

# US Solar & Alternative Energy

## Sizing Up the US Solar Market

### Equities

North America  
Electric Utilities

#### Looking to gauge expectations for US solar market growth

In an effort to refine our view, we have put forward our first glimpse of annual additions, emphasizing a clear step-up into 2015 and 2016, followed by a drop-off to 2017 of ~3GW largely driven by rooftop additions amidst very limited utility-scale efforts. Altogether, our aggregate growth isn't outsized vs. Street expectations. We provide context to these estimates alongside a wider consolidated review of the US solar outlook.

#### The Evolving competitive landscape: But who will capture this opportunity?

While renewables will nominally continue to grow, we suspect the 'independent' developer model may yet see some evolution in the landscape, with more utilities poised to participate in its growth. For tax purposes, many utilities have been limited in the extent to which they can develop renewables in ratebase (required to amortize rather than immediately recognize tax benefits). Meanwhile, we see a merging of the business model with retail marketing firms as well, keen to cross-sell their products.

#### And who will win? The diversified renewable plays

Expanding on our Global Q-Series last week [Does the future of solar belong with Utilities?](#) We answer an emphatic yes in the context of the US. While we see successful niches in many different angles of the renewable industry, we see the most promise in being fully diversified across the value chain emphasizing exposure to both rooftop and utility-scale across both wind and solar. We highlight that this variety most fully makes use of scale in costs as well as hedges against the individual booms and busts of respective niches. We further see diversified renewables as best positioned to make use of YieldCo structures, which have been the deposits of the completed projects; coupled with the benefit of so-called Incentive Distribution Rights, renewable developers are highly incentivized to grow these entities accretively at a meaningful clip to receive a disproportionate share of dropped-down cash flows. The US YieldCo structure is a key element of competitive advantage to those with sufficient scale; while many will evaluate pursuing such a structure, we suspect only a handful of successful YieldCo structures with successful growth track record will exist.

#### Now is the time for contracts roll in to meet ITC and PTC expiration

With a 12-18 month 'gestation' period for renewable projects to turn around, we see 2H15 as the critical period for both wind and solar deals to be penned; we suspect this will prove critical in providing a sense for the scale of the 'boom' associated with pending expiration of both PTC and ITCs. This should accrue particularly well to renewable developer long-term guidance, as opportunities are translated into contracts for both of two developer picks, NextEra and SunEdison. Shares should remain strong through these respective periods. In turn, we see this contributing quite well to the 3-year earnings outlook as projects completed by year-end 2016 will contribute to meaningful continued YoY growth on FY basis in 2017. Rather, it is 2018 that remains the crucial 'swing' year – with 2020's driven by pace of carbon reforms.

#### How quickly can the cost structure come down in the US?

Among the critical questions into the forthcoming ITC, expiration remains the potential for costs to continue to come down in the industry. Notably, we see FSLR's projection of \$0.30/Watt in lower costs for its systems to have a near corresponding impact on market prices (no expansion in margin projected), offsetting the bulk of the ITC expiration impact. We see real procurement efforts picking up only in the 2018/19 period (as any project contemplated for 2017 has largely been accelerated already into 2016 to take advantage of expiring ITCs).

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## Investment Thesis for Solar and Power Nexus

We continue to see renewable penetration as an ongoing inevitability in the US, as both wind and solar continue to gain market share. We see the market as entering a 'third' phase of adoption, towards one geared towards compliance with forthcoming 111(d) carbon regulations, set to be finalized by the EPA later this month. In the interim, particularly 2015, we are in the midst of the latest surge in renewable contracting given robust federal tax credits from the Production Tax Credit (PTC) and Investment Tax Credit (ITC). This has effectively made renewables near 'economic' for utilities to procure in their own right – and they have been – vigorously. Among the developers we prefer the two heavy-weights SUNE and NEE. We also see EIX as benefitting from this thesis through increased infrastructure investment.

In terms of IPPs, we continue to see a generally toppish market of late, with not just solar and wind threatening power prices, but rather new gas plant additions a more meaningful medium-term swing factor. We continue to see the near-term as relatively robust with the potential for real summer volatility post MATS retirements. We see California as the most challenged power market, with CPN as the most exposed. Secondly, we see the Midwest and Texas markets as similarly threatened from growth in the wind deployment. Strategically we appreciate NRG's efforts to diversify into Solar, and DYN's current discounted valuation already reflecting this reality – rather, we see a strategic redirection from EFH to diversify *out of* its Texas coal portfolio as bolstering our expectations for a takeout. While we remain more bearish on long-term heat rate trends following the multi-year bully rally, we believe gas basis may indeed be reaching relative (extreme) lows of late as offtake infrastructure improves.

*[Please see below for links to our recent Alternative Energy reports](#)*

[Does the future of solar belong with Utilities? – Global Q Series](#)

[Breaking Down the Post ITC Economics – Cost Declines of Solar](#)

[A New Take on Resi Solar: A Look at the Community Opportunity](#)

[NRG Yield: Paving the Road with Solar](#)

[SUNE: Poised to Perform](#)

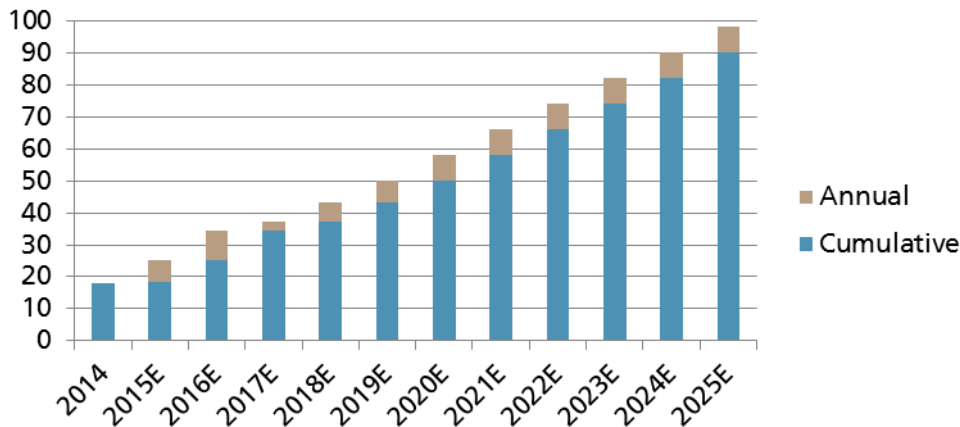
[How Economic Is Residential Solar? \*Look at state-by-state Analysis\*](#)

