

**MEMORANDUM****For Informational Purposes Only**

TO: Members of the School Review Committee

FROM: Kris Kolluri, Chief Executive Officer

DATE: October 21, 2009

SUBJECT: Proposed Options for Pilot Photovoltaic Energy Program

In recent meetings of the School Review Committee (SRC), the Members expressed interest in the Authority making recommendations to support the inclusion of renewable energy systems in school facilities, to assist school districts in reducing their energy costs and meet the State's Energy Master Plan, which sets a thirty percent (30%) goal for renewable energy sources by 2020. Toward these objectives, what follows is a discussion of options to apply photovoltaic energy technology in a pilot program funded by non-SDA resources.

SDA Renewable Energy History Overview

The SDA has applied use of renewable energy technology in the manner of both geothermal and solar. Ground-source HVAC systems at Summerfield Elementary and Neptune HS in Neptune and into the New Greater Egg Harbor Regional High School are examples of applied geothermal technology. Under a pilot photovoltaic energy system program, the Authority entered into a Memorandum of Agreement with NJBPU Office of Clean Energy in 2004. With rebates to be provided by NJBPU, the Authority installed photovoltaic systems at Neptune HS, Newark Science Park HS and Phillipsburg ECC. As the NJBPU agreement with the SDA has expired and such rebating for photovoltaic energy technology application may not be available, the SDA seeks other viable options to apply and fund photovoltaic energy technology.

Photovoltaic (PV) Technology Overview

Essentially, photovoltaic (PV) is an energy-producing technology that converts sunlight (photons) to electricity (voltage). While manufacturing advancements continue, current PV technology is comprised of thick silicon cells (first generation) and thin film cells (second generation). While thick silicon cells presently provide more conversion efficiencies than that of thin film cells, thin film cells remain less costly to produce, are smaller and more flexible, and therefore afford potentially greater applicability and less invasiveness.

Current PV technology is applied via panels (the array one might see atop a building created using thick silicon cell technology) or, more recently, integrated into a structure itself. With Building Integrated Photovoltaics (BIPV), using second generation thin film cells, PV material is integrated into a building's structural elements, e.g., walls, windows, roofs, balcony railings, terrace walls and guardrails.

Regardless of whether the cells are first- or second-generation, there exist two basic PV-powered systems available today: grid-tied and off-grid systems. In a grid-tied system, also called grid interactive or utility interconnected, the PV system is directly connected to the utility. When PV-produced electricity is not sufficient for the energy needs of the facility, then the system pulls electricity from the utility. When more PV-produced electricity is generated than is used, the electricity is sold back to the utility company. An off-grid system, independent of the utility grid, consumes only the energy it produces, necessitating energy storage batteries.

Proposal for SDA Photovoltaic Energy Pilot Program

As a first step, it is recommended that SDA identify three projects appropriate for application of PV technology based upon early stage of planning and/or design, anticipated site placement of the facility, etc.

The second consideration relates to funding in that project scopes and budgets for SDA Capital Plan projects currently do not include PV elements. The SDA has considered the following possible scenarios in addressing the funding aspects for this pilot program:

- SDA Direct Design and Installation of Photovoltaic Energy Systems
In such straightforward arrangement, SDA would engage and manage the design and installation of PV systems with funding provided from external sources. Such funding sources under consideration include:
 - 1) State and Federal incentive/rebate programs
 - 2) Private sector donations/sponsorships that support clean energy growth and development. School districts, both nationally and in New Jersey, have funded PV systems through such funding arrangements. The SDA will explore similar opportunities..

Both first generation (traditional panels) and second generation (building integrated) technology PV systems can be used in direct design and installation.

- Public-Private Partnership: Develop-Design-Build-Operate, Power Purchase Agreement
In this funding arrangement, a private company develops the project plans and finances, designs, builds and operates the PV system, essentially owning the PV-energy infrastructure. The school district enters into a power purchase agreement (PPA) with the private company, which provides the PV Energy infrastructure to the school district at no capital cost. The school district buys the electricity produced by the PV Energy system from the private company at a fixed cost over the life of the agreement term (10-15 years). The school district pays for its electric usage; in return, the private company receives any earned energy credits (Solar Renewable Energy Credits or SRECs), and proceeds from the sale of produced excess electricity back to the grid.

In such arrangement, SDA would ensure that the design of the facility could accommodate the technology and then serve as facilitator for the partnership.

Such funding arrangement applies only to first generation (traditional panels) technology PV systems and not second generation, building integrated, PV systems.

- Public-Private Partnership, Lease/Purchase

In this funding arrangement, a private company finances, installs and owns the PV system. The school district pays a monthly or a yearly rent (not more than 15 years in NJ based upon articulated statutory limitation). At the end of the lease term, the school district can purchase the PV Energy system, renew the lease with new terms and conditions or terminate the lease agreement completely. Again, this funding method applies to first generation (traditional panels) technology PV systems and not second generation, building integrated, PV systems.

In such arrangement, SDA would ensure that the design of the facility could accommodate the technology and then serve as facilitator for the partnership.

The SDA continues its research to explore other possible programming and arrangements to fund PV systems, such as PSE&G's recently introduced Solar 4 All program.

The SDA will create a cross-divisional working group/task force that includes Project Management, Strategic Planning, Project Controls and Program Analysis and Development to identify appropriate school projects, parameters and implementation of this recommended pilot program, and will provide the Committee with periodic status reports.

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