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September 26, 2011

Michael Winka
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RE: Next Steps - Solar Transition

Dear Mr. Winka,

Thank you for convening the meeting on September 15, 2011, to discuss next steps in the solar transition process. Constellation Energy submits the following comments regarding several of the issues discussed at the meeting.

I. Constellation Background

Constellation Energy is a diversified Fortune 200 energy company, serving retail and wholesale customers throughout the U.S. including two-thirds of the Fortune 100. In New Jersey, Constellation operates from over nine locations, and serves customers state-wide. Constellation is also one of the nation's leading solar developers, designing, financing, and constructing solar projects that will help New Jersey meet its renewable portfolio standard and solar carve-out.

II. SREC Floor Price

BPU should not adopt an SREC price floor, primarily because there is no practical way to enforce such a mechanism. A floor such as that in Massachusetts is inextricably intertwined with the design of the SREC program, and includes features such as a clearinghouse, and fluctuating carve-out. Without re-writing New Jersey's SREC program virtually from scratch, it would be impossible to design a functioning floor. Such a re-write and the associated regulatory uncertainty would hinder the SREC market more than it would help, and likely have innumerable unintended consequences.

Constellation agrees with the Solar Alliance’s position in its comments that no single “silver bullet” exists that will keep the market in perpetual balance. Constellation also agrees with the Solar Alliance that the fluctuations that the New Jersey solar market is undergoing are in large part the result of normal, albeit painful, market influences, and that a long-term healthy market would be undermined by repeated regulatory interventions that destabilize market rules. However, as discussed below, Constellation believes there are several important measures that BPU could take that would promote a healthier, better-functioning market.

III. Queue Management

Improving the reporting processes for solar projects was touched on at the September 15, meeting. Currently, project developers, LSEs, and other market participants base their views of market supply and demand largely off of the monthly Project Activity Reports published by the Office of Clean Energy. Currently, all projects with an SRP number continue to be tracked in the reports, regardless of whether they have a feasible path to completion.

At the meeting, BPU offered to develop and publish a summary document tracking projects with an SRP number that are no longer being pursued. This step would go a long way to improving market clarity. However, if BPU relies solely on developers voluntarily reporting that they are no longer pursuing projects, BPU is likely to receive little such information. A thorough queue management process is critical to a well-functioning market.

Constellation is working with the Solar Alliance and reaching out to other stakeholders to attempt to develop a joint proposal that comprehensively addresses queue management. Constellation hopes to submit a joint proposal to BPU during the next several weeks, and welcomes the involvement of any stakeholder who may be interested in this issue.

IV. Technical Market Improvements

Constellation also recommends the following technical measures that would improve the health of the New Jersey solar market:

1. BPU should publish project activity reports more frequently than the currently monthly basis. A bi-weekly publication, or ideally real-time data on the OCE website would substantially improve market clarity and efficiency.
2. The EDC BGS SREC auctions are held in an ascending clock format with an opening floor that appears to correlate to the EDC SREC based financing program results. This floor provides undue control over price, which contradicts the market-based intention of the programs. Constellation suggests that a below market opening price will be more efficient in clearing the auction, which will in turn reduce the administrative costs

associated with repeated auctions. Such market prices could be obtained by BPU from several brokers, and BPU could then formulate a view of current market conditions.

3. BPU should consider holding the EDC BGS SREC auctions more frequently. Conducting auctions when a designated volume threshold is triggered would allow wholesale suppliers to better plan for transactions, and lead to more efficient auctions. Market trading efficiencies can only be achieved with a more transparent process – one that allows participants to be aware of the volume to be auctioned. Currently, participants enter the auctions with very little knowledge of supply. More frequent auctions, triggered by a volume threshold, would also facilitate a timely, consistent, distribution of SRECs into the market.

Thank you again for the opportunity to submit these comments. We look forward to continuing to work with BPU and other stakeholder on these issues.

Sincerely,

Bryan Miller

Bryan Miller
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Constellation Energy
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-----Original Message-----

From: Neal Zislin [<mailto:nzislin@renuenergy.com>]

Sent: Friday, September 23, 2011 11:46 AM

To: OCE

Subject: Comments on Solar Transition

Mike Winka and OCE Staff:

I want to thank the OCE for organizing and conducting this solar transition forum last week to encourage input from the various stakeholders in NJ's solar industry on the future viability of the EDC sponsored programs to encourage solar system investment. I found this session to be quite informative and beneficial in hearing the perspectives offered by various stakeholders.

As a project developer of solar systems, one of our major hurdles to be overcome, as expressed by several participants last week, is access to investment capital. Obtaining financial resources in the form of private equity or borrowed debt is dependent on demonstrating a predictable and quantifiable income stream that is sufficient to service the debt and provide an acceptable rate of return on the equity. We encountered difficulties in being able to enter into bilateral contracts for SRECs with LSE's needing to fulfill their obligations under the RPS, because the time horizon of the LSE's for these commitments do not coincide with the time horizon that financiers require. The time commitment for LSE's providing electricity to the EDC's under BGS is typically 3 years to coincide with the BGS auctions. From the standpoint of the LSE providing electricity in the BGS market, there is no incentive to making SREC commitments beyond the period in which the LSE knows what its RPS obligation will be based on its success securing contracts during the auctions. 3 years is too short of a period to satisfy the viability of a solar project with equity or debt financial partners where the SREC's constitute the preponderance of the revenue stream for these solar projects. This was substantiated by the Retail Energy Supply Association spokesperson, representing third party suppliers servicing their own retail networks. The spokesperson commented that longer term contracts are not in the best interests of their members because there is no reasonable track-record of retail demand captured by their new members in which to make a prudent decision about quantities and future valuations of SREC's. I would surmise that for the more established third party suppliers, the customer base is quite variable given that there are no penalties or barriers for customers to switch supplier nominations and therefore, would also be reluctant to enter into longer term contracts.

