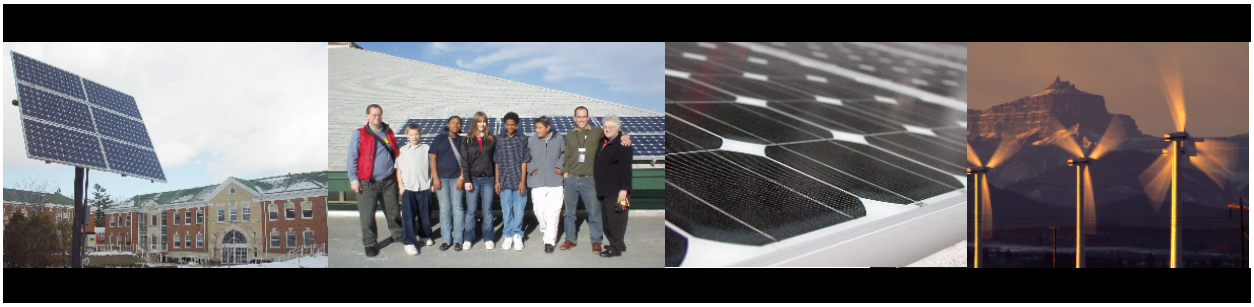
BONNEVILLE ENVIRONMENTAL FOUNDATION

Progress Report to the Bonneville Power Administration

Renewable Energy Activities October 2005-September 2006



from The Bonneville Environmental Foundation

June 6, 2007

Bonneville Environmental Foundation 240 SW 1st Avenue Portland, OR 97204 **T** (503) 248-1905

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About this Report

This report is provided to BPA in fulfillment of BEF's obligations under MOA No. 04PB-11472, Section 4(c), executed July 15, 2004.

This report summarizes BEF's use of funds received from BPA public customers during FY 2006 (October 2005 to September 2006).

Our current activities are outlined in the Current Activities section. This section includes an itemized list of expenditures incurred during the reporting period.

Information on the future direction of our programs, as envisioned at the time of this report, can be found in the Anticipated Activities section.

Use of Funds

Funds provided to BEF under the BEF funding Memorandum of Agreement (04PB-11742) shall be used for the following activities for the benefit of BPA's public utility and electric cooperative customers:

1. Renewable education programs;
2. Renewable research, development and demonstration (RD&D) activities;
3. Direct Application Renewable Resources by end-use customers served by BPA's public utility and electric cooperative customers.

Eligible Expenses include:

- Capital expenses associated with renewable education programs, RD&D or Direct Application Renewable Resources projects;
- Expenses associated with activities directly related to installing or implementing renewable education programs, RD&D projects, or Direct Application Renewable Resources projects;
- Expenses associated with studies or research demonstrating the viability of new renewable technologies;
- Expenses associated with other activities that have been approved in writing by BPA;
- A maximum of 20% may be used for general and administrative expenses that jointly support BEF in general, and this agreement in particular.

FY Consolidated Expenses

Figure 1.

Expenditures By Category	
Direct Application	**Expense**
Solar Co-op	$622
Wind Co-op	$1,198
Grants/LOE Review	$9,550
Bulk Purchases	$2,584
Outreach	$8,466
General (project planning, project review, contracts)	$3,659
Total Direct Application:	$26,079
RD&D	**Expense**
Ellensburg	$60,008
Ashland	$1,751
BIPV	$1,407
Biomass	$29,650
Wind Integration	$5,875
Wave and Tidal Energy	$777
Total RD&D:	$99,468
RE Education	**Expense**
S4RS Program Improvement	$13,362
Internet Monitoring & Data Display	$20,588
Regional Awareness Campaign	$1,260
Public Utility Educational & Assistance	$32,981
Last Mile Electric Cooperative	$25,712
Total RE Education:	$93,903
G& A (20% of total expenditures)	$57,943
Total MOU Funds 10/1/05-9/30/06	$277,394

MOA Funds Balance Summary

Figure 2.

Funds Rolled Forward to Next Period	
Current Period Budget	$86,000
Dollars available from prior budget (rolled forward)	-$5,708
Total Available Dollars	$80,292
Total Current Period Expenditures	$277,394
Total Dollars Allocated to Next Period (rolled forward)	-$197,102

Current Activities:

Current Direct Application Renewable Resource Activities:

This section details the installation of current direct application renewable resources in the territories of BPA's public utility and electric cooperative customers.

BEF continued its support of distributed generation in FY 2006, adding more than 63 additional kW in the reporting period (Figure 3), excluding solar and wind coop installations.

Through it's two coops, BEF supported an additional 377 kW of renewable energy technology installation during this year. Since the year 2000, BEF has supported the installation of more than 835 kW of small-scale distributed generation (Figure 4).

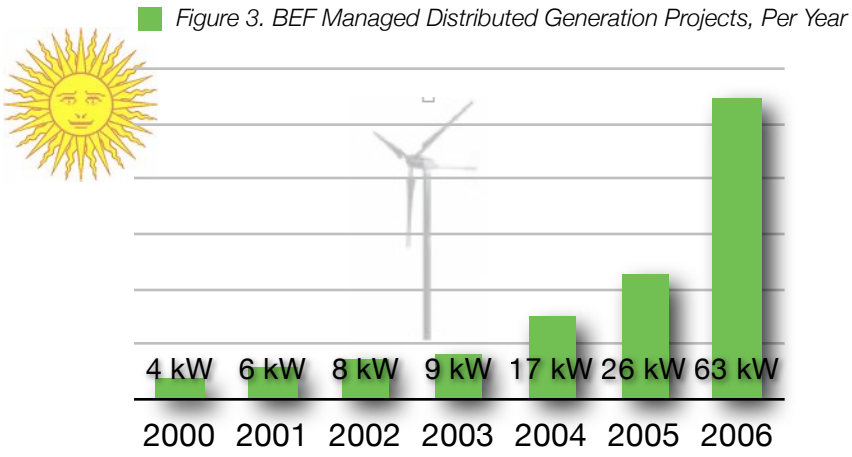


Figure 3. BEF Managed Distributed Generation Projects, Per Year

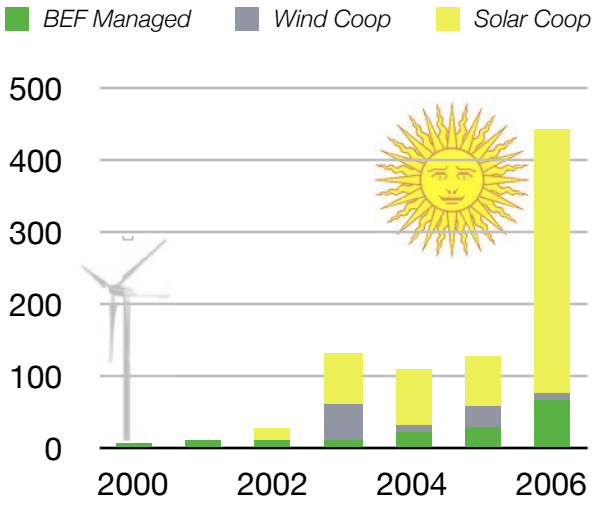


Figure 4. Installations supported per year

Of the 27 renewable energy demonstration projects that BEF managed during FY 06, we completed nine and broke ground on 18 others (Figure 5). 12 of these projects are located in BPA

