PUBLIC VERSION

BEFORE THE STATE OF NEW JERSEY

BOARD OF PUBLIC UTILITIES

IN THE MATTER OF THE PETITION OF PUBLIC SERVICE ELECTRIC AND GAS COMPANY FOR APPROVAL OF EXTENSION OF A SOLAR GENERATION INVESTMENT PROGRAM AND ASSOCIATED COST RECOVERY MECHANISM AND FOR CHANGES IN THE TARIFF FOR ELECTRIC SERVICE B.P.U.N.J. No. 15 ELECTRIC PURSUANT TO N.J.S.A. 48:2-21 AND N.J.S.A. 48:2-21.1	)	**BPU DOCKET NO. EO12080721**

SURREBUTTAL TESTIMONY OF DAVID E. DISMUKES, PH.D. ON BEHALF OF THE NEW JERSEY DIVISION OF RATE COUNSEL

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I. INTRODUCTION

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is David E. Dismukes. My business address is 5800 One Perkins Place Drive, Suite 5-F, Baton Rouge, Louisiana, 70808.

Q. ARE YOU THE SAME PERSON WHO FILED DIRECT TESTIMONY IN THIS DOCKET ON JANUARY 18, 2013 AND REBUTTAL TESTIMONY ON FEBRUARY 4, 2013?

A. Yes.

Q. WHAT IS THE PURPOSE OF YOUR SURREBUTTAL TESTIMONY?

A. The purpose of my testimony is to respond to the rebuttal testimony of Terrence J. Moran of PSE&G.

Q. HAVE YOU CHANGED OR MODIFIED THE OPINIONS OR RECOMMENDATIONS IN YOUR PREVIOUSLY-FILED DIRECT OR REBUTTAL TESTIMONIES AS A RESULT OF THE EVIDENCE PROVIDED BY PSE&G

A. No, my opinions and recommendations remain the same.

Q. HOW IS THE REMAINDER OF YOUR TESTIMONY ORGANIZED?

A. My testimony is organized into the following sections

- Section II: Policy

- Section III: SREC Oversupply Projections
- Section IV: Rate Impact Analysis

II. POLICY

Q. DO YOU AGREE WITH THE COMPANY'S ASSERTION THAT ITS PROPOSED SOLAR 4 ALL EXTENSION PROGRAM (**"SFAE") IS CONSISTENT WITH STATE ENERGY POLICY?**

A. No. The Company cites section 1 of the legislation commonly known as the Regional Greenhouse Gas Initiative ("RGGI"), N.J.S.A. 26:2C-45, as support for its SFAE proposal.[1] The Company specifically quotes the legislative finding that: "public utility involvement and competition in renewable energy, conservation, and energy efficiency industries are essential to maximize efficiencies" as the primary support for its position that the SFAE is consistent with state energy policy. However, this citation and specific quotation do not, contrary to the Company's assertions, provide strong policy support for the proposed SFAE for a variety of reasons.

Q. DO YOU THINK THE COMPANY'S REFERENCE IS TAKEN OUT OF CONTEXT?

A. Yes. While it is true that the legislation explicitly states "public utility involvement" is important, the legislation does not go so far as to specifically define or require a certain type of involvement for utilities. Electric distribution companies ("EDCs" or "utilities") can participate in renewable and energy efficiency programs in a number of ways that go beyond making utility-owned, rate-recovered investments. For instance, New Jersey's other EDCs are "involved" in solar markets, and help facilitate long-term contracting in those markets, without owning any

[1] Rebuttal Testimony of Terrence J. Moran, 5:1-3.

solar generation assets.[2] While it is also true that the Company's Solar 4 All and Solar Loan programs were filed and approved by the Board under the RGGI legislation, the Board was not forced to unconditionally accept either program, nor was it required to approve any program that may result in negative net economic benefits. Moreover, public utility involvement in renewable energy is not without limits. Section 13 of the RGGI legislation allows the Board to issue orders "approving, modifying or denying" cost recovery for such programs and in so doing, to consider subject to a number of market conditions and factors:

> An electric public utility or a gas public utility seeking cost recovery for any program pursuant to this section shall file a petition with the board to request cost recovery. In determining the recovery by electric public utilities and gas public utilities of program costs for any program implemented pursuant to this section, the board may take into account the potential for job creation from such programs, the effect on competition for such programs, existing market barriers, environmental benefits, and the availability of such programs in the marketplace.[3]

Q. DOES THE COMPANY'S REFERENCE TO THE RGGI LEGISLATION IGNORE OTHER IMPORTANT MARKET CONSIDERATIONS?

A. Yes. The RGGI legislation explicitly notes the combination of both "utility involvement and competition" as being important in renewable energy, including solar. The Company fails to recognize that even if the Company's program is consistent with the "utility involvement" aspect of the legislation, the SFAE is likely inconsistent with "competition" requirements. Several intervenors representing the solar industry in this proceeding have raised important questions about the fact that the SFAE subsidizes the Company's participation in solar energy markets as a non-price sensitive direct investor. For instance, KDC Solar notes that both the size and duration of the SFAE will "directly and adversely" impact market competition by guaranteeing PSE&G's

[2] See I/M/O the Review of Utility Supported Solar Programs, BPU Dkt. No. EO11050311V, Order at 3 (May 23, 2012).

[3] N.J.S.A 48:3-98.1.b, emphasis added.

solar investments with ratepayer funds giving PSE&G and unfair competitive edge.[4] SEIA also notes that:

> "where the state policy is to create a vibrant competitive marketplace, as is the case in New Jersey, regulators should consider as well the impact of such ownership on the competitive solar market place currently under development via the Solar Renewable Energy Credit (SREC) market. Because the Company is unresponsive to SREC prices, the negative impact of utility direct investment on the competitive market place must be seriously considered and addressed."[5]

SEIA also notes that utility-direct investment is just one tool in a suite of options available to regulators and that SEIA's support for the initial Solar 4 All program was in the "context of a very different market environment."[6]

Q. HAVE ANY INTERVENORS EXPRESSED CONCERNS ABOUT PUBLIC UTILITY INVOLVEMENT IN THE SREC MARKET?

A. Yes. MSEIA has recognized this, arguing that:

> MSEIA's position is that SRECs were created to support the growth of solar power in a competitive marketplace. Therefore, we believe that it is inappropriate for solar capacity developed and owned by a regulated monopoly to receive SRECs.[7]

Q. IS THE COMPANY'S REFERENCE TO THE ENERGY MASTER PLAN ("EMP") TAKEN OUT OF CONTEXT AS WELL?

A. Yes. The Company focuses on the section in the EMP that discusses the Governor's preference for linking solar energy development and wise land use policies.[8] While it is true that the EMP seeks to make better use of productive and unproductive land in the state, none of these recommendations were made in a vacuum ignoring "net economic benefits." The EMP is crystal clear in noting that "New Jersey's environmental, economic, and reliability goals require that

[4] Direct Testimony of Thomas P. Lynch, 3:7.
[5] Direct Testimony of Katie BolcarRever, 3:28-29; and 4:1-4.
[6] Direct Testimony of Katie BolcarRever, 3:22-23; and 10:20-21.
[7] Direct Testimony of Lyle Rawlings, p. 3.
[8] Rebuttal Testimony of Terrence J. Moran, 5:10-20.

cost/benefit studies rationally measure total impacts, including direct energy costs, quantifiable environmental benefits, and indirect socio-economic benefits."[9] The EMP also notes that:

> New Jersey can meet its renewable energy challenges through measured and cost-effective policy choices. Determining the cost-effectiveness of policy options requires a comprehensive analytic effort that considers all costs and benefits, both direct and indirect. In addition, cost-effectiveness must be calculated from both the perspective of program participants and non-participants. It is often the case that participants benefit from programs that are driven by admirable policy choices, *e.g.*, customer rebate programs that subsidize the purchase of efficient home appliances, or clean solar PV installations that encourage in-State manufacturing. It is not clear, however, if non-participants reap sufficient benefits in the form of cleaner air or lower power prices to offset the additional cost that then become enshrined in the retail electric bill. Going forward, New Jersey should implement more rigorous cost/benefit analyses to determine the cost-effectiveness of its energy policy options.[10]

Further, the EMP notes:

> The policy goals and action plans set forth in this EMP are designed to support this target in a way that ensures that worthwhile environmental objectives do not undermine other laudable resource planning objectives, in particular, reliability and economics, *i.e.*, price. Informed tradeoffs among these objectives – the environment, reliability and economics – are therefore required to achieve the annual RPS targets. In gauging the impact of new renewable energy sources to meet the RPS, New Jersey must continue to evaluate job creation prospects and associated economic multiplier effects as well as the efficiency and fairness of incentives and subsidies. Against the backdrop of high energy costs, New Jersey's current fiscal challenges remind policymakers that the method for achieving the RPS should be flexible – neither rigid nor absolute. New Jersey should formulate the incentives and portfolio of renewable energy sources that result in the most cost-effective energy alternatives possible. Mid-course corrections to achieve the RPS objectives that safeguard New Jersey's need for reliability and economic benefits are encouraged. Emphasis should be placed on resources that provide a net economic benefit to the State by providing jobs and investment, in addition to clean energy.[11]

Q. DO YOU AGREE WITH THE COMPANY'S ASSERTION THAT "WITHOUT [THE] SFAE THESE PROGRAMS WILL SIMPLY NOT BE BUILT?"

A. No, and several of the citations provided by the Company that suggest other intervenors support its position appear to be taken out of context, and inconsistent with the bigger picture

[9] 2011 New Jersey Energy Master Plan, December 6, 2011, p. 75.
[10] 2011 New Jersey Energy Master Plan, December 6, 2011, p. 75 (Emphasis added).
[11] 2011 New Jersey Energy Master Plan, December 6, 2011, p. 76, emphasis added.

policy positions taken by these parties. For instance, PSE&G cites the testimony of Thomas Lynch[12]as stating that landfills "could potentially benefit from subsidized investment." However, this was ***after*** his testimony stated that private companies are seeking the opportunity to make investments in the solar market without the need for ratepayer subsidies. Further, Mr. Lynch's statement that landfills could potentially benefit also came ***after*** he stated that "[a]lternatively, if the Board is inclined to proceed..."[13] Mr. Lynch also goes on to say that investment in other program segments of the SFAE, such as warehouse roofs and municipal locations:

> is not constrained and needs no special incentives. Allowing PSEG to enter these segments under the Extension Program, subsidized by the rate payers, would have significant adverse impacts on market competition – the exact consequence that the BPU was attempting to avoid when it approved PSEG's initial Solar 4 All Program in 2009."[14]

PSE&G also cites the testimony of SEIA "regarding PSE&G's expertise"[15] when in fact SEIA's testimony clearly states that:

- The market segments being targeted by the SFAE are not underserved.[16]
- Direct utility participation should be limited:

> There is a heighted risk that the utility will leverage any advantage it has established in marketing, financing, or distributing electricity by virtue of its authority to operate as a regulated entity to supplant, rather than supplement third party development.[17]

- The warehouse sector does not "merit utility intervention."[18]

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[12] Rebuttal Testimony of Terrence J. Moran, page 6, footnote 5.
[13] Direct Testimony of Thomas P. Lynch, 3:14.
[14] Direct Testimony of Thomas P. Lynch, 4:8-14.
[15] Rebuttal Testimony of Terrence J. Moran, page 6, footnote 5.
[16] Direct Testimony of Katie BolcarRever, 14:3-5.
[17] Direct Testimony of Katie BolcarRever, 15:10-14.
[18] Direct Testimony of Katie BolcarRever, 15:15-18.

- The parking lot sector does not warrant utility intervention.[19]
- While the landfill/brownfield segment is targeted by policy makers, utility ownership "is one tool" and other incentives or market support mechanism may address any market barriers.[20]

Q. DOES PAST SOLAR INSTALLATION DATA SUPPORT THE COMPANY'S ASSERTION THAT "WITHOUT [THE] SFAE THESE PROGRAMS WILL SIMPLY NOT BE BUILT?"[21]

A. No. Data distributed by the Office of Clean Energy ("OCE") shows that at least 60 projects have been built or are underway at brownfield, landfill, parking lot and farmland sites. Schedule DED-SR-1 provides a summary of these projects. In New Jersey, 11 brownfield installations totaling 21 MW have been completed, and eight of these brownfield installations are in PSE&G's service territory. There are 48 parking lot installations totaling almost 24 MW and at landfills seven projects totaling 17.1 MW have been completed. In addition, about 99 MW have been installed in 19 farmland and "various" other settings. All together, these projects total 161 MW, or about 17 percent of New Jerseys' total solar installations.[22]

III. SREC OVERSUPPLY PROJECTIONS

Q. DOES THE COMPANY ATTEMPT TO REFUTE THE CLAIM THAT THE PROPOSED S4AE IS UNNECESSARY IN LIGHT OF THE CURRENT STATE OF THE MARKET FOR SOLAR RENEWABLE ENERGY CERTIFICATES?

A. Yes. PSE&G essentially makes three arguments attempting to refute the point made in my Direct Testimony that the S4AE is unnecessary in light of the over development that exists

[19] Direct Testimony of Katie BolcarRever, 16:3-8.
[20] Direct Testimony of Katie BolcarRever, 16:27-33; and 17:1-17.
[21] Rebuttal Testimony of Terrence J. Moran, 6:2-3.
[22] OCE has noted that this is "not a full and complete representation of all solar projects located on these land use types.

within the State's solar energy market. First, the Company claims that attempting to predict the New Jersey future solar build rates or future SREC prices is difficult in light of uncertainties.[23] Second, the Company claims that a review of the historic solar build rate in New Jersey suggests that the market may not be overbuilt for as long as some parties have suggested.[24] Lastly, the Company insists that Rate Counsel is "missing the point," in its definition of necessity.[25]PSE&G claims that its proposal is intended to ensure solar development on non-productive properties consistent with the State's general policy objectives.[26]

Q. DO YOU DISAGREE WITH THE COMPANY'S POSITION THAT SOLAR INSTALLATION AND SREC SUPPLY FORECASTS OFTEN INCORPORATE A DEGREE OF UNCERTAINTY?

A. No. Forecasts by definition incorporate varying degrees of uncertainty. However, the Company is likely overstating the extent of uncertainty surrounding the solar market forecasts. For instance, the Company references a Bloomberg New Energy Finance ("BNEF") December 3, 2012 publication showing solar supply status starting Energy Year 2015 ("EY2015") as **#BEGIN CONFIDENTIAL#** [redacted] **#END CONFIDENTIAL#**. What the Company fails to put into context is the **#BEGIN CONFIDENTIAL#** [redacted]

[23] Rebuttal Testimony of Terrence J. Moran, 11:9-10.
[24] Rebuttal Testimony of Terrence J. Moran, 10:13-16.
[25] Rebuttal Testimony of Terrence J. Moran, 10:13.
[26] Rebuttal Testimony of Terrence J. Moran, 10:10-12.