An option which the province of Ontario and specific municipal utility authorities across the country have adopted is the feed-in tariff. These feed-in tariff contracts value the SREC's at \$550-650 each and are being offered for 15-years or longer. The distinction is that these feed-in tariff rates are set by the utility regulatory authority, not the marketplace, which imparts predictability and quantification of a major segment of the revenue stream. Like the SACP profile which was set at a high enough price to induce rapid investments into the solar generation sector, the feed-in tariff provides similar financial incentives and revenue stream predictability over a term which satisfies debt and equity holders. The EDC SREC program also provides for predictability and quantification of a major portion of the revenue stream for a 10 or 12-year period. The committed SREC pricing is market-driven and so the SREC valuation for each auction will fluctuate based on supply-demand dynamics. Also, it is applicable only for SREC's generated under the net metering program. The PSEG loan program, which provides a floor price for SREC's, is limited to the PSEG service territory, is applicable to net metered systems and commands a high interest rate of 11.5%.

When EDECA was passed in 1999 followed by the Solar Advancement Act recently, there was no discernment made as to from what sources the kwh's of solar generated electricity would come. In fact, one of the guiding principles behind the RPS was to facilitate participation of all utility ratepayer classes. Longer term contracts cementing the quantity and valuation of the SREC's are essential to sustaining present and future investments in solar capacity until such time as investors' returns on solar are at parity with those of natural gas fired generators while commanding electricity prices sanctioned by the BPU. Our own experience has confirmed that the possibility of engaging in bilateral agreements with independent power producers for SREC's over 10-15 year period does not exist. This reality suggests that the targeted capacities to be reached via the EDC SREC auction approach ought to be at a high enough percentage of the RPS with adjustments for:

- 1) SREC's earned from prior years that are available from other channels such as short-term bilateral agreements with LSE's, aggregators, system owners trading in the spot market & LSE's earning & retiring their own SREC's.
- 2) Incremental increase in SREC's per installed KW of capacity (above 1200 kwh/kw DC-year typically used) due to performance enhancing microinverters or boosters.

The EDC SREC auctions offer a vehicle for supplying longer term contracts and should continue having modifications with these features:

Eligible SREC's for guaranteed valuations are extended to grid connected solar generation systems.

Targeted capacities to be awarded guaranteed SREC valuations can be established among several categories of solar generators to ensure equitable participation. Categories to be established are 1) smaller-scale systems from residential and commercial facilities (25 KW or less), 2) larger-scale commercial facilities (25 KW to 3 MW) and 3) utility-scale facilities (>3 MW).

EDC SREC auction process is expanded to the PSEG territory as an option to the PSEG Loan Program for those who can acquire debt financing at more competitive interest rates.

An established SREC floor price produces a marketplace signal that would stabilize or facilitate the growth of the solar industry workforce in a less volatile fashion so that when periods of surplus SREC's catch up to the higher SREC targets of the RPS, the solar industry can respond rapidly with new investments and an experienced labor force. This floor price represents a regulated "feed-in-tariff" equivalency that is delivered in the marketplace between LSE and SREC owner. The predictability of this revenue stream enables the project lenders/investors to assess expectations about project outcomes with more confidence. This approach is consistent with the two other guiding principles of achieving the RPS and delivering electricity at the lowest possible cost to the ratepayer. A floor price can be calculated based on the current capital investment and operational costs for solar that would deliver a 12% rate of return over 15 years and provide for a simple payout within 5-7 years. This reassessment should be conducted again in 3 years to recalibrate the appropriate floor pricing of SREC's being generated from that time forward.

A concern raised by the OCE during the discussion was how would the floor price of the SREC's purchased through the EDC auctions be backstopped. One approach to consider if the situation arises where purchased SREC's under the EDC auctions becomes in excess of the market demand, is to extend the lifetime of these SREC's indefinitely. The EDC directly and the ratepayers indirectly, would be able to sell these "tagged" SREC's to satisfy demand of RPS compliance in future years without the risk of expiration. The buyer of these "tagged" SREC's must retire these SREC's in the year of purchase. These "tagged" SREC's do not remain in the system to be traded for speculative purposes indefinitely. Gains and losses incurred by the EDC's when selling the SREC's to the LSE's would be reconciled through formal tariff filings seeking distribution rate adjustments. This safety valve to protect the ratepayers is predicated that the determination of SREC's to be purchased according to the auction process is conducted accounting for the availability of SREC's from all of the channels cited above. There is no need for a pool of money to be allocated by the BPU to support the SREC floor price because only the price is set not the commitment to purchase SREC's outside of the EDC auction process.

The forward 15-year SACP schedule needs to be set high enough to induce LSE's to purchase SREC's while managing the embedded cost of RPS compliance at the SACP level to the ratepayer through the LSE's electricity supply price.

An earlier study completed by Summit Blue in 2008 identified market stability and predictability, access to low interest financing and longer-term contracts as being essential to the viability of renewable energy projects in NJ. These factors are very much relevant today in sustaining a healthy solar market.

