

# Progress Report to the Bonneville Power Administration

from

## The Bonneville Environmental Foundation



Midstate Electric Cooperative's  
new LEED certified administrative building with 7 kW solar power, funded in part by the  
Bonneville Environmental Foundation

Reporting Period: October 2004  
through September 2005

Report Date - June 2006

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## **Purpose of 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.

## **About this Report**

This report summarizes BEF's use of funds received from BPA public customers during FY 2005.

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:

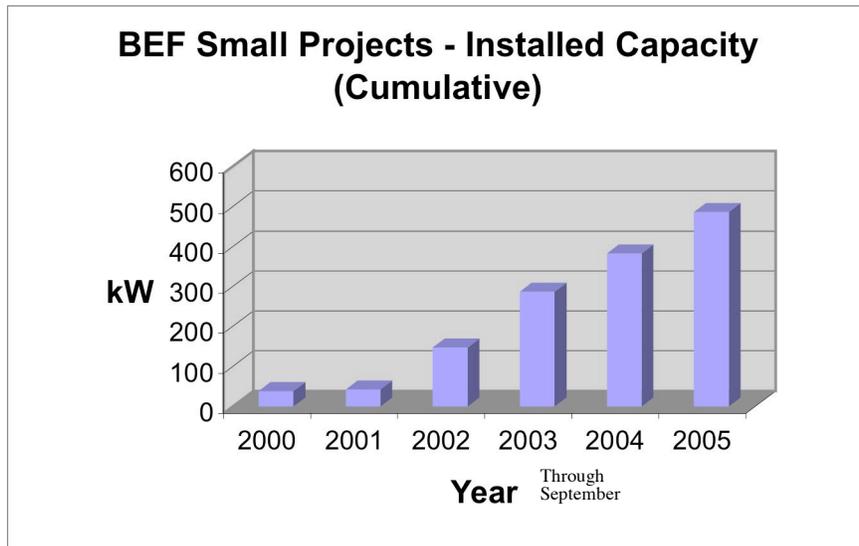
1. Capital expenses associated with renewable education programs, RD&D or Direct Application Renewable Resources projects;
2. Expenses associated with activities directly related to installing or implementing renewable education programs, RD&D projects, or Direct Application Renewable Resources projects;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

## Current Activities

### Current Direct Application Renewable Resource Activities

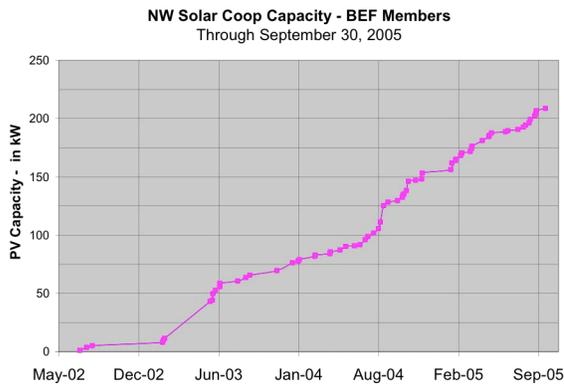
This section covers current direct application renewable resources by end-use customers served by BPA’s public utility and electric cooperative customers.

BEF has continued its support of distributed generation, adding more than 106 additional kW in the current reporting period, bringing our total to over 487 kW.



<u>2005 Projects</u>	<u>Capacity kW</u>	<u># Of Projects</u>
NW Solar Co-op Installs 2005	74	30
Wind Co-op Installs 2005	10	1
Clark County Op Center	2.1	1
Clark Public Utilities Op Center	2.24	1
Columbia Vista	2.1	1
Hillsboro Civic Center	3.1	1
Lincoln Elementary	1.1	1
Cleveland High	1.1	1
Orlo Vista Elementary	1.1	1
HB Lee Middle	1.1	1
Vashon	1.1	1
Midstate Electric Coop	7	1
<b>Totals -</b>	<b>106.04</b>	<b>41</b>

The Northwest Solar Co-op – The solar co-op continued to grow, and the growth required the co-op to expand its sales to buyers other than just BEF. We worked with the co-op to ensure that this was accomplished in a way that addressed the needs of all parties in the chain of ownership. The co-op added 30 new systems and over 74 kW of capacity during BPA FY 2005, 43% of which is in the service territories of BPA’s public utility and electric cooperative customers. BEF created this program in 2002 in collaboration with Cascade Solar Consulting. The co-op provides production-based incentives for new solar energy installations in Oregon and Washington. BEF (and now other green tag marketers) purchases the tags from the solar co-op for the first 3-5 years of projects’ 20+-year lifespan. Funding for those solar Green Tags are not charged against the BPA MOA. BEF provided substantial staff support including defining rules under which the co-op continues to operate to ensure product credibility, assistance with contract language as needed, and providing feedback on the needs of the voluntary Green Tag market. As of September 30, 2005, the Solar Co-op supported a total of over 227 kW of solar, 48% of which is in the service territories of BPA’s public utility and electric cooperative customers.