## Putting Pen to Pad: US Market Sizing for Solar

Below, we give an indication of where we think the solar market will grow to in the US by 2025. The base cumulative GW installed for FY14 has been taken from SEIA, and is slightly above 18GW. We believe the market can grow to ~50GW cumulative by 2020, and ~90GW cumulative by 2025. This scenario is predicated on the assumption that the residential ITC drops to 0% and utility/commercial drops to 10%, off an existing base of 18.3GW as of year-end 2014. More specifically, we expect the 2014 acceleration of 6.2GW/yr in 2014 to see a significant step-up to take place into 2016 (with 7 and 9GW/yr in '15 and '16 respectively), however just 3GW to be installed in 2017. Longer term, we see annual installations rising to 7GW by 2019, and flat at 8GW/year 2021-2025.

**We put together an initial estimate of our projections for US Solar**

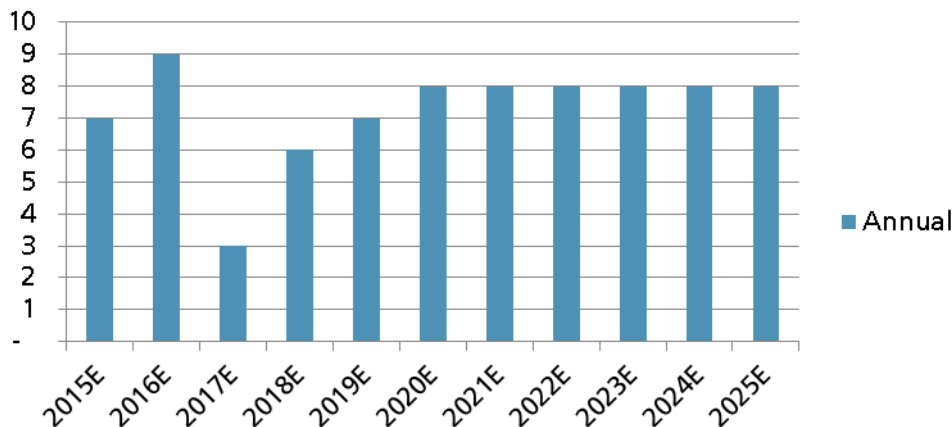
**Figure 1: US Cumulative PV Market, 2014-2025E (GW) – Climbing substantially...**



Source: SEIA, UBSe

We suspect the bulk of the 2017 procurement will be driven by rooftop and other distributed installations depending on both state benefits (in SREC markets) as well as selective utility-scale procurements (Georgia), etc. Rather, we see utility-scale procurement returning by 2018+.

**Figure 2: US Annual PV Market, 2015-2025E (GW)**



Source: UBSe

## How does our projection jive? Addressing the Fallacies

While we project meaningful continued growth off the current base of US solar in 2014, we emphasize this may prove to be shy of the more bullish projections in the industry for two key reasons:

- **Net Energy Metering reforms** and fixed tariffs will prevent rooftop adoption from going asymptotic. Rather, it's geographic expansion of distributed solutions that is most interesting
- **RPS compliance extension?** While ITC expiration is noteworthy, it's important to frame solar procurement for utility-scale efforts in the context of existing RPS standards. Despite the falling price, subsidies are still needed – and will require RPS support. As such, extension and expansion of existing standards will be critical leading into late in the decade. We suspect this could take the form of

carbon reforms, but could be more biased to early in the next decade before real impact.

### **Bottom line, our forecast is very healthy relative to experience with Wind**

If the wind sector is any clue around the 'seasonality' introduced with tax credit expirations, we see our near-term cliff in development in 2017 as adequately reflecting the real cyclical added. While wind is predominantly utility-scale, rooftop solar appears to be sufficiently diversified across states and subsidy sources such that change in ITC is only piece of wider pie (albeit the most important). We tie our ~8GW/yr growth factor beyond 2020 as related to wind experience this decade, with utility-scale wind having executed on average in the mid-single GWs driven by a confluence of RPS compliance and economic factors. We see solar trending *higher* than this principally on account of a secondary distributed (rooftop) tailwind, driving a several further GWs of demand per annum (upwards of 2-3GW/yr). A further consideration to sustained meaningful pace of solar penetration growth remains to what extent will wind prove a meaningful competitor in 'overlap' states like Colorado where both resources are relatively abundant. Overall, we remain biased wind will keep its market share in many of these states given its cheaper post- and pre-tax credit costs, albeit the time-of-use considerations lends itself to a portfolio of both resources.

