PUBLIC COMMENTS ON MITIGATING SOLAR DEVELOPMENT VOLATILITY

Initial Request for Comments Issued January 7, 2013
Deadline Extension Issued January 31, 2013
Comments Received by February 7, 2013

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Linda Wetzel

From: renewables-bounces@njcleanenergy.com on behalf of Hunter, B <B.Hunter@bpu.state.nj.us>
Sent: Thursday, January 31, 2013 11:26 AM
To: renewables@njcep.com
Subject: Reminder/extension of deadline for comments/responses to SEIA questions in relation to defining Solar Development Volatility for 02.14 RE meeting
Attachments: SEIA comments on RE Committee agenda - 122112.pdf; ATT00001.txt

RE List members:

Re:

Staff is extending the deadline for comments or responses to questions posed by SEIA in our attempt to define Solar Development Volatility (attached pdf) pursuant to subsection d. (3) (b) of the Solar Act. At our January 7th meeting, staff requested comments be submitted to the OCE@bpu.state.nj.us email address by February 1st.

Staff have been requested to extend the deadline to February 7th.

Thank you in advance for your submission.

Scott

http://www.njcleanenergy.com/main/clean-energy-council-committees/renewable-energy

SEIA Solar Energy Industries Association®

December 21, 2012

Mr. Scott Hunter
New Jersey Board of Public Utilities
44 South Clinton Avenue
Trenton, NJ 08625-0350

RE: Suggested agenda items for the Jan 7, 2013 Renewable Energy (RE) Committee meeting regarding solar market development volatility

Dear Mr. Hunter,

Per your request to stakeholders at the December 11 RE Committee meeting, the Solar Energy Industries Association (SEIA) would like to thank you for the opportunity to suggest agenda items for the upcoming RE Committee meeting discussion on solar market development volatility.

Before beginning to discuss possible solutions to market development volatility, SEIA suggests that the BPU first focus the conversation on definitions and goals, developing as much consensus around these as possible. Where consensus is not possible, the stakeholder process will benefit from airing the various perspectives.

To this end, SEIA suggests the following agenda items for discussion.

1) Definition of 'solar market development volatility' and key indicators
- What is market development volatility? What does this include?
- What is the timeframe over which volatility is viewed?
- What are the key indicators that can be used to measure volatility? How easily available are they? What do they tell us about market development volatility?

2) Discuss of SREC market construct
- The SREC market is created by policy. What are the key attributes of the SREC market construct in NJ that contributes to market development volatility or stability?
- What are the negative effects of market volatility? To ratepayers? To developers? To end-users? To other stakeholders?

We look forward to continuing to constructively engage with the BPU and other stakeholders on this critical issue.

Sincerely,

Katie Bolcar Rever
Director, Mid-Atlantic States
krever@seia.org

SOLAR MARKET DEVELOPMENT VOLATILITY

Offered below are comments to the questions that the Solar Energy Industries Association posited as being of importance to calibrate all stakeholders while engaged in formulating recommendations for minimizing solar market volatility in the future. Following these comments is an overview and perspective on the present status and future behavior of the NJ solar market.

Discussion Topics –

1) Definition of Solar Market Development Volatility & Key Indicators

What is market development volatility? What does this include? What is the timeframe over which volatility is viewed?

Volatility connotes frequent, unexpected changes in conditions that influence and impact the development of a market. Factors that impart volatility are those that incentivize, disincentivize, facilitate and govern the behavior of a market's development. Volatility becomes more pronounced in its influence and impact and elevates risk when the magnitude and frequency of changes occur in shorter time periods than completion of a business activity cycle; e.g. period spanning from when a decision to a pursue solar system investment is made to startup of a solar system operation.

What are the key indicators that can be used to measure volatility? How easily available are they? What do they tell us about market development volatility?

It is imperative to understand factors of inclusion that contribute to volatility & impact economic viability of project investments. Each market opportunity is somewhat unique.

Factors Impacting Volatility for the Solar System Market are:

- Financial Incentives – Investment Tax Credit, 1603 Law, SREC Pricing
- Financial Disincentives – SREC Pricing, Delays with Interconnection Permits, Distribution System Upgrade Requirements
- Facilitation – Affordable Financing, Long Term Power Purchase Agreements, Long Term SREC Purchase Agreements
- Governance – NJ Laws, BPU Regulations, Board Orders, Petition Resolutions

For the development of solar generation in NJ, spot market price of SRECs is a lagging indicator relative to making decisions to invest in solar generating capacity while solar capacities of projects being approved for SREC eligibility (pipeline) and those approved for operation may serve as leading indicators. The combination of the potential and actual solar generating capacities tempered by one's interpretation of this data provides a forward perspective on what the supply-demand balance for SRECs may be at some future point and an anchor for investment decision-making.

The manufacturing costs of solar equipment (modules and inverters), introduction of innovative equipment that enhanced solar system performance in terms of kilowatt-hours/kilowatt of capacity and entry of balance of system products that squeezed labor from installation costs were all contributing to more economical outcomes for solar system installations. These increasingly attractive operating margins relative to high alternative compliance payment pricing stimulated the rate of solar capacity adoption. What was

unexpected during this period was the significant actual rate of descent in solar system installed costs that occurred.

2) Discussion of SREC Market Construct

SREC market is created by policy. What are the key attributes of the SREC market construct in NJ that contributes to market development volatility or stability?

Solar generation market experienced an unsteady-state transition from virtually zero capacity a few years ago to nearly 1GW of capacity today. Driving force that contributed to the growth phase of rapid investment and buildup in solar system generation was the economic margin attributable to the alternative compliance payment in a market of SREC scarcity. In an environment of scarcity, the SREC market price floated to the ceiling price, the alternative compliance payment. Magnitude of economic margin impelled a high rate of capital investment. The result was the market overshot the SREC requirements and triggered a rapid decline in SREC pricing as supply exceeded demand. Today, the SREC market price is functioning beyond the initial and growth phases and within a control phase as it zeroes in on a pricing band that continues to attract solar investment for future years but at a more sustainable level.

Were it possible to know with near certainty what the operational solar system capacity would be 6-12 months out at the beginning of the business activity cycle, rational decision makers would have had keener insight into the relative supply-demand balance on SRECs. Lack of experience and relevant information with projecting the scrub rate of projects and inefficiencies in completing the project cycle that delayed the start of operations contributed uncertainty as to what the operational capacity would be 6-12 months forward.

There exists a dramatic contrast in time periods between SREC pricing variability and the business activity cycle; 1 month versus 6-12 months

What are negative effects of market volatility? To ratepayers? To developers? To end-users? To other stakeholders?

Magnitude of volatility is crucial. If market conditions change within a band that would not necessarily alter business decisions, then the volatility becomes inconsequential. Volatility that would influence business decisions creates uncertainty which presents risk to the solar system asset owner. Nature of risk might result in a reversal of the decision to make the investment or compel the asset owner to expect increased cash flows to potentially offset less desirable outcomes.

The scenario that unfolded with the SREC market in NJ is analogous to a process that is being brought under control with a controller whose settings are too low. A controller with settings that are too low will not react quickly or intensely enough to enable the process to reach steady state quickly and with minimal fluctuations (volatility). The process tends to overshoot its steady state point by a considerable amount. The quantity of SRECS available substantially exceeds the demand for SRECS for the next several years. If the SREC market price today at approximately $85/SREC over a 3-year term did not attract new investment (undershot the target), eventually that SREC surplus would evaporate, a shortage in SRECs would emerge and the SREC market price would spike upward. The analogous behavior of the process would display undershooting the steady state point followed by heading toward the desired value. With each cycle of overshooting and undershooting, the variance decreases until the process settles at the steady state value dictated by the controller. The

degree of volatility expressed in the SREC market is dependent on the confidence that the prospective developers/owners have in projecting the SREC supply/balance relationship into the future.

The objective is to install solar capacity that meets or exceeds the RPS with the lowest practical cost borne by ratepayers and with the participation of all willing segments of ratepayers. Large volatility in SREC pricing represents a high degree of uncertainty in solar system cash flows and project economic viability. The response of the developer/owner to this scenario is to demand higher pricing of SRECs, greater financial incentives, etc. to hedge against unfavorable outcomes. One result may be fewer people willing to make the investments, a lower level of solar system capacity installed and failure to reach the RPS. An alternative outcome that satisfies the RPS entails a higher subsidy to the developer/owner to encourage making the investments.

Greater volatility imposes more risk which makes prudent business decision more demanding to secure financial success. The result is that the objective is not achieved and the developer/owner earns a lower rate of return on the investment or the objective is achieved at a higher cost to the ratepayer.

Overview & Perspective of NJ Solar Market

Three factors that created high volatility in the NJ SREC market may no longer be major determinants with influencing SREC pricing going forward. First, the market is no longer in an extreme unsteady-state condition of virtually no SREC availability versus mandated SREC retirements per the RPS. We observe continuing investments in solar which will reduce the probability of returning to a severe SREC-deficient status. The combined operational plus pipeline solar capacity has remained somewhat stable with slight growth. There potentially exists a 3-4 year overhang of SREC's.