[redacted]#END CONFIDENTIAL#

Q. HAVE YOU PERFORMED ANY ANALYSIS ASSESSING THE IMPACT THAT THE SFAE WILL HAVE ON THE NEW JERSEY SOLAR MARKET UNDER CONSERVATIVE PROJECTIONS?

A. Yes, and the results of that analysis are presented in Schedule DED-SR-2. The first page of this schedule presents the SREC supply assumption used in this analysis relative to the State's annual RPS requirements. As shown, I assume the SREC market will be long EY2012 through EY2014, with SREC supply equating to 150 percent, 200 percent, and 125 percent of the State's RPS in each of these energy years. I then assume that in EY2015 and EY2016, SREC supply excluding S4AE will only account for 90 percent of the State's RPS. This assumption is intended to be consistent with the most pessimistic solar development forecasts presented in this proceeding.

Q. WHAT HAPPENS TO THIS CONSERVATIVELY LOW FORECAST WITH THE COMPANY'S SFAE DEVELOPMENT IS ADDED TO THE MARKET?

A. The results show that even under these overly conservative assumptions, the SREC market will be long (in excess of the State's RPS requirement) through EY2018. With the inclusion of the proposed S4AE, the SREC market will never return to balance through at least EY2020. This further reinforces the consideration of a "new normal" in New Jersey solar energy markets consisting of relatively steady and strong solar installation rates with lower and more stable SREC prices.

Q. HAVE YOU ESTIMATED JUST HOW UNDERSUPPLIED THE MARKET NEEDS TO BE IN ORDER TO ACCOMMODATE THE COMPANY'S PROPOSED SFAE DEVELOPMENT?

A. Yes. Solar development would have to decrease to about 68 to 69 percent of the State's RPS in EY2014 and EY2015 in order to accommodate the capacity that would be developed under the SFAE as proposed. This is a level of under-development well below what most forecasts and solar stakeholders expect for those EYs.

Q. PLEASE DESCRIBE THE COMPANY'S POSITION REGARDING THE OCE SOLAR DEVELOPMENT FORECASTS.

A. The Company suggests that the OCE's solar development forecasts should not be given much weight due to the simplicity of the methods used to develop it. In this the Company argues that the OCE's forecast does not take into account industry trends as it calculates future solar build rates as an assumed proportion of the incremental RPS.[27]

Q. DO YOU AGREE THAT THE OCE'S SOLAR DEVELOPMENT FORECAST SHOULD BE DISMISSED OUT OF HAND AS BEING OVERLY SIMPLISTIC?

A. No. It is a well held concept in forecasting that predictive models should maintain a certain degree of simplicity, so the Company's arguments that OCE's forecasts are too simple does not hold a considerable amount of merit. Further, the Company, despite its criticisms, has failed to provide any forecasting variance analysis of past OCE projections to support its claims that OCE's approach is significantly flawed. OCE's projections represent another set of insights into solar market development, and are important since they come from a neutral third party.

[27] *See*, Rebuttal Testimony of Terrence J. Moran, 12:8-16.

The fact that OCE's projections are consistent with other sources, including commercial sources purchased by the Company, suggests that the "simplistic" approach may not be without merit.

Q. HAS THE COMPANY RAISED ANY ISSUES IN THE PAST REGARDING OCE'S SOLAR DEVELOPMENT FORECAST?

A. No and, in fact, the Company was asked in discovery to provide all analyses, comments or other materials it provided to the OCE regarding OCE's solar installation projections. The Company answered that it had not provided any comments, input or recommendations to the OCE. The Company also indicated that it had not performed a variance analysis (measuring the difference between actuals-to-projected installations) on the OCE's forecast.[28]

Q. HAS THE COMPANY PRESENTED AN EMPIRICAL ANALYSIS OF THE SOLAR ENERGY MARKET IN ANY OF ITS TESTIMONY IN THIS PROCEEDING?

A. No, it has not. The Company has taken every opportunity to criticize and dismiss the solar market analyses of all parties who have presented such analyses within this proceeding, without submitting an alternative analysis of its own. In fact, when asked in discovery to provide all New Jersey solar market analyses within its possession, the Company provided a series of reports, that included a number of solar market projections, from BNEF.[29] The BNEF forecast presented in my Direct Testimony was the most recent of these reports from BNEF and was provided by the Company as the only solar market forecast in its possession.

Q. HAS THE COMPANY SUBSEQUENT TO THE FILING OF TESTIMONY ATTEMPTED TO PRESENT AN EMPIRICAL ANALYSIS OF THE SOLAR ENERGY MARKET?

[28] Company response to RCR-P-53.
[29] Company response to Data Request RCR-P-1.

A. Yes. The Company prepared a forecast that was provided in response to discovery questions associated with its rebuttal testimony.[30] This new Company solar development forecast clearly comes late in this proceeding. Regardless, even this new PSE&G forecast is only able to justify the inclusion of its proposed S4AE by assuming a 487 MWh, or 36.4 percent, shortfall in New Jersey solar generation supply in EY2014. This is inconsistent with the position of the BNEF, and the OCE worse-case projections, which project New Jersey solar generation supply to equate to **#BEGIN CONFIDENTIAL#** [redacted] **#END CONFIDENTIAL#** and 126.6 percent of the State's RPS, respectively. In fact, the Company's estimated solar market shortfall does not appear to be supported by its prior testimony which clearly states that "[w]hat is known with relative certainty is that the New Jersey SREC market will be 'long' through EY2014."[31]

Q. DO YOU AGREE WITH THE COMPANY'S ASSERTION THAT AN INFLUX OF LARGE GRID-CONNECTED PROJECTS IS CHANGING THE MAKEUP OF THE PROJECT PIPELINE?[32]

A. I agree that an increase in large grid-connected projects accounts for a large portion of the project pipeline, however, I disagree with the Company's assertion that this has imparted a greater degree of uncertainty to the market. Namely, the Company's assertion that large grid connected projects are generally less likely to come to fruition, or that an increase in the cancellation rates of these projects has had a substantial effect on the overall market, is unsupported.

[30]Company response to Data Request RCR-P-53.
[31]Rebuttal Testimony of Terrence J. Moran, 11:13-14.
[32]Rebuttal Testimony of Terrence J. Moran, 12:18-19; 13:9-11.

Q. HAVE YOU CONDUCTED ANY ANALYSIS OF THE CANCELLATION RATES OF NEW JERSEY SOLAR PROJECTS?

A. Yes, and the results of that analysis are presented in Schedule DED-SR-3. This analysis utilizes monthly reports provided by the OCE to compare the total capacity of projects listed in the project pipeline with the capacity of those that end up being cancelled or scrubbed.[33] This schedule depicts, on a capacity (kW) basis, the percentage of grid-connected and net metered capacity residing within the pipeline in any given month versus the amount of capacity which ends up actually being constructed. The results of my analysis show that historically, grid-connected projects within the pipeline were far more likely to come to fruition than net metered projects. Around the beginning of 2012 this began to change, as market conditions and new regulations have caused circumstances where a substantial portion of capacity proposed after this time has ended up being cancelled. However, the completion percentage of net metered capacity has remained strong, averaging 62.5 percent since November 2010 and has only fluctuated between a low of 54.5 percent and a high of 70.9 percent. The decline in the completion rate of grid-connected projects has also had little effect on the overall completion rate of solar energy capacity within the pipeline, which remained at a healthy 58.2 percent in October 2012, due to the small percentage of overall New Jersey solar market grid-connected projects. Even during the substantial run up in grid-connected capacity seen in the summer of 2012, in my analysis grid-connected solar energy only accounted for 30.6 percent of the total solar energy pipeline. On average since November 2010, grid-connected solar has accounted for less than 20 percent of solar capacity moving within the pipeline.

[33] For the purpose of this analysis, all projects within the pipeline as of December 31, 2012 were removed from calculations as it is unknown whether these projects will be built.

Q. HAS THE OCE CHANGED ITS PROJECTION OF NEW JERSEY SOLAR BUILD RATES AND GENERATION?

A. Yes. At the most recent BPU-OCE Renewable Energy Committee meeting held February 14, 2013, the OCE presented an update of its solar generation forecast to include 2012 solar projects installed subsequent to October 31, 2012. I have updated the historic and forecasted solar installation trends based on this updated information in Schedule DED-SR-4. The second page of this analysis shows that the OCE forecasts monthly build rates to continue to be significant, at between 14 MW per month, to 48 MW per month over the next five energy years. The OCE's revised numbers are arguably more optimistic than previous forecasts regarding build rates as the OCE "low" forecast now projects an increase in solar installation rates in EY2015 and EY2016. This means that, contrary to the Company's position, the OCE sees greater possibility of the current oversupply in the Solar Markets continuing into the future than it did just two months ago.

In addition, Schedule DED-SR-5 shows that OCE also estimates SREC availability to be above, if not significantly above, the new solar RPS requirement defined in the Solar Energy Act ("SEA")[34] until EY2016. The one exception to this above-requirement is still the trend within the "low" forecast scenario for EY2016 where SREC availability is anticipated to be below the RPS requirement in that year. OCE's median SREC availability forecast, however, ranges from a high of 230 percent of the annual SREC requirement to a low of 116 percent of the SREC requirement in EY2016.

[34] L. 2012, c. 24.

Q. DO YOU BELIEVE THE COMPANY'S CITATION TO TWO RECENT CANCELLATIONS OF LARGE GRID SUPPLY PROJECTS[35] INDICATES "EVIDENCE" OF A SIGNIFICANT REDUCTION IN BUILD RATES BEYOND THAT INCORPORATED WITHIN FORECASTS BY MARKET ANALYSTS?

A. No. I have reviewed the OCE published inventory of projects currently within the pipeline and at the time of the December forecast, which was provided as a Schedule in my Direct Testimony, the OCE had already removed both of these two grid supply projects from its pipeline inventory. This understanding is apparently consistent with the Company's understanding.[36] Contrary to the Company's claims, this would imply that the OCE had already taken into account the effect the withdrawal of these two projects would have on projected solar development.

IV. Rate Impact Analysis

Q. DO YOU AGREE WITH THE COMPANY'S ASSERTIONS THAT YOUR RATE IMPACT ANALYSIS IS INCORRECT?

A. No. In my direct testimony I noted that the revenue credits utilized by the Company in developing its rate impact estimates were overstated. These revenue credits were based upon unrealistically high SREC prices as well as PJM energy and capacity prices. The Company suggests that my criticism of these revenue credits is incorrect since "these figures are not guarantees of future market conditions," since "the actual rate may go up or down."[37] The point of my analysis, however, was not to suggest that prices were, or should be, known with any certainty but rather to point out that the Company's estimated rate impacts were understated

[35] Rebuttal Testimony of Terrence J. Moran, 14:14 to 15:5.
[36] Company response to Data Request RCR-P-55.
[37] Rebuttal Testimony of Terrence J. Moran, 23:18-19; 24:13-14.

since they were based upon SREC, energy and capacity prices that were beyond most reasonable expectations of future market conditions.

Q. WHAT ARE THE CONSEQUENCES OF OVERSTATING THE MAGNITUDE OF THESE REVENUE CREDITS?

A. For ratepayers, two consequences are noteworthy. First, high SREC prices can make the rate impacts associated with the Company's proposal appear reasonable. And second, since there are no regulatory or financial consequences to the Company at some later date if these revenue credits were incorrectly estimated, ratepayers would, in fact, bear the full responsibility for the Company's revenue credit forecasting error. This fact was highlighted by Ms. Andrea Crane[38] in her direct testimony, and was also highlighted, although with a different emphasis, by SEIA[39] in its direct testimony. SEIA correctly noted in its direct testimony that utilities like PSE&G are SREC price insensitive since, holding other factors constant, these utilities will likely be held harmless for any revenue credit shortfalls that may occur in the future.[40] One of the points made in my direct testimony was to provide an empirical example of this indifference and the resulting rate impacts that arise from that SREC-price insensitive as it relates to ratepayers.[41]

Q. DID SEIA'S ANALYSIS OF THIS SREC RATE INSENSITIVITY FOCUS ON RATEPAYER IMPACTS?

A. Not directly, but SEIA did highlight another important aspect of this SREC rate insensitivity that impacts ratepayers: namely, the anti-competitive aspects that a program like the SFAE can have on solar market development. As I noted earlier, the approach the Company

[38] Direct Testimony of Andrea Crane, 14:11-17.
[39] Direct Testimony of Katie BolcarRever, 4:6-11; and 10:12-17.
[40] Direct Testimony of Katie BolcarRever, 4:6-11; and 10:12-17.
[41] Direct Testimony of David E. Dismukes, Schedule DED-24.

uses to estimate its rate impacts excludes any incentive for revenue credit accuracy since it will be held harmless for any revenue deficiencies that limit its ability to earn a reasonable return on and of its prudently-incurred SFAE investments. SEIA notes that the Company also has little incentive to maximize the value of the SFAE investments it makes once they are put into place since, once again, the Company will be held harmless for any revenue deficiencies associated with any prudently-incurred SFAE investment.[42] So, ratepayers bear the risk of both the forecast errors of the Company's filing as well as any failures to maximize the value of those investments once they are put into place. This is an outcome that does not happen in competitive markets: if a developer incorrectly predicts the revenue streams associated with its investment, or if this same developer fails to maximize the value of that investment once it is put in place, the developer and its shareholders bear the risk of those bad decisions and actions. This result will likely not occur if the SFAE is approved. If anything, the Company's rebuttal testimony simply underscores its indifference to the level of revenue credit since, according to the Company "rate impact[s] may go up or down."[43]

Q. ARE THE COMPANY'S ESTIMATES BASED ON THE MOST RECENT CEEEP ANALYSES?

A. No. The Company also rejects my recommendation that the Board use the most recent Rutgers' Center for Energy, Economic & Environmental Policy ("CEEEP") energy and capacity forecast used for evaluating cost-effectiveness for energy efficiency programs.[44] The Company's rate impact analysis uses CEEEP's assumptions and forecasts from a June 2012 memo, when a more recent and revised set of assumptions and forecasts is available. The CEEEP forecasts

[42] Direct Testimony of Katie BolcarRever, 4:6-11; and 10:12-17.
[43] Rebuttal Testimony of Terrence J. Moran, 23:19.
[44] Rebuttal Testimony of Terrence J. Moran, 24:13-22.

were developed to be utilized as avoided cost assumptions by the utilities in their RGGI filings and for an energy efficiency market potential study prepared on behalf of the New Jersey Clean Energy Program. The "DRAFT Energy Efficiency Cost-Benefit Analysis Avoided Cost Assumptions" memo, dated June 5, 2012, was circulated by CEEEP to interested parties for comment. CEEEP updated its June 5 report and circulated a revised draft for comment on July 25, 2012. CEEEP considered comments from Rate Counsel, New Jersey Natural Gas, and Nexant, Inc., and distributed its resultant "Energy Efficiency Cost-Benefit Analysis Avoided Cost Assumptions" on October 22, 2012. There should be nothing unreasonable about using a more contemporaneous and revised set of assumptions and forecasts from a neutral party like CEEEP.

