28)	(107)	372	484	483	271
Tax Rate	0%	0%	0%	0%	0%	0%
Taxes	-	-	-	-	-	-
FCF	(28)	(107)	372	484	483	271
FCF / Share	\$ (0.13)	\$ (0.52)	\$ 1.79	\$ 2.33	\$ 2.33	\$ 1.31
FCF Yield	-0.82%	-3.13%	10.87%	14.14%	14.11%	7.92%
Debt amortization	-	331	11	7	(265)	(265)
CAFD	(28)	(107)	372	484	295	286
CAFD / sh (basic share count)					\$ 1.62	\$ 1.57
CAFD / Sh	\$ (0.13)	\$ (0.52)	\$ 1.79	\$ 2.33	\$ 1.42	\$ 1.38
FCF Yield	-0.82%	-3.13%	10.87%	14.14%	8.62%	8.35%

Prior to mid-2015, trading multiples were 20-25x forward EBITDA, and most viewed these as dividend growth stories. 3% yields were generally the norm, for both TERP and NYLD. RNW CN traded at higher yields, as there were few growth elements to that story, and parent TransAlta (NYSE:TAC) was not exactly acting in RNW's best interests with dropdowns. GLBL is a poor comparison, as it is focused on riskier emerging markets with entirely different dynamics.

After SunEdison filed for bankruptcy, TERP cut off its dividend. The growth strategy became flawed as they even attempted to "diversify" into the residential solar industry. While superficially similar to utility scale renewable power, the reality is the economics of the residential solar business are horrendous.

In any case, TERP trades at 11.5x EBITDA, and is 6.0x levered. Financial performance has been dismal, with 2017 EBITDA expected to be down 10% (per guidance). NYLD has a better portfolio, with no IDR structure, and trades at 10.4x EBITDA.

TransAlta Renewables (OTC:TRSWF) (RNW CA) is a good comp, and trades at 12.3x EBITDA. Similar to NYLD, they own renewables as well as a few gas-fired power plants. The yield on RNW is similar to NYLD at 6.0%. The only real difference is that RNW is less levered (mid-3s on a debt/EBITDA basis), but has clearly overpaid for certain assets in order to help the parent (TransAlta Corp. ticker TA in Canada) to deliver.

Pattern Energy (NASDAQ:PEGI) is also a good comp. But with only a 14-year average life on its portfolio (that is only 89% contracted), and exposure to Chile, Puerto Rico, and Mexico, we find it a less appealing portfolio at a more expensive valuation (11.0x EBITDA and a 7% CAFD yield).

At 12x EBITDA, NYLD would be worth \$23. At a conservative 7% FCF yield, NYLD would be worth \$21 in a year with dividends. Below is a case assuming similar forward dividend yields as today, and downside case of a 7.5% dividend yield (or a 10% FCF yield using 2017 estimates) It is hard to see these utility-like assets trading north of a 10% FCF yield).

	2017 Year End	2018 Year End	Downside
Dividend \$	1.15	\$ 1.32	\$ 1.00
Assumed Yield	6.00%	6.00%	7.50%
Price per share \$	19.17	\$ 22.04	\$ 13.33
Dividends \$	1.08	\$ 2.33	\$ 1.00
Total Return \$	20.25	\$ 24.37	\$ 14.33
Upside	22.71%	47.71%	-13.13%

Given the predictable nature of NYLD's cash flow, a DCF analysis also makes sense. Assuming zero residual value on the renewables portfolio (and assuming also that the gas plants are worth just enough to pay off parent level debt), the existing 17 years of contracted cash flow alone (discounted at 6%) should support a stock at \$16.50 per share. That means investors today can buy NYLD with a 6% return, and get any growth in CAFD for free. 6% seems a reasonable level of return for investment grade (A- rated), levered cash flows. Any future accretive growth or dropdowns would be gravy.

Risks

While we like NYLD and think it is an interesting opportunity for investors, there are a number of risks to be aware of.

Counterparty credit risk. Roughly 40% of revenue is derived from Southern California Edison (NYSE:EIX), and 15% from PG&E Corp. (PGE). These are "A" rated customers today, and the overall portfolio averages A-/A3. Long dated, 2034 maturity bonds at both of these names trade at under 4% yields.

Production Risk - The primary variability to cash flow year to year is driven by wind and solar conditions. In 2016, for example, the company experienced higher than normal wind. 2017 guidance, under normal wind conditions, shows a decline in EBITDA from \$885mm to \$865mm. However, management stresses that cash will be utilized to add CAFD from projects acquired (likely from NRG).

Contracting Expiration Risk - The only contract expirations prior to 2029 are related to their gas plants, which are far more likely to get renewed than a solar or wind project (which would probably mandate removal/reinstallation of wind/solar power generators). In 2023, 3 of their gas plant PPAs expire.

Inflation - NYLD is more like a utility, and only has 1-2% type price escalators in their offtake contracts. Inflation and higher rates would erode the value of the cash flows here.