Secondly, the availability and quality of data about present and potential future solar generation capacity has improved dramatically. The approach in establishing a systematic procedure for registering and validating solar projects and the collection and dissemination of information has made this possible. This has raised the visibility of market activity which leads to more informed and rational business decisions.

Thirdly, experience in launching solar projects and improved coordination with the utility companies have shaped more efficient timelines from concept to startup. The basic generation system auctions guide LSE's and third party generators into studying 3-year horizons for SREC availability and pricing. Indications of entering into an SREC deficient period would be flagged by increasing SREC price bidding by the LSE's and third party generators for the last or next-to-last years of this 3-year cycle. This cycle is usually longer than the required lead time to produce operational solar system capacity.

It would appear that the underpinnings of the solar market today characterized by quality and timely information and maturity, as represented by the installed capacity and numerous participants, contribute the resiliency that could enable the solar market to perform within modest SREC supply-demand imbalances and reduced volatility.

Neal Zislin
Renu Energy

Quantum Solar

Mike Winka
Board of Public Utilities
Newark, NJ 07445

February 6, 2013

Subject: Comments on Solar Development Volatility in Solar Act

Dear Mr Winka:

As an industry stakeholder Quantum Solar respectfully submits a response to your request for industry and stakeholder information in your efforts to understand the Legislative intent in Section 38 d.(3)(b) of the recently amended Solar Act. Which states:

"...the board shall complete a proceeding to **investigate approaches to mitigate solar development volatility** (*bold for emphasis*) and prepare and submit, pursuant to section 2 of P.L.1991, c.164 (C.52:14-19.1), a report to the Legislature, detailing its findings and recommendations. As part of the proceeding, the board shall evaluate other techniques used nationally and internationally;"

In order to investigate ways to understand the legislative intent of "mitigate(ing) solar development volatility" it would be best to understand what the authors of the legislation meant by solar development volatility. Because the Act does not define "solar development volatility" it may be argued the authors were concerned about "volatility" as it applies to the total amount of solar development that is installed in the state. It is a fact that there has been little volatility in the absolute growth of solar development in New Jersey. The authors of the Act amendments could not have been referring to the absolute growth volatility, because there was none. Except for a recent slowdown in solar applications that have occurred in the last two months, solar development volatility could not have been what the language intended unless you assume the authors of the amendments were prescient. This is unlikely given pace of applications last Summer.

It is more likely that authors of the legislation were concerned about other market volatility issues. For example there has been a huge swing in sector ownership participation from a relatively even participation of commercial, industrial, public entities, non-profits and residential ratepayers to a much smaller ratepayer participation and huge third party non-ratepayer participation in solar financial incentives. In addition to sector participation volatility there was an underlying financial and concomitant risk volatility caused by the collapse of SREC prices. I believe it is the sector participation and SREC price volatility that were the reasons for the authors including the above language in the amendments to the Act. Please keep in mind it is the ratepayer segments that are specifically targeted for financial incentive participation in Section m of the Act.

It should be recognized that the major authors of the legislation were Senator Smith and Assemblyman Chivukula with significant input from the Governor's Office and approval by Senator Sweeney. Although it may not be practical or permitted to solicit their input,

these parties were instrumental in writing the language in the Bill. However, numerous members of the REC committee participated in negotiations with Senator Smith and Assemblyman Chivucula and the Governor's staff in the development of language in the Bill. It would be unwise not to poll these participants in an effort to determine if they have insight about this issue. We know that at least the Rate Council, Utility interests, MSEIA, and SEPA were consulted and negotiated with the authors to develop language in the Bill. Not investigating or asking these people for their understanding of the Legislature's "volatility" concerns would be like a policeman not getting witness information about an accident at a busy and crowded intersection. You need to ask the people involved in the Bill language negotiations what were the volatility concerns.

I for one, was among about 50 others who attended a meeting on November 15, 2012 sponsored by MSEIA where Senator Smith and Assemblyman Chivukula stated to the audience that they were very concerned about the volatility of SREC prices and the negative impact it might have on the development of solar PV in the state. One could conclude that it was this SREC price volatility that was paramount in their concern about solar development when writing the amendments to the Act.

We recognize that you have what sometimes seems to be competing responsibilities in developing procedures to implement provision in the Act. I have highlighted important items in Section l and m that I see are threatened by the market volatility.

In addition in Section 38 l, states:
"The board shall implement its responsibilities under the provisions of this section in such a manner as to:
(1) place greater reliance on competitive markets, with the explicit goal of encouraging and ensuring the emergence of new entrants that can foster innovations and price competition;
(2) maintain adequate regulatory authority over non-competitive public utility services;
(3) consider alternative forms of regulation in order to address changes in the technology and structure of electric public utilities;
(4) promote energy efficiency and Class I renewable energy market development, taking into consideration environmental benefits and market barriers;
(5) make energy services more affordable for low and moderate income customers;
(6) attempt to transform the renewable energy market into one that can move forward without subsidies from the State or public utilities;
(7) achieve the goals put forth under the renewable energy portfolio standards;
(8) promote the lowest cost to ratepayers; and
(9) **allow all market segments to participate.**

m. The board shall ensure the **availability of financial incentives** under its jurisdiction, including, but not limited to, long-term contracts, loans, SRECs, or other financial support, to ensure market diversity, competition, and **appropriate coverage across all ratepayer segments**, including, but not limited to, residential, commercial, industrial, non-profit, farms, schools, and public entity customers.

What is clear in the past 18 months as solar development continues to grow in New Jersey, is that the availability of financial incentives to the various ratepayer segments has been dramatically reduced due in large part to the volatility of SRECs. This volatility in SRECs (which is really risk volatility) has scared off the ratepayers from participating in the financial incentives the Act specifically requires.

In conclusion, I would submit that the board has allowed the solar financial incentives to be captured by the corporate investment companies and private equity markets to the exclusion of the ratepayers. Now I'm not sure I can entirely blame the board for not seeing this eventuality, but the board has a mandate and time to investigate approaches to mitigate this ratepayer solar development volatility and to look nationally and internationally for solutions to reduce volatility. Feed-in tariffs have worked successfully in other jurisdictions. Another simple change would be to move to a three year compliance period (patterned after the CO_2 compliance period) for each electric power supplier. This would have moderating effect on SREC volatility. I'm sure the electric power suppliers and the Rate Council would favor this change because it would reduce their workload and costs.

As an alternative to a feed-in tariff, a quantitative evaluation of the cost, environmental, and health benefits of solar distributed energy could be calculated on an annual basis. One would use the LMP and EPA environmental and avoided health cost estimates to retroactively assign a SREC value to the previous year solar production. You could still have a market for SRECs but there would be a time that the SRECs would have a fixed value. There could be a sliding scale in this calculus that allows the SREC fixed cost to go to zero or some very low value at year 2028.

Thank you for this opportunity to comment on market volatility.

Sincerely

John Jenks
Quantum Solar Solutions

effi Solar

12 Wynwood Drive West Windsor, NJ 08550 • Tel: (646) 414-2448 • Fax (646) 390-6555

7 February 2013

Kristi Izzo, Secretary
Board of Public Utilities
41 South Clinton Avenue
Trenton, New Jersey 08625

Re: **Comments in Response to Attempt to Define Solar Volatility**

Dear Secretary Izzo:

EffiSolar Development LLC ("EffiSolar") is a developer of grid supply solar energy projects on properties located in Burlington, Middlesex, Monmouth, Hunterdon, Mercer and Warren the Counties in New Jersey. EffiSolar would like to make the following comments regarding regulations or actions to be taken by the Board of Public Utilities ("BPU") regarding the volatility of the SREC market place.

It is our observation that the bulk of the attention of the Legislature and the BPU has been on the impact of grid supply projects on SREC market volatility but with very little focus on the impact of net metered projects. There is little, if any, monitoring, regulation or oversight proposed for net metered projects, which is in stark contrast to grid supply projects that have been ordered to stand up and be counted, an accounting that has already begun. Absolutely no reliable accounting mechanism has been set up early in the development cycle to accurately project net metered development, leaving the BPU and the rest of the industry in the dark with respect to the impending volume of net metered projects and their impact on the SREC market.