**Of our 8GW normalized, we suspect distributed efforts will make up ~3GW/yr**

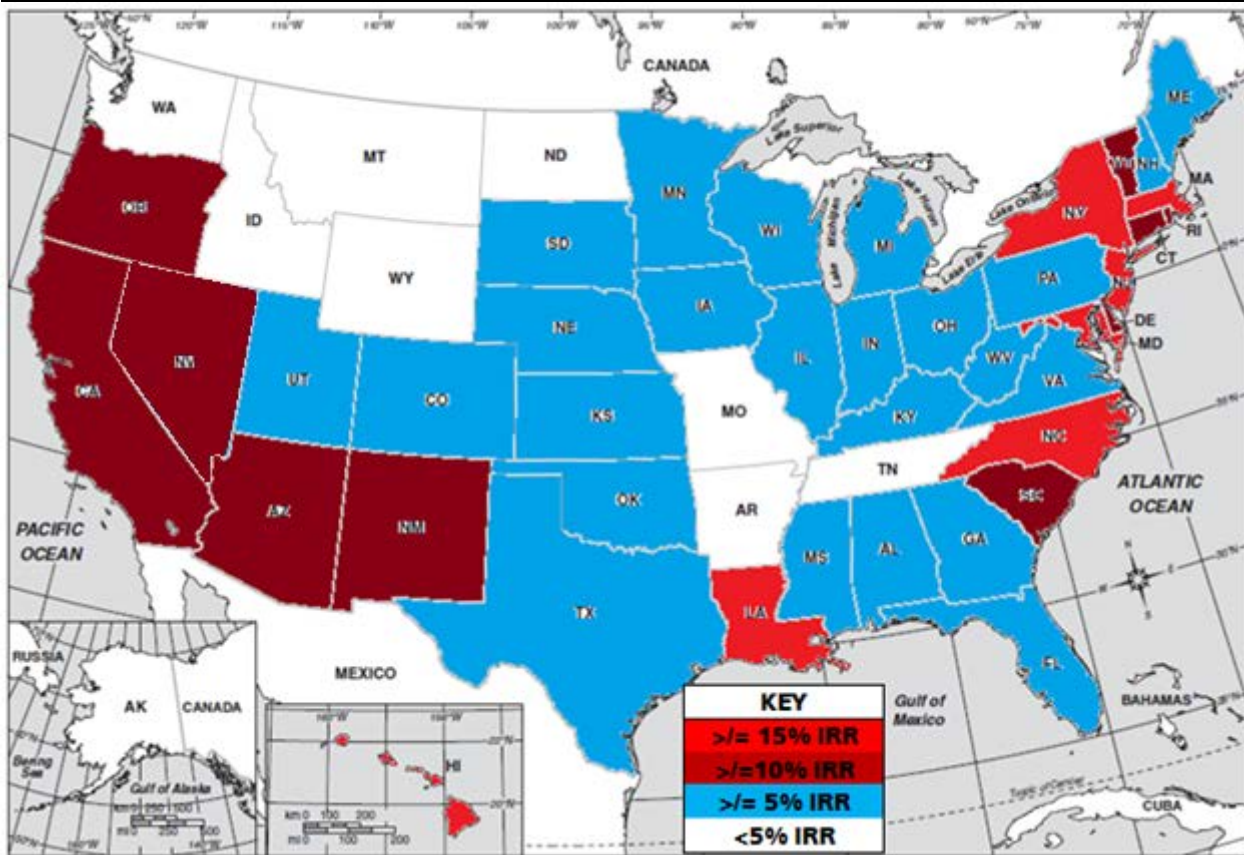
### **Net metering reforms will not keep up with pace of rooftop expansions - positive for solar**

We emphasize that while net metering subsidies on rooftop solar ultimately derive their legitimacy from RPS standards, we see an expanding opportunity set as economics of solar decline (even post 2016 ITC cliff). We estimate that investors should think about the acceleration of solar rooftop opportunities as more of a geographic 'spread' as more states reach a net metered 'grid parity', rather than seeing an asymptotic adoption of solar with states like CA and AZ potentially poised to see reforms to reduce compensation and effectively stabilize pace of adoption (we don't see removal of NEM to point where solar is 'uneconomic' in any jurisdiction given the perceived bad politics of such a move). Bottom line, we see distributed solutions (and inherent subsidies) as providing the bulk of the future incentive for continued solar build in the 2017 timeframe. We provide a summary of *which* states have breakeven economics for residential consumers below from our latest UBS residential economic model (first map below).

### **What about NRG's perspective? Also on next page**

To provide a contrasting viewpoint to our map above, we also include NRG's projections on distributed solar economics from their Analyst Day. While including fewer states than our assessment above, this likely reflects a need to provide a savings to a customer (not adjusted above) as well as likely reflects breakdown between fixed/variable (our assessment uses a basic all-in rate assumption provided by EIA).

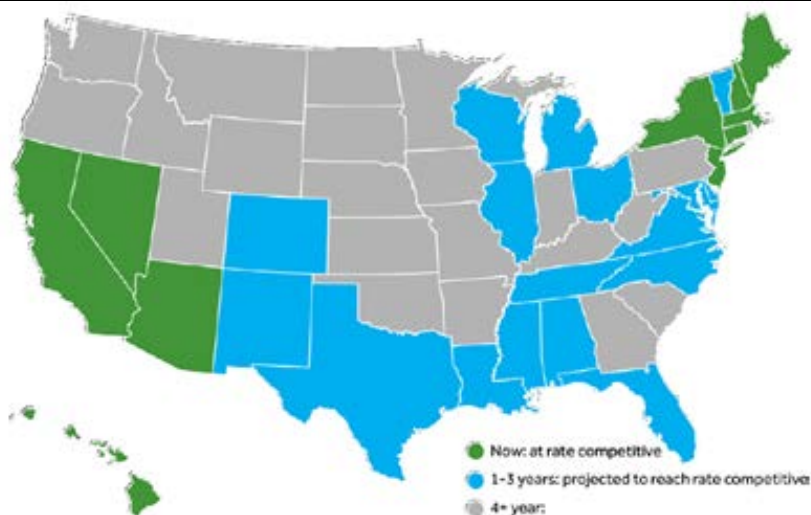
Figure 3: UBS View on Residential Breakeven on Rooftop solar -> All Incentives at Base Rate



Source: Company Filings, UBSe, EIA, DOE, SRECTrade

And now for the NRG view of the world...

