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Dominion®

VIA HAND DELIVERY

September 1, 2016

Mr. Joel H. Peck, Clerk
c/o Document Control Center
State Corporation Commission
1300 East Main Street
Tyler Building – First Floor
Richmond, Virginia 23219

Third Annual Report of Virginia Electric and Power Company on Its Solar Partnership and Solar Purchase Programs

Dear Mr. Peck:

Enclosed for filing in Case No. PUE-2011-00117 (Solar Partnership Program) and Case No. PUE-2012-00064 (Solar Purchase Program), please find an original and fifteen (15) copies of Virginia Electric and Power Company's Third Annual Report on its Solar Partnership and Solar Purchase Programs to the State Corporation Commission of Virginia ("Annual Report").

If you have any questions regarding this filing, please do not hesitate to contact me.

Sincerely,

William H. Baxter II
Senior Counsel

Enclosures

cc: William H. Chambliss, Esq
K. Beth Clowers, Esq.
Frederick D. Ochsenhirt, Esq.
Alisson P. Klaiber, Esq.
Mr. David Eichenlaub
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Service List

CERTIFICATE OF SERVICE

I hereby certify that a true copy of the foregoing was delivered by hand or regular mail, postage prepaid, this 1st day of September, 2016, to the following:

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Third Annual Report of Virginia Electric and Power Company on Its Solar Partnership and Solar Purchase Programs to the State Corporation Commission of Virginia

Case Nos. PUE-2011-00117 and PUE-2012-00064

September 1, 2016

Table of Contents

Section 1. Executive Summary

This Report will provide an annual update for the period July 1, 2015 to June 30, 2016 on two solar programs proposed by Virginia Electric and Power Company (the "Company") pursuant to Chapter 771 of the 2011 Virginia Acts of Assembly ("Chapter 771"), and approved by the State Corporation Commission of Virginia (the "Commission"): the Solar Partnership Program and the Solar Purchase Program. This is the Company's third annual report on these programs to the Commission.[1]

Solar Partnership Program (Case No. PUE-2011-00117)

The Solar Partnership Program is a demonstration program in which the Company is authorized to construct and operate up to 30 megawatts ("MW") of Company-owned solar distributed generation ("DG") facilities under a "blanket" certificate of public convenience and necessity ("CPCN") on leased commercial customer property and in community settings. This is intended as a demonstration program per the terms of Chapter 771 to study the benefits and impacts of solar DG on targeted distribution circuits. More information can be found on the Commission's website in the on-line docket for Case No. PUE-2011-00117.

The Solar Partnership Program is designed to study the impacts and assess the benefits of distributed solar photovoltaic ("PV") generation on the Company's electric distribution grid.

[1] The Company filed its first annual report with the Commission in Case Nos. PUE-2011-00117 and PUE-2012-00064 on August 29, 2014. In its second annual report filed on September 4, 2015, the Company stated that this third annual report would include related information about the Company's then-recently approved DCS Pilot. *Application of Virginia Electric and Power Company For approval of a pilot and experimental rate, designated Rider DCS, to enable customer purchases of distributed solar generation pursuant to § 56-234 B of the Code of Virginia*, Case No. PUE-2015-00005, Final Order, 2015 S.C.C. Ann. Rept. 268-69 (Aug. 11, 2015). However, the DCS Pilot and its experimental rate, Rider DCS, are not yet available to customers. Accordingly, the Company intends to provide information about the DCS Pilot in its next annual report to be filed in 2017.

Approximately 750 customer inquiries and applications have been received and evaluated since the Program[2] was approved, and the Company is currently partnering with qualifying commercial, industrial, high school, and university customers with suitable facilities located in select target areas for installation of solar projects for demonstration and Grid Impact Study ("Study") purposes. Projects completed or currently under construction have a total alternating current ("AC") grid-connected generating capacity of approximately 6.7 MW (or 8.4 MW direct current ("DC")).[3]

The project site selection process includes matching interested customers offering qualifying sites with the electric distribution circuits selected for the Company's Grid Impact Study. Each eligible location proposed for the Solar Partnership Program is reviewed by the Company and undergoes a preliminary site analysis to determine project feasibility. To ensure cost-effective site development, the Company manages the site selection process and employs solar industry consultants and contractors to design and build the PV systems. The Company's observations and recommendations will be used to develop better planning models and determine grid impacts of solar DG. In addition, the Company has used the site construction and interconnection information obtained from these projects to improve grid protection policies for future renewable generators interconnecting to Company's distribution system.

Solar Purchase Program (Case No. PUE-2012-00064)

[2] Unless otherwise indicated, references to "Program" in discussions about the Solar Partnership Program are to the Solar Partnership Program, and references to "Program" in discussions about the Solar Purchase Program are to the Solar Purchase Program.

[3] For consistency and ease of reference, the capacity of a program or participating site will initially be stated in both AC and DC.

Launched in June 2013, the Solar Purchase Program is a demonstration program consisting of a special tariff designed to help customers cover the cost of installing solar generation, while also promoting additional solar development in the Commonwealth of Virginia. The Solar Purchase Program is a net energy metering alternative for customers interested in installing solar generation on their homes or small businesses. Participants in the Program install and own the solar generation installations, and sell the solar generation and Renewable Energy Certificates ("RECs") directly to the Company at a premium rate of 15 cents per kilowatt-hour ("kWh").

Residential and non-residential customers are eligible to participate in the Solar Purchase Program, provided that they meet the rate schedule qualifications, capacity is available, and their system size does not exceed the Program limits. Residential systems are limited to 20 kilowatts ("kW") AC capacity or less, while non-residential systems are limited to 50 kW AC capacity or less (provided that the requested capacity is available in the Program). Non-jurisdictional customers are not eligible to participate in the Program at this time.

Compensation to Program participants is comprised of two components: (1) an avoided cost component, and (2) an environmental contribution from revenues provided by customers voluntarily participating in the Dominion Green Power® program. The avoided cost component is eligible for cost recovery from customers through the Company's fuel factor. The incremental difference between the avoided cost component and the 15 cents per kWh rate comes from the Dominion Green Power® program. The voluntary environmental contribution component is payment for the environmental attributes (*i.e.*, the RECs) associated with the

solar renewable generation, and the Solar Purchase Program RECs are subsequently retired through the Dominion Green Power® program. The Company has agreed to pay the 15 cents per kWh rate for an initial five-year period.

The Solar Purchase Program continues to experience a steady stream of customer interest with many customers following through in completing their proposed projects. As of June 30, 2016, 123 projects have been completed under the Solar Purchase Program for a combined 1,544.4 kW AC. An additional 19 projects representing 420.8 kW AC are currently under construction.

Section 2. Introduction

On October 31, 2011, pursuant to Chapter 771, the Company proposed the first part of a two-part solar DG program for Commission approval. That day, the Company filed its application for the first component, the Solar Partnership Program, a demonstration program to study the impact and assess the benefits of distributed solar PV generation on its distribution system through the construction and operation of no more than 30 MW of Company-owned solar DG. The Commission approved the Solar Partnership Program (known then as the "Community Solar Program"), granting a blanket CPCN for the Program's facilities subject to certain requirements on November 28, 2012.[4]

On May 17, 2012, the Company filed a petition with the Commission for approval of the second component, the Solar Purchase Program, a demonstration program consisting of a new

[4] *Application of Virginia Electric and Power Company For approval of a Community Solar Power Program and for certification of proposed distributed solar generation facilities pursuant to Chapter 771 of the 2011 Virginia Acts of Assembly and §§ 56-46.1 and 56-580 D of the Code of Virginia*, Case No. PUE-2011-00117, Order, 2012 S.C.C. Ann. Rept. 328-33 (Nov. 28, 2012).

special tariff under which the Company would purchase no more than 3 MW of energy output from customer-owned distributed solar generation installations as an alternative to net energy metering. The Solar Purchase Program received Commission approval subject to certain requirements on March 22, 2013.[5]

The Company filed its first annual report with the Commission in these dockets on August 29, 2014 and its second annual report on September 4, 2015.

Section 2.1 Program Reporting Requirements

Consistent with, and to help facilitate, the Commission's annual reporting requirement to the Governor of Virginia and certain Committee chairs in the General Assembly under § 4 of Chapter 771, the Company will submit annual reports on the Solar Partnership Program and the Solar Purchase Program to the Commission on or about September 1 for a period of five years from the date that each participating solar DG installation becomes operational.

Under the Commission's directive on page 8 of its November 28, 2012 Order in Case No. PUE-2011-00117, the Company's annual reports must include, but are not limited to, information regarding the Solar Partnership Program; identification and information regarding each installation site; environmental findings of the Virginia Department of Environmental Quality ("DEQ"); operating performance of the distributed solar generation facilities; capacity and energy produced by these facilities; effects on the Company's distribution system; the value of associated RECs; and the Program's role in satisfying the Company's renewable energy portfolio standard ("RPS") Goals. Additionally, the Company is to provide revised system cost

[5] *Petition of Virginia Electric and Power Company For approval of a special tariff to facilitate customer-owned distributed solar generation pursuant to Chapter 771 of the 2011 Virginia Acts of Assembly*, Case No. PUE-2012-00064, Order, 2013 S.C.C. Ann. Rept. 269-72 (Mar. 22, 2013).

and benefit analyses using actual data as available and detailing its Study results for the Company's distribution system.[6] The Company is also to provide a more detailed review of Program implementation, customer interest, and the selection and development of project sites, along with initial operating information and a data collection plan to support the Program's stated Study objectives, plus other information about installation costs as requested by Commission Staff ("Staff") Witness David R. Eichenlaub in that proceeding.

Consistent with the Commission's directive on page 6 of its March 22, 2013 Order approving the Solar Purchase Program in Case No. PUE-2012-00064, annual reports will provide key metrics including participation levels and generation load data gathered from Program participants.

Section 3. Solar Partnership Program

Section 3.1 Program Implementation Update

To develop Company-owned solar generation projects supporting the Company's stated Study objectives (discussed more fully below in Section 3.4), the Company matches eligible and interested customers having suitable and available host sites with the solar circuit target areas identified by the Company's Electric Distribution Planning Department. Sites selected to host a solar system of 500 kW DC or larger must meet one or more of the Company's Study objectives to participate in the Program. The Company's preliminary observations and grid impact study results are detailed in Section 3.4 of this report to support the Study objectives, which are to:

[6] As indicated in Section 3.3.2, there is presently insufficient data to update the revised cost-benefit analysis for the Solar Partnership Program from that provided to the Commission in the CPCN proceeding. As more operational data becomes available from Program sites, this information will be provided in future annual reports.

1. Determine the effects of solar DG on circuit loading, analyze the peak demand reduction benefits to the distribution system, and collect the necessary data to develop a solar DG load model for the Company's Distribution Planning process.
2. Quantify the reduction in line losses from solar DG at various points on the distribution system.
3. Study the operational impact of "high saturation" solar DG on a single circuit.
4. Assess the potential for solar DG to improve conservation voltage reduction ("CVR") performance.

