CONSULTANT REPORT

EVALUATION OF THE 2013 DELAWARE SREC PROCUREMENT PROGRAM

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1. INTRODUCTION AND EXECUTIVE SUMMARY

From March 25 to April 12, 2013, the Delaware Sustainable Energy Utility ("SEU"), through its contractor SRECTrade, Inc. ("SRECTrade"), conducted a solicitation for solar renewable energy credits ("SRECs") under long-term contracts. The SRECs purchased by the SEU will be acquired by Delmarva Power and Light Company ("Delmarva Power") for the purpose of meeting Delmarva Power's obligations under the Delaware Renewable Energy Portfolio Standards Act ("REPSA"). The solicitation design was developed and recommended by the Delaware Renewable Energy Taskforce ("RETF"), and Delmarva Power's participation in the program was approved by the Delaware Public Service Commission ("Commission") in Order No. 8281 issued on January 22, 2013.[1] In its order, the Commission approved the Commission staff's recommendation that an independent consultant be retained to review the solicitation and to provide a report to the Commission. The Commission staff recommended that the consultant address a variety of matters, including:

- The robustness of the response to the solicitation;
- The structure of the solicitation with regard to tiers;
- The extent to which SREC prices should be determined by competitive bidding;
- The effect of the SEU's involvement in terms of cost of administration;
- The quality of the conduct of the solicitation.[2]

The Commission retained New Energy Opportunities, Inc. ("New Energy Opportunities"), in conjunction with La Capra Associates, Inc. ("La Capra Associates"), to provide this report.

This solicitation, the 2013 Delaware SREC Procurement Program, followed the 2012 SREC Procurement Pilot Program conducted last year.[3] There were several major differences in the design of the program for 2012:

- The 2013 program involved an auction process for existing projects as well as new projects (the pilot program was only for new projects);
- The tier structure was modified so that for new projects there were three tiers instead of four tiers; in addition, there were two additional tiers for existing projects;

[1] P.S.C. Docket No. 12-526.

[2] Report From the Delaware Public Service Commission Staff on Delmarva Power and Light Company's Application for Approval of the 2013 Program for the Procurement of Solar Renewable Energy Credits, PSC Docket No. 12-526 (January 11, 2013), pp. 14-16.

[3] New Energy Opportunities and La Capra Associates (a) advised the Commission staff in its participation with the RETF regarding the development of the pilot program and (b) provided a report on the pilot program in connection with the regulatory approval process before the Commission in Docket No. 11-399.

- In all tiers, bid selection was based on a price-only "pay as bid" competitive bidding process, rather than using a combination of competitive bidding for larger projects and administratively-set pricing for smaller projects, as in the pilot program;
- Use of Delaware equipment and/or Delaware labor was not used as the primary selection criterion (as it was in the pilot program for those tiers using administratively-set pricing where the auction was oversubscribed);
- Participants bid prices for years 1-7 of the contract term; for years 8-20 of the contract term, SRECs are paid at $50.00 per SREC. The 2012 Pilot Program contract term was also 20 years, but the bid/administratively set price was paid for years 1-10, with $50.00 per SREC paid for years 11-20.
- There was also a separate auction for short-term contracts (spot market) for existing projects in the 2013 program.

The level of participation in the 2013 SREC procurement auction process was robust. Of the target procurement of 7,000 SRECs/year, there were bids for 22,659 SRECs/year, more than triple the target procurement. The systems bid totaled over 17 MW in capacity, with the successful bids totaling approximately 5.5 MW in capacity.

There were almost 800 bids for individual systems, with 387 successful bids, almost a 50% success rate. Levelized prices of winning bids over the 20-year contract term averaged $56/SREC for new projects and less than $45/SREC for existing projects, much less than the pricing for new projects in the 2012 pilot program. In part II of this report, we summarize and assess the structure of the 2013 SREC Procurement Program. In part III, we analyze the results of the solicitation and a survey conducted of participants (i.e., bidders) in the solicitation. In part IV, we assess the conduct of the solicitation, including the roles of the SEU and SRECTrade, and the cost of administration of the SREC procurement process. In part V, we discuss a number of policy issues and address how the program could be better designed to minimize ratepayer costs given the other objectives set forth in the REPSA.

2. 2013 SREC PROCUREMENT PROGRAM: SOLICITATION DESIGN AND MARKET RESPONSE

2.1 OVERALL SOLICITATION DESIGN

The 2013 Delaware SREC Procurement Program had a target procurement of 8,000 SRECs/year, with 4,000 SRECs to be procured from new facilities and 4,000 SRECs to be procured from existing facilities:

- Procurement of SRECs from new solar PV facilities (defined as facilities with final interconnection approvals after April 2, 2012)[4]: 4,000 SRECs
- Procurement of SRECs from existing facilities (final interconnection approvals obtained before April 2, 2012): 3,000 SRECs
- Spot market purchases: 1,000 SRECs

This breakdown differed from the 2012 pilot program, which provided for procurement of 11,472 SRECs from new facilities (defined in the pilot program as facilities with final interconnection approvals on or after December 1, 2010).

With respect to new facilities, the 2013 program had three tiers, for which competitive bids were used to select winners, while the 2012 pilot program had four tiers, for which two tiers for smaller projects used administratively-set prices and a lottery system to select winning bidders. Table 1 compares the 2013 solicitation amounts for new facilities (SRECs/year) by tier to those for the 2012 pilot program.

[4] April 2, 2012 was the first date of the pilot program auction.

TABLE 1 – NEW PROJECTS: 2013 SOLICITATION COMPARED TO 2012 PILOT PROGRAM

2013 Solicitation			
Tier	Size (kW)	Volume	Procurement Method
N-1	0-30	1,200	Competitive auction
N-2	>30-200	1,400	Competitive auction
N-3	>200-2,000	1,400	Competitive auction
Total		4,000	
2012 Pilot Program			
Tier	Size (kW)	Volume	Procurement Method
1	0-50	2,972	Administratively-set prices/lottery
2A	>50-250	2,000	Administratively-set prices/lottery
2B	>250-500	2,000	Competitive auction
3	>500-2,000	4,500	Competitive auction
Total		11,472	

Tier N-1 is comparable to Tier 1 under the pilot program, except the size limit was reduced from 50 kW to 30 kW, which is more reflective of upper size limits for residential systems. Tier N-2 is comparable to the former Tier 2A under the pilot program, but also with a lower upper size limit (200 kW compared to 250 kW). These two tiers were competitively bid under the 2013 solicitation, while they were subject to administratively-set pricing and a lottery under the pilot program. Tier N-3 is comparable to a combination of Tiers 2B and Tier 3 under the pilot program.

For the 2013 program, bids were for 20-year contracts, with the last 13 years having a set price of $50/SREC. Bidders submitted one price bid per project for the first seven contract years. This compares with the 2012 pilot program, which also offered 20-year contracts, but with the last 10 years having a set price of $50/SREC with the price for the first 10 years a bid price or an administratively-set price, depending on the tier.

Of the 4,000 SRECs to be procured from existing projects in the 2013 program, 3,000 SRECs were to be procured as part of the same procurement process and the with same contract terms as for new projects (see Table 2). SRECs from existing projects were not part of the 2012 pilot program.

TABLE 2 – EXISTING PROJECTS: 2013 SREC SOLICITATION

Tier	Size (kW)	Volume	Procurement Method
E-1	0-30	1,500	Competitive auction
E-2	>30-2,000	1,500	Competitive auction
Total		3,000	

Delmarva also planned to purchase 1,000 SRECs separately from existing projects under short-term contracts.

With respect to the SRECs to be procured under long-term contracts, Delmarva retained the SEU to procure the SRECs, including conducting the auction as well as contracting for the SRECs. The SEU, in turn, retained SRECTrade both to conduct the auction and to administer the contracts. Separately, Delmarva retained SRECTrade to conduct a spot auction for the purchase of SRECs from existing projects under short-term contracts.

2.2 NEW PROJECTS

With regard to the new projects, the solicitation results are summarized in Table 3 for both the 2013 solicitation and the 2012 pilot program based on annual SRECs bid.

TABLE 3 – NEW PROJECTS: WINNING BIDS, PRICES, AND TOTAL NUMBER OF SRECS BID

2013 Solicitation--Effective SRECs							
Tier	Size (kW)	Winning Bids	Wtd. Avg. Price	Levelized Price	Total Bids	Success Ratio	% of Total Winning Bids
N-1	0-30	1,215	$46.48	$48.29	2,238	54%	30%
N-2	>30-200	1,400	$86.60	$67.81	2,194	64%	35%
N-3	>200-2,000	1,385	$51.13	$50.55	10,188	14%	35%
Total		4,000	$62.13	$55.90	14,620	27%	
2012 Pilot Program--Effective SRECs							
Tier	Size (kW)	Winning Bids	Wtd. Avg. Price	Levelized Price	Total Bids	Success Ratio	% of Total Winning Bids
1*	0-50	2,972	$260	$185	6,600	45%	26%
2A*	>50-250	2,000	$240	$172	9,881	20%	17%
2B	>250-500	2,000	$130.92	$102	7,275	27%	17%
3	>500-2,000	4,500	$154.45	$118	10,220	44%	39%
Total		11,472	$ 192.61	$ 142.07	33,976	34%	
*Administratively-set prices for these tiers							

Similar information is provided in Table 4 with respect to project sizes and number of systems bid.

TABLE 4 – NEW PROJECTS: WINNING BIDS AND TOTAL BIDS BY PROJECT SIZE AND APPLICANTS

2013 Solicitation		Project Size (kW)			Number of Systems		
Tier	Size (kW)	Winning Bids	Total Bids	Success Ratio	Winning Bids	Total Bids	Success Ratio
N-1	0-30	920	1,674	55%	134	240	56%
N-2	>30-200	1,048	1,676	63%	15	27	56%
N-3	>200-2,000	902	6,949	13%	2	13	15%
Total		2,871	10,299	28%	151	280	54%
2012 Pilot Program		Project Size (kW)			Number of Systems		
Tier	Size (kW)	Winning Bids	Total Bids	Success Ratio	Winning Bids	Total Bids	Success Ratio
1*	0-50	2,007	4,722	42%	148	483	31%
2A*	>50-250	1,332	6,811	20%	9	42	20%
2B	>250-500	1,518	5,182	29%	5	14	32%
3	>500-2,000	2,828	6,698	42%	4	7	50%
Total		7,685	23,412	33%	165	546	30%
*Administratively-set prices for these tiers							

Comparing the two solicitations with respect to new projects, we note that the 2013 solicitation was significantly smaller than the pilot program, both with respect to the targeted procurement amount (and winning bids) and the total bids. While there were only 14 fewer systems bid in 2013 than in the pilot program (8% of the 2012 total), the number of effective SRECs bid was almost 20,000 SRECs less than in the pilot program, 57% of the total.[5] Even though the SRECs sought from new projects in the 2013 program was 4,000 SRECs, almost 8,500 SRECs less than in the pilot program, the total success rate of systems bid went up from 30% to 54%, while the success rate based on effective SRECs went down from 34% to 27%. This has to do with the differences in the targeted procurement amount by tier and success rates in the different tiers in the two solicitations. In the 2013 program, proportionately, the demand was weighted more to the lower tiers, Tier 1 and Tier 2, and less to larger projects (Tier 3 for 2013 and Tiers 2B and Tier 3 in the pilot program) compared to the pilot program.[6]

[5] "Effective SRECs" is a reference to the number of SRECs expected to be generated by a system, which is the sum of SRECs to be generated by metered electrical output in MWh plus additional SRECs resulting from the Delaware equipment and workforce bonus adders (10% each).

[6] In 2013, the residential-scale tier was allotted 30% of the total new system demand and approximately 55% of the bids were successful. This compares to the 2012 pilot program, where 31% of the total demand was allotted to Tier 1 with a success ratio ranging from 31% based on number of bids to 45% based on the number of effective SRECs. In 2013, the small commercial tier, Tier 2, comprised 35% of the total demand with a success ratio ranging from 56% by number of systems to 64% by effective SRECs. By contrast in 2102, the comparable tier, Tier 2A, comprised 26% of the demand with a success ratio of approximately 20%. In 2013, the large tier, Tier 3, represented 35% of demand with a success ratio of approximately

Most strikingly, the 2013 solicitation resulted in far lower prices than the 2012 pilot program. Taking the differences in the structure of the contract prices of the two solicitations into account—$50 for the last 13 of 20 years in the 2013 solicitation and $50 for the last 10 of 20 years in the pilot program—the levelized prices for Tier 1 fell from $185/SREC to $48/SREC, a reduction of $136/SREC or 74%; the levelized prices for the small commercial tier fell (Tier 2 and Tier 2A) fell from $172/SREC to $68/SREC or 61%. For the larger projects (Tier 3 and Tier 2B/Tier 3), the levelized prices fell from $114/SREC to $51/SREC, a reduction of $63/SREC or 55%.[7] The largest reductions were in the lower tiers, whose prices had been set administratively in the pilot program and were set through competitive bidding in the 2013 solicitation. Overall, the weighted average prices for the 2013 solicitation declined 61% when compared to the 2012 pilot program.

The 2013 results by tier, including the tiers for existing projects, are summarized in Table 5.

TABLE 5 – 2013 SREC PROCUREMENT RESULTS: NEW AND EXISTING PROJECTS

	Price: Winning Bids				Number of Bids		
Tier	High	Low	Wtd. Avg.	Avg. Levelized	Total	Accepted	Success %
N-1	$62.87	$0.00	$46.48	$48.29	240	134	56%
N-2	$140.00	$0.00	$86.60	$67.81	27	15	56%
N-3	$63.90	$49.00	$51.13	$50.55	13	2	15%
E-1	$50.00	$0.00	$34.59	$42.50	491	226	46%
E-2	$50.00	$0.00	$39.29	$44.79	25	10	40%
TOTAL					496	387	49%

Using bid data, we created supply curves in order to understand the relationship among the bids and the impact on prices[8] of selecting lower and higher procurement targets. The supply curves for the new project tiers are shown in the three figures below. Interestingly, the supply curve for the smallest (N-1) tier shows a relatively flat structure up to $50/SREC level indicating a large amount of similar bids below that level.

15%. By contrast in 2012, the comparable two largest tiers represented approximately 56% of demand, with a success ratio of approximately 37%.

7 The levelized price is the constant amount over the term of the contract that is based on the net present value of the prices in individual years based on a discount factor. In this case, the discount factor was 6%. For purposes of the calculation, degradation of the output of the solar PV facilities was not taken into consideration.

8 The supply curves show the marginal cost of procuring additional SRECs above the demand levels set forth in the solicitation by tier, as well as the bid price/quantity relationship below those demand levels.