Q. ARE THE COMPANY'S OBJECTIONS TO USING THE CEEEP FORECAST CONSISTENT WITH ITS OTHER CRITICISMS OF YOUR TESTIMONY?

A No. Although the Company highlights changes in solar installation rates over the past two months as somehow representing a significant change in solar markets (potentially justifying its SFAE investment), it fails to apply the same logic when examining an energy and capacity price forecast developed by CEEEP.The CEEEP forecast simply shows continued improvement in energy and capacity market conditions created, in part, by recent New Jersey policy actions. Changes in these market conditions should be included in the SFAE rate impact analysis.

Q. DO YOU AGREE WITH THE COMPANY'S ASSERTION THAT LOW SREC PRICES CREATE OFFSETTING RATEPAYER BENEFITS IN ELECTRICITY COMMODITY COSTS?

A. No, since (1) there is simply no way a directly and proportional pass-through of SREC price decreases can be verified in the broader electricity commodity market; and (2) the average

price for solar paid for by PSE&G customers will still be higher under the Company's SFAE proposal, if approved.

Q. WITH REGARD TO THE FIRST OF YOUR TWO POINTS, ARE YOU SUGGESTING THAT ELECTRICITY COMMODITY MARKETS IN NEW JERSEY ARE NOT FULLY COMPETITIVE?

A. Not necessarily, but the degree to which SREC prices are simply "pass-through" to Basic Generation Service ("BGS") and by Third Party Suppliers ("TPS") has been discussed and debated for several years in many of the Board's prior solar investigations, proceedings, and workshops. No one knows for certain the competitiveness of the SREC component of BGS offers, in particular, and there have been claims and opinions that BGS suppliers bid the full Solar Alternative Compliance Price ("SACP") as part of their overall commodity bids into the auction. This does not necessarily mean that these commodity markets are uncompetitive. It could mean that some competitive participants in this market tend to choose, and incur, the same hedging cost (i.e., the SCAP) for their uncertain solar energy requirements rather run the risk of incurring higher SREC prices at some later date in their three-year generation service obligation. This may not be an entirely unreasonable decision for these market participants given what were consistently "short" SREC markets prior to last year. The statement the Company references from my direct testimony was simply referencing this likely outcome in past years. It is uncertain whether or not this bidding strategy has changed since. This is one of the reasons why Rate Counsel has recommended a bifurcated BGS bidding process that completely separates the SREC component of the longer term bid from the electricity commodity component. It is my understanding from participating in the last Renewable Energy Committee meeting that Rate

Counsel's proposal is one of several ideas being explored in the Board's investigation of solar development volatility that is required under the SEA.

Q. DOES THE COMPANY'S POSITION DO ANYTHING TO MINIMIZE THE RISK-SHIFTING NATURE OF ITS SFAE PROPOSAL?

A. No, and if anything, the Company's rebuttal position underscores and highlights the repeated instances in which the market risk of its SFAE investments will be shifted away from itself and onto ratepayers without any form of compensation or reasonable risk mitigation. The Company's SREC price reduction pass-through theory is based upon the same program design fundamentals as its various revenue credits: SREC price reductions may or may not be passed through the BGS or through TPS charges but the degree, nature, and likelihood of such a pass-through occurring is up to the market, not the Company. Such an uncertain outcome is inequitable, inefficient, and unnecessary given the current and anticipated SREC oversupply, or adequately-supplied market conditions.

Q. DO YOU AGREE WITH THE COMPANY'S POSITION THAT THE SREC PRICE OFFSET, TO THE EXTENT IT OCCURS, WILL ADEQUATELY COVER THE COSTS OF ITS SFAE PROGRAM?

A. No, since such a position flies in the face of a basic economic axiom: "there is no such thing as a free lunch." Consider that the levelized cost of the Company's program is $344/MWh of solar generation. Even if SREC prices were to fall by $50/SREC, as noted in the Company's example, and passed entirely through by the BGS auction and TPS charges, it would still not be enough to offset the $194/SREC premium associated with its program. Even at $200/SREC, the Company's program is "out of the market" by as much as $144/SREC, or some 139 percent. Requiring ratepayers to pay such a premium, despite the fact that they have already paid some

$600 million in rebates, prior PSE&G solar programs, SREC and SACP-related charges, deprives them of a return on the hard-earned investments they have made to develop a competitive and low-cost New Jersey solar energy market (see Schedule DED-SR-6 for an itemization of these costs).

V. Net Economic Benefits: Methodology and Assumptions

a. Leakage Analysis

Q. DO YOU AGREE WITH THE COMPANY'S CRITICISM OF THE LEAKAGE FACTOR USED IN YOUR NET ECONOMIC BENEFITS ANALYSIS?

A. No. The Company asserts that the use of a leakage factor is incorrect since "even if an EPC contractor's mailing address is out-of-state, our experience has been that contractors have used in-state labor to construct PSE&G's solar projects in New Jersey."[45] This defense is highly flawed since:

1) The assessment of leakages is a well-recognized, methodologically-appropriate, and mathematically necessary component of any economic impact model.
2) My analysis never stated nor suggested that there would be a zero in-state labor impact.
3) The solar energy industry, like most aspects of the energy industry, is capital intensive, not labor intensive.
4) Such conclusions are anecdotal and unsupported by any alternative economic analysis estimating or quantifying the in-state economic impacts of the Company's past Solar 4 All program.

[45] Rebuttal Testimony of Terrence J. Moran, 22:10-13.

Q. LET'S TURN TO THE FIRST FLAW YOU IDENTIFIED. CAN YOU EXPLAIN THE ROLE OF LEAKAGES IN REGIONAL ECONOMIC IMPACT MODELING?

A. Yes, leakages are a crucial component to input-output ("I/O") modeling. Leakages account for goods and services that are imported into an economy, and are therefore not produced within the study area of interest. Accurate estimation of these leakages is crucial in obtaining reasonable economic impacts, since imported goods and services that are not produced in the study area should be treated differently than goods and services that are produced within the study area. Failure to account for leakages can lead to large overestimates of economic impacts.

Q. ARE THERE ANY THEORETICAL AND MATHEMATICAL REASONS WHY LEAKAGES HAVE TO OCCUR IN A REGIONAL ECONOMIC IMPACT MODEL?

A. Yes, there are two main sources of leakages that must be included an I/O model. First, the input used in the I/O model must consist of the dollars actually spent in the study area, not necessarily the entire cost of the project. These study area direct impacts (often called "shocks") consist of "production changes associated with the immediate effects or final demand changes."[46] These direct effects are then "backward-linked" to industries and household spending patterns to estimate indirect and induced effects.[47] Thus, failure to appropriately account for leakages will result in an overestimate of not only the direct effects, but also the indirect and induced effects as well. The second source of leakages occurs when direct expenditures are backward-linked to industries and households since some portion of these dollars will also be spent on imports. The proportion of dollars spent in the study area through

[46]Lindall, Scott A., and Douglas C. Olson. "The IMPLAN input-output system." *Stillwater MN* (1996). Page 14.

[47]*Ibid.*

these backward linkages are defined by what are called Regional Purchasing Coefficients ("RPC"). Each industry within the economy has a unique RPC which "are derived by an econometric equation" leading to RPCs that "predict how much local production is actually used locally."[48] These RPCs are important in scaling the local indirect and induced effects from an economic "shock."

Q. HAVE ANY OTHER STUDIES RECOGNIZED THE LEAKAGES ASSOCIATED WITH SOLAR ENERGY INVESTMENTS?

A. Yes, there are several studies that recognize the leakages associated with a wide range of renewable energy investments, including solar energy. Specific examples include:

- A study that estimates the employment impacts of an expanded infrastructure investment program. The paper provides a breakdown of domestic supply versus imports in considering supplies from the manufacturing sector to overall infrastructure. Within the energy infrastructure sector, imports provide about 22 percent of total supplies; and for solar specifically, imported supplies account for 30.2 percent, representing a significant import leakage.[49]
- Similarly, in a study on behalf of the National Renewable Energy Laboratory ("NREL") estimating the benefits of the Solar American Initiative, the implied leakages range from 76 percent to 85 percent.[50]

[48] IMPLAN Pro User's Guide. MIG, Inc. page 41.

[49] See J. Heintz, R. Pollin and H. Gerrett-Peltier. 2009. How Infrastructure Investments Support the U.S. Economy: Employment, Productivity and Growth. Political Economy Research Institute.

[50] S. Grover. 2007. Energy, Economic, and Environmental Benefits of the Solar America Initiative. ECONorthwest. Prepared for National Renewable Energy Laboratory. NREL/SR-640-41998.

- Another NREL study estimating the development benefits of wind power in Nebraska assumes that the share of construction expected to stay in Nebraska ranges from 13 to 25 percent.[51]
- A study by the Brattle Group, in calculating economic and fiscal impacts of a 550 MW solar plant in California, estimates that $175 million out of $1.2 billion would be spent locally on materials and labor during the construction phase of the project. This implies a leakage of about 85 percent.[52,53]

Thus, the Company's assertion that the use of a leakage factor is incorrect is refuted by a number of studies and empirical research.

Q. DID YOUR ANALYSIS ASSUME THAT ALL LABOR WOULD BE OUT-OF-STATE?

A. No. My analysis assumed that as much as 62.3 percent of all project labor would come from within New Jersey. This would result in as much as 3.8 direct jobs per million dollars in SFAE installation expenditures (in-state only) or as many as 5.7 total jobs per million dollars in installation expenditures. These estimates are developed using the employment impact multiplier incorporated in the JEDI model. This direct employment multiplier does not "low-ball" the potential employment impact of solar investments and is actually higher than the 6.5 jobs per

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[51] E. Lantz. 2009. Economic Development Benefits from Wind Power in Nebraska: A Report for the Nebraska Energy Office. National Renewable Energy Laboratory, p. 6.

[52] S. Hamilton, M. Berkman and M. Tran. 2011. Economic and Fiscal Impacts of the Topaz Solar Farm. The Brattle Group.

[53] See also, Global Insight. 2003. Economic Impact Analysis of the Cape Wind Off-Shore Renewable Energy Project. p. 11; Northwest Economic Associates. 2003. Assessing the Economic Development Impacts of Wind Power. Prepared for National Wind Coordinating Committee. pp. 43-44; E. Lantz and G. Mosey. 2009. How to Estimate Economic Impacts from Renewable Energy. National Renewable Energy Laboratory. p. 15; U.S. Government Accountability Office. 2004. Wind Power's Contribution to Electric Power Generation and Impact on Farms and Rural Communities. GAO-04-756. pp. 76-77; and N. Mongha, E. Stafford and C. Hartman. 2006. An Analysis of the Economic Impact on Utah County, Utah from the Development of Wind Power Plants. Energy Efficiency and Renewable Energy, U.S. Department of Energy.

MW (or 1.19 jobs per million dollars) assumed by the Company in its own net benefits estimate. Thus, it is difficult to accept or even understand the Company's basic argument on this matter. The Company's assertions miss the big picture: my estimates do not under-estimate solar employment impacts and there is simply no reason to increase those employment estimates to any higher level as the Company's rebuttal would suggest.[54]

Q. IS THE LABOR COMPONENT OF THE COMPANY'S SFAE PROGRAM THE MOST SIGNIFICANT SHARE OF ITS OVERALL PROGRAM EXPENDITURES?

A. No. Total program labor expenditures are estimated to be as much as 26 percent of overall SFAE program expenditures. In-state labor expenditures are estimated to be as much as 16 percent of overall SFAE expenditures, and 45 percent of all in-state SFAE expenditures. The results of even the Company's analysis would still result in a likely negative net economic impact even if 100 percent of all estimated SFAE program labor were assumed to be supplied in-state and the Company's erroneous rate impacts were included in the analysis. Schedule DED-SR-7is provided for illustration purposes only and shows that even if the erroneous assumption of 100 percent of all SFAE labor came from within New Jersey, and the Company's exceptionally understated rate impacts are included, the net economic impacts of the program would continue to be negative on a constant dollar basis. For instance, the direct net economic benefits, as measured in terms of economic output, is a negative $406.76 million, while the total net economic benefits, as measured by economic output, is a negative $398.32; all of which are estimated in constant dollar terms. The estimated economic output impacts are only slightly positive on an NPV basis ($76.78 million), however, net employment associated with the SFAE remains negative in the analysis (a loss of 706 employment-years).

[54]Rebuttal Testimony of Terrence J. Moran, 22:10-22 and 23:1-10.

Q. HAS THE COMPANY PROVIDED ANY SPECIFIC RECORD EVIDENCE TO SUPPORT ITS LEAKAGE ASSERTIONS?

A. No, the Company has provided no documented alternative leakage factor. Instead, it bases its decision to dismiss all program leakages on an assertion that "the existing Solar 4 All projects were built using in-state union labor" and the "expect[ation that] the Extension Program would also employ a local New Jersey workforce."[55] This response is deficient for a number of reasons. First, trades and craft labor are not the only types of labor that goes into a solar installation. "Labor" also includes professional labor including engineering, design, legal, and other professional services support. It is highly unlikely that out-of-state solar developers would rely exclusively on in-state professional services since many have their own set of in-house professionals. Second, the Company's assertions are based upon a labor, not an equipment-based justification. The Company, however, takes this labor-based assertion, and generalizes it to ALL program expenditures. In other words, the Company's asserts (through the alternative analysis provided in TJM-S4AE-4 and TJM-S4AE-5) that since in-state union trades and crafts labor will be used in the SFAE, then 100 percent of all program expenditures must also be in-state as well. This assumption is clearly unjustified, and not supported by the information provided by the Company.