A summary of the Program implementation results are shown in the table below:

Site	Study Type	Size (kW DC)	Size (kW AC)	Status/ In-service Date
Canon - Gloucester	Heavily Loaded	521	500	6/14/14
Old Dominion University	Demonstration	151	125	7/3/14
Capital One	Heavily Loaded	633	500	12/17/14
Virginia Union University	Demonstration	69	50	12/31/14
Prologis - Concorde Center	Heavily Loaded	859	746	3/31/15
Randolph-Macon College	Demonstration	69	50	3/31/15
Philip Morris Park 500	Lightly Loaded	2,450	2,000	3/31/16
Western Branch High School	Heavily Loaded	1,003	806	4/25/16
Merck	Heavily Loaded	2,211	1,512	4Q 2016
University of Virginia	Demonstration	452	381	Under construction
Total		**8,418**	**6,670**	

Section 3.1.1 Program Design

The Company employed a vendor selection process and procurement system to obtain price certainty for purposes of gaining Commission approval of the Program. Specifically, the

Company currently has procurement contracts with four qualified Engineering, Procurement and Construction ("EPC") contractors to competitively bid and build the Solar Partnership Program projects. In support of 2015 legislation (Chapter 6 of the 2015 Virginia Acts of Assembly) calling for the use of Virginia-based businesses in the construction of future solar facilities, the Company has been successful in the Solar Partnership Program to employ, or cause to be employed by its select group of EPC firms under contract (which includes one Virginia-based firm), local solar industry supporting vendors and contractors where practicable – and when contractors meeting internal standards for price, diversity, experience, and quality are available. The Company also employs an Owner's Engineer to perform the following site evaluation and engineering tasks:

- Site assessment services and customer proposals;
- Structural and geotechnical engineering services to determine site suitability;
- Request for Proposal ("RFP") bid packages;
- Periodic construction inspections;
- Final commissioning of each solar generation system; and
- Other tasks as required to safely and cost-effectively administer the Solar Partnership Program

Section 3.1.2 Project Development

The Company proposed to construct and operate the Company-owned facilities in the Solar Partnership Program in two phases. In Phase I, the Company originally proposed to construct and operate up to 10 MW DC of distributed solar generation between the date of Application approval and December 31, 2013. Project development and customer engagement

activities for Phase I commenced upon receipt of the Commission's Order approving the Program on November 28, 2012 and ultimately concluded on December 31, 2014.

To cost-effectively secure project sites for the Program, the Company instituted a leasing plan to option properties with agreed-upon general leasing terms, and then pursue more detailed site suitability engineering before entering into long-term lease agreements. Due to longer than anticipated project development cycles, including negotiating full lease terms with participating site hosts prior to securing properties, completion of corporate risk evaluations by both parties, and completing other necessary site engineering and permitting tasks subject to site host review and approval, the Company completed Phase I projects of 1.374 MW DC by the end of 2014. The completed projects include a large roof-top and ground solar array along with two of four smaller demonstration sites.

Likewise, in Phase II of the Program, the Company had originally proposed to construct and operate no more than 20 MW of distributed solar generation between January 1, 2014 and December 31, 2015. In an "Update Notice" letter filed with the Commission on May 7, 2015 in Case No. PUE-2011-00117, the Company advised that Phase II would extend to December 31, 2016. All projects under the Solar Partnership Program will be constructed and operated under the Commission-approved blanket CPCN for the Program.

Section 3.1.3 Customer Participation

Interest in the Program has continued among commercial, industrial, educational, and governmental customer groups from across the Company's Virginia service territory. An additional 50 inquiries have been received from July 2015 to July 2016, bringing the total

number of inquiries to approximately 750. On July 3, 2014, the Company placed the first of several solar demonstration sites in-service at Old Dominion University ("ODU"). This project consists of more than 600 solar panels (Exhibit 1) installed on the roof of ODU's Student Recreation Center generating up to 125 kW AC (151 kW DC) for the electric grid. The roof solar array occupies 20,000 square feet of roof space above the facility's gymnasium floor and visitors can view operating information on the kiosk located in the building lobby. ODU faculty also use a Company-provided Internet link to monitor the output of the facility for their own research purposes, and ODU staff have conducted tours for interested school system personnel from around the Commonwealth. A more detailed description of the operating performance of this installation is provided in Section 3.3.1 of this Report.

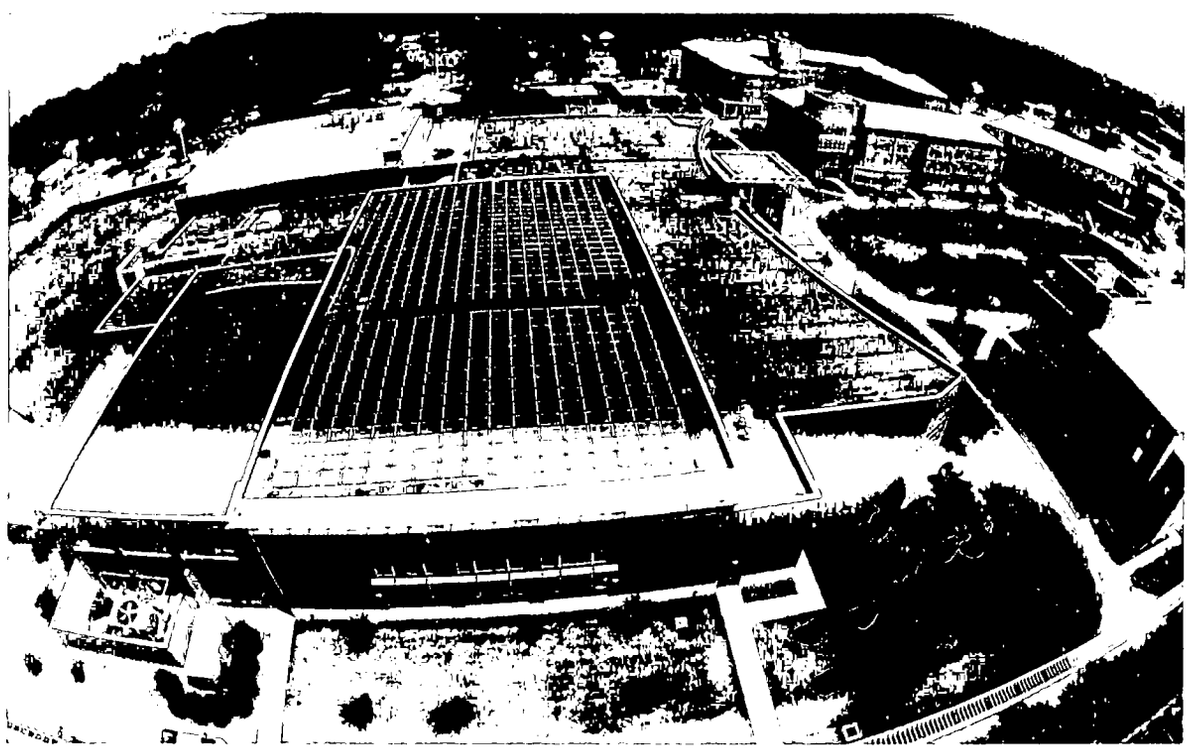


Exhibit 1. Old Dominion University Student Recreation Center solar roof project

More broadly, the Company has designated projects as either "demonstration" or "study" sites. The first group is limited to smaller demonstration projects of less than 500 kW, such as the ODU project referenced above, located on public or community buildings/sites. These locations provide opportunities for customer outreach and education on solar technologies, as well as to obtain generation and other Study-related data across the Company's service territory where applicable. These smaller projects are being developed in part to satisfy the legislative requirement in § 2 of Chapter 771 to install at least four systems in community settings. The ODU project is the first of these smaller demonstration projects, and two additional demonstration projects, both rated at 50 kW AC output, have been completed and placed in service at Virginia Union University (Exhibit 2) and Randolph-Macon College (Exhibit 3). Dedication ceremonies at all three university demonstration sites were well attended by administration, faculty, students, local and state government officials, media, and other interested parties. The Company is currently constructing its fourth public demonstration site at the University of Virginia and that project will be completed by the end of 2016. In addition to serving as public demonstration sites, the Company has also gained significant experience in evaluating the appropriate level of grid protection and associated equipment at Company solar DG installations.

Exhibit 2: 50 kW AC solar system installed on Henderson Hall at Virginia Union University

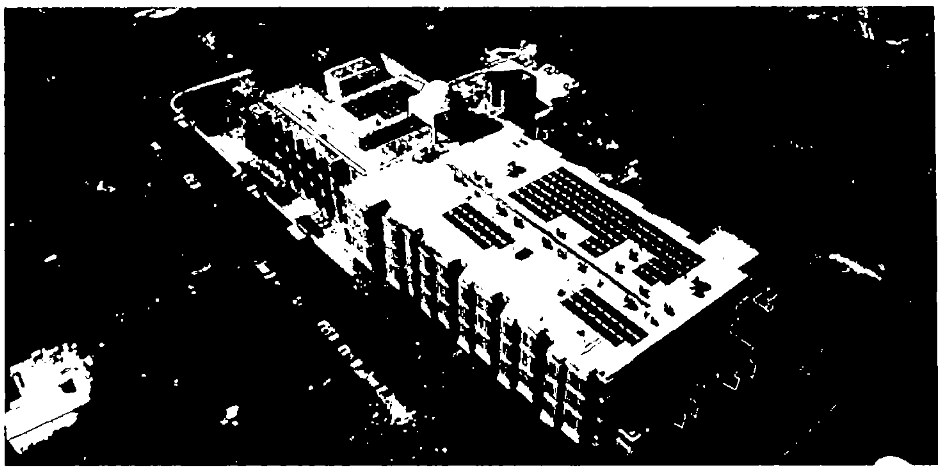


Exhibit 3: 50 kW AC solar system and battery storage facility at Randolph-Macon College

Sites selected by the Company to accommodate solar DG facilities greater than 500 kW DC on targeted circuits make up the majority of installations in the Solar Partnership Program in furtherance of the Company's Study objectives. All prospective project sites undergo a rigorous selection process, including thorough engineering due diligence, and are subject to mutually agreeable lease terms with site host property owners.

The first roof-top Study site completed and placed in-service during 2014 is the 500 kW AC (521 kW DC) roof-mounted project at the Canon Environmental Services manufacturing

facility in Gloucester, VA (Exhibit 4). In addition, the Company placed the Prologis Concorde Executive Center 746 kW AC (859 kW DC) solar DG facility in-service in Sterling, VA (Exhibit 5).

