2021 GREENPOWER GRANT

2021 EWEB GreenPower Grant Program
Guidelines and Application

Program goal:
To fund projects or programs that help promote a commitment to the environment and the community by increasing awareness and use of renewable energy sources, adoption of emerging technologies, and/or reducing or offsetting our community's carbon footprint.

Eligibