

US Electric Utilities & IPPs

Distilling The Web's Wisdom on Solar

Equities

Americas
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Understanding DG Trends via the EnergySage online platform

We held our latest conference call with Vikram Aggarawal, CEO of the EnergySage.com solar platform, the preeminent online shopping platform for consumers to compare loan vs. lease options. Solar remains a relatively opaque industry, with many potential customers 'sold' solar rather than pursuing solar, allowing vendors to dictate savings for consumers. While offers vary widely by jurisdiction, shopping online produces 10-15% greater savings for consumers; with most deals today offering ~20% discounts vs. their utility bills, whereas EnergySage appears to offer upwards of ~30% when shopped across multiple offers. Interestingly, for those pursuing 'community solar', the savings are the least at just ~10%, typically marketed to those ineligible for rooftop (renters, apartments). Bottom line, we remain concerned around structural margin pressures on residential solar vendors as customer awareness of offerings increases, particularly with greater awareness of EnergySage and other similar price-shopping platforms.

The Loan vs. Lease Debate – a further illustration of margin pressure

We link the rising preference for solar loans, where customers buy (and borrow) against the system outright, rather than leasing to a wider push to keep vendors honest on passing through panel cost reductions rather than dictating prices via discounts off utility bills. With discounts to customers having declined modestly, rather than passing alongside the full benefits of lower solar installation costs, the disparity in savings between owning and leasing systems has seemingly increased meaningfully. EnergySage, estimates 70-75% of customers opt for loans now, when compared side-by-side, similar to the ~2/3rds quoted by SunPower in their latest 4Q release. Within these sales roughly half are via unsecured loan products, with the balance with more complicated (and cheaper) first- and second-lien products. We expect the cost of financing to become even more competitive as the ability to securitize these loans into securitizations (ABS) becomes pervasive. Following SCTY's example, NYLD confirmed it would likely seek such structures on its capitalization of portfolios sold down from NRG.

What's the analogy to the retail electric sector – it's all about sales channel

Akin to the intense competition we've already seen take hold in the ERCOT electric retail market, sales channels are centrally important to the margin proposition. Electric sales done online see near no margin, with all offers on the Powertochoose.org website seemingly designed to provide long-dated benefits to suppliers who are betting customers who choose to shop after their upfront low rates expire. In contrast, door to door rates, among other venues customers choose to shop offer up to 30% margins. We expect this bifurcation to exist to an even greater extent as penetration remains low. Notably, we flag customer acquisition costs are significant for the most lucrative door-to-door opportunities, where costs can be \$3k-\$6k/residential customers. The question will be whether customer education for solar becomes more meaningful, as taking the decision to sign up for a 20-year commitment more seriously than a short-tenor electric contract. Bottom line, intense competition and limited customer awareness are two key lessons for the solar world from the electric retailer experience.

Where is solar sold today? Online platform yields clues

Leveraging the wealth of data available from this online platform, EnergySage emphasized the most significant opportunities it saw were across the Northeast, with NY the 'hottest' of late. While the platform transacts just 2-3% of industry volumes, markets in which it operates are indicative of underlying solar economics- and sales acceleration. Notably, EnergySage has seen promising trends in Texas, likely in West Texas where solar irradiance is among the highest in the country, alongside the cheapest installed \$/Watt costs. When coupled with panels facing Westwards to peak shave, rates offered appear to compete with 8-9¢/KWh range.

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Loan vs Lease debate will shift with the ITC step-down

Among the key points in evaluating the trend towards buying via loan in lieu of a lease is the step-down to 0% for the residential ITC, vs. the step-down to 10% for the business ITC at the end of 2016. We see this as an important discrepancy, reflecting the greater need for the ITC at larger utility-scale vs. the net metering subsidies available for smaller residential installations. We suspect this will play out favoring leasing options, which can continue to capitalize on the 10%, vs. the individual who will no longer.

Customers haven't fully benefited as solar costs continue to decline

According to EnergySage data, cash prices on an average were close to \$5/kw three years ago, and have now come down to mid-\$3's, a ~30% or so drop. However, Vikram said that lease prices have remained constant. Installers price their systems based on what they expect customers are willing to pay, rather than their underlying costs (generally in the 20, 30% discount vs. current electricity bills). This also leads to cost differentials across regions as rates vary significantly across service territories due to differences in taxes, volumetric rates, etc. This is in turn the primary driver behind the latest trend towards loans rather than leases, seeing the benefits under this scenario as disproportionately accruing to those pursuing loans.

Declining costs do not benefit all consumers equally.

Cost of solar varies widely by state

We include a chart below illustrating the significant variations in cost by state from the EnergySage presentation. Key to this chart is the low cost in states like Texas, where variable rates are among the cheapest in the country. Mr. Aggarwal emphasized costs in this region had been as low as \$2.50/Watt in some regions, reflecting the lower cost of installation. We continue to see the bulk of cost reduction in residential solar as tied to declining installer costs, seeing Germany as a notable datapoint in its low relative cost vs. the US (upwards of ~40% cheaper according to some estimates).

Figure 1: System costs vary significantly by state

AVERAGE QUOTED PRICES FOR TURNKEY, HOST-OWNED SYSTEMS						
CA	AZ	CO	MA	NY	NC	TX
\$3.75	\$3.45	\$3.75	\$4.10	\$3.95	\$3.75	\$3.20

Source: EnergySage Presentation

Could loans force leasing companies to offer wider discounts?

The trend towards loans could very well be the 'forcing mechanism' for leasing companies to offer wider discounts. While leasing will always come at a premium to loan products, particularly for marginal customers with weaker FICO scores, it remains unclear how wide this delta will remain down the line.

What kinds of loans are available?

We include a brief comparison of the types of loans available to consumers. The key question for many remains whether to pursue secured or unsecured products. In specific states, customers can also choose from subsidized state loan products. Property Assessed Clean Energy (PACE) is available to customers in California; the

state of CA still constitutes roughly ~half of all incremental DG home sales, and ~35% for EnergySage, making this particular subsidy program quite relevant. In Hawaii, customers can opt for the Green Energy Market Securitization Program (GEMS) solar product. These discounted loan programs are typically geared towards customers with relatively lower credit quality.

Figure 2: Comparing the EnergySage Loan Products – What's on Offer?