Q. WAS THE COMPANY ASKED TO PROVIDE SUPPORTING EVIDENCE FOR THIS 100 PERCENT IN-STATE PROGRAM EXPENDITURE ASSUMPTION?

A. Yes. In its response to Data Request RCR-P-12, the Company provided a list of the contractors used in its original S4A program. In Data Request RCR-P-64, the Company was asked to provide invoices as well as a break-down of equipment versus labor costs and a break-

[55] Rebuttal Testimony of Terrence J. Moran, 22:12-14.

down of labor hours for each of the out-of-state contractors listed in its response to RCR-P-12. The Company objected stating that the request was overly broad, unduly burdensome, and not relevant to this proceeding. The Company was also asked to provide in Data Requests RCR-P-65 through RCR-P-82, copies of the contracts for each of the solar projects supported by out-of-state contractors. The Company objected to each of these requests as well.The Company's responses claim that this information is "not relevant" to the current proceeding, when, in fact, such information is directly relevant in addressing the issue of SFAE program expenditure leakages.

b. Direct Impact Estimation

Q. DO YOU AGREE WITH THE COMPANY'S ASSERTION THAT YOUR POSITIVE ECONOMIC IMPACTS ARE "FAR LARGER THAN THE CONSERVATIVE ESTIMATES PROVIDED BY PSE&G?"[56]

A. Not entirely, since the Company's original direct economic impacts are not as much "conservative" as they are wrong. The Company's analysis only considers the direct economic impacts of the construction activities associated with the proposed SFAE. The Company's analysis fails to consider the additional positive economic impacts associated with the ongoing annual operation and maintenance ("O&M") expenditures associated with the SFAE installations. My net economic benefits analysis included both the one time construction, as well as the annual, ongoing benefits associated with the SFAE solar installations. The Company is simply comparing oranges and apples in its rebuttal testimony when it compares my estimated 8,270 job-years of total impacts (combined construction and O&M) to its estimated 885 job-years (construction only).

[56] Rebuttal Testimony of Terrence J. Moran, 23:3.

Q. ARE THE COMPANY'S ESTIMATES BASED UPON ANY WELL-RECOGNIZED MODELING FRAMEWORK?

A. No. The Company's "modeling" consists of multiplying 136 MW of proposed SFAE capacity by the 6.47 job years per MW factor utilized by Rutgers in developing estimates for the EMP.[57]This represents the direct economic impact of construction only and does not include the direct and indirect impacts. PSE&G did not model any indirect or induced impacts and simply assumed the "indirect jobs would be the same as the direct jobs, i.e., 6.5 job years per MW."[58] Thus, at best, the Company's analysis (1) focuses only on direct and indirect impacts – excluding any induced impact and (2) bases 50 percent of its impact on an assumption.

c. Model Selection

Q. DOES THE COMPANY TAKE ISSUE WITH YOUR USE OF THE JEDI MODEL FOR EXAMINING THE ECONOMIC IMPACTS OF ITS SFAE?

A. Yes, the Company notes that "JEDI models are simple spreadsheet screening tools and as such cannot accurately model some of the more complicated aspects of the Solar 4 All Extension program" and goes further to note "[JEDI] is a simple input-output model and does not have the ability to directly model multi-year programs such as [the] Solar 4 All Extension."[59] This characterization of the JEDI model certainly crosses the line in both its hubris and degree of inaccuracy, and is somewhat ironic given that the Company's own estimation of the economic impacts of its SFAE program consists of the simple multiplication of two numbers.[60] The Company's criticisms are incorrect since:

1) JEDI is not a "simple" spreadsheet model but one that is based upon a larger

[57] Company response to RCR-P-21.
[58] Company response to RCR-P-21.
[59] Rebuttal Testimony of Terrence J. Moran, 28:5-8.
[60] See RCR-P-21

underlying input-output modeling framework. This framework is then incorporated into a more user-friendly spreadsheet platform.

2) JEDI and IMPLAN (the model I used to estimate my rate impacts) are not independent models but are directly related.

3) JEDI and IMPLAN are well-recognized and used and relied upon in numerous policy making contexts at the federal and state levels.

4) The JEDI and IMPLAN models utilized in my net economic benefits analysis are based upon reliable economic and empirical principles and methods, and while the direct estimation process for both models is static in nature, that process can be easily modified to estimate dynamic economic impacts.

Q. CAN YOU PLEASE EXPLAIN WHY JEDI IS NOT A SIMPLE SPREADSHEET MODEL?

A. As I noted in my direct testimony,[61] the JEDI model is created by the NREL to estimate "the number of jobs and economic impacts to a local area that can reasonably be supported" by a project such as S4AE.[62]The Company is incorrect in asserting that just because the JEDI model has been developed in a user-friendly manner, it should be characterized as "simplistic." In fact, JEDI includes a considerable degree of complexity. This model has been specifically calibrated in a number of different ways in order to allow for robust estimation of the economic impacts of an array of energy project types across the U.S. First, JEDI has been calibrated for each state in the U.S. to control for economic differences created by similar projects in differing parts of the country. Second, the JEDI model has been calibrated specifically for a number of power generation investments that include biofuels, coal, CHP, geothermal, marine & hydrokinetic

[61] Direct Testimony of David E. Dismukes, Ph.D., 37:22 to 38:1.
[62] *See <http://www.nrel.gov/analysis/jedi/about_jedi.html>*

power, natural gas, photovoltaics, and wind.[63] Third, JEDI allows for users to incorporate customized (project specific) information such as costs and expenditures, financing and tax parameters and local shares of spending in order to provide a reasonable estimate of the economic impacts associated with a specific project. Finally, the JEDI model breaks these economic impacts into components that include employment, labor income and output. This degree of calibration and customization makes JEDI something considerably more than what the Company characterizes as a "simple spreadsheet model."

Q. ARE JEDI AND IMPLAN DIFFERING, UNRELATED ECONOMIC IMPACT MODELS?

A. No. The JEDI model is actually a modification of the IMPLAN model. JEDI's "[e]conomic multipliers . . . are derived from Minnesota IMPLAN Group's IMPLAN accounting software and state data files."[64] JEDI utilizes the multipliers and consumption patterns derived from IMPLAN "to estimate the local economic activity and the resulting impact from new energy generation plants."[65] The JEDI model incorporates changes in spending patterns due to investment in power plants or other projects and matches these changes with the appropriate IMPLAN industries. Thus, the underlying methodology under which these models operate work is identical. The primary difference between the two models comes from NREL's calibration of the IMPLAN model to provide a more accurate estimate of economic impacts for specific energy related investments.

Q. IS JEDI A RELATIVELY WIDELY-USED MODEL FOR EXAMINING RENEWABLE ENERGY IMPACTS?

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[63] *Ibid.*
[64] *Ibid.*
[65] *See <http://www.nrel.gov/analysis/jedi/methodology.html>*

A. Yes. The JEDI model has been used for analyzing a variety of different renewable energy impacts throughout the United States. In 2012 alone, NREL cites fifteen separate publications that have utilized the JEDI model.[66]NREL also notes that studies using the JEDI model have been published in peer-reviewed academic journals such as *Energy Policy, Clean Technologies and Environmental Policy, AIChE Journal, Renewable Energy, Renewable and Sustainable Energy Reviews,* among others.[67] Furthermore, the model has been used by other entities such as the U.S. Environmental Protection Agency (EPA), the World Bank, and the Center for Renewable Energy at Illinois State University.[68]

Q. IS IMPLAN A WELL-RESPECTED MODEL FOR EXAMINING REGIONAL ECONOMIC IMPACTS, PARTICULARLY THOSE ASSOCIATED WITH ENERGY INDUSTRIES?

A. Yes. The IMPLAN model is not only well respected, but also has been used extensively in modeling economic impacts of energy related projects. For example, IMPLAN has been used to estimate the employment and gross state product impacts of renewable portfolio standards in states including Arizona, Wisconsin, Nebraska, Colorado, Texas, and Washington.[69] In fact, the Clean Energy States Alliance cites IMPLAN as an appropriate model for evaluating the benefits and costs of an RPS.[70] The Edward J. Bloustein School of Planning and Public Policy at Rutgers University also cites IMPLAN as a model that can be used to estimate economic impacts of

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[66] *See <http://www.nrel.gov/analysis/jedi/publications.html>*

[67] *Ibid.*

[68] *Ibid.*

[69] Ernest Orlando Lawrence Berkeley National Laboratory. *Weighing the Costs and Benefits of State Renewables Portfolio Standards: A Comparative Analysis of State-Level Policy Impact Projections. May 2007. Table 3 on page 24.*

[70] Clean Energy States Alliance. *Evaluating the Benefits and Costs of a Renewable Portfolio Standard. A Guide for State RPS Programs.* May 2012.

energy infrastructure investments.[71] IMPLAN has also been utilized by the U.S. Department of the Interior's Bureau of Ocean Energy Management ("BOEM") in estimating economic impacts of holding lease sales in the Gulf of Mexico[72] as well as the MAG-PLAN Alaska model.[73] I personally have worked for about 15 years with BOEM and its predecessor agency in developing these customized, IMPLAN-based models for offshore energy investments. IMPLAN has also been used to model a number of non-energy based natural resource impacts by federal agencies such as the U.S. Department of Transportation ("USDOT") and the U.S. Department of Agriculture ("USDA").[74]

Q. CAN YOU EXPLAIN WHY IMPLAN REPRESENTS A METHODOLOGICALLY SOUND FRAMEWORK FOR MODELING ECONOMIC IMPACTS?

A. The IMPLAN model is based upon a through "input-output accounting [that] describes commodity flows from producers to intermediate and final consumers."[75] IMPLAN has data on 508 sectors and constructs Social Accounting Matrices ("SAMs") to describe "all commodity flows, not only purchases and production of sales and commodities, but transfer payments to and from institutions." It is these commodity flows between industries that drive the economic multipliers. IMPLAN utilizes data from a number of sources including the Bureau of the Census, Bureau of Labor Statistics, and the Bureau of Economic Analysis (BEA).[76]

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[71] Edward J. Bloustein School of Planning and Public Policy, Rutgers University. *Economic Impacts of Energy Infrastructure Investment.* October 2010.

[72] U.S. Department of the Interior: Mineral Management Service Gulf of Mexico OCS Region. *Gulf of Mexico OCS Oil and Gas Lease Sales: 2003-2007. Final Environmental Impact Statement. Volume I: Chapters 1-10.*

[73] U.S. Department of the Interior: Bureau of Ocean Energy Management. *MAG-PLAN Alaska Update.* May 2012

[74] U.S. Department of Transportation. *Analyzing the Economic Impact of Transportation Projects Using RIMS II, Implan, and REMI. 2000.*
See <http://www.nrcs.usda.gov/wps/portal/nrcs/detail/null/?cid=nrcs143_009732>

[75] Lindall, Scott A., and Douglas C. Olson. "The IMPLAN input-output system." *Stillwater MN* (1996).

[76] Hartgen, David T. *Traffic Congestion in North Carolina. Status, Prospects and Solutions.* March 2007

Q. ARE YOU SUGGESTING THAT THE RUTGERS MODEL IS AN INADEQUATE METHOD?

A. No, but the Rutgers R/ECON model is proprietary and users typically pass along various types of assumptions to Rutgers, which in turn, estimates a variety of New Jersey-specific impacts. There is nothing inherently wrong with this approach to economic impact modeling, but these underlying equations are not available for independent verification making R/ECON a "black box" type of modeling that is likely not fully understood by users outside of The Rutgers Economic Advisory Services.

Q. DOES R/ECON HAVE AN ADVANTAGE OVER JEDI AND IMPLAN BECAUSE IT USES NEW JERSEY-SPECIFIC DATA?

A. No, R/ECON, JEDI, and IMPLAN all use New Jersey specific data. However, JEDI and IMPLAN have datasets that allow the modeling framework to be used in other states as well. R/ECON is limited to New Jersey alone. All three models though are appropriate for economic impact studies in New Jersey since each model takes advantage of New Jersey specific data in estimating economic impacts.

Q. DO THE RESULTS FROM R/ECON AND IMPLAN DIFFER SIGNIFICANTLY?

No, given the inputs are provided to each model in a comparable manner, these models will in general produce outputs that are similar. For instance, the CEEEP employed the R/ECON model to estimate the economic impact of a small 8 kW residential photovoltaic system.[77] R/ECON estimates a multiplier of 1.44. I replicated this analysis using the JEDI model and estimated a multiplier of 1.85. While these two models will not produce identical multipliers due to

[77] Edward J. Bloustein School of Planning and Public Policy: Center for Energy, Economic & Environmental Policy. *Economic Impact Analysis of New Jersey's Proposed 20% Renewable Portfolio Standard: Prepared for NJ Board of Public Utilities – Office of Clean Energy. December 2004.*

differences in the underlying methods employed by these models, these estimates are similar, differing by 0.41. Interestingly, the JEDI multiplier is actually larger than the R/ECON multiplier meaning that JEDI estimates larger economic impacts for renewable energy investments than R/ECON.

Q. IS IT POSSIBLE TO INCORPORATE DYNAMIC CONSIDERATIONS INTO EITHER JEDI OR IMPLAN?

A. Yes, while the direct estimation process for both JEDI and IMPLAN is static in nature, that process can be easily modified to estimate dynamic economic impacts. In fact, the economic impacts presented in my Direct Testimony do just that. Schedules DED-15, DED-17, DED-18, DED-24 and DED-25 use JEDI and/or IMPLAN results to estimate dynamic economic impacts until 2036. In order to extrapolate these results into a dynamic model, it is assumed that the relationship between inputs and outputs within each sector is constant over time. JEDI divides estimated economic impacts into both construction and O&M, where the construction impacts will occur during construction years and O&M impacts will occur yearly during the operational life of the project. While it is true that the IMPLAN and JEDI models are inherently static models, their results can easily be expanded to estimate dynamic impacts.

Q. DOES JEDI AUTOMATICALLY TAKE LEAKAGES INTO ACCOUNT?

A. JEDI does take into account leakages on the front end of the project, but it is responsibility of the modeler/user to define and insert this leakage share into the specific prompt for leakages. The Company assumes that 100 percent of installation labor, permitting, other costs and business overhead will be purchased locally,[78] and as such, fails to account for any leakages leading to an overstatement of the economic benefits of S4AE.