Regards,

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american
clean energy

September 17, 2011

Michael Winka
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Re: Comments of American Clean Energy, LLC regarding OCE White Paper

Dear Mike,

As requested, I am forwarding you the comments of American Clean Energy regarding the OCE staff White Paper and the comments made at the stakeholder meeting last week.

Additionally Mike, I am attaching a copy of our comments to the Energy Master Plan Draft which were previously submitted to the Board. That document covers in some more detail how one might arrive at the solar distributed resource benefit calculation as well as some other thoughts regarding the attainment of the RPS.

As I have said on a number of occasions, our experience is that lack of certainty and predictability are far bigger impediments to development of this industry. Once we know how the process works and can predict with a high degree of certainty how it will behave going forward, we will be able to develop solutions to problems that prevent investment today.

Sincerely yours,


Stephen E. Morgan

cc: njcleanenergy.com

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Comments of American Clean Energy, LLC regarding The Next Steps in the Solar Transition

American Clean Energy, LLC is a New Jersey based solar PV developer. We are focused on the development of net-metered solar projects for commercial, industrial and public sector customers. We are in this business because we believe that Solar Distributed Generation represents one of the most viable forms of distributed generation which, when integrated with the interconnected grid, and eventually coupled with widely distributed energy storage technologies has the ability to take the operation of the grid to the next level of reliability and make it viable for the coming century.

Our belief is founded on over three decades of experience in the construction, maintenance and operation of the electric T&D infrastructure in this country and state. The electrification of this country which has occurred over the last century has largely been responsible for fueling our economic growth. In fact, according to US EIA data, the average *Real* price of electricity at the end of 2010 was the same as it was in 1960—for 50 years our electric energy prices have been indexed to GDP growth!

The promise of distributed generation technologies is not the replacement of the large scale interconnected T&D system in this country rather the enhancement of its performance. Once energy storage technologies mature and are coupled with widely dispersed forms of alternative energy production, it is our belief that consumers will in fact see improved reliability, cost effective and secure sources of energy well into the future. Distributed generation technologies are necessary but not sufficient to bring us to the next level of performance. Nor is it likely that widely dispersed renewable energy generation will supplant or replace central station generation that relies on fossil and nuclear fuel cycles anytime soon. However, as we move forward into this next century of electric energy production and transportation, there are real issues regarding security, cost, siting and societal benefits that favor the adoption of widely dispersed renewable generation.

American Clean Energy has a number of comments in response to the questions posed by OCE at the stakeholders meeting on September 15, 2011 and the staff's White Paper.

Much has been said about the cost to consumers in achieving the state's RPS goals. In particular, the solar set aside under SEAFCA has been denounced in the past as too expensive because SRECs in the spot market were trading near the SACP declination schedule. Since the acceleration of developments now promises to satisfy the demand for SRECs for the next several energy years, SREC prices have fallen dramatically. Now the concern is that development will cease and the benefits thought to attend the creation of the solar set aside will go away and rate payers will be left holding the bill.

It has been suggested that the market construct for SRECs is flawed and that a floor price mechanism should be examined. We disagree. The single most important requirement for this industry to flourish is certainty in the form of predictability of prices.

The SREC market construct is working as one would expect relative to supply and demand. When the oversupply drives price below the price necessary to incent investment the reasonable cure is to increase the size on the demand side.

Under the Solar Energy Advancement and Fair Competition Act, the Board was directed to establish the requirement that Load Serving Entities provide “... *at least the following number of kilowatt-hours from solar electric power generators in this State:*

EY 2011 306 Gigawatthours (Gwhrs)

EY 2012 442 Gwhrs

EY 2013 596 Gwhrs

EY 2014 772 Gwhrs

EY 2015 965 Gwhrs

EY 2016 1,150 Gwhrs

EY 2017 1,357 Gwhrs

EY 2018 1,591 Gwhrs

EEY 2020 2,164 Gwhrs

EY 2021 2,518 Gwhrs

EY 2022 2,928 Gwhrs

EY 2023 3,433 Gwhrs

EY 2024 3,989 Gwhrs

EY 2025 4,610 Gwhrs

EY 2026 5,316 Gwhrs

EY 2027, and for every energy year thereafter, at least 5,316 Gwhrs per energy year to reflect an increasing number of kilowatt-hours to be purchased by suppliers or providers from solar electric power generators in this State, and to establish a framework within which suppliers and providers shall purchase at least 2,518 Gwhrs in the energy year 2021 and 5,316 Gwhrs in the energy year 2026 from solar electric power generators in this State,...”

The intent of the legislation was clearly to phase in the solar generation over the period through the year 2026 in a way that did not create large disruptions. But the numbers stated for each energy year are clearly *Minimums* not exact mandates. The legislation goes on to provide for a significant 20% increase in the solar set aside whenever the annual target is met for three years and SREC prices are declining.

This suggests that the legislature understood that there might be times of oversupply and that could well lead to a boom and bust cycle that would not be good for the industry or for the consumers of the state.

The appropriate way to deal with the current problem, as suggested by the legislature in their approach, is to advance the annual solar generation schedule a sufficient amount to bring the SREC demand into a reasonable balance with project supply. This will raise SREC prices to a point where active investment will take place but without returning to SACP like prices of the past.

If subsequent events cause a significant undersupply and therefore a return to higher SREC prices, the Board should reset the demand closer to the original SEAFCA schedule level in a way that moderates the volatility. We think such adjustments should be infrequently required. The notion is not to eliminate all volatility in the market but make sure that we don't destroy the

nascent industry through wildly swinging SREC prices. The “normal” ups and downs in SREC prices in the spot market can best be handled through the here year shelf life of an SREC.