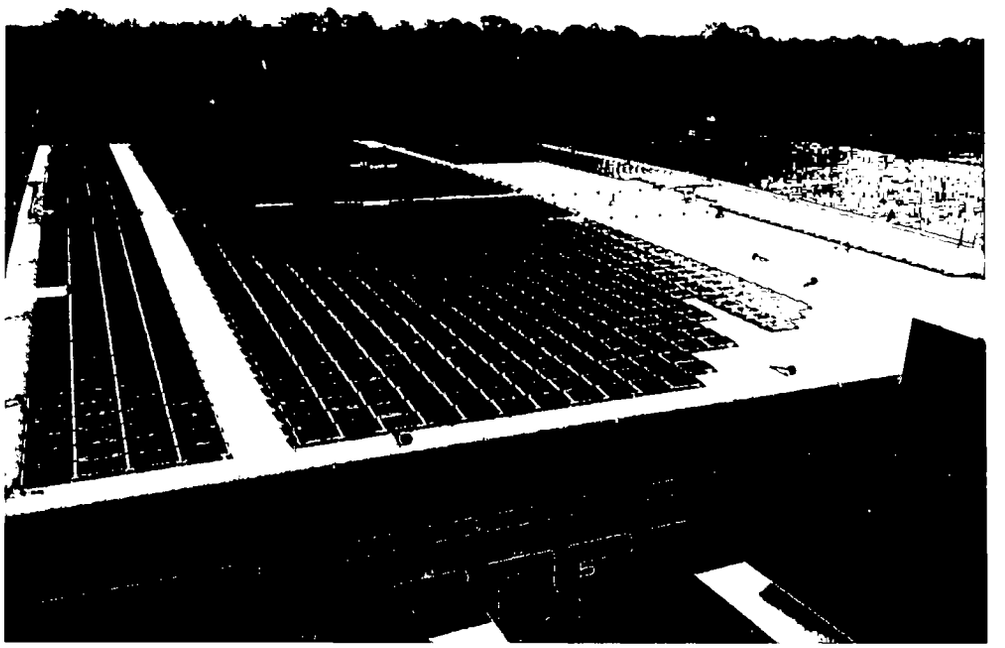


Exhibit 4: Canon Environmental Systems, Gloucester, VA facility solar roof project

Exhibit 5: Prologis Concorde Executive Center, Sterling, VA facility solar roof project

The Company's Western Branch High School ("WBHS") roof-top solar system was placed in service in April 2016 and has a peak AC output of 806 KW AC (1,003 kW DC). This project is currently the largest single roof-top solar system in the Commonwealth of Virginia (Exhibit 6).

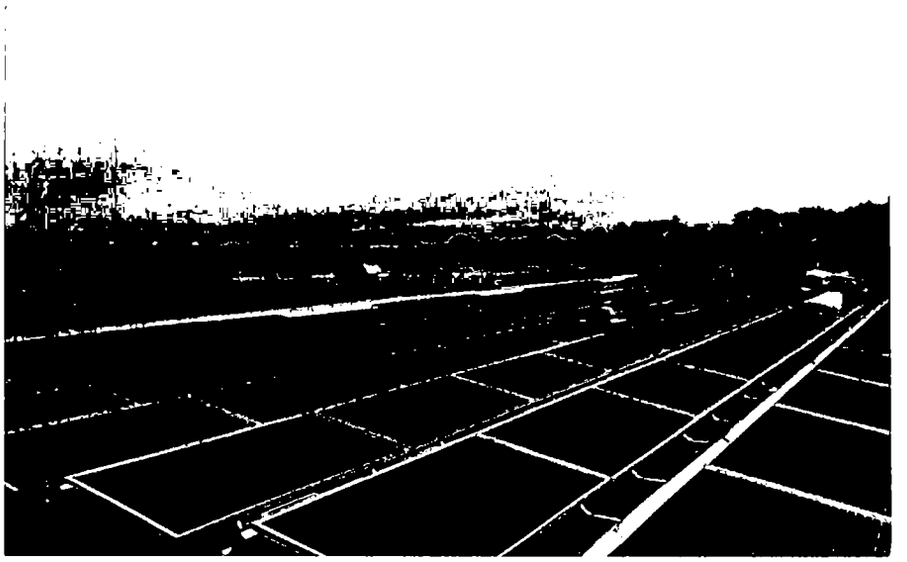


Exhibit 6: Western Branch High School, Chesapeake, VA solar roof project

The Company's first ground-mount solar DG installation, rated at peak power output of 500 kW AC (633 kW DC), was placed in service in December 2014 at the Capital One Meadowville Technology Park facility in Chester, VA (Exhibit 7).

Exhibit 7: Capital One Meadowville Technology Park facility solar ground project

Two additional ground solar installations, a 2 MW AC (2,450 kW DC) solar facility at Philip Morris (Exhibit 8) in Chester and a 1.512 MW AC (2,211 kW DC) solar facility at Merck near Elkton (Exhibit 9), have been or will be completed in 2016. As the Company has gained additional experience with solar DG, its sites have generally become larger to take advantage of economies of scale when constructing Solar Partnership Program facilities.

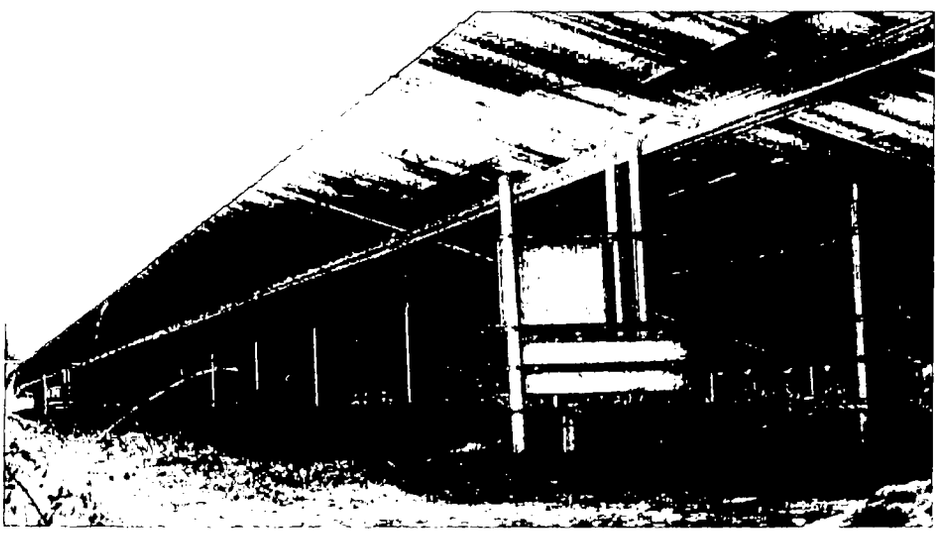


Exhibit 8: Phillp Morris Park 500 facility solar ground project

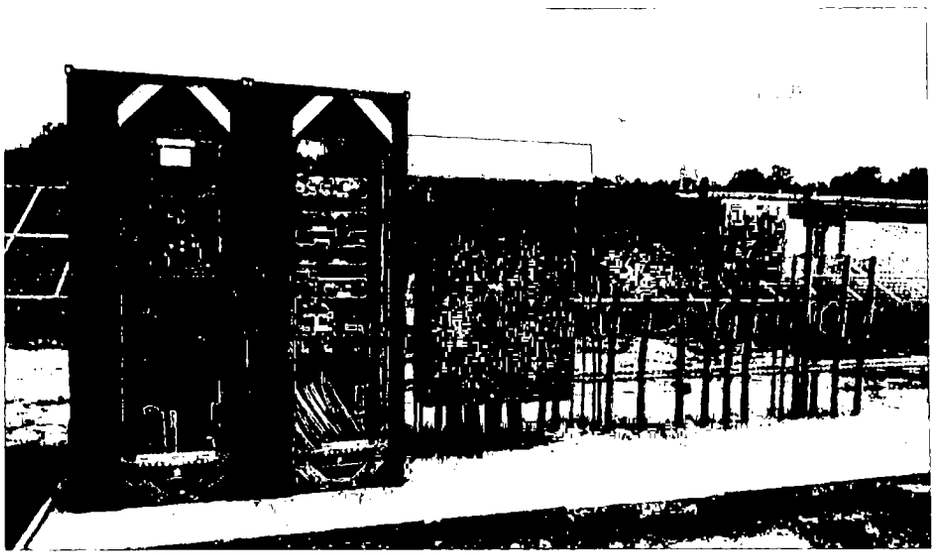


Exhibit 9: Merck solar project main switch gear and interconnection metering equipment

All Study site projects meet the Company's physical property selection criteria and are located on targeted Study site circuits which align with the Company's previously defined Grid Impact Study objectives. In addition, all ground-mount solar DG facilities are located on previously developed sites as defined by the DEQ. Appendix A provides summary details and a photograph of each completed Solar Partnership Program installation.

Section 3.1.4 Customer Education Plan

The Company has implemented a customer education program at Western Branch High School, the first secondary education facility to participate in the Solar Partnership Program, for classroom instruction. A "train the trainer" session held on July 26, 2016 included a six-hour training workshop for thirteen Chesapeake City School teachers and staff members. The workshop included a mix of scientific theory, including how solar generation works along with

basic information relating to solar power, a tour of the school's solar DG PV facility, and hands-on solar power demonstrations to reinforce the classroom instruction. Each participant received a notebook of the information covered in the class. In addition, host site training participants received solar laboratory kits with accompanying curriculum to be used as the school administration determines (Exhibit 10).