SECURED LOANS	UN-SECURED LOANS	MUNICIPAL LOANS
<ul style="list-style-type: none"> • Home as collateral • FHA-Guaranteed loans • 5-20 year term • 4- 6% interest • Low origination fees • Tax-deductible interest 	<ul style="list-style-type: none"> • Equipment as collateral • 650+ FICO Score • 5-20 year term • Up to 9% interest 	<ul style="list-style-type: none"> • e.g., PACE Loans • 3%+ interest • Tax deductible interest

Source: EnergySage Presentation to UBS

Unsecured loans should increase solar penetration further

Many consumers are choosing the unsecured loan options, which allows the installer to pay an origination fee of about 10 to 20% of the value of the solar PV system to the loan provider and buy down the loan to as low as 2.9% in interest; typically with a duration of 10 to 20 years. Assuming they qualify on the FICO score, the process is very straight forward for the customer. Further, if the consumer qualifies and can take the ITC, then for the first 12 to 18 months, the loan equals the amount of the ITC, mostly at low to no explicit interest cost.

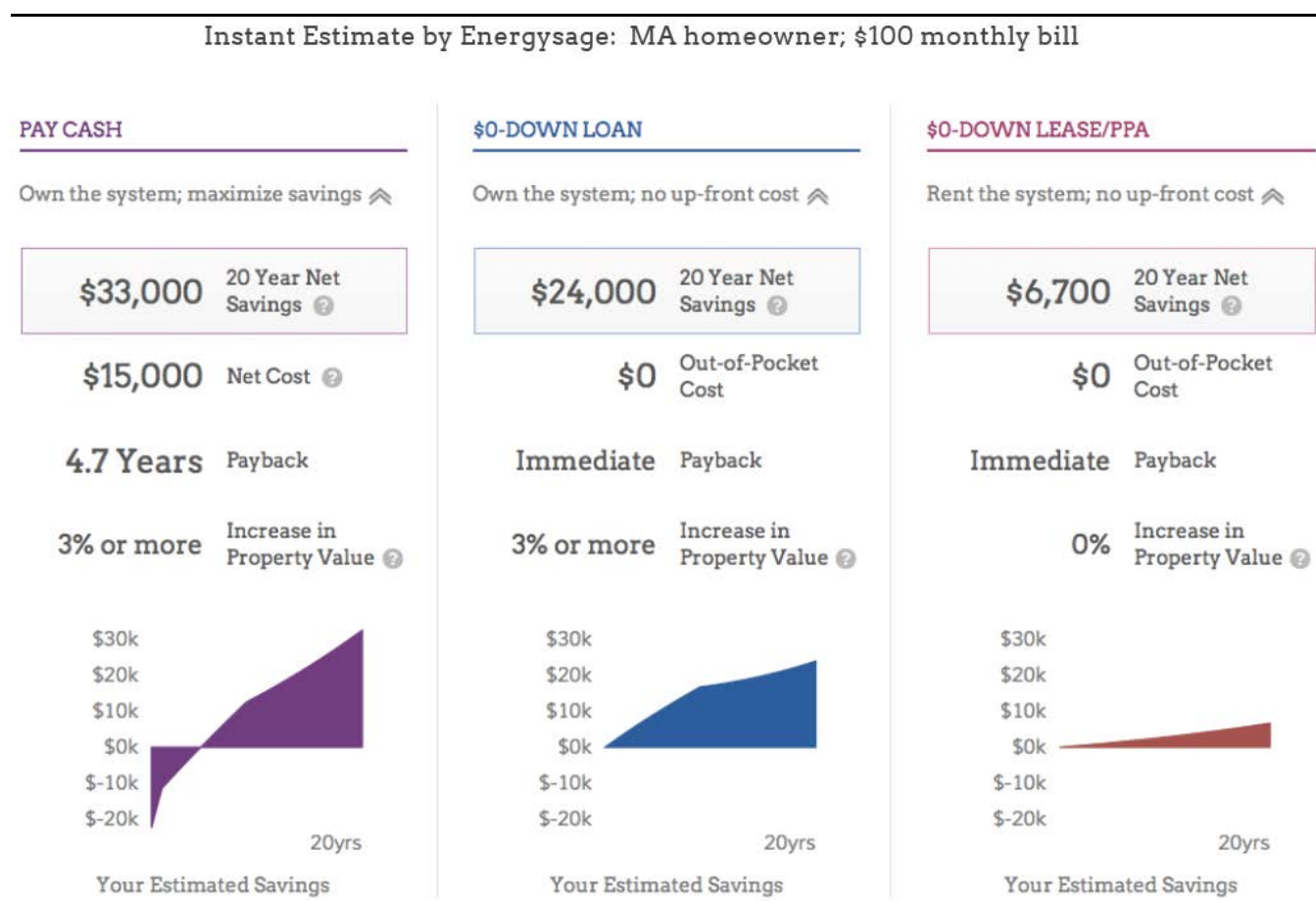
Solar LCOE can be as low as 1-2 cents/kw in Massachusetts

In Massachusetts, factoring in the ITC and Solar Renewable Energy Credits (SRECs) over a 20 year period, EnergySage estimates the solar LCOE is as low as 1-2 ¢/kwh. In New York, with ITC income fund rebates built into the economics, the LCOE is an amazingly low ~3-4 cents/kwh. In the lease model in these markets, the lease provider is looking to charge somewhere between 10 and 12 cents with an escalator of 2 to 3% for the 20 year duration. We suspect the current levels of LCOE are unsustainable and reflect transitional economics for these products as solar subsidies are scaled back in the next couple years.

How do the numbers stack up? Looking at an illustrative example in MA

We illustrate the results from EnergySage's web platform for a typical Massachusetts consumer with a \$100/mo bill. While clearly paying cash will always be the lowest cost option (without consideration for fungible alternatives for cash deployment), it's notable to see the wide disparity between the loan vs. lease. The \$0-down loan reflects the leveraging of the entire project, including the 30% ITC tax credit. The most aggressive financing programs will offer very low, or interest-free short-duration loans to customers to bridge them until the receipt of the ITC benefits.

Figure 3: Comparison of Typical MA Bill – How do the savings accrue?