NW Solar Co-op Manager Doug Boleyn hands a check to a solar co-op member.

**MOA Charges: BEF Staff Support (contracts, policies, etc) \$1,748**

“Our Wind Co-op” – Our Wind Coop is a project of NW SEED. During BPA FY 2005, BEF provided zero-interest loans of \$6,000 per turbine to the co-op for 9 of its first 10, 10-kW turbine installations. The loans provide crucial up-front capital to help cover equipment costs. Those loan payments are recovered over time and are *not* charged against this agreement. However, during this reporting period, BEF also provided staff support including defining rules under which the co-op operates to ensure product credibility, assisting with contract language, and assisting the co-op in finding a buyer for the co-op’s Green Tags. We also 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). The co-op serves an important function in the region as a clearinghouse for information and expertise regarding small wind energy systems. The entire region benefits from this capability.

Six turbines were installed prior to the period covered in this report, one was installed during the 12 months covered in this report, and two were installed between the end of the reporting period and the writing of this report. (See installation dates in the table, below.) Three of the nine co-op installations are in BPA’s public power customer’s service territories, and all of the installations are inside BPA’s control area. One way in which BEF supported the small turbines installed in public power service territory was to negotiate an arrangement with Puget Sound Energy under which BEF will deliver Oregon and Washington-based Green Tags from the wind co-op to the utility as a way to provide additional support to the co-op. BEF’s expenses under the MOA are for BEF staff time 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.

<b>Turbine Number</b>	<b>Installation Date</b>	<b>Size</b>	<b>Location</b>	<b>Interconnecting Utility</b>
1	May 23, 2003	10 kW	Peshastin, WA	Chelan County PUD
2	Sep. 29, 2003	10 kW	Stanford, MT	NorthWestern Energy
3 BPA public power customer	Oct. 9, 2003	10 kW	Glacier, MT	Glacier Electric
4 BPA public power customer	Nov. 3, 2003	10 kW	Goldendale, WA	Klickitat PUD
5	Dec. 16, 2003	10 kW	Chester, MT	Northwestern Energy
6 BPA public power customer	Sep. 2, 2004	10 kW	Goldendale, WA	Klickitat PUD
7	June 1, 2005	10 kW	Belt, MT	Sun River Elec. Cooperative
8	March 9, 2006	10 kW	Kittitas, WA	Puget Sound Energy
9	March 30, 2006	10 kW	Wolf Creek, MT	Northwestern Energy



Don and Beverly Grim receive a check from BEF as an up-front payment for their Green Tags.<sup>1</sup>



- Washington**
- 1) [Peshastin](#)
  - 4) [Goldendale](#)
  - 6) [Goldendale](#)
  - 8) [Kittitas](#)
  - 10) White Salmon (under development)



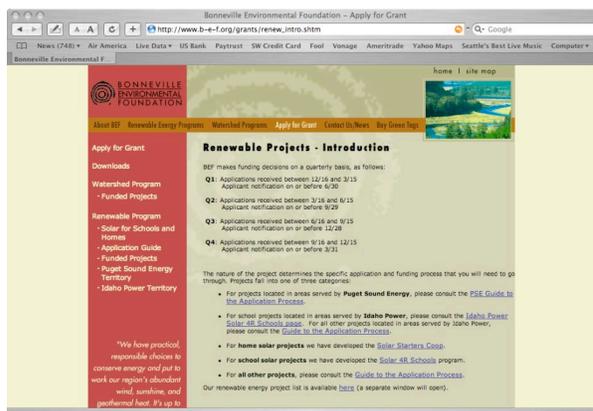
- Montana**
- 2) [Stanford](#)
  - 3) [Browning](#)
  - 5) [Chester](#)
  - 7) [Belt](#)
  - 9) [Wolf Creek](#)

Installation sites for the first 9 “Our Wind Co-op” small wind turbines.

**MOA Charges: BEF Staff Support (contracts, policies for NW SEED, etc) - \$ 1,654**

Letters of Enquiry (LOE) – Since 2000, BEF has offered an open solicitation process, allowing Northwest organizations to apply for support for renewable energy projects. This open process is a relatively minor part of our renewable energy program. We find the majority of our projects through a direct negotiation process with partners.

However, some very good projects do come to our attention through this process. For instance, during BPA FY 2005 a LOE from Eugene Water and Electric Board resulted in BEF’s first solar school project. BEF also uses the LOE process to standardize information on the projects we advance through negotiation. For instance, when BEF negotiates solar school projects with our partners, and host schools are identified, we then ask the schools to use the LOE process to submit information we need to evaluate the projects.



During BPA FY 2005 BEF reviewed 41 LOEs that were submitted through our web site. Twenty-seven of those were under the open solicitation process and 14 were under new processes developed specifically for our partners who utilize our Project Management service. Ten of the open solicitations (thirty-seven percent) are from the service territories of BPA’s public power customers. Five of those did not meet BEF criteria,

<sup>1</sup> No Green Tag funds are charged against this agreement.

and five of them are under discussion with the proposer. BEF's criteria can be found here: <http://www.b-e-f.org/grants/guide.shtm>

(As part of BEF's new Project Management Services 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 these calculations.)

