

School Power...Naturally^(sm)

News and Views from Solar Works, Inc. to School Solar Coordinators

May 8, 2003

Newsletter: Number 3

A Message from the Project Director

The snow has melted, the sun is shining, and our site visit and installation team is anxious to conduct site visits to schools and prepare quotes for your solar electric photovoltaic (PV) and data acquisition systems (DAS). These activities will continue throughout May and June. A main factor influencing which schools are being served first is whether the school has provided the information needed by Solar Works to send an installer to the school to finalize the location where the PV and DAS hardware will be installed.

Project management staff at Solar Works and Creighton Manning Engineering are ready to file utility interconnection applications, submit schools' "architect/engineers letters," and "asbestos letters" to the New York State Education Department, and write contracts for schools that are ready for installation. Curriculum writers are preparing lesson plans, teacher trainers are preparing training sessions for the summer and fall, and our public education and outreach team is writing outreach materials and thinking about dates next fall and winter for public events.

All this would not possible without your ongoing participation, enthusiasm, and timely responses to our requests for information. On behalf of all the **School Power... Naturally^(sm)** team, thank you for your help thus far. In addition, special thanks to Judy Jarnefeld, our project manager at the New York State Energy Research and Development Authority (NYSERDA). This program would not exist without NYSERDA's leadership, vision, and financial support!

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A Special Note to the Solar Coordinators

Much of what is discussed in this newsletter addresses technical and contractual issues needing prompt attention by technical and/or administration personnel in your school and/or district.

While each Solar Coordinator is serving as the key contact for their school for **School Power...Naturally**^(sm), we strongly encourage you to pass this newsletter along to the appropriate personnel for action, and to ensure the requested actions are being taken. This should assist your school in meeting our program requirements during the busy end-of-school-year season.

This is especially important because many schools are very late in supplying the **School Power...Naturally**^(sm) team critical information we need to proceed with the site visit, state review, contract execution, and installation process for your school. The site visit, state review, and contract execution portion of the process alone can take up to three months (though the actual hardware installation takes only two to four days!). Hence, time is of the essence and your school's ability to benefit from this program could be jeopardized if the required information is not submitted ASAP.

Technical Update

Special Thanks to Astropower and Heliotronics

The two major technology providers for the PV and DAS system being offered to each school are:

- Astropower, a leading manufacturer of photovoltaic modules based in Newark, Delaware. Serving markets for solar electricity worldwide for over a decade, Astropower's modules are among the most cost-effective, durable, and efficient in the marketplace today. The modules are attractive, have no moving parts, are completely silent during operation, and produce no emissions. They are one of the most environmentally-friendly ways to produce electricity today!
- Heliotronics, Inc. a Massachusetts provider of data acquisition systems focused exclusively on the educational market. Formed in 1998, the company is offering hardware and software packages designed to assist teachers in educating students about the performance of solar electric systems located on their schools. In addition, their software enables data to be uploaded to a web site and shared among other schools.

More about the “Standard” PV and DAS Systems

A “standard” 2 kilo-Watt (kW) PV and DAS system is being offered to each school participating in **School Power...Naturally**^(sm). The standard PV system includes the following equipment and materials:

- Twenty 100-watt single crystal AP-100B Sunline solar modules produced by Astropower;
- One standard mounting system for the solar modules;
- One Sunny Boy 2500 inverter manufactured by SMA America, Inc.;
- Switchgear and related equipment;
- Balance of system (BOS) materials determined by the installer during installation; and a
- Systems Operation Manual.

The standard DAS system includes the following equipment and materials:

- One anemometer;
- One pyranometer;
- One ambient temperature sensor;
- One module temperature sensor;
- One kWh meter;
- One data logger;
- Two transducers (one AC, one DC);
- One optically isolated RS 422 converter (short haul modem);
- SunViewer software and site license;
- SunServer software and license; and
- Two User Manuals.

The standard installation for **School Power...Naturally**^(sm) will consist of mounting the PV modules and exterior DAS equipment on the roof of the school (unless weight loading issues require the PV modules to be installed on the wall as an awning mount). The PV array will be attached with wires and conduit to an inverter and associated electrical disconnects on a four-by-four foot “power conditioning panel” located, ideally, in a utility closet.