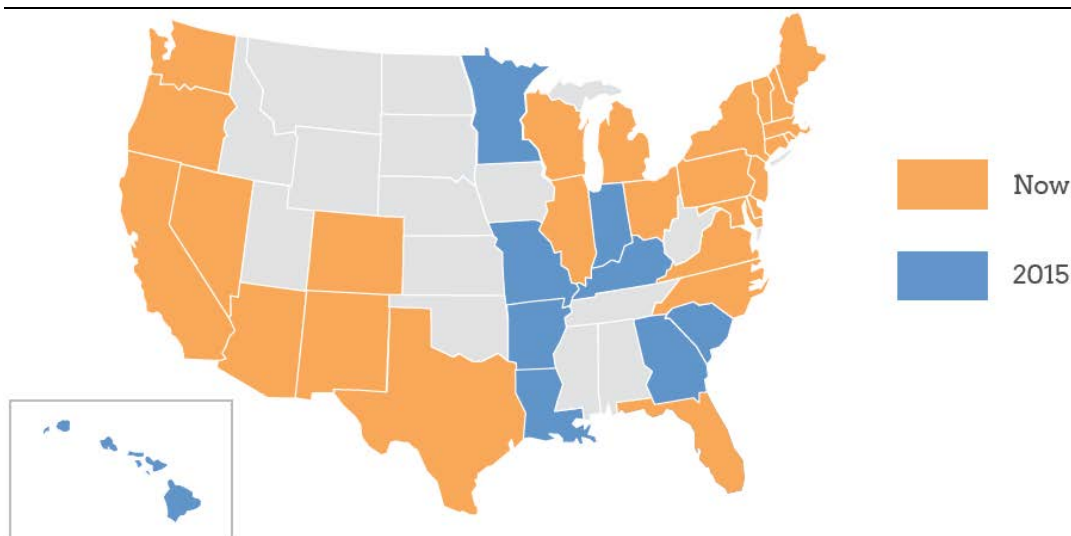
Source: EnergySage Presentation to UBS

Illustrating the Extent of DG Penetration: Where does EnergySage Operate?

Illustrating the wide breadth of markets where DG economics remain interesting, we include a map of both existing and prospective DG markets in which EnergySage operates. While they operate in Florida today, anecdotally the company reports limited sales in this jurisdiction.

Similarly, this does not reflect market penetration 'reversal' when the 30% ITC drops down at the end of 2016. We would expect this map to reflect fewer states in 2017+.

Figure 4: Where do the DG Economics 'Work' today? Operating markets for EnergySage



Source: EnergySage presentation to UBS

For further background on Solar opportunities, please refer to our recent notes below:

[Background on Tax Equity Matters – How much does it cost ?](#)

[BNEF's take on the solar outlook – US capacity and cost trends](#)

[DG Policy outlook with SunRun - Weighing in on net metering](#)

[The US Solar Policy outlook with SEIA – ITC and trade prospects](#)

[How Cheap can Solar Get? NREL's Take – Why are costs coming down?](#)

[Cracking the Carbon Code – Thoughts on 111\(d\) compliance at NARUC](#)

[NRG: Picking Apart the Solar Opportunity – The Economics of Solar DG](#)

Conference Call on Trends in Distributed Solar

We present below the transcript from our call with Vikram Aggarwal from EnergySage, an online solar sales platform. They have been edited for clarity. The accompanying slides can be accessed by emailing your UBS representative.

Julien Dumoulin-Smith: Good afternoon everyone and thank you for joining us. Today we are joined by Vikram Aggarwal, CEO of EnergySage, to not just discuss the background on his Web platform, but to also broadly parse out the information he has access to through that platform; and to also talk about the loan versus lease debate which is clearly taking up some momentum in the industry.

So with that, I will turn it over to Vikram to go through his slides briefly before we open it up to a moderated question and answer. Good afternoon, Vikram and thank you for taking the time. Why don't you talk about where you're coming from and the trends you're observing in the solar industry?

Vikram Aggarwal: Thank you Julien. Hello everyone. I'm Vikram Aggarwal, founder and Chief Executive of EnergySage. I will be referring to my slides here as I talk on the topic.

I'll start by giving you a quick overview of EnergySage and who we are and what we are doing. Number two, we will talk about the financing options that are available to the consumers today that are making the solar market grow even faster than it has ever grown.

Next we will talk about the lease versus loan debate and what trends we are seeing and why consumers are choosing one versus the other. Next I would like to talk a little bit about the solar prices in the United States. We have excellent data of how solar is being priced around the country and would like to give you some insights into that.

So EnergySage has been described as the 'kayak.com' of solar and just like kayak, we make it really easy and quick for consumers to research and shop for turnkey solar PV systems and financial options online. Consumers typically get quotes on three or more solar installers who

have been pre-screened by us - they are high quality solar installers.

These quotes are then presented to the consumer in a standardized apples-to-apples format so consumers can easily and quickly compare their options and select the one that offers them the best value. For consumers we are offering value options of simplicity, choice and transparency.

As I said, we make it really easy for them to research and shop, give them all their choices in one place. These choices could include the different type of solar installers, different equipment options, financing options, etc. and present this information in a transparent fashion so that they know that they're making the decision in an informed fashion.

For the installers, our value proposition is that it is a new, efficient sales channel that allows them to grow their business more rapidly and profitably. We launched a beta version of this platform just about two years ago; and a non-beta nationally about 18 months ago. So that's our history.

Moving onto page 3, EnergySage has partnerships with a number of different organizations, World Wildlife Foundation, Staples and a number of other state and city organizations that are now promoting EnergySage to their customers, employees, residents, etc. as a way for them to research and shop for solar. I will not spend too much time on this slide but will be happy to answer questions later on about this.

Moving onto page 4, we are currently operational in 26 states so consumers in these states whether they are homeowners or commercial property owners, both businesses and non-profit, can get quotes through our marketplace.

We have a network of 225 solar installers today and plan to increase our network to be about 500 by the end of this year. And they'll be operational in about 30 states.

Moving onto page 5, let's shift the discussion towards what kind of financing options are available to the consumers today. Here I show an example of a consumer who's based out of Massachusetts and spends about \$100 on their monthly electric bill. This consumer can have three options. They can either buy the system for cash. They will pay about \$15,000 net and end up saving somewhere in the range of \$30,000 or more over the next 20 years by installing solar. This system will give them an IRR of close to 20% with a payback of less than 5 years.

They can also finance this system by using the no money down solar loan. In this case, they will be cash flow positive day 1 and they will get to **keep about 70% of their savings.**

The third option that the consumer has is signing up for a lease power purchase agreement in which case again, they will cash flow positive day 1 but they will **get to keep only about 20% of the financial savings.**

The good news is that these different options are allowing more mass market consumers to consider solar and install solar. And they are making solar more affordable to the broader market.