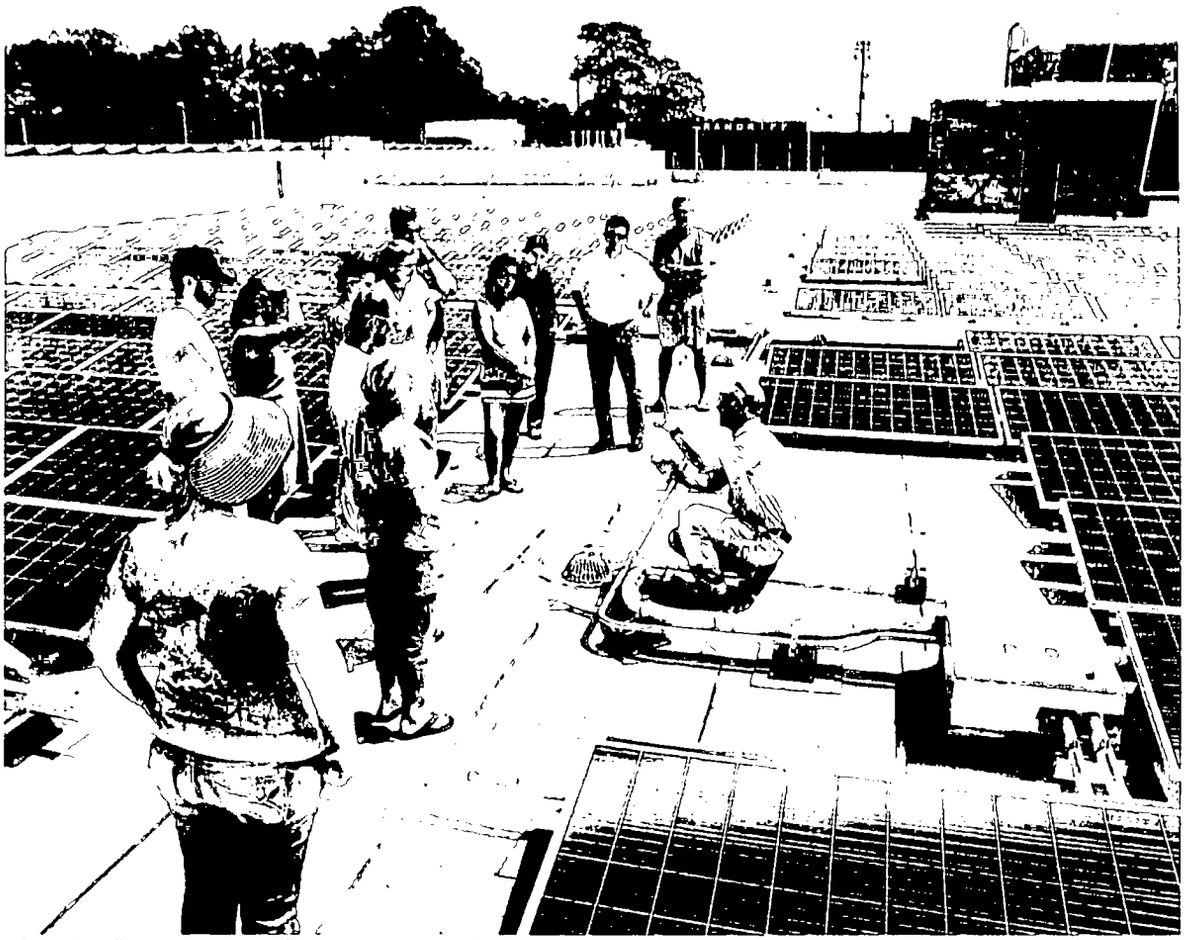


Exhibit 10: "Train the Trainer" event at Western Branch High School

The Company has also provided each participating customer with an educational kiosk which provides project information as shown in Exhibit 11. The information includes energy output information and environmental attributes related to the solar system.

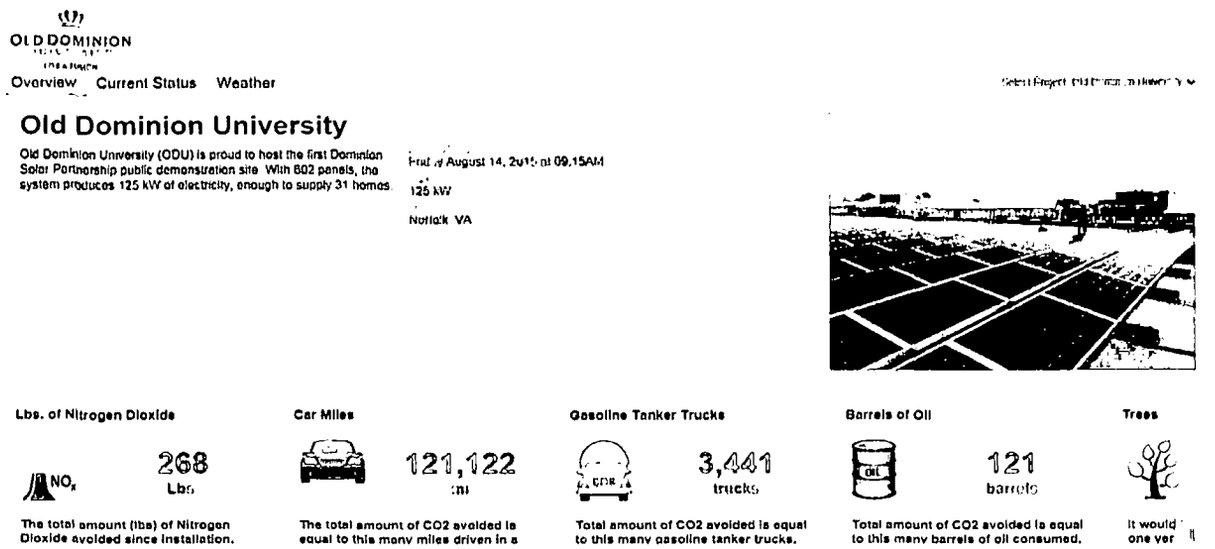


Exhibit 11: Sample customer screen view of solar operating and environmental information

The Company has conducted dedication and/or open house solar tour events at each location to commemorate the solar DG facilities with its host partners and provide opportunities for interested parties to learn more about solar DG. These events have been well attended and typically draw local, regional, and industry media attention to the Company's distributed energy project activities (Exhibit 12).

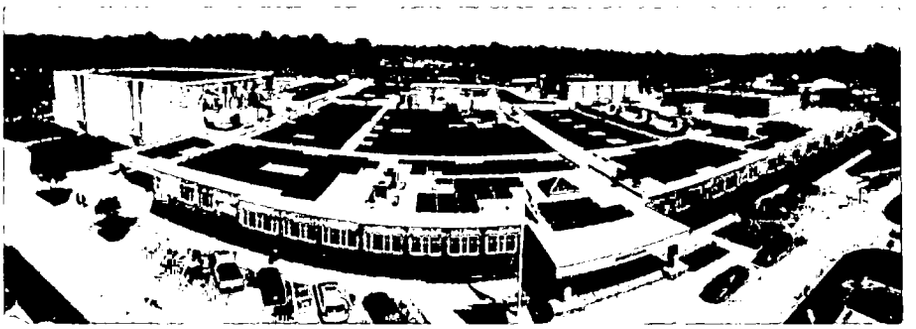
Dominion

MEDIA ADVISORY

Chesapeake Public Schools

Date: April --, 2016

Be Among the First to Tour Largest Array of Solar Panels in Virginia



WHAT: Dominion Virginia Power and Chesapeake Public Schools invite you to a ribbon cutting for the largest single rooftop solar system in Virginia at Western Branch High School. It is made up of 3,000 solar panels. At peak sunlight, it can generate electricity for about 200 homes. The output will go onto the energy grid. Students, teachers, local officials and community leaders will be in attendance to learn more about the solar system that will convert sunlight into electric power. Visitors can review educational materials provided by Dominion that will give students and faculty hands-on learning opportunities as well as a real-time data kiosk located within the school.

WHEN: Wednesday, April 27, 1:00pm. MEDIA – PLEASE ARRIVE BY 12:45

Exhibit 12: Sample of media reporting on Solar Partnership Program projects

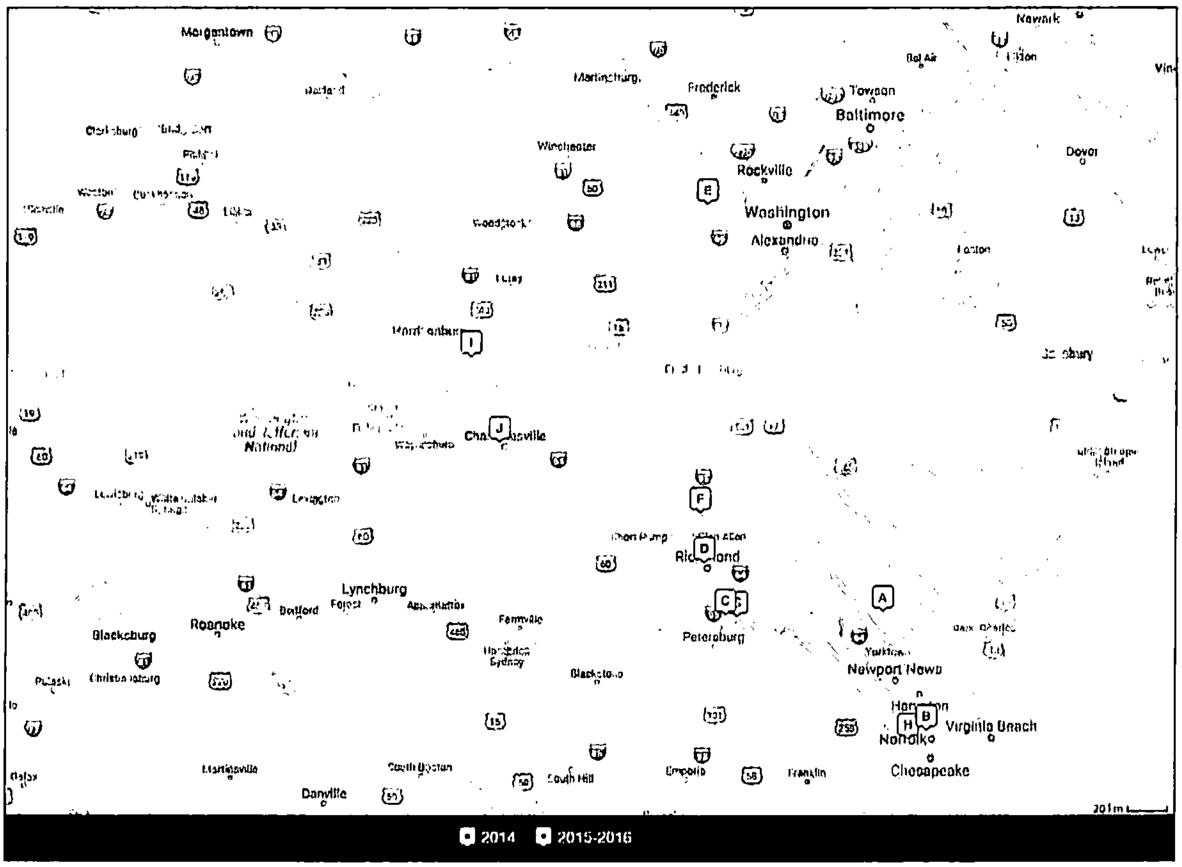
Upon completion of the training, participating faculty/officials will be able to instruct current and future students and others on the basic operation of solar arrays and the benefits and impacts of solar systems. The Company will sponsor this education plan as part of its broader demonstration program, and training will be conducted by solar industry experts. Western Branch High School in Chesapeake was the first Virginia school system to receive the education plan.

In addition, the Company has hosted site tours for numerous county administrative and elected official groups at its Philip Morris solar facility as other large solar projects are being planned and proposed in various jurisdictions around the Commonwealth. This facility has provided opportunities for county leaders and decision-makers to tour and inspect large solar facilities before permitting and construction begins on proposed projects in their localities.

Section 3.2 Program Implementation

Section 3.2.1 Customer Participation and Host Site Summary

The following project host site location map depicts the Solar Partnership Program locations completed or under construction. The participating project host sites are distributed across the Company's electric distribution system as shown below, with the color of each location indicating the year of actual or expected project completion.



The summary data table below also provides additional details on the numbers and sizes of installations. The Company has completed eight projects, with two additional projects under construction.