**MOA Charges: time and expenses associated with reviewing LOE's from within the service territories of BPA public power customers - \$607**

Project Management Services Program – The prior BPA Progress Report summarized BEF accomplishments for the twelve months ending October 2004, and also alluded to various upcoming Project Management Services program activities. We are pleased to report that, in most respects, our accomplishments in this current reporting period reflect the activity predicted in the prior update. In particular, in 2004 we hoped to:

**1. Work with Clark Public Utilities to install 3-5 solar demonstration projects.**

Information on this activity can be found in the Appendix.

**2. Support a large community solar project with the City of Ellensburg.**

**Status:** In an attempt to provide the people of Ellensburg with the opportunity to invest in locally produced renewable electricity, the City of Ellensburg proposes to construct and manage a novel, replicable, community-based, solar electric project. The City will install and maintain a 24 kW system by December 31, 2006, but intends to expand the system until it reaches 165 kW. The system will be sited in a highly visible location along Interstate 90, on the southwest edge of the West Ellensburg Park. With this project, the City seeks to overcome multiple barriers to widespread adoption of solar-electric technology. The specific barriers addressed by this project include high capital cost, aesthetic concerns, lack of knowledgeable installers, shading issues, and a general lack of awareness of renewable technology. In BPA FY 2006 BEF plans to provide assistance to the City of Ellensburg in a number of ways:

- Project Design- BEF will work with Ellensburg to devise a replicable project that meets BPA funding guidelines.
- Finance- BEF will use BPA MOA dollars to make an upfront donation of 12 kW of solar panels to the project. Ellensburg will solicit from investors, pre-purchases of an additional 12 kW of panels, bringing the initial system size to 24 kW. Ellensburg will pool the funds from any subsequent investors to expand the system in 12 kW increments. The system will be expanded in this manner until it reaches 165 kW.
- Procurement- BEF will manage all equipment and installation invoice payments, using Ellensburg's FY 2006 C&RD dollars and/or FY 2007 CRC dollars. In addition to donating 12 kW of solar panels, BEF will supply, at its

reduced bulk-purchase cost, the second 12 kW of solar panels that will be funded with investor pre-purchase dollars.

**MOA Charges: BEF staff time (contracts, research) - \$ 1,837**

**3. Fund and support a solar project on Midstate Electric Cooperative's new LEED certified administrative building.**

**Status:** Midstate Electric Coop's new administration building was completed in September of 2005, with funding and procurement assistance from BEF. The building is the first LEED<sup>®</sup> certified project in Central Oregon.



**MOA Charges: BEF staff time (contracts, research, procurement)- \$ 924**  
**Solar Equipment - \$10,206**  
**Project Total - \$11,130**

## **Current Renewable Research, Development And Demonstration Activities**

Building-Integrated Solar – BEF continued its efforts to promote building integrated solar in the region. We continued to work with a builder who is preparing standardized building-integrated designs for awning systems, bus stops, and carports. We hope to collaborate with this builder on a building-integrated carport project in the near future. Such a design would then be available to us for use in future projects.

**MOA Charges: BEF staff time and expenses - \$1,619**

### Biomass

Project Enquiries - Although BEF has found few developers able to develop cost-effective biomass projects over the last six years, in BPA FY 2005 we continued to field enquiries from hopeful developers of projects that would rely upon animal waste, lumber mill waste, agricultural processing waste, forest slash and other biomass fuels. (We are not encouraging interest from liquid biofuels, since their electrical generation potential is low). Since 2003, we have had ongoing project discussions with Warm Springs Forest Products and the Colville Tribal Economic Development Office, from which project collaboration may result.

Forest Wood Waste Gasification - In the spring/summer of 2004, BEF initiated a staff study of the application of biomass gasification technology to the forest fuel-loading problem. The accumulation of such fuel has been identified as a major contributor to the intense forest fires suffered in the Pacific Northwest over the preceding five to ten years. We consulted with BPA and NREL staff and with regional and Central Oregon authorities on fuel and technologies.

In February 2005, BEF contracted with Mater Engineering, Corvallis, Oregon, and TR Miles Associates, Portland, Oregon, to undertake a reconnaissance study of the feasibility of a forest fuel waste-fired biomass-to-electricity project in the 0.5 MW to 5.0 MW range. BEF budgeted approximately \$30,000 from BPA MOA revenues to support this project, but was able subsequently (June, 2005 contract date) to persuade the Oregon Department of Energy (ODOE) to cost-share the project up to \$13,000.

Preliminary findings of the study were reported informally to BEF in the summer of 2005. Mater Engineering was able to confirm substantial available forest waste biomass in the study area (80 mile radius around Bend, OR): over 250 million board feet (mmbf). Most of this material would be in the 4" to 9" diameter range, which would include some marketable (7" to 9") timber to the few mills capable of utilizing it. Proportions varied by type of tree (e.g., Doug Fir, Ponderosa Pine, etc.), but generally split about 50/50 between <7" and greater.

