



Local Solar Demonstration Projects: A Complement to Utility Green Power Programs



b-e-f.org

Bryce Smith,
Bonneville Environmental Foundation
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About BEF



A 501(c)(3) public benefit organization

Founded in 1998

Our dual mission:

- Supporting clean, domestic, renewable energy development
- Supporting long-term, science-based watershed restoration

Our distinction:

- We fund our mission by operating a business -- the business of selling renewable energy credits (RECs, Carbon Offsets).
- The net revenues from the program make the foundation almost completely self-supporting, from activities that themselves support the mission

Project Management Group & Solar 4R Schools



A Comprehensive Approach to Community Education



- Installations of 1 to 100 kW PV systems
- Data monitoring
- Renewable energy Activity Guides (curriculum)
- Renewable energy Science Kits
- Teacher & Student Training
- Virtual “Renewable Classroom” (Solar4RSchools.org)
- Interactive flash-animated kiosk
- Ongoing teacher support
- Community outreach, event management, & PR services
- Celebration event management/PR support

Science Kits

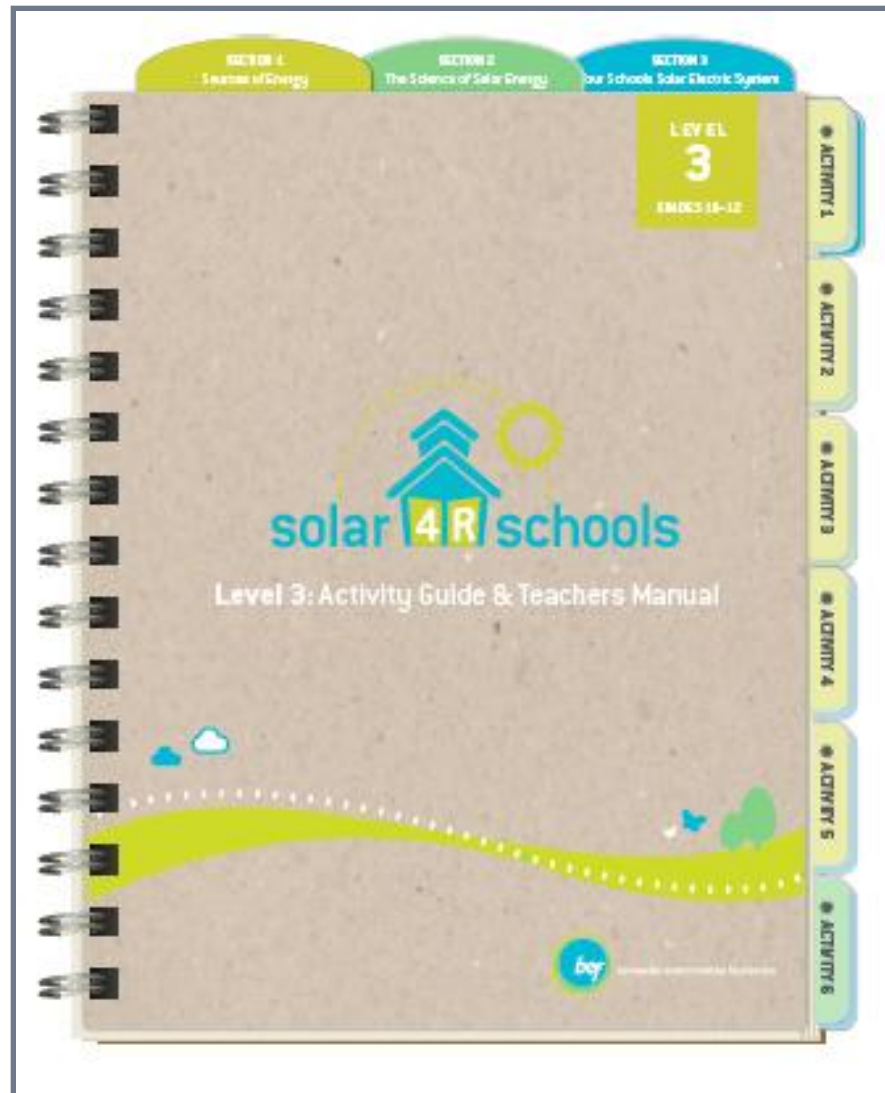
Science Kits



Science Kits



Activity Guides & Lesson Plans



Data Display



Data Display




SeQuential Biofuels
86714 McVay Hwy
Eugene, OR 97405-6622

SYSTEM SIZE: 33 kW

SeQuential Biofuels Live Solar Electric Generation

● LIVE DATA ● HOW IT WORKS ● ABOUT PROJECT ● ABOUT PARTNERS ● RENEWABLE TECHNOLOGY ● RENEWABLE BENEFITS ● GREEN DESIGN ● CALL TO ACTION ●

WIND BIOMASS WAVE ENERGY GEOTHERMAL SOLAR THERMAL




Courtesy of DOE/NREL

WIND ENERGY


A wind turbine system transforms the kinetic energy of the wind into electrical energy that can be harnessed for practical use.