Moving onto page 6 what we are starting to see at lease on the EnergySage marketplace, that consumer are increasing electing to go with no money down solar loans. On **our platform, we have seen 70% or more of consumers electing to own solar, either pay cash for it or finance it with a loan.**

And the reason (we ask these consumers; and we keep track of why they're making the decisions) is that consumers who prefer a lease or a PPA, value its simplicity. It's very easy. They sign-up. They basically sign a document and the company will come and install and maintain the solar PV system. Consumers are highly attracted by that.

The other consumers who wanted to go and buy the system or finance it with a loan, either did not have the tax liability to benefit from the tax, the ITC and maybe other rebates and depreciation.

On the other hand we are hearing from a lot more consumers when they see the financial benefit and see that they're only keeping 20% of their savings of a solar PV system. Increasingly they are choosing to go with a solar loan. And I'll talk more about some of the loan options.

There are increasingly some solar loan options that are as simple as a lease where they just have to sign a document and they can get financing. Increasingly, consumers want the option to own the system. We have heard from consumers who say I own my house and I want to own anything that I put on it.

And last but not the least, consumers do feel that solar increases the value of their homes and we're starting to see more and more empirical evidence that that proves that point.

Moving onto the next slide - slide 7, consumers now have several loan options. They can be grouped in secured loans, unsecured loans and some sponsored by municipalities.

The secured loans typically use the home as collateral whether it's a first mortgage or a second lien on the property. Some of them are guaranteed by FHA that offers them, with no or low origination fees. The terms are quite flexible and they range anywhere from 5 to 20 years and interest rates are also in the range of 4 to 6% which are tax deductible. It's a little bit more paper intensive to get these loans but from a financial perspective they offer the consumers the best options. And a number of installers are offering this and EnergySage is increasingly offering secured loan options directly to the consumers as they start the shopping process.

On the unsecured loan option, these are loans where the consumer can get a loan by just signing on a document based on their FICO scores. And in a few cases the shipment of the panels themselves may be used as collateral. Again, they offer flexible loan terms, from 5 to 20 years and the interest rates can be as high as 9% although consumers have an option to, most consumers and installers have an option to buy down this interest rate and some of them are offering interest rates as low as 3%.

Last but not the least in a very few markets around the country consumers have access to municipally sponsored loans and some of you might be familiar with PACE loans. They are funded through the property tax bill, have low interest rates and are tax deductible. So, this is a very, very attractive option that is currently available to only a few consumers.

Today we know of at least one hundred banks and other financial institutions that are now providing solar loans to consumers but I would say about 18 months ago, you could have counted these banks and financial institutions on your fingers. So the number has increased rapidly and they're expecting a number of additional providers to enter the market. We regularly hear from private investors and banks who are interested in offering solar loans to consumers.

Moving onto page 8, there are several reasons that we are seeing why consumers favor solar loans. I think the first and the foremost of that is the dramatic fall in the solar PV system prices. As you know, system prices have fallen over 50% mostly driven by the fall in the solar panel costs; but installing solar has become quite efficient too. So if you looked at the solar PV prices about five years ago when solar leases started becoming more attractive, at that point, the consumer may have had to spend either from 30 to \$40,000 to buy a solar PV system. Today, consumers may be somewhere between 10 and \$20 thousand to buy a PV system. So it's much more like buying a car and financing it with a loan so more and more consumers are comfortable with that.

Secondly, most installers outside of the top five, are increasingly offering loan options only and that is driving and increasing interest in solar loans from consumers. Third, we are starting to see that consumers are becoming more informed.

The solar market is now transitioning from a push to a pull market. As you know, most consumers were either called upon by a solar installer whether it's a phone call or knock on the door or through flyers but increasingly consumers are seeing that solar is being installed in the neighborhood or they're friends and family have done that and they're starting to become active shoppers.

As an active shoppers, as you know, one choice is an option to evaluate and see financial benefits and the cost benefit of leases versus loans and they're starting to see that it's helping to drive the consumer towards the solar market and increasing transparency and helping overall.

So that was a few pages about solar loans and leases and I'm happy to discuss more in the Q&A. Now, if you move onto page 9, let's move the discussion towards a little bit more about what we are seeing in terms of solar prices. What we are seeing is that the prices for solar PV systems definitely vary between states.

The average prices that we see on the EnergySage marketplace nationally, we can see a price as low as \$3.20 in Texas and as high as \$4.10 in Massachusetts. By the way, this is 2014 data.

A number of factors are driving this, either more expensive installation costs or it also reflects higher incentives in certain markets at competitive rates. So I think the installers are generally pricing solar to maximize their revenue and not primarily driven by their own cost structure at times.

The second thing that we are seeing is that if a consumer comparison shops and they get quotes from let's say three installers, the difference between the price that they get from the most expensive installer and the cheapest installer could be as high

as 50%. Typically it ranges from 20 to 30% but it could be highly variable.

So on average, consumers who are using the EnergySage marketplace can save up to 20% over market averages by shopping on our site. But as you can see over the last few years where a few years ago the prices would have been in the \$5 to \$6 watt range and now we are starting to see prices in the \$3 range and in most markets, you could get prices as low, as close to the \$3 watt range in the industry.

The next slide, page 10, it's mostly talking about the additional data that EnergySage is collecting and we are preparing to conduct some analysis on the data. A couple of the examples of the data analysis that we are in the midst of performing is looking at how different solar PV packages are being priced in the industry.

Not all solar PV systems are the same. The difference typically is the quality of the solar panels themselves, whether they're standard or customized panels, the quality of the modules and even what size of the system there is.

We have very good insights and detailed data of how different packages are being priced by solar installers. And in the next several months, we would be able to give consumers an insight into if they're shopping for a standard solar PV system, what kind of market average and prices are for those systems and whether they're paying more or less than what their neighbor has paid.

Second, we have some great insight into what kind of equipment installers are offering. We were able to see over the last couple of years how SolarEdge became the leading provider of solar optimizers and even started replacing, more and more solar started offering SolarEdge versus Microinverters in certain cases.

We also have very interesting data on consumer behavior. Different consumers, as you know, have

different shopping preferences, information needs, etc. than can be used to define a different consumer segment and based on which we could offer consumers a better customized shopping experience moving forward.

So I'll stop here. As promised 20 minutes and I'll open the floor for questions.

Julien Dumoulin-Smith: Great. Let me ask some initial questions before we move to the broader Q&A. Your comments are very relevant when we think about energy savings and just what residential consumers are paying. Where is the greatest difference between consumers getting a good deal versus not. Are there regional drivers to this? What are the primary drivers for high prices versus what's available on your platform?