The PV system will be directly connected to the utility grid, will operate in parallel with the utility grid, and will not require batteries. The AC power from the PV system will be tied directly into the building's main circuit panel for connection to the facility's electrical service. A licensed electrician will do the wiring for the installation. All hardware is UL-listed and meets local, state, and national electric code equipment and interconnection requirements, including those established by local electric utilities. Should utility power be lost, the PV system will automatically shut off according to utility safety requirements.

Program Limitations for Customizing Systems

NYSERDA planned and budgeted this program based on the expectation that the PV and DAS hardware provided as the standard **School Power...Naturally**^(sm) system would be installed at most schools using a ballast pan roof mounting system. It was also expected that the roof at some schools would not meet the weight loading requirements for the ballast pan roof mounting system. At those schools, it was anticipated that awning mounts would be used instead of ballast pan mounts, and that such awning mounts would not require site-specific engineering analysis and/or customized system design work by the SPN team.

We appreciate your understanding in the event that roof-loading, exterior wall conditions, other technical issues, esthetic considerations, or historic preservation issues at your school make it not possible to utilize the standard **School Power...Naturally**^(sm) hardware and installation package at your school without site-specific engineering analysis, customized mounting designs, and/or hardware substitutions.

Please note that NYSERDA (and therefore Solar Works) do not have available funds, equipment, or materials for making roof or wall repairs or reinforcements needed to allow installation of the PV and DAS hardware. In addition, NYSERDA (and therefore Solar Works) do not have available funds to pay for site-specific engineering analysis, customized mounting designs, and/or hardware substitutions not anticipated as part of the standard **School Power... Naturally**^(sm) PV and DAS hardware and installation package.

If it becomes apparent that a school is not able to utilize the standard SPN package without site-specific engineering analysis, customized mounting designs, and/or hardware substitutions, Solar Works will inform the school of the situation in writing (via email), explain the reasons why, suggest steps the school might take to address the issues, and request that the school respond via telephone or email on how they wish to proceed.

If site-specific engineering analysis, customized mounting designs, and/or hardware substitutions are needed, it is the school’s responsibility to procure and pay for this. In such circumstances, school personnel will need to decide whether to spend school resources to customize the standard SPN system for the school. If the cost for additional engineering, design, and/or building modifications needed to customize the standard SPN package for a school is cost-prohibitive, the school may choose to withdraw from the program. NYSERDA and Solar Works sincerely hope this does not happen, but issues beyond any of our control may result in that outcome for a few schools.

School Contracts Update

A contract will be executed between Solar Works and each school, prior to scheduling and completing the PV and DAS installation. Solar Works will prepare the contract and provide it to the school, for review and execution.

Otsego Area Occupational Center in Milford is the first school to be ready “to go to contract” with Solar Works and is currently on track to be the first PV and DAS installation site for **School Power ... Naturally** ^(sm)! Special thanks go to the Otsego Solar Coordinator, Building and Grounds Supervisor, Principal, and Superintendent for their important roles in making this possible.

Critical Path Items Needed from Each School


1. Your “Architect’s or Engineer’s Letter”:

Beginning in November 2002, all solar coordinators were sent a letter followed by individual emails and/or voice mail(s) requesting that the school’s architect or engineer send a letter to Solar Works, Inc. indicating whether or NOT the school’s roof can sustain weight loads of 17.3 pounds per square foot. (As explained in last month’s newsletter, this weight load is a 20% decrease from the 21.5 pounds per square foot cited earlier in the project, due to design changes to the ballast pan mounting system). If you were initially told by your school’s architect or engineer that your roof can not sustain 21.5 pounds per square foot, you may wish to check again to find out whether the roof can sustain 17.3 pounds per square foot.)

To date, a surprising number of schools have NOT yet sent a letter to Solar Works indicating whether or NOT your school’s roof can sustain this weight load. The letter needs to be on the architect’s or engineer’s letterhead and needs to:

1. State clearly that the school’s roof can sustain this weight load, OR
2. State clearly that the school’s roof can NOT sustain the weight load.

The letter is a **critical path item** for each school for three reasons.