Map Location	Site	Study Type	Size (kW DC)	Size (kW AC)	Status/ In-service Date
A	Canon - Gloucester	Heavily Loaded	521	500	6/14/14
B	Old Dominion University	Demonstration	151	125	7/3/14
C	Capital One	Heavily Loaded	633	500	12/17/14
D	Virginia Union University	Demonstration	69	50	12/31/14
E	Prologis - Concorde Center	Heavily Loaded	859	746	3/31/15
F	Randolph-Macon College	Demonstration	69	50	3/31/15
G	Philip Morris Park 500	Lightly Loaded	2,450	2,000	3/31/16
H	Western Branch High School	Heavily Loaded	1,003	806	4/25/16
I	Merck	Heavily Loaded	2,211	1,512	4Q 2016
J	University of Virginia	Demonstration	452	381	Under construction
	Total		**8,418**	**6,670**	

Section 3.2.2 Project Host Site Identification

The Company began actively soliciting Solar Partnership Program participants upon Commission approval of the Program. The Company implemented a target circuit identification plan to ensure that selected project sites meet the identified Study objectives, and focused on positioning projects on three key categories of circuits:

- Heavily loaded circuits – circuits presently utilizing or projected to utilize 90% or greater of total capacity load during peak conditions;
- Lightly loaded circuits – circuits with less than 2 MVA (megavolt-amp) total circuit load; and
- CVR circuits – circuits fed from substations currently utilizing conservation voltage reduction technology.

As described previously, all prospective sites undergo a rigorous selection process, including thorough engineering analyses, before they are finally selected for inclusion in the Solar Partnership Program.

Section 3.2.3 Customer Engagement

The Company identified eligible host sites on circuits targeted for the Study objectives by conducting comparative analysis where target circuit areas were matched with available building inventories in the corresponding areas. The Company has investigated over 750 potential solar project host locations throughout its Virginia service territory to meet Study objectives and has developed the best available sites for Solar Partnership Program projects.

After a potential host site is identified and deemed potentially eligible based on Study objective criteria, the Company communicates eligibility information to interested host site participants, including preliminary solar assessments if applicable, and general leasing term information to identify good prospect sites and address potential concerns. To ensure a cost-effective site identification process, initial host site assessments are limited in scope and focus on whether (i) adequate roof or ground space is available to install Program systems, and (ii) the sites meet one or more Study objectives. This initial assessment is then communicated with the host site participant and sufficient customer commitment must be demonstrated via a property lease option before further, more intensive site assessment and engineering studies

are begun. Ideally, once the lease option is obtained, the Company initiates more detailed due diligence with its consulting engineers to confirm site suitability for the Program. However, in practice, most site hosts have expected to negotiate full lease terms prior to making any commitment to participate in the Program. This due diligence includes a roof structural or soil analysis, inspections of roof or ground surface condition, a review of the building's age and condition (if applicable), an energy evaluation of the potential PV system, environmental review, and a preliminary interconnection study. At the completion of the site suitability process, eligible sites are selected and the sites are secured for project development.

Technical feasibility specifications for eligible project sites were developed in conjunction with solar consultants and contractors, and the following industry best practices for site screening were employed to efficiently and cost-effectively evaluate over 750 prospective project sites:

- Roof material must be less than five years old, or have more than 15 years remaining under warranty;
- Building area available must be greater than 75,000 square feet, or available ground area must be sufficient to accommodate the space required to install a solar DG system with at least 500 kW DC generating capacity; and
- Host site structures must be less than 50 years old, and ground sites must be on previously developed parcels, to qualify for permitting under the DEQ's solar "Permit by Rule" ("PBR") regulations.[7]

[7] 9 VAC 15-60-10, *et seq.*

Section 3.2.4 Environmental Findings

The Company's Environmental Services Group reviews potential project sites to better ensure that there are no environmental impacts or issues. The completed projects at ODU, Canon, Prologis, Virginia Union University, Randolph-Macon College, and Western Branch High School met the Categorical Criteria of the Solar Permit By Rule, 9 VAC 15-60-130 A 2 b, for small solar projects mounted on buildings less than 50 years old. Due to the assumed *de minimis* environmental impact from a project that meets the criteria, no submission to, or certification from, the DEQ is required to construct these projects. Mounting the solar systems on the rooftops at each location prevents impacts to environmental or cultural resources of the Commonwealth.

Three ground-mount solar systems have been developed on previously disturbed but not improved sites. To date, the Company has secured ground-mount solar system locations, including a former construction lay down area at a customer data center, a commercial site previously graded for warehouses never completed, and land adjacent to a manufacturing facility which is zoned industrial. For these sites, the Company has complied with the DEQ's PBR guidelines which outline the qualifying criteria for each Solar Partnership project location under rules established in Part III of the guidelines, titled "Provisions for Projects Less Than or Equal to Five Megawatts or Less Than or Equal to 10 Acres or Meeting Certain Categorical Criteria". This provision reads as follows:

"Part III
Provisions for Projects Less Than or Equal to Five Megawatts or Less Than or Equal to 10 Acres or Meeting Certain Categorical Criteria

9 VAC 15-60-130. Small Solar Energy Projects Less Than or Equal to Five Megawatts or Less Than or Equal to 10 Acres or Meeting Certain Categorical Criteria.

A. The owner or operator of a small solar energy project is not required to submit any notification or certification to the department [DEQ] if he meets at least one of the following criteria:

1. The small solar energy project has either a rated capacity equal to or less than 500 kilowatts or a disturbance zone equal to or less than two acres; or

2. The small solar project falls within at least one of the following categories, without regard to the rated capacity or the disturbance zone of the project:

a. The small solar energy project is mounted on a single-family or duplex private residence.

b. The small solar energy project is mounted on one or more buildings less than 50 years old or, if 50 years of age or older, have been evaluated and determined by DHR [the Virginia Department of Historic Resources] within the preceding seven years to be not VLR [Virginia Landmarks Register]-eligible.

c. The small solar energy project is mounted over one or more existing parking lots, existing roads, or other previously disturbed areas and any impacts to undisturbed areas do not exceed an additional two acres.

d. The small solar energy project utilizes integrated PV only, provided that the building or structure on which the integrated PV materials are used is less than 50 years old or, if 50 years of age or older, has been evaluated and determined by DHR within the preceding seven years to be not VLR-eligible.

B. The owner or operator of a small solar energy project with either a rated capacity greater than 500 kilowatts and less than or equal to five megawatts or a disturbance zone greater than two acres and less than or equal to 10 acres shall notify the department and shall submit a certification by the governing body of the locality or localities wherein the project will be located that the project complies with all applicable land use ordinances."

In addition to using renewable sunlight in lieu of other fuels to generate electricity, during operation, the solar DG sites in the Program will not generate noise, air emissions, waste water, or solid waste – and at the end of life, the Company intends to reuse or recycle project materials to the greatest extent possible. The Company has also complied with all local

permitting and conditional use zoning requirements required by the local jurisdictions, including the purchase of Phosphorous Offset credits required by the Chesterfield County Planning Commission to construct the Philip Morris solar DG facility on a previously developed site.

Section 3.2.5 Securing Host Sites

The Company undertook a nationwide study of solar project risk assessment and mitigation in renewable energy projects. Numerous meetings, site tours, and conferences with other utilities, solar contractors/developers, and solar industry associations were conducted to develop Company processes for contract structuring, documentation, risk sharing, *Force Majeure*, change of law, and other hard-to-quantify casualty and operational risks. Allocation of project risk and the roles/duties of the Company, site hosts, and contractors are performed as part of the project development process for each site. The Company enters into agreements and contracts with select and qualified solar developers and contractors before commencing with the construction and operation of the Solar Partnership Program facilities.

Site host lease agreements cover the duration and payment terms of the agreement, property management issues, access rights, and roof or ground maintenance obligations necessary to ensure reliable operation and the safe and quiet enjoyment of the lease area during the term. Lease payment terms for project sites are based on installed capacity for roof- or ground-mount systems. Lease rates vary depending on the terms reached with the site host, but generally the Company makes an annual lease payment with provisions including a 15-year initial term with an automatic five-year renewal period. In addition, termination rights cover

any unforeseen situations where it may be necessary to remove and relocate a Program solar installation before the end of a lease term.

Securing leases for these projects requires in-depth risk analysis by both parties and a comprehensive review of the owner's and the Company's obligations including indemnification and insurance. The Company also requires the site host to maintain the property in good condition during the lease term to help ensure safe operation of the solar DG systems.

Section 3.2.6 Project Construction and Operation

Once a lease has been executed by the host site and the Company, and the detailed engineering due diligence is conducted, the project is ready to go through the required procurement and bid processes. The Company has entered into master service agreements ("MSAs") with a select group of qualified EPC contractors for the construction and operation of these projects. The EPC agreements include terms which provide consistent warranties and operation plans once the facilities are placed in-service. For each proposed facility, a RFP is released to the EPC contractors using the data obtained through the Company's site assessment and bid specification processes. A pre-bid meeting is held at each location to provide bidders the opportunity to review unique site details and help ensure competitive pricing. The EPC contractors provide a bid price and a high level layout for the project. The bids are reviewed separately by the Company and Antares Group Inc., its Owner's Engineer, for cost and technical competency. A bid is then awarded to the selected EPC contractor based on this evaluation under the procurement terms reached under the MSA contract.

With respect to equipment and material sourcing, the Company has entered into EPC turn-key contracts that require the installing contractor to specify, procure, and warrant equipment and materials for a five-year period. The major material components, solar panels and inverters used at each Solar Partnership Program site are identified in the Project Summaries provided in Appendix A.

To further reduce risk and assist in the cost-effective design, construction, and operation of the solar DG facilities, the Company developed the following guidelines and policies in consultation with its engineers, suppliers, and other industry consultants. These guidelines and policies govern overall project development goals to install and operate consistently reliable and safe solar DG facilities at customer site host locations:

- Supplier Evaluation Plan: The Company's consulting engineer evaluates the material specified for each project to ensure manufacturer quality, warranty, experience, and financial performance on other projects.
- Roof Installation Guidelines: This provides the Company and site host specifications regarding the roof composition and appropriate mounting methods and precautions to be taken to ensure that roof integrity is maintained during construction and operation. These guidelines also contain design standards for thermal expansion and wind/snow loads on roofs.
- Solar Panel Orientation Study: The Company has evaluated the tradeoffs between southern orientation, which is recommended for optimal energy production, and more southwesterly-to-west facing solar panels, which provide

daily peak power more consistent with the Company's historical summer peak demand periods.

Section 3.2.7 Construction and Commissioning

After a bid has been awarded, the EPC contractor develops a detailed final design which is reviewed and approved by the Company. The EPC contractor then obtains the required permits and begins construction. There are four technical review site visits during the construction phase by the Company's solar consulting engineer in addition to a third-party inspection at the final commissioning stage.