Vikram Aggarwal: Sure. I think the biggest challenge that the industry faces today is that solar is a very opaque industry. If we think of ourselves as consumers, and we want to shop for something - it could be a very simple product or a very complex product - we can go on the Web and find out where the product is being sold and at what price and who's selling it. That kind of information until today had not existed in the solar PV marketplace.

The solar market is very much a push market - at least has been largely till now - so the goal of the industry has been, especially on the largest players, to spend a lot of money on marketing and advertising and getting to the consumer first and making a very strong and hard pitch for solar and hoping that the consumer would end up buying from them while competitively shopping.

This situation exists in mostly all of the markets, but markets like California and some of the other more advanced markets, where customers are generally more informed, we see that consumers are becoming more like shoppers. So consumers in California which is about 50% of the solar market today, are very aware that it is a comparative shop, they can get better prices.

So we see a lot of cases where consumers from California register on EnergySage, get the quotes. They know exactly that they're going to buy solar. They're just looking for the best options which they're not able to get either from one of the providers that may not have pitched to them directly.

We see a lot of cases where consumers got quotes from one of the large companies. Then they register with us and say is this the best deal that I can get? So we are obviously very happy with that trend, that consumers want to be more informed and want to comparison shop and ask where we see the best value.

And so far we have not, at least from the publically available information, we have, not seen any place that can offer lower prices than what consumers can get on our site.

Julien Dumoulin-Smith: Interesting. So what are consumers choosing? If you can kind of summarize the loan versus lease versus the PACE subsidized loan market?

What are consumers choosing across these different markets and what are the key drivers, i.e., I imagine FICO score availability is a key input there, whether a loan or lease or government program?

Vikram Aggarwal: Sure. I think a lot of consumers are choosing the unsecured loan options. So generally the way the unsecured loan options work is because they're very easy and they offer at least on the surface on it, good value to the consumer. So let me tell you a little bit about how that works.

There are several other companies now entering the market, say there about ten or more companies that are offering unsecured loans today. What they allow the installer to do is pay an origination fee of about 10 to 20% of the value of the solar PV system to the loan provider and buy down the loan to as low as 2.9% in interest. And the duration could be anywhere from 10 to 20 years.

And all the consumer has to do is sign on a paper and make sure they qualify based on their FICO score. So that is a very easy sell for the installer. They can offer that to the consumer, bring the paper work or send the paper work to the consumer. They sign it and there you go.

You now have a solar PV system installed on your roof. A lot of these loan providers are also offering an interest free or very low interest financing from the ITC. So if the consumer qualifies and can take the ITC, these loan providers are saying the first 12 to 18 months, the value of the ITC, the loan equal to the amount of the amount of the ITC, carries no interest.

So you essentially get on a, let's say a \$20,000 system, \$6,000 interest free for the 12 to 18 months and pay that off when you get your taxes filed. And the loan is now re-amortized and you now pay interest on the rest, \$14,000.

So there are increasingly making it very, very easy for the consumer to go solar. On the other hand, secured loans and some of the municipality loans are a little bit more complex, more involved, more paperwork and at times, even though they offer consumers a better financing option, they are selected last.

But I think we see signs from a number of different banks to make that process more easy and simple and we fully expect that those loan options will also become more attractive going forward.

Julien Dumoulin-Smith: Could you break down the interest rates - how much are folks choosing one way or another?

Vikram Aggarwal: Unsecured versus secured?

Julien Dumoulin-Smith: Yes, unsecured, versus secured versus lease, the breakdown of that composition, of what are folks are shopping for on your site, if you can.

Vikram Aggarwal:

Sure. So at least, and I can only quote the numbers that we see on our site, we see I'd say 70 to 75% of consumers choosing to own the system. So essentially either they paid cash for it or they signed up for a loan. And of the 75% of people that ended up owning the system I think I would say about half of them use an unsecured loan to finance their installation and the balance either paid cash or they took out a secured loan.

In the case of the secured loan, in some cases we're not able to track if the consumer signed up for an unsecured loan. We will be able to in the future but as of now, we're not able to tell that. So there's a lot more interest at least when our platforms weren't owning the system.

Julien Dumoulin-Smith:

Great. Excellent. You obviously operate across a lot of states - what are the states that are the "hottest" in terms of trends and perhaps which are the most disappointing for solar adoption? For example, New York has become very interesting amongst folks we talk to. And I note that even though the economics of solar in Texas seem challenged, ultimately you still do operate in the state.

Vikram Aggarwal:

So California is our most active market, about 35% of our leads at any time are coming from California versus the 50% industry average, I would say. So California remains a pretty active market. Then from there, Massachusetts, our home state, is very active for us. Along with New York, Connecticut, these three states in the northeast are very, very active. We are seeing a lot of interest from Connecticut and New York.

New York is definitely one of the fastest growing markets recently. Massachusetts and Connecticut have done quite well over the last few years on a per capita basis but New York is definitely growing very, very fast.

I'll go through the rest of the states. Mid-Atlantic is doing very, very well. For us, Maryland, North Carolina are doing quite well. Colorado is still very active. Arizona is not as good as it used to be; and the same for New Jersey, at least for us. Limited action we are seeing from Washington and Oregon. Pennsylvania, is actually a very good market for us. We have some very good partnerships at the local level that are driving a lot of consumer interest.

So as I mentioned, one of the unique things about EnergySage is we are actively promoted by organizations who are promoting solar to either their employees, their customers, their residents, members, etc. So as we form relationships with either Chambers of Commerce or non-profits or businesses in different markets, our lead volume grows in those markets substantially. So I think our traffic numbers at least may not reflect the market anymore. It may reflect our partner's ability to drive traffic to us at times.

Julien Dumoulin-Smith: Right. That makes a lot of sense. So what about Texas, if you can talk about that briefly. Texas and Florida, perhaps.

Vikram Aggarwal: Yes, so both Texas and Florida are very interesting because one, there are very limited incentives or programs to promote solar in both of these states. So as a result, we actually see one of the lowest prices that solar is being sold in both these states. We are seeing prices as low as, in the low 2's that the installers are actually willing to sell at a gross price of \$2.25, \$2.50 a watt to consumers which could be 30% plus cheaper than other states.

So installers and consumers are interested in certain markets. In Austin and San Antonio, Dallas markets and some in the Panhandle. We see some strong pockets of interest in Texas. Texas is much, much stronger than Florida, at least for us.