The report is available from BEF upon request.

Direct BEF contacts with the US Forest Service and the Bureau of Land Management in Central Oregon confirmed the interest of these agencies in finding market-based solutions to their removal tasks.

Preliminary technology findings were less encouraging. Initially BEF had stipulated a preference for gasification technology with a carbon/char by product and for unit sizes that allowed semi-mobility and periodic (annual or biennial) facility relocation. Only a very few machines meeting our technology and size criteria could be identified, and none with any commercial running time to confirm the reliability of the equipment. Mater and Miles were asked to revisit the technology search with wider criteria. The outcome of that review was pending as of September 30, 2005.

BEF undertook a concurrent review of the potential for interconnection of the generating unit with a utility Transmission and Distribution system, contracting in August 2005 for the services of Karl Friesen and Associates. Three possible utility hosts were identified: Pacific Power, Central Electric Cooperative, and Mid-State Electric Cooperative. The alternatives of wheeling to either Portland General Electric or BPA were also considered. Results were pending as of September 30, 2005.

BEF spent significant staff time on these biomass-related activities. However, we have concluded that during this reporting period, documentation of biomass-related time and expenses is insufficiently precise, and no funds from this agreement are allocated to these expenses during this reporting period. BEF's costs associated with the professional services contracts are allocated.

**MOA Charges: Forest Fuel Waste Recovery, Biomass Reconnaissance Study -  
\$8,768**

## Current Renewable Education Program Activities

### Solar Schools Program

**Process Development** - During the year, BEF continued to improve our ability to deliver Solar 4R School and other direct application projects in a meaningful and efficient manner. Significant improvements were made to our project identification and evaluation methods, and to the site survey and contracting processes. We also appreciably enhanced the content and presentation of the Solar 4R Schools curriculum materials. Other improvements during BPA FY 2005 include:

- a. **Standardized Site Survey Process** - In order to streamline the project management process, BEF created a standardized site survey this year. This survey includes a detailed project description, digital mock-ups of the project, technical system diagrams, a sun chart, and a data monitoring site survey. This comprehensive survey gives all parties a thorough understanding of the project's scope and compresses the project's installation time. Because bidding contractors do not need to go on-site before submitting a quote, BEF can easily request bids from multiple installers. This new bidding process has significantly reduced project installation costs.
- b. **Contracting Efficiency** - In order to delineate project responsibilities more clearly, BEF augmented the standard language in both the host and installer contracts. Using the newly created standard site survey, we also began to install multiple projects under the terms of a single installation contract. This ability to award multiple projects to a single contractor substantially reduced the cost, time, and effort associated with project installation.
- c. **Solar 4R Schools Curriculum Development** - A detailed summary of this year's curriculum development work can be found below in the Current Renewable Education Program Activities section.
- d. **Design Enhancements to Renewable Projects Database** - BEF made multiple improvements to the Renewable Projects Database during the past year in order to track the large (and increasing) number of Solar 4R Schools and other direct application projects with maximum efficiency. By developing better reporting functionality in the database, we were able to move applicants through the process more quickly and respond to their questions and concerns in a more timely manner.

**Solar Schools Curriculum Development** - Building on the prior year's curriculum development, BEF modified and improved the educational content of the S4RS package. Specifically, in BPA FY 2005 we:

- Reviewed the Fat Spaniel Technologies data acquisition system in order to determine the best way to integrate the available data into the BEF curricula.
- Modified the curriculum package as needed for consistency with Fat Spaniel's data acquisition system.

- Considered how curriculum could be integrated into various classroom formats, depending on time allotted to the subject by each school (e.g., a single class, one term unit, project basis).
- Modified the existing BEF high school curriculum packages so that middle school students may also use the data from their photovoltaic systems in classroom settings.
- Developed more basic solar education presentations (lesson plans and curriculum) that serve as introductory material for middle and high school students and teachers, and enable them to understand their photovoltaic system data.
- Designed PowerPoint presentations that explain the various curriculum materials to teachers, and that also demonstrate effective ways of integrating these materials in classroom settings.

**MOA Charges: BEF staff and consulting time enhancing processes related to distributed generation and the Solar Schools Program<sup>2</sup> - \$26,188**

Regional Puget Sound Green Power Awareness Campaign – BEF had hoped to duplicate the collaborative effort between BEF, Puget Sound Energy, Snohomish Public Utilities and Tacoma Power, which took place in 2004. That campaign was designed to raise awareness of the availability of renewable energy in the region. The Emmy Award-winning campaign also received the National Beacon Award from the Environmental Protection Agency and the Center for Resource Solutions (Green-e). Unfortunately, the group was unable to reach consensus on a campaign this year. However, the meetings the group undertook helped clarify the needs of utility participants, which should help reduce costs in future years.