There are other considerations that need to be discussed as well. The SREC market, unlike other markets does not lend itself to long term bilateral contracts. This is an artifact of the BGS auction mechanism which has a maximum exposure for an LSE of three years. No LSE is going to take on contracts for SRECs longer than their CURRENT BGS obligations. To do so would create significant risk in their portfolio management. If they were long on SRECs when the market crashed, they would be required to mark the value of those certificates to then current market prices. While those losses certainly might be recoupable over the out years given the life expectancy of an SREC, the risk is simply one that they do not need to manage and therefore they will not. It is unrealistic to expect a long term market in SRECs to be created in NJ as long as the BGS auction cycle is at most three years.

The historic lack of the SACP declination schedule should be solved once the Energy Master Plan is updated. It would appear that the days of spot markets up against the SACP schedule are over. One should expect though that there is going to continue to be volatility in the price of SRECs. The proper role of the board is to smooth out some of the extremes of volatility by balancing demand against supply.

The ultimate goal of the RPS and the enabling legislation was to obtain a significant portion-over 5GWhr of energy and 5GW of capacity by the end of energy year 2026. Doing that sooner, with reasonably predictable and stable SREC prices, would be a net benefit to the state, the industry and consumers.

The current oversupply situation is not unexpected particularly given the rush by some developers to take advantage of the US Treasury 1603 cash grant program that may expire at the end of the year. If that program is not extended, the major investment vehicle will revert to Tax Equity Investors and the capital available in that market is substantially reduced from the current situation. In addition, that capital is likely to demand higher returns for those projects that are ultimately funded and low SREC prices again will work to diminish the supply of viable projects and therefore the ability of the state to meet its RPS goals.

Establishing a better balance between project supply and SREC demand can best be achieved by accelerating the annual SEAFCA schedule and relying on the three year SREC life to manage the remaining volatility.

There are many people who want to focus on the cost side of this program without giving attention to the benefits to be derived. Apart from the societal benefits and the creation of jobs that attend the development of a new industry, there are significant benefits to be derived from distributed generation resources. We lay out our argument in the response to the Energy Master Plan Draft which I have attached to these comments but which is summarized below.

Despite the fact that energy consumption has fallen during the recession, peak demand growth has rebounded. The EDCs in this state, like others, have to build T&D capacity to serve the all-time peak or face the consequences of failure induced blackouts.

The problem is multi-faceted because this peak last for only a very few hours of the year, the investment is supposed to be recovered over the life of the equipment but it is paid for by energy throughput. Do the math, if the top ten percent of peak demand last for 1% of the hours of the year or less, there is never enough energy transported by those facilities to pay for themselves.

The EDCs in this state have invested over \$21B in Plant In Service and that number is growing each year. The bulk of those investments are designed to serve that growing future peak demand. But assume for the sake of argument that only 10% of that investment is made to serve the top ten percent of the peak, it still amounts to about \$1,100 per kW of system peak served. That is \$1.10 per Watt and compares to current solar prices around \$4.50 per Watt for a finished commissioned solar distributed energy resource.

However, that is only a part of the story. That T&D investment sits idle 99% of the year. The load factor of the EDCs in NJ, like those of most utilities, run around 50%. There are not too many industries that would invest in a capital asset that was idle half of the time. Consumers are paying for an expensive insurance policy and one that necessarily gets more expensive every year.

A solar array also provides the benefit of a generation resource-on average 5 hours per day in NJ -day in and day out. Every kW of installed capacity creates on average 1150 kWhr of energy. That energy performs two roles in a net metered installation. It obviously offsets and reduces the host consumer's electrical consumption and costs. However, equally important, it offsets the amount of energy required in the BGS auction process and that should drive down BGS supply costs since it reduces the market relative to generation supply and it reduces losses and congestion expenses associated with long distance electric energy transport.

Additional operational benefits show up in the form of voltage regulation and VAR support under periods of heavy peak load. and those benefits inure to all consumers. The economic benefits are hard to calculate since they tend to be heavily influenced by circuit topology and solar generation penetration rates but we can make estimates regarding those benefits as well as the reliability and quality of service improvements they provide.

Under theSEAFCA schedule, we will need about 5GW of solar capacity installed by 2026. That is about 2 ½ times the 2GW 10% peak experienced in 2006. We can invest in solar distributed generation to reduce BGS supply, losses and congestion charges and improve reliability and quality of service or we can make a traditional investment in T&D infrastructure that sits idle for most of the year and which is really never truly an economic investment.

Finally, some have suggested that perhaps we just need to focus attention on large grid connected arrays and be done. Obviously there are ways to obtain scale economies from large installations but many of the benefits discussed above will not be derived for grid connected projects. Economies of scale and scope are also available for distributed energy resources and we have seen dramatic cost reductions in the area over the last three years and it is a trend that will continue. If one could credibly make an argument that converting land with other valuable uses to a solar field made sense we would still find that we are missing out on the benefits that only distributed resources can provide. We are not opposed to large grid connected projects but we question the long term wisdom of such investments particularly when one considers the likely evolution of energy storage technologies and their role in the operation of the interconnected T&D system going forward..