Figure 4: NRG's Solar Grid Parity Map



Source: NRG Energy 2015 Investor Day Presentation

## Who's more exposed to ITC Drop-off?

This remains among the key questions in the US today, with the 'Fair Market Value' drop-off in the residential space suggesting that without an ability to correspondingly increase the 'net metered' tariff the residential and C&I spaces may be more impacted by a re-entrenchment in the ITC than the utility-scale market (where PPA prices will correspondingly climb to meet the market-demanded price); this is effectively a transfer of the above-market subsidy from the federal government to the state. Bottom line, it's the 'fringe' states where distributed economics are least favorable that will drive the principal reduction in 'opportunity' for solar

**Rooftop more exposed, but utility-scale is boom-bust b/c of forward procurement cycle**

## Real question is one of a further extension of federal tax credits

Among the critical angles still is an extension of the federal tax credits- both the Production Tax Credit (PTC), typically geared towards wind, as well as the ITC geared towards solar. NEE has come out as recently as its March Analyst Day reiterating its confidence at least the PTC will be extended one more time – albeit not necessarily at the same rate (a deal had previously been proposed to extend the credits at a lower rate, gradually feathering out over a 5-year period). As for the ITC, we would expect 'commence construction' language if potentially approved would effectively drive a ~2-year extension of utility-scale efforts (through 2018YE assuming consistent with PTC approach), benefitting larger scale developers able to front capital down rapidly to qualify much of their development sites.

**Commence construction language would help utility-scale projects**

## Risks of rising rates also a consideration – to fundamentals

Among the further considerations for renewable development in the US remains the key risk to the potential for rising US interest rates. While the solar equities (particularly SUNE) remain more 'growthy' in nature, with limited dividend yields (we see the YIeldCos for instance as more defensive than many utilities), the underlying business model relies upon renewables to discount back the benefits provided over the project's life relative to the fixed upfront capital cost of installation. In many senses, this appears among the key offsetting risks to improving technology cost structure of solar and wind.

**Interest rates are a key threat to long-term renewables outlook**

## Exposure to Northeast solar markets best positioned to absorb ITC roll off

We emphasize the potential for rising Solar Renewable Energy Credits (or SRECs) would help offset much of the lost economics to both utility-scale and renewable market efforts with the ITC rolloff. Rather these credits would effectively transfer the subsidy burden previously offered at the federal level to the states. We see NRG as particularly well positioned given its mostly Northern-focus on residential and C&I efforts, in contrast to many of the conventional solar companies having previously derived the bulk of their growth out west. It's notable that states out West with high tariffs (notably California) will still be 'economic' as well

**SREC programs should 'ease' the pain... once more, bullish for distributed resources**



**Figure 5: SREC Markets & Prices**

Name	State/ Territory	Energy Year	Markets for Systems	Tracking Registry	Latest Recorded SREC Price (Current Year SREC)	Eligible System Locations
SREC	DC	Jan-Dec	DC & PA	GATS	\$480	DC
SREC	DE	June-May	DE & PA	GATS	n/a	DE
SREC	MA	Jan-Dec	MA	NEPOOL-GIS	\$455=I, \$300=II	MA
SREC	MD	Jan-Dec	MD & PA	GATS	\$170	MD
SREC	NC	Jan-Dec	NC or PA (Dominion)	NC-RETS or GATS	n/a	All States
SREC	NJ	June-May	NJ & PA	GATS	\$207.50	NJ
SREC	OH	Jan-Dec	PA & OH	GATS or MRETS	\$35	OH, PA, MI, IN, KY, WV
SREC	PA	June-May	PA & OH	GATS	\$35	PA, OH, NJ, DE, MD, DC, VA, WV, IN (AEP), IL (ComEd), KY (AEP), TN (AEP), MI (AEP), NC (Dominion)

Source: SRECTrade

## What about the 'other' tax option: REITs

We suspect this angle of the US tax code could well be employed in the future to encourage solar development. While many developers today do not have taxable income to speak of given the combined benefits of both investment tax credits as well as accelerated depreciation. We see the REIT angle as increasingly viable as an executive branch alternative to spur continued investment in the renewable sector should Congress fail to act on a further ITC extension. We look for further clarification this Fall, after initial indications solar rooftop would indeed qualify as income for REITs last Spring.

## Increasing pressure on US merchant fossil and nuclear units

### Looking at the future of California: Putting 50% RPS back on the map

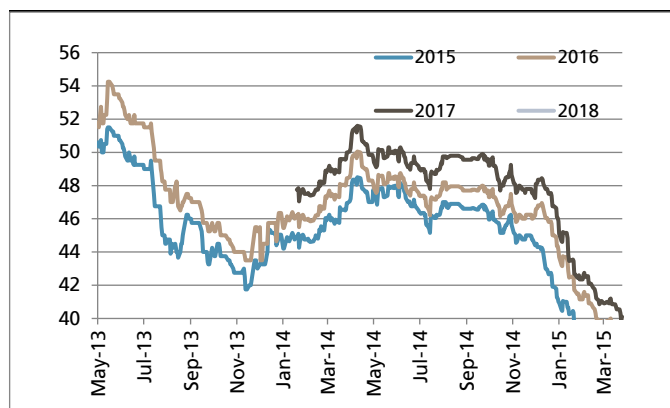
Following a quiet period of any further RPS increase, we see the latest talk of increasing the RPS to 50% by 2030 as potentially kick-starting stalled utility-scale procurement efforts; that said, with a focus on a GHG framework rather than an explicit RPS having real support, utility-scale efforts could be relegated to 'backstop procurement' using CPUC Chair Picker's words. The outlook in CA is really about the distributed rooftop effort as putting downward pressure on power prices throughout the forecast period, with continued market penetration for solar despite the coming rate tier reform and tax credit step-down by 2017/18.

**Adoption of a 50% RPS in CA could drive utility-scale PV project build in the state**

## The IPP Equation: California Spark Spreads

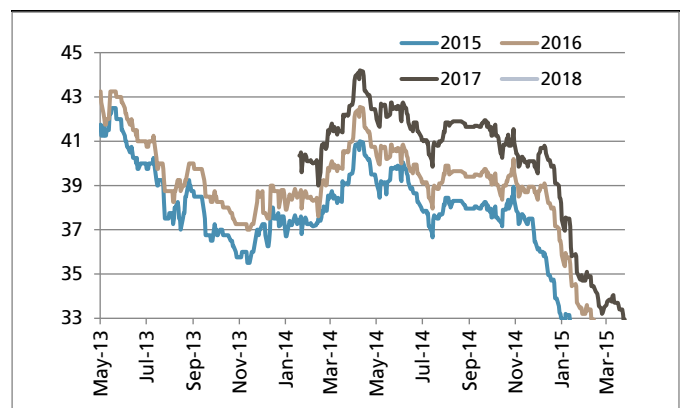
**Fundamentally, we continue to see meaningful long-term pressures on California forwards as the drought normalizes in future years.** The charts below show evolution of on-peak and off-peak power prices for the NP15 market. Both curves have seen meaningful degradation this year. We continue to believe that power prices remain fundamentally pressured from continued renewables growth; despite offsets from the drought.