public territory. BEF also assisted the City of Ellensburg in completing it's innovative 36 kW "community-solar" project. For the purposes of this report, this Ellensburg endeavor is classified as RD&D, and is discussed in detail in the appropriate section below.

Figure 5. BEF-managed projects, October 2005-September 2006

	Project FY 2006	Technology	Capacity (kW)	Serving Utility	Public
Under Construction	Barnard Elementary	PV	1.1	out of region	
	Camas HS	PV	1.1	Clark Public Utilities	✓
	Del Pueblo Elementary	PV	1.1	out of region	
	Eagle MS	PV	1.1	Idaho Power	
	Habitat For Humanity House	PV	1.1	Portland General Electric	
	Hatfield Science Center-OSU	PV	1.1	Lincoln County PUD	✓
	La Center High HS	PV	1.1	Clark Public Utilities	✓
	Lake Metroparks Farmpark	PV	1.7	out of region	
	Maharishi School	PV	1.1	out of region	
	North Mountain Park	PV Data Monitoring	-	City of Ashland	✓
	Payette HS	PV	1.1	Idaho Power	
	Sequential Biofuels	PV Data Monitoring	-	EWEB	✓
	Vancouver Water Resources Center	PV	1.1	Clark Public Utilities	✓
	Washington MS	PV	1.1	PSE	
	Whitman Mission	PV	2	Pacific	
	William Thomas MS	PV	1.1	Idaho Power	
	Wood River HS	PV	1.1	Idaho Power	
	Woodward School	PV	1.1	out of region	
Completed	Hewlett-Packard	PV	2.1	Clark Public Utilities	✓
	Sharp Electronics	PV	2.1	Clark Public Utilities	✓
	Ellensburg Community Solar	PV	36	Ellensburg	✓
	The Family Centers	PV	4.1	out of region	
	Crest Center	PV Data Monitoring	-		
	Oregon City	PV Data Monitoring	-		
	Washington School for the Blind	PV Data Monitoring	-	Clark Public Utilities	✓
	West Salem HS	PV Data Monitoring	-	Salem Electric	✓
	Wilamette HS	PV Data Monitoring	-	EWEB	✓

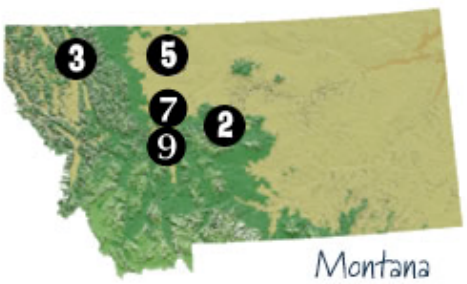
The Northwest Solar Co-op

The solar co-op, founded in 2002 by BEF and Cascade Solar Consulting, provides production-based incentives for new solar energy installations in Oregon, Washington, Idaho, and Montana. Figure 2 above charts the considerable success of this production incentive. By purchasing tags from the solar co-op for the first 3-5 years of a project's 20+-year life-span, BEF has encouraged the growth of the burgeoning residential and small commercial solar market.

In 2005, as the co-op matured, it began to sell to other buyers, in addition to continuing to sell to BEF. In BPA's FY 2006, the solar co-op continued its expansion, adding 113 new systems and more than 367 kW of capacity. During this period, BEF continued to provide critical staff support to the co-op. Our input ensured that the co-op continues to operate in an exemplary manner, with the highest level of product credibility. As of September 30, 2006, the Solar Co-op supported more than 602 kW of solar, 30% of which is installed in the service territories of BPA's public utility and electric cooperative customers.

MOA Charges for Solar Co-op: BEF staff support (contracts, policies, etc) $622

Washington
1) Peshastin
4) Goldendale
6) Goldendale
8) Kittitas
10) White Salmon



Montana
2) Stanford
3) Browning
5) Chester
7) Belt
9) Wolf Creek

Our Wind Co-op Projects

The Northwest Wind Co-op

On September 30th, 2006, a 10th turbine was installed in White Salmon, WA, marking the completion of the Co-op's initial goal. "Our Wind Coop", a project of NW SEED, serves an important function in the region by acting as a clearinghouse for information and expertise regarding small wind energy systems, services from which the entire region benefits.

The 10th co-op turbine, located in White Salmon, WA, was erected in September, 2006

BEF supported the co-op by providing zero-interest loans of $6,000 per turbine for the ten, 10-kW installations. The loans provided crucial up-front capital to help cover equipment costs. BEF recovers these loans over time, and does not charge them against this agreement. During this reporting period, BEF continued to provide staff support to the

co-op in order to ensure ongoing product credibility. In the previous period, BEF negotiated an arrangement with Puget Sound Energy under which BEF delivers Oregon and Washington-based Green Tags from the wind co-op to the utility, and this arrangement remained in place during this current reporting period. Finally, we continued to work with the co-op to determine the viability of a utility-scale wind project near Goldendale, WA (in the service territory of one of BPA's public power customers).

Three of the ten co-op installations are located in BPA's public power customer's service territories (Figure 6), and all of the installations are inside BPA's control area. BEF's expenses covered by the MOA are limited to those incurred while supporting Northwest SEED in its institutional development. No Green Tag payments or loans were charged against the MOA. All turbine installations are listed to demonstrate the work the co-op has undertaken.