And we are about to launch a few programs with some utilities in Texas who have aggressive targets to install solar. So we are expecting a pretty significant jump in our Texas business.

Florida, very little activity for us and there's a bit of short-term upside that we're seeing.

Julien Dumoulin-Smith: Can you elaborate because that's kind of an interesting business model for you as well. So what are you doing in Texas exactly with a partner? How is that working, just to be clear?

And do you have any kinds of partnerships elsewhere too, because I suppose for you that's a great way to bring traffic to you but also to provide a platform for utility companies to deploy solar rapidly across their footprint.

Vikram Aggarwal: Exactly. I think our partnerships usually with these organizations are that we would provide educational and informational content for their audience. EnergySage is not tied to any particular manufacturing company, installation company or financing company.

But we are in a very unique position where we can provide information to the consumer about all the options they have, the pros and cons of the different choices and under what circumstances one option may be better than the other.

So if you go on at EnergySage, we have one of the most comprehensive objective set-up information for customers. So a lot of our partners like utilities are very interested in providing that kind of content to their audience so consumers can learn and understand what their solar options are.

We have the quick estimate feature on our site where consumers can get a very quick estimate of what solar will cost them and how much they could save - and this is available for about 50 million properties - they will even be able to tell how big it is and if solar will fit on their roof.

So literally in seconds we are able to tell the consumer will solar even work for them and what their economics will likely be. And then when the consumer is ready to shop, we can work with them, we have the consumer get quotes from prescreened installers.

So a lot of these value propositions are very attractive to these utilities targets. The idea is that they would market us to their customers through different channels and encourage the consumers to consider their solar options and competitively shop.

Julien Dumoulin-Smith: That makes a lot of sense. Could you talk about net metering as a factor into your savings that you talk about on slide 5? I suppose many states offer a number of net metering policies ranging from crediting excess solar at the retail rate to the short term of weighted costs. Could you give us your opinion on various net metering policies in impacting sales?

Vikram Aggarwal: Yes I think that's going to be a difficult topic. If you think about ITC potentially going away in about 20 months or so; if there is no ITC and the utilities are only reimbursing just on the cost of electricity and what it costs, I think in solar the economics are not going to look this good. So I think definitely the industry would suffer substantially.

Julien Dumoulin-Smith: Can you actually elaborate briefly? You mentioned earlier 2 to 2.50 a watt - what does that translate into sort of an LCOE? What's the cost of that solar on the cents per kilowatt hour basis that the consumer would realize?

Vikram Aggarwal: Again there are a few factors that go into some of these numbers. So let's say, in Massachusetts, if you are installing solar and you get the ITC and in Massachusetts you also qualify for something called the Solar Renewal Energy Certificates, if you include all of that over a 20 year period, your LCOE may be in the 1-2 cents range.

In New York, with ITC income fund rebates built into the economics, you may be looking at a 3-4 cents LCOE. So the numbers are very attractive at least today and if you look at the lease or the PPA costs in most of these markets, the lease provider is looking to charge somewhere between 10 and 12 cents with an escalator of 2 to 3% for the 20 year duration.

Julien Dumoulin-Smith: Got it. Excellent. Basically you've got kind of a break-even here in New York, for example of 3-4 cents. They're charging for example 10 to 12 and if you think about it, that's really their margin that they can pay you and other folks to get it off the ground. Is that kind of the way to think about it - that's their margin?

Vikram Aggarwal: That's the lease provider's margin but actually the lease margin would be higher because they qualify for additional depreciation tax benefits and the homeowner does not. So their LCOE would be lower.

So in Massachusetts right now we are paying close to 20 cents per kilowatt hour for our electricity and by installing solar I can bring that down to about one to two cents, if I own the system. And if I lease it, I can bring that down to 12 to 13 cents per kilowatt hours with an escalator.

Julien Dumoulin-Smith: Got it. That's great. Where in Texas are you seeing the deployment? Again, that being one of the more controversial markets, that being West Texas really or is it really able to compete across the state?

Vikram Aggarwal: Not across the state. We barely see any interest from the eastern part of Texas. The central Austin market, the San Antonio market, a little bit of the Dallas and some of the southwest of the state, we see a lot more interest.

We actually have a chart that we were planning to include, where we show where all of these are today on the U.S., on the map. If people have interest, I'll be happy to share that afterwards.

Julien Dumoulin-Smith: That's great. Yes, we'll follow-up with you there. Can you talk about markets that are opening in 2015, just to elaborate there? What's driving that in your

mind? Is it basically just the LCOE has kind of hit the point where you can make it work?

Vikram Aggarwal: Exactly.

Julien Dumoulin-Smith: And then you're also getting involved in Hawaii. Why hadn't you been involved in Hawaii before? I'm just kind of curious, is there something discrete about how that market works?

Vikram Aggarwal: No it just so happened. One thing that we did was we decided to enter a market if a few people from that state registered on our site. So for some reason, we have not had people registering from Hawaii on EnergySage so we never paid attention.

We have several more people in Tennessee, Indiana, Minnesota. Those markets are heating up. Iowa, middle of the country is heating up quite a bit. We are starting to see a lot of interest coming in from those markets.

Ohio was hot but I think because of some policies at least temporarily we have seen lower interest from Ohio. In the future that could change.

Julien Dumoulin-Smith: Interesting. And what have you seen in terms of pricing trends (as realized by consumers)? How quickly have lease and loan prices come down all in at least over the time that you've been doing this?

Vikram Aggarwal: Yes the cash prices have definitely dropped significantly, since the last three plus years since we've been actively tracking. We were, I would say our averages were close to \$5 a kilowatt three years ago. And now as I've mentioned we're looking at mid 3's. So definitely a 30% or so drop.

Lease and PV prices over the last few years (I've been in the business since 2010) - the lease and PV prices

really have not dropped. They have remained quite constant. So the consumers don't think are seeing the drop in the solar, the benefit of the drop in the solar PV in the least.

One other point that I mentioned was what we see is installers large or small, they are pricing their systems based on what they believe the consumer can either pay or should pay. So, for example, they could use what you're current electricity rates are. So if your electricity rates are high, the quote that you're likely to get will be so the PPA is going to be matching that. It will generally be in the 20, 30% discount on your current electricity rates.

Second, we also see installer's price differently by towns, we have seen that in several occasions that the same installer with the same equipment may price a system higher in more expensive towns, richer towns than otherwise. And as I mentioned, the biggest reason for that is the market is very opaque. And we're hoping to put a dent in the opacity of the market. We have the ability to start showing to the consumer what the average prices are in their market for cash options and lease options. That, I think is also going to happen with the loans.