**MOA Charges: BEF staff time and expenses for Utility Green Power Awareness Campaign - \$1,202**

Campus Greening Campaign - BEF has partnered with Northwest SEED to support an education and information campaign on college and university campuses to demonstrate better environmental principles and stewardship by being more attentive to environmentally-preferred energy efficiency and renewable energy. With BEF's financial support, Northwest SEED has:

1. Created a database of campuses in the Northwest;
2. Began building a website called NW Green Campus (<http://www.nwgreencampus.org/renewable-energy>) that provides colleges with much needed information on how they can use renewable energy on campus.
3. Evaluated and selected the campuses that are the most highly motivated and best able to take action to explore on-site energy efficiency and renewable energy options; and

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<sup>2</sup> As part of BEF's new Project Management Services program line, BEF performs services under contract with some specific utilities, utilizing funds from those utilities. BEF staff time and expenses associated with those projects are paid under those contracts and are not included in these calculations.

4. Built relationships with student groups and administrators with the goal of moving them to demonstrate their commitment to environmentally-preferred energy through the purchase of a green power product through their utility or another vendor, investment in an on-site renewable demonstration project, or any combination of these options. Subsequent to this activity, the University of Washington chose to purchase green power from Seattle City Light.

BEF paid half of the expenses associated with this activity. The other half is charged against the MOA.

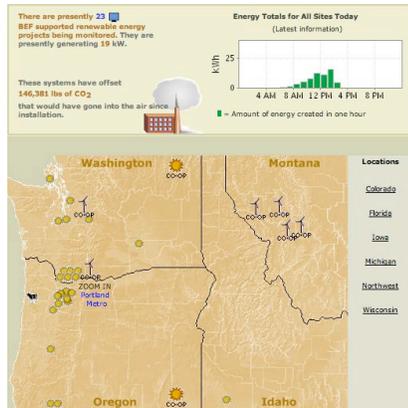
**MOA Charges: Support for Campus Greening Campaign - \$7,500**

Last Mile Electric Cooperative – BEF joined LMEC shortly after it was organized in 2002. While most of LMEC's *visibility* is associated with its utility wind project development at White Creek, the group's *activities* have always been far more diverse, and have always been focused on educating public utility organizations and members about renewable energy opportunities. LMEC initiatives have included supporting the NW SEED small wind turbine program, identifying Animal Waste to Energy (AWE) opportunities in member territories and reviewing AWE technologies for suitability to these opportunities, and participating in renewable energy environmental forums. LMEC is currently collaborating with Northwest SEED and the Northwest Cooperative Development Center to develop a web-based "access-to-tools" education initiative targeted to Northwest publicly-owned utilities that will offer information and links on renewable technologies particularly suited to smaller, often rural, publicly-owned utilities.

In BPA FY 2005, BEF continued both its White Creek Wind and Last Mile activities. BEF activities related to the LMEC wind project are *not* included in this report and expenses associated with that work are not charged against this agreement. BEF served as LMEC Program Committee Chair. In this role, BEF worked with other LMEC members to develop non-White Creek program goals and objectives, including addressing the seminal question of how small to mid-sized public utilities can participate in utility-scale wind projects, given the disconnect between the large demands of such projects and the limited financing capability, credit standing, and ability to take power to load, of such utilities. This work is essential to determining how LMEC members take advantage of other project opportunities like White Creek, or smaller but still financially demanding renewable generating projects (e.g., the BEF biomass enquiry). The practical ability of small utilities to participate in projects will materially affect the future of LMEC, which was organized specifically to provide such access.

BEF spent significant time on LMEC-related activities. However, we have concluded that during this reporting period, documentation of LMEC-related time and expenses is insufficiently precise, and no funds from this agreement are allocated to these expenses during this reporting period.

Internet-Based Monitoring for Small Renewable Projects – In December of 2004 BEF negotiated a contract with Fat Spaniel Technologies, a company that provides web-based monitoring of small, renewable energy technologies. As a result, the live data from all new BEF projects can be found on our newly created web-based project map. We have provided similar interactive project maps to our utility partners so they can share project information with their customers. This method of visualizing energy production allows regional utilities to showcase renewable energy investments, and to identify and repair impaired systems more quickly.

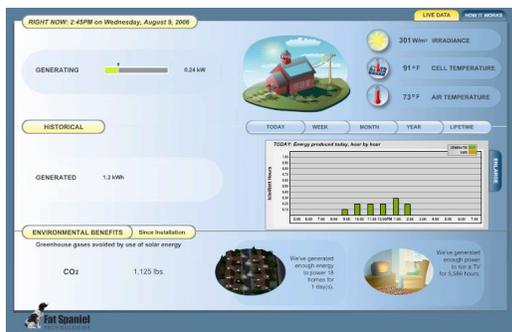


BEF's "distributed, renewable power plant"



Live data from Midstate Electric Coop's Solar Project

Additionally, during this period, BEF commissioned Fat Spaniel to design customized flash views that display live data and system information on educational kiosks.