The following facts are based directly on a review of published reports:

1. As of January 25, 2013, 79.2% of installed solar capacity were net metered projects.
2. During the past 12 months from February 2012 to January 2013, 87.5% of the new installed solar capacity were net metered.
3. During the past 6 months from August 2012 to January 2013, 87.2% of the new installed solar capacity were net metered.
4. These are the figures for the last 12 months from February 2012 to January 2013:

Size of Net Metered Projects	% of Capacity
<500kW	51.4%
500kW-1,000kW	14.0%
1,000kW-2,000kW	14.6%
>2,000kW	20.0%
	100%

5. These are the figures for the last 6 months from August 2012 to January 2013:

Size of Net Metered Projects	% of Capacity
<500kW	53.3%
500kW-1,000kW	14.3%
1,000kW-2,000kW	15.0%
>2,000kW	17.4%
	100%

Based upon these facts, EffiSolar makes the following indisputable observations:

1. The persistent volatility in the New Jersey SREC market has clearly been caused by the unfettered and unregulated proliferation of net metered projects. In particular, the volatility is dominated by the significant number of small and medium net metered projects. Simply put, rather than taking the blame for SREC volatility, the low percentages of grid supply projects demonstrate that they have not played a significant role in the past nor do they in the current market place.

2. Grid supply solar projects are largely irrelevant in the current environment. Early fears about thousands of MW in the pipeline have been proven wrong and scrub rates for grid supply projects under development continue to be high. Over 250 projects with a total capacity of 2,070MW were withdrawn from the PJM Queue from 2010-2012. In addition, new developments have all but ceased as much a result of the regulatory uncertainty in the new solar legislation and of the weak SREC market.

3. While some grid supply projects were installed between October 2011 and January 2012, the installed grid supply capacity could hardly be deemed to have had any major impact on the SREC market compared to the impact of the net metered projects. The proposed regulations will largely manage and curtail the construction of the future grid supply projects such that the future market place will be dominated by net metered projects. By contrast, there is little regulation proposed for the management of net metered projects, the very projects that have led to the current oversupply.

4. Without regulation and management of the net metered projects by the BPU akin to the regulation and management proposed for grid supply projects, we do not believe the SREC market place will ever stabilize. Most noticeably, net metered monthly installation rates are still surprisingly strong in spite of the continued collapse in SREC spot market prices. During the past 12 months from February 2012 to January 2013, the average monthly net metered installation was 23.7 MW, compared to 2.8 MW of grid supply installation. During the past 6 months from August 2012 to January 2013, the average monthly net metered installation was 19 MW, compared to 1.5 MW for grid supply installation.

5. It is our opinion that the BPU cannot predict, let alone manage the volatility in the SREC market place without adopting and implementing regulations on net metered projects. The BPU should institute an early mandatory registration process for net metered projects to allow accurate forecasting as part of the overall program to manage installation rates for all projects and discourage oversupply and volatility. The BPU should also create regulations for net metered projects akin to those proposed for grid supply projects. We strongly advocate that the BPU use its regulatory discretion to adopt and implement regulations that speak to all of the foregoing issues pursuant to the broad authority granted to it by the new solar legislation.

Respectfully submitted,

Lawrence Neuman
President
EffiSolar Development LLC

MSEIA MID-ATLANTIC SOLAR ENERGY INDUSTRIES ASSOCIATION

c/o Rutgers EcoComplex, Suite 208-B
1200 Florence-Columbus Road, Bordentown, NJ 08505

February 7, 2013

Mr. Scott Hunter
New Jersey Board of Public Utilities
44 South Clinton Avenue
Trenton, NJ 08625

Re: S1925 subsection d.(3)b
Approaches to mitigating solar development volatility

Dear Mr. Hunter,

As requested by BPU staff, MSEIA offers the following comments regarding defining solar development volatility and regarding questions to explore in assessing approaches to mitigating volatility.

The letter by SEIA asks several questions regarding the definition of volatility. It is worthwhile to note that the above-referenced section of S1925 requires investigation of approaches to mitigate "solar development volatility", yet much stakeholder discussion has focused on *SREC market* volatility. Those two issues are related, but different.

Although S1925 does not provide a definition of the term "solar development", it is evident that "solar development" must refer to the pace of construction of solar projects. If this is the case, then the legislation calls for investigation into ways to mitigate volatility in the pace of construction of solar projects. Volatility, then, would mean a pace of construction that becomes too fast or too slow, and that is what the legislation asks the BPU to prevent ("mitigate").

What constitutes too fast or too slow, then, still needs to be defined. In order to do this, it would be important to understand what is considered undesirable about solar development that is too fast or too slow. MSEIA is prepared to discuss and offer answers to these questions, but clarification from the Legislature regarding the definition of the terms in subsection d.(3)b may be an important element in the investigation.

Subsection d.(3)b also requires evaluation of "other techniques used nationally and internationally" Regarding techniques used nationally, MSEIA suggests that several adjacent states have used techniques that naturally prevent volatility in solar development. Those states include Delaware, Connecticut, and New York.

Finally, MSEIA hopes that the required investigation can be conducted, and result in action, in a timely fashion so that it is not too late to prevent the undesired effects of solar development volatility.

Sincerely,

Dennis Wilson
President

Lyle K. Rawlings, P.E.
Vice-President, New Jersey

SEIA Solar Energy Industries Association®

February 13, 2013

Mr. Scott Hunter
New Jersey Board of Public Utilities
44 South Clinton Avenue
Trenton, NJ 08625-0350

RE: Comments on definition, indicators, and impact of 'solar market development volatility'

Dear Mr. Hunter,

Per your request to stakeholders at the January 2013 RE Committee meeting, the Solar Energy Industries Association (SEIA) respectfully submits the following comments regarding the definition, indicators, and impact of 'solar market development volatility'.

Sincerely,

Katie Bolcar Rever
Director, Mid-Atlantic States
krever@seia.org

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As the Board of Public Utilities (BPU) explores ways to address the volatility in the SREC market, per the requirement in the Solar Advancement Act of 2012, there needs to be a common understanding of the term 'solar market development volatility', what the issue(s) is(are) that need to be addressed, and what indicators might tell us about this volatility. SEIA submits these comments as part of a broader on-going stakeholder discussion on the topic of solar market development volatility.

New Jersey has invested much in building a vibrant and competitive solar industry over the last decade. The State has seen the fruits of that investment though jobs created, emissions avoided, home-owners and businesses that realize stability and savings in their electricity bills, and private capital invested in New Jersey to build much needed in-state generation capacity.

In creating this market, the State has an interest in maintaining an orderly environment for investment. Market stability reduces investment costs and thus RPS costs paid by ratepayers, improves the long-term viability of businesses, promotes job stability, and contributes to the attainment of the state's RPS goals.

The Solar Transition Order of September 12, 2007, set up the initial framework for a solar market driven by incentives from the SREC market. In this Order, the Board highlighted the importance of sustained orderly development as a primary criterion for choosing the market design. Per this Order, sustained orderly development includes both 1) the ability for the market to reduce incentives over time as the cost of solar installations decline and 2) an environment that supports investor confidence. It was noted that uncertainty in the cash flow associated with solar projects lowers investor confidence, raising the cost of financing and the need for higher returns. Reducing such risk would reduce the level of incentives required. (Solar Transition Order, pgs 17 & 18)

During the timeframe of the above-mentioned Board Order, when the market was transitioning from a rebate model to an SREC model, it was clear that long-term contracts were key to minimizing price volatility inherent in a commodity market. The debate over market development volatility has continued since.

Indicators of Solar Market Development Volatility

There are many different intervals over which to view volatility. However, when trying to understand volatility in a given market, it should be viewed over a timeframe consistent with the investment and business planning horizons within an industry. For solar projects, the investment horizon can be anywhere from 10 to 25 years. In terms of the business planning horizon, this is generally over a 3 to 5 year window.

When looking for data that indicates volatility, it should be kept in mind that SREC markets are still very young. Any data and the accompanying analysis will tell an incomplete picture.

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By comparison, restructured electricity markets have been around since the 1990's, and the corresponding data still tells an incomplete picture as the markets evolve. With many different variables driving solar market development and the lack of historic data, any quantitative analysis will at best only tell a partial story.

With that said, the best indicators are ones that have explanatory power – in other words, indicators that are good predictors of future conditions.

In the SREC market, demand is fixed in any given year, and it is the amount of supply relative to the demand that is the primary factor in the value of SREC prices. Although it is one of many factors that explains solar build rates, the value of SRECs is inextricably intertwined with solar market development. Because market participants respond to SREC prices and future expectations of SREC prices, this is a key leading indicator of future development.

- Spot prices

Spot prices are primarily driven by changes in the relationship between supply and demand. The extent to which most trades occur on the spot market is an indication of the importance of this indicator. The more reliant the solar market is on spot trades, the more spot prices drive future development, and the more important the volatility of spot prices are as in indicator of market development volatility.

- Forward prices

Although actual spot prices may be volatile, forecasts of those spot prices may have accurately predicted such volatility. In other words, spot price volatility may not necessarily be a reliable indicator of uncertainty in forecasts of market prices or of the price risk faced by market participants from uncertainty in price forecasts.