1. The New York State Education Department requires SPN to provide such a letter to the Department, before proceeding with the installation.
2. The standard PV and DAS system offered through SPN is intended to be mounted on a flat roof, using a ballast pan mounting system. This letter determines whether that is possible.
3. A Solar Works employee or installation subcontractor cannot do their site visit to your school, until they know whether or not your roof is adequate for the ballast  mounting system. This information enables the installer to prepare adequately for the site visit.

If you or a representative of your school have not sent the “architect’s or engineer’s letter” to Solar Works yet, please do so immediately or notify Mary Dicaro, our Sales Assistant, why there is a delay in obtaining such a letter. This will enable Solar Works to determine how best to proceed with your school. Mary can be reached via email at mdicaro@solar-works.com.

Schools who have not sent their “architect’s or engineer’s letter” or have not communicated with Solar Works about why they can not send such a letter by June 1, 2003 will be considered non-responsive to the program requirements for SPN. The school may be asked by NYSERDA to withdraw from the program.

2. Age of Your School Building(s):

As part of the review process required by the NYS Education Department, our team needs to check on the historic character of the buildings where the photovoltaic modules will be installed. If the building on which your photovoltaic array will be mounted is over 40 years old, we are required to work with the State Office of Historic Preservation to determine if the building is historic. Most buildings over 40 years old will not be considered “historic,” but additional review may be needed for those that are.

An email was sent in March to all Solar Coordinators by Chuck Manning asking for the date of construction of your school building(s) being considered as the location for your photovoltaic array. So far, information has been received back from ONLY 29 schools. If you have not replied, please send this information **by no later than June 1, 2003** via email to Chuck Manning at cmanning@cmellp.com. Chuck is handling all SPN coordination with the Education Department and the Office of Historic Preservation.

Schools who have not sent information on the date of construction of the school’s building(s) or communicated why they can not provide such information by June 1, 2003 will be considered non-responsive to the program requirements for SPN. The school may be asked by NYSERDA to withdraw from the program

3. Your “Asbestos Letter”:

In addition to the “architect’s or engineer’s letter” and the historic review described above, the Education Department requires SPN to provide a letter for each school documenting the fact that there is no asbestos present in the location(s) where the PV and DAS equipment and related wiring will be installed.

Some schools will not be able to provide such a letter until Solar Works sends a contract that specifies exactly where the PV and DAS equipment and related wiring are proposed to be installed.

However, some schools may know there is no asbestos on site and/or may be able to document succinctly where it is located. You can expedite your school’s installation date if a representative of your school is able to submit a letter documenting that no asbestos is

present in the school or documenting succinctly where it is located. If your school can prepare such a letter now, **please send a signed original as soon as possible** to Mary Dicaro, Sales Assistant, Solar Works, Inc., 64 Main Street, Montpelier, Vermont 05602.

4. Contract Review (for Installation):

A contract for the PV and DAS installation will be sent by Solar Works, Inc. to your school for review and approval by at least two duly authorized representatives after:

1. Solar Works receives your architect's or engineer's letter.
2. A Solar Works employee or installation subcontractor completes their site visit.
3. Solar Works and the installer determine the final location of your system.
4. Solar Works receives and accepts a bid from the installer for installation costs.

While we very much appreciate the assistance and contribution of Solar Coordinators as the lead contact for each school throughout this program, our experience indicates that most schools prefer that we send the installation contract directly to the Principal for review and approval. This is because typically the Solar Coordinator simply sends the contract along to others for review, approval, and execution. Sending the contract directly to the Principal can expedite contract review and approval.

Unless the Solar Coordinator at a school instructs Solar Works differently, we will send your school's installation contract directly to your principal. The Solar Coordinator will be cc'd on the cover letter but will not receive the full contract. Please be aware that we are doing this and work with your principal to see that the process is carried through to execution. If you would prefer that your school's contract be sent directly to the Solar Coordinator instead (and NOT directly to the Principal), **please indicate this by no later than June 1, 2003** to Mary Dicaro at mdicaro@solar-works.com.