FIGURE 1 – N-1 SREC SUPPLY CURVE

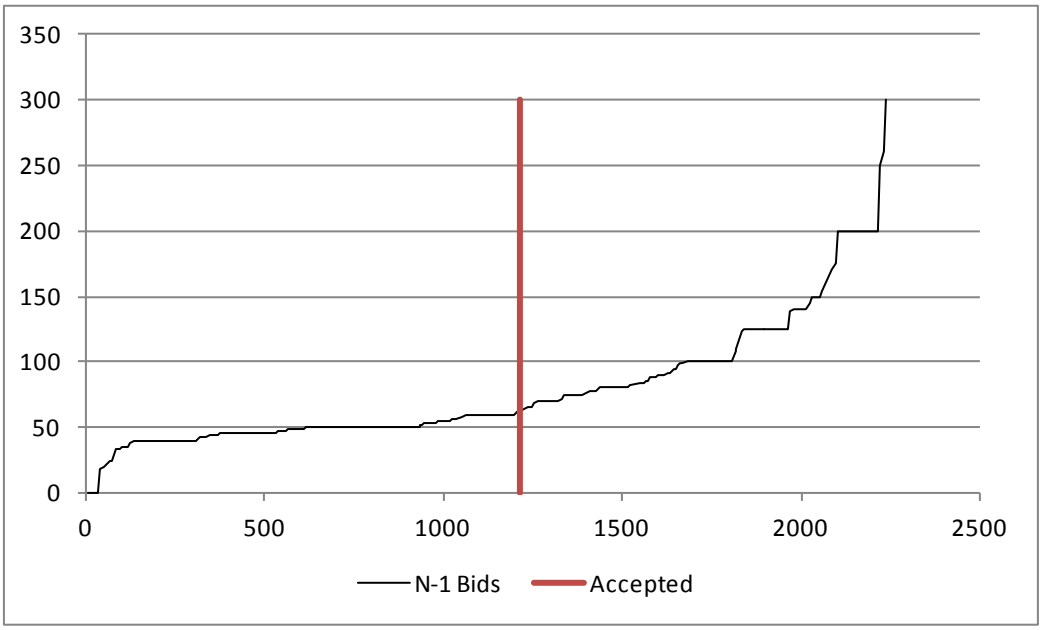


FIGURE 2 – N-2 SREC SUPPLY CURVE

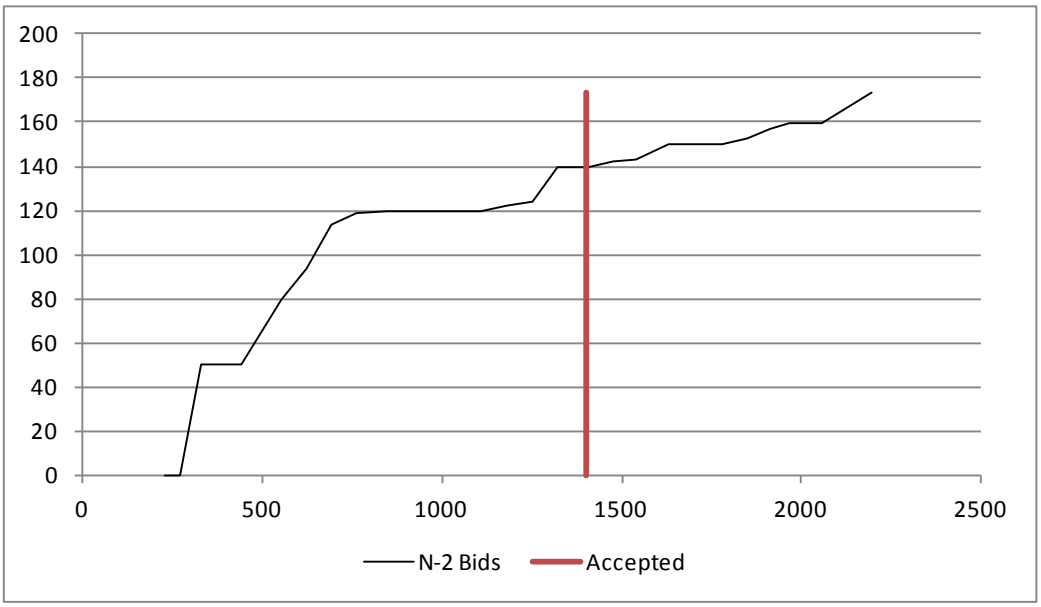
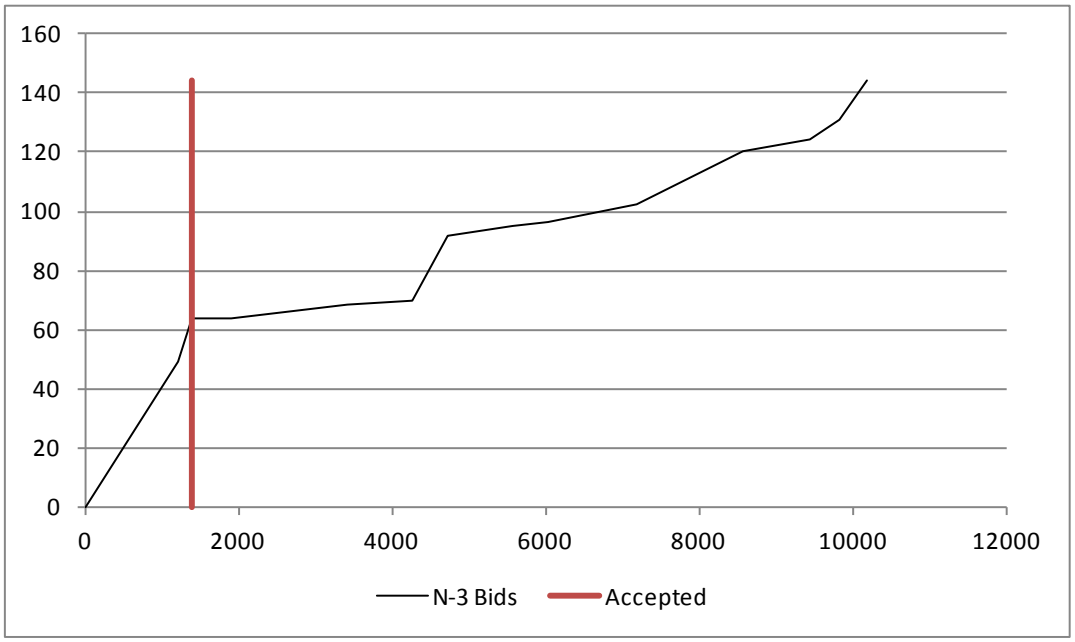


FIGURE 3 – N-3 SUPPLY CURVE



2.3 EXISTING PROJECTS

With regard to the existing projects, the accepted bid prices were somewhat higher, although not that much higher, than the winning bids in the spot auction conducted by SRECTrade for Delmarva Power (see Table 6). Soon after the solicitation for long-term contracts was conducted, SRECTrade, on behalf of Delmarva Power, conducted a spot auction for existing SRECs (i.e., SRECs for energy that had already been produced by a qualifying solar PV facility). Out of 5,394 SRECs offered, 2,978 SRECs were purchased, 55% of the total amount bid representing 40% of total bids. The weighted average price was $33.94 (with a low of $1.50 and a high of $45.00)[9]. This compares to bid prices for the first seven years for long-term contracts from existing projects averaging in the $34-$40/SREC range, with levelized pricing over 20 years in the $42-$45 range.

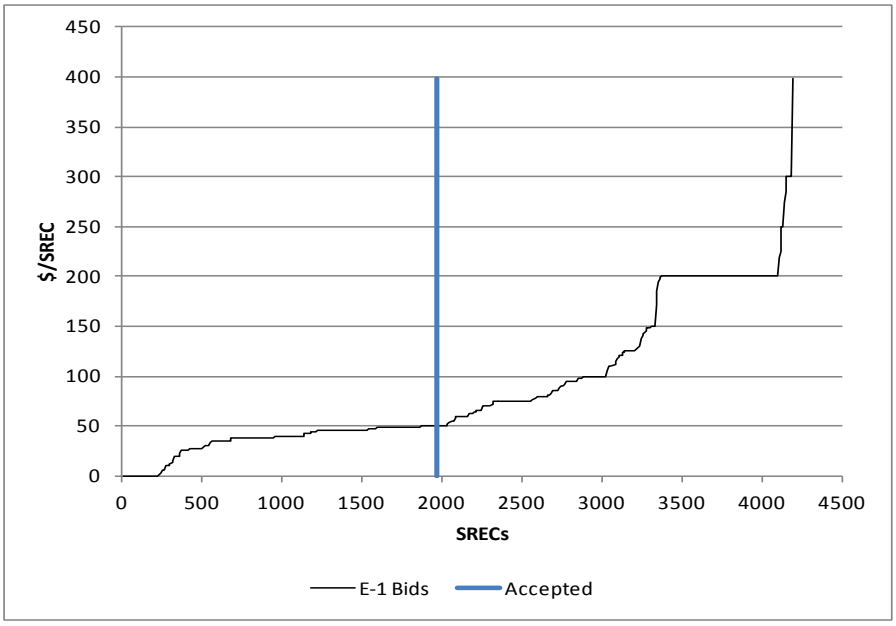
TABLE 6 – 2013 SOLICITATION RESULTS: EXISTING PROJECTS

	Price: Winning Bids				Number of Bids		
Tier	High	Low	Wtd. Avg.	Avg. Levelized	Total	Accepted	Success %
E-1	$50.00	$0.00	$34.59	$42.50	491	226	46%
E-2	$50.00	$0.00	$39.29	$44.79	25	10	40%
Spot	$45.00	$1.50	$33.94	n/a	25	10	40%

9 http://www.srecdelaware.com/2013-spot-auction-results/.

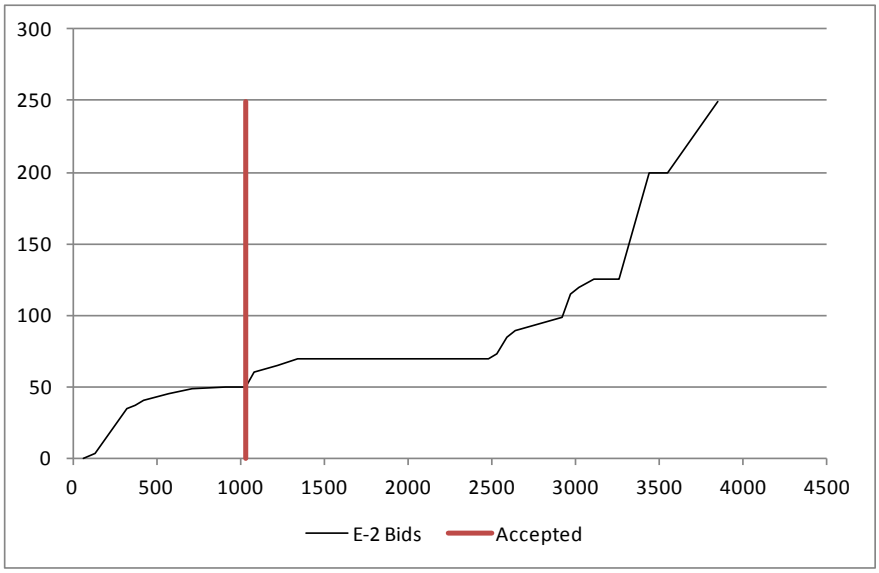
For existing projects, the alternative for bidders in the auction for long-term contracts was the spot market. Hence, it is not surprising that there should be a fairly close relationship between long-term contract prices and spot prices. And in light of the excess of supply relative to demand, as indicated in the bidding processes for long-term and short-term contracts, it is not surprising that the prices are relatively low compared to where SREC prices have been in Delaware historically.[10] Supply curves for the existing tiers are shown below. Similar to the N-1 curve above, the E-1 supply curve is relatively flat initially but then accelerates after a certain price point—$50/SREC in this case. The E-2 curve has a similar acceleration but then plateaus at around the $70/SREC price.

FIGURE 4 – E-1 SUPPLY CURVE



[10] From 2009 through 2011, prices for Delaware SRECs were in the $100 to $300 range, according to SRECTrade's website,.http://www.srectrade.com/srec_prices.php.

FIGURE 5 – E-2 SUPPLY CURVE



2.4 PROPOSED PROJECTS VS. "NEW" PROJECTS THAT HAVE ALREADY BEEN BUILT

"New" projects represent a mix of projects that are proposed projects—they have not yet been built—and projects that have already been built but are considered "new" under the definition of the solicitation. "New" systems are defined as those that have final interconnection approval after the first date of the preceding auction (the 2012 SREC pilot solicitation), which was April 2, 2012.[11]

Based on a report by a consulting firm retained by the Commission to evaluate the 2012 pilot procurement, eligible projects that had already been built were disproportionately successful in the two tiers that used competitive bidding, Tier 2B and Tier 3 (comparable to Tier 3 in the 2013 solicitation).[12] This suggests that there was more competitive pressure on owners of "new" systems that had already been commissioned to bid low prices to obtain greater assurance that their bids would be selected than proposed projects that had not been built.

[11] State of Delaware 2013 Program for the Procurement of Solar Renewable Energy Credits (November 20, 2012), Section 4.3 n. 13.

[12] Meister Consultants Group, Evaluation of the Delaware SREC Pilot (August 3, 2012). According to the report, 4.5 out of 14 systems bid were successful in Tier 2B, including 3.5 out of 4.0 systems that were already operational (one system was a partial fill). Table 7, p. 14. In Tier 3, 3.5 out of 7.0 systems bid were successful, including 0.5 out of 2.0 systems that were already operational (one system was a partial fill). Table 9, p. 17. In both tiers where competitive bidding was used, already commissioned systems had a 67% success ratio (4 out of 6 bids), while overall the success ratio was only 38% (8 out of 21 bids).

The data are more nuanced in the 2013 solicitation. In the tiers for commercial-scale projects, Tiers 2 and 3, there were only two bids for "new" projects that had already been built out of 40 total bids—only 5 percent of the total. Of these two bids, one was fully successful and the other won on a "partial fill" basis.[13] This high success rate compares to an overall 43% success rate for all bids in these tiers.

Of the 240 Tier N-1 bids, 124 had already been built—more than 50% of the total. However, their success rate was approximately the same as those projects that had not yet been built—56%.

2.5 DELAWARE EQUIPMENT AND WORKFORCE BONUSES

In 2010, Governor Markell signed into law amendments to REPSA, which provided, among other things, incentives for renewable energy projects sited in Delaware that employ Delaware labor and manufactured products. Specifically, an electricity supplier with a compliance obligation would be entitled to (a) a 10% extra credit toward meeting the REPSA goals if a solar facility sited in Delaware had at least 50% of the cost of its equipment manufactured in Delaware and (b) another 10% additional credit if a solar facility sited in Delaware was built with a minimum of 75% in-state workforce.[14] For example, under these provisions Delmarva, the ultimate SREC buyer, would receive credit for 11 SRECS for each 10 MWh produced by a solar PV project that qualified for one 10% credit and 12 SRECs if the project qualified for both 10% credits.

In the 2013 SREC auction, bids for systems that used or planned to use both Delaware labor and Delaware equipment for new projects were more successful than those that did not. As Table 7 below indicates, 52% of the first-year effective SRECs from new projects that were awarded a contract were from bids that proposed to use both Delaware labor and equipment; only 10% of the first-year effective SRECs from new projects featured no use of Delaware bonuses.

TABLE 7— USE OF DELAWARE EQUIPMENT AND WORKFORCE BONUSES: % OF FIRST-YEAR EFFECTIVE SRECS

	Both		Either		Neither	
	Won	Lost	Won	Lost	Won	Lost
N-1, N-2, N-3	52%	15%	38%	71%	10%	14%
E-1, E-2	11%	39%	37%	22%	52%	39%

Table 8 compares the use of bonuses in terms of percentage of applications. Findings are comparable, but the use of both bonuses is lower among winning bids, indicating that smaller projects (with a smaller number of first-year SRECs) tended to utilize both bonuses less than larger projects—32% success ratio

[13] Under the solicitation rules, if a project selected based on its bid price would cause the solicitation (or tier) to be oversubscribed, the bidder will be given the option of reducing the capacity of its generating unit, and associated SREC quantity, so that the solicitation (or tier) will not be oversubscribed. State of Delaware 2013 Program for the Procurement of Solar Renewable Energy Credits, Section 7.2.

[14] Senate Substitute Bill No. 1 for Senate Bill No. 199 adding 26 Del. C. §356(d)-(e).

based on percentage of applications compared to 52% based on percentage of SRECs). By contrast, there was greater use among winning applications of one of the two bonuses based on percentage of applications (60%) than was the case for percentage of SRECs (38%).

TABLE 8 – USE OF DELAWARE EQUIPMENT AND WORKFORCE BONUSES: % OF APPLICATIONS

	Both		Either		Neither	
	Won	Lost	Won	Lost	Won	Lost
N-1, N-2, N-3	32%	25%	60%	59%	8%	16%
E-1, E-2	6%	11%	38%	39%	56%	50%

As shown in the tables, the data are quite different for existing projects. The majority of successful bids in Tiers E-1 and E-2 used neither Delaware equipment nor labor and the ratio was somewhat higher when compared to total bids in these tiers. A number of these projects may have been built before the adders went into effect as a result of amendments to REPSA enacted in 2010.[15]

With regard to new projects, the use of Delaware labor and equipment adders is somewhat less than in the 2012 pilot program, where 13 of the 22 systems in the competitively bid tiers, 59% of the bids, bid with both the Delaware equipment and labor adders.[16] However, it appears to have played a significant role in solar installer and customer decisions, when one compares the higher percentages of (a) both Delaware equipment and labor adders and (b) Delaware equipment or labor adder for new projects compared to existing projects. In addition, a review of the winning bids to total bids for the 2013 solicitation indicates a competitive advantage to bidders in selecting Delaware equipment and labor or either Delaware equipment or labor. This suggests that the value of the 10% adders, in terms of revenues to project owners or other beneficiaries, may outweigh any additional costs associated with use of Delaware equipment or labor and that Delaware equipment or labor is generally available.

2.6 PROJECT SIZE WITHIN TIERS

Within tiers, system size did not appear to provide a competitive advantage for larger systems.

The great majority of the bids in the residential scale tiers were below 10 kW in size. In both Tiers E-1 and N-1, 88% of the bids were for systems below 10 kW in size. With respect to winning bids, 88% of

[15] Senate Substitute 1 for Senate Bill 119, Section 12 amending §356 of Title 26 of the Delaware Code by adding new paragraphs (d) and (e); http://www.legis.delaware.gov/LIS/lis145.nsf/vwLegislation/SS+1+for+SB+119/$file/legis.html?open. Other projects may have been built after the legislation was enacted but before it was known that in the pilot program Tier 1 and Tier 2A projects that used Delaware labor and equipment would be treated preferentially in any lottery in the event these tiers were oversubscribed.

[16] In the pilot program, the percentage of bids in the non-competitively bid tiers combined selecting both Delaware equipment and labor adders was 42%, although it was much higher in Tier 2A—83%. The role Delaware equipment and labor played in the tiers with administrative pricing was significantly different in that it placed bidders in a preferred class from which winners in the lottery were selected.