**Figure 6: On-Peak NP15 Prices (\$/MWh)**



Source: Platts

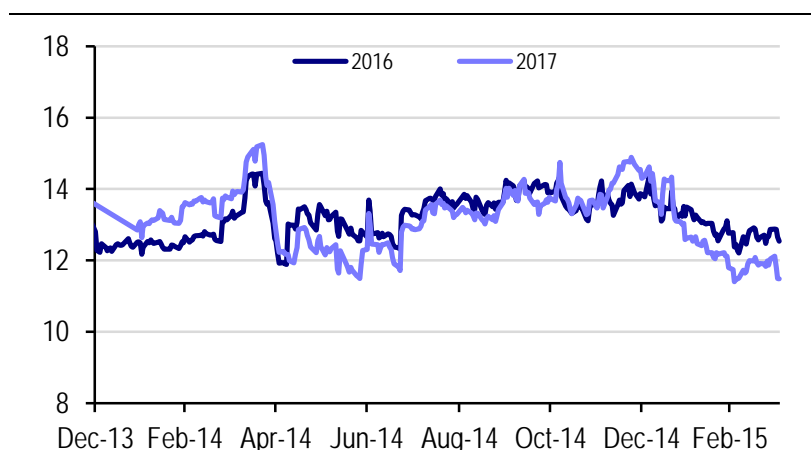
**Figure 7: Off-Peak N15 Prices (\$/MWh)**



Source: Platts

**Normalization of hydro conditions shows backwardation.** Spark spreads have only recently begun to reflect the expected backwardation in forwards as hydro conditions normalize YoY, and reflect continued growth in renewables (squeezing margins). We expect further structural pressure on long-dated power forwards with the RPS poised to expand to 50%. We suspect worsening drought conditions have allowed for sparks to remain largely intact through the last 18-month period. *We see gas consumption from CCGTs as likely reaching records this year amidst the drought.*

**Figure 8: NP15-PG&E Citygate Spark Spread @ 7.2 Heat Rate (\$/MWh)**



Source: Platts and UBS estimates; not adjusted for CO<sub>2</sub>

### Wind hits Midwest off-peak pricing, hurting baseload units

In the Midwest, we've also noted the strong impact of wind on the region's baseload coal and nuclear fleets. For example, EXC's Quad Cities nuclear facility sees negative basis of more than \$5/MWh due to the substantially negative impact of wind from adjacent Iowa (the plant sits on the border, along the main East-West transmission thorough fare).

**In the Midwest, we've also noted the strong impact of wind on the region's baseload coal and nuclear fleets**



## What's the impact on power prices from renewables – it's hard to tell yet

It is too early to distill the precise negative impact it has had principally in the California markets thus far on account of the worsening drought conditions in the state. With spark spreads having been flattish in recent years for forward delivery, we emphasize the most significant downside to this market most as hydrology 'normalizes'. Wind growth remains the primary impediment to merchant markets, most notably the Midwest (MISO) and Texas (ERCOT) markets. Holistically, we estimate RPS compliance modestly exceeds total load growth through 2020, with rooftop solar incremental to these projections – suggesting no upside to power prices under a best case scenario (we expect a wider deflationary trend aside shifts in underlying commodity prices).

Weather has limited ability to discern solar impacts

## Top Companies & Markets for Solar

### Top Picks

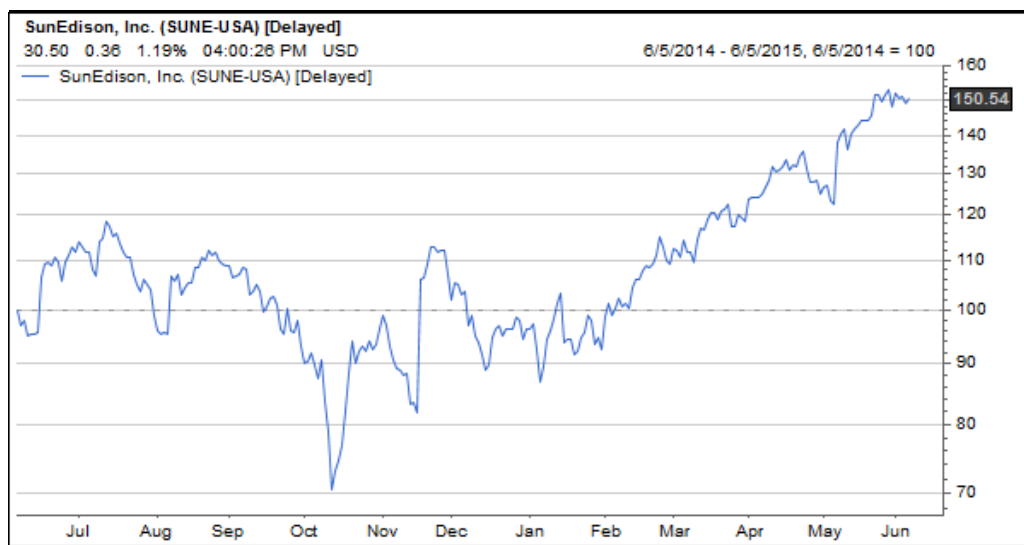
- **SunEdison (Buy; \$32 PT)** - SunEdison is well positioned to capitalize on growing solar ambitions both domestically and internationally, targeting 4GW/yr of development by 2017 (off a 1GW in 2014). We expect a litany of positive datapoints around both organic execution and deal generation throughout 2015 from one of the most diverse renewables developers in the sector. The story is one of quarterly execution. We believe the stock will continue to grind higher as management delivers on their targets, particularly for 2015, where promises of **2.1-2.3GW** appear quite ambitious over just the last couple years (backend weighted).