5. Utility Interconnection Application:

No action is required by your school at this time, but please be advised that once the solar electric system is operating on your school, your electric utility will enter into a "Utility Interconnection" agreement with your school. The terms of such an agreement apply to all facilities that install electricity-producing devices, were developed and approved by the New York Public Service Commission, and are standard terms that are not negotiable on a case-by-case basis.

As part of our installation management role for **School Power...Naturally^(sm)**, Solar Works will file an application for a utility interconnection agreement on your school's behalf with your electric utility. The application will be sent to your school for an authorizing signature before we send it to the utility. This will be done as soon as we receive the system design and quote from the installer.

The utility will then review the application and supporting materials provided by us indicating the wiring plan for the PV system and noting where the “utility disconnect switch” will be located. Once the utility approves the application (which typically takes up to four weeks), Solar Works will notify our subcontractor to schedule the installation for your school.

Curriculum Update

Under the leadership of Bill Peruzzi, Curriculum Coordinator for **School Power... Naturally**^(sm), our curriculum writers are hard at work preparing 45 lesson plans for distribution to teachers throughout New York State this summer and fall.

Results from a small sample on the question in an earlier newsletter regarding “interdisciplinary” lessons” indicate that at the high school level (level III), teachers would like the lessons kept pretty much “content specific,” but that adding interdisciplinary connections to the lessons would be fine. At the upper elementary/middle school level (level II), those who responded indicated that many lessons should be “content specific,” but interdisciplinary lessons should also be developed. If you disagree with this feedback, please convey your comments directly to Bill NOW at BillPeruZ@aol.com. Otherwise, the writers will attempt to respond to the preferences of the small sample heard from thus far.

Special thanks go to Heidi Busa of Marcellus High School and Kim Preshoff of Williamsville North High School who volunteered to pilot one or more of the energy lessons between now and the end of the school year. We very much want all teams at least to have seen one lesson before their team training date. Accordingly, Bill has taken the liberty of sending each Solar Coordinator a sample lesson and two forms (one for piloting and one for paper review). Perhaps a member of your team might pilot a lesson or at least provide constructive feedback through a paper review? Should you want additional lessons to review or pilot, a list of all the lessons was also sent for you to peruse.

Teacher Training Update

As mentioned previously, **School Power...Naturally**^(sm) teacher trainers will be oriented to the lesson plans by the curriculum writers and Bill Peruzzi on July 7 and 8, 2003. As soon as possible thereafter, teachers from your school/district along with other teachers in your region will be provided a one-day training session by your trainer on use of the curricular materials and how they relate to the DAS. Training sessions will be conducted regionally to reduce teacher travel and to provide your teachers with a person to relate to

on curricular matters. Each school/district will send a team of 3-5 teachers for regional training at a time-to-be-mutually-determined among the schools and trainer. Your trainer, who will be available to you for assistance in curricular matters throughout the grant period, will contact you well in advance of your training session.

Prior to your training, should you have any questions, please direct them to Bill Peruzzi at BillPeruz@aol.com.

1. Mike Johnson (Southern Tier/Buffalo), 5 schools, email:

MICHAELJOHNSON@crcs.wnyric.org

Schools: Newfane CSD, Niagara County; Sweet Home CSD, Erie County; Warsaw CSD, Wyoming County; West Seneca CSD, Erie County; Williamsville CSD, Erie County.

2. Ed Currier (Rochester Area), 5 schools, email: Ercurrier@aol.com

Schools: Canandagua CSD, Ontario County; Newark HS, Wayne County; Pavilion CSD, Genesee County; Wayne CSD, Wayne County; Wayne-Finger Lakes BOCES, Wayne County.

3. Jim Overhiser (Southern Tier), 6 schools, email: joverhis@twcyny.rr.com

Schools: Dryden CSD, Tompkins County; Ithaca City SD, Tompkins County; Lansing CS Tompkins County; Spencer-Van Etten CSD, Chemung County; Wayland-Cohocton CSD, Steuben County; McGraw CSD, Cortland County.

4. Todd Rogers (North and South of Syracuse), 5 schools, email:

toddrogers@usadatanet.net

Schools: Jamesville-DeWitt CSD; Onondaga County, Jefferson Lewis BOCES, Jefferson County; Liverpool CSD, Onondaga County; Marcellus CSD, Onondaga County; Beaver River CSD, Lewis County.