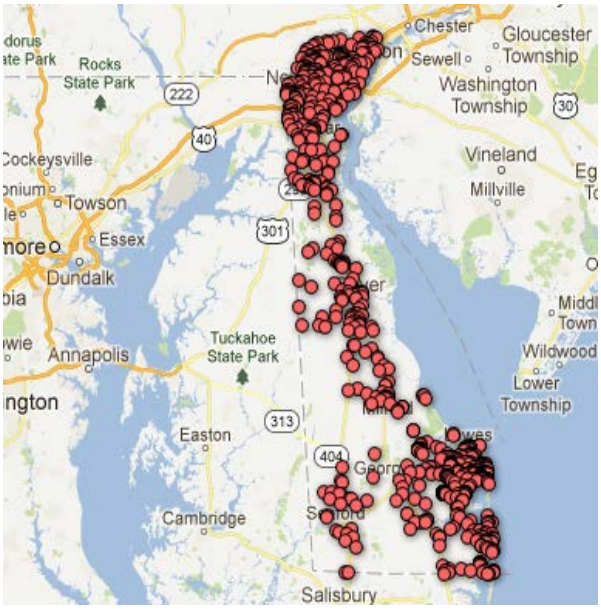
the Tier E-1 bids and 90% of the Tier N-1 bids were for systems below 10 kW in size. Within these tiers, there appeared to be no competitive advantage for larger projects.

The same is true in Tier E-2 where 80% of the total bids and 80% of the winning bids were between 30 kW and 150 kW in size and for Tier N-2 where 56% of the total bids and 56% of the winning bids were for systems between 30 kW and 50 kW in size.[17] The sample size in Tier N-3 was too small to draw any strong conclusions but the average size of the winning bids was in middle of the size range for total bids with respect to this tier.

2.7 PROJECT LOCATION

In terms of location of potential projects, Figure 6 shows that there were applications from a wide geographic region with some geographic concentration of applications in Southeast Delaware (Lewes/Rehoboth Beach area), and in the northern part (Wilmington metropolitan area) of the state.

FIGURE 6 – LOCATION OF APPLICATIONS



Source: SEU/SRECTrade Based on Solicitation Data

[17] A possible reason for the prevalence and success rates of Tier N-2 bids below 50 kW in size could be the availability of grants for these projects. Under the Delmarva Power Green Energy Program, grants for solar PV systems are limited to projects that are less than 50 kW in size. http://www.dnrec.delaware.gov/energy/services/Documents/December%2010%20Updates/Green%20Energy%20Program%20Incentive%20Revision%20-%20Delmarva%20Power%20Customers%20Only.pdf.

There was little correlation between the location of applications (or winning bids) and the population density of the zip code[18], which further confirms the geographic diversity of the applications. We also examined spatial diversity in terms of the income characteristics of the zip code. Using publicly available tax data from 2008, we analyzed the relationship between the number of applications (and number of effective SRECs) and the adjusted gross income ("AGI") of the zip code of the solar facility. This analysis does not permit analysis of the income characteristics of the bidders themselves, but does allow us to examine whether solar applications were provided from wealthier areas of the state. Table 9 shows that there was essentially zero correlation between the location of the applications and income levels of the zip codes.

TABLE 9 – CORRELATION BETWEEN INCOME AND NUMBER OF APPLICATIONS

	Win	Not Win
# of Applications	0.03	0.06
Effective SRECs	(0.03)	0.01

3. ANALYSIS OF SOLICITATION RESULTS AND SURVEY OF PARTICIPANTS

In this section of the report, we analyze some of the key results of the 2013 solicitation in the context of industry trends and practices and in relation to the 2012 pilot program. We also summarize the results of an on-line survey we conducted of solicitation participants.

3.1 SREC AUCTION PRICES, TRENDS IN SYSTEM COSTS, PROJECT SIZES AND OTHER FACTORS

As shown in the prior section of this report, SREC prices declined sharply in the 2013 auction compared to the 2012 pilot program. Key reasons for the reduction in SREC prices are:

- Use of competitive bidding, instead of administratively-set pricing, for residential and small commercial scale projects;
- Eligibility for existing projects, as well as "new" projects;

[18] Correlation between the number of applications and population density was approximately -0.1, which indicates a very week relationship between less dense areas and location of solar projects.

- Continuing decline in installed costs for solar PV modules and systems;
- Competitive pressures associated with limited demand for SRECs in the auction (the procurement target for the 2013 program was 30% lower than that of the 2012 pilot program) and for Delaware SRECs in general;
- Competitive pressures associated with projects that have been installed since the 2012 pilot auction but which qualify as "new" projects; and
- Availability of Green Energy Program grants to residential and small commercial scale project (less than 50 kW in size) at levels that have, at least for the Delmarva Power program, not changed for several years, even though the cost of installed systems has substantially declined.

In addition, the structure of the 2013 program, with the last 13 years of the 20-year contract term pre-set at $50/SREC, may have been perceived as creating a signal of $50/SREC as a pricing point. It also may have created an incentive for some bidders to bid a very low price for the first seven years, even a price of $0 in some cases, in order to assure $50/SREC payments for the last 13 years of the contract term.

Competitive market prices for SRECs are affected by two major factors. With respect to new, to-be-built projects, a key factor is the requirement for revenue necessary to allow the project owner or other party in interest to recover the cost of the investment plus a reasonable return on the investment. If the financial benefits (including revenues and/or cost reductions with respect to the production of electric energy and/or capacity and tax benefits) are insufficient to cover the costs plus an acceptable return, it would not make economic sense for an owner of a new project to build it. Hence, according to economic theory, a bidder for a new project should bid prices based on its costs. The other fundamental factor is the interaction of supply and demand. Competitive market prices will be set based on supply and demand—if there is an excess of supply relative to demand, prices will be lower. Conversely, if there is more demand than supply, prices will be higher.

The economics of solar PV projects are highly weighted to initial capital costs. Operating costs, by comparison, are low. Once a project has already been built, regardless of whether it is classified as a "new" project or an "existing" project, the initial capital costs have already been committed and the key competitive driver is the relationship between supply and demand for SRECs.

The underlying rationale, as we understand it, for placing "new" projects and "existing" projects in separate auctions was (a) to facilitate the development and construction of new projects since the last solicitation and (b) to provide owners of projects built before the last solicitation with an opportunity to obtain a competitively-priced long term contract in light of the overhang of un-contracted supply on the market, without forcing out new projects and the attendant economic benefits associated with new construction.

Within the categories of "new" and "existing" projects, different tiers were established based on project size with separate auctions conducted for the different tiers. The underlying rationale, as we understand it, is that larger projects have greater economies of scale than smaller projects. In addition, commercial projects have another advantage over residential projects in that commercial projects

qualify for depreciation, indeed, accelerated depreciation, for tax purposes, while residential projects do not. One would ordinarily expect that the tiers for larger projects would have lower winning prices than for the tiers for smaller projects. There are, however, countervailing factors that offset the economy of scale and tax advantages of larger, commercial projects: (1) the availability of Green Energy Program grants for smaller projects;[19] and (2) the economic value of net metering for smaller projects that have an energy-only tariff structure with their local electric utility company/retail electric supplier compared to larger projects that have both a demand component and an energy component.

While, as expected, the winning prices for existing projects were lower than for new projects, the expected relationship between projects based on size did not materialize. In fact, the prices for the smallest projects, residential-scale in size, were lower on average for new projects ($46 for Tier N-1) than for larger new projects ($87 for Tier N-2 and $51 for Tier N-3). Tier N-3 pricing, however, was lower than Tier N-2 pricing, although Tier N-3 projects are larger than Tier N-2 projects. In the pilot program, the weighted average winning price for Tier 2B (projects between 250 kW and 500 kW--$131) was lower than the weighted average winning price for Tier 3 (projects between 500 kW and 2 MW--$154).

Similarly, for existing projects, the tier for residential-scale projects ($35 for Tier E-1) had lower prices than in the tier for larger existing projects ($39 for Tier E-2).

As indicated in the data summarized in Section 2.4 of this report, only 5 percent of the "new" commercial scale projects—Tiers N-2 and N-3—had received final interconnection approval and were built before the auction. As in the pilot program, commercial scale projects that were already built had a higher success rate than projects yet to be built.

In contrast, more than 50% of Tier N-1 projects had already been installed. Based on the data, there was no difference in success rate in residential scale projects that were already built when compared to those in the planning stage.

This data suggests that there was a very small pool of owners for commercial scale projects willing to go forward to build new solar PV projects without having a long-term contract with a known SREC price in hand, and for those that did go forward there was considerable pressure to bid low prices in order to obtain a contract. For residential scale projects, Tier N-1, more than 50% of the project owners had already had the projects installed, with the attendant financial commitments, without having a long-

[19] The Delmarva Green Energy Program grant program had, as of the date of 2013 auction, retained its structure and incentive rates that had become effective in December 2010.

http://www.dnrec.delaware.gov/energy/services/Documents/December%2010%20Updates/Green%20Energy%20Program%20Incentive%20Revision%20-%20Delmarva%20Power%20Customers%20Only.pdf. The Delaware Electric Cooperative, on the other hand, had reduced its incentive rates for 2013 and limited participation to those that had submitted applications by January 15, 2013 based on an excess of demand for the grants relative to a funding cap. http://www.dnrec.delaware.gov/energy/services/GreenEnergy/Pages/CoopGEP_F.aspx.

term contract with known SREC prices.[20] This suggests that either (a) it was not important for many homeowners to have a long-term SREC contract in hand before they made a financial commitment on a solar PV facility and/or (b) there was willingness to take the financial risk of not having a known long-term SREC price although without, perhaps, having a full understanding of the risk. Consistent with the foregoing, whether a project had or had not been built appeared to have no influence on bid prices.

The data also raises questions regarding the basis for the segmentation of the market based on project size, a question that we address in Part 5.2 of this report.

In terms of comparing the auction results to SREC auctions conducted in other states, there are issues regarding availability of information and comparability of project sizes and vintages as well as the timing of the conduct of the auction. (Other relevant factors include the availability and amount of grants and state tax benefits for owners of solar PV systems.) Timing is important due to the continuing decline in solar PV module and system costs. For example, according to the Solar Energy Industries Association, national average solar PV installed costs in the United States declined 15.8% from Q1 2012 to Q1 2013, from $5.86/watt to $4.93/watt, and non-residential system installed costs declined 15.6% from $4.64/watt to $3.92/watt.[21]

With respect to an auction conducted by Connecticut utilities for 15-year zero emission renewable energy credits (ZRECs) in August 2012, the weighted average price of accepted bids were in the range of $135-$149, based on the utility for medium projects in the 100-250 MW range size, and $101 to $117 for large projects in the 250 kW to 1,000 kW range.[22] In the 2012 pilot program, the levelized weighted average prices for Tier 2B (250-500 kW) was $102 and for Tier 3 B, the levelized weighted average price was $118. These prices are in the same range as last year's Connecticut ZREC auctions, which are roughly comparable. The results of Connecticut's 2013 ZREC auction are not currently available. In light of declines in system costs, one would expect the results of this year's ZREC auction to result in lower prices.

In Connecticut, small solar PV projects can obtain a price based on 110% of the weighted average price for medium sized projects from the last auction. For the 2012 auction, this resulted in ZREC prices in the range of $148 to $164/SREC, depending on the individual utility.

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[20] This potentially includes transaction structures where the homeowner is leasing the solar PV system or purchasing the electrical output under a power purchase agreement as well as where the homeowner has purchased the solar PV system itself.

[21] Solar Energy Industries Association, U.S. Solar Market Insight Q1 2013, http://www.seia.org/research-resources/us-solar-market-insight-q1-2013.

[22] http://www.distributedsun.com/docs/CT%20ZREC%20Program%20D-Sun%20Newsletter.pdf.

3.2 SURVEY OVERVIEW

We conducted an on-line survey of solicitation participants to provide additional insight into the auction results described in the previous chapter. The survey instrument consisted of 42 questions that covered a number of areas: (a) the type of applicant, (b) information about the project (tiers, whether Delaware bonuses were utilized, use of net metering and/or green energy program ("GEP") grants, (c) how the solicitation was publicized, (d) and the participant's views concerning the solicitation (and the SREC transfer agreement). See Appendix A for the full survey instrument.

A link to the survey instrument was sent (via email) to 668 participants, representing 98% of the total number of solicitation participants (including both owners and owner representatives). In total, we received 192 responses, which corresponds to a 29% response rate.[23] Most respondents (71%) did not participate in the 2012 Pilot Solicitation. Though the majority of respondents were owners, a much greater portion of the owner representatives that participated in the solicitation[24] also answered the survey compared to owners (see Table 9).

TABLE 9 – SURVEY AND SOLICITATION PARTICIPATION TYPE

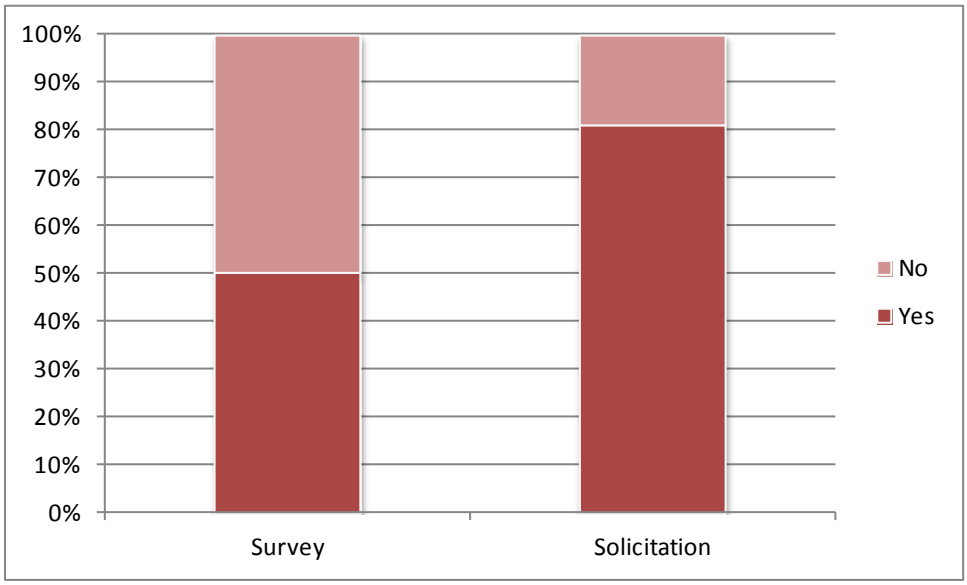
	Survey	Solicitation
Owner	171	656
Owner's Representative	20	25
Total	191	681

Figure 7compares the results of the survey to data from the solicitation regarding the use of owner representatives. Though it is possible that survey respondents made less use of owner representatives, it is more likely that there was uncertainty regarding the exact meaning of the term "owner representative." Indeed, a number of comments indicated uncertainty over the definition and whether the installer was the same as the owner representative.

[23] This response rate is consistent with the response rate of 28% obtained in the 2012 SREC pilot procurement report.

[24] The owner representative data in the table only includes representatives that were not project owners. There were a number of owners that indicated (in the solicitation) that they were representing themselves.

FIGURE 7 – USE OF OWNER REPRESENTATIVES: SURVEY VS. SOLICITATION



In order to gauge the reasons to use or not use an owner representative, a common theme for those that used a representative was the complexity of the process and/or lack of knowledge or expertise to participate in the solicitation. We provide examples of the some of the comments (edited for ease of reading) in support of using an owner representative:

> "I would handle my own transaction, however, I feel as a single home owner the system is stacked against me."
>
> "They were recommended by the installer, the whole process is too new and complicated and I did not have time to do all the research…"
>
> "Not familiar with the process and don't have time…"
>
> "Convenience"
>
> "Easier for me to have a rep"
>
> "I was not sure of the details of the solicitation and thought it made sense to have an owner's representative."
>
> "Was not sure how to submit a bid ourselves."
>
> "I didn't have enough information to do my own bidding."

There were fewer comments describing reasons why an owner representative was not used, but most comments related to desire to avoid paying a commission or fee—though there were comments stating that the low fee charged by the owner representative was a reason in support of using a representative—or maintaining control over the process. A more limited number of comments indicated lack of value in utilizing an owner representative, citing the owner's ability to complete the process.

In terms of project type, the survey featured a greater participation than the actual solicitation (in terms of percentage of applications) from projects in the new tiers than the existing tiers (see Table 10). As such, the survey features a similar distribution of applications and can thus be considered somewhat representative of the participants in the solicitation.

TABLE 10 – PERCENTAGE OF PROJECTS BY TIER: SURVEY VS. SOLICITATION

	Applied		Accepted	
Tier	Survey	Solicitation	Survey	Solicitation
N-1	36%	30%	46%	35%
N-2	7%	3%	11%	4%
N-3	1%	2%	2%	1%
E-1	52%	62%	40%	58%
E-2	4%	3%	1%	3%
% of Applications Accepted			30%	49%

The table also compares the breakdown of accepted projects in the survey to the solicitation with the survey being even more representative of new projects relative to the solicitation for projects that were accepted. Overall, the survey respondents feature a much lower percentage of accepted applications than the solicitation, possibly indicating that there was more interest in responding to the survey from unsuccessful participants.