We are in the process of launching a finance marketplace where consumers will be able to see what the different loan options are when the loan comes from different loan providers. So I believe more transparency over the next upcoming months and years will help the market grow and give consumers more confidence and make solar more pervasive.

Julien Dumoulin-Smith:

So excellent. So that's actually really telling, that last data point - so you're really not seeing those lease prices come down and so from a certain perspective, the reason why the loan option is become more attractive is simply because the margins are becoming that much greater on the leasing side such that folks are seeing it well worth their time to go look elsewhere. Is that kind of a good way to summarize the trend of late?

Vikram Aggarwal:

Absolutely. I think three years ago if you were comparing a lease to a loan you would have said because there are fewer loan providers and loans were expensive, yes, you are saving. If the system costs more, your savings would have been much narrower.

I think because the panel prices have declined and the lease prices have not declined I think the delta has increased and absolutely, you said it best.

Julien Dumoulin Smith:

Interesting and so let's talk about the loan side. So obviously you've got a variety of different sellers offering different products. What are you seeing in terms of the financial, call it securitization?

There are certain securitization packages especially that are kind of becoming more pervasive. Are you seeing loan terms themselves improve in terms of what you all offer on the site. Will the costs on that loan come down, I mean clearly with interest rates?

Vikram Aggarwal:

Absolutely. I think the biggest innovation that we're seeing is the, is in the simplicity of getting a loan. I think that was the competitive advantage that leases offer. I think consumers definitely value simplicity. So loan providers are saying let me make sure I can get you a loan.

You can fill in an application online. All I need is your FICO score and I can use your personal guarantee or the equipment as the collateral and I'll give you a loan.

That I think has been one of the biggest innovations at least in the last year or so. As I mentioned, because there is still lack of transparency, they did

not really have to compete on the loan terms themselves but going forward with increased transparency, there may be some decrease in the interest rate also.

Julien Dumoulin Smith: Right. Absolutely. So where are average loan terms now?

Vikram Aggarwal: So the loan terms are, as I mentioned in the secured loan side, their interest rates generally range from 4 to 6, 6.5% for good credit, people with good credit. They really have not declined, at least that we have seen.

On the unsecured side, the interest rates are still in the single digits but high single digits with an option to buy down the loan, buy down the interest rate by the consumer by paying higher origination fee or (unintelligible).

Julien Dumoulin Smith: Great. Last question before I turn it over. The GEMS and the PACE program, how much market share do you see those garnering? What are the terms there? I mean how good are the terms relatively speaking versus other methodologies?

Vikram Aggarwal: In terms of the PACE?

Julien Dumoulin Smith: Indeed.

Vikram Aggarwal: Yes, I have a little bit limited information on PACE primarily because it has been a very limited product in very few geographies. We have not formed any kind of direct distribution agreements with any PACE

providers as just yet so I'd rather not provide that information.

Julien Dumoulin Smith: Got it. Okay. Excellent. And then I'd be curious or rather this is a question coming in, SolarCity, obviously a big player in the industry. Do you market their products or anyone else's products who are kind of the "mainstream providers"? I mean has it come to that yet or are you still kind of mostly, sorry. Go for it.

Vikram Aggarwal: Sure. So we don't have SolarCity on our platform as yet. We have two of the large national installers and are in discussions with three others to be added soon. But SolarCity, I don't see them being part of the network at least in the next three to six months.

Julien Dumoulin Smith: Who are the two big ones you deal with right now, if I can ask?

Vikram Aggarwal: RGS and Astrum.

Julien Dumoulin Smith: Got it. And what total percent of the market share do you guys have right now, just to be very clear about this?

Vikram Aggarwal: We have still pretty small. I would say we are in the 2 to 3% range.

Julien Dumoulin Smith: And do you have other Web competitors out there? I mean I suppose the question is as a platform, you know, as a marketing channel, how many other folks are out there marketing the way you are?

Vikram Aggarwal: The good news is we are still the only true online marketplace that allows multiple installers to compete for consumers. We are, as I mentioned, we are only (seven years) old, growing pretty fast and making, starting to make a difference.

Julien Dumoulin Smith: Right. Absolutely. And you would expect over time to have more of these large installers take you up on your offer presumably?

Vikram Aggarwal: Absolutely. I think with SolarCity because of their marketing engine, we just don't have that kind of lead volume that can move a needle. With some of the other big ones, we are working on essentially building electronic API's, if you would.

We would get the quotes and then integrate with their internal systems so that's what's keeping us from some of the other big ones. With SolarCity, our lead volumes are not there.

Julien Dumoulin Smith: Right.

Vikram Aggarwal: And I think it's going to be, it's becoming more of a market share game, as you know. There is a lot of competition. There are by some counts over 3 thousand solar installers out there all looking for business.

And some of the local, smaller installers have a very low cost structure. They can over really attractive prices for solar PV versus some of the larger providers. So it's going to be an interesting competitive environment moving forward.

Julien Dumoulin Smith: Well with that, Operator, why don't we open it up to the lines, to see what questions are coming in? And again, obviously if you're feeling shy, feel free to send me an email.

Question #1: Hi. Is there a market for something in between where we can begin with a lease type of a structure whereas the owners in the early years get the depreciation benefits and then the sort of a lease sale that says after six years or whatever the transfer, somehow it gets sold effectively to the, to the customer at that point?

Vikram Aggarwal: Yes, we are, we've actually seen that quite, that kind of a structure over the seven years, a lease buyback in the commercial sector, in the small commercial.

We have not yet seen that in the, in the residential sector but my gut feel and this is just my personal gut feel is that if you, if you look at a contract from a leasing company, from a SolarCity, SunRun, whoever else that leases, they have buyout price for the consumers.

It would be above the seven year mark that buyout price is the lowest. And I have a feeling a lot of the consumers may get a phone call from the leasing company to say hey, do you want to buy it out. It's only a thousand bucks or whatever, 15 hundred bucks to buy the system out.

And at that point the leasing company does not have any liability for any maintenance for anything. So it is possible that could happen.

Question #1: Thank you.

Vikram Aggarwal: But we have not seen that as a product.

Julien Dumoulin Smith: Maybe in the interim, the \$1,000-1,500 to buy it out, have you see it actually executed at the price for the residential side?