Figure 6. Our Wind Coop projects

Turbine #	Location	Install Date	Interconnecting Utility	BPA Customer
1	Peshastin, WA	May 23, 2003	Chelan County PUD	
2	Stanford, MT	Sep. 29, 2003	NorthWestern Energy	
3	Glacier, MT	Oct. 9, 2003	Glacier Electric	
4	Goldendale, WA	Nov. 3, 2003	Klickitat PUD	X
5	Chester, MT	Dec. 16, 2003	Northwestern Energy	
6	Goldendale, WA	Sep. 2, 2004	Klickitat PUD	X
7	Belt, MT	June 1, 2005	Sun River Elec. Cooperative	
8	Kittitas, WA	March 9, 2006	Puget Sound Energy	
9	Wolf Creek, MT	March 30, 2006	Northwestern Energy	
10	White Salmon, WA	September 30, 2006	Klickitat PUD	X

MOA Charges for Wind Co-op: BEF staff support (contracts, policies for NW SEED, etc) - $ 1,198

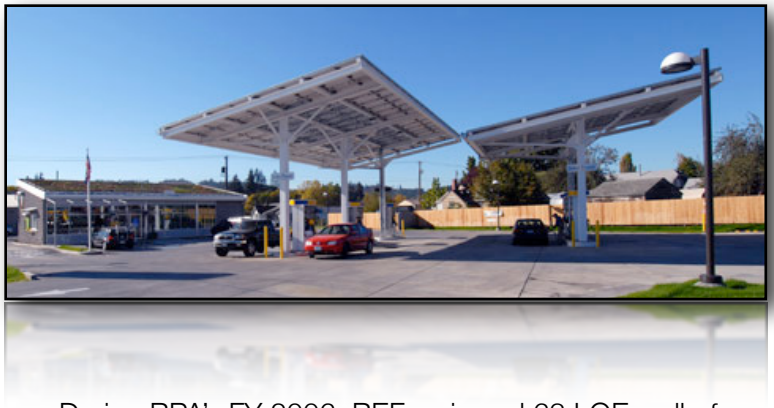
Letters of Enquiry

Since 2000, BEF has offered an open solicitation process, allowing Northwest organizations to apply for funding support for their renewable energy projects. This open process is only one part of our renewable energy program, and we discover many of our projects through direct negotiation with partners. However, many good projects continue to come to BEF through the open solicitation process accessible to all interested applicants and explained in details on the BEF website: www.b-e-f.org/grants

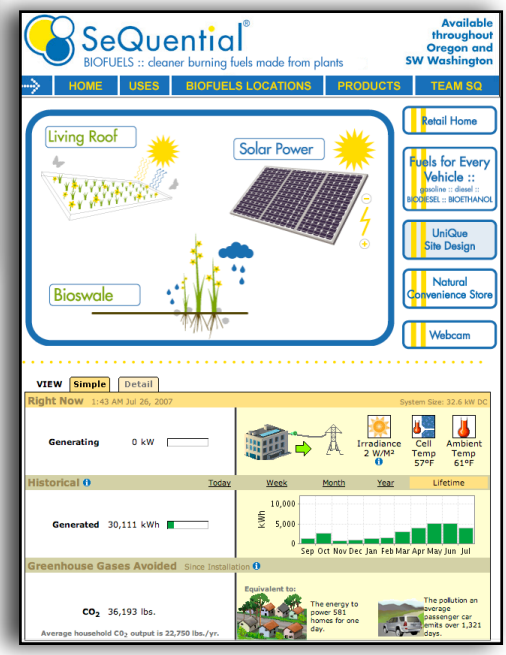
One of BEF's most interesting current projects, underway during this 2006 reporting period, came to us through this open solicitation process. The Sequential Biofuels retail station, located on a

formerly toxic site in EWEB territory, displays an impressive array of environmentally-friendly technology. Among other features on-site, the project includes a 33 kW building-integrated solar-electric canopy that shades several biodiesel and ethanol pumps, a bioswale to filter pollutants from highway runoff, and a "living roof" that covers the convenience store. BEF was proud to design an on-site interactive, flash-animated kiosk that instructs customers on the functions and benefits of renewable energy, and explains how rate-payers can take advantage of EWEB's renewable energy incentives. BEF's MOA expenses associated with this project during the current reporting period are included in the "Current Renewable Education Program Activities" listed below, due to the educational nature of our contribution.

Building-integrated PV covers biodiesel pumps in Eugene, OR



During BPA's FY 2006, BEF reviewed 63 LOEs, all of which were submitted through our web site. Thirteen of these applications were submitted by customers of BPA public utilities.[1] Of these, five have turned into actual projects (Sequential Biofuels, the North Mountain Park Nature Center in Ashland, and three projects in Clark Public Utilities service territory--Camas High School, La Center High School, and the Vancouver Water Resources Education Center).



Sequential submitted an unsolicited application to BEF, and received an advanced data monitoring and display system for their 33 kW solar system.

As part of BEF's Project Management program line, BEF reviews Letters of Enquiry and manages installations under contract with some specific utilities, utilizing funds from those utilities. BEF staff time and expenses associated with those projects are paid for under those contracts and are not included in calculations in this report.

MOA Charges for Letters of Enquiry: time and expenses associated with soliciting and reviewing LOE's from within the service territories of BPA public power customers - $9,550

[1] Many of the other LOEs were submitted in response to RFPs that BEF issued in collaboration with funding partners who utilize our Project Management services.

Project Management Group (formerly called Project Management Services)

BEF's Project Management Group (PMG) works to break down the barriers to the widespread adoption of renewable energy technology. The PMG team achieves this goal, primarily, by managing the installation of renewable energy demonstration projects on behalf of various partners. Before, during, and after the actual installations, PMG works with various stakeholder groups (e.g. students, teachers, installers, utilities, city permitting officials) and empowers them to promote renewable energy in their own capacities. During this period, the Project Management Group completed or initiated a number of projects in BPA service territory using BPA funds, offered BEF's project services to many BPA public utilities, and undertook various activities to make the actual installation of small-scale renewable energy projects in the region easier and less expensive. (PMG's specific educational activities are detailed in the "Renewable Education" portion of this report.)

MOA Charges for General BPA Project-Related Expense: BEF staff time (project planning, project review, contracts) - $3,659

The following bullet points detail some of PMG's activities related to the direct installation of renewable energy resources during the reporting period:

• La Center High School, La Center WA

During FY 2006, PMG broke ground on a 1.1 kW demonstration solar-electric project at this school in Clark Public Utilities territory. As a participant in BEF's "Solar 4R Schools" program, La Center will receive a full weather station and data monitoring system, renewable energy curriculum and other learning materials, a teacher-training session and ongoing educational support, and an interactive hallway kiosk that details the function and benefits of various renewable energy technologies. BEF does not recognize revenue on its projects until they are fully complete. Therefore, the expenses related to the La Center project will appear in the succeeding report.