The physical grid interconnection for Program projects is managed by the Company's Electric Distribution Construction group, which makes the cable connection at a Company-owned distribution transformer using standard electrical distribution construction methods employed within the Company's service area. The line of delineation between the Company-installed electric distribution equipment and the contractor-provided solar equipment is the metering point. All installation and operating maintenance beyond the metering point is the responsibility of the installing EPC contractor.

Section 3.2.8 Solar Technology

The Company has continued to gain experience with solar technology advancements including the use of string inverters for installations in place of central plant inverters as part of the overall evaluation of distributed solar system installation. The Company is constructing two string inverter projects during 2016 at Merck and the University of Virginia. In addition to greater design flexibility, string inverters allow the conversion of electricity from DC to AC closer

to the source of generation, which allows for better cable management including the transmission of AC without long cable runs of DC conductor circuits.

Section 3.2.9 Battery Storage

To further understand how solar energy intermittency and energy storage may play a role in energy distribution in the future, the Company installed battery storage capability under a separately funded study at its Randolph-Macon College 50 kW AC solar demonstration facility in Ashland, VA. The site is designed to provide data and experience on battery and solar integration, system design, layout, software, controls, data collection, and system protection considerations. The battery portion of the facility is comprised of two batteries – a 48 kW, 148 kWh zinc air flow battery and a 7 kW, 28 kWh aqueous hybrid ion battery. After gathering operational and test data for approximately a year, the Company removed the zinc air flow battery from testing in August 2016. The Company will continue to test the capabilities of the remaining aqueous hybrid ion battery:

Capabilities to Evaluate:

- Peak Shifting
- Battery duty cycling
- Degradation / round trip efficiency

Section 3.3 Generation Load Data and Operating Performance

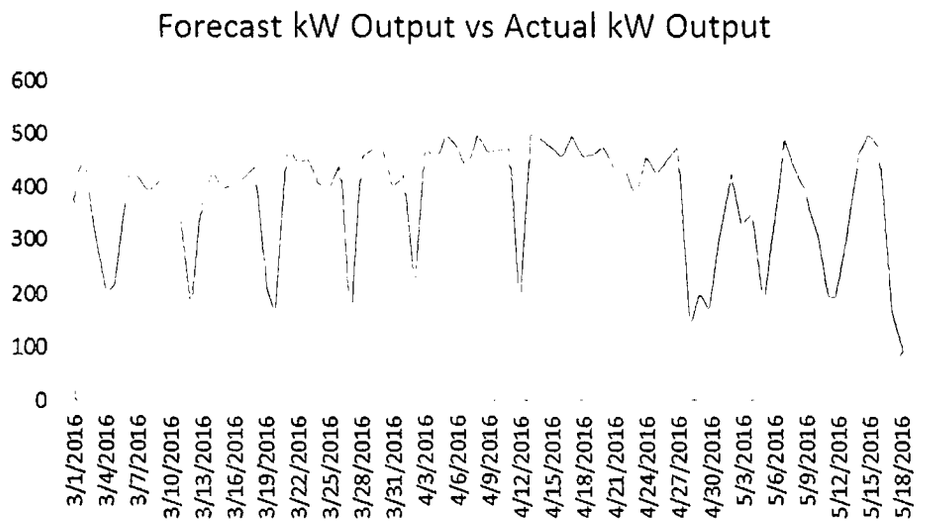
Section 3.3.1 Operating Performance and Capacity and Energy Report

All active Solar Partnership Program sites have been configured with Draker power and weather monitoring equipment. This data connectivity allows the Company and the host site participants to monitor, in real time, the performance of the solar facilities. Draker also provides data historian services, allowing the Company to archive and analyze historical operating performance at the sites. This data includes real and apparent power output, power factor, ambient temperature, solar irradiance, and wind speed and direction. This data is sufficient to characterize the output performance, efficiency, and gross energy of each site. The details of each facility's solar exposure and actual electrical output are outlined below.

3.3.1.1 Canon Environmental Services

The Canon Environmental Services facility, the first active Solar Partnership participant, was completed in the first quarter of 2014. The Gloucester facility is comprised of 2,044 solar panels at a 5 degree tilt. Each panel is rated at 255 watts, generating 500 kW AC of electricity.

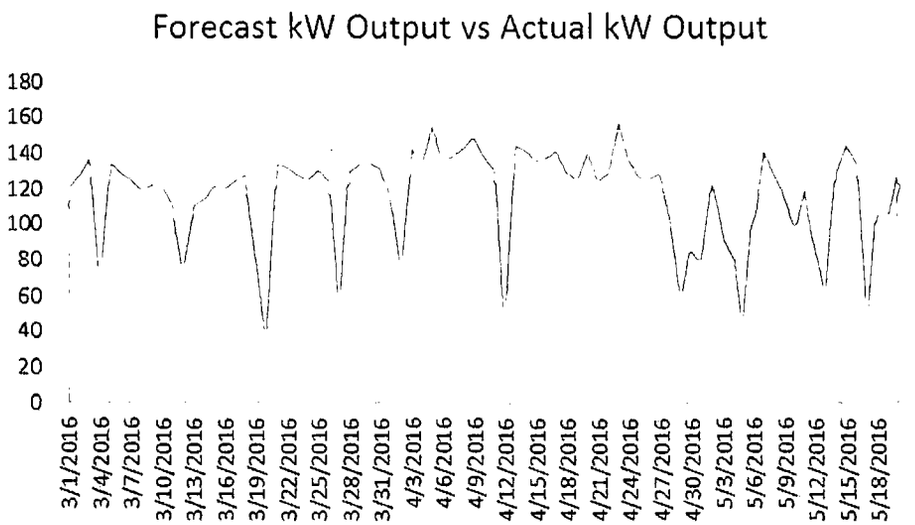
National Renewable Energy Laboratory ("NREL") solar insolation data estimates annual average solar exposure at this site to be 4.39 kWh/m2/day. Since June 2015, the average insolation measured at the site was 4.48 kWh/m2/day. The actual power output from the site has slightly trailed the forecast by approximately 4% in the last year. Since going on-line in 2014, the site has produced more than 1,220 MWh with a peak output of 482 kW AC. This is 87% of its forecast energy.



3.3.1.2 Old Dominion University Student Athletic Center

The Old Dominion University Student Athletic Center facility in Norfolk was completed in the second quarter of 2014 and generates 125 kW AC of electricity. It is one of four active Program demonstration sites and is accompanied by an educational kiosk in the lobby. The facility utilizes 600 solar panels, rated at 250 watts each, at a 10 degree tilt.

NREL solar insolation data estimates annual average solar exposure at this site to be 4.53 kWh/m2/day. Since June 2015, the site has averaged 4.36 kWh/m2/day. The actual power output from the site has trailed the forecast by 3%, but has consistently generated power at the nameplate maximum output of 125 kW AC for much of its service duty. The site has produced 355 MWh, 99% of the forecast supply.

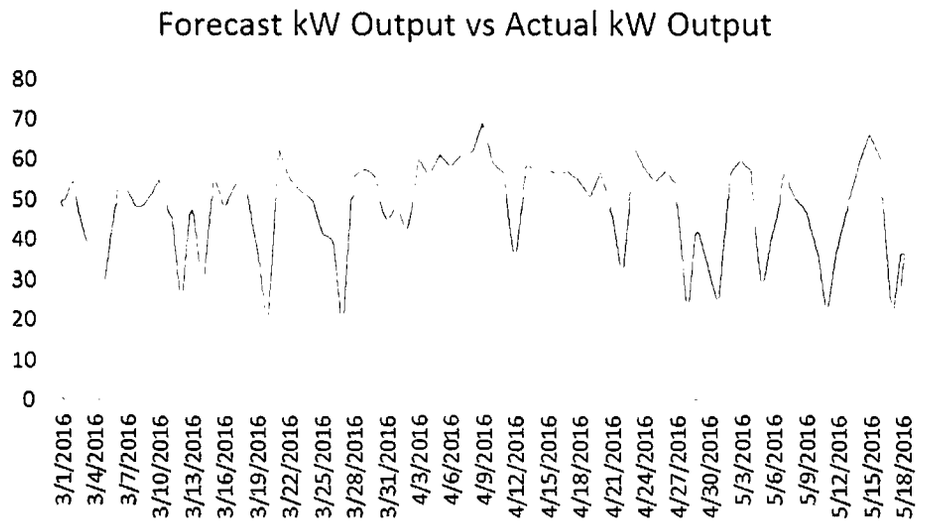


3.3.1.3 Virginia Union University Henderson Center

The Henderson Center at Virginia Union University in Richmond houses a second Program demonstration site. The facility is rated at 50 kW AC, from 247 solar panels rated at 250 watts per panel at a 10 degree tilt. The facility was completed in the fourth quarter of 2014. As a demonstration site, this facility also has an educational kiosk on the premises.

NREL solar insolation data estimates annual average solar exposure at this site to be 4.39 kWh/m2/day. Since the beginning of 2015, the site has averaged 4.26 kWh/m2/day.

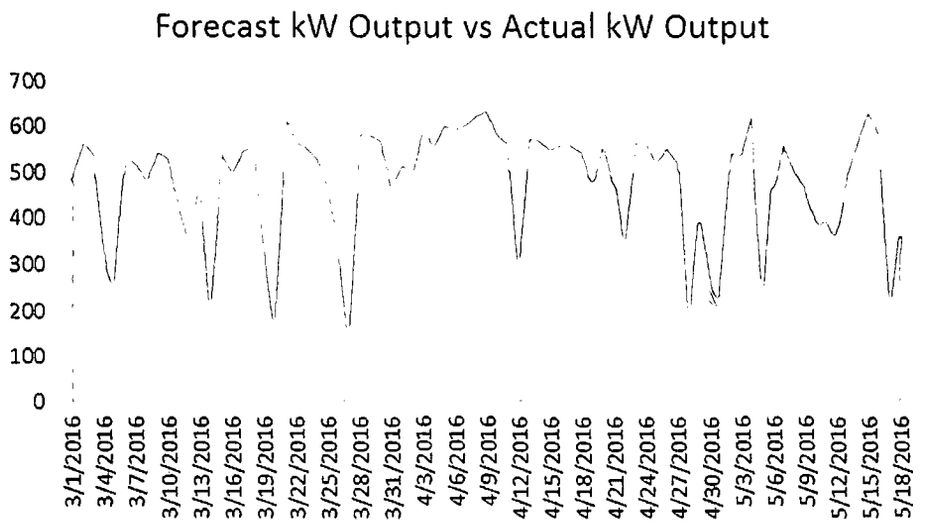
The installation generates its 50 kW AC rated output consistently, and actual output tracks very closely with the Draker forecast model. To date, this site has generated 115 MWh, 91% of its forecast energy production.



3.3.1.4 Capital One Meadowville Technology Park

The Capital One Meadowville Technology Park facility in Chester is a ground-mounted solar facility adjacent to the Capital One Data Center that opened in March 2014. The PV array was completed in the fourth quarter of 2014 and is rated at 500 kW AC. There are 2,434 panels, rated at 260 Watts each , at a 20 degree tilt.