5. Fred Oberst (North Country), 5 or 6 schools, email: Oberst@capital.net

Schools: Canton CSD, St. Lawrence County; Carthage CSD, Jefferson County; Colton - Pierrepont CSD, St. Lawrence County; Potsdam CSD, St. Lawrence County; Thousand Islands CSD, Jefferson County.

6. Mary Colvard (Southern Herkimer to Delaware counties), 5 schools, email:

mcolvard@klink.net

Schools: Dolgeville CSD, Herkimer County; Oppenheim-Ephratah CSD, Fulton County; Van Hornesville ODV CSD; Herkimer County (south), Otsego North. Catskills BOCES, Delaware County; Sidney CSD, Delaware County.

7. Susan Killeen (Orange, Ulster, Dutchess counties), 4 schools, email:

smk@warwick.net

Schools: Highland CSD, Ulster County; Our Lady of Lourdes, Dutchess County, Tabernacle Christian Academy, Dutchess County; Warwick Valley CSD, Orange County.

8. Bruce Tulloch (Capital District 1), 5 schools, email: tullbhs@bcds.neric.org

Schools: Albany Free School, Albany County; So. Colonie CSD, Albany County; Bethlehem CSD, Albany County; No. Colonie CSD, Albany County; Voorhesville CSD, Albany County.

9. Cindy Sargent (Capital District 2), 5 schools, email: fnatc@att.net

Schools: Notre Dame Bishop Gibbons, Schenectady County, Berlin CSD, Rensselaer County; Burnt Hills-Ballston Lake CS, Saratoga County; East Greenbush CS, Rensselaer County; Darrow School, Columbia County.

10. Art Lebofsky (Orange-Rockland-Westchester-NYC), 5 schools, email:

ArtL@optonline.net

Schools: Clarkstown CSD, Rockland County; Ethical Culture, NYC; Sommers HS, Westchester County; St. Francis of Assisi, Kings County; Highland Falls/Ft. Montgomery, Orange County.

Public Education and Outreach Update

Public education and outreach events will be directed at homeowners, businesspeople, community leaders, and elected officials using your school as a shining example of solar energy at work today! Such events will be planned, once the installation is completed on your school. In the meanwhile, the outreach team directed by Linda Anne Burtis, Outreach Coordinator for **School Power...Naturally^(sm)**, is preparing printed materials, Solar Outreach Kits, and other items that will be used during events next fall and winter. As explained previously, outreach is divided into five areas with each area having its own Regional Outreach Coordinator:

Area 1 Downstate: 6 schools in Bronx, Kings, Orange, Rockland, and Westchester Counties. Coordinator: Tina Carr, telephone 212-645-9930, email: tina@sustainabilityed.org

Area 2 Mid-Hudson: 6 schools in Dutchess, Columbia, Ulster, and Delaware Counties. Coordinator: Linda Anne Burtis, telephone 518-439-3771, email: antanana@yahoo.com

Area 3 Capital Region: 12 schools Albany, Rensselaer, Schenectady, Saratoga, and St. Lawrence Counties. Coordinator: Linda Anne Burtis, telephone 518-439-3771, email: antanana@yahoo.com

Area 4 Central: 15 schools in Lewis, Jefferson, Herkimer, Tompkins, Onondaga, Cortland, Fulton, and Chemung Counties. Coordinator: Hal Smith, telephone 607-655-2491, email: hals205b@aol.com

Area 5 Western: 11 schools in Ontario, Wayne, Niagara, Genesee, Erie, Wyoming, and Steuben Counties. Coordinator: Linda M. Hardie, Executive Director of Clean

Communities of Western NY, telephone 716-634-1038, e-mail:
ccofwny.lmh@verizon.net

Later in the summer and fall, you will be hearing lots and lots from your Regional Outreach Coordinator. In the meanwhile, please keep your coordinator informed of any solar and renewable-energy activities coming up in your community or region (such as Energy Fairs, or media coverage) that could help create awareness of your school's PV and DAS system once it is installed.

From all of us on the Project Team, thanks again for all your assistance.

Please circulate this newsletter within your school district and to others interested in School Power...Naturally^(sm) !!