To the extent available, forward price curves, and in particular volatility in those price curves, may provide a more robust indicator of price uncertainty than spot prices. The shape of the forward curve indicates current market expectations regarding spot prices in the future. Changes in the shape of that curve over time provides a measure of the uncertainty in the market forecasts of those spot prices. The greater the volatility in forward price curves, the more uncertain those curves' forecasts of spot prices, and the greater the risk to developers that market revenues will not cover their investments.

At this time, the forward market for New Jersey SRECs is neither liquid nor transparent. As such, the historical volatility in SREC forward prices may not be a reliable indicator of price uncertainty in the future. Moreover, to the extent that forward trading is limited to individual brokers, rather than on a centralized platform (such as NYMEX), developers may not have

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ready access to forward-price data. If so, developers would instead have to rely on spot prices and spot-price volatility to gauge uncertainty in future prices and to inform their investment decisions.

Another good indicator of solar market development volatility is the volatility in the relationship between the supply and demand of SRECs. Some changes in this relationship are normal in commodity markets. Extreme and persistent swings are an indicator of development volatility. In a stable market, supply and demand will remain in relatively close balance. See Figure 1a. Large and persistent periods of over and under-supply are indicative of volatile markets. See Figure 1b. With the aforementioned caveat of not having sufficient data to tell a complete picture, the NJ SREC market shares more characteristics with the graph in 1b than in 1a.

Figure 1a.

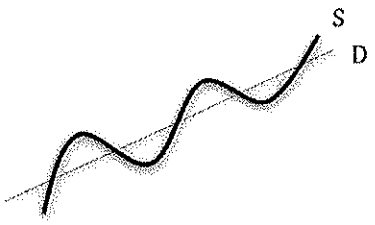
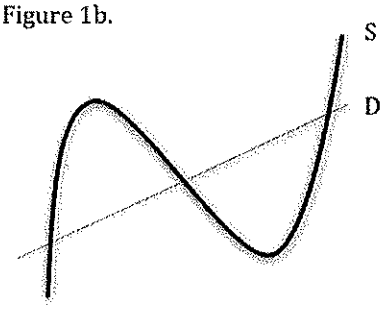


Figure 1b.



The above indicator is a good backward-looking indicator of the volatility in the market, and it is difficult to predict future trends in the relationship between supply and demand. However, absent significant changes in the way the market is constructed, one could expect the past to be a good predictor of the future.

SRECTrade suggests a scenario analysis using the trailing 6 month average to look at the future relationship between supply and demand. (phone call, January 30, 2012) If the average build rate continues and places the market out of balance, this is an indicator of market development volatility.

It has been suggested before that the number and trend of SREC applications received by the BPU be used as an indicator of solar market development volatility. This metric, however, is not entirely helpful on its own, or predictive of what will ultimately be realized in the market. Applicants that submit today likely have of rising SREC value, and will not build unless they see either upward movement at some point in the future or the ability to establish a long-term contract for SRECs. If these values do not materialize, the projects will not be built.

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Thus, while applications to the SREC program may be considered, this should not significantly inform the definition of market volatility.

Harm caused by an overly risky and volatile market

A stated goal of the RPS is to develop a robust and sustainable market for solar energy in New Jersey, including the associated job growth. (Solar Transition Order, pg 17) Too much volatility harms this goal in two ways. First, job stability is directly tied with an orderly investment environment. Uncertainty in future revenue streams drives up costs to finance investments and to hedge against the risk of low prices. In addition, the short-term nature of the price signal from spot markets increases uncertainty regarding expected future revenues and tends to promote boom-bust development cycles. These boom-bust cycles, in turn, contribute to spot-market volatility. A 'bloody' market, where high risk leads to big winners and big losers is overly destructive, an inefficient use of capital, and leads to job instability.

Secondly, an overly volatile market damages the business ecosystem needed for vibrant and competitive markets. The number and composition of businesses active in a competitive market will naturally evolve over time. However, an unstable investment environment will lead businesses to conclude that the market is flawed, and may cause businesses to either leave New Jersey or decide not to enter. An orderly investment environment facilitates the building of strong business ecosystem today in order to serve the market demands of tomorrow.

Ratepayers are likewise harmed by reliance on overly volatile markets to comply with RPS requirements. The economic damage is not just from paying high prices when the development pipeline dries up, but also from paying higher prices on average to cover the additional financing and hedge costs incurred by developers as a result of spot-market volatility.

In the case where a customer – such as a municipality, business owner, or homeowner – takes on the risk associated with future SREC prices, this volatility adds another source of risk and uncertainty to their overall budget.

Conclusion

From the perspective of a developer of solar projects, volatility in future income streams drives uncertainty and risk. As the BPU investigates and develop its report to the legislature on 'solar market development volatility', mitigating volatility in future income streams and reducing risk in a competitive manner will be essential to reducing the harmful impacts of volatility on developers, ratepayers, customers, and the New Jersey economy and solar industry as a whole.

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Note that this does not mean driving up spot-market prices and keeping them high, but rather ensuring the availability of less-volatile sources of revenues such as long-term contracts in order to stabilize market development activity and promote efficient pricing in both spot and longer-term markets. SEIA is not arguing for just taking risk out of the market. Rather, SEIA argues for reducing risk in a competitive manner, allowing markets to find efficient and stable prices so that both buyers and sellers can benefit.

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ALPHA INCEPTION, LLC
3838 N. BRAESWOOD BLVD. UNIT 356
HOUSTON, TX, 77025
801-455-3033

January 3, 2013

Mr. Scott Hunter
New Jersey Board of Public Utilities
44 South Clinton Avenue
Trenton, NJ 08625-0350

RE: Response to request for suggested agenda items for the upcoming Renewable Energy Committee meeting regarding solar market development volatility.

Dear Mr. Hunter,

Thank you for the opportunity to submit suggestions for discussion at the upcoming RE Committee meeting. In response to your request during the December meeting Alpha Inception would like to suggest the following proposals be discussed on the agenda for the upcoming Committee meetings:

1. The establishment of an Auction Reserve Price
2. The establishment of a Price Containment Reserve
3. Potential mechanisms for Reintroduction of Reserve SRECS

Included below, for your consideration, is an analysis by Alpha Inception highlighting the potential benefits of the above-mentioned mechanisms. You will find that by creating an Auction Reserve Price or "floor" in the SREC auctions and allowing for a Price Containment Reserve to hold in reserve any SRECs that fail to clear at the floor price, market confidence and stability will return to New Jersey's Renewable Energy Program. This confidence will promote economic growth for the state through the encouragement of further developments in solar generation (keeping pace with demand), thereby adding to the number of jobs within the state.

We thank the committee members for their interest and efforts in working to achieve a real working solution to the current issues surrounding the SREC program.

Sincerely,

Andre Templeman
Principal
andre@alphainception.com

CURRENT SREC MARKET OUTLOOK

During the first year of the program SRECs traded near the Solar Alternative Compliance Payment ("SACP") of about $650.[1] Recently, as a result of oversupply concerns in the market, prices have collapsed considerably down to levels between $60 and $70. On July 23, 2012 New Jersey Governor Chris Christie signed bill S-1925 that increased the solar component of the Renewable Portfolio Standards ("RPS") from a fixed 772 Gwhrs in 2014 to 2.050%,[2] with subsequent increases in remaining years. S-1925 also established a diminishing SACP through 2028[3] and extended the useful life of an SREC to 5 years, among other things.

Although these adjustments are intended to stabilize the SREC market, alone they are insufficient to balance the volatile "boom/bust" cycle we have seen as a result of the current market construct. This cycle of rapid escalations in demand followed by an oversupply of SRECs in leads to an increased cost to the load serving entities and ultimately the ratepayers themselves. Additionally, the lack of predictability in the market has stymied economic development and employment opportunities within the state. Simple economic analysis of the SREC market shows the need for a substantial increase in SREC prices before there is any incentive for companies to invest capital into building new solar projects. The current market equilibrium price of SRECs to support continued steady solar development is approximately $180/SREC. However, instability in the market causes artificially high SREC prices when supply is low which in turn causes a surge in new installation projects likely to flood the market once again with a surplus of SRECs continuing this boom/bust cycle, harming developers, utilities, and ultimately ratepayers. Due to a significant surplus of existing market supply and the large amounts of SRECs offered in the quarterly EDC auctions, prices continue to fluctuate between $70 and $80.