SUNE's diversification between geographies, asset technology, and project size positions it well to lead the pack

We emphasize 1H15 should also continue to see the 'last' rush of contracts signed for development with US federal tax credits (both ITC and PTC) before they end in late 2016; the full cycle is 12-18 months suggesting much will be delivered in coming quarters. Execution on contracts through 2015 will help firm up the **5.2GW** backlog of projects, with the real upside from incremental execution into 2017, as management targets **3.75-4GW/yr** (we assume this is the long-term new run-rate) despite the rolling off of tax credits in the US. We also see upside to shares north of its current valuation as TERP shares should improve on greater visibility of backlog (worth a further ~\$5/sh in our SOP), as well as roll-forward the valuation on our General Partnership.

Assuming management can effectively build-out an international renewables platform, this could readily shift our GP valuation for TERP (and the EM YieldCo) to north of \$20/sh. Altogether, executing on management's growth targets could provide upside to the ~\$50/sh context. Our \$32 PT effectively assumes execution through its stated plan at high discount rates to account for execution risk.

**Figure 9: SUNE Stock Performance**



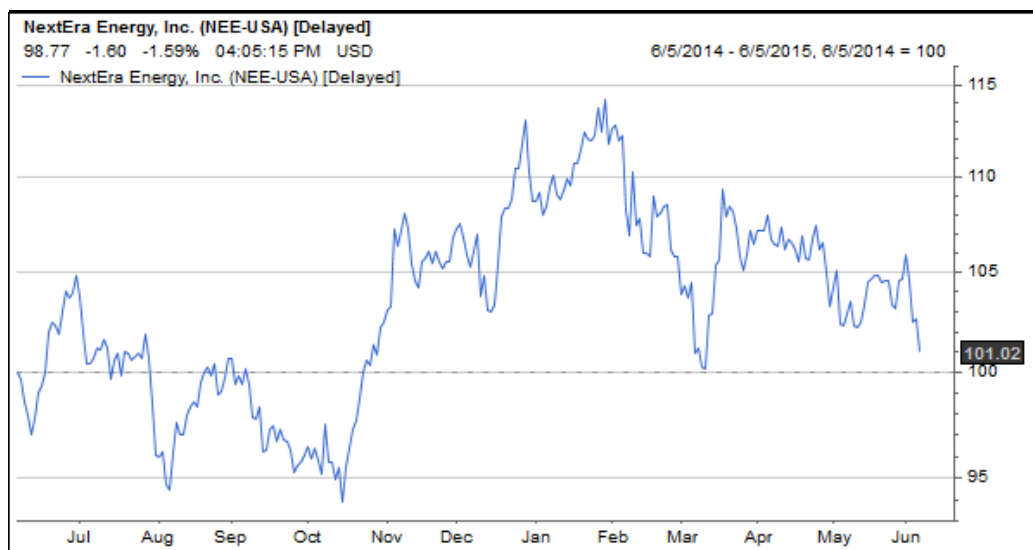
Source: Factset

- **Nextera (Buy; \$118 PT)** - Nextera began 2015 on the right foot with a strong earnings beat and successful conversion for renewables development to the backlog from the forecast (pipeline). We acknowledge investor concerns around the lack of incremental renewables pipeline in 2017/2018 but view this as coming in time. While unlikely to add additional solar to its backlog for 2015/2016 given the extended development cycle, there is still approximately ~7 months left to secure wind deals by ~November to achieve a YE16 COD; we suspect 2Q and 3Q updates could yet see further awards (hence the 900-1,100MW in '15/'16 still pending).

**NEE has a significant asset portfolio of both wind & solar**

We attribute some of the weakness to few updates, amid anxious investors for further deals and contracts. This lack of new additions is likely driven by an abundance of caution; management expressed particular confidence in Ontario procurements of solar, wind, and storage as particularly intriguing. Unlike renewable development peers, NEE is more conservative.

**Figure 10: NEE Stock Performance**



Source: Factset

## Concerns from the Solar Boom

*While the entire IPP industry is cleared impacted, we emphasize Calpine first given its twin portfolios in both the California and Texas market. We see renewables within the other organized markets as still playing a more modest overall role.*

- **Calpine (Neutral; PT \$23)** – As a large holder of merchant gas-fired units, CPN is poised to suffer from increased renewables penetration into its California fleet. We see the latest talk of increasing the California Renewable Portfolio Standard to 50% by 2030 as potentially kick-starting stalled utility-scale procurement efforts, with distributed generation putting downward pressure on power prices throughout the forecast period. This is expected despite the coming rate tier reform and tax credit step-down by 2017/18. As a possible offset, CPN expects to get involved in renewables once tax credits expire, with the playing field more level among peers.

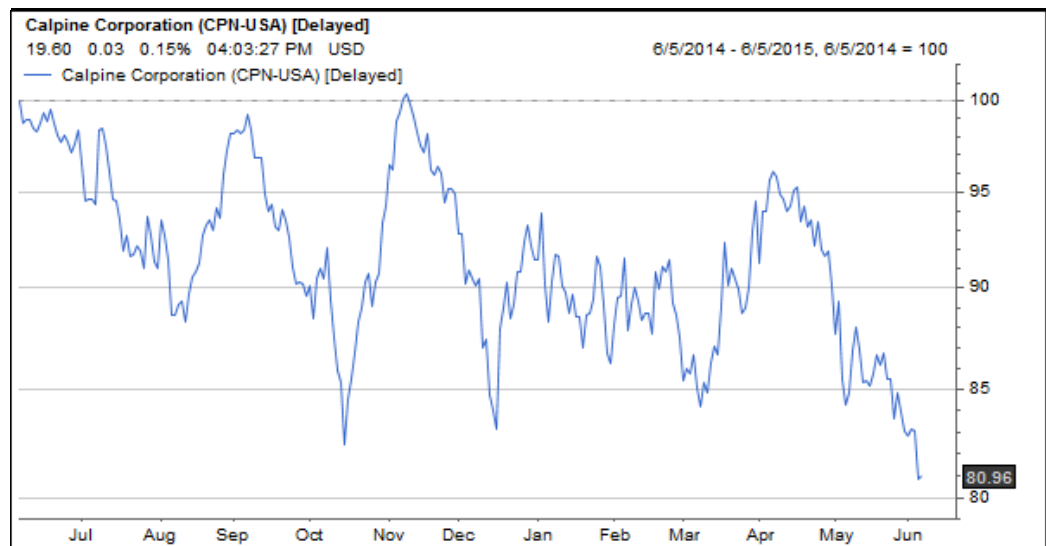
**As a large holder of merchant gas-fired units, CPN is poised to suffer from increased renewables penetration into its California fleet.**