"Live Data" Kiosk View



"How It Works" Kiosk View

For a demonstration of this technology, visit this link:  
<http://www.b-e-f.org/renewables/index.shtm>

**MOA Charges: BEF staff time and expenses - \$9,369**

Educational Assistance to Public Utilities and Regional Stakeholders - BEF is viewed as a regional leader in information dissemination regarding the environmental benefits of renewable energy. Many regional utilities utilize the research that BEF undertook with the Northwest Power and Conservation Council regarding the

specific environmental benefits of renewable energy in the Northwest. We continue to engage in discussions with the region's utilities and other stakeholders to help them better understand and inform their customers about the complex issues associated with renewable energy. Those impacts vary widely by pollutant and region, and there is a great deal of misunderstanding regarding the environmental benefits renewable energy projects produce.

BEF has actively engaged with regional stakeholders to develop materials and disseminate information that assists those entities. For instance: BEF works with the Renewable Northwest Project on regional renewable energy awareness campaigns; BEF works with public power customers at regular regional meeting; and BEF works with the Last Mile Electric Coop on educational activities focused on those public utilities.<sup>3</sup>

**MOA Charges: Materials development and information dissemination that assists public utilities and regional stakeholders; staff time in preparing for and participating in educational activities (e.g, technical and educational conferences) - \$8,984**

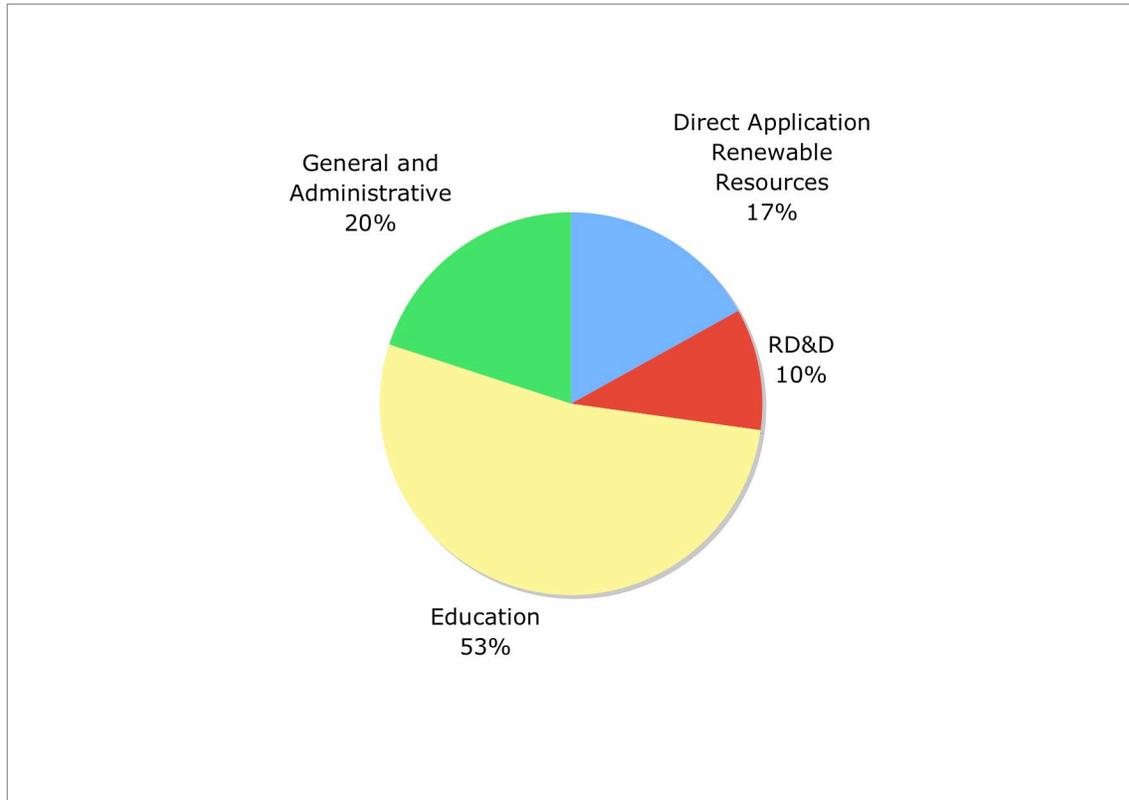
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<sup>3</sup> No activities related to the LMEC White Creek wind project are included in this report.