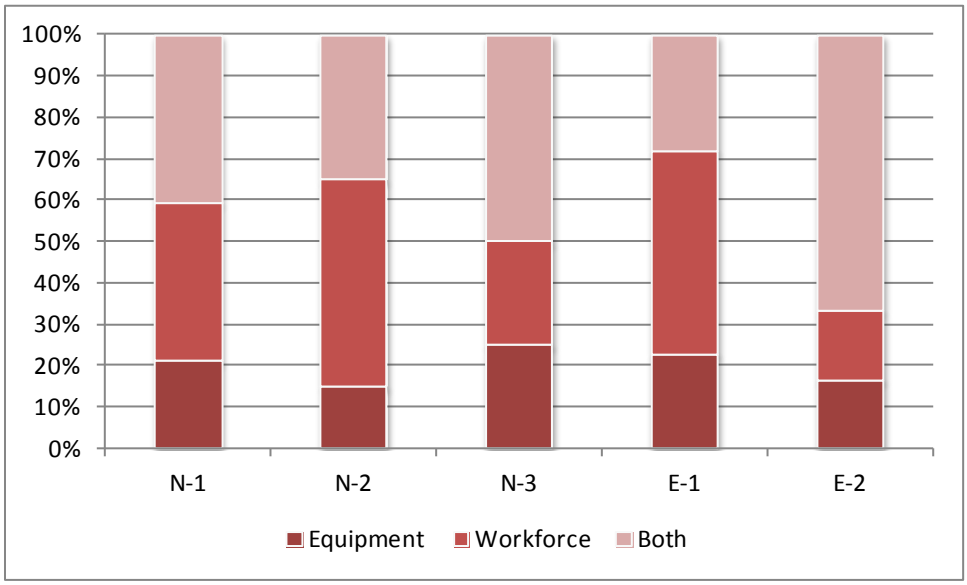
As a final point in way of overview, respondents were asked whether they participated in the 2012 pilot SREC solicitation. Most respondents (71%) indicated that they did not participate in the prior solicitation.

3.3 ROLE OF BONUSES AND INCENTIVES

We asked potential respondents a number of questions regarding the availability of Delaware-component (workforce and equipment) bonuses and use of other incentives. In particular, we wished to determine the extent to which the Delaware labor and workforce incentives were available relative to one another. As described in the prior chapter, new projects were much more likely to take advantage of the workforce and equipment than existing projects with only 8% of winning applications from the new tiers not taking advantage of one or both of the equipment bonuses.

Figure 8 shows the relative availability of the Delaware Bonuses, indicating that workforce bonuses were more available than equipment for almost all tiers (except for N-3 respondents).

FIGURE 8 – RELATIVE AVAILABILITY OF DELAWARE BONUSES



As a follow-up, we inquired concerning possible reasons for not taking either bonus. Table 12 shows number of responses according to each reason choice and confirms that Delaware equipment was less available than workforce. Lack of financial incentive was also cited, but most respondents provided "other" as a reason. Some of the comments received explaining the "other" response are shown below:

> "Equipment was installed prior to eligibility"
>
> "The equipment bonus determination is complicated because my system was installed in 2 parts several years ago."
>
> "Questions like this are why we use a representative."
>
> "I have no idea what Delaware Workforce & Equipment Bonus are, but the system was installed by a Delaware company."
>
> "I don't know the origin of the panels or the inverter"
>
> "Don't know if the workforce was from Delaware"
>
> "We got federal and state credits when the system was installed. Is this different?"

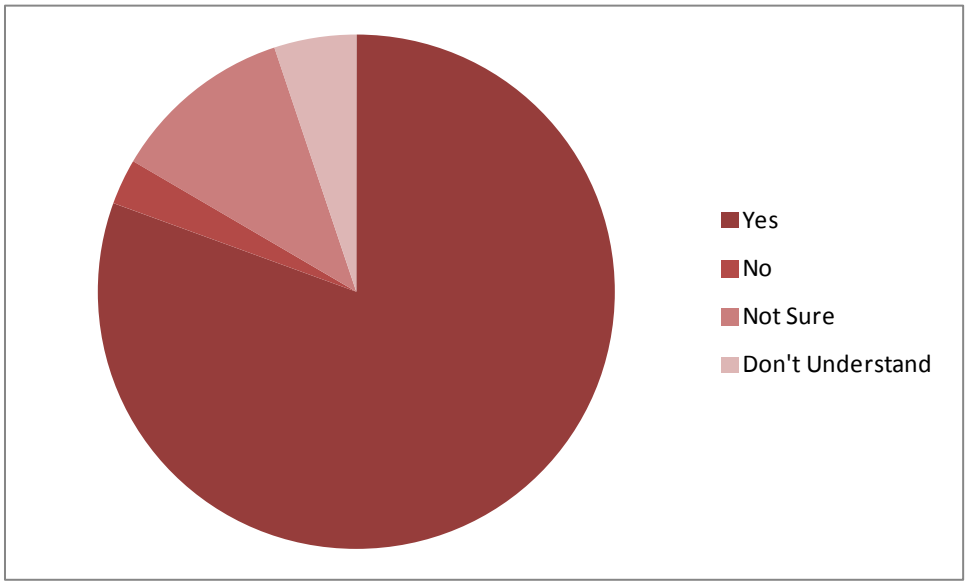
TABLE 11 – REASONS FOR NOT TAKING DELAWARE BONUSES

	Workforce	Equipment	Total
Bonus was not financially sufficient to offset cost increase	7	12	19
DE Component did not meet technical requirements for project	2	8	10
DE Component was not available	11	20	31

Other	31	38	69

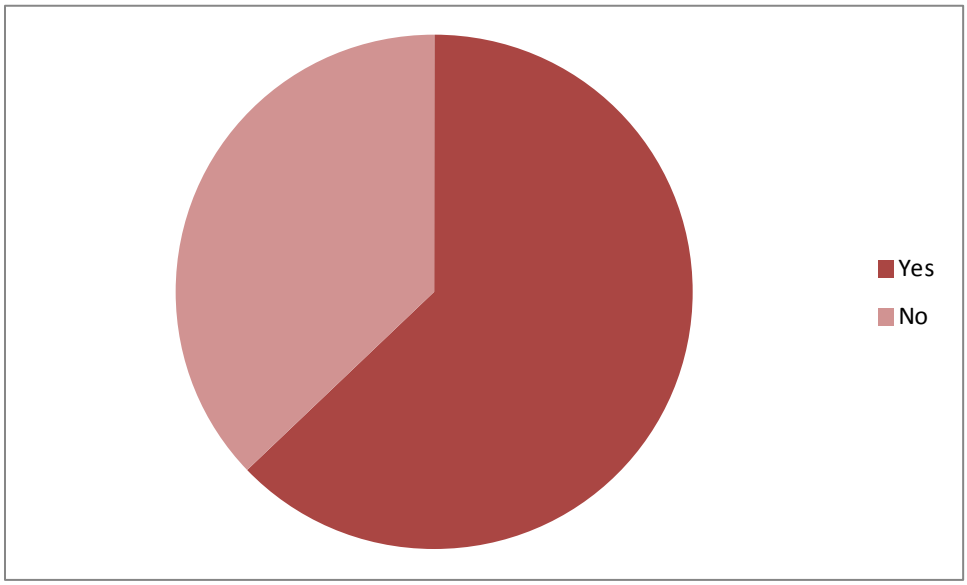
Turning to incentives, we asked respondents to comment on their use of (a) net metering and (b) the Green Energy Program Grant.[25] Use of either or both of these incentives serves to reduce the amount of additional revenue needed through other sources and thus has the potential to reduce bid prices. Figure 9 and Figure 10 show that use of these two incentives was common.

FIGURE 9 – USE OF NET METERING



[25] Delmarva Power, the Delaware Electric Cooperative and a number of Delaware municipal electric utilities have Green Energy Program grants with various project size, dollar, and availability limits. The responses may reflect the constraints of the GEP grant programs.

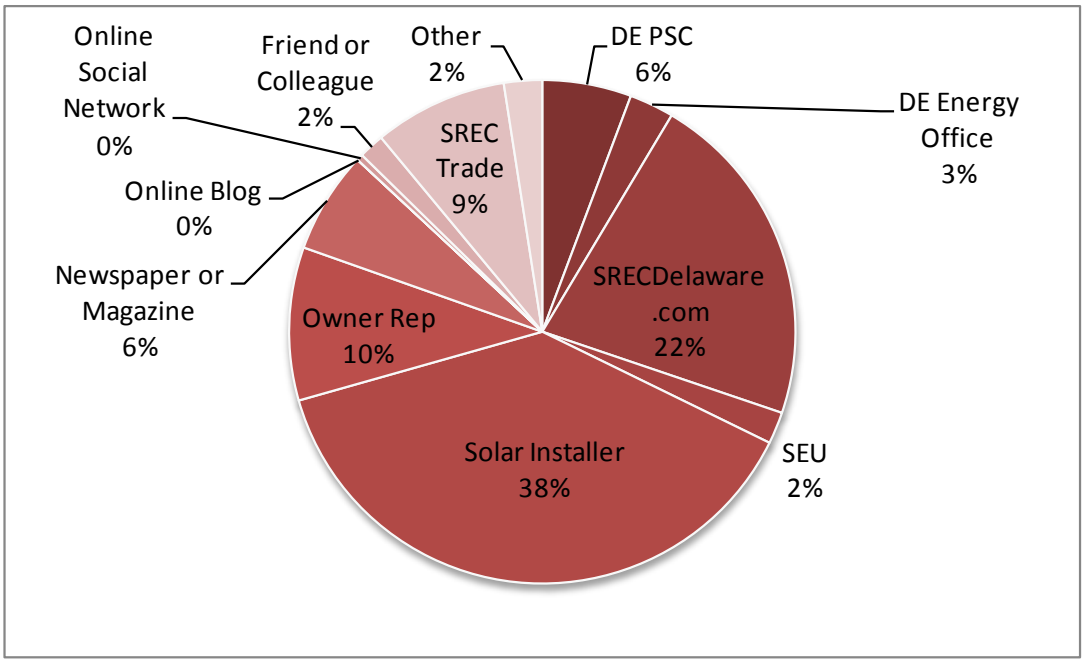
FIGURE 10 – USE OF GREEN ENERGY PROGRAM GRANT



3.4 PUBLICIZING THE SOLICITATION

In terms of publicizing the solicitation, we asked respondents to indicate how they first learned about the solicitation. The largest percentage of respondents, 38%, indicated their solar installer and 22% of the respondents stated that the website "srecdelaware.com" was the source, followed by an owner representative (10%) and SRECtrade (9%). These four sources totaled 80% of respondents. Figure 11 shows the full response set.

FIGURE 11 – SOURCE OF SOLICITATION INFORMATION



Overall, a majority felt that the SEU and SRECTrade did an adequate job of notifying the solar community about the solicitation with only 31% indicating that they felt notification was inadequate. We also asked specifically for respondents to provide suggestions on how notifications (rather than the solicitation process and interface) could be improved. Some examples are shown below:

> "I would like to have been notified through our power company since they have all pertinent information."
>
> "You have contact info for all of the system owners in Delaware. Why not just end them an e-mail and/or a piece of mail?"
>
> "Have the utilities announce it in their customer mailings."
>
> "Email out everyone who had applications in for state grants."
>
> "Being visually impaired I was not made aware of any public media communications regarding the auctions."

There were many more respondents that took the opportunity to provide suggestions on the complexity of the process and how more education could be provided (also discussed in a later section):

> "More explanation of how the program functions from the owners' perspective vs. what the owner representative roles actually are."

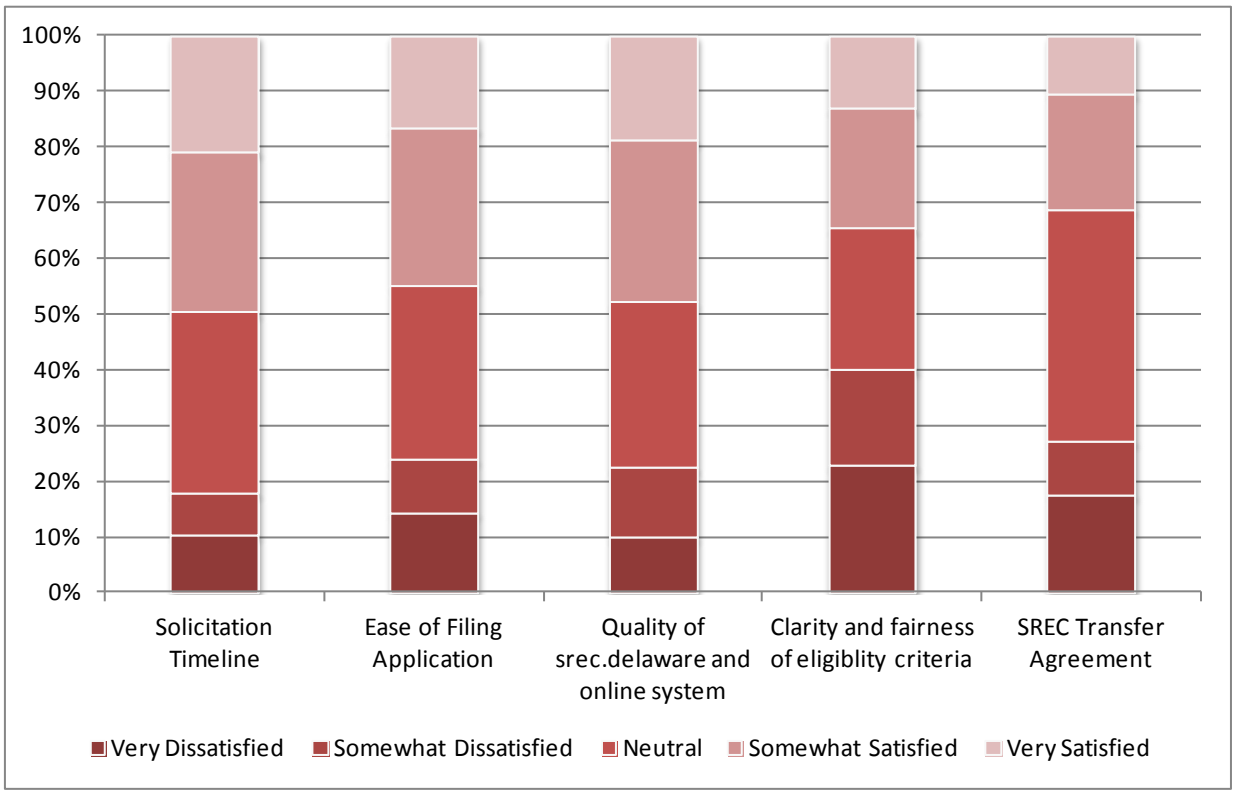
"A simple glossary of all the terms and acronyms used in some of the program documents would be a huge help and a big step in helping a layman such as myself to understand how the entire thing works, i.e., what is a "Solicitation."

"An on-line, in-depth video explaining how the whole process works."

3.5 SOLICITATION PROCESS AND INTERFACE

We asked a number of questions designed to capture respondents' level of satisfaction with the solicitation process, interface, and documentation. Figure 12 summarizes the responses to five different components of customer satisfaction. We discuss each of these in turn below, but overall, no component was deemed as unsatisfactory. Clarity and fairness of eligibility criteria featured the highest level of dissatisfaction (40%), but 60% were satisfied or neutral.

FIGURE 12 – SOLICITATION PROCESS AND INTERFACE SATISFACTION



In terms of solicitation timeline, 18% indicated that either they were very or somewhat dissatisfied, which was the lowest of any component. In their comments, some respondents indicated that they were surprised by the amount of involvement that was necessary on the owner's part (versus the installer) and how the complexity of the process made the process feel rushed. Overall, however, the large majority of respondents were either neutral or satisfied by the timeline.

The ease of filing the application received more dissatisfied responses (24%) and more strident comments, especially from those that attempted to do the applications themselves (without use of an owner representative of the installer):

> "If we hadn't had representative…we would be sunk…"
>
> "Solar installer filed the application. I guess it was easy enough for them."
>
> "Picking the price to bid was terribly nerve wracking. It was like gambling in Las Vegas. It forced us to guess the future for many years to come."
>
> "Could not understand all the questions."
>
> "Somewhat difficult, but primarily due to the fact that it was the first time."

There were also some suggestions and indications that the webinar and/or Q&A proved helpful:

> "You already have the information in interconnection and grant applications. Pre-fill in the information that you already have so I don't have to go hunt it down."
>
> "The form itself was very simple—fill in your name and sign. It was the 3 pages of 'Terms of Service' that were a little over the top."
>
> "The application is very detailed and if I had not found a previous application online to start to prepare for the questions I think it would have delayed my application submission within the allotted timeline."
>
> "SREC Delawre staff quickly resolved the problem."
>
> "Needed to call for help which was handled very well."