• Solar Panel Bulk Purchase

In July of 2004, during the previous reporting period, PMG procured solar panels in bulk in an effort to inoculate ourselves and our utility partners from the global PV module shortage, to lower the costs of the solar projects that we manage, and to install them more expeditiously. Our initial experience with the bulk order was very positive. We procured modules at a significant discount to the spot market and streamlined the project management process. Our utility partners now view our instant access to modules as a key asset. Because this first purchase was so successful, we initiated a second bulk purchase of modules in December of 2005, securing a stockpile of approximately 150 kW (880 170-watt modules).

• Data Monitoring Bulk Purchase

Recognizing that bulk purchases of project hardware can dramatically streamline the project management process, PMG staff also secured a long-term pricing deal with Fat Spaniel Technologies, a renown renewable energy data monitoring company. Under this agreement, BEF can now access data monitoring hardware and customized flash-animated kiosk web-pages at significant discounts, and in relatively short order.

MOA Charges for Bulk Solar and Data Monitoring Purchases: BEF staff time (contracts, research) - $2,584

• Additional Regional Benefits from BEF's Project Management

PMG, with BPA's vital assistance, has developed the capacity to install highly educational demonstration projects quickly, and cost-effectively. This ability has benefitted BPA's regional public power customers, substantially, in that they now have access to comprehensive and competent renewable energy project management. PMG managed the installation of six additional projects in public utility territory during this period. Because these projects were not billed to the BPA MOA, information on these activities can be found in the Appendix.

Renewable Energy Project Management Services: Case Study

BONNEVILLE ENVIRONMENTAL FOUNDATION

Clark Public Utilities' Operations Center
Vancouver, WA

The Challenge:
Connect urban-living green power supporters to their renewable energy supply.

The Solution:
Reinvest voluntary green power funds in a local renewable energy demonstration project. While green power purchases often support renewable energy in more remote areas of the region, BEF provides the tools to bring customers face to face with renewable energy. Incorporating state of the art displays of the data (live and on-line) bring the experience to an even wider audience.

"In partnership with BEF, we work to provide our community with a range of renewable energy options- from a simple choice on their utility bill to a hands-on learning experience. BEF is great to work with. We appreciate what they do, and so do our customers."

-Bruce Carter,
Manager of Energy Programs
Clark Public Utilities

Unique Community Benefits:

The innovative arrangement of these rectangular and triangular solar panels gives this installation its unique sunflower look. The solar electric system was funded by revenues from Green Lights, Clark PUD s voluntary program that allows customers to purchase clean energy supplied by BEF.

The project serves the community by connecting green power customers with a local example of renewable energy supply and by demonstrating CPU s hook-up requirements for customers interested in installing their own solar generators. The educational value of the system is greatly enhanced with monitoring and display of weather, energy, and production data.

Visitors can view the output of the array in real-time, in person, or on-line. By activating additional loads on-site, customers can witness the direct relationships between energy produced and energy consumed.

Project Snapshot:
System Capacity: 2.1 kilowatts
Estimated Energy Output: 2600 kilowatt hours annually
Placed in service: May 2005
PV System Components: Sharp 140 Watt and 70 Watt modules, SMA SunnyBoy 2500 inverter
Data Monitoring: Fat Spaniel Technologies Energy Monitoring System

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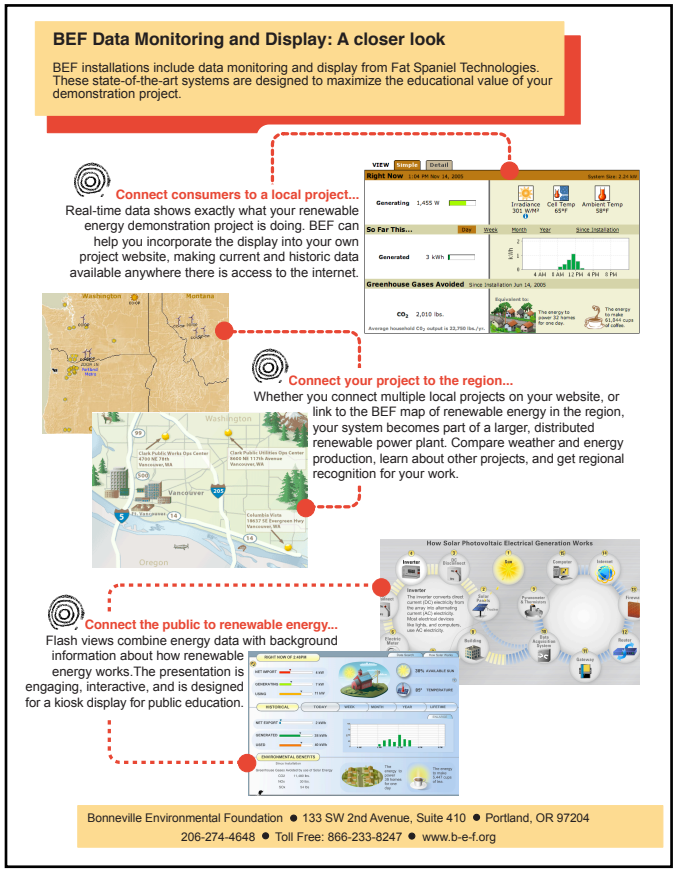

BEF Data Monitoring and Display: A closer look

BEF installations include data monitoring and display from Fat Spaniel Technologies. These state-of-the-art systems are designed to maximize the educational value of your demonstration project.

Connect consumers to a local project...
Real-time data shows exactly what your renewable energy demonstration project is doing. BEF can help you incorporate the display into your own project website, making current and historic data available anywhere there is access to the internet.

Connect your project to the region...
Whether you connect multiple local projects on your website, or link to the BEF map of renewable energy in the region, your system becomes part of a larger, distributed renewable power plant. Compare weather and energy production, learn about other projects, and get regional recognition for your work.

Connect the public to renewable energy...
Flash views combine energy data with background information about how renewable energy works.The presentation is engaging, interactive, and is designed for a kiosk display for public education.

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Examples BEF Project Management Case Studies

• Outreach

BEF informed various public utilities about our educational and project management services during this period. We attended regional public utility events, and produced case studies and a project management handbook to demonstrate BEF's capacity to assist utilities with the installation of renewable energy demonstration projects. Representatives from BEF's Project Management Group attended BPA's Utility Energy Efficiency Workshop and presented the details of BEF's Solar 4R Schools program. In attendance were dozens of BPA public utilities, many of whom now have a project management relationship with BEF.

MOA Charges for Outreach: BEF staff time (material development, travel, staff time) - $8,466

Update on Planned Direct Application Activities (from previous Progress Report)

In the previous report, we listed various Direct Application goals for this current period. Our Direct Application goals included:

Figure 7.