## Itemized Expenditures

<b>Direct Application Renewable Resources</b>	
The Northwest Solar Co-op (BEF Staff Support – contracts, policies, etc)	\$1,748
“Our Wind Co-op” (BEF Staff Support – contracts, policies for NW SEED, etc)	\$1,654
Grant Application Review (BEF staff time and expenses associated with reviewing LOE’s from within the service territories of BPA public power customers)	\$607
Ellensburg Solar Project (BEF staff time)	\$1,837
Midstate Solar Project (BEF staff time and solar equipment)	\$11,130
<b>Sub-Total (DG)</b>	<b>\$16,976</b>
<b>RD&amp;D</b>	
Building Integrated Solar (BEF staff time and expenses)	\$1,619
Biomass (Reconnaissance Study)	\$8,768
<b>Sub-Total (RD&amp;D)</b>	<b>\$10,387</b>
<b>Education</b>	
BEF staff and consulting time enhancing processes related to distributed generation and the Solar Schools Program	\$26,188
Puget Sound Regional Awareness Campaign (BEF staff time and expenses)	\$1,202
Campus Greening Campaign (contract with NW SEED)	\$7,500
Last Mile Electric Coop (BEF staff time and expenses)	\$0
Internet-Based Monitoring for Small Renewable Projects (BEF staff time and expenses)	\$9,369
Educational Assistance for our Public Utility Customers (Materials development and information dissemination that assists public utilities and regional NGOs)	\$8,984
<b>Sub-Total (Education)</b>	<b>\$53,243</b>
<b>Total Program Expenses</b>	<b>\$80,606</b>
<b>General and Administrative (20% of total expenditures)</b>	<b>\$20,300</b>
<b>Total Itemized Expenditures</b>	<b>\$100,906</b>
Current Period Budget	\$86,000.00
Dollars available from prior budget (rolled forward)	\$9,197.60
Total Available Dollars	\$95,197.60
Total Itemized Expenditures	\$100,906
Total Dollars Allocated from Next Period (if available)	\$5,708.40

## Expenditures by Category



## Anticipated Activities

### Anticipated Direct Application Renewable Resource Activities

This section covers anticipated direct application renewable resources by end-use customers served by BPA's public utility and electric cooperative customers.

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.

“Our Wind Co-op” – We anticipate continuing our support of the small wind co-op.

#### Bulk PV Module Orders

In July of 2004, the Project Management Services business line procured 30 kW of PV modules for our small-scale demonstration projects. We did so for three reasons:

1. Module Scarcity-With the bulk of global production allocated to Germany and Japan, lead-time on individual module orders for U.S. projects was uncertain, at best. Panel shipment delays did not fit well with the Project Management services project schedule.
2. Cost Savings- By ordering in larger quantities, we hoped to lower our module costs by approximately 5-10%.
3. Time Savings- Because managing a small project is nearly as time-intensive as managing a large project, Project Management Services needed to streamline and automate the project process as much as possible. By ordering modules in bulk, we hoped to eliminate a very cumbersome step in the project process.

Our initial experience with the bulk order emphasized the value of such a purchase. We procured modules at a modest discount to the spot market. More importantly, our bulk purchase streamlined the project management process. Our utility partners (Clark PUD and Ellensburg, in particular) now view our access to modules as a key asset. Because the market for modules will likely become tighter in the next year or two, a second bulk purchase could be even more valuable to us. We intend to make a second bulk purchase during the next reporting period. I love this!

#### Bulk Data Monitoring Orders

BEF plans to negotiate another bulk data monitoring order with Fat Spaniel Technologies, as our first bulk purchase of such equipment provided significant cost and time savings.

#### PV Demonstration Projects

We anticipate installing several solar projects during the next reporting period. We hope to work with:

- Clark Public Utilities to install 3-5 additional solar projects.

- Snohomish PUD under a new multi-year contract that allows for reinvestment in their service territory.
- The City of Ellensburg to install their community solar project.
- The City of Ashland to provide data monitoring equipment and service for their existing PV projects.
- Various smaller public utilities in an attempt to expand the Solar 4R Schools program.

Development of Internal Capabilities to Install DG - We anticipate continuing to improve our ability to manage projects for our partners.

Assisting Regional Utilities with DG-Related Activities - We anticipate extending our relationship with Clark Public Utilities. We also anticipate offering this program (including the Solar 4R Schools program) more widely to BEF's public utility customers in hopes of signing contracts with those who are interested.

Solar Schools Installations – We anticipate completing at least ten new solar schools installations during the next reporting period. Additionally, we plan to install interactive kiosks at a large portion of these schools in order to improve the projects' educational impact.

Letters of Enquiry – We anticipate continuing to review numerous requests for funding under the open solicitation process on our web site.

## **Anticipated Renewable Research, Development And Demonstration Activities**

Building-Integrated Solar –We anticipate hiring an intern to review the building-integrated solar market in order to determine how BEF can most effectively promote the technology. We also plan to install our building-integrated “awning-style” PV array, when appropriate, on our Solar 4R Schools projects. We hope to collaborate with EWEB to install a local, highly visible building integrated solar project. We have ongoing discussions with the City of Ashland on expansion opportunities for that municipal utility’s distributed solar system. Finally, we hope to work with Cowlitz PUD to design a building-integrated demonstration project on the Fine Arts Center in Longview.

Biomass - Forest Wood Waste Gasification Reconnaissance Study – In 2005-2006, BEF and its contractors will complete the reconnaissance study, and determine whether to proceed to a demonstration project. Initial results indicate the presence of substantial fuel supplies, although access to the fuel is difficult (since it is distributed across the forest floor in a very large area with often difficult topography). Access to conversion technology appears more problematic within the specifications established by BEF and the study team. These specifications were being broadened as this reporting period closed.

BEF will also complete its feasibility review of interconnection with, and delivery of power to, utilities with T&D systems in the Central Oregon study area.