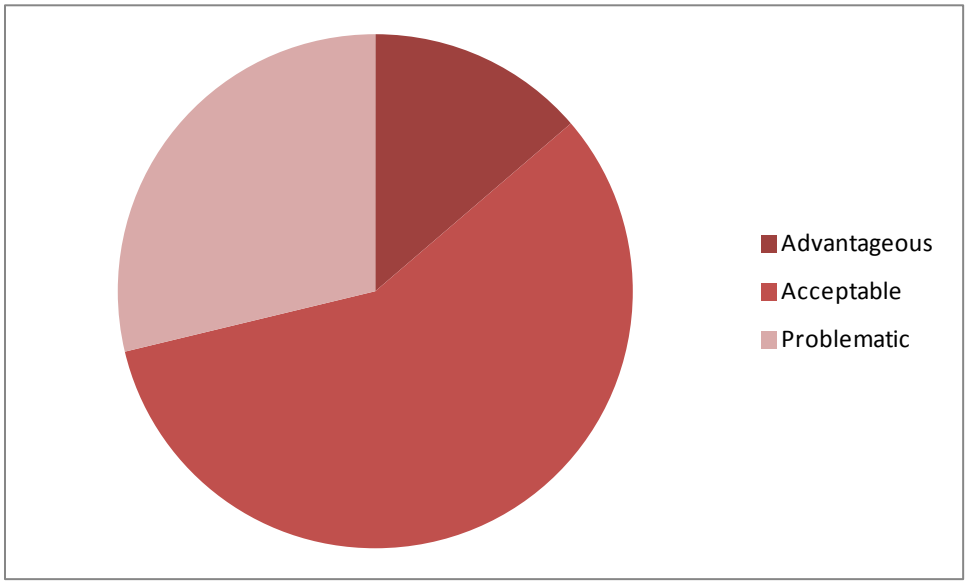
With respect to the quality of the solicitation's website (www.srec.delaware.com) and the online system, 78% of the respondents provided neutral or satisfied responses. Interestingly, there were several respondents that commented that they had no knowledge of the website (implying that bidding and other tasks were performed by an installer or owner representative). Besides a few comments complaining about the complexity of the material, there were a number of comments that provided suggestions for improvements:

> "Little too wordy…don't like to wade through a lot of verbiage when using a website."
>
> "The 'Home' page needs to be free of clutter and very, very clear as to how to navigate the site and how to receive an account."
>
> "Probably need more discussion groups…"
>
> "The website used to be very slow, but it has dramatically improved in this regard in the last 6 months…"
>
> "Have someone there organize it all into a comprehensive FAQ. Don't just have the latest round of answers as the headlines."

> "Online system was adequately updated regarding the bid winners. The losers waited over 2 months to get deposit back. Also we did not get a detailed explanation of why we lost the bid. Or how close or far we were at getting the bid price offer."

Figure 13 shows that the most respondents (72%) believed that the online-based auction was acceptable or advantageous. Most of the negative comments in the responses to this set of questions were not regarding the online nature of the auction but the difficulty in setting prices and/or the fact that bids had to be provided at all.

FIGURE 13 –VIEWS ON USE OF ON-LINE BASED AUCTION PROCESS



The clarity and fairness of the eligibility criteria received the most negative reaction of the customer satisfaction questions with 40% indicating dissatisfaction. Most of the written comments criticized the use of Delaware bonuses for favoring certain applications over others. A number of respondents complained that low bids priced them out of the market. Finally, there were some comments regarding how commercial projects were able to obtain larger SREC payments than residential projects.

The final customer service metric was satisfaction with the SREC transfer agreement. Twenty-eight percent indicated dissatisfaction, but most of the written comments discussed the complexity and length of the agreement. Examples are provided below:

> "Somewhat complicated as all 30 pages needed to be returned by Fax or Scan."
>
> "What's that?"
>
> "I don't understand any of it!!!"
>
> "Just have price concerns...don't really understand the overall revenue model."
>
> "I should have been able to print the page to sign the agreement and returned that page only."

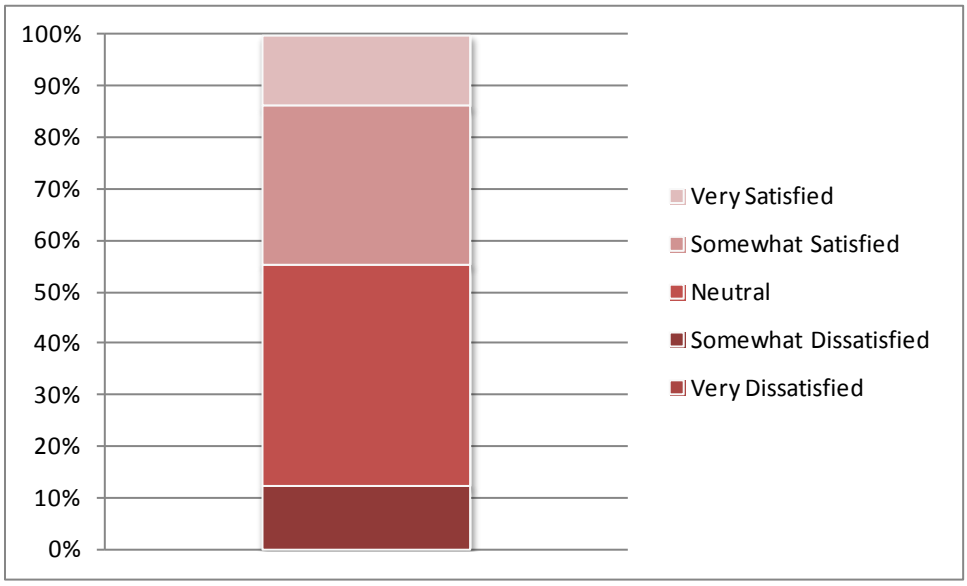
> "Too complicated and legalistic."
>
> "I have no idea what you're talking about."

A majority of the respondents (65%) indicated that they did not watch the webinar provided by SRECTrade, despite the suggestions that the program was complex and additional education would be helpful. However, respondents did provide some reasons why they did not watch the webinar:

> "I could not watch the webinar because I could not get it, despite all the directions given. Then you changed the time. Then I still could not get it."
>
> "I had no idea there was a 'webinar'; I rest my case."
>
> "I would like to watch the webinar…where is that?"

Figure 14 indicates that respondents were generally satisfied with the webinar and question and answer process with nobody responding as very dissatisfied and only 14% indicating some dissatisfaction.

FIGURE 14 – SATISFACTION WITH WEBINAR AND Q&A PROCESS



3.6 PROGRAM DESIGN AND OVERALL ASSESSMENT

A final set of questions inquired about the overall program design and asked respondents to provide their overall views of the solicitation. Given that this solicitation involved contracting with the SEU rather than with the utility, we asked respondents whether they perceived any additional risk with contracting with SEU. Eight-seven percent (87%) indicated that they did not perceive any additional risk.

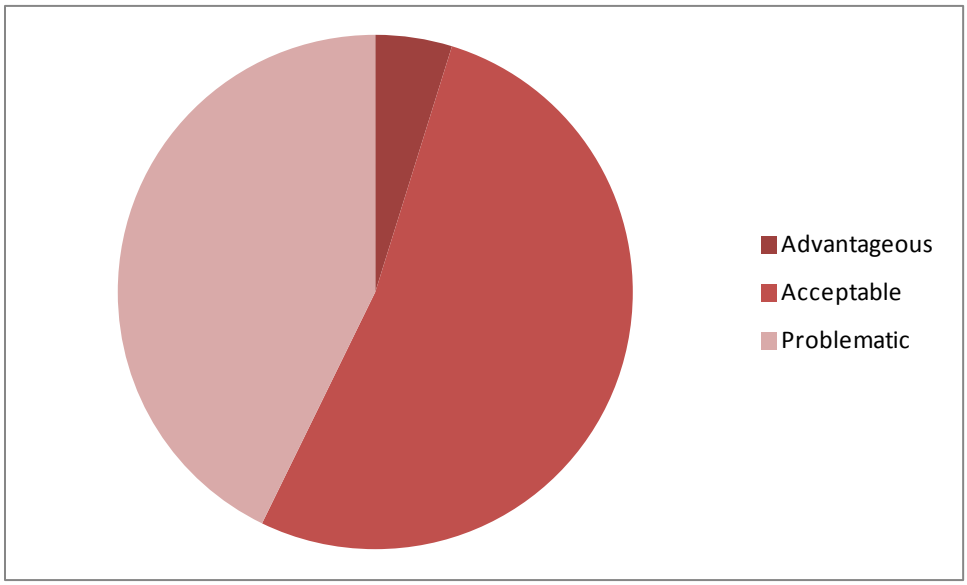
However, there were many comments that indicated unfamiliarity with SEU. Thus, this response may indicate a lack of knowledge.

We also asked whether there was any aspect of the SREC transfer agreement that caused bidding of a higher price or created problems in terms of future performance. A large majority (78%) answered that the agreement did not cause a higher price or create problems. Some of the comments reflected anger at the eventual winning bid prices being so low:

> "Again not sure about this but we were told to set price at $50 as at some point we would be receiving $50…we've now dropped price and still getting no bids."
>
> "Disappointed that successful bids had to be so low—expected at least $150 when installed."
>
> "It caused me to bid lower than I wanted."

In terms of the bid price in the latter part of the contract, we asked respondents to describe their view regarding the structure of the SREC transfer agreement (bid price for first seven years and $50 for remaining 13 years). Results are shown in Figure 15.

FIGURE 15 – VIEW REGARDING STRUCTURE OF SREC TRANSFER AGREEMENT (PRICES AND TERM)



A slight majority thought the SREC contract structure was accepted or advantageous, but over 40% thought the structure was problematic. There were some interesting comments, but most complained about the low prices in the final 13 years and the length of the contract:

> "I think you had a BIG nerve to decree that the last 13 years would only have a $50 price tag."
>
> "We thought SRECs would be more valuable."

"Just set the price."

"I would rather you set a price. I am not in the industry!"

"No provision for inflation."

"20 year commitment is too long for homeowners with rooftop systems."

We also asked whether a lower ($25/SREC) price over the final 13 years would be preferable to the current price of $50. Results are shown in Figure 16. Somewhat surprisingly, a little less than 50% indicated that a lower price would be less preferable, and 20% of the respondents indicated that a lower price would be more preferable. This response may indicate lack of knowledge of the contract terms and/or misunderstanding of the question. There were many comments that questioned why anyone would want less money over more money.

FIGURE 16 –VIEWS ON PREFERABILITY OF $25 FOR 13-YEAR PERIOD AT END OF CONTRACT TERM

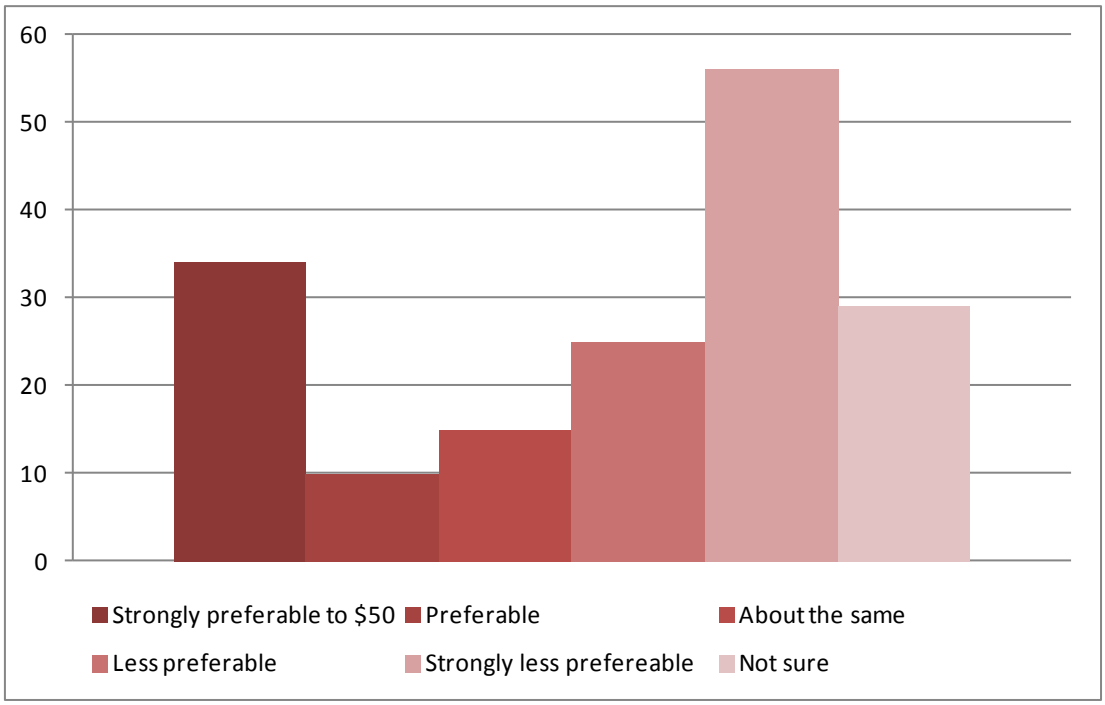


Figure 17 shows the respondents' views on the competitive bidding process with 50% commenting that a competitive bidding process was problematic. There were many comments received elaborating on these views and describing any issues that came up and how respondents' managed these issues. Overall, there was clear concern about the low prices and uncertainty on how to arrive at a reasonable bid. A sample of these comments is found below:

”No one has any idea of what they [SRECs] are worth.”

“I have previously received over $200 for some SRECs and I don’t fully understand what the change in law and the process was to reduce the value of SRECs so dramatically.”

“There are probably more advantages to the competitive bidding process but when you are getting nothing for your RECs anything is problematic to the owner.”

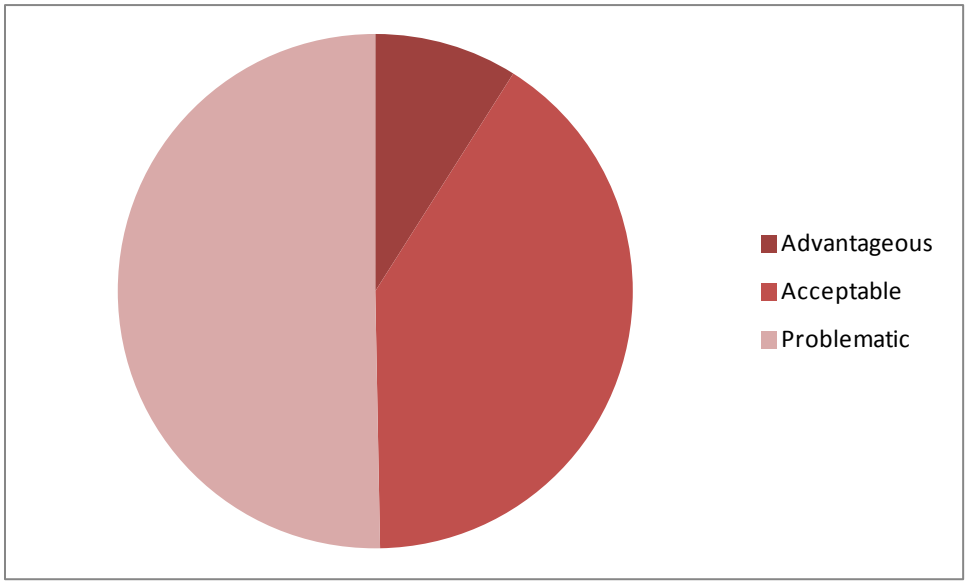
“I had no basis upon which to base my bid. It was a shot in the dark.”

“This process seems to put residential owners at a distinct disadvantage to thoroughly investigate and weigh all options.”

“If bidding is allowed to be $0 there is no competition.”

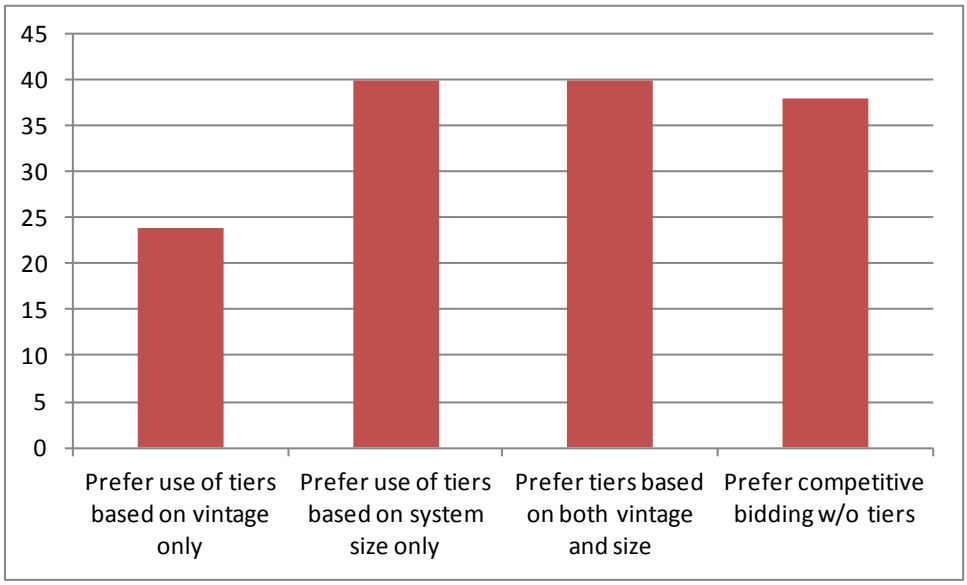
“Looking at the SRECTrade site for different states, prices range from $450 to $35…too wide a “bid/ask” spread.”