	Goal	Progress
1	Bulk Purchase of modules and data monitoring hardware	Complete
2	Follow through on Wind and Solar Co-op obligations	Complete
3	Install 2-5 additional projects in Clark Public Utilities service territory	Underway
4	Pursue a Building-Integrated PV project in Snohomish County	Underway
5	Undertake additional Solar 4R Schools projects	Complete (and ongoing)

Current Renewable Research, Development And Demonstration Activities:

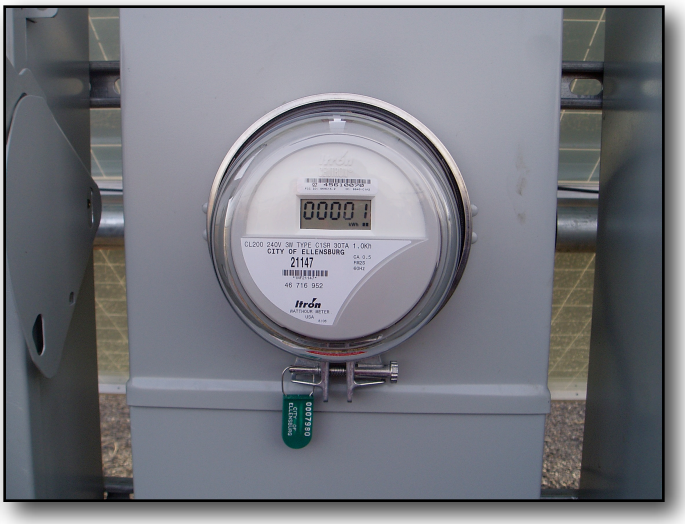
The Ellensburg Community Solar Project ("virtual net-metering")

BEF and the City of Ellensburg have constructed a novel, replicable, community-based, solar electric project in order to, among other things:

1. Provide Ellensburg rate-payers with the opportunity to invest in locally produced renewable electricity without having to worry about maintenance, shading, or building ownership issues.
2. Offset the retail rate of power (like a traditional residential or commercial net-metered system), while capturing the scale benefits of a large installation.

In 2006, the City installed a 36 kW system (with the intention of expanding the project to 165 kW over the next several years). Although the majority of the design and installation work was done during this current reporting period, the system was energized in November of 2006. The system is sited in a highly visible location along Interstate 90, on the southwest edge of the West Ellensburg Park.

The first phase (36 kW) of the Ellensburg Community Solar Project, as viewed from Interstate 90



Shortly after the ribbon is cut, the system generates its first kWh

With BPA's support, BEF assisted the City of Ellensburg in a number of ways:

1. Project Design- BEF helped Ellensburg devise an innovative model that can be replicated on a regional and national scale.
2. Finance- BEF used BPA MOA dollars to make an upfront donation of 12 kW of solar panels to the project.
3. Procurement- BEF managed all equipment and installation invoice payments, using Ellensburg's Conservation Rate Credit dollars. In addition to donating 12 kW of solar panels, BEF supplied, at its reduced bulk-purchase cost, the second 12 kW of solar panels.

BEF has categorized this project as a Renewable RD&D Activity. Clearly, the installation could be also be considered a Direct Application Activity, but its most unique and important contribution is the cooperative, community-utility financial model. By demonstrating this new funding mechanism, BEF and Ellensburg have paved the way for future similar projects.

MOA Charges for the Ellensburg Community Solar Project: BEF staff time and project hardware - $60,008

City of Ashland

The City of Ashland is exploring how and whether to expand its existing municipal distributed solar PV system through use of CREBS bonds, tax credits, and "solar co-operative" shares sold to Ashland utility customers (Note: The City's existing solar system was established in 1999 in significant part with BEF's first renewable energy grant.) Ashland's Utilities Director, Dick Wanderscheid, requested and is receiving ongoing BEF consultation in program design, siting, equipment procurement, finance, and structuring an "offering" to Ashland residents. This project, if undertaken, will be developed independent of BEF's Green Tag co-marketing arrangement with Ashland.

MOA Charges for the City of Ashland: BEF staff time- $1,751

Building-Integrated Photovoltaics

In the summer of 2006, BEF hired an intern to research Building Integrated Photovoltaics (BiPV), a collection of emerging and exciting technologies that, supporters claim, may reduce the cost of solar electricity and improve the aesthetics of the installations. In an attempt to help BEF better understand the state of BiPV's technological and market development, the intern prepared an extensive report that outlines the cost, availability, and functionality of current commercial products, and reviews promising BiPV technologies still in development. Most importantly, the report recommends several ways that BEF might support the BiPV market. As a direct result of this research, BEF is currently developing several new BiPV projects which are discussed further in the Anticipated RD&D Activity section below. Copies of this report are available upon request.

Like we did with the Community Solar model outlined above, BEF has chosen to categorize our BiPV efforts as RD&D. Though the BiPV approach has the potential to lower installed costs and improve aesthetics, the concept is still not widely implemented.

MOA Charges for BiPV: BEF staff time and commissioning of report- $1,407

Biomass

BEF continued its exploration into the biomass energy generation potential of forest fuel loads. In this reporting period, BEF hired two consultants to focus on biomass conversion technologies, with the goal of identifying a conversion process that meets several tests:

1. Medium-scale (5 MW to 12 MW capacity), allowing units to be located near fuel sources, avoiding long fuel delivery supply lines;
2. Commercial availability, with sufficient operating histories that equipment reliability could be ascertained;
3. Predictable O&M requirements that do not imperil project economics;
4. Capability to produce multiple outputs (biogas, bio-oil, and/or char, which could in turn be used as fuel to generate electricity and process heat, and/or find other markets).

These efforts led to the identification of several private sector technology options under development in eastern Canada with Canadian government assistance. Links to a preliminary analysis can be found at http://www.b-e-f.org/renewables/BiomassUtilization.pdf

MOA Charges for Biomass: BEF staff time and commissioning of reports- $29,650

Wind Integration

As a participant in the White Creek Windfarm, BEF encountered, first-hand, the regional issues raised by the prospect of efficiently integrating substantial amounts of wind resource into the PNW grid. We realized that not just BPA, but all regional utilities, their customers, and state regulatory agencies needed to be parties to this solution-seeking process. So BEF (in collaboration with Eliot Mainzer at BPA and Jeff King at NPPC) drafted a concept paper on a regional wind integration initiative, shopped it to the region's utility CEO's, and assembled a consensus agreement on a regional cooperative agenda and initial task list. The Regional Wind Integration Policy Committee, chaired by Steve Wright and Tom Karier, met in the summer of 2006 to adopt a work plan. Angus Duncan, BEF's President, is a member of the Policy Committee, and of the Technical Committee on Flexibility Augmentation.