Questions regarding our comments or the attached comments relative to the Energy Master Plan Draft can be addressed to:

Steve Morgan

American Clean Energy

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732-912-8040

Issues:

1. The problem of volatility of SREC prices in a “Capacity” market

The SREC market, from an economist’s perspective does not operate in a purely supply and demand market but rather operates in an artificial created “Capacity” market with a decreasing cap. In its simplest form, the two ends of the market drive prices. These two ends are the SACP and a “fire sale” value (some point near zero). Evidence for these divergent prices are present in virtually all the states that have SRECs. At one point in time the price of SRECs is near the compliance price and at some other point in time, when capacity is achieved the price dives toward zero. If program managers accept this wild volatility as acceptable, then this issue is not a problem. However, business managers generally do not like to operate in a climate where expected payments change by a factor of four. Quantum Solar Solutions, proposes that this volatility around the extremes remains an issue for my business and customers.

Solutions by other states to this problem: The simplest solution is a feed in tariff like in Hawaii, this is probably not acceptable to many because it doesn’t respond to market conditions. The most complicated will have market based triggers and throttles like the Massachusetts program (or was it the MIT modelers) who developed it. Triggers and or throttles are designed to respond to market conditions, but the problem is still temporal and these triggers may take a year to be activated. Again the artificial walls will probably keep the price bouncing from one wall to another. This volatility reduces the confidence the business community has in investing in the market and ultimately may increase cost due to the uncertainties. We recommend a SACP near the floor of long term financing, to try and keep the bounce small. Known prices and milestones are more acceptable to the regulated community.

2. The problem of cost to the ratepayer

The ratepayer pays for the SRECs. Their issue is “for what purpose –value”? The classic answer is that it benefits the community as a whole. Reduces dependence on foreign energy sources, provides clean green energy, enhances grid security, and reduces the grid transmission and congestion secondary costs by having distributed energy generation. This last item may be the best economic reason to promote solar. In the wholesale electricity market, when the lowest – price electricity cannot reach all locations, more expensive electricity but advantageously located electricity is dispatched in order to meet that demand. This is the definition of congestion. PJM Interconnection’s locational marginal pricing (LMP) system takes into account congestion in determining electricity prices. It reflects the value of the energy at the specific location and time it is delivered. As a result, the LMP’s are higher at the receiving end of the congestion. According to PJM, congestion in northern New Jersey alone will increase over the next two years, adding more than \$400 million to electric bills.¹ This is one of the many reasons why the

¹ See <http://www.njspotlight.com/stories/11/0620/0047/>

Christie administration on January 28, 2011, signed into law P.L. 2011, c. 9, amending and supplementing P.L. 1999, c. 23, establishing a Long-term Capacity Agreement Pilot Program (LCAPP) to promote the construction of qualified electric generation facilities for the benefit of New Jersey's electric consumers. Distributed generation, such as solar, produces electricity at or near consumption and if located in constrained areas, distributed generation can reduce the need for distribution and transmission system upgrades. Adding small generators to the grid also can increase reliability. The 400 MW of installed solar in New Jersey that the SREC program incentivized works to reduce the price of electricity to the ratepayer. Quantum Solar Solutions suggests that it may be helpful to model and quantify the costs of not installing 400 MW of distributed generation. Rate Council and BPU could use this information to calculate the net costs of the SREC program and fund the program accordingly.

3. The problem of irrationality installing solar projects

It is clear that the value of adding solar electric generating equipment is not only based upon financial considerations. Some people and companies will add solar because of their commitment to green energy or the perceived environmental benefits. Just like casinos believe they derive benefit from having huge lighting costs; environmentalists will install solar because it benefits the planet as long as the cost is reasonable. One need not look beyond Pennsylvania, with recent SRECs at \$40, to see the "irrationality" of people installing solar. And there is not much reduction in the PA rate of installation. Is it a commitment to the environment, herd mentality, gambling, or are people just "unsophisticated"?

Or there is profit at installing solar in PA with a near zero SREC value. If this is the case it must certainly happen at economies of very large scale.

Solar installation costs have been dropping steadily over the last 4 years with average installation costs dropping from \$8+/Watt to \$3+/Watt for large scale projects. Crystalline silica is now a commodity and the price of panels is fast approaching the magical \$.50/W level where solar begins to compete with fossil fuel in high tariff areas. The Federal tax credit is nearly enough an incentive to fund the large projects. The BPU needs to recognize this reality and adjust the SREC registration program to exclude large projects from the SREC program. Small, more expensive projects, ones of 100kW (or 50kW) and smaller that are almost 100% net-metered projects will always help the distributed energy solution and should continue in the program unaffected. Quantum Solar believes that the time has come for solar PV applicants at the large end of the spectrum, greater than 500kW or some other number derived from the installation prices that the Office of Clean Energy has access to, be exempted from the SREC market. This exemption should be for those applications beginning January 2012. This throttling of the SREC market will reward those who have currently invested in starting the solar industry in New Jersey.

Summary of essential points

In order to reduce the volatility of the SREC "Capacity" market, not burden the ratepayer with ballooning solar subsidies, and recognize the lower cost of large projects, Quantum Solar proposes the following simple changes:

1. All project applications received after December, 2011 that are larger than 500kW are excluded from the SREC program. Those projects between 100kW and 500kW will receive SRECs based upon 2000kWh per SREC. Projects below 100kW will receive standard value SRECs.
2. In order to reduce volatility there will be a Utility long term financing program offered to 100MW of applications per year with a floor on SRECs of \$X (\$250?) beginning January 2012. This would be divided up between the commercial and residential sector based upon historical ratios. The floor should be reduced by $\$X/5$ (\$50) every year till 2017. The BPU should announce that after 2016, Solar projects will not receive SRECs. Projects that received interconnection after January 2010 may apply retroactively for utility sponsored long term financing.
3. The SACP will be reduced to $X + \$100$ in 2017 and reduced linearly to zero in 2032 at which time the SREC program ends.
4. The SREC market for all noncontract solar projects shall remain open with no floor.
5. After 2017 the State exits the solar registration program and GATS/Utilities take over.
6. \$X may be determined by congestion modeling plus environmental value or staff recommendations.