FIGURE 17 – VIEWS ON COMPETITIVE BIDDING PROCESS



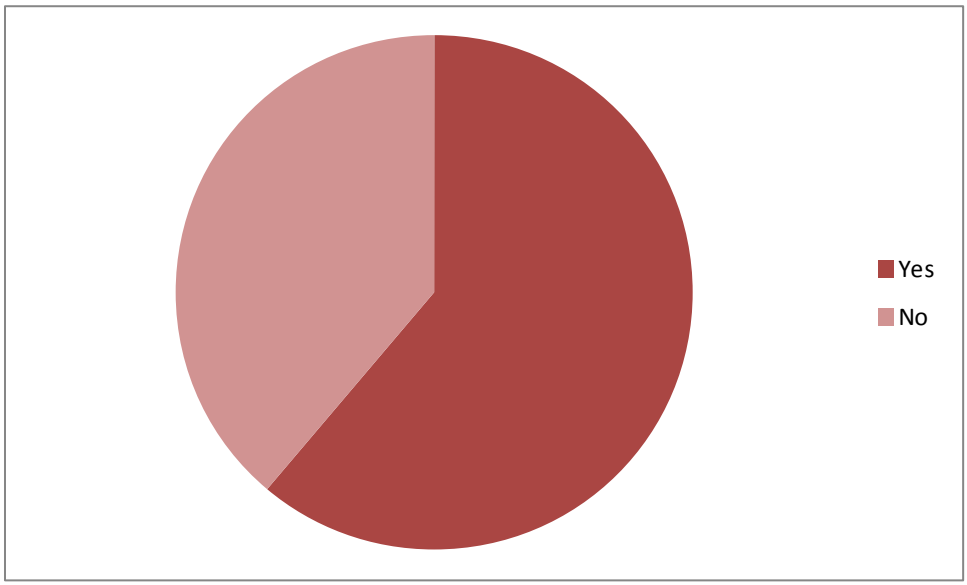
In terms of views on options for different or no tiers, respondents generally preferred some use of tiers, with a slight preference for tiers that included at least size (or both size and vintage). Responses are shown in Figure 18.

FIGURE 18 – PREFERENCES CONCERNING TIER STRUCTURE



We included a final set of questions regarding the fairness and effectiveness of the 2013 solicitation, how the 2013 solicitation compared to the pilot, and suggestions for improving the solicitation going forward. Not surprisingly, this group of questions generated the most comments. Figure 19 shows the results of a summary yes/no question regarding the fairness and effectiveness of the 2013 solicitation, indicating that 61% of respondents thought that the solicitation was administered in a fair and effective way. It is important to note that such a response does not necessarily imply that respondents felt that the outcomes were fair. We provide examples of comments following the figure.

FIGURE 19 – FAIRNESS AND EFFECTIVENESS OF ADMINISTRATION OF 2013 SOLICITATION



"Separation of new vs. existing was beneficial."

"The 2013 solicitation was more fair with the DE bonus of equipment and DE labor."

"The 2013 price was obviously a problem, as an auction the $0 bid won and blew other projects totally out of the solicitation."

"It may have been fairly administered, but with no frame of reference, again I hesitate to make a judgment call, but it does by its nature seem unfairly slanted toward commercial owners who have additional resources to navigate the technical, legal, & financial waters."

"Administered well but poorly conceived."

"Effective yes, but totally slanted to the SREC buyer."

Respondents provided a number of suggested improvements. We provide examples of the more common types of comments below:

"1. Quit showing preferences 2. Allow bids to be reasonable in order to provide for an appropriate payback time frame. 3. Set permanent prices by tiers. 4. Allow the SREC price for the first seven years to be higher to provide a quicker payback and reduce the remainder of the years substantially."

"Stop using auctions as a vehicle."

"Increase the need of SRECs and $s."

"Provide more education for residential owners so that there is a better understanding of the process and the terms associated with the process."

"Bidding should start at some minimum price set at $20 or so."

"Establish price and let owner accept or decline."

"Put the program back the way it was."

"Give us more data re: supply/demand, ranges previously accepted/offered."

"Less technical terminology."

"Make the existing (vintage) tier larger for those that have been online before the creation of the program. Those systems used to make decent money and now there are a lot that are making little or none."

"Never accept a system that is not ready to be monitored at the start of the bidding process."

4. THE SEU'S ADMINISTRATION OF THE SOLICITATION

4.1 OVERVIEW

There are a variety of different parties that participated in the development and implementation of the 2013 SREC procurement program. The Renewable Energy Task Force, led by the Department of Natural Resources, developed the program design, for which Delmarva Power sought and obtained, with minor modifications, approval from the Delaware Public Service Commission. Under contract with Delmarva Power, the SEU was responsible for implementing the solicitation. The SEU, in turn, contracted with SRECTrade to both conduct the auction and to assist in administering the contracts. In this section of the report, we review both the conduct of the SEU's administration of the 2013 SREC procurement program as well as the associated costs.

4.2 CONDUCT OF THE SOLICITATION

SRECTrade conducted the 2013 auction for the SEU, as it did for the 2012 pilot program. The auction itself went relatively smoothly. There were bidding ties at $50 for Tiers E-1 and N-1. These were resolved according to the bidding rules, through a rebidding process for those bids that were tied.

The Delaware SREC procurement program is somewhat unique in several ways: (a) a substantial part of the SRECs sought are from residential-scale solar PV systems, (b) the solicitation is conducted by or through a government agency on behalf of a utility company, rather than by the utility company itself, and (c) the government agency itself contracts for the SRECs and is responsible for administering the contracts. In addition, the 2013 solicitation sought competitive bids from all owners of all systems, including owners of existing systems. The 2013 program also differed from the 2012 program in that homeowners were not required to have an owner representative, although most in the 2013 program elected to use one.

In preparing this report, we conducted interviews with representatives of the SEU, SRECTrade and Delmarva Power, conducted a survey of participants in the auction, and obtained information from the Public Service Commission staff based on feedback they received. Overall, the feedback on the SEU's and SRECTrade's conduct of the auction was positive. However, there were a number of criticisms, primarily from homeowners and other non-industry participants, that the solicitation and explanatory information was too complex, not sufficiently understandable, and there was not sufficient notice regarding the timing of the auction given the complexity of having to decide what price to bid, even with input from solar installers and/or owner representatives.

On one level, it appeared to us that the explanations provided by SRECTrade on the website for the program, srecdelaware.com, were sufficiently clear, the webinar was professionally conducted, and the SEU did provide notification, both on the website and in advertisements in four statewide newspapers

shortly before and after the opening of the auction. However, for a future solicitation, several enhancements should be considered, some of which may go beyond the SEU's specific role in implementing solicitations:

- Consider a simplified process and standard transfer agreement for Tier 1 projects;
- An effort should be made to provide notifications substantially in advance of the conduct of auctions—a month or two in advance;
- A workshop should be considered to be held in an evening or evenings for interested parties, especially aimed at non-industry participants.

However, given the way the procurement program was designed, it appears that the SEU and SRECTrade performed well in implementing the 2013 SREC procurement auction. While administration of the contracts will take place over a 20-year period commencing, and there is no information to evaluate the SEU's and SRECTrade's efforts in this regard, we have received no negative feedback regarding their administration of the 2012 pilot program contracts. Overall, the SEU and Delmarva Power representatives have expressed satisfaction with SRECTrade's handling of its responsibilities.

4.3 THE COST OF SEU ADMINISTRATION OF THE SREC PROCUREMENT PROGRAM

There are two elements of cost in terms of the SEU's administration of the SREC procurement program: (1) costs relating to conducting auctions and (2) costs in administering the contracts. Since the contracts are for 20 years in duration, the administrative costs extend for 20 years. With respect to both the auction and ongoing costs, there are two components: (a) costs the SEU pays SRECTrade, which are then passed on to Delmarva Power; and (b) separate charges from the SEU.

Prior to the implementation of the pilot program, the SEU conducted a competitive process for a firm to serve as procurement agent, both for the conduct of auctions and for administration of the contracts. Out of several bidders, SRECTrade was selected by the SEU. Delmarva Power negotiated a contract with the SEU to purchase SRECs procured by the SEU and for certain oversight rights, and the SEU negotiated a contract with SRECTrade.

The costs to run the 2013 auction were significantly reduced from the costs to run the 2012 auction, as shown in Table 12 below. This is not surprising since much of the software and set-up from the first auction was usable in the second auction.

TABLE 12 – DELAWARE ADMINISTRATIVE COSTS TO CONDUCT SREC SOLICITATIONS

Type of Charge	Pilot Program	2013 Program	Difference
SEU Set Up Fee	$61,495	$0	($61,495)
SRECTrade Platform Fee	$45,000	$0	($45,000)
SRECTrade Auction Fee	$43,682	$45,866	$2,184
SRECTrade Programming Fee	$0	$7,500	$7,500
Total of All Charges	$150,177	$53,366	($96,811)
MW Contracted	7.685	5.462	(2.223)
$ Cost/MW Contracted	$19,542	$9,770	($9,771)

The costs to run the two auctions were significantly less than the costs to administer the New Jersey SREC long-term contract solicitations conducted by NERA Economic Consulting on behalf of Atlantic City Electric Company, Delmarva Power's affiliate, as well as Jersey Central Power & Light Company, and Rockland Electric Company. Table 13 is based on data from the "EDC Solar Long-term Contracting Program Analysis" authored by the Center for Energy, Economic and Environmental Policy for the New Jersey Board of Public Utilities.[26]

TABLE 13 – NEW JERSEY ADMINISTRATIVE COSTS TO CONDUCT SREC SOLICITATIONS (2010-12)

Type of Charge	Atlantic City Electric	Jersey Central	Rockland Electric
NERA Solicitation Mgr. Fee	$624,126	$1,517,222	$128,854
Internal Utility Costs	$111,357	$207,012	$22,910
Total of All Charges	$735,483	$1,724,234	$151,764
MW Contracted	19.5	40.0	3.9
Solicitation Mgr. Fee $/MW	$32,006	$ 37,931	$33,039
Total Cost $/MW Contracted	$37,717	$43,106	$38,914

Meister Consultants also concluded that the SEU's and SRECTrade's auction-related costs were lower than the auction-related costs of the New Jersey utilities in its report to the Commission last year.[27]

[26] The report was dated May 2, 2012 and can be found at http://www.njcleanenergy.com/files/file/Renewable_Programs/SRECs/Solar%20Page%20updates/CEEEP%20Solar%20Long-term%20Financing%20Analysis%20(5-3-12)%5B1%5D.pdf.

[27] Meister Consultants, Evaluation of the Delaware SREC Pilot (August 3, 2012), p. 56. We included the internal costs of the utilities in our analysis in addition to that of the solicitation manager retained by the utilities because those costs, in our view, were comparable to the SEU's auction-related charges. To compare the different solicitations, we used $/MW of systems contracted because, we believed, these costs related to the initial amounts procured and factored out bonuses and contract

The bulk of the SEU and SRECTrade administrative costs are ongoing costs associated with the administration of the SREC contracts. For the 2013 procurement program, the SEU is paid a fee by Delmarva Power of $5.789 per SREC delivered into Delmarva Power's GATS account in 2013. That fee adjusts on an annual basis and applies to each SREC traded under both the 2013 program and the pilot program. The fee had initially been higher for the 2012 pilot program but was negotiated downward beginning in 2015 due to economies of scale and learning curve benefits. In addition, Delmarva Power reimburses the SEU for a monthly fee of $5,525 ($66,300 per year) paid to SRECTrade for its role in entering the project owner's meter readings into the GATS accounts and performing the logistics associated with the SEU's invoicing Delmarva Power and directing payments to the accounts for the SREC sellers. The monthly fee for SRECTrade in the pilot program was $11,000 ($132,000 per year), which will continue. The fee was reduced for the 2013 program, due to the smaller size of the program (7,000 RECs/year compared to 11,472 RECs/year) and in light of some learning curve benefits. The following table summarizes the administrative costs for the 2013 program.

term lengths in light of the role of the Delaware equipment and workforce adders and the different lengths of the contracts in New Jersey and Delaware.

TABLE 14 – 2013 PROGRAM ADMINISTRATION COSTS

	SEU FEES			SRECTrade FEES		Total Costs	
Year	SRECS	SEU fee/SREC	SEU FEES	Auction fees	Monthly fees	Total $	$/SREC
2013	3,500	$5.79	$20,262	$53,366	$33,150	$106,778	$30.51
2014	7,000	$6.13	$42,896		$66,300	$109,196	$15.60
2015	6,965	$5.16	$35,949		$66,300	$102,249	$14.68
2016	6,930	$5.37	$37,195		$66,300	$103,495	$14.93
2017	6,896	$5.58	$38,483		$66,300	$104,783	$15.20
2018	6,861	$5.80	$39,819		$66,300	$106,119	$15.47
2019	6,827	$6.03	$41,196		$66,300	$107,496	$15.75
2020	6,793	$6.28	$42,624		$66,300	$108,924	$16.04
2021	6,759	$6.52	$44,091		$66,300	$110,391	$16.33
2022	6,725	$6.78	$45,619		$66,300	$111,919	$16.64
2023	6,691	$7.06	$47,213		$66,300	$113,513	$16.96
2024	6,658	$7.34	$48,848		$66,300	$115,148	$17.30
2025	6,624	$7.63	$50,541		$66,300	$116,841	$17.64
2026	6,591	$7.93	$52,290		$66,300	$118,590	$17.99
2027	6,558	$8.25	$54,106		$66,300	$120,406	$18.36
2028	6,526	$8.58	$55,981		$66,300	$122,281	$18.74
2029	6,493	$8.92	$57,921		$66,300	$124,221	$19.13
2030	6,461	$9.28	$59,929		$66,300	$126,229	$19.54
2031	6,428	$9.65	$62,008		$66,300	$128,308	$19.96
2032	6,396	$10.03	$64,159		$66,300	$130,459	$20.40
2033	3,182	$10.43	$33,196		$66,300	$99,496	$31.27
TOTAL	**133,863**		**$ 974,325**	**$53,366**	**$1,359,150**	**$2,386,841**	
Years	20				Average cost/SREC		$17.83
SRECs /year	6,693				Ongoing cost only/SREC		$17.43

The average price for SRECs over the 20-year contracts is projected to be $50.02 based on the contracts executed by the SEU. The administrative costs represent approximately 35% of the total amounts paid for SRECs. This is a higher percentage than for the pilot program—16%—due largely to the 61%

reduction in SREC purchase prices compared to the 2012 pilot program.[28] The current administrative costs associated with the 2012 pilot program contracts are shown below.

TABLE 15 – 2012 PROGRAM ADMINISTRATION COSTS

	SEU FEES			SRECTrade FEES			Total Costs	
Year	SRECS	Set-Up Fee	SEU fee/ SREC	$/SREC Fee	Auction fees	Monthly fees	Total $	$/SREC
2012	4,509	$61,495	$6.22	$ 89,559	$88,682	$66,000	$305,736	$ 67.81
2013	8,000		$5.79	$ 46,312		$132,000	$178,312	$ 22.29
2014	11,398		$6.13	$ 69,850		$132,000	$201,850	$ 17.71
2015	11,341		$5.16	$ 58,537		$132,000	$190,537	$ 16.80
2016	11,285		$5.37	$ 60,566		$132,000	$192,566	$ 17.06
2017	11,228		$5.58	$ 62,664		$132,000	$194,664	$ 17.34
2018	11,172		$5.80	$ 64,839		$132,000	$196,839	$ 17.62
2019	11,116		$6.03	$ 67,081		$132,000	$199,081	$ 17.91
2020	11,061		$6.28	$ 69,407		$132,000	$201,407	$ 18.21
2021	11,005		$6.52	$ 71,795		$132,000	$203,795	$ 18.52
2022	10,950		$6.78	$ 74,284		$132,000	$206,284	$ 18.84
2023	10,896		$7.06	$ 76,879		$132,000	$208,879	$ 19.17
2024	10,841		$7.34	$ 79,541		$132,000	$211,541	$ 19.51
2025	10,787		$7.63	$ 82,298		$132,000	$214,298	$ 19.87
2026	10,733		$7.93	$ 85,147		$132,000	$217,147	$ 20.23
2027	10,679		$8.25	$ 88,103		$132,000	$220,103	$ 20.61
2028	10,626		$8.58	$ 91,157		$132,000	$223,157	$ 21.00
2029	10,573		$8.92	$ 94,315		$132,000	$226,315	$ 21.41
2030	10,520		$9.28	$ 97,584		$132,000	$229,584	$ 21.82
2031	10,467		$9.65	$ 100,971		$132,000	$232,971	$ 22.26
2032	9,452		$10.03	$ 94,818		$132,000	$226,818	$ 24.00
TOTAL	218,642	$61,495		$1,625,708	$88,682	$2,706,000	$4,481,885	
Years	20					Average cost/SREC		$ 20.50
SRECs/year	10,932					Ongoing cost only/SREC		$ 19.81

[28] These percentages are calculated as follows: (1) 2013 program: total SREC purchase costs=$6,695,514 divided by $2,386,841 in administrative costs, and (2) 2012 pilot program: total SREC purchase costs=$26,896,283 divided by $4,411,389 in administrative costs.