MOA Charges for Wind Integration: BEF staff time-$5,875

Wave and Tidal Energy

BEF engaged in several discussions with Snohomish PUD, other public utilities, and the U.S. EPA in an effort to assess electricity generation from wave and/or tidal power. Those discussions are ongoing and are being led, in large part by Snohomish PUD.

MOA Charges for Wave and Tidal Energy: BEF staff time-$777

Update on Planned RD&D Activities (from previous Progress Report)

In the previous report, we listed various Renewable Research, Development And Demonstration Activities goals for this current period. These included:

Figure 8.

	Goal	Progress
1	Building-Integrated PV- Hiring an intern to analyze this market	Complete
2	Building-Integrated PV-Collaborate with EWEB on highly visible BiPV project	Complete
3	Building-Integrated PV-Work with Ashland to expand its existing distributed solar system	Underway
4	Building-Integrated PV-Work with Cowlitz PUD to install BiPV on the Longview Fine Arts Center	Underway (an alternate location has been identified)
5	Biomass-Complete reconnaissance study	Complete
6	Biomass-Determine whether to proceed with a demonstration project.	Underway
7	Biomass- Continue to support biomass activities in the Northwest through Tag purchases and sales, and through participation in regional working groups.	Complete (and ongoing)
8	Community Solar- Support the Ellensburg project	Complete (and ongoing)

Current Renewable Education Program Activities:

Solar 4R Schools (S4RS) Program Improvement

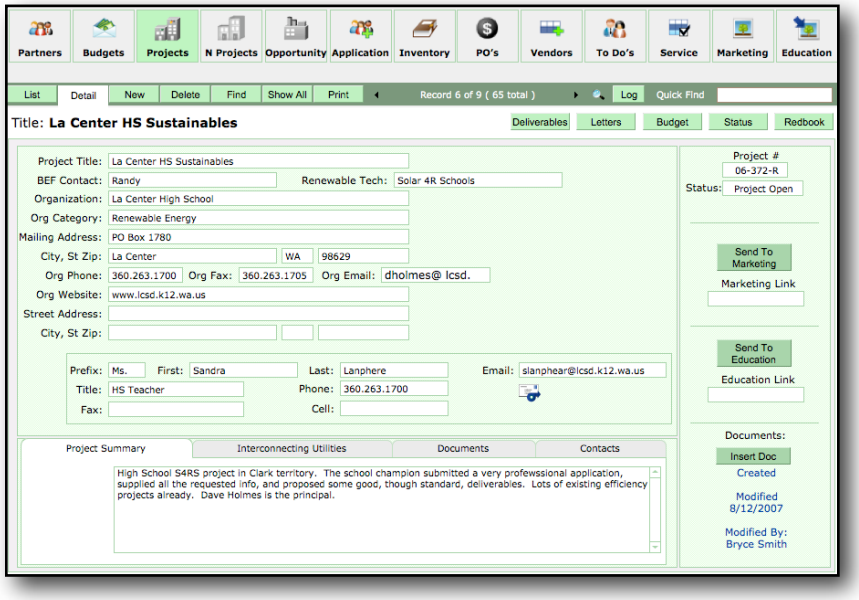
• Curriculum Refinement

BEF worked to refine and improve the S4RS curriculum throughout the year. In particular, we made an effort to reorganize the basic "classroom exercises" packet that each teacher champion is given upon entry into the program. Based on feedback from teachers in the program, we determined that the original packet contained many terrific lesson plans, but that choosing from the sheer volume of materials presented a daunting task for some teachers. As such, we streamlined the packet so that teachers could more easily integrate the exercises into their classrooms. Though more in-depth materials are still available for particularly dedicated teachers, the new format is far more accessible for most teachers.

• Database Updates

In order to streamline the S4RS program, BEF continued to automate project management steps. By improving database functionality (invoicing, document-tracking, financial analysis) we are able to install projects more cost effectively, and can spend more time collaborating with the teacher champions on their educational efforts.

Figure 9. The database allows BEF to track all aspects of a S4RS



• New Hire

BEF hired a Renewable Energy Project Coordinator during this period. The presence of the Coordinator, whose primary job is to manage the hardware installation associated with a S4RS project, allows others within the Foundation to focus exclusively on the educational aspects of the program.

MOA Charges for Solar 4R Schools Program Improvement: BEF staff time-$13,362

Internet-Based Monitoring for Small Renewable Projects

• Web-Based "Solar Classroom"

In order to enhance the educational value of the S4RS projects, BEF created a web-based Solar Classroom that allows students and teachers to access the live and historical data from their projects, and to compare system performance to that of other schools in the program. For each school project, BEF customizes 4 web pages:

1. Project Background and Photos (Figure 10)
2. System Technical Specifications (Figure 11)
3. Data Search and Download (Figure 12)
4. Current Electrical Production, Solar Irradiance, PV Module Temperature, Air Temperature (Figure 13)