This is just the latest illustration of how a decline in the barriers to entry around renewables without tax credits will lead to a more competitive field for renewables development down the line. We suspect CPN's angle around development will be to offer a full 'firm' product, with renewables backstopped with contracts supported by its existing gas portfolio. In particular, we see opportunities for the company to sell firm products in California, especially given the governor's push for a 50% renewable standard and the need there for increased grid stability. However, in Texas, the biggest long-term threat to CPN's recently announced gas-fired new-build is merchant solar for utility-scale projects. Good solar geography coupled with generous transmission interconnection policies position the state well in this capacity.

After more than a -10% slide post-1Q results, CPN shares look better, but we still emphasize caution and our Neutral rating with a \$23 PT based on a 2016E sum-of-the-parts. Calpine's fortunes could rise in near-term with low gas prices and coal-to-gas switching, but this thesis looks close to peak now that the April 2015 MATS deadline has passed. Down the line (~2019/20), we see potential value around EPA's carbon reduction proposals, but for now, we see

less to be excited about given increased Texas development amidst compressed spreads there and a more mild summer forecast.

**Figure 11: CPN Stock Performance**



Source: Factset

## Top Markets

Below, as discussed in depth in *How Economic Is Residential Solar?*, we display the top states for resi solar by IRR, based on 3 scenarios surrounding incentives.

**Figure 12: IRRs by State: Fed & State Incentives**

State	IRR
HI	62%
MA	27%
NC	25%
DC	23%
NJ	22%
LA	20%
NY	18%
MD	15%
RI	12%
CA	12%
SC	12%
OR	12%
CT	11%
NM	11%
DE	11%
VT	11%
AZ	10%
NV	10%

Source: EIA, DOE, SRECTrade, UBSe

**Figure 13: IRRs by State: State Incentives**

State	IRR
HI	34%
MA	17%
NJ	14%
DC	14%
NC	11%
NY	10%
MD	10%
CA	7%
LA	7%
CT	7%
VT	6%
NM	6%
DE	6%
RI	6%
SC	6%
AZ	6%
NV	5%
MI	5%

Source: EIA, DOE, SRECTrade, UBSe

**Figure 14: IRRs by State: No Incentives**

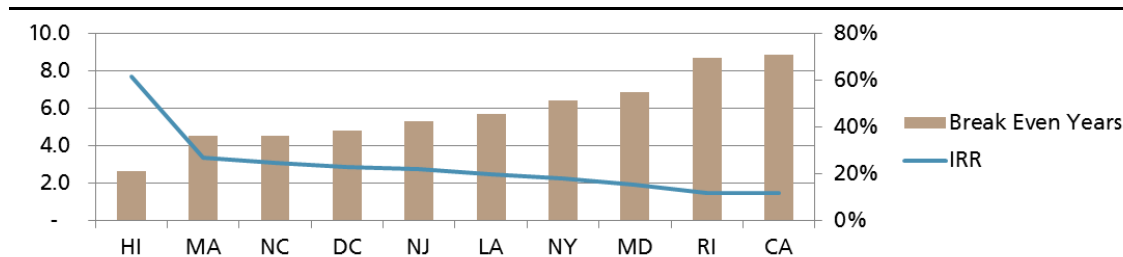
State	IRR
HI	22%
CA	7%
NY	7%
CT	7%
VT	5%
MA	5%
NM	5%
AZ	5%
NJ	5%
NH	4%
NV	4%
CO	4%
ME	4%
MI	4%
WI	3%
KS	3%
SC	3%
FL	3%

Source: EIA, DOE, SRECTrade, UBSe

### **Scenario 1: Fed & State Incentives**

In the first of 3 scenarios testing the returns at the average residential electricity rates between 2013 and 2014, all federal and state incentives into account. In this situation, HI, MA, NC, NJ, LA, NY, MD, RI, and CA comprise the states with the top-10 IRR's. In this scenario, systems in HI are paid back in 2.6 years, with the remaining state's pay backs between 4.5 and ~9 years.

**Figure 15: Top-10 Performers, by IRR—All Incentives + Base Rate**



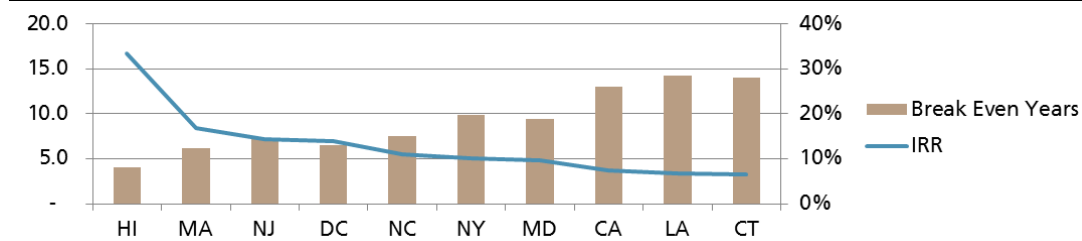
Source: Company Filings, UBSe, EIA, DOE, SRECTrade

**Of the top-10, all but RI and CA have IRR's greater than 15%.** We flag CA as the only state in the top 10 without state-incentives (outside of RPS mandates) taken into account, with the flagship CSI program culminating in ~2014. This indicates the current strength of the CA market, and represents the difference in maturity levels between CA and most other states, outside of HI.