As an editorial, we would encourage the discussion of variants of the plan adjusting prices and the year of implementation. Maybe you should implement at the start of the energy year.

There are implementation details that need to be worked out by staff.

Might the Rate Council recommend incentives for those projects in the grid congested areas of Union, Essex, Bergen, Hudson and Middlesex counties?

I would be happy to participate in discussions regarding the future of the SREC program.



Green Sun Energy Services, LLC
Comments on the Office of Clean Energy Stakeholders Meeting
EDC SREC Based Financing Program Evaluation and Next Steps in Solar Transition
September 15, 2011

Green Sun Energy Services, LLC (GSES) would like to thank The Board of Public Utilities and for hosting the public stakeholder meeting on September 15, 2011. We would also like to thank our associates and colleagues for their preparation and participation in a topic that is critical to the long-term success of the solar program and our industry. Based in Middletown New Jersey, GSES is a full service Solar Installation and Management Company that works with residential clients and small businesses to maximize their long-term energy production and financial returns through our innovative SolarBase™ programs.

Swift and decisive action is required to ensure the long-term success of New Jersey's solar program and viability of a successful cottage industry that is in the early stages of becoming self-sufficient. Simply put, "slowing down" solar development because of SREC oversupply will drive many solar companies out of business; scare off consumers that are considering solar; and further distance us from the financial institutions that are needed to fund our projects. It is our opinion that these potential results will not be easy for the state of New Jersey to recover from.

Someone in the stakeholder meeting was kind enough to remind us that the three goals of the SREC program were to:

- Meet the RPS
- At the Lowest Cost to the Rate Payers
- With All Markets Participating

We would like to suggest amending the 2nd goal to read "Deliver the Greatest Value to the Rate Payers".

Since cost is certainly an important factor in determining the value of the program, GSES would like to understand the true costs [to the ratepayer] per kWh that was projected for the original program and the actual costs per kWh that were incurred as a result of the program(s) to date. We would also encourage the Rate Council to evaluate the alternative costs to the Rate Payer. For example, what is the long-term cost per kWh to fund and develop the proposed natural gas generation facilities or increase the stability of the transmission grid? How do these costs compare to increasing the RPS and/or instituting a SREC price floor?

On the value side of the equation, what costs are being avoided because of more evenly distributed generation? Is the long-term benefit of smaller generators adding value to the grid, the environment, the community? How are the blended rates per kWh impacted by solar generation since solar produces energy during peak demand hours (avoiding peak rates) as opposed to off-peak times? Do residential solar generators reduce the overall burden on the transmission grid? If more rate payers purchase and install solar (and retain their SRECs, tax credits and energy savings), does it provide more value to the rate payers and the state than enabling out-of-state companies to take ownership of the SRECs? To that point, should New Jersey charge a tariff or surcharge for non-rate payers who take ownership of SRECs as part of a lease or PPA? --- If so, could this revenue be used to fund a SREC price floor?



There were several comments about the costs of solar dropping since the inception of the program, and several conversations about the desire to modify the program accordingly. Yes, the costs of solar panels have dropped at an unprecedented rate. But, the cost of copper wire for grounding hasn't gone down, inverter prices are relatively the same as they were a year ago, the cost of quality labor has remained about the same, the cost of liability insurance and workers compensation has gone up, and the cost of shipping these materials has also increased. And we all know that the printing, travel and administrative costs required to for permitting, interconnection and the SRP haven't gone down. Further, is it an oxymoron that the Office of Clean Energy requires that SRP paperwork be delivered by mail or in person when most people have access to e-mail and the internet? How much CO2 has been emitted into the environment because we have had to hand deliver REIP and SRP paperwork in person?

The September 9, 2011 White Paper defines the terms of an "open market" and "structured market." In a true open market, "commodities" are bought and sold based on a perceived current/future value --- which is impacted by supply and demand for the particular commodity at the time of the trade. If the state has met its RPS goal, and is projecting that it has enough projects in the pipeline to meet the RPS for the next two years, how can there be any value left in the market? Without some mechanism to provide value it appears that the SRECs for the next two years will not be worth much more than the paper that they are printed on. The SACP was instituted to help provide a value to the SRECs and without directly communicating it --- also provides a price ceiling for the SRECs. If the SRECs are going to be the mechanism to co-fund our cottage industry and the investment in solar then they must have a tangible value that consumers have long-term confidence in --- in other words, we either need a price floor or some other means to ensure that SRECs have tangible economic value.

Consumers, businesses, and municipalities will only invest in solar if it delivers tangible economic value. Last year we hosted multiple independently managed focus groups to understand what typical [non solar] consumers would expect from installing solar. We discovered that most people "say" they believe in clean energy, but they aren't motivated to do anything unless there is a significant economic benefit (e.g. "Why would I put ugly solar panels on my house to save 15% on my energy bill?"). Further, the consensus from all of our focus groups pointed to a targeted payback period of 5 years, with the majority of residential customers expecting to achieve a minimum net savings (after all expenses) in excess of \$100/month. Interestingly, about half of the participants liked the idea of an open market for SRECs while the other half liked the security of locking in a set price for 10+ years. But, all of the participants asked if there was any guarantee for the value of SREC. As of today, 37% of our clients have contracted with us to participate in the SREC Based Financing Program or the PSE&G Solar Loan Program, while the remainder preferred the upside potential of the open market.