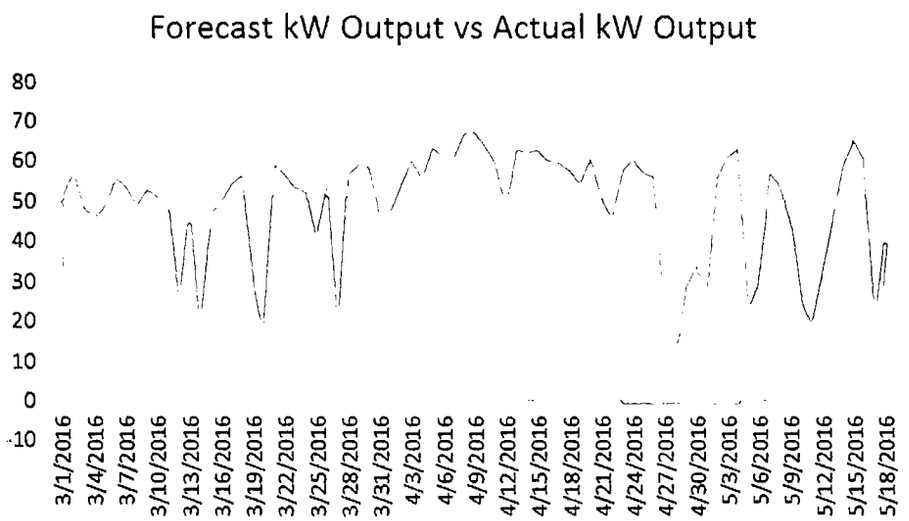
NREL solar insolation data estimates annual average solar exposure at this site to be 4.73 kWh/m2/day. Since December 2014, the site has measured average solar exposure of 4.06 kWh/m2/day. The site has generated over 1100 MWh since it was commissioned, or 87% of the energy forecast. The array consistently meets it rated output of 500 kW AC and the forecast model follows actual output closely at this site.



3.3.1.5 Randolph-Macon College Copley Science Center

The Copley Science Center building at Randolph-Macon College in Ashland is the first Program demonstration site integrating battery storage technology. The 265 panel array generates 50 kW AC and was commissioned in the first quarter of 2015. The 260-watt panels are installed at a 10 degree tilt and are connected to a battery storage array at the south side of the building.

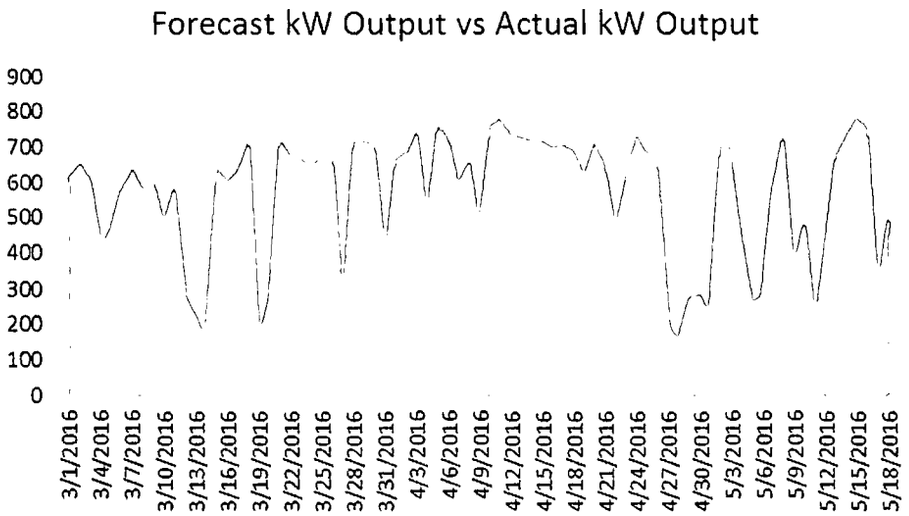
NREL solar insolation data estimates annual average solar exposure at this site to be 4.52 kWh/m2/day. Since going on-line in April 2015, the site has seen an average solar exposure of 3.88 kWh/m2/day, and has generated over 85 MWh, or 84% of the forecast.



3.3.1.6 Prologis Concorde Executive Center

Two Prologis warehouse buildings in the Concorde Executive Center in Sterling house this Program site. Just north of Dulles International Airport, the 3,369 panel array generates nearly 750 kW AC and was completed in the first quarter of 2015. The 255-watt panels are mounted at a 5 degree tilt.

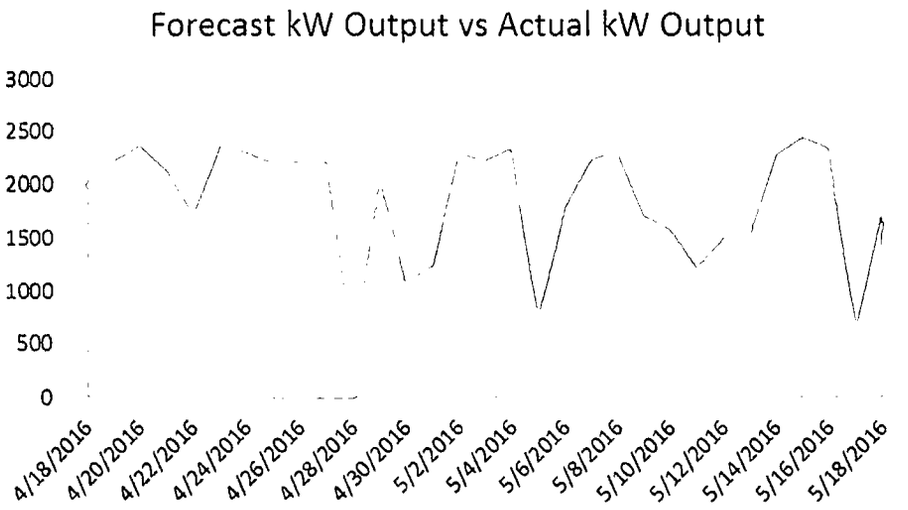
NREL solar insolation data estimates annual average solar exposure at this site to be 4.26 kWh/m2/day. Since commissioning, the site has seen an average solar intensity of 3.96 kWh/m2/day. The site has reached 99% of its rated 746 kW AC output consistently and the site output closely tracks the generation forecast. Since its commissioning, this facility has generated 1,084 MWh of electricity, 91% of the forecast energy production.



3.3.1.7 Philip Morris - Chester

Philip Morris Park 500 in Chester, VA hosts the largest active participant in the Solar Partnership Program. The nearly 8,000 panel fixed array is ground-mounted and is capable of generating 2,000 kW AC. The site was completed in the first quarter of 2016.

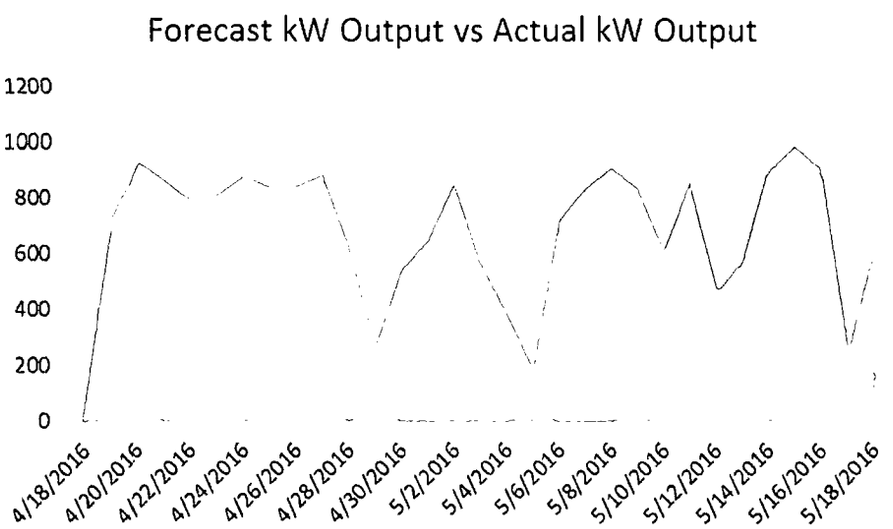
NREL solar insolation data estimates annual average solar exposure at this site to be 4.63 kWh/m2/day. Based upon 2016 weather records, the site has seen an average solar exposure of 4.24 kWh/m2/day. In its short output history, the output of the site routinely has achieved its maximum output of 2,000 kW. Since March 2016, the site has generated over 760 MWh, or 95% of the forecast. The site is on track to perform in line with the other Program participant sites.



3.3.1.8 Western Branch High School

The most recent addition to the Program's project portfolio is Western Branch High School. The Chesapeake, VA home of the Bruins hosts an 806 kW AC, roof-mounted, 3000 panel solar array. When constructed, it was the largest roof-top installation in the state. Completed in the second quarter of 2016, the WBHS partnership is also the first to incorporate the Company's Education Plan for enhanced classroom teacher education on solar energy.

NREL solar insolation data estimates annual average solar exposure at this site to be 4.39 kWh/m2/day. For the first two months that the WBHS site was active, NREL's insolation average was 5.55 kWh/m2/day versus a measured average of 5.02 kWh/m2/day. In its short output history, the site has already performed at a maximum output of 894 kW AC. Since April 2016, the site has generated over 116 MWh, or 71% of the forecast, and it too is expected to continue performing in line with the other Program participant sites.



Section 3.3.2 Revised Cost/Benefit Analysis

Data and analysis for the sites currently in operation have been included in this year's report; however, continued accumulation of data will provide for a more meaningful cost-benefit analysis and it is anticipated that such analysis will be included in the final Program report to the Commission.

Section 3.3.3 Solar Renewable Energy Certificates (SRECs)

In compliance with the Commission's final order, SRECs generated by Solar Partnership Program facilities are sold in states with Renewable Energy Portfolio Standards ("REPS"), with a credit applied towards Program expenses. The Program, with its associated environmental attributes including SREC values, is ineligible to help satisfy the Company's Virginia RPS goals. In following those Commission directives, the Program was not presented or approved as part of the Company's RPS Program, and the Company does not plan to use any Program facilities to meet the requirements of its RPS Program compliance.

The Company has executed contracts in the Pennsylvania ("PA") SREC market. The PA energy reporting year ended on May 30, 2016 and the Company has sold and delivered SRECs from the in-service Solar Partnership Program facilities. For the 12 months ending June 30, 2016, the Company sold 1,187 SRECs in this market for $36,332.50 and credited proceeds from these sales towards Solar Partnership Program expenditures. All Solar Partnership Program facilities will have executed contracts in place as market conditions and compliance with individual state laws allow once the facilities are placed in-service.