Under the EDC program the last couple of years; utilities have purchased output from these projects at SREC prices of up to $350/MWh for 10 years. The EDC program requires utilities to sell the quarterly SREC generation at the EDC auction, which due to oversaturation of SRECs and low auction value, has resulted in significant losses of approximately $200/SREC sold.[4] Flett Exchange, a leading solar market exchange, brokerage and consulting firm, in a recent market brief to clients estimated losses of $18,000,000 as a result of the recent October 2012 auction in which SRECs sold for around $70.[5] It is expected that if the current low SREC prices continue and development is curtailed, demand will outpace supply in 2015 and 2016 resulting in yet another artificial price spike. (See attached Appendix 1). According to Alpha Inception's estimates the 2016 excess demand will be nearly 400MWs. The potential 2016 price spike resulting from this shortage is likely to be $323, which represents the 2016 SACP. Assuming this price trend of $80/SREC continues nearly 1,000,000 EDC SRECs will likely be sold at a

[1] http://www.njcleanenergy.com/renewable-energy/project-activity-reports/srec-pricing/srec-pricing; http://srectrade.com/srec_prices.php
[2] N.J. Stat. Ann. § 48:3-87 (d)(3)

[3] N.J. Stat. Ann. § 48:3-87 (j)
[4] Auction results: April 2012 approx. $155, July 2012 approx. $135, and October 2012 approx. $70
[5] http://www.njcleanenergy.com/renewable-energy/project-activity-reports/srec-pricing/srec-pricing

significant loss.[6] The total loss the ratepayers are likely to suffer as a result of the current market structure and volatility could be approximately $160,000,000.[7]

PROPOSED MARKET SOLUTION

To accomplish the purposes of the SREC market and encourage future development to keep pace with future demand, Alpha Inception respectfully requests the Board consider adopting into regulation the following market control mechanisms:

1. Establish an Auction Reserve Price ("ARP")

Having an ARP in place sets a floor price for SRECs and would mean that SRECs would not be sold for less that the ARP. It would therefore, protect ratepayer investments in solar projects by not being forced to sell at significant losses. In addition, short-term prices will rise to equilibrium levels and provide incentives for reasonable market stability.

2. Create a Price Containment Reserve ("PCR")

If the auction fails to clear at the ARP for all or a portion of the quarterly volume, SRECs would be transferred to the PCR. Reserve volumes would then be held for a designated period of time until demand has increased sufficiently. (See attached Appendix 2).

3. Establish a mechanism to gradually reintroduce reserve volumes when demand exceeds supply.

After the designated trigger for reintroduction of credits held in reserve has been met, reserve volumes would then be reintroduced into the market in a controlled manner.[8] Implementation of these price containment reserve instruments will bolster current market mechanisms and provide much needed stability and security. A gradual reintroduction of the reserve protects against supply shortages as well as price spikes and creates a design that is more sustainable in the market by dampening volatility, taming the current boom/bust cycle. (See attached Appendix 3).

CONCLUSION

Ultimately, the benefactors of the proposed market mechanisms will be the ratepayers through the protections against future price spikes and non-discounted selling. The net savings for New Jersey residents resulting from the Price Containment Reserve is projected to be roughly $140,000,000.[9] In addition to ratepayer savings, these proposed standards provide jobs and protect against supply shortages by enticing new build solar installation projects and infrastructure as well as creating reserves in years of excess protecting ratepayers from future price spikes.

---

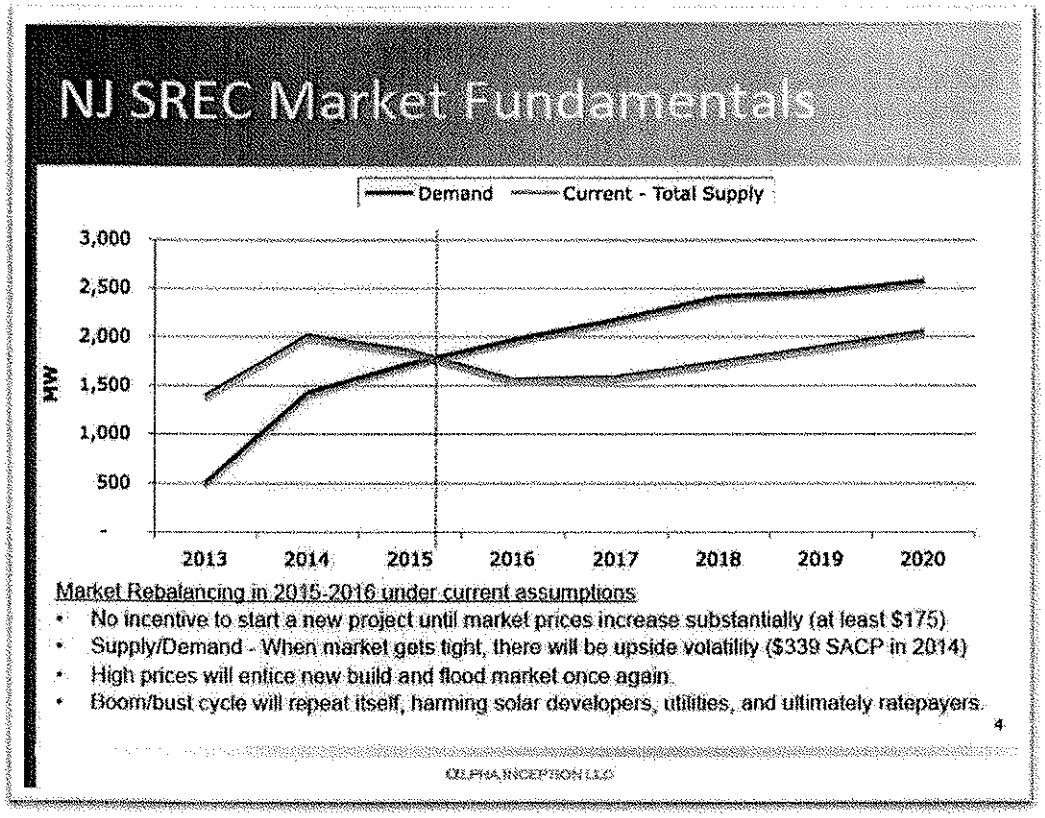
[6] Estimate assumes 75,000 SRECs per auction x 4 quarterly auctions each year for 3 years (2013-2015).

[7] $90 million loss in rate payer investments in solar (market equilibrium price of $180 – $80 recent SREC price at auction) plus $70 million in additional costs from purchasing SRECS at the 2016 ACP of $323/SREC instead of the equilibrium price of $180.

[8] In order to prevent an oversupply, SRECS could be reintroduced at auction in increments of approx. 25% for example.

[9] ($160,000,000 savings from mitigated losses + increased costs) – ($20,000,000 in carry costs (assuming 8% cost of carry), resulting from shifting excess EDC auction supply from 2013 to 2016.

Appendix 1


NJ SREC Market Fundamentals
Demand
Current - Total Supply
3,000
2,500
2,000
1,500
1,000
500
-
MW
2013
2014
2015
2016
2017
2018
2019
2020
Market Rebalancing in 2015-2016 under current assumptions
• No incentive to start a new project until market prices increase substantially (at least $175)
• Supply/Demand - When market gets tight, there will be upside volatility ($339 SACP in 2014)
• High prices will entice new build and flood market once again
• Boom/bust cycle will repeat itself, harming solar developers, utilities, and ultimately ratepayers
4
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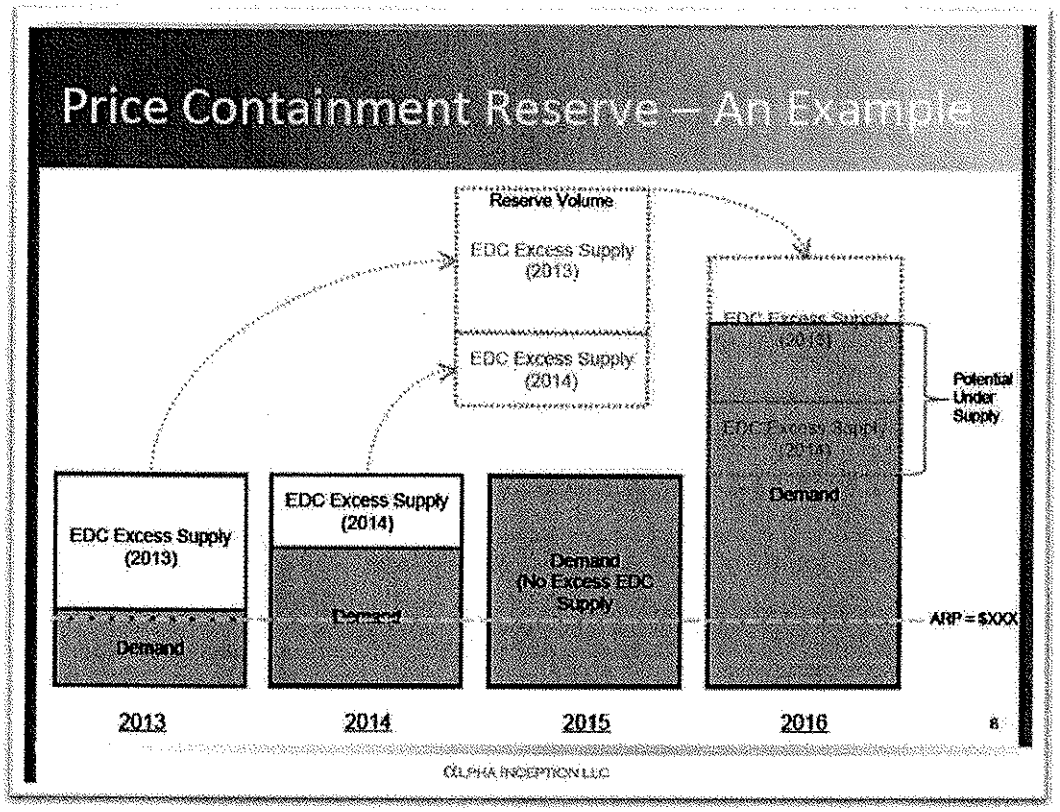
Appendix 2