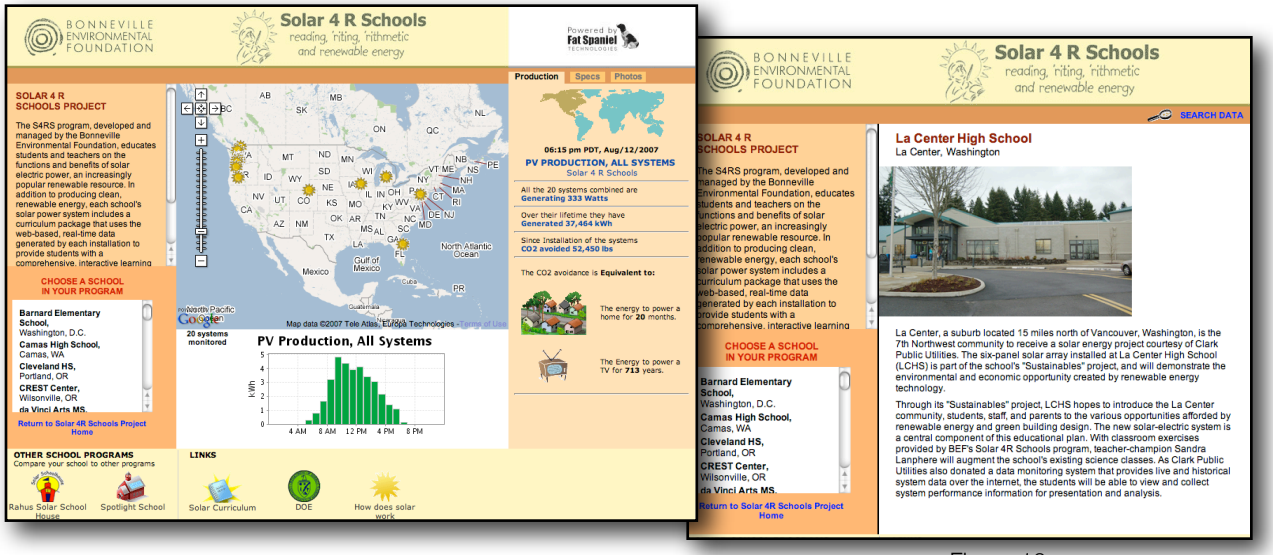
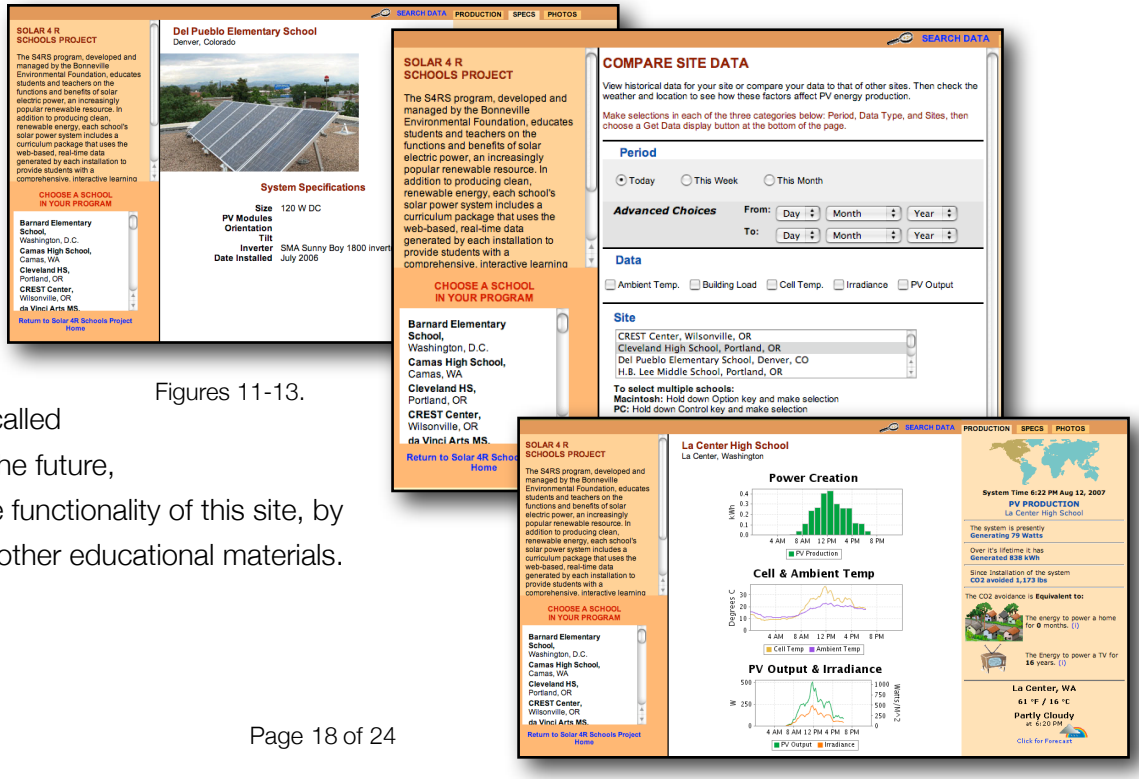


Figure 10.

The Solar Classroom's main page displays the cumulative output of all schools in the program, and allows students to view an interactive, flash-animated presentation called "How Solar Works". In the future, BEF will likely add to the functionality of this site, by posting curriculum and other educational materials.



Figures 11-13.

• Data Monitoring Retrofits

Because the educational value of a renewable energy demonstration project is far more substantial when people are able to view the live and historical production data, BEF elected to retrofit a few existing projects with data monitoring hardware. West Salem High School (Salem, OR), Willamette High School (Eugene, OR), Washington School for the Blind (Vancouver, WA), and the North Mountain Park Nature Center (Ashland, OR) were recipients of this equipment during the period. Because BEF's new Solar 4R Schools curriculum package frequently requires the use of a local system data, the three schools in particular benefitted greatly from the retrofit.

MOA Charges for Internet-Based Monitoring: Project hardware and BEF staff time-$20,588

Regional Puget Sound Green Power Awareness Campaign

In an effort to expand the successful 2004 Green Power Awareness Campaign, BEF met with Snohomish PUD, Seattle City Light, Puget Sound Energy and Tacoma Power. While no campaign was launched during this reporting period, we anticipate that a campaign will be launched in 2007.

MOA Charges for Regional Puget Sound Green Power Awareness Campaign: BEF staff time-$1,260

Educational Assistance to Public Utilities and Regional Stakeholders

BEF continued it's efforts to promote the Campus Greening Initiative, in collaboration with Northwest Seed. During the year, BEF staff delivered renewable energy and climate change presentations to various universities, including Seattle University, Lane Community College, and Marylhurst University.

BEF's President, Angus Duncan, also undertook various educational activities to benefit regional stakeholders during this reporting period. Such activities included preparing and delivering presentations on renewable energy technologies, economics, and public policies to numerous Consumer-Owned Utilities and other regional stakeholders. Copies of these presentations are available upon request.

Mr. Duncan also spent significant time participating in other regional educational activities *not* charged to the BPA MOA. These activities include his participation in:

- State and regional task forces (e.g., Oregon Governor's Renewable Energy Working Group [REWG]; Oregon Energy Trust Renewables Advisory Committee);
- Power Council and Regional Dialogue proceedings relating to the role of renewables in reaching the region's energy generation goals.

MOA Charges for Educational Assistance to Public Utilities and Regional Stakeholders: BEF staff time-$32,981

Last Mile Electric Cooperative

As an LMEC member and Chair of the Program Committee, Mr. Duncan helped to design a renewable technology information web site for small PNW consumer-owned utilities; a joint project with NW SEED and NWCDC (also an LMEC member). The Program Committee also developed LMEC's plan for outreach, education, and recruitment of PNW Consumer-Owned Utilities as new LMEC members. The Committee produced a "lessons learned" memorandum for small utility participation in utility-scale wind, with recommendations for organizational decision-making, structure, and business model. (Note: No time spent as a member of the White Creek Participants' Committee supporting development of the White Creek project was included in this category.)