A comparison of the two tables shows a decrease in administrative costs from $20.50/SREC to $17.83/SREC.

The total ongoing administrative costs exceed $100,000/year for the 2013 program and more than $300,000/year for both the 2013 program and the pilot program. Under the Commission's Order No. 8281, Delmarva Power has the burden of proof of showing that these costs are not higher than what Delmarva would have paid if it had administered the contracts itself and not used the SEU as a contractual intermediary. Clearly, there would have been considerable contract administration work that would have been, and would be, performed by Delmarva employees that is obviated as a result of using the SEU as a contract intermediary and SRECTrade to perform contract administration functions. This might involve hiring additional utility personnel, setting up systems, and training utility personnel. We are unaware of any utility that has outsourced these functions. Nor have we been able to find data on the cost of performing those functions. We have been able to identify the costs, however, of utilizing the SEU and SRECTrade. It will be Delmarva's burden to show that it could not have performed the same functions more cost effectively. Also, Delmarva should explore ways to reduce ongoing administrative costs by either seeking further reduction in SEU and SRECTrade charges in future solicitations or taking the functions in house if it is more cost-effective to do so.[29]

As a practical matter, reducing the cost of administering the program may be related to making adjustments in program design that would address the underlying issues driving the cost of administration—primarily, the need to administer literally hundreds of contracts with different small customers over a 20-year period of time.

[29] We note that Delmarva purchased 3,331 effective SRECs (2,978 SRECs without consideration of workforce and equipment bonuses)in the spot auction for which it paid SRECTrade $2.57 per effective SREC to run the auction.

5. POLICY ISSUES

5.1 INTRODUCTION

In this section of the report, we address a variety of program design and planning-related matters pertaining to the SREC procurement program. This assessment includes addressing a number of policy issues applicable to future rounds of the program. As a general matter, this section addresses how the SREC procurement program could be designed to minimize ratepayer costs given the other objectives set forth in REPSA, including encouraging deployment of solar energy technologies, establishing revenue certainty for appropriate investments in solar technologies, establishing mechanisms for maximizing in-state renewable energy generation and local manufacturing, and ensuring that different size solar PV projects are financially viable investments in Delaware.[30] Specifically, in this section we address:

- To what extent should the program differentiate between new and existing projects?
- To what extent should Delmarva procure SRECs on the spot market instead of under long-term contracts?
- To what extent should Delmarva continue to procure SRECs from existing projects under long-term contracts?
- Should "new" projects include projects that have received final interconnection approval since the conduct of the last solicitation?
- To what extent should the program be modified with respect to project tier design and bidding rules?
- To what extent should competitive bidding be used for all tiers?
- Should the structure of the long-term contracts be modified? If so, how?
- What should be the future amounts of SRECs procured by Delmarva under long-term contracts and how should the procurement amounts be managed given the potential reduction of Delmarva's REPSA obligations as a result of the Bloom energy project?
- How should the Green Energy Program and the SREC procurement program be coordinated to better achieve policy objectives and to do so in a cost-effective manner?

As a number of these questions are related, we address them together in this section.

[30] These are the key relevant considerations, along with minimizing ratepayer cost that the Renewable Energy Task Force was charged with taking into consideration in developing recommendations for a SREC procurement program. See 26 *Del. C.* § 360(d)(2).

5.2 NEW AND EXISTING PROJECTS; TIER STRUCTURE; COMPETITIVE BIDDING

As indicated previously in this report, a key difference in the 2013 SREC procurement program from the 2012 pilot program was the eligibility of existing projects to bid for long-term contracts. Existing projects could bid separately from new projects and were divided into two tiers with the dividing line set at 30 kW, what is considered the upper end size for residential and small commercial projects. However, the median size E-1 project, both with respect to total bids and winning bids, was 5.6 kW, substantially lower than the 30 kW upper limit.

The rationale for structuring a solicitation where new projects do not have to compete with existing projects is to encourage the continued development and installation of new projects. In light of the excess of supply over demand, a solicitation design that did not encourage the deployment of new systems would run afoul of one of the legislative objectives of designing a SREC procurement program.

The rationale for including existing projects in the long-term contracting program was to give those who had made decisions to go forward with projects in the past with the opportunity to obtain a long-term contract, just as owners of new projects were given that opportunity. Apart from using a long-term contracting program to stimulate development of new projects, It is not usual for utilities to want to procure energy products, regardless of whether the facilities that generate the products are new or existing, using a combination of long-term contract purchases and spot market purchases (although 20 years would be on the long end of the contract term spectrum). It seems to make sense for Delmarva Power to continue to make long-term purchases of SRECs from existing projects, as there continues to be a surplus and market prices are low. (Ultimately, long-term contracting of SRECs from existing projects might be reduced and then eliminated.) However, it does not, in our opinion, make sense to split out existing projects into separate tiers.

First, the results of the 2013 solicitation did not show any major differences between the bidding results of Tier E-1 and Tier E- 2. In fact, the weighted average prices for Tier E-1 were $4.70/SREC lower for the first seven contract years and on a levelized basis were $2.29 lower per SREC than for Tier E-1. The rationale for dividing existing projects into tiers, apparently, is to protect the interests of owners of smaller projects, who have higher $/watt costs than owners of larger projects. However, owners of existing projects, or at least economically rational ones, tend to submit bids based on what they believe will result in winning the auction, not based on investment costs that have already been incurred. The 2013 auction results support this premise. If there was a desire to protect the interests of owners of smaller projects against being outbid by a few owners of much larger projects, there could be a requirement that at least a designated percentage of the total auction pool be reserved for owners of small projects—the percentage should be lower than what might be the “target” allotment.

Consistent with the foregoing, it is sensible for Delmarva to continue to make some degree of SREC purchases on the spot market or using short-term contracts. Retaining SRECTrade to conduct auctions for these purchases appears to be an effective means of making these purchases. Purchasing on the

spot market also provides project owners, at least those of existing projects (depending on what SREC vintages are being sought), with another opportunity of obtaining value for their SRECs, particularly for those project owners who believe that SREC market prices are likely to increase over the next few years.

Another question is whether "new" projects should continue to be defined as projects that have received their final interconnection approval since the conduct of the last auction as well as those projects that are still in the planning stage. As indicated in Section 2.4 of this report, there were only a few larger projects (Tier N-2 and Tier N-3) that received final interconnection approvals and were built since the last solicitation (April 2012). Apparently, few owners of larger projects with their larger capital requirements were willing to go forward without the assurance of a long-term SREC contract with known prices. However, there were many residential-scale projects that had received interconnection approvals and were built since the last solicitation.

There is a strong argument that allowing projects that go forward from the conduct of the last solicitation will create incentives on the part of owners to go forward during the year or so between solicitations, creating a more steady flow of deployments of systems and employment. In addition, it brings more competitive pressure on pricing, which is favorable to ratepayers. There does not appear to be a strong reason to change this feature of the procurement program.

The tier design for new projects was modified from the pilot program to reduce the number of tiers from four to three and the dividing lines between tiers. Similar to the tiers for existing projects, the pricing between different tiers did not materialize as expected. In fact, the lowest weighted average pricing was for Tier N-1, for residential-scale projects. Pricing for Tier N-3 was next highest, while pricing for Tier N-2 was higher than for Tier N-3 as well as Tier N-1. Costs for the 2013 solicitation could have been reduced, while more residential-scale systems would have been accepted, if there were no distinctions for new projects based on size. Removing the tiers for new projects in the next solicitation should be considered. An alternative should be to have a single solicitation for new projects, but with minimum amounts for Tier N-1 and possibly Tier N-2, but with the minimums less than where the target allocations would otherwise be set.

A major change to the procurement program from the 2012 pilot was the use of competitive bidding for all tiers, rather than a mix of competitive bidding for larger projects and administratively-set bidding for smaller projects. Competitive bidding for all tiers brought about substantially lower prices and without the hard work, controversy and difficulties associated with setting prices administratively in a declining cost industry. However, as indicated in the previous section of this report, there were reports of confusion and uncertainty among homeowners and other non-industry participants in participating in the process. Use of owner representatives, which were an option in this solicitation, was certainly helpful, but consideration should be given to doing more in the future to educate potential bidders and perhaps in simplifying the transfer agreement and the application process for residential scale projects.

For the next solicitation, one option is to maintain the competitive bidding process for all tiers, as in the 2013 program, but to improve outreach to, and education of, prospective participants. This could include a webinar or webinars targeted more to non-industry participants, preferably conducted in the

evening to allow interested homeowners to participate, with relevant information posted on one or more websites.

Another alternative is to give owners of residential scale projects the option of seeking a contract at the price set by winning bidders in the auction. If the demand for these contracts exceeded, the pool of SRECs available, winners could be determined by lottery. This would simplify the process for homeowners, on the one hand, while producing pricing that is market-based. On the other hand, it would leave pricing to be determined by a relatively small pool of bidders, which would likely put upward pressure on pricing and could provide an opportunity for gaming.[31]

A third alternative is to modify the Green Energy Program, or at least Delmarva Power's version of it, to give owners of new, truly residential scale projects (less than 10 kW) the *option* of obtaining grants at a certain level that would be a sufficient incentive to finance a solar PV system without SREC revenues (subject to potential funding limits). As a condition of the grant, the project owner/homeowner would be required to waive its right to sell SRECs. This could achieve several objectives: (a) make the process easier and less confusing for homeowners (bidding would not be required) and (b) potentially reduce the cost of administration of the SREC procurement program.

In addition, it would create the potential for facilitating development of more solar PV facilities in-state without modifying Delmarva Power's SREC procurement obligations. It could also provide for more cost-effective use of GEP funding. There are, however, a number of questions that should be considered:

- Should Delmarva Power receive any credit against its REPSA obligations for the MWh produced by the solar PV systems supported by modified GEP grants? If so, what should be the arrangements for metering energy produced by the systems?
- Should there be GEP funds made available at lower levels for project owners that do not wish to waive their rights to sell SRECs?
- What impact, if any, should this option for residential scale projects have on the design of the SREC procurement program?

There have been programs in other states that have taken the approach of providing for grants for solar PV facilities, but not allowing the sale of SRECs for Renewable Portfolio Standards compliance purposes.[32]

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[31] While there was no evidence of anti-competitive behavior in the 2013 SREC procurement program, it is advisable that the SREC procurement program in future years contain a provision that specifically authorizes the SEU to not accept bids where there is evidence of anti-competitive behavior. From a structural standpoint, there appears to have been significant concentration among owner representatives in the 2013 SREC procurement program, which warrants some degree of review in future solicitations.

[32] For example, solar PV facilities that received grants from the Massachusetts Renewable Energy Trust prior to a certain date or which received certain funding for more than 67% of installed costs are not eligible to sell SRECs in Massachusetts. See

5.3 DURATION AND STRUCTURE OF THE SREC TRANSFER AGREEMENTS

A complaint from some bidders was that it was unfair that some auction participants bid $0 for the first seven contract years. Apparently, these participants bid $0 in order to have a contract price of $50 for the last 13 years of the contract. This also raises some concerns regarding enforcement of the SREC contracts as the owner will have less incentive for the first seven years of the contract to submit its meter readings since it would not be obtaining any payments. The SEU would have the right to terminate the SREC contract if the seller did not cooperate, but it is not desirable to use contract termination as an ordinary contract administration vehicle to ensure enforcement.

Another development relating to the design of the SREC contract was the large amount of $50 bids, which led to some bidding ties. The prevalence of $50 bids may have been associated with the $50 price for the last 13 years of the contract term—perhaps, as an inadvertent "price signal."

The rationale for the duration and pricing structure of the SREC Transfer Agreement was (a) Delmarva wanted a 20-year contract to provide it with assurance that it would have available to it SRECs at a stable, known price to meet its REPSA obligations over the period those obligations increased annually, (b) the front-end of the contract would have a higher price during a seven-year period when project owners were seeking payback of their investment (and sometimes outside financing), and (c) a price of $50 for the last 13 years, which was viewed as being sufficiently high to provide an incentive for continued operations and compliance, including the expected need to replace the inverter after 10-15 years of operation.

However, the weighted average price of all winning bids in the 2013 SREC program was almost exactly $50--$50.05 to be precise.[33] Also, 20 year contracts are not needed to support financing of new projects and are certainly not needed for existing projects. Structuring the SREC Transfer Agreement the way it was done for the 2013 program apparently provided an incentive of sorts for bidders to bid $0 to get the benefit of a long-term contract at $50 for 13 years (although the payments would not commence until after year 7). This created a non-optimal competitive bidding process that was viewed by some participants as being unfair.

There are several alternative ways that the structure of the contracts could be modified to alleviate these concerns:

14 CMR 14.05(4)(b). In using Massachusetts as an example, we are not suggesting in any way that the GEP fund anything close to 67% of installed costs.

[33] This amount was calculated based on the weighted average winning bids for each tier, which were then weight averaged based on the amount of SRECs purchased in each tier.

1. Allow bidders to submit a single price for the term of the contract (which could remain at 20 years or be reduced to 15 years);
2. Reduce the pre-set price for the back end of the contract to $25 (or some specified price significantly under $50);
3. Set the price for the back end of the contract to 50% (or perhaps, 75%) of the price bid for the first 7 years.

Any of these approaches would substantially reduce or eliminate any incentive to bid $0. The approach which appears to best meet the design objectives for new projects is a pricing structure where the price for the back end of the contract is a specified percentage of the pricing bid for the years on the front end. This pricing structure or flat pricing for the entire term would appear to be appropriate for existing projects.

5.4 PLANNING FOR FUTURE PROCUREMENTS IN LIGHT OF BLOOM-RELATED EPSA PURCHASE OBLIGATION REDUCTIONS

In planning for future SREC program solicitations, a key issue is the amount of SRECs to be procured, including the amounts to be procured under long-term contracts. This planning is somewhat more complicated in Delaware as the result of provisions in REPSA which provide the Commission, in conjunction with the Secretary of the Department of Natural Resources and Delmarva Power, to determine whether Delmarva's obligation to purchase RECs or SRECs will be reduced in conjunction with MWh production of 30 MW of qualified fuel cell projects using Bloom Energy Corporation fuel cells.

In order to maintain a level of stimulation of the solar PV market in Delaware, it is important that there be some level of assurance that there be a continuation of the solar PV procurement program for the next year, and, preferably, several years at some reasonable level. Based on discussions with Delmarva's representatives, Delmarva plans on doing so for the foreseeable future, assuming that there is an unmet need for SRECs.

Due to changes in REPSA as a result of the 2011 amendments, Delmarva, as the state's only investor-owned electric distribution utility is responsible for procuring RECs and SRECs based on its in-state distribution load. At the same time, Delmarva's obligations to purchase RECs and SRECs under REPSA are subject to reduction based on the MWh production of the Bloom fuel cell projects approved by the Commission pursuant to the 2011 amendments.

Under Senate Bill No. 124 (the 2011 amendments to REPSA), Delmarva's obligations to purchase RECs would be reduced by 1 MWh for each 1 MWh of fuel cell production or, alternatively, 6 SRECs (MWh) for each 1 REC, which is equivalent to 1 MWh of fuel cell production. However, the Commissioner of DNREC exercised his authority, pursuant to the same legislation to change these ratios to:

- 2 RECs for each 1 MWh of fuel cell production for the first 15 years after operation; thereafter, to 1 REC for each 1 MWh of fuel cell production; or
- 12 SRECs for each 1 MWh of fuel cell production for the first 15 years after operation; thereafter, to 6 SRECs for each 1 MWh of fuel cell production, subject to a SREC contribution cap of 25% in years 1-5, 30% in years 6-15, and 35% thereafter.[34]

To our knowledge, Delmarva Power's most recent projections regarding its needs for incremental SREC needs are contained in its 2012 Integrated Resource Plan filed with the Commission on December 6, 2012.

The projections and requirements are contained in Attachment D of the Appendix to the plan, and, as applicable, are summarized in the following table.

[34] The 12 to 1 ratio is based on the statutory 6 SREC to 1 REC ratio, adjusted by the revised 2 REC to 1 MWh of fuel cell production ratio. See Order 8079, PSC Docket No. 11-362 (December 1, 2011), pp. 16, 28.