Price Containment Reserve – An Example
Reserve Volume
EDC Excess Supply (2013)
EDC Excess Supply (2014)
EDC Excess Supply (2013)
EDC Excess Supply (2014)
Potential Under Supply
Demand
EDC Excess Supply (2013)
EDC Excess Supply (2014)
Demand
Demand (No Excess EDC Supply)
Demand
ARP = $XXX
2013
2014
2015
2016
8
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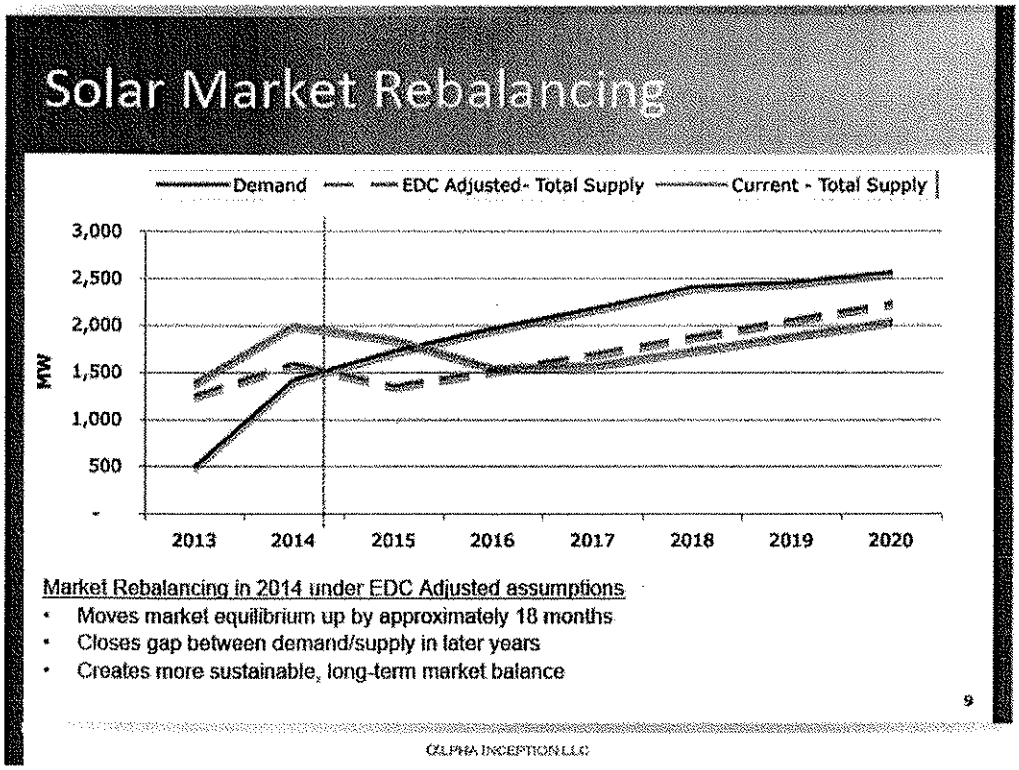
Appendix 3


Solar Market Rebalancing
Demand
EDC Adjusted- Total Supply
Current - Total Supply
MW
3,000
2,500
2,000
1,500
1,000
500
-
2013
2014
2015
2016
2017
2018
2019
2020
Market Rebalancing in 2014 under EDC Adjusted assumptions
• Moves market equilibrium up by approximately 18 months
• Closes gap between demand/supply in later years
• Creates more sustainable, long-term market balance
9
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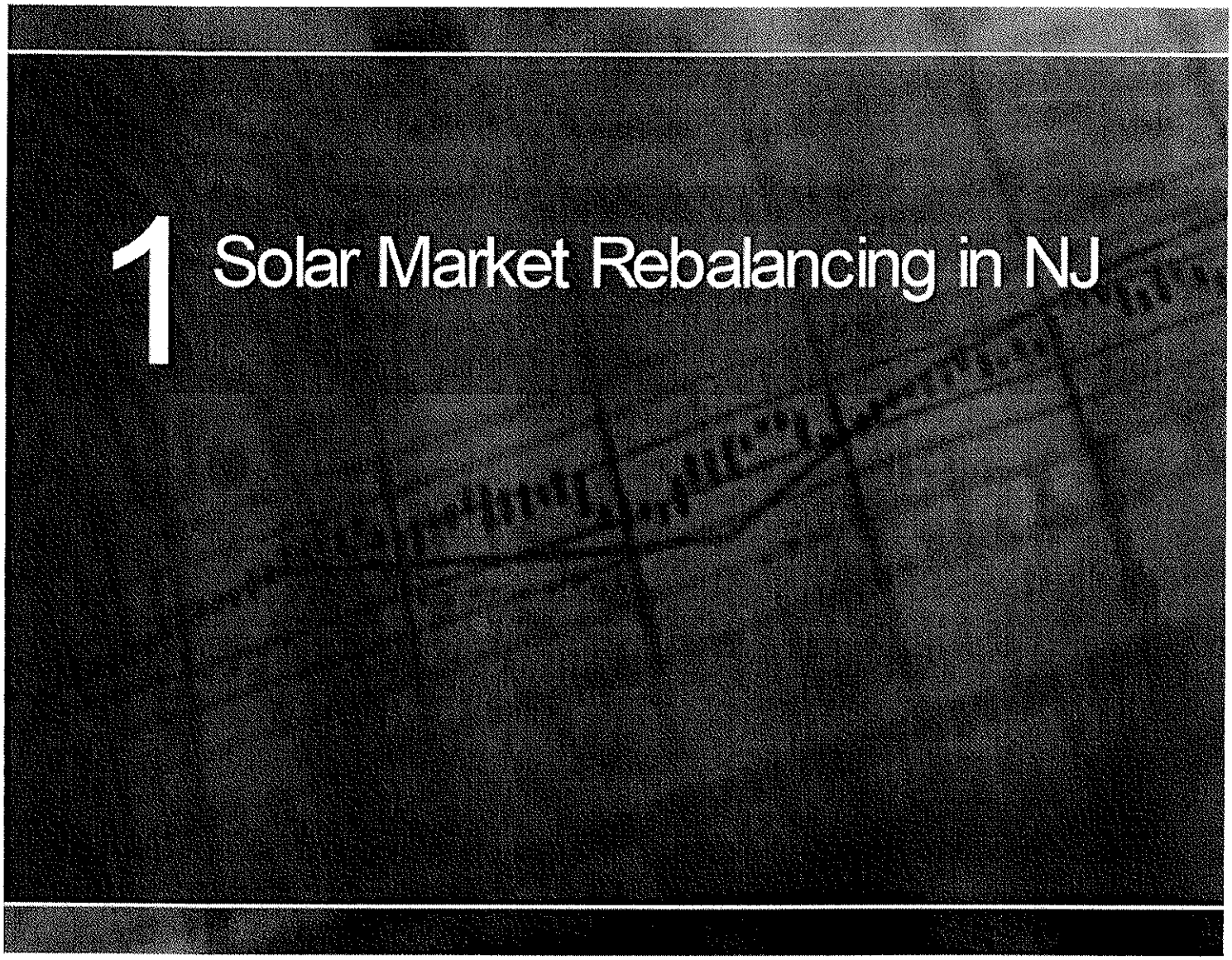
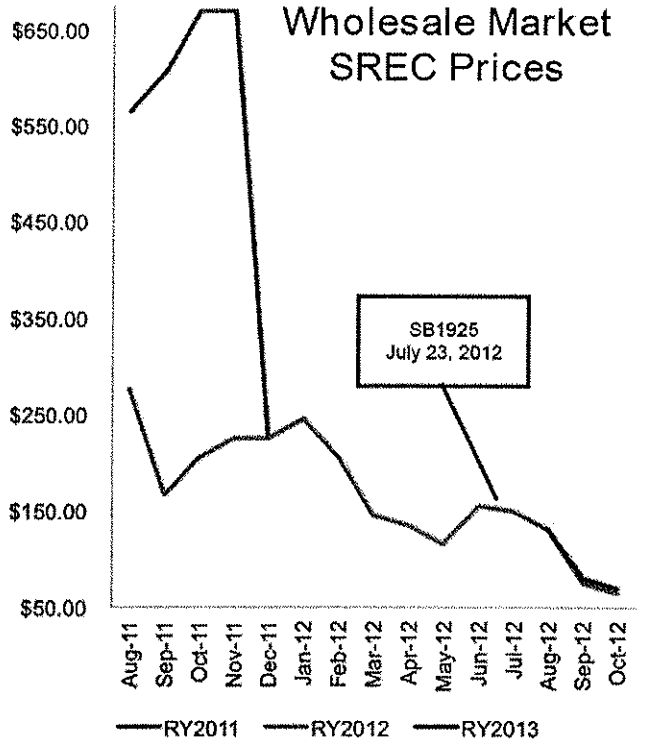

1
Solar Market Rebalancing in NJ

Market Prices

- SRECs traded near cap levels ~$650 for first few years of program.
- Prices recently collapsed to ~$60-$70 due to concerns of oversupply.
- Continued new-build completions from pipeline of projects previously started.