Biomass - Project and Technology Review - BEF will continue to support biomass activities in the Northwest through Tag purchases and sales, co-funding feasibility and demonstration projects with public utility partners among others, and seeking technology applications that have the potential to be cost-effective without extraordinary public subsidies. BEF will be partial in particular to approaches that contribute to multiple public goods: clean renewable energy, watershed and other environmental byproduct gains, and local economic development and job creation. BEF collaborates with other parties – from utility, environmental and industry groups to tribes and local governments – in both project development and education efforts. Thus, BEF continues to purchase Green Tags from (and to financially support) the Port of Tillamook Animal-Waste-to-Energy facility, in cooperation with Tillamook PUD, and to remarket these Tags to public power utilities in the Pacific Northwest. BEF participates as a member of the Renewable Advisory Council to the Energy Trust of Oregon (along with Northwest Power Council and BPA staff) in seeking biomass technologies and development opportunities that will also benefit BPA’s public power customers.

## **Anticipated Renewable Energy Education Program Activities**

Support for Utility GP Programs – We intend to engage with our utility partners in efforts to:

1. Raise the general awareness of GP and its benefits.
2. Create calls to action to buy public utility green power products.
3. Develop marketing/support materials for public utility use.

Development of The Solar Schools Program - We plan to continue to develop and implement our solar schools program, enhanced by the web-based system monitoring. The new Internet site will be located at <http://www.solar4rschools.org/>.

Internet-Based Monitoring for Small Renewable Projects – In the coming year, BEF plans to retrofit at least six older Solar 4R Schools projects so these students can access the production data online. We also anticipate rolling out an online learning center, tentatively titled “Solar Classroom”. This web portal will be designed exclusively for students and teachers participating in the Solar 4R School program. It will allow students to download data from their PV system, to compare this data with that of the other Solar 4R Schools projects, and to integrate the data with BEF’s renewable energy curriculum package. We also plan to upgrade this web portal in the coming years with additional functionality (perhaps by including interactive curriculum units, discussion forums, carbon calculators, etcetera).

Education on Environmental Benefits, Attributes of Renewable Energy - We anticipate continuing our efforts to:

1. Develop materials and disseminate information that assists public utilities and regional NGOs in better understanding the environmental benefits of renewable energy generation.
2. Participate in educational activities (e.g. technical and educational conferences).

Biomass - BEF is a member of the Last Mile Electric Cooperative (LMEC) and chairs its Program Committee. That committee is negotiating with NW SEED to create access to renewable technology products, services and development tools for Northwest public utilities. LMEC, NWSEED and the Northwest Cooperative Development Center (NWCDC) will offer web site access to regionally- and nationally-available tools (tax credits, co-investment partners, siting and permitting guidance, technology selection guidance and assistance; finance structures for community energy projects), as well as access to project developers and contractors able to provide services to communities and small public utilities without such capabilities in-house.

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

### Solar Projects with Clark Public Utilities

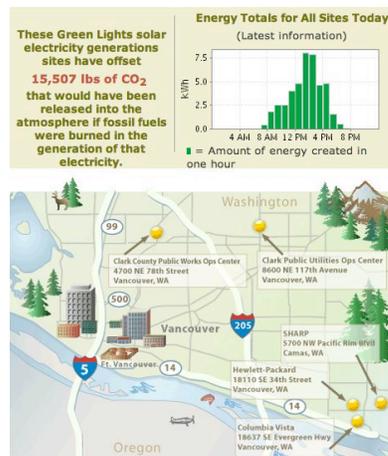
**Status:** During BPA FY 2005, BEF managed the installation of three solar demonstration projects in Clark Public Utilities service territory, each designed to demonstrate the viability of renewable resources in urban areas of the Pacific Northwest. BEF dedicated solar projects at Columbia Vista, the Clark County Public Works facility, and the Clark Public Utilities Operations Center in January, February, and May of 2005, respectively. The tags generated by each facility will be sold to local public utility customers. These revenues will, in turn, directly support future local demonstration projects.

<p>2.1 kW PV system at Clark County Public Works Center</p>	<p>“Sunflower” design at the Clark PUD Operations Center</p>

In addition to serving as visible examples of local renewable energy production, these three projects also allow for online education.

BEF also installed data monitoring systems at each site in order to monitor and display the real-time production information on the web. By visiting Clark’s “regional view” online, customers can monitor the past and present performance of each system, and can view the cumulative production from the “distributed, virtual power plant”. To view the map visit:

<http://www.clarkpublicutilities.com/Community/greenLights/map>



No MOA funds were utilized for this effort as all funds were generated by Clark PUD's Green Lights program. The summary of the activity is included here as a demonstration of how the Project Management Services work which BEF is developing (described elsewhere in this report) benefits public power customers.

Solar demonstration project with Oregon State University.

**Status:** BEF worked with OSU to plan a solar demonstration project and interactive kiosk at the Hatfield Marine Science Center in Newport, Oregon. We hope to complete the project during the next reporting period.

No MOA funds were utilized for this effort.