MOA Charges for LMEC-Related Educational Support: BEF staff time-$25,712

Update on Renewable Education Activities (from previous Progress Report)

In the previous report, we listed various Renewable Education Activities goals for this current period. These included:

Figure 14. Renewable Education Goals: Previous Report

	Goal	Progress
1	Support for public utility Green Power programs	Complete
2	Enhance the Solar 4R Schools program	Complete (and ongoing)
3	Retrofit old projects with data-monitoring hardware	Complete
4	Roll-out online learning center, "Solar Classroom"	Complete
5	Develop materials and disseminate information that assists public utilities and regional NGOs in better understanding the environmental benefits of renewable energy generation.	Complete (and ongoing)
6	Participate in educational activities (e.g. technical and educational conferences).	Complete (and ongoing)

Anticipated Activities

Anticipated Direct Application Renewable Resource Activities:

The Northwest Solar Co-op

We anticipate that the solar co-op will continue to grow. We intend to work with the co-op to ensure that this growth is accomplished in a way that addresses the needs of all parties in the chain of ownership.

PV Demonstration Projects

BEF intends to install several more PV demonstration projects in the succeeding period. St. Helen's High School, in Columbia River PUD's service territory, will be the recipient of a S4RS project, as will at least three schools in Cowlitz PUD territory. We intend to evaluate additional project applications as they arrive, and to award projects to those applicants most capable of promoting renewables in the Northwest.

Marketing Campaign to PUDs

We will increase our efforts to market our project management services and the S4RS program to public utilities in the Northwest.

Bulk Orders

The Project Management Group anticipates organizing a bulk order of inverters, in much the same way that we have saved time and money previously by ordering solar panels and data monitoring hardware in bulk.

Anticipated Renewable Research, Development And Demonstration Activities:

Analysis of Solar Incentives in the Northwest

BEF hopes to devise a financial model that will allow us to monetize all available federal, state, and local incentives for photovoltaic projects, thereby enabling us to install much larger demonstration projects. We anticipate that this model will involve creating a partnership between a non-profit (a school, for instance) and a for-profit and will be loosely based on similar structures used to finance some wind projects on farms in the Midwest (called the "Minnesota Flip").

Building Integrated Photovoltaics (BiPV)

In the coming year, BEF plans to develop several BiPV projects in the region, in an effort to promote this approach to installing solar-electric projects. BEF hopes to work with the da Vinci Arts

Middle School in Portland to design a state-of-the-art, "zero-emission", modular classroom. This classroom, as conceived, would incorporate all reasonable efficiency measures, as well as a BiPV system, and would serve as a design model for other schools in the region.
As proposed, BEF would offer design and data monitoring assistance, and would provide the solar panels. We also hope to work with Cowlitz PUD to install a BiPV project on the Science and Technology building on the campus of Cowlitz Community College.

Community Solar Projects

Though the first phase of the Ellensburg Community Solar Project is complete, BEF will continue to support the project by providing additional data monitoring and display capabilities and marketing support. BEF will also continue to pursue a Community Solar Project with the City of Ashland, using the experience gained during the Ellensburg project. We will explore how the City might use CREBS bonds and tax credits, in addition to selling co-op like "shares".

Biomass

In the 2006-2007 period, BEF will seek to complete technological due diligence on the proposed biomass (forest-fuel) project, and will turn its attention to fuel supply issues. BEF hopes to complete the pre-development/RD&D evaluation phase in 2007-2008 and to decide, at that point, whether to field a demonstration unit in 2009.

Anticipated Renewable Education Program Activities:

Data Monitoring Retrofits

Just as we retrofit four existing projects with data monitoring equipment in this current year, so too do we plan to outfit a number of older projects with similar monitoring equipment this year. We have tentative plans to upgrade 5 existing projects in the City of Ashland.

Enhance the Solar 4R Schools Program

- BEF plans to improve the content and delivery of our school educational materials on an ongoing basis, and to provide better support to teachers participating in the S4RS program. To this end, we hope to recruit a full-time Educational Liaison to complement our current Solar 4R Schools Program Manager and Project Coordinator.

- We anticipate adding functionality to our web-based "Solar-Classroom", perhaps by adding online educational activities or by creating ways for the teachers and students in the program to network with each other.

- We will design customized, less expensive hallway kiosks for our S4RS projects so that this highly educational item can be included in more projects.

- In order to make the most out of these kiosks, we will develop additional flash-animated kiosk pages to inform students about renewable energy.
- We will create a PowerPoint (or similar) presentation so that public utilities in the Northwest can better understand what the S4RS program entails.
- In collaboration with Seattle City Light, BEF will devise a plan to deliver renewable energy educational material to schools in City Light's territory.

Regional Puget Sound Green Power Awareness Campaign

We anticipate joining with Snohomish PUD, Seattle City Light, Puget Sound Energy and Tacoma Power in an effort to expand the successful 2004 Green Power Awareness Campaign.

Educational Assistance to Public Utilities and Regional Stakeholders

BEF staff will continue to present information on renewable energy technologies, economics, and public policies to regional public utilities and other stakeholders.

Appendix-Activities Undertaken with BPA Public Customers Without the Use of MOA Funds

Expenses from the following activities are not be billed to the MOA, as they are all covered under other Agreements:

Clark Public Utilities PV Demonstration Projects

As part of our commitment to assist Clark Public Utilities with its public renewable energy education strategy, BEF completed solar-electric demonstration projects at the HP and Sharp campuses in the utility's service territory. On behalf of Clark Public Utilities, BEF also began Solar 4R School projects at Camas High School and the Vancouver Water Resources Education Center.

Hewlett-Packard's pole-mounted PV project, installed April '06

Snohomish County PUD BiPV

BEF, in collaboration with Snohomish PUD, also initiated a building-integrated PV project at the Snohomish Community Transit Center during 2005-2006 fiscal year. We plan to continue this work through the next reporting period.

Hatfield Marine Science Center

BEF began the installation of a solar-electric demonstration project at the Hatfield Marine Science Center on Oregon State University's coastal campus. To complement the solar project, BEF plans to install an interactive, public education kiosk to be located inside the world-class marine science education center. BEF hopes to complete this project during the upcoming reporting period.

Whitman Mission

With the coordination of BPA, BEF contributed $7,000 (non-MOA funds) to the Whitman Mission National Historic Site's PV project, the first grid tied system in the Walla Walla valley. The contribution (in return for Green Tags from the system) enabled the Whitman Mission, a Federally owned National Monument with over 50,000 visitors per year, to expand its existing project by 2.2 kW.