Large, high-tech turbines, grouped into "wind farms" with generating capacities that range from a few megawatts to hundreds of megawatts, produce power that flows into the electricity grid.

While wind contributes less than 1% of the electricity generated in the U.S. today, installed capacity has been expanding at an average annual rate that exceeds 20%. In the early 1980s, when the first utility-scale turbines were installed, wind-generated electricity cost as much as 30 cents per kilowatt-hour. Now, some state-of-the-art wind power plants can generate electricity for less than 5 cents per kilowatt-hour, a price that is competitive with new coal and gas-fired power plants.



Courtesy of DOE/NREL



Courtesy of DOE/NREL

ROCKEFELLER ENVIRONMENTAL FOUNDATION

Fat Spaniel TECHNOLOGIES

Data Display



The screenshot shows the homepage of the Solar 4R Schools website. At the top, there is a navigation bar with links for HOME, SCHOOLS, ABOUT, LEARN, and APPLY. A search bar and a 'Sign Up For Our Newsletter' link are also present. The main content area features a map of the United States with green pushpins indicating project locations in various states. Below the map, a dropdown menu labeled 'Schools & Projects:' allows users to 'Choose Yours'. To the right of the map, there is a sidebar with navigation links for TEACHERS, STUDENTS, FUNDERS, and BLOG. Below these links, a section titled 'What is Solar 4R Schools?' provides a brief description of the program, mentioning that it is developed and managed by the Bonneville Environmental Foundation (BEF). A small photo of two children is included in this section. At the bottom of the page, there are social media icons for Twitter, Facebook, and RSS. The background of the website is decorated with illustrations of a red barn with solar panels, a windmill, and a landscape with hills and a river.

Home | Solar 4R Schools

Teachers: [Login](#) or [Sign-up](#)

HOME SCHOOLS ABOUT LEARN APPLY

Sign Up For Our Newsletter

TEACHERS

STUDENTS

FUNDERS

BLOG

What is Solar 4R Schools?

Developed and managed by [Bonneville Environmental Foundation \(BEF\)](#), Solar 4R Schools provides schools nationwide with hands-on teaching tools such as science kits, lesson plans and photovoltaic solar arrays so students can learn about solar, wind and other renewable energy technologies.

Get Solar 4R Schools updates!

[Twitter](#) [Facebook](#) [RSS](#)

Schools & Projects:

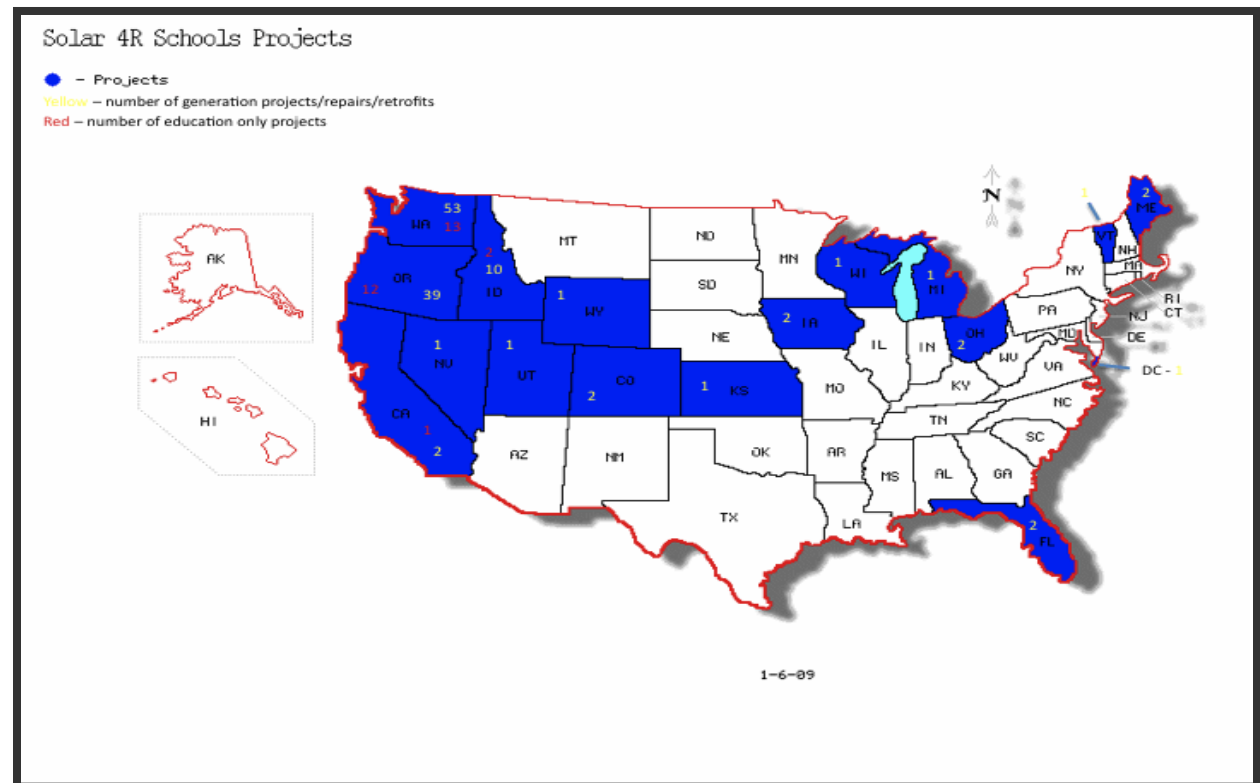
126 PHOTOVOLTAIC SYSTEMS ARE CURRENTLY GENERATING 216,710 WATTS.
1,334,280 KILOWATT HOURS (KWH) HAVE BEEN GENERATED TO DATE.
THIS AMOUNT OF ELECTRICITY FROM FOSSIL-FUELED SOURCES WOULD HAVE EMITTED
1,867,992 LBS CO₂ INTO THE ATMOSPHERE.