Legislative Fix to Stabilize Construction

- On July 23, 2012, Governor Christie signed a new bill (SB1925/AB2966) .
  - Increased solar RPS beginning 2014.
  - Lower SACP.
  - SREC life extended to 5 years.
  - Various other amendments.
- After rising slightly in anticipation of the legislation, prices have since fallen to ~$60-$70 due to significant overhang of existing supply and large quarterly EDC auctions.



ROR Economic Analysis:

Case 1. Panel + EPC Cost = $2300/kw

Soft Costs = $200/kw, Size = 2MW, 50% net metered

ITC Leakage = 20%, After Tax ROR = 12%, Debt/Eq = 50/50

- Estimated 5 yr SREC Breakeven Price = $215/MWh

Case 2. Assuming $180/MWh SREC price

Same assumptions as above except economies of scale savings

Soft Costs = $100/kw, ITC Leakage = 5% (assuming tax equity appetite)

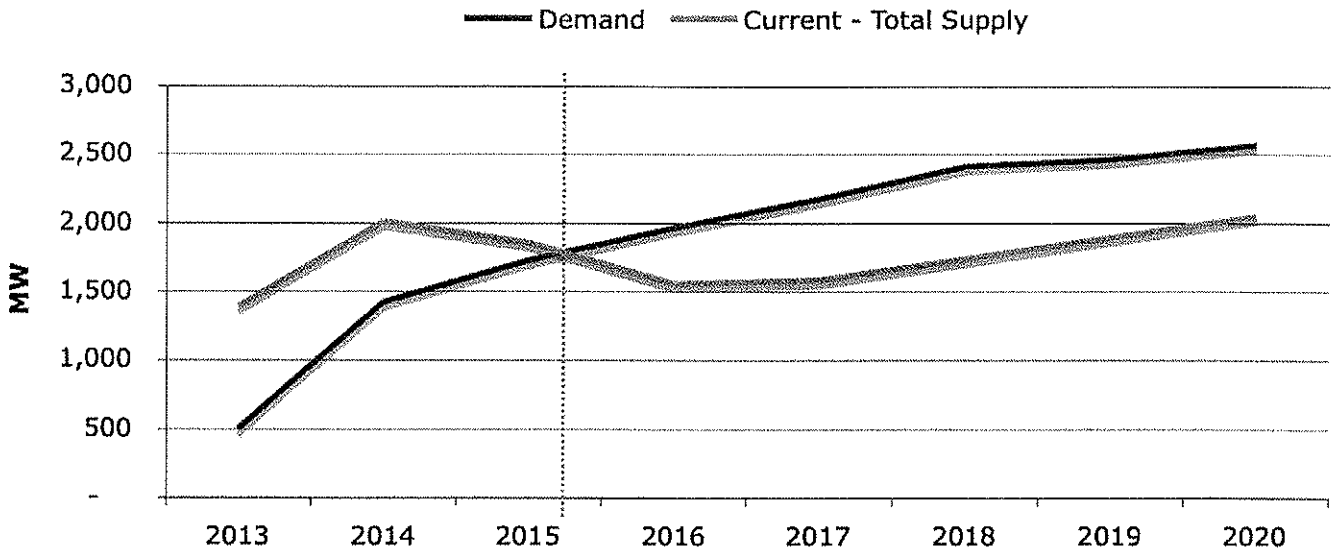
- Estimated After Tax Equity ROR = 12%

Re-igniting the Solar Momentum:

- Sustained new-build requires SREC pricing of at least $150 and closer to $200
- Increased RPS may be insufficient to address near-term oversupply
- Additionally, won't establish a consistent construction rate or avoid a collapse next year due to distressed SREC pricing
- Boom/Bust cycle likely to continue

This cycle increases costs to load serving entities and ultimately rate payers due to higher costs of capital.

Economic development and employment suffers from the lack of predictability.



Market Rebalancing in 2015-2016 under current assumptions

- No incentive to start a new project until market prices increase substantially (at least $175)
- Supply/Demand - When market gets tight, there will be upside volatility ($323 SACP in 2016)
- High prices will entice new build and flood market once again.
- Boom/bust cycle will repeat itself, harming solar developers, utilities, and ultimately ratepayers.

4

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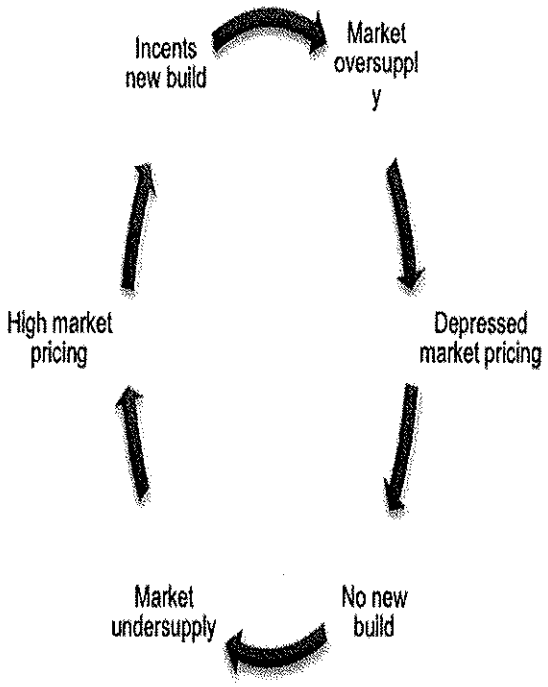
- Under the EDC program over the last few years, utilities purchased projects/output at high SREC prices up to $350/MWh for 10 years.
- Utilities are required to sell quarterly SREC generation at EDC auction:
  - Under current mechanism and market conditions, EDC volumes flood a saturated market
  - Auction results: ~$155 (April 2012), ~$135 (July 2012) and recently ~$70 (Oct 2012)
  - Essentially "locked" in significant loss of ~$200+ per SREC sol
  - Flett Exchange estimates losses of $18MM for rate payers in recent October auction
- Persistent low prices will curtail development and market is expected to be "short' in 2015/2016.
- Distressed SRECs sold at auction and the cost of repurchasing in 2016 at the SACP when supply/demand rebalances could result in losses to ratepayers of $160MM.



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Impact to the ratepayer (our estimates):

- Market oversupply until the 2015/2016 timeframe
- 495,000 MWh short (excess demand) in 2016
- ACP in 2016 is $323 represents potential price spike when market is undersupplied
- Current Forward Curve:
  $90 (2013); $95 (2014); $115 (2015)
- Initial utility purchase price of $350 per SREC
- Market equilibrium price is $180 (would lead to sustainable rate of development)

Forced customer losses:

- Average expected EDC auction clearing price of $80 per SREC
- Nearly 1,000,000 EDC SREC will be sold at a loss ($350-$80)
  Assumes 75,000 per auction x 4 quarterly auctions x 3 years (2013-2015) = 900,000
- $90MM loss in rate payer investment in solar ($180-$80) x 900,000
- $70MM additional cost from purchasing at 2016 ACP instead of equilibrium price ($323-$180) x 495,000
- Total cost to ratepayers: $160MM.

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Amend the EDC Auction:

- Implement a price containment reserve in the quarterly EDC SREC auctions, which may defer auction volumes to future years.

1. Create an Auction Reserve Price ("ARP" or "Floor").

   No SRECs would be sold for less than the ARP.

   - Protects the ratepayer investment in solar projects by not selling at significant loss
   - Raise short-term price to provide incentives for reasonable market stability.

2. Create a Price Containment Reserve ("PCR"). If the auction fails to clear the ARP for all or a portion of the quarterly volume, SRECs would be transferred to PCR.

   Reserve volumes would be held for some period of time, such as when two consecutive auctions clear above the ARP.

3. Reserve volumes would be reintroduced when demand exceeds supply

   Could be re-introduced at auction in increments ~25% to prevent oversupply

   Protects against supply shortages and price spikes

   Creates a design that is more sustainable in the market and dampens volatility, taming the current boom/bust cycle (higher troughs and lower peaks)

- Ultimately, benefit to rate payer due to non-discount selling and protecting against future price spikes.