Since we manage the registration and bid processes for our clients, GSES supports the comments that SunRun made --- as they pertain to allowing small projects to be built and interconnected before bidding projects. We also agree that simplifying, automating or otherwise reengineering the process and the paperwork required to submit a bid through the SREC-Based Financing Program is desperately needed. If we really want to save the rate payers money, let's improve the process and automate it --- it's costing all of us time and money.

As an alternative to the existing SREC-Based Financing Program, GSES is suggesting to take the best aspects of the PSE&G Solar Loan Program and combine them with the best aspects of the SREC-Based Financing Program. For instance, rather than holding up projects for 6-months while they go through



the bidding, award, and contracting process, would the Board consider developing a hybrid program, whereby each EDC publishes a quarterly schedule of contract prices that they are willing to pay... in a manner similar to the table below:

System Size (DC)	5 Year Contract	10 Year Contract	15 Year Contract
Under 10KW	\$400	\$375	\$325
10KW to 50KW	\$375	\$325	\$300
50KW to 200KW	\$300	\$275	\$225
200KW+	\$225	\$175	\$150

This approach could significantly reduce the EDC's administrative costs and thus save the rate payers money. And, unlike the solar loan program, GSES is recommending that the SRECs are issued and paid as they are generated (monitored and measured through a single meter). Since this is not a loan, it would also eliminate the upfront payment requirements for the EDC and provide the project owner with the ability to accurately predict their annual ROI prior to entering into a contract.

Thank you again for your time, interest and support!

Sincerely,

A handwritten signature in black ink, appearing to read "Glen Koedding", written over a light blue circular stamp.

Glen Koedding
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Response to PBU White paper 9/9/11

Donald Powell LEED AP
Powell Energy and Solar, LLC

I would first like to give you my background and interest in the topic. I am a residential and commercial solar EPC and developer. I have had a solar system on my personal residence for almost five years. I am also, along with a couple of partners, a PPA provider to charitable organizations (primarily churches) in the state. We presently have approximately 500kW of solar under PPA contract. We additionally have additional organizations which represent another 500kW or more of solar which we would like to provide for our mutual benefit.

I think it is fair to say that the BPU and the NJ State Legislature have created a wonderful solar program. NJ is the poster child for all the other states in the USA and arguably most of the world. The program was well thought out and runs relatively free of political interference. Most importantly, it has gotten the solar industry in NJ going in high gear and has begun to provide all the important benefits solar brings to the residents of NJ. NJ residents are enjoying a healthy solar job market and the benefits of reduced emissions associated with traditional means of electric generation. All this costs the rate payers a very minor increment on their utility bill; in many cases only a few dollars a month. I'm confident most rate payers, if given the choice, would be happy to continue the current program for the benefits of jobs and clean air.

The system of rebates (now gone), SRECs and net metering combined with the Federal Investment Tax Credit/Grant have produced returns on investment which have induced residents and businesses to "take the plunge" into solar in spite of an insecure market for the SRECs. While these families and businesses knew that the SREC market might not track the SACP in the long term, they certainly expected the SREC value to remain at a reasonable level so they could realize a reasonable return on their investment. Many took out loans or surrendered retirement savings to fund a solar installation.

I think the solar program in NJ as set up by the BPU, as good as it is, has one major flaw. There is no control mechanism to limit the amount of solar constructed and brought online in any given year once the rebate structure was eliminated. For several years, NJ rebates were the only thing that made solar affordably in NJ. There was only so much money available for rebates and they were rationed in order to ensure an orderly and fair process. The decline in solar cost has led to a decrease and eventual elimination of rebates in NJ which is altogether appropriate. However, with the exit of rebates also went the exit of any sort of control mechanism for solar in NJ.

That said, I think it is fair to say that no one envisioned the economic climate of the past few years. NJ's solar program provides financial returns that due to the economic collapse are unavailable in nearly any other sector of the economy. This has led to a huge influx of investment money coming into the state from sources not necessarily consisting of residences and businesses that live and pay taxes in NJ. These large scale systems have flooded the SREC market; the returns not necessarily going to rate payers in NJ.

The residents and businesses of NJ who pay the taxes and pay the SBC and the increase utility cost to develop solar in NJ need to be protected from outside interests. What is happening is that outside interests are swamping the interests of the residents and businesses of NJ who are producing clean electricity and using it onsite. The glut of SRECs is due not to installations of systems on structures where it is directly consumed but rather from direct-to-grid projects. The residents and businesses of NJ who bought into the vision of the BPU and State legislature are suffering at the hands on purely economic interests. Their hard earned dollars invested with the reasonable expectation of a fair return are presently in question. They have a right, just as any business has a right, to a return on their investment and to be compensated for the benefit they are providing all NJ residents.

Sales of residential and commercial solar as I'm sure you are aware are having a tough time at the moment. It was not an easy process to sell solar with an insecure future in the SREC market. Many people sited lack of confidence in the SREC market as the primary reason to not participate. In addition, the structured market, created as a response to the reluctance of banks to finance solar due to the insecure SREC market, was so "one-sided" in favor of the EDCs that many people felt it was abusive.

Now the breathtaking decline in the SREC market would seem to bear them out. The nay-sayers have been proved right and the adopters are being hurt.