TABLE 16 – DPL DE PLANNING (COMPLIANCE) YEAR

	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23
Standard Offer Service (GWH)	3,974	3,740	3,553	3,480	3,467	3,455	3,420	3,349	3,298	3,269	3,241
Third-Party Suppliers	4,054	4,085	3,985	3,931	3,986	4,027	4,007	3,917	3,848	3,814	3,784
Total Distribution Load	8,029	7,825	7,538	7,411	7,453	7,483	7,427	7,266	7,146	7,083	7,026
Transitional Third Party Supplier Load Obligation	1,673	576	147	57	0	0	0	0	0		
RPS Exempt Load	700	900	1,100	1,300	1,500	1,500	1,500	1,500	1,500	1,500	1,500
DPL RPS Load Obligation (GWH)	5,655	6,349	6,291	6,054	5,953	5,983	5,927	5,766	5,646	5,583	5,526
Solar RPS Requirement %	0.40%	0.60%	0.80%	1.00%	1.25%	1.50%	1.75%	2.00%	2.25%	2.50%	2.75%
Preliminary Solar RPS Requirement	22,621	38,093	50,327	60,536	74,406	89,743	103,725	115,323	127,037	139,581	151,960
Bloom ESRECs	5,655	9,523	12,582	0	0	0	0	0	0	0	0
Adjusted Solar RPS Requirement	**16,966**	**28,570**	**37,745**	**60,536**	**74,406**	**89,743**	**103,725**	**115,323**	**127,037**	**139,581**	**151,960**
Adjusted Solar RPS Requirement (%)	0.30%	0.45%	0.60%	1.00%	1.25%	1.50%	1.75%	2.00%	2.25%	2.50%	2.75%
Total RPS Requirement %	8.50%	10.00%	11.50%	13.00%	14.50%	16.00%	17.50%	19.00%	20.00%	21.00%	22.00%
Total Requirement les s Solar	458,084	596,802	673,138	726,443	788,711	867,523	933,530	980,246	1,002,187	1,032,902	1,063,723
Existing REC Allowance (1%)	56,553	63,489	62,909	60,536	59,525	59,829	59,271	57,661	0	0	0
Preliminary New REC Requirement	401,531	533,313	610,229	665,907	729,186	807,694	874,259	922,585	1,002,187	1,032,902	1,063,723
Bloom ERECs	10,907	218,181	353,595	504,576	504,576	504,576	504,576	504,576	504,576	504,576	504,576
Adjusted New REC Requirement	**390,624**	**315,132**	**256,634**	**161,331**	**224,610**	**303,118**	**369,683**	**418,009**	**497,611**	**528,326**	**559,147**
Total RECs	**464,143**	**407,191**	**357,288**	**282,403**	**358,541**	**452,690**	**532,679**	**590,993**	**624,648**	**667,907**	**711,107**

	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23
Preliminary Solar Req'mt	22,621	38,093	50,327	60,536	74,406	89,743	103,725	115,323	127,037	139,581	151,960
Bloom Obligation Reduction (ES RECs)	5,655	9,523	12,582	0	0	0	0	0	0	0	0
Adjusted Solar Requirement	**16,966**	**28,570**	**37,745**	**60,536**	**74,406**	**89,743**	**103,725**	**115,323**	**127,037**	**139,581**	**151,960**

SREC Purchases

Total Dover/S EU Contracts	**10,127**	**14,126**	**17,025**	**17,835**	**18,865**	**13,845**	**13,776**	**13,707**	**13,639**	**13,571**	**13,503**
Total Solar Pilot Program	6,431	11,472	11,415	11,358	11,301	11,245	11,188	11,132	11,077	11,021	10,966
Total Contracted Purchas es	**16,558**	**25,598**	**28,440**	**29,193**	**30,166**	**25,090**	**24,964**	**24,840**	**24,715**	**24,592**	**24,469**
Additional SRECs Required	268	2,972	9,305	31,343	44,240	64,653	78,761	90,483	102,322	114,989	127,491
Incremental SRECs Required		2,703	6,333	22,038	12,897	20,413	14,107	11,723	11,838	12,668	12,502
Beginning of Year SREC Bank	140	0	0	0	0	0	0	0	0	0	0
End of Year SREC Bank	0	0	0	0	0	0	0	0	0	0	0
Expiring SRECs	0	0	0	0	0	0	0	0	0	0	0

RECs from Existing Wind Contracts

	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23
AES Armenia Wind	129,210	129,210	129,210	129,210	129,210	129,210	129,210	129,210	129,210	129,210	129,210
Ges tamp - Roth Rock	105,120	105,120	105,120	105,120	105,120	105,120	105,120	105,120	105,120	105,120	105,120
Games a - Ches tnut Flats	99,864	99,864	99,864	99,864	99,864	99,864	99,864	99,864	99,864	99,864	99,864
Total RECs from Wind Contracts	**334,194**	**334,194**	**334,194**	**334,194**	**334,194**	**334,194**	**334,194**	**334,194**	**334,194**	**334,194**	**334,194**
Additional RECs Required	3,882	0	0	0	0	0	0	0	0	66,708	224,953
BOY REC Bank	52,548	0	19,062	96,622	269,485	379,069	410,145	374,656	290,841	127,424	0
EOY REC Bank	0	19,062	96,622	269,485	379,069	410,145	374,656	290,841	127,424	0	0
Expiring RECs	0	0	0	0	0	0	0	0	0	0	0

Based on this forecast, there are significant forecasted incremental SRECs required to support ongoing rounds of the SREC procurement program. In fact, in light of the substantial reduction in SREC market prices and current REC market prices, Delmarva might apply the portion of the Bloom REPSA obligation reduction initially allocated to SRECs to RECs instead, based on a discussion with a Delmarva representative. It would be useful if the SREC procurement quantity for the next solicitation were developed and made public early in the planning process, even if it were to be subject to some adjustments later on.

6. CONCLUSIONS

On the whole, it is our conclusion that the 2013 SREC procurement program was conducted fairly and in a professional manner. The re-design of the program from the 2012 pilot program, including (a) the reliance on competitive bidding rather than a combination of competitive bidding for large projects and administratively-set pricing for small projects and (b) the inclusion of owners of existing projects as eligible bidders contributed to much lower costs, which is beneficial from the ratepayers' standpoint, and an increase in perceived fairness in the program from a project owner's perspective. At the same time, the statutory-based incentives for Delaware workforce and manufacturing provided the projects that planned to use them a competitive advantage, as they were designed to do, without driving the results of the process in a manner that undercut the benefits of competitive bidding from a ratepayer perspective.

There are, as might be expected, areas for continued improvement. Based on the survey conducted, there were expressions of concern from owners of residential-scale projects and other non-industry participants that the process was too complicated and that it was difficult to determine what prices to bid. The members of the Renewable Energy Task Force, in terms of program design, and the SEU, Delmarva Power and SRECTrade, in terms of program implementation, should consider how to address these concerns. Some of the possible approaches raised in this report include (a) holding one or more webinars for non-industry participants as the target audience and (b) modifying the Green Energy Program (at least, Delmarva's version of it) to provide an alternative for owners of new residential-scale projects to participating in the SREC procurement program (which could also reduce the cost of administering the SREC procurement program). In addition, consideration should be given to modifications to the tiering structure to promote more open competition within the "new project" and "existing project" categories, while perhaps reserving certain minimum SREC amounts for smaller new projects.

APPENDIX A – SURVEY INSTRUMENT

2013 Delaware SREC Procurement Program

Section A: Type of Applicant/Role in Bid

1. Did you participate in the 2013 SREC solicitation as an Owner or an Owner's Representative?

2. What was your role with respect to the project(s) that were subject of your bids?

- Site owner and project owner
- Project owner and lessee of site
- Own or control SRECs but not site or solar project
- Other:

3. If you are an Owner, did you have an owner representative?

- Yes
- No (Skip to Question 5)

4. Who was your owner representative?

5. Why did you decide to have an owner representative or not have an owner representative?

Section B: Project Information

6. Which utility serves the location at which your project(s) is/are located?

Please check all that apply.

- ☐ Delmarva Power
- ☐ Delaware Electric Cooperative
- ☐ Municipal utility
- ☐ Other: _____

7. How many projects did you complete applications for by type of site?

	0	1	2	3	4	5	Greater than 5
Residential Building	○	○	○	○	○	○	○
Commercial Building	○	○	○	○	○	○	○
Industrial Building	○	○	○	○	○	○	○
Public Building	○	○	○	○	○	○	○
Open Space	○	○	○	○	○	○	○
Other	○	○	○	○	○	○	○

8. At the time the applications were submitted, how many of the projects in Tiers N-1, N-2, and N-3 were proposed (not built) and how many were already commissioned?

	0	1	2	3	4	5	More than 5
Proposed Projects	○	○	○	○	○	○	○
Commissioned Projects	○	○	○	○	○	○	○

Not Applicable (Tier E-1, E-2)

- ☐ N/A

9. Please identify the number of projects you submitted in each category:

	0	1	2	3	4	5	More than 5
Tier N-1 (new, ≤30 kW)	○	○	○	○	○	○	○
Tier N-2 (new, >30 kW ≤200kW)	○	○	○	○	○	○	○
Tier N-3 (new, >200kW ≤2,000 kW)	○	○	○	○	○	○	○
Tier E-1 (existing, ≤30 kW)	○	○	○	○	○	○	○
Tier E-2 (existing, >30 kW ≤ 2,000 kW)	○	○	○	○	○	○	○

10. How many of your applications were accepted?

	0	1	2	3	4	5	More than 5
Tier N-1 (new, ≤30 kW)	○	○	○	○	○	○	○
Tier N-2 (new, >30 kW ≤200kW)	○	○	○	○	○	○	○
Tier N-3 (new, >200kW ≤2,000 kW)	○	○	○	○	○	○	○
Tier E-1 (existing, ≤30 kW)	○	○	○	○	○	○	○
Tier E-2 (existing, >30 kW ≤ 2,000 kW)	○	○	○	○	○	○	○

11. Please identify how many of your applications were eligible for BOTH the Delaware Equipment and Delaware Workforce Bonus:

	0	1	2	3	4	5	More than 5
Tier N-1 (new, ≤30 kW)	○	○	○	○	○	○	○
Tier N-2 (new, >30 kW ≤200kW)	○	○	○	○	○	○	○
Tier N-3 (new, >200kW ≤2,000 kW)	○	○	○	○	○	○	○
Tier E-1 (existing, ≤30 kW)	○	○	○	○	○	○	○
Tier E-2 (existing, >30 kW ≤ 2,000 kW)	○	○	○	○	○	○	○

12. Please identify how many of your applications were eligible for the Delaware Equipment Bonus only:

	0	1	2	3	4	5	More than 5
Tier N-1 (new, ≤30 kW)	○	○	○	○	○	○	○
Tier N-2 (new, >30 kW ≤200kW)	○	○	○	○	○	○	○
Tier N-3 (new, >200kW ≤2,000 kW)	○	○	○	○	○	○	○
Tier E-1 (existing, ≤30 kW)	○	○	○	○	○	○	○
Tier E-2 (existing, >30 kW ≤ 2,000 kW)	○	○	○	○	○	○	○

13. Please identify how many of your applications were eligible for the Delaware Workforce Bonus only:

	0	1	2	3	4	5	More than 5
Tier N-1 (new, ≤30 kW)	○	○	○	○	○	○	○
Tier N-2 (new, >30 kW ≤200kW)	○	○	○	○	○	○	○
Tier N-3 (new, >200kW ≤2,000 kW)	○	○	○	○	○	○	○
Tier E-1 (existing, ≤30 kW)	○	○	○	○	○	○	○
Tier E-2 (existing, >30 kW ≤ 2,000 kW)	○	○	○	○	○	○	○

14. Please describe how many of your applications were...

	0	1	2	3	4	5	More than 5
Rooftop?	○	○	○	○	○	○	○
Ground Mount?	○	○	○	○	○	○	○

15. If your project(s) was/were not eligible for the Delaware EQUIPMENT Bonus, why not?

- ☐ Bonus was not financially sufficient to offset cost increase
- ☐ DE equipment did not meet technical requirements for project
- ☐ DE equipment was not available
- ☐ Not applicable
- ☐ Other: _____

16. If your project(s) was/were not eligible for the Delaware WORKFORCE Bonus, why not?

- ☐ Bonus was not financially sufficient to offset cost increase
- ☐ DE workforce did not meet technical requirements for project
- ☐ DE workforce was not available
- ☐ Not applicable
- ☐ Other: _____

17. Are you currently using, or do you plan to use net metering (which allows customers to use energy generated by the solar project to offset energy purchased from the utility)?

- Yes
- No
- Not sure
- Don't understand the question

18. Have you received, or do you plan to receive a Green Energy Program grant for the project(s) that are the subject of your application(s)?

- Yes
- No

Comments:

Section C: Publicizing the Solicitation

19. How did you learn about the 2013 Delaware SREC Solicitation?
Please check all that apply.

- [ ] Delaware Public Service Commission
- [ ] Delaware Energy Office
- [ ] SRECdelaware.com
- [ ] Delaware Sustainable Energy Utility (SEU)
- [ ] Solar installer
- [ ] Owner representative
- [ ] Newspaper or magazine
- [ ] Online blog
- [ ] Online social network
- [ ] Friend or colleague
- [ ] SRECTrade
- [ ] Other: _____

20. Do you think the SEU and SRECTrade did an adequate job of notifying the solar community about the solicitation?

- ○ Yes
- ○ No

21. Do you have suggestions regarding what the SEU and SRECTrade could do to improve those notifications?

Section D: Solicitation/Ratings for Customer Satisfaction

Please rate your experience regarding:

22. Solicitation timeline (sufficient notice and promptness in conduct of solicitation)

1 2 3 4 5

Very Dissatisfied ○ ○ ○ ○ ○ Very Satisfied

Comments:

23. Ease of filing application

1 2 3 4 5

Very Dissatisfied ○ ○ ○ ○ ○ Very Satisfied

Comments:

24. Quality of srec.delaware.com website and online system

1 2 3 4 5

Very Dissatisfied ○ ○ ○ ○ ○ Very Satisfied

Comments:

25. Clarity and fairness of eligibility criteria

	1	2	3	4	5	
Very Dissatisfied	○	○	○	○	○	Very Satisfied

Comments:

26. Please indicate whether or not you watched the webinar:

- ○ Yes
- ○ No

27. If so, please rate the webinar and the question & answer process:

	1	2	3	4	5	
Very Dissatisfied	○	○	○	○	○	Very Satisfied

☐ Not Applicable

Comments:

Section E: SREC Transfer Agreement

28. What is your view of the SREC Transfer Agreement?

	1	2	3	4	5	
Very Dissatisfied	○	○	○	○	○	Very Satisfied

Comments:

29. Did you perceive any additional risk associated with contracting through the SEU instead of directly with Delmarva Power?

- ○ Yes
- ○ No

Comments:

30. Was there any aspect of the SREC Transfer Agreement that caused you to bid a higher price than you might have otherwise have bid, or create a problem in terms of your future performance?

- ○ Yes
- ○ No

31. If so, describe the provision and why it caused you to bid a higher price, or why it creates a problem in terms of future performance.

Section F: Program Design/Overall Assessment

32. Please describe your view regarding the structure of the SREC Transfer Agreement in the current 2013 solicitiation where the Seller will receive its bid price for the first seven years and $50/SREC for the remaining 13 years of a 20-year contract.

- Advantageous
- Acceptable
- Problematic

Comments:

33. As an alternative to the current structure of the SREC Transfer Agreement, what is your view if the Seller would receive its bid price for the first seven years (as in the current solicitation) and $25/SREC (rather than $50/SREC) for the remaining 13 years of the 20-year contract?

- Strongly preferable to $50/SREC for the last 13 years of 20-year term
- Preferable
- About the same
- Less preferable
- Strongly less preferable
- Not sure

Comments:

34. Please describe your view regarding the use of a competitive bidding process (in contrast to an administratively determined price) for this solicitation.

- Advantageous
- Acceptable
- Problematic

Comments:

35. Please describe any issues associated with use of a competitive bidding process and how you have managed, or plan to manage, those issues.

36. What is your view regarding the use of tiers for this solicitation based on (a) project size and (b) whether the projects are "new" or existing (i.e., vintage)?

- Prefer use of tiers based on whether projects are "new" or "existing" (vintage)
- Prefer use of tiers based on system size
- Prefer tiers based on both vintage and size
- Prefer competitive bidding without tiers

Comments:

37. What is your view regarding use of a similar online-based auction process for Delmarva's purchase of SRECs on the spot market?

- Advantageous
- Acceptable
- Problematic

Comments:

38. Did you participate in the Pilot SREC solicitation conducted in 2012?

- Yes
- No - Please skip to Question 41.

39. What aspects of the 2013 solicitation did you find MORE preferable to the 2012 solicitation? Why?

40. What aspects of the 2013 solicitation did you find LESS preferable to the 2012 solicitation? Why?

41. In general, do you think the 2013 solicitation was fairly and effectively administered?

- Yes
- No

Comments:

42. Please tell us how the program can be improved for future solicitations.