## Scenario 2: State Incentives

Hawaii remains in the pole position with the Federal ITC removed, while MA's IRR stayed above 15% and only NJ, DC, NC, NY and MD have IRRs above 10%. Average break-even years shifted to 9.3 years for the top-10 performers.

Figure 16: Top-10 Performers, by IRR—State Incentives + Base Rate



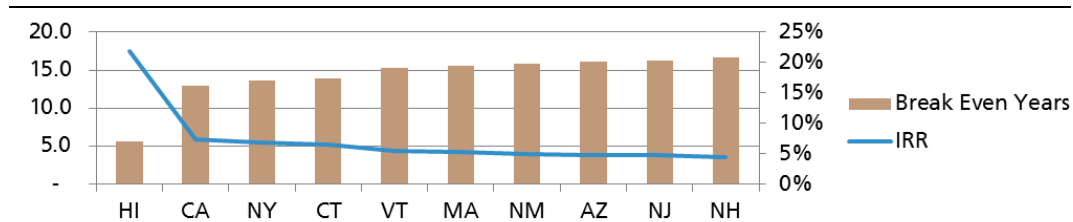
Source: Company Filings, UBSe, EIA, DOE, SRECTrade

**LA and DC do not get much attention regarding their solar initiatives**, and the state and district respectively have not installed a great deal of residential solar. Our model highlights the regions as having beneficial policy, DC with SRECs and LA with a 50% ITC. Combined with the Federal ITC, customers in LA can get up to 80% of the upfront system cost rebated. It is additionally interesting to note that outside of HI, the states with IRR's above 10% are all located on the East Coast, highlighting the initiatives in the region to promote solar adoption, combined with high energy costs.

## Scenario 3: No Incentives

As previously noted, CA's CSI program is drained of all funding ahead of schedule and the state does not have any state-wide incentives accounted for in our model. When all incentives are removed, a combination of states with the highest energy rates and irradiances remain in the top-10. This scenario is arguably the best indicator of the states with the greatest potential for sustainable resi solar growth as it tests the most organic variables.

Figure 17: Top-10 Performers, by IRR—No Incentives + Base Rate



Source: Company Filings, UBSe, EIA, DOE, SRECTrade

**Without any incentives to offset installation and equipment costs**, only HI maintains an IRR over 15%. No states in this scenario retain IRR's between 10% and 15%, with 8 states having IRR's between 5% and 10%. These states include CA, NY, CT, VT, MA, NM, AZ, and NJ. Following the ITC dip, and assuming state-level incentives will gradually be removed by ~2025, these are the states that we feel could have the most stable and sustainable long-term resi solar markets.



## Statement of Risk

Risks for Utilities and Independent Power Producers (IPPs) primarily relate to volatile commodity prices for power, natural gas, and coal. Risks to IPPs also stem from load variability, and operational risk in running these facilities. Rising coal and, to a certain extent, uranium prices could pressure margins as the fuel hedges roll off Competitive Integrations. Further, IPPs face declining revenues as in the money power and gas hedges roll off. Other non-regulated risks include weather and for some, foreign currency risk, which again must be diligently accounted in the company's risk management operations. Major external factors, which affect our valuation, are environmental risks. Environmental capex could escalate if stricter emission standards are implemented. We believe a nuclear accident or a change in the Nuclear Regulatory Commission/Environment Protection Agency regulations could have a negative impact on our estimates. Risks for regulated utilities include the uncertainty around the composition of state regulatory Commissions, adverse regulatory changes, unfavorable weather conditions, variance from normal population growth, and changes in customer mix. Changes in macroeconomic factors will affect customer additions/subtractions and usage patterns.

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12-Month Rating	Definition	Coverage <sup>1</sup>	IB Services <sup>2</sup>
Buy	FSR is > 6% above the MRA.	45%	37%
Neutral	FSR is between -6% and 6% of the MRA.	43%	33%
Sell	FSR is > 6% below the MRA.	12%	20%
Short-Term Rating	Definition	Coverage <sup>3</sup>	IB Services <sup>4</sup>
Buy	Stock price expected to rise within three months from the time the rating was assigned because of a specific catalyst or event.	less than 1%	less than 1%
Sell	Stock price expected to fall within three months from the time the rating was assigned because of a specific catalyst or event.	less than 1%	less than 1%

Source: UBS. Rating allocations are as of 31 March 2015.

1:Percentage of companies under coverage globally within the 12-month rating category. 2:Percentage of companies within the 12-month rating category for which investment banking (IB) services were provided within the past 12 months.

3:Percentage of companies under coverage globally within the Short-Term rating category. 4:Percentage of companies within the Short-Term rating category for which investment banking (IB) services were provided within the past 12 months.

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**UBS Securities LLC:** Julien Dumoulin-Smith; Michael Weinstein; Paul Zimbardo.

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Company Name	Reuters	12-month rating	Short-term rating	Price	Price date
<b>Calpine Corporation</b> <sup>2, 4, 6, 16</sup>	CPN.N	Neutral	N/A	US\$19.60	05 Jun 2015
<b>Dynegy, Inc.</b> <sup>2, 4, 5, 6, 16</sup>	DYN.N	Buy	N/A	US\$31.96	05 Jun 2015
<b>Edison International</b> <sup>2, 4, 6, 16</sup>	EIX.N	Buy	N/A	US\$57.68	05 Jun 2015
<b>First Solar Inc</b> <sup>13, 16</sup>	FSLR.O	Neutral	N/A	US\$51.30	05 Jun 2015
<b>NextEra Energy</b> <sup>2, 4, 6, 16</sup>	NEE.N	Buy	N/A	US\$98.77	05 Jun 2015
<b>SunEdison Inc.</b> <sup>13, 16</sup>	SUNE.N	Buy	N/A	US\$30.50	05 Jun 2015
<b>TerraForm Power, Inc.</b> <sup>1, 5, 16</sup>	TERP.O	Buy	N/A	US\$37.88	05 Jun 2015

Source: UBS. All prices as of local market close.

Ratings in this table are the most current published ratings prior to this report. They may be more recent than the stock pricing date

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