Parent Risk - NRG Energy owns 41% of the equity, and has 55% voting control. The float is only 122 million shares of the 207 million outstanding. Activist hedge fund Elliott Associates (in conjunction with Bluescape Energy Partners) accumulated 9.4% of NRG stock. There might be some concern of pressure to act in NRG's best interests, at the expense of NYLD. However, NYLD's contracts with its counterparties can be canceled in the event of NRG losing voting control.

That means it is pretty unlikely NRG would simply divest itself of the stake. Also, NYLD is really the crown jewel in the mix of NRG's assets too, so killing the golden goose via dropdowns at excessive multiples, would only hurt them. Elliott/Bluescape's disclosures suggest they are seeking cost cuts, a board seat, perhaps an outright sale of NRG, or divestment of other non-performing assets.

Conclusion

NYLD is a safer, get rich slow type stock at a very attractive valuation. Management is solid, and has even been nibbling on shares in the open market between \$14 and \$16. We prefer NYLD.A over NYLD, given that it is slightly cheaper, but also has voting rights. But both should provide solid upside potential. Acquisition and equity issuance risk is perhaps the biggest concern here, but management teams have learned what happens to stock prices when acquisitions are done at aggressive valuations followed by public offerings.

High Risk Perovskite Solar Plays

Many investors come to us to learn more about high risk plays that they can use to capitalize on perovskite. As noted above, we think NYLD is a great option to get upside from perovskite while minimizing downside risk. But for those who want more direct options, we have found a few. In fact, we have literally scanned all of the investment opportunities around the globe to find the companies most directly tied to this technology.

Here is what we have found:

For investors looking for a safe but limited direct investment in new solar technologies, German firm Heliatek fills that need. The firm is at the forefront of the industry and is partially owned by industrial giant BASF and BNP Paribas. Heliatek's site [is here](#). You may not be able to invest in Heliatek directly, but you can safely invest in either BNP Paribas or BASF easily. The problem is that these mammoth companies own only a part of Heliatek and they are so large that even if Heliatek grows hundred times in size, it would probably only have a small impact on the larger strategic investor.

Outside of Heliatek, probably the most liquid direct way to invest in new solar developments such as perovskite is through Japanese firm Sumitomo Chemical Co. The firm has [a US ADR](#), but it [trades directly](#) through the Tokyo Exchanges as well. The issue again is that like BASF, Sumitomo is a huge company. The Japanese firm is one of the Nikkei 225 – as a result, its solar operations can help the company but they are never going to lead to an explosion in the stock price.

Another one of the best options for direct perovskite investment is Australian firm Dyesol. It trades on the ASX exchange under the [ticker symbol DYE](#). It also trades in the U.S. in an [ADR form](#). The US ADR only trades a few thousand dollars of stock per day, so if you want to invest and you have capability to invest through the Australian exchange, that is a better option.

Dyesol is a leading player in developing new solar panels using the Super Crystal technology.

An alternative to Dyesol for investor with access to the Hong Kong markets is Hanergy Thin Film Power Group. The stock page for the company [is here](#). Hanergy is a slightly more diversified pick in the solar space – it has some substantial operations outside of the new solar technology space, but it also owns [Alta Devices](#), a California company focusing heavily on new technologies in solar like perovskite crystals. Hanergy [trades in the US through the Grey Markets](#) – again though, if you have the capacity to access the stock through the Hong Kong exchange, that is a better choice.

Another firm in the space is [Oxford Photovoltaics](#). The firm is a British company developing the new perovskite Super Crystal technology – like Dyesol it does not trade in the US, and unfortunately it does not have any US ADRs. [Austrian firm CrystalSol](#) is also doing impressive work in this space. Both of these firms are still in the venture capital stage, so high net worth individuals may be able to invest directly via the company itself.

Japanese firm Saule Technologies is at a slightly earlier stage than Oxford Photovoltaics. The firm is looking for outside investors and clearly says that they are pre-revenue. Again, investors willing to take a risk and invest at the bleeding edge on this technology should contact the firm directly. Their page for investors [is here](#). Firms like Saule Technologies may be more willing to take funding from investors than later stage, but safer competitors like British firm [Eight19 Ltd](#) does not appear to be seeking to raise funds at present.

Chinese firm Xiamen Weihua is at an even earlier stage than Saule Technologies, and we can't recommend it to anyone unless you have deep connections to Chinese investments already. That said, the firm is a pure-play option on perovskite technologies. Their website is here in [translated English](#) and here in [Mandarin](#).

There are other firms in the new solar tech space, but there are no clear paths to investment for these companies even via venture capital funding. Still for readers interested in reaching out to the companies directly to learn about possible future investment opportunities, the firms that we think are most interesting include:

Swedish Firm [Exeger](#)

British Company [G24 Power](#)

Swiss Venture [Solaronix](#)

As a group we hope that these names give you some potential investment choices. Again, we think that all of these firms are either risky or diluted opportunities to access the upside potential of perovskite. For those looking for direct investment, we'd recommend a basket of these companies. None of these firms are a perfect fit for most investors though which is why they have not made our list of monthly stock picks.

As always, we will keep our eyes open for new opportunities in the space. It is our view that in the coming year, some of the smaller firms on this list may be acquired by existing established solar players which in turn will create new investment options.