[78] See RCR-P-50 – PSGE Version – 02D-PV_Model_rel._PV10.17.11

d. **Expenditure Profile Assumptions and Impacts**

Q. HAS THE COMPANY RAISED ANY ISSUES REGARDING YOUR METHODS FOR ALLOCATING CERTAIN SFAE PROGRAM EXPENDITURES?

A. Yes. The Company has raised two issues about the methods I used to allocate certain SFAE capital expenditures to various economic sectors for net benefits estimation. The Company suggests that I misallocated two different types of expenditures and in doing so "underestimate[s] the labor involved in constructing Solar 4 All extension projects, thus reducing the impact on projected jobs, output, and employment."[79] The Company opines that the $60.5 million associated with SFAE "Site Preparation" activities should not be allocated to a category entitled "Permitting" in JEDI but instead should be allocated to "Labor – Installation" (95 percent) and Permitting (5 percent)[80]The Company also opines that "Contingencies" should be reallocated to "Materials and Equipment" (30 percent), "Labor" (60 percent), and "Other Costs" (10 percent).[81]

Q. WOULD YOU PLEASE EXPLAIN THE SIGNIFICANCE OF PROGRAM EXPENDITURES ALLOCATIONS TO YOUR ECONOMIC IMPACT ANALYSIS?

A. Impact expenditure profiles are important components of regional economic impact analyses since one economic sector can generate a set of economic activities that differs from another. Consider, for example, the petroleum refining sector, which is relatively capital-intensive, and creates proportionally fewer jobs than a more labor-intensive sector like retail services. For illustration purposes, assume there are only two sectors in a regional economy: refining and retail services. If a regional economic impact modeler were to allocate more of an

[79] Rebuttal Testimony of Terrence J. Moran, 29:13-15.
[80] Company response to RCR-P-62.
[81] Company response to RCR-P-63.

anticipated investment amount into the refining sector, as opposed to the retails services sector, the model output would yield fewer overall jobs than if the investment allocation was more highly leveraged to the retail services sector. This does not mean that the overall economic impact will be larger for the labor-intensive sectors since wages (and labor income) can also influence the resulting total economic impacts. For instance, in this two-sector economy example, it could easily be the case that while refining creates fewer jobs, it creates a higher labor income and overall positive economic impact since the wages paid to workers in the refining sector are considerably higher than those in the retail services sector.

Q. ARE THE MOVEMENTS OF DOLLARS FROM ONE ECONOMIC SECTOR TO ANOTHER LIKELY TO RESULT IN A CONSIDERABLE SHIFT IN THE OVERALL IMPACTS?

A. No. The Company's proposed reallocations of program expenditures will not change the overall economic impacts much given offsetting interactions of sector-specific leakages as well as wage differentials between sectors. In fact, the Company' re-allocation proposals result in outcomes that suggest its SFAE proposal is more, not less uneconomic. Schedule DED-SR-8 provides the new economic impact results utilizing each of the Company's re-allocation proposals and its faulty rate impact analysis. The results continue to show a negative net economic impact associated with the SFAE. For instance, there is still a negative net economic benefit, as measured in terms of economic output, from the Company's re-allocation proposal of $578.77 million in current dollar terms, and a negative $57.05 million in net economic benefits (measured in economic output) on an NPV basis. Page 2 of the exhibit shows that the Company's recommended changes will still result in a loss of some 1,852 employment opportunities (as measured in employment-years), even though (as shown on page 3) there is a

marginally small NPV increase in labor income of $53.25 million. Overall, the conclusion is still the same: changing the expenditure profile, and assuming the Company's faulty rate impacts, still results in negative net economic benefits.

Q. THEN HOW DOES THE COMPANY ARRIVE AT A POSITIVE NET ECONOMICS BENEFIT ESTIMATE UNDER ITS REVISED ANALYSIS?

A. The positive net economic benefit generated by the Company in its analysis is generated entirely by eliminating all leakages associated with its program expenditures. As I noted earlier in my testimony, the Company justifies its zero leakage assumption on the position that since in-state union trades and skilled union labor will be used on SFAE projects, then 100 percent of all program expenditures must also be in-state as well. This logic is clearly unjustified, and not supported by any record information in this proceeding. In fact, the Company repeatedly failed to respond to numerous Rate Counsel data requests attempting to ascertain the merits of its unsupported leakage position by asking for invoice-specific information from out-of-state contractors that participated in its Solar 4 All program. The Company repeatedly objected to the requests for these out-of-state invoices claiming that such information is irrelevant to this proceeding. Absent such support, the Board should dismiss the Company's assertions on this matter.

VI. Conclusion

Q. DOES THIS CONCLUDE YOUR SURREBUTTAL TESTIMONY FILED ON MARCH 1, 2013?

A. Yes it does, however, I hold open the right to modify or supplement my surrebuttal testimony should additional information or evidence be provided at some later date.

SCHEDULES DED-SR-1 THROUGH DED-SR-8

Solar Installations by Land Use (as of February 8, 2013)

Land Use Type	Number of Installations	Total Capacity (MW)
Brownfield	11	21.0
Parking Lot	48	23.9
Landfill	7	17.2
Farmland	11	68.8
Various	8	30.0
Total	**85**	**160.8**

Source: Office of Clean Energy, "New Jersey's Clean Energy Program: 2012 Renewable Energy Program Update," February 14, 2013.

SREC Market Oversupply Projection, without SFAE

Energy Year	RPS Requirement (GWh)	Solar Generation Assumption (%)	Solar Generation SREC Supply (GWh)	Banked SRECs Total (GWh)	Banked SRECs Used (GWh)	Banked SRECs Remaining (GWh)	SREC Oversupply (GWh)	SREC Oversupply (%)
EY2012	442	150%	663	221	-	221	**221**	**150.0%**
EY2013	596	200%	1,192	817	-	817	**596**	**200.0%**
EY2014	1,686	125%	2,108	1,239	-	1,239	**422**	**125.0%**
EY2015	2,034	90%	1,831	1,239	203	1,035	-	**100.0%**
EY2016	2,305	90%	2,075	1,035	231	805	-	**100.0%**
EY2017	2,538	90%	2,284	805	254	551	-	**100.0%**
EY2018	2,733	90%	2,460	551	273	278	-	**100.0%**
EY2019	2,836	90%	2,552	278	278	(0)	**(6)**	**99.8%**
EY2020	2,942	90%	2,648	(0)	-	(0)	**(294)**	**90.0%**

Source: Company Response to RCR-P-15.

SREC Market Oversupply Projection, with SFAE

Energy Year	RPS Requirement (GWh)	Solar Generation Assumption (%)	SREC Supply (GWh)	S4AE (GWh)	Banked SRECs Total (GWh)	Used (GWh)	Remaining (GWh)	SREC Oversupply (GWh)	SREC Oversupply (%)
EY2012	442	150%	663	-	221	-	221	**663**	**150.0%**
EY2013	596	200%	1,192	-	817	-	817	**1,192**	**200.0%**
EY2014	1,686	125%	2,108	12	1,251	-	1,251	**2,120**	**125.7%**
EY2015	2,034	90%	1,831	34	1,251	169	1,081	**2,034**	**100.0%**
EY2016	2,305	90%	2,075	86	1,081	145	937	**2,305**	**100.0%**
EY2017	2,538	90%	2,284	150	937	104	833	**2,538**	**100.0%**
EY2018	2,733	90%	2,460	159	833	114	719	**2,733**	**100.0%**
EY2019	2,836	90%	2,552	158	719	126	593	**2,836**	**100.0%**
EY2020	2,942	90%	2,648	158	593	136	457	**2,942**	**100.0%**

Source: Company Response to RCR-P-15.

Capacity in Solar Project Pipeline

As of Month Ending	Capacity in Solar Project Pipeline (kW)			Precentage of Pipeline (%)	
	Net Metered	Grid-Connected	Total	Net Metered	Grid-Connected
Nov-10	174,516	40,903	215,419	81.01%	18.99%
Dec-10	104,043	41,851	145,894	71.31%	28.69%
Jan-11	113,533	38,675	152,208	74.59%	25.41%
Mar-11	194,304	28,099	222,402	87.37%	12.63%
Apr-11	208,952	28,099	237,050	88.15%	11.85%
May-11	252,743	28,099	280,841	89.99%	10.01%
Jun-11	248,771	27,184	275,955	90.15%	9.85%
Jul-11	238,838	77,724	316,562	75.45%	24.55%
Aug-11	224,548	136,871	361,418	62.13%	37.87%
Oct-11	240,390	148,694	389,084	61.78%	38.22%
Nov-11	235,105	143,553	378,658	62.09%	37.91%
Dec-11	231,523	134,499	366,022	63.25%	36.75%
Jan-12	213,355	91,657	305,012	69.95%	30.05%
Feb-12	197,044	88,317	285,360	69.05%	30.95%
Mar-12	172,904	85,106	258,010	67.01%	32.99%
Apr-12	145,195	81,392	226,586	64.08%	35.92%
Jun-12	105,268	64,653	169,921	61.95%	38.05%
Jul-12	89,284	63,272	152,556	58.53%	41.47%
Aug-12	70,334	45,854	116,188	60.53%	39.47%
Oct-12	35,155	8,076	43,231	81.32%	18.68%
			Average:	**71.99%**	**28.01%**

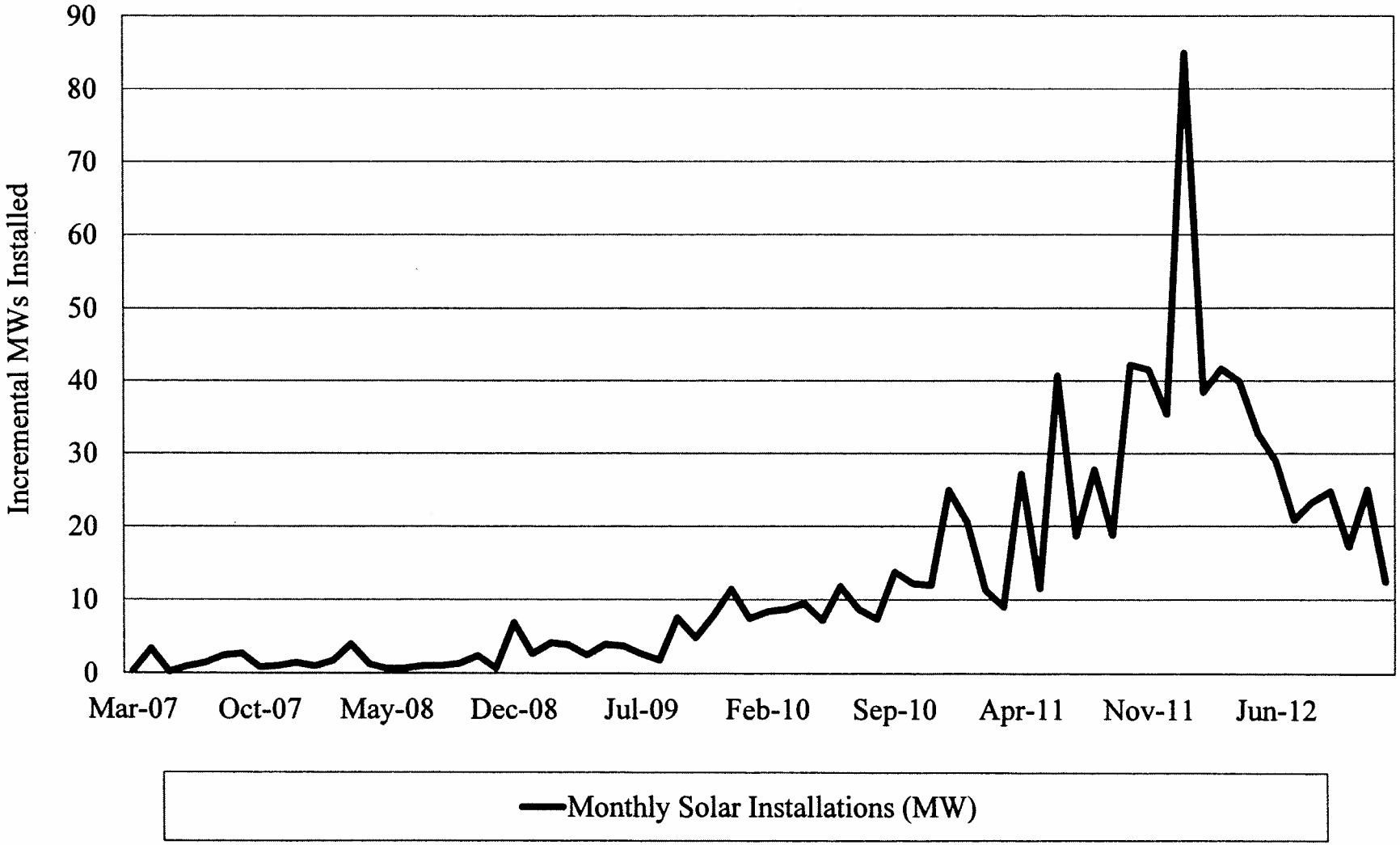
Source: Office of Clean Energy, Solar Projects Pipeline and Solar Installation Summary.