Vikram Aggarwal: No, not on the residential side. As I mentioned, that transaction may be happening but we don't have an insight into, we're not able to track that. But on the commercial side, that's a very common structure that we see.

Julien Dumoulin Smith: Got it.

Julien Dumoulin Smith: We'll keep going here with a few other questions, if you will. What have you seen with community solar? I mean is that something that you all are thinking about offering? I mean we're certainly hearing a good amount on that. What are your thoughts about community solar as a product offering and is there any need, you know, for you all to get involved and market broadly speaking.

Vikram Aggarwal: Absolutely. We are, at least in Massachusetts, we will have our first community solar offering in a couple of months so consumers who will register on EnergySage would get an option to buy into community solar.

The challenge that we are seeing, we just published some content about community solar on our site. There are a couple of challenges that I see right now, is that community solar is being priced very richly

right now because there are very limited options in the market.

Typically these are limited time offers. A company builds a 2 megawatt solar garden. They can sell potentially a hundred to two hundred consumers on average let's say and that's all they need.

And they're going after consumers who are more driven by the green than by saving for solar. We are in discussion with several providers of community solar and as we are getting, as we get comfortable with the transparency of the contract and the value that they're offering to the consumer, we'll add more and more in different states.

We have a few discussions going on with utilities in multiple states who are planning to get into community solar so that could be a very attractive option for consumers.

Julien Dumoulin Smith: That's great. So I suppose kind of running with that, you're saying, well first, when you're saying it's richly priced, you're saying it's not offering a material amount of savings to consumers?

Vikram Aggarwal: Yes.

Julien Dumoulin Smith: And then secondly, is the reason why you're targeting Massachusetts as kind of the first state here a function of the fact that they offer the so-called virtual net metering such that you don't need to be at the residence actually to have that full retail rate?

Vikram Aggarwal: Absolutely. So typically these providers are offering maybe a 10% discount on their current electric rates, maybe 15%. So that's why it's being very richly priced. As you can imagine on a commercial

scale of a 2 megawatt system would have pretty attractive economics.

So, we have a good insight on what a residential system costs. We don't have a very good insight of what a community solar does. So I cannot comment on what kind of margins community solar providers have but I know that from a pricing perspective, they, the savings are small for consumers and they're mostly targeting either renters or they're targeting people who cannot get solar because of, on their roof because they do not have a good location.

And absolutely Massachusetts because it's, it is a virtual net metering state and they're finding willing partners who are willing to compete and be transparent and will be adding more and more providers.

Julien Dumoulin Smith: Right. And community solar can be scaled up as you get more customers in there right? There's no minimum scale up, necessarily?

Vikram Aggarwal: No.

Julien Dumoulin Smith: Right.

Vikram Aggarwal: It is a great option. Our goal is to become the destination site. There is an option available to consumers who want to make sure they can shop or learn about it on our site.

Julien Dumoulin Smith: And now let me just be clear. You mentioned like a 10% discount on their electric bills. What are most so-called independent solar guys offering and then what is typically offered on your site, you know, as a

percentage of or a discount off of what they're currently paying, just to provide some context there.

Vikram Aggarwal: Sure. There will be two comparisons of a lease versus a PPA in that case. So leases and PPA's both typically offer a 20 to 30% discount on most cases. If a consumer is a comparison shopper and they can, if the company knows that the consumer is comparison shopping they can get you I would say another 10, 15% discount.

So in case of a lease or a PPA, yes you can get a discount let's say 30% off on average versus 10% for community solar. But an ownership price is what it is for the system. Usually they don't price it high.

Julien Dumoulin Smith: Right. Absolutely. Operator, do we have other questions on the line?

Operator: Yes, we have a question from Questioner #2. Please proceed.

Questioner #2 Yes. So you mentioned that the simplicity of the loan process is the main competitive advantage and do you have any other competitive advantage that loan has over lease?

Vikram Aggarwal: The biggest competitive advantage is the amount of savings. So that's where the consumer interest starts. And then the, having the providers, the solar installers and EnergySage itself is making sure that the loan options that are available to the consumers are easy to execute.

Then about a couple of years ago when we first started in the state, getting a secured loan could take from 60 to 90 days and a lot of paperwork and that was not a good scenario for the consumers.

So most of the banks are now working on simply applying that and making sure that a consumer can get a loan very, quickly in less than a month, hopefully in a week or two versus unsecured loans which they can get immediately.

Julien Dumoulin Smith: All right. Well I'm going to keep on going. Last question here before we close it out. If you were to describe the opportunity, what's most interesting trend that you've seen of late, what's the most interesting state that's evolving in your mind and what would you be paying attention to from your vantage point given the sales that you see move through your site?

Vikram Aggarwal: Yes, Julien you stumped me. There are some very, very interesting trends. To me I see personally, what I think the big difference is, **this industry needs more transparency. And the consumers are becoming more informed and they are asking for more information.**

I think that is likely to transform this industry, at least in the near future very significantly. And that is the trend that we are keeping an eye on. **We want to be a leader in providing transparency to this market because we do see consumers becoming shoppers rather than being sold solar. And as consumers find out, as consumers become aware of the economics of solar, their interest is increasing significantly.**

Julien Dumoulin Smith: And that makes a lot of sense.

Vikram Aggarwal: Yes

Julien Dumoulin Smith: Great. That makes a lot of sense. You seem very well positioned to capture that, so. I think with that, it being the top of the hour, I want to thank you Vikram very much for taking the time and sharing your insights.

Hugely informative. Very interesting perspectives and best of luck with your endeavors.

Vikram Aggarwal: Thank you.

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Company Disclosures

Company Name	Reuters	12-month rating	Short-term rating	Price	Price date
First Solar Inc. ^{13, 16}	FSLR.O	Neutral	N/A	US\$60.61	06 Mar 2015
NextEra Energy ^{2, 4, 5, 6, 16}	NEE.N	Buy	N/A	US\$98.70	06 Mar 2015
NextEra Energy Partners LP ^{2, 4, 6, 16}	NEP.N	Neutral	N/A	US\$37.38	06 Mar 2015
NRG Energy Inc. ¹⁶	NRG.N	Buy	N/A	US\$24.49	06 Mar 2015
NRG Yield ¹⁶	NYLD.N	Neutral	N/A	US\$51.16	06 Mar 2015
SunEdison Inc. ^{13, 16}	SUNE.N	Buy	N/A	US\$22.64	06 Mar 2015
TerraForm Power, Inc. ¹⁶	TERP.O	Buy	N/A	US\$34.01	06 Mar 2015

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