SREC sales from additional Solar Partnership Program sites are pending market approval. Due to the unique grid flow of the energy output at our customer site host location projects, the Pennsylvania Alternative Energy Portfolio Standards Program is requiring additional documentation to substantiate that the site owner does not own, or has not taken possession, of the SRECs. The Company is working with each site host to obtain the certification documents necessary to secure market approvals.

As reported in the Company's previous annual report, several host site participants have asked for an option to buy SRECs at project sites, but to date no program participants have reached agreement with the Company to purchase SRECs associated with solar projects located on their properties.

Section 3.3.4 Operations and Maintenance (O&M)

The installing EPC contractor of each Solar Partnership Program installation provides a five-year comprehensive warranty covering all materials and associated installation labor. Each EPC contractor also enters into a separate contract agreement for the O&M of each respective

facility. This contractual arrangement provides the installing contractor with the means to maintain and inspect the facilities during the overlapping five-year construction warranty period. The Company selected this contract structure to provide the best combination of warranty and maintenance during the term at reasonable cost.

Facility Maintenance

For the Company's projects, maintenance inspections and facility operations have been routine with no significant failures or extended outages. Having reviewed best practices in other parts of the country with significant solar projects, the Company follows the California PV Fire Prevention Code guidelines where applicable. Due to the current number of solar installations in Virginia, similar Commonwealth guidelines do not currently exist and may develop as more installations are built and operated in the state. The Company conducts inspections twice per year on roof-mounted installations, which is a greater frequency than the industry standard of once per year, and once per year on ground-mount installations. In addition to evaluating and maintaining acceptable levels of energy output and peak capacity, a primary emphasis of the Company's O&M plan is to reduce unsafe conditions detected in similar systems. The Company is employing current solar industry fire and electrical hazard design standards to promptly identify and correct faults in DC solar circuits previously undetected in other similar utility-owned solar programs.

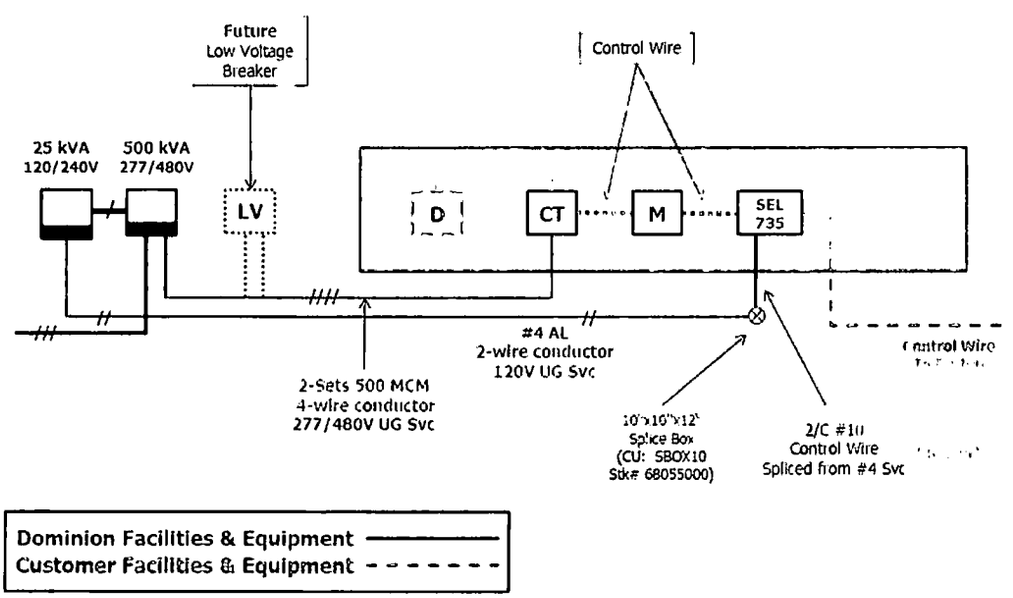
In addition, 24-hour monitoring with electronic alarm capability has been included in the maintenance agreements for Solar Partnership Program installations. This Internet-based system, along with other system ground fault detection equipment installed at each location, allows the Company's facility maintenance providers the ability to isolate and shut off power

within segments of the solar systems when faults are detected. In cases of abnormal operation, the inverter is taken off-line to disconnect the facility from the electric grid. Unlike other generation sources, solar panels will contain potential energy anytime that sunlight is available; current disconnect equipment will stop current flow on the rooftop at the combiner box, but not within the solar panels themselves. Prior to the in-service date of each Program installation, the Company reviews the operating characteristics of solar installations and the proper emergency procedures for the facility's safe shutdown.

A typical equipment schematic layout is illustrated below:

Typical Structure / Equipment Layout

Building Wall or Free Standing
May vary depending on Developer's Plan



Some of the more common O&M issues that the Company has experienced include planning for and mitigating loss of production due to derate factors, some of which, such as snow cover, are not accounted for when modeling solar system production output. Soiling of

PV panels due to dirt, snow, and other airborne particles on the panel surface can also decrease PV production. In addition, the Company's distribution operations departments remotely take Program installations off-line prior to any line work occurring up line of the generator as a standard precaution to eliminate the potential for circuit back feed conditions.

Through its comprehensive design and engineering processes, the Company has sought to eliminate other common forms of production losses resulting from issues such as module mismatch, which causes PV modules to have slightly different current-voltage characteristics due to manufacturer differences. The actual PV module nameplate DC rating, which may be different from the manufacturer specified nameplate rating, may also affect system output. The Company has endeavored to seek the most cost-effective blend of energy intensity per panel, rated in Watts DC, and has deployed panels rated from 250 Watt DC to 325 Watt DC at its Solar Partnership Program installations depending on available space and other considerations. Likewise, other losses can occur in DC and AC wiring between modules, the PV array and inverter, and wiring between the inverter and the local utility service. All of these resistive losses can affect the output of a solar system.

Inherent in solar technology is reduced capacity over time due to light-induced degradation and the aging of the PV modules. Inverter inefficiencies due to the physical properties of the currently available technology and weathering can also result in performance losses over time. The Company uses Tier 1-rated solar panels from reputable manufacturers to provide better levels of power production over time. System downtime due to maintenance, utility outages, or other operational factors have also affected Solar Partnership Program

installations as the Company ensures that the systems are operated on customer properties safely.

Section 3.4 <u>Distribution System Impacts</u>

Section 3.4.1 Distribution System Benefits and Impacts

As earlier noted in Section 3.1, the Company previously identified four specific Study objectives for the Solar Partnership Program in its application for Commission approval of the Program:

1. Determine the effects of solar DG on circuit loading, analyze the peak demand reduction benefits to the distribution system, and collect necessary data to develop a solar DG load model for the Company's Distribution Planning process.
2. Quantify the reduction in line losses from solar DG at various points on the distribution system.
3. Study the operational impact of "high saturation" solar DG on a single circuit.
4. Assess the potential for solar DG to improve CVR performance.

At this point in time, there is data available to partially evaluate objectives #1 and #2 for the participant sites. As the Program continues to mature and connect new participant DG sites, evaluation of items #3 and #4 will be further studied as well.

Section 3.4.2 Study Methodology

To perform the operational evaluation, the Company utilized data captured from each participant site through the Draker data logger, facility monitoring data records at the connected substation, and a detailed load flow study on each circuit. By using real insolation

and PV output data, the load flow simulations reveal the direct impact of each PV site on circuit loading, delivery voltage, and distribution system losses.

Two types of analysis were selected for the current Program participant sites:

Snapshot Analysis

The Snapshot Analysis methodology is a simplified simulation approach used to compare circuit performance. Two scenarios are investigated: daytime maximum loading and daytime minimum loading, both under 100% PV output and 0% PV output. These scenarios allow for evaluation of optimal PV output under the extreme daylight conditions to illustrate the worst case performance scenarios for the circuits, even if the DG site has not been on-line for long or is too small to be considered an operational concern. This method is employed on three sites – Virginia Union University, Old Dominion University, and Randolph-Macon College.

Time Series Analysis

Time Series Analysis takes a deeper dive approach to evaluating DG performance and circuit impacts. Using Company feeder monitoring data, a gross load (no PV impact) maximum and minimum loading day are identified for the study period. Using Draker insolation and demand data, a PV generation capability profile is created for each site, from 0700 (7:00 a.m.) to 1900 hours (7:00 p.m.), not accounting for cloud cover. These data sets are used to build maximum and minimum loading scenarios, similar to those in the Snapshot analysis. The power flow simulations are then run on an hourly basis, showing the gross load (Base) case and the PV impact (Project) case. Using this methodology on larger PV sites, specifically on installations

larger than 500 kW, yields valuable information about circuit voltage profiles, demand reduction, and improvement in line losses on an hourly basis. This study is also capable of identifying the impact of the PV site on the operation of voltage and VAR (V5olt-ampere reactive) control devices. This method is employed on the Canon, Prologis, Capital One, Philip Morris, and Western Branch High School participant sites.

Section 3.4.3 Snapshot Analysis

How to Interpret the Snapshot Analysis Tables

The sections that follow contain snapshot analysis for three sites - Virginia Union University, Old Dominion University, and Randolph-Macon College. Two sets of tables are used per site to show the impact of the solar DG – one for the minimum loading scenario and one for the maximum loading scenario.

For each site, two specific dates and times were selected over the course of the analysis period; i.e., when:

- The largest circuit daytime load was observed – the maximum loading scenario; and
- The smallest circuit daytime load was observed – the minimum loading scenario

Using these specific dates and times, calculations were done to determine the impact of:

- The solar DG producing 0% of its rated output – called the Base Case; and
- The solar DG producing 100% of its rated output – called the Project Case

Seven parameters were examined to determine the impact of the solar DG on different aspects of the distribution system:

- **Power Flow at the start of the feeder in kW** - How the presence of solar DG impacts real power. The bigger the difference between the Base Case and Project Case, the more real power that the solar DG is contributing to the system.
- **Power Flow at the start of the feeder in Kilovolts-amperes reactive ("kVAR")** - How the presence of solar DG impacts reactive power. The bigger the difference between the Base Case and Project Case, the more reactive power that the solar DG is contributing to the system.
- **Substation LTC tap position** - How the presence of solar DG affects the Load Tap Change (LTC) tap position. More LTC operations result in more wear and tear on substation equipment.
- **Losses in kW** - How the presence of solar DG affects line losses. Reduced current means less loss. Any differences between the Base Case and Project Case quantify the impact of reducing the current flow from the substation (as the solar DG services the distributed loads).
- **Minimum and maximum voltage range in Volts ("V")** - How the presence of solar DG impacts the secondary voltage (seen by customers). The bigger the difference and the greater the deviation from nominal service voltage (120V), the more disruptive the influence of the solar DG.
- **Max Loading (%)** - The analysis tool used to evaluate the different scenarios (SynerGEE) calculates this figure by dividing the current flows through the different sections of the

feeder by the current ratings of those sections. The maximum loading is the highest section loading level on the feeder. The presence of solar DG on a feeder can cause the maximum loading level to decrease as loads are supplied by the solar DG.