Celebration Events



Accomplishments

- Total mission related investment ~ \$4 million
- Over 50,000 students have been reached
- Installation of nearly 200 projects in 16 states



Vision



The Bonneville Environmental Foundation's Solar 4R Schools program delivers meaningful, hands-on educational experiences to students, parents, educators, utilities, installers, and municipalities throughout the United States, in order to break down the barriers that inhibit the widespread adoption of renewable energy technology.

Outcomes-Utilities (funders)



- Break down impediments to adoption of renewable energy technology
- Develop goodwill & relationships with customers
- Create awareness of utility's RE activities & existing green power programs
- Encourage GP customer retention, attract new customers
- Satisfy the expectation that some voluntary green power dollars will be invested in the community
- Generate significant local media coverage

Funding Mechanisms



1. REC Revenue Reinvestment

- BEF reinvests revenue from utility's REC purchase into local demo project
- *Snohomish County PUD, Idaho Power, Clark Public Utilities, Puget Sound Energy*

2. Project-based Green Power Program

- A utility collects voluntary dollars exclusively for investment in local demo projects
- Independent of or in lieu of REC-based GP program
- *Seattle City Light, Snohomish PUD*

3. Internal Utility Funds

- Utility utilizes other, non GP program, internal funds
- *Puget Sound Energy, City of Ellensburg*

Case Study #1-Idaho Power



Pocatello Community Charter School - Idaho

Partner

Idaho Power (IPC)

Funding mechanism

BEF reinvested \$x per REC sold to IPC, and IPC also donated internal funds (BPA CRC)

Description

BEF has installed 11 demonstration projects on schools in IPC territory

Outcome

- Significant net-metering barriers broken down
- Vast interest in the S4RS program

Case Study #2-Puget Sound Energy



Partner

Puget Sound Energy (PSE)

Funding mechanism

Reinvestment of PSE's green power revenue & tariff funds

Description

- 19 PV demonstration projects on public facilities.
- Recently rewarded green power customers (Vashon Island) with two projects.

Outcome

- PSE built important relationships with stakeholders interested in local generation
- Green power customer retention

Case Study #3-Seattle City Light



Partner

Seattle City Light (SCL)

Funding mechanism

SCL's Project-Based (non-REC) green power program

Description

BEF has assisted SCL with 40 PV demonstration and education projects

Outcome

- Thousands of Seattle students learning about RE
- Network of trained teacher-champions
- Hope to translate that into increased sign-ups

Case Study #3-Seattle City Light



Case Study #3-Seattle City Light



Case Study #3-Seattle City Light



Thank You!



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Solar4RSchools.org

Outcomes-Students



- Provide students with a basic understanding of global energy issues in an entertaining and engaging way
- Empower students to promote conservation and renewable energy development in their homes
- Help students to appreciate the connection between the natural environment and human social and economic well-being
- Make lessons more relevant and durable by showing students how energy issues affect their daily lives
- Highlight job opportunities in the rapidly expanding renewable energy sector



Outcomes-Educators

- Deepen Teachers' knowledge of energy issues, and enable them to convey this information effectively to students and other teachers
- Create a national network of renewable energy "Teacher Champions" that can share curriculum ideas and collaborate on projects.
- Allow Teachers to satisfy state and national academic content standards using a flexible, inspirational, and easy-to-implement program
- Help Teachers develop a greater rapport with students by using a student-driven, project-based approach
- Provide Teachers with a vehicle to engage students creatively
- Offer Teachers professional development opportunities and continuing education credits



Outcomes-Communities

- Introduce communities, in an incremental, non-controversial manner, to renewable energy technologies that function on a local level
- Enable communities to organize, design, permit, and install renewable energy projects on their own
- Strengthen connections between schools, installers, local residents, businesses, and government officials
- Spur job creation in an emerging industry by creating opportunities for local solar-electric installers