So how to fix the problem; I believe the solution is multi-faceted. The first piece of the solution is to restore a monitoring and rationing system. Such a system should do several things:

1. It should only approve as much solar as the RPS can absorb in the following energy year.
2. There should be a priority system set up to control the release of permits to construct solar. It should grant first priority to systems that serve the public good (schools, public buildings, hospitals, etc.), second priority should be given to residential and commercial systems that consume the electricity onsite and lastly if any excess capacity remains within the RPS, then and only then that capacity should be awarded to direct-to-grid installations. This should be done on a monthly basis much like the rebate rationing system with controls so no one company or provider swamps the market. This will ensure a reasonable smooth flow of installations and prevent the boom and bust cycles that have happened in the past.
3. A minimum price should be established for SRECs which will provide some certainty in the market place and allow financing to proceed and assure a reasonable rate of return or payback period for a solar installation.
4. The RPS standard should be advanced at least one year to use up the excess capacity in the SREC market and the SACP should be formalized through 2026 at the same rate of decline (2.5%) as it is now. If done in conjunction with the above points will allow the SREC market to operate freely.

Regarding the other points raised:

1. In regards to verifiability, while I understand the need to verify the amount of electricity produced, All systems over 10kW already require a "revenue grade" meter be installed that the owner must report his production on a periodic basis. For the small residential system owner,

the estimating system based on PVWatts is reasonable close and the potential difference is so small, it hardly seems worth the effort to require a homeowner to report his production. I have no idea the number of under 10kW residential systems but I can't imagine if each was off by one SREC, it would create a noticeable difference or cost to the rate payers. The GATS system works very well and I don't think any changes are in order.

2. Regarding free trade of SRECs, as stated above, the rate payers and citizens of NJ are paying the bill for a solar future. Nothing should be implemented that will allow anything or anyone from outside the state to undermine their interests. An alternative solution to the current SREC issue would be to establish a separate market for residential and commercial systems (defined as using the energy onsite) with a separate carve-out and a separate SACP. That would allow the State to advance its solar goals as quickly as possible without endangering the residents and businesses. However, without the higher SREC values those investments may be hard to attract. In addition, the segment of the market will fade when the Section 1603 grant program and the 100% depreciation disappear in 2012.
3. Regarding certainty, the best way to create certainty is to establish a floor price for SRECs. Unlike a feed-in tariff, this will allow the market to operate freely but create enough certainty that financial institutions will have confidence to lend for solar installation. A floor price of \$350 will allow a reasonable return on investment at today's price of solar and could be adjusted as needed similarly to the way the rebate structure was decreased in steps if required. The metric should be the time it takes to "break-even" on the investment. Presently it is off the charts with SRECs in the \$150 range. A five to seven year payback period is reasonable.
4. Regarding vintage, the answer is similar to #3 above. In order to induce people to make the investment, which we all recognize as a good thing for NJ and country as a whole, a reasonable level of return on investment is required. That translates into payback period and the present 15 year SREC period provides (assuming the value is restored) for a 6-7 year payback and then a reasonable rate of return on investment over the period. Once that period is complete, Class1 RECs are great but a \$4 or so not a real incentive. Therefore I believe you should stay with the 15 year SREC program.

Please find my comments below relating to Next Steps – Solar Transition.

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Comments

One challenge for the Clean Energy Program Team is to determine the right level of government insensitive for solar panels because “we can’t buy our way to the solar RPS goals”. To determine what the right level of the insensitive is, one needs to know what the price tag of solar panels is and how well the benefit of solar panels is aligned with the clean energy goals of the state. The cost-and-benefit analysis should be performed **on the basis of the energy solution** that solar panels constitute.

The common mistake that we make is to treat solar panels as if they were a functional energy solution on their own. Although capable of converting sunlight into electric power, solar panels are not an energy solution on their own because they can’t be functional without a backup. To compensate the variation of power production by grid-tied solar panels, standby gas-fired capacity is needed presently, which can be dialed up or down in the opposite direction of solar irradiation fluctuation. Therefore, the energy solution implemented when solar panels are installed in grid-tied projects is in fact comprised of both the solar panels and corresponding fossil fuel backup. There is a cost associated with the backup, even though it has never been considered in the cost model of solar panels. A typical cost model of solar panels addresses the cost of the panels, brackets, inverters and installation labor. The capital cost of gas-fired capacity is \$6/W. For each W of solar panels installed, a fraction of W of gas-fired capacity is needed to be the backup. If the fraction is known, the capital cost of backing up solar panels can then be calculated; however, the fraction is not known at present. The fraction may be small when the installed base of solar panels is very small, but may increase quickly as the installed base reaches a point and continues to grow. There is a **need for a model to quantify the gas-fired capacity needed to back up solar panels**. There is also a **need to include the capital and operating cost of the fossil-fuel backup** when considering the price tag of solar panels.

Moreover, how well is the benefit of the energy solution comprised of solar panels and the fossil fuel backup aligned with the clean energy goals of the state relating to topics such as zero emission, dependence on fossil fuel, cost of energy and economic development? The energy solution implemented when solar panels are installed is only partially solar. Is this partially solar energy solution **80% or 50% or 30% aligned** with the clean energy goals of the state? **There is a need for developing an answer for the alignment question.**

We have learned more about the nature of solar panels as an energy solution since the legislative solar RPS goals were established 4 years ago, and the new learning shows how challenging it is, in part because of the issues discussed above, to scale up solar panels cost-effectively and driven eventually by market force. To have a successful “solar transition”, new policies are needed to encourage the development of alternative solar technologies, incentivize solar technologies on the basis of the energy solutions that they constitute, and offer different incentives for energy solutions with different benefits and values.