7

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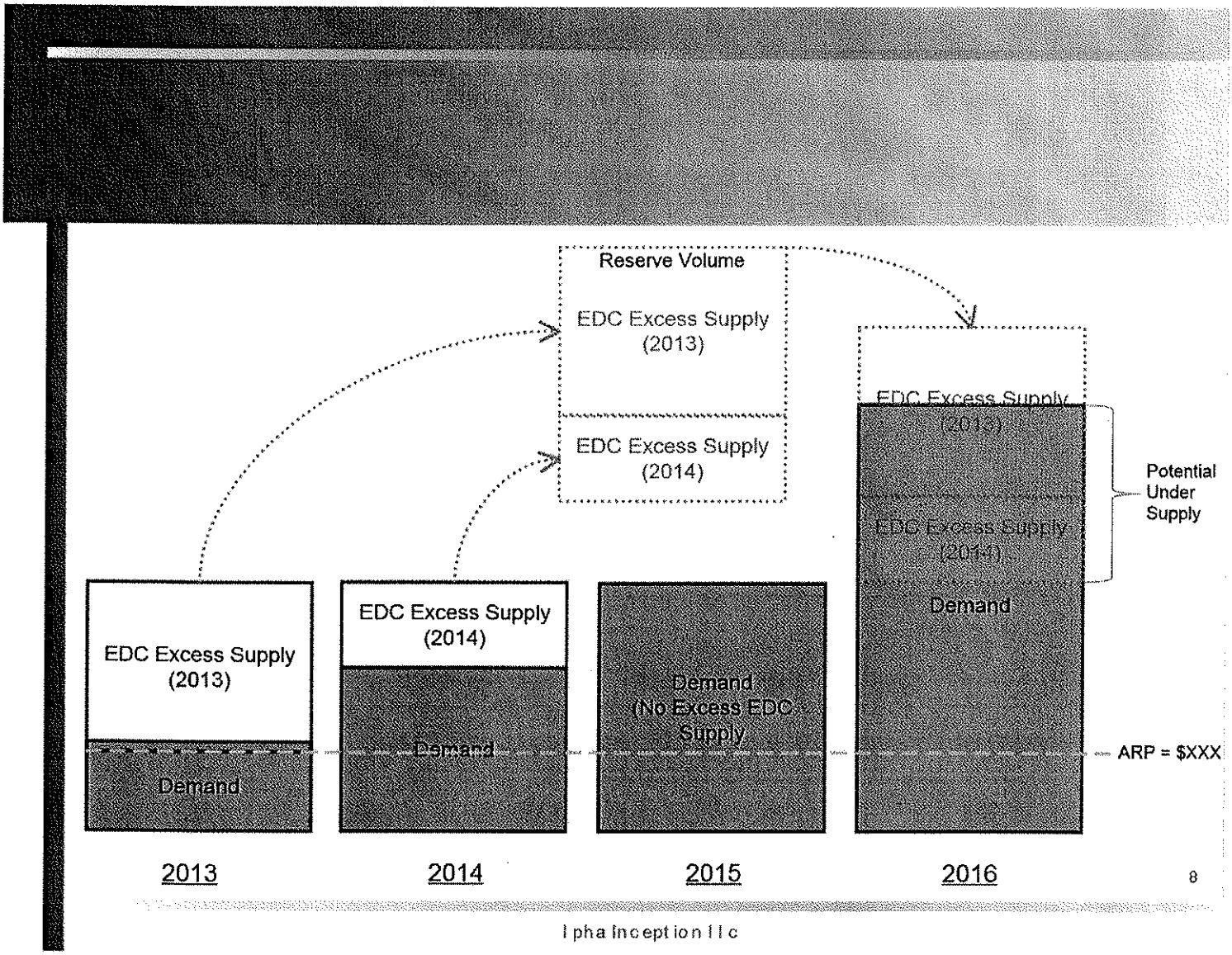
Reserve Volume
EDC Excess Supply (2013)
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8
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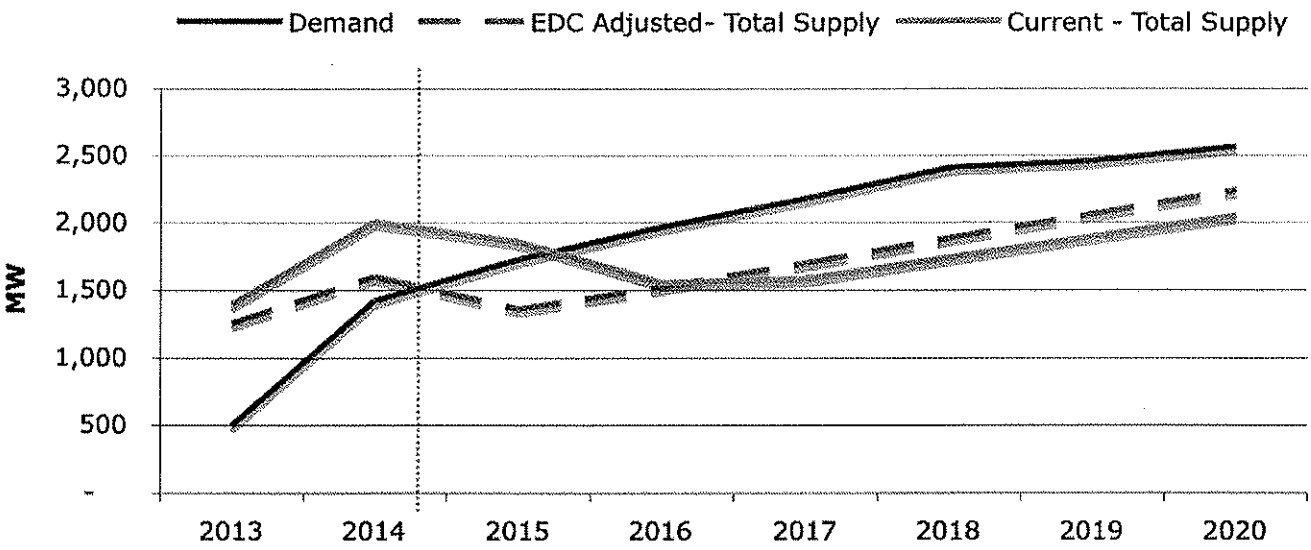

Market Rebalancing in 2014 under EDC Adjusted assumptions

- Moves market equilibrium up by approximately 18 months
- Closes gap between demand/supply in later years
- Creates more sustainable, long-term market balance

9

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- Significant potential cost savings.
  - $160MM savings from mitigated losses + increased costs
  - $20MM in carry costs (assuming 8% cost of carry), shifting excess EDC auction supply from 2013 to 2016
  - Net savings of Price Containment Reserve to the residents of NJ ~$140MM
- Protects the rate payer investment in solar projects by not selling at significant losses
- Raise short-term price to provide incentives for reasonable build rate
- Protects against supply shortages and price spikes:
  - i) enticing some new build - retains jobs and infrastructure
  - ii) creating a reserve for future years - protect rate payer from future price spikes
- Creates a design that is more sustainable in the long term

- <u>Ultimately, benefit to the rate payer due to not selling at a discount (lost investment) and protecting against future price spikes.</u>

EDC Auction - Ratepayer Impact:

Market Assumptions:						
Market Oversupply until 2015/2016 (see next tab)						
Excess demand in 2016 (MWhs)		494,400				
ACP in 2016 ($/SREC)	$	323.00				
Initial Utility EDC Purchase Price ($/SREC)	$	350.00				
Market Equilibrium Price ($/SREC)	$	180.00				
Cost of Carry		8%				
EDC Assumptions:		Oct-12		Jul-12		Apr-12
2013 Forward Price	$	85	$	160	$	175
EDC Auction Clearing Price ($/SREC)	$	70	$	135	$	155
EDC Discount to Forward Price ($/SREC)	$	(15)	$	(25)	$	(20)
Average Discount to forward price	$	(20)				
		2013		2014		2015
Current Forward Curve	$	90	$	95	$	115
Average 3-year strip price ($/SREC)	$	100				
Less EDC Average Discount to forward price	$	(20)				
Expected EDC clearing price ($/SREC)	$	80				
EDC Auction Volume (SRECs)		75,000				
EDC Auction Volume 2013-2015		900,000				
Analysis:						
1. Forced EDC/ Customer Losses:		$ (243,000,000)				
2. Increased Costs to Ratepayer:						
Lost Ratepayer Investment in Solar		$ (90,000,000)				
Increased costs in 2016		$ (70,699,200)				
		$ (160,699,200)				
EDC Proposal Savings:						
Avoided costs to ratepayer		$ 160,699,200				
Cost of carry charges		$ (18,699,264)				
Net Savings		$ 141,999,936				