Estimated Solar Cancellation Rates by Project Type

As of Month Ending	Capacity in Solar Project Pipeline				Completion Percentages		
	Completed Projects		Cancelled Projects				
	Net Metered	Grid-Connected	Net Metered	Grid-Connected	Net Metered	Grid-Connected	Total
	(kW)				(%)		
Nov-10	115,633	34,681	58,882	6,222	66.26%	84.79%	69.78%
Dec-10	104,043	35,629	58,340	6,222	64.07%	85.13%	68.39%
Jan-11	113,533	32,044	66,943	6,631	62.91%	82.85%	66.43%
Mar-11	194,304	21,467	79,863	6,631	70.87%	76.40%	71.38%
Apr-11	208,952	21,467	87,407	6,631	70.51%	76.40%	71.02%
May-11	252,743	21,467	121,124	6,631	67.60%	76.40%	68.22%
Jun-11	248,771	20,553	150,755	6,631	62.27%	75.61%	63.12%
Jul-11	238,838	46,672	129,047	31,052	64.92%	60.05%	64.07%
Aug-11	224,548	77,556	153,922	59,314	59.33%	56.66%	58.62%
Oct-11	240,390	76,297	153,367	72,397	61.05%	51.31%	58.38%
Nov-11	235,105	71,156	150,743	72,397	60.93%	49.57%	57.85%
Dec-11	231,523	62,102	148,442	72,397	60.93%	46.17%	57.07%
Jan-12	213,355	19,260	144,937	72,397	59.55%	21.01%	51.70%
Feb-12	197,044	16,330	135,322	71,987	59.29%	18.49%	50.72%
Mar-12	172,904	13,119	108,365	71,987	61.47%	15.41%	50.77%
Apr-12	145,195	9,405	99,794	71,987	59.27%	11.55%	47.37%
Jun-12	105,268	6,756	87,739	57,897	54.54%	10.45%	43.48%
Jul-12	89,284	5,375	54,250	57,897	62.20%	8.50%	45.77%
Aug-12	70,334	5,375	52,087	40,479	57.45%	11.72%	44.99%
Oct-12	35,155	1,073	19,050	7,003	64.86%	13.29%	58.17%
				Average:	**62.51%**	**46.59%**	**58.36%**

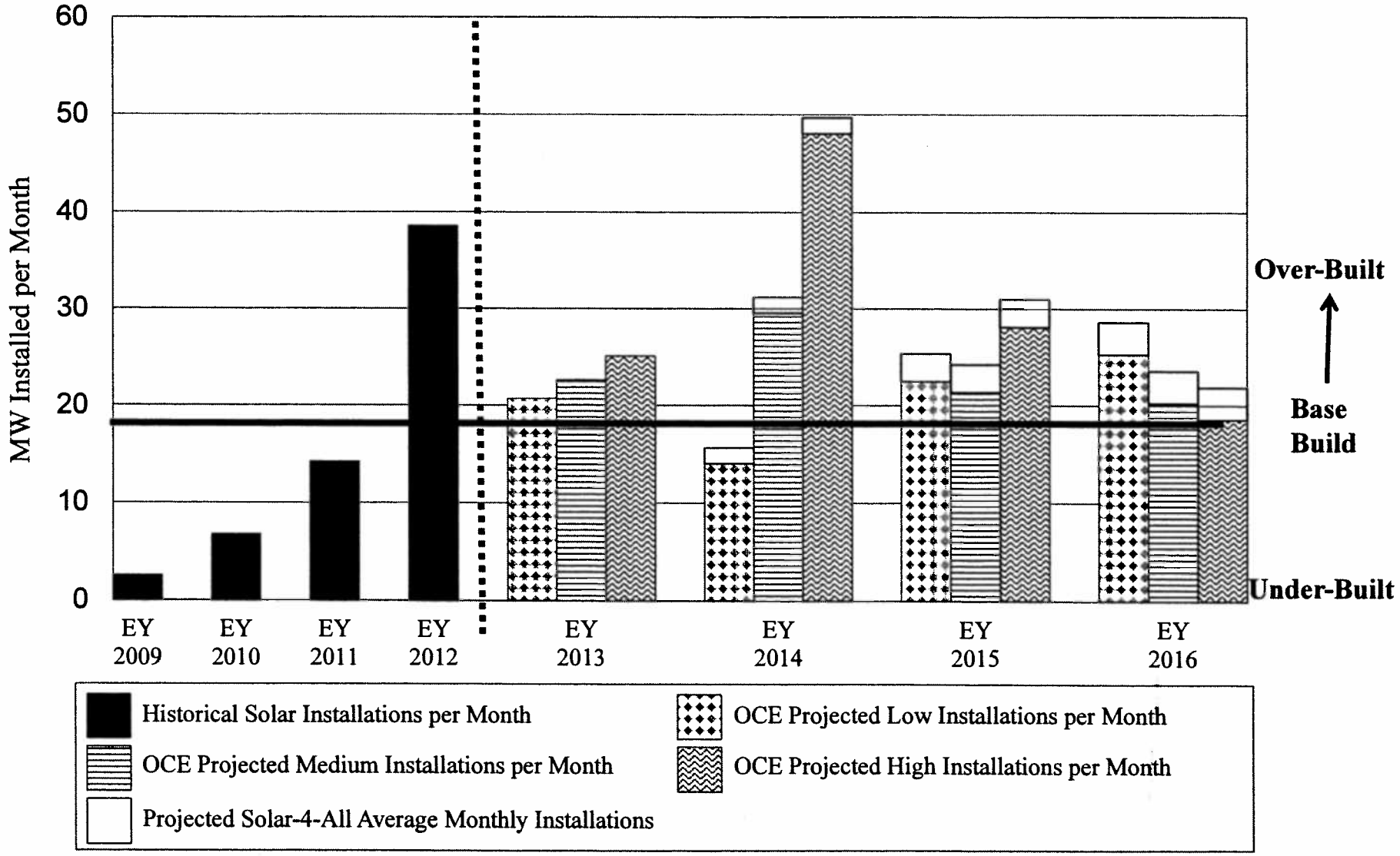
Source: Office of Clean Energy, Solar Projects Pipeline and Solar Installation Summary.

Updated OCE Forecast, Historical Monthly Solar Installations



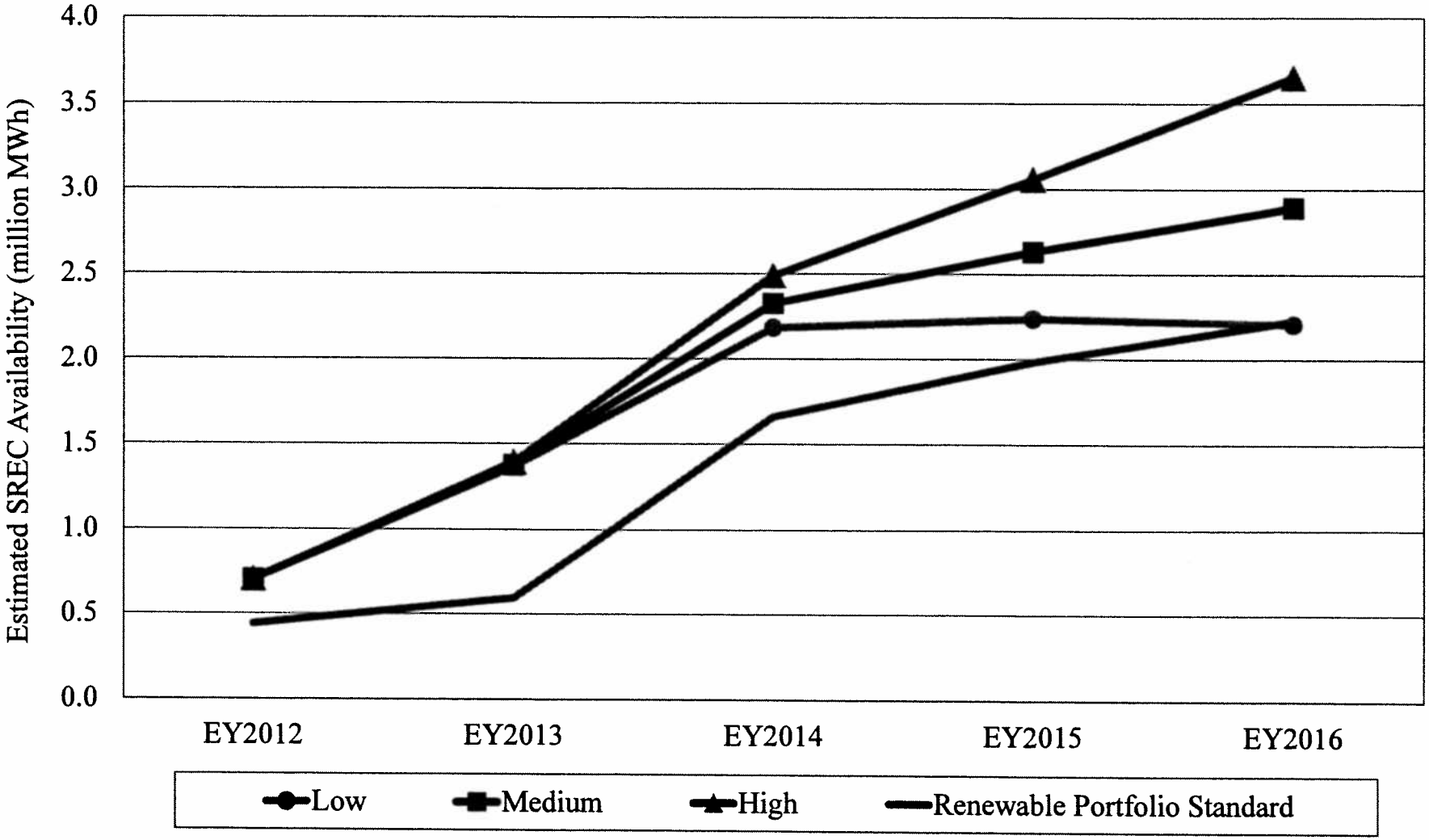
Source: Office of Clean Energy, Solar Installation Summary (as of Oct. 31, 2012).

Updated OCE Forecast, Projected Monthly Solar Installations



Source: Office of Clean Energy, Solar Installation Summary and Solar Installed Capacity Forecast (as of Oct. 31, 2012); and Company Response to RCR-A-15.

Updated OCE Forecast, SREC Availability



Source: Office of Clean Energy, Solar Installed Capacity Forecast (as of Dec. 31, 2012).

Updated OCE Forecast, SREC Availability

Energy Year	NJCEP Solar Generation Forecast Item	Low	Medium	High
2012	OCE Projected SREC Availability (MWh)	704,688	704,688	704,688
	NJ Solar RPS Requirement (MWh)	442,000	442,000	442,000
	Percentage of RPS Requirement	**159.43%**	**159.43%**	**159.43%**
2013	OCE Projected SREC Availability (MWh)	1,367,588	1,377,688	1,378,988
	NJ Solar RPS Requirement (MWh)	596,000	596,000	596,000
	Percentage of RPS Requirement	**229.46%**	**231.16%**	**231.37%**
2014	OCE Projected SREC Availability (MWh)	2,102,788	2,255,788	2,441,388
	NJ Solar RPS Requirement (MWh)	1,660,500	1,660,500	1,660,500
	Percentage of RPS Requirement	**126.64%**	**135.85%**	**147.03%**
2015	OCE Projected SREC Availability (MWh)	2,041,288	2,436,688	2,976,788
	NJ Solar RPS Requirement (MWh)	1,984,500	1,984,500	1,984,500
	Percentage of RPS Requirement	**102.86%**	**122.79%**	**150.00%**
2016	OCE Projected SREC Availability (MWh)	2,001,588	2,592,688	3,519,088
	NJ Solar RPS Requirement (MWh)	2,227,500	2,227,500	2,227,500
	Percentage of RPS Requirement	**89.86%**	**116.39%**	**157.98%**

Source: Office of Clean Energy, Solar Installed Capacity Forecast (as of Dec. 31, 2012).

Total SRECs and Ratepayer Expense, without SFAE

Energy Year	Current Solar RPS	Total SRECs (SRECs)							Utility Supported Funded Programs ($)							
					PSE&G			Remaining SREC Market				PSE&G			Remaining SREC Market[1]	Total
		ACE	JCP&L	RE	Solar Loan I & II	Solar for All	Total EDCs		ACE	JCP&L	RE	Solar Loan I & II	Solar for All	Total EDCs		
2005	5,714	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	5,714	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	$ 47,695,793	$ 47,695,793
2006	10,450	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	10,450	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	$ 80,442,096	$ 80,442,096
2007	32,743	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	32,743	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	$ 65,439,838	$ 65,439,838
2008	65,384	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	65,384	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	$ 61,905,188	$ 61,905,188
2009	130,266	n.a.	n.a.	n.a.	3,397	92,000	95,397	34,869	n.a.	n.a.	n.a.	$ 1,613,636	$ 439,633	$ 2,053,269	$ 19,555,523	$ 21,608,793
2010	171,095	2,588	13,368	111	17,194	92,000	125,261	45,834	$ 964,176	$ 5,435,400	$ 51,224	$ 8,166,904	$ 9,641,591	$ 24,259,295	$ 28,040,745	$ 52,300,039
2011	306,000	12,865	33,235	1,759	30,304	92,000	170,163	135,837	$ 5,336,812	$ 13,832,566	$ 678,423	$ 13,777,224	$ 17,222,238	$ 50,847,263	$ 76,952,792	$ 127,800,056
2012	442,000	23,939	49,056	4,770	36,387	92,000	206,152	235,848	$ 8,138,521	$ 17,498,063	$ 1,822,641	$ 16,078,993	$ 37,714,975	$ 81,253,193	$ 62,051,216	$ 143,304,408
2013	596,000	23,939	49,056	4,770	36,387	92,000	206,152	389,848	$ 8,138,521	$ 17,498,063	$ 1,822,641	$ 16,078,993	$ 31,888,979	$ 75,427,197	$ 46,781,760	$ 122,208,957
2014	1,726,615	23,939	49,056	4,770	36,387	93,000	207,152	1,519,463	$ 8,138,521	$ 17,498,063	$ 1,822,641	$ 16,078,993	$ 30,409,532	$ 73,947,750	$ 129,154,314	$ 203,102,064
2015	2,093,566	23,939	49,056	4,770	36,387	93,000	207,152	1,886,414	$ 8,138,521	$ 17,498,063	$ 1,822,641	$ 16,078,993	$ 25,259,323	$ 68,797,541	$ 84,888,634	$ 153,686,175
2016	2,383,652	23,939	49,056	4,770	36,387	92,000	206,152	2,177,500	$ 8,138,521	$ 17,498,063	$ 1,822,641	$ 16,078,993	$ 32,474,467	$ 76,012,685	$ 82,745,002	$ 158,757,687
2017	2,637,145	23,939	49,056	4,770	36,387	92,000	206,152	2,430,993	$ 8,138,521	$ 17,498,063	$ 1,822,641	$ 16,078,993	$ 27,564,702	$ 71,102,920	$ 316,029,098	$ 387,132,018
2005 through 2012:																
Total	**1,163,652**	**39,392**	**95,659**	**6,640**	**87,282**	**368,000**	**596,973**	**566,679**	**$ 14,439,509**	**$ 36,766,029**	**$ 2,552,288**	**$ 39,636,757**	**$ 65,018,437**	**$ 158,413,020**	**$ 442,083,191**	**$ 600,496,211**
NPV									**$ 11,401,703**	**$ 29,519,699**	**$ 1,976,625**	**$ 29,549,650**	**$ 47,067,081**	**$ 115,614,938**	**$ 297,695,889**	**$ 376,662,447**
2005 through 2017:																
Total	**10,600,630**	**159,087**	**340,939**	**30,490**	**269,217**	**830,000**	**1,629,733**	**8,970,897**	**55,132,114**	**124,256,344**	**11,665,493**	**120,031,722**	**212,615,440**	**523,701,113**	**1,101,681,999**	**$ 1,625,383,112**
NPV									**$ 34,580,815**	**$ 79,355,481**	**$ 7,167,641**	**$ 71,180,709**	**$ 123,834,746**	**$ 305,109,944**	**$ 514,990,930**	**$ 723,385,127**

Note: [1]Includes Estimated Solar RPS Expenditures (SACP + SREC) and REIP and/or CORE Solar Rebate Expenditures.
Source: Company Response to RCR-A-1 and RCR-P-15; "EDC Solar Long-term Contracting Program Analysis," Center for Energy, Economic and Environmental Policy May 3, 2012; OCE Compliance Results; and Docket No. ER12070606, Direct Testimony of Stephen Swetz, Schedule SS-S4A-2a.

Total SRECs and Ratepayer Expense, with SFAE

Energy Year	Current Solar RPS	Total SRECs: ACE	JCP&L	RF	PSE&G: Solar Loan I & II	PSE&G: Solar for All	PSE&G: Solar for All Ext	Total EDCs	Remaining SREC Market	Utility Supported Funded Programs: ACE	JCP&L	RF	PSE&G: Solar Loan I & II	PSE&G: Solar for All	PSE&G: Solar for All Ext	Total EDCs	Remaining SREC Market[1]	Total
		(SRECs)								($)								
2005	5,714	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	5,714	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	$ 47,695,793	$ 47,695,793
2006	10,450	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	10,450	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	$ 80,442,096	$ 80,442,096
2007	32,743	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	32,743	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	$ 65,439,838	$ 65,439,838
2008	65,384	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	65,384	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	$ 61,905,188	$ 61,905,188
2009	130,266	n.a.	n.a.	n.a.	3,397	92,000	n.a.	95,397	34,869	n.a.	n.a.	n.a.	$ 1,613,636	$ 439,633	n.a.	$ 2,053,269	$ 19,555,523	$ 21,608,793
2010	171,095	2,588	13,368	111	17,194	92,000	n.a.	125,261	45,834	$ 964,176	$ 5,435,400	$ 51,224	$ 8,166,904	$ 9,641,591	n.a.	$ 24,259,295	$ 28,040,745	$ 52,300,039
2011	306,000	12,865	33,235	1,759	30,304	92,000	n.a.	170,163	135,837	$ 5,336,812	$ 13,832,566	$ 678,423	$ 13,777,224	$ 17,222,238	n.a.	$ 50,847,263	$ 76,952,792	$ 127,800,056
2012	442,000	23,939	49,056	4,770	36,387	92,000	n.a.	206,152	235,848	$ 8,138,521	$ 17,498,063	$ 1,822,641	$ 16,078,993	$ 37,714,975	n.a.	$ 81,253,193	$ 62,051,216	$ 143,304,408
2013	596,000	23,939	49,056	4,770	36,387	92,000	n.a.	206,152	389,848	$ 8,138,521	$ 17,498,063	$ 1,822,641	$ 16,078,993	$ 31,888,979	n.a.	$ 75,427,197	$ 46,781,760	$ 122,208,957
2014	1,726,615	23,939	49,056	4,770	36,387	93,000	2,229	209,381	1,517,234	$ 8,138,521	$ 17,498,063	$ 1,822,641	$ 16,078,993	$ 30,409,532	$ 8,899,474	$ 82,847,224	$ 128,964,849	$ 211,812,073
2015	2,093,566	23,939	49,056	4,770	36,387	93,000	20,545	227,697	1,865,869	$ 8,138,521	$ 17,498,063	$ 1,822,641	$ 16,078,993	$ 25,259,323	$ 28,108,684	$ 96,906,225	$ 83,964,109	$ 180,870,334
2016	2,383,652	23,939	49,056	4,770	36,387	92,000	56,168	262,320	2,121,332	$ 8,138,521	$ 17,498,063	$ 1,822,641	$ 16,078,993	$ 32,474,467	$ 50,824,705	$ 126,837,390	$ 80,610,618	$ 207,448,008
2017	2,637,145	23,939	49,056	4,770	36,387	92,000	110,764	316,916	2,320,229	$ 8,138,521	$ 17,498,063	$ 1,822,641	$ 16,078,993	$ 27,564,702	$ 81,269,910	$ 152,372,830	$ 301,629,778	$ 454,002,609
2005 through 2012:																		
Total	**1,163,652**	**39,392**	**95,659**	**6,640**	**87,282**	**368,000**	**-**	**596,973**	**566,679**	**$ 14,439,509**	**$ 36,766,029**	**$ 2,552,288**	**$ 39,636,757**	**$ 65,018,437**	**$ -**	**$ 158,413,020**	**$ 442,083,191**	**$ 600,496,211**
NPV										**$ 11,401,703**	**$ 29,519,699**	**$ 1,976,625**	**$ 29,549,650**	**$ 47,067,081**	**$ -**	**$ 115,614,938**	**$ 297,695,889**	**$ 376,662,447**
2005 through 2017:																		
Total		**159,887**	**340,939**	**30,490**	**269,217**	**830,000**	**189,706**	**1,819,439**	**8,781,191**	**$ 55,132,114**	**$ 124,256,344**	**$ 11,665,493**	**$ 120,031,722**	**$ 212,615,448**	**$ 169,102,773**	**$ 692,803,886**	**$ 1,084,034,305**	**$ 1,776,838,191**
NPV										**$ 34,580,815**	**$ 79,355,481**	**$ 7,167,641**	**$ 71,180,709**	**$ 123,834,746**	**$ 125,014,544**	**$ 382,734,140**	**$ 509,742,792**	**$ 771,155,359**

Note: [1]Includes Estimated Solar RPS Expenditures (SACP + SREC) and REIP and/or CORE Solar Rebate Expenditures.
Source: Company Response to RCR-A-1 and RCR-P-15; "EDC Solar Long-term Contracting Program Analysis," Center for Energy, Economic and Environmental Policy May 3, 2012; OCE Compliance Results; and Docket No. ER12070606, Direct Testimony of Stephen Swetz, Schedule SS-S4A-2a.

Net Economic Impacts using 100 Percent In-State Labor

Year	Economic Impacts - Output (million $)											
	Construction and O&M				Rate Impact				Total			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
2013	$ 19.42	$ 6.98	$ 11.07	$ 37.47	$ (1.49)	$ (0.38)	$ (0.94)	$ (2.79)	$ 17.94	$ 6.60	$ 10.13	$ 34.68
2014	52.37	18.57	29.54	100.48	(7.58)	(1.94)	(4.78)	(14.21)	44.79	16.63	24.76	86.27
2015	107.01	37.84	60.23	205.08	(23.51)	(6.01)	(14.83)	(44.08)	83.50	31.83	45.40	161.00
2016	106.62	39.45	62.31	208.37	(41.84)	(10.70)	(26.39)	(78.45)	64.77	28.74	35.92	129.91
2017	41.63	19.82	30.17	91.62	(68.77)	(17.59)	(43.37)	(128.94)	(27.14)	2.23	(13.21)	(37.33)
2018	4.81	7.97	10.99	23.77	(64.07)	(16.38)	(40.40)	(120.12)	(59.25)	(8.42)	(29.42)	(96.35)
2019	4.94	8.18	11.28	24.40	(54.53)	(13.95)	(34.39)	(102.24)	(49.59)	(5.77)	(23.11)	(77.84)
2020	5.08	8.40	11.58	25.06	(45.85)	(11.73)	(28.92)	(85.97)	(40.78)	(3.33)	(17.33)	(60.91)
2021	5.21	8.62	11.89	25.73	(39.42)	(10.08)	(24.86)	(73.91)	(34.21)	(1.46)	(12.97)	(48.19)
2022	5.35	8.85	12.21	26.42	(32.78)	(8.38)	(20.67)	(61.46)	(27.43)	0.47	(8.46)	(35.05)
2023	6.98	9.59	13.34	29.90	(29.79)	(7.62)	(18.79)	(55.85)	(22.81)	1.97	(5.45)	(25.95)
2024	9.27	10.55	14.83	34.65	(28.87)	(7.38)	(18.21)	(54.12)	(19.60)	3.17	(3.38)	(19.47)
2025	14.36	12.46	17.83	44.65	(30.26)	(7.74)	(19.08)	(56.74)	(15.90)	4.72	(1.25)	(12.09)
2026	14.19	12.60	18.01	44.80	(32.47)	(8.30)	(20.48)	(60.88)	(18.28)	4.30	(2.47)	(16.08)
2027	9.42	11.21	15.72	36.35	(32.66)	(8.35)	(20.60)	(61.24)	(23.25)	2.86	(4.88)	(24.89)
2028	6.27	10.38	14.31	30.96	(32.12)	(8.21)	(20.25)	(60.22)	(25.84)	2.16	(5.94)	(29.25)
2029	6.37	10.54	14.54	31.46	(29.65)	(7.58)	(18.70)	(55.59)	(23.28)	2.96	(4.16)	(24.13)
2030	6.02	9.96	13.74	29.72	(38.95)	(9.96)	(24.56)	(73.03)	(32.93)	0.00	(10.82)	(43.30)
2031	6.19	10.23	14.11	30.53	(38.95)	(9.96)	(24.56)	(73.03)	(32.76)	0.27	(10.45)	(42.50)
2032	6.35	10.51	14.50	31.36	(38.95)	(9.96)	(24.56)	(73.03)	(32.60)	0.55	(10.07)	(41.67)
2033	6.26	10.36	14.29	30.91	(38.95)	(9.96)	(24.56)	(73.03)	(32.69)	0.40	(10.27)	(42.12)
2034	6.41	10.60	14.63	31.64	(38.95)	(9.96)	(24.56)	(73.03)	(32.54)	0.64	(9.94)	(41.38)
2035	6.34	10.49	14.47	31.30	(38.95)	(9.96)	(24.56)	(73.03)	(32.61)	0.53	(10.09)	(41.72)
2036	4.68	7.73	10.67	23.08	(38.95)	(9.96)	(24.56)	(73.03)	(34.27)	(2.23)	(13.90)	(49.95)
TOTAL	**$ 461.55**	**$ 311.89**	**$ 456.25**	**$ 1,229.70**	**$ (868.32)**	**$ (222.07)**	**$ (547.60)**	**$ (1,628.02)**	**$ (406.76)**	**$ 89.82**	**$ (91.35)**	**$ (398.32)**
NPV	**$ 256.69**	**$ 125.25**	**$ 190.03**	**$ 571.97**	**$ (264.11)**	**$ (67.55)**	**$ (166.56)**	**$ (495.19)**	**$ (7.43)**	**$ 57.71**	**$ 23.47**	**$ 76.78**

Net Economic Impacts using 100 Percent In-State Labor

Year	Economic Impacts - Employment (number of jobs)											
	Construction and O&M				Rate Impact				Total			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
2013	227	37	66	330	(15)	(1)	(4)	(20)	212	36	62	310
2014	612	99	176	887	(75)	(4)	(22)	(101)	537	95	154	786
2015	1250	202	358	1811	(233)	(13)	(67)	(312)	1018	189	292	1499
2016	1246	211	371	1827	(414)	(23)	(119)	(556)	832	188	252	1272
2017	487	106	180	772	(680)	(38)	(195)	(913)	(193)	68	(16)	(141)
2018	57	43	65	165	(634)	(35)	(182)	(851)	(577)	8	(117)	(686)
2019	58	44	67	169	(539)	(30)	(155)	(724)	(481)	14	(88)	(555)
2020	60	45	69	174	(453)	(25)	(130)	(609)	(394)	20	(61)	(435)
2021	61	46	71	178	(390)	(22)	(112)	(523)	(329)	25	(41)	(345)
2022	63	48	73	183	(324)	(18)	(93)	(435)	(261)	30	(20)	(252)
2023	82	51	79	213	(295)	(16)	(85)	(395)	(213)	35	(5)	(183)
2024	109	57	88	254	(286)	(16)	(82)	(383)	(177)	41	6	(130)
2025	168	67	106	341	(299)	(17)	(86)	(402)	(131)	50	20	(61)
2026	166	68	107	341	(321)	(18)	(92)	(431)	(155)	50	15	(90)
2027	111	60	94	264	(323)	(18)	(93)	(434)	(212)	42	1	(169)
2028	74	56	85	215	(318)	(18)	(91)	(426)	(244)	38	(6)	(212)
2029	75	57	87	218	(293)	(16)	(84)	(394)	(218)	40	2	(175)
2030	71	53	82	206	(385)	(21)	(111)	(517)	(314)	32	(29)	(311)
2031	73	55	84	212	(385)	(21)	(111)	(517)	(312)	34	(27)	(305)
2032	75	56	86	218	(385)	(21)	(111)	(517)	(310)	35	(24)	(300)
2033	74	56	85	214	(385)	(21)	(111)	(517)	(312)	34	(26)	(303)
2034	75	57	87	220	(385)	(21)	(111)	(517)	(310)	36	(24)	(298)
2035	75	56	86	217	(385)	(21)	(111)	(517)	(311)	35	(24)	(300)
2036	55	42	64	160	385	21	111	517	440	63	174	677
TOTAL	**5,403**	**1,670**	**2,716**	**9,790**	**(7,818)**	**(431)**	**(2,245)**	**(10,494)**	**(2,414)**	**1,239**	**472**	**(704)**

Net Economic Impacts using 100 Percent In-State Labor

Year	Economic Impacts - Labor Income (million $)											
	Construction and O&M				Rate Impact				Total			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
2013	$ 14.51	$ 2.22	$ 3.30	$ 20.04	$ (0.71)	$ (0.05)	$ (0.28)	$ (1.04)	$ 13.80	$ 2.17	$ 3.03	$ 19.00
2014	39.11	5.91	8.81	53.87	(3.63)	(0.28)	(1.40)	(5.31)	35.48	5.63	7.41	48.56
2015	79.93	12.05	17.97	110.01	(11.27)	(0.86)	(4.35)	(16.47)	68.66	11.19	13.62	93.53
2016	79.64	12.56	18.54	110.86	(20.05)	(1.53)	(7.74)	(29.32)	59.59	11.03	10.80	81.54
2017	31.11	6.32	8.84	46.46	(32.96)	(2.51)	(12.72)	(48.19)	(1.84)	3.81	(3.88)	(1.73)
2018	3.62	2.55	3.09	9.45	(30.70)	(2.34)	(11.85)	(44.89)	(27.08)	0.21	(8.77)	(35.44)
2019	3.71	2.61	3.17	9.71	(26.13)	(1.99)	(10.09)	(38.21)	(22.42)	0.62	(6.92)	(28.50)
2020	3.81	2.68	3.25	9.97	(21.97)	(1.67)	(8.48)	(32.13)	(18.16)	1.01	(5.23)	(22.16)
2021	3.92	2.75	3.34	10.23	(18.89)	(1.44)	(7.29)	(27.62)	(14.97)	1.32	(3.95)	(17.39)
2022	4.02	2.83	3.43	10.51	(15.71)	(1.20)	(6.06)	(22.97)	(11.69)	1.63	(2.63)	(12.46)
2023	5.24	3.06	3.76	12.29	(14.27)	(1.09)	(5.51)	(20.87)	(9.04)	1.98	(1.75)	(8.58)
2024	6.95	3.37	4.20	14.76	(13.83)	(1.05)	(5.34)	(20.23)	(6.88)	2.32	(1.14)	(5.47)
2025	10.75	3.98	5.09	20.07	(14.50)	(1.10)	(5.60)	(21.20)	(3.75)	2.87	(0.50)	(1.14)
2026	10.62	4.02	5.14	20.04	(15.56)	(1.19)	(6.01)	(22.75)	(4.94)	2.84	(0.87)	(2.71)
2027	7.06	3.58	4.45	15.35	(15.65)	(1.19)	(6.04)	(22.89)	(8.59)	2.39	(1.59)	(7.54)
2028	4.71	3.32	4.02	12.32	(15.39)	(1.17)	(5.94)	(22.50)	(10.68)	2.14	(1.92)	(10.19)
2029	4.79	3.37	4.08	12.51	(14.21)	(1.08)	(5.49)	(20.78)	(9.42)	2.29	(1.40)	(8.26)
2030	4.52	3.18	3.86	11.82	(18.66)	(1.42)	(7.21)	(27.29)	(14.14)	1.76	(3.35)	(15.47)
2031	4.65	3.27	3.96	12.14	(18.66)	(1.42)	(7.21)	(27.29)	(14.02)	1.85	(3.24)	(15.15)
2032	4.77	3.36	4.07	12.47	(18.66)	(1.42)	(7.21)	(27.29)	(13.89)	1.94	(3.13)	(14.82)
2033	4.71	3.31	4.01	12.29	(18.66)	(1.42)	(7.21)	(27.29)	(13.96)	1.89	(3.19)	(15.00)
2034	4.82	3.39	4.11	12.59	(18.66)	(1.42)	(7.21)	(27.29)	(13.85)	1.97	(3.10)	(14.71)
2035	4.77	3.35	4.06	12.45	(18.66)	(1.42)	(7.21)	(27.29)	(13.90)	1.93	(3.14)	(14.84)
2036	3.51	2.47	3.00	9.18	(18.66)	(1.42)	(7.21)	(27.29)	(15.15)	1.05	(4.21)	(18.11)
TOTAL	**$ 345.26**	**$ 99.51**	**$ 131.58**	**$ 581.39**	**$ (416.08)**	**$ (31.70)**	**$ (160.64)**	**$ (608.43)**	**$ (70.82)**	**$ 67.81**	**$ (29.07)**	**$ (27.04)**
NPV	**$ 191.85**	**$ 39.92**	**$ 55.64**	**$ 288.67**	**$ (126.56)**	**$ (9.64)**	**$ (48.86)**	**$ (185.06)**	**$ 65.29**	**$ 30.28**	**$ 6.78**	**$ 103.61**

Net Economic Impacts using PSE&G Reallocation Proposals

	Economic Impacts - Output (million $)											
	Construction and O&M				Rate Impact				Total			
Year	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
2013	$ 13.15	$ 4.60	$ 7.86	$ 25.61	$ (1.49)	$ (0.38)	$ (0.94)	$ (2.79)	$ 11.66	$ 4.22	$ 6.92	$ 22.82
2014	35.38	12.15	20.80	68.33	(7.58)	(1.94)	(4.78)	(14.21)	27.80	10.21	16.02	54.12
2015	72.27	24.71	42.34	139.31	(23.51)	(6.01)	(14.83)	(44.08)	48.76	18.69	27.51	95.23
2016	72.46	26.57	45.02	144.05	(41.84)	(10.70)	(26.39)	(78.45)	30.62	15.87	18.63	65.59
2017	29.46	15.32	24.78	69.57	(68.77)	(17.59)	(43.37)	(128.94)	(39.31)	(2.27)	(18.59)	(59.38)
2018	4.91	8.13	12.11	25.16	(64.07)	(16.38)	(40.40)	(120.12)	(59.16)	(8.25)	(28.29)	(94.96)
2019	5.04	8.35	12.44	25.83	(54.53)	(13.95)	(34.39)	(102.24)	(49.49)	(5.60)	(21.95)	(76.41)
2020	5.18	8.57	12.77	26.52	(45.85)	(11.73)	(28.92)	(85.97)	(40.67)	(3.16)	(16.14)	(59.45)
2021	5.32	8.80	13.11	27.23	(39.42)	(10.08)	(24.86)	(73.91)	(34.11)	(1.28)	(11.75)	(46.68)
2022	5.46	9.04	13.47	27.96	(32.78)	(8.38)	(20.67)	(61.46)	(27.32)	0.65	(7.21)	(33.50)
2023	6.60	9.59	14.37	30.56	(29.79)	(7.62)	(18.79)	(55.85)	(23.19)	1.97	(4.42)	(25.30)
2024	8.19	10.29	15.52	34.00	(28.87)	(7.38)	(18.21)	(54.12)	(20.68)	2.91	(2.68)	(20.12)
2025	11.65	11.58	17.71	40.94	(30.26)	(7.74)	(19.08)	(56.74)	(18.61)	3.84	(1.38)	(15.80)
2026	11.59	11.78	17.98	41.35	(32.47)	(8.30)	(20.48)	(60.88)	(20.88)	3.47	(2.50)	(19.53)
2027	8.45	11.01	16.58	36.04	(32.66)	(8.35)	(20.60)	(61.24)	(24.21)	2.66	(4.02)	(25.20)
2028	6.40	10.59	15.78	32.77	(32.12)	(8.21)	(20.25)	(60.22)	(25.72)	2.38	(4.47)	(27.44)
2029	6.50	10.76	16.04	33.30	(29.65)	(7.58)	(18.70)	(55.59)	(23.15)	3.18	(2.66)	(22.29)
2030	6.14	10.17	15.15	31.46	(38.95)	(9.96)	(24.56)	(73.03)	(32.81)	0.21	(9.41)	(41.57)
2031	6.31	10.44	15.56	32.32	(38.95)	(9.96)	(24.56)	(73.03)	(32.64)	0.48	(9.00)	(40.71)
2032	6.48	10.73	15.98	33.19	(38.95)	(9.96)	(24.56)	(73.03)	(32.47)	0.77	(8.58)	(39.84)
2033	6.39	10.57	15.76	32.72	(38.95)	(9.96)	(24.56)	(73.03)	(32.56)	0.61	(8.81)	(40.31)
2034	6.54	10.82	16.13	33.49	(38.95)	(9.96)	(24.56)	(73.03)	(32.41)	0.86	(8.43)	(39.54)
2035	6.47	10.71	15.96	33.13	(38.95)	(9.96)	(24.56)	(73.03)	(32.48)	0.75	(8.61)	(39.89)
2036	4.77	7.89	11.76	24.43	(38.95)	(9.96)	(24.56)	(73.03)	(34.18)	(2.07)	(12.80)	(48.60)
TOTAL	**$ 351.09**	**$ 273.18**	**$ 424.98**	**$ 1,049.25**	**$ (868.32)**	**$ (222.07)**	**$ (547.60)**	**$ (1,628.02)**	**$ (517.23)**	**$ 51.11**	**$ (122.62)**	**$ (578.77)**
NPV	**$ 182.48**	**$ 97.90**	**$ 157.76**	**$ 438.14**	**$ (264.11)**	**$ (67.55)**	**$ (166.56)**	**$ (495.19)**	**$ (81.63)**	**$ 30.36**	**$ (8.80)**	**$ (57.05)**

Net Economic Impacts using PSE&G Reallocation Proposals

Year	Economic Impacts - Employment (number of jobs)											
	Construction and O&M				Rate Impact				Total			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
2013	184	24	47	255	(15)	(1)	(4)	(20)	169	24	43	235
2014	495	64	124	683	(75)	(4)	(22)	(101)	420	60	102	583
2015	1011	131	252	1394	(233)	(13)	(67)	(312)	779	118	185	1082
2016	1011	141	268	1420	(414)	(23)	(119)	(556)	597	118	149	864
2017	403	82	147	632	(680)	(38)	(195)	(913)	(277)	44	(48)	(281)
2018	58	44	72	173	(634)	(35)	(182)	(851)	(576)	9	(110)	(677)
2019	59	45	74	178	(539)	(30)	(155)	(724)	(480)	15	(81)	(546)
2020	61	46	76	183	(453)	(25)	(130)	(609)	(393)	21	(54)	(426)
2021	62	47	78	188	(390)	(22)	(112)	(523)	(327)	26	(34)	(336)
2022	64	48	80	193	(324)	(18)	(93)	(435)	(260)	31	(13)	(242)
2023	80	51	86	217	(295)	(16)	(85)	(395)	(215)	35	1	(179)
2024	102	55	92	249	(286)	(16)	(82)	(383)	(184)	39	10	(134)
2025	150	62	105	318	(299)	(17)	(86)	(402)	(149)	45	19	(84)
2026	149	63	107	319	(321)	(18)	(92)	(431)	(172)	45	15	(112)
2027	104	59	99	262	(323)	(18)	(93)	(434)	(219)	41	6	(172)
2028	75	57	94	226	(318)	(18)	(91)	(426)	(242)	39	3	(200)
2029	76	58	95	230	(293)	(16)	(84)	(394)	(217)	42	11	(164)
2030	72	55	90	217	(385)	(21)	(111)	(517)	(313)	33	(20)	(300)
2031	74	56	93	223	(385)	(21)	(111)	(517)	(311)	35	(18)	(294)
2032	76	58	95	229	(385)	(21)	(111)	(517)	(309)	36	(15)	(288)
2033	75	57	94	226	(385)	(21)	(111)	(517)	(310)	35	(17)	(291)
2034	77	58	96	231	(385)	(21)	(111)	(517)	(308)	37	(15)	(286)
2035	76	57	95	228	(385)	(21)	(111)	(517)	(309)	36	(16)	(289)
2036	56	42	70	168	385	21	111	517	441	64	181	686
TOTAL	**4,652**	**1,460**	**2,530**	**8,642**	**(7,818)**	**(431)**	**(2,245)**	**(10,494)**	**(3,166)**	**1,029**	**285**	**(1,852)**

Net Economic Impacts using PSE&G Reallocation Proposals

Year	Economic Impacts - Labor Income (million $) Construction and O&M Direct	Indirect	Induced	Total	Rate Impact Direct	Indirect	Induced	Total	Total Direct	Indirect	Induced	Total
2013	$ 11.82	$ 1.46	$ 2.34	$ 15.63	$ (0.71)	$ (0.05)	$ (0.28)	$ (1.04)	$ 11.11	$ 1.40	$ 2.06	$ 14.59
2014	31.84	3.84	6.19	41.91	(3.63)	(0.28)	(1.40)	(5.31)	28.21	3.57	4.79	36.60
2015	65.05	7.82	12.61	85.55	(11.27)	(0.86)	(4.35)	(16.47)	53.79	6.96	8.26	69.08
2016	65.02	8.42	13.35	86.91	(20.05)	(1.53)	(7.74)	(29.32)	44.97	6.89	5.61	57.59
2017	25.90	4.87	7.21	38.19	(32.96)	(2.51)	(12.72)	(48.19)	(7.06)	2.36	(5.51)	(10.00)
2018	3.65	2.60	3.40	9.88	(30.70)	(2.34)	(11.85)	(44.89)	(27.05)	0.26	(8.45)	(35.01)
2019	3.75	2.67	3.49	10.14	(26.13)	(1.99)	(10.09)	(38.21)	(22.38)	0.68	(6.59)	(28.06)
2020	3.85	2.74	3.59	10.42	(21.97)	(1.67)	(8.48)	(32.13)	(18.12)	1.07	(4.90)	(21.71)
2021	3.95	2.81	3.68	10.69	(18.89)	(1.44)	(7.29)	(27.62)	(14.94)	1.37	(3.61)	(16.93)
2022	4.06	2.89	3.78	10.98	(15.71)	(1.20)	(6.06)	(22.97)	(11.65)	1.69	(2.28)	(11.99)
2023	5.07	3.07	4.05	12.43	(14.27)	(1.09)	(5.51)	(20.87)	(9.21)	1.98	(1.47)	(8.44)
2024	6.48	3.29	4.38	14.41	(13.83)	(1.05)	(5.34)	(20.23)	(7.35)	2.23	(0.96)	(5.81)
2025	9.58	3.70	5.03	18.58	(14.50)	(1.10)	(5.60)	(21.20)	(4.92)	2.59	(0.57)	(2.62)
2026	9.50	3.76	5.11	18.65	(15.56)	(1.19)	(6.01)	(22.75)	(6.06)	2.57	(0.90)	(4.10)
2027	6.64	3.52	4.68	15.12	(15.65)	(1.19)	(6.04)	(22.89)	(9.01)	2.33	(1.36)	(7.77)
2028	4.76	3.39	4.43	12.87	(15.39)	(1.17)	(5.94)	(22.50)	(10.63)	2.21	(1.51)	(9.63)
2029	4.83	3.44	4.50	13.08	(14.21)	(1.08)	(5.49)	(20.78)	(9.37)	2.36	(0.98)	(7.70)
2030	4.57	3.25	4.26	12.36	(18.66)	(1.42)	(7.21)	(27.29)	(14.10)	1.83	(2.95)	(14.93)
2031	4.69	3.34	4.37	12.69	(18.66)	(1.42)	(7.21)	(27.29)	(13.97)	1.92	(2.83)	(14.60)
2032	4.82	3.43	4.49	13.04	(18.66)	(1.42)	(7.21)	(27.29)	(13.84)	2.01	(2.72)	(14.26)
2033	4.75	3.38	4.43	12.85	(18.66)	(1.42)	(7.21)	(27.29)	(13.91)	1.96	(2.78)	(14.44)
2034	4.86	3.46	4.53	13.15	(18.66)	(1.42)	(7.21)	(27.29)	(13.80)	2.04	(2.68)	(14.14)
2035	4.81	3.42	4.48	13.01	(18.66)	(1.42)	(7.21)	(27.29)	(13.85)	2.00	(2.72)	(14.28)
2036	3.55	2.52	3.30	9.59	(18.66)	(1.42)	(7.21)	(27.29)	(15.12)	1.10	(3.90)	(17.70)
TOTAL	**$ 297.82**	**$ 87.09**	**$ 121.69**	**$ 512.16**	**$ (416.08)**	**$ (31.70)**	**$ (160.64)**	**$ (608.43)**	**$ (118.27)**	**$ 55.39**	**$ (38.95)**	**$ (96.26)**
NPV	**$ 160.04**	**$ 31.13**	**$ 45.85**	**$ 238.41**	**$ (126.56)**	**$ (9.64)**	**$ (48.86)**	**$ (185.06)**	**$ 33.48**	**$ 21.49**	**$ (3.01)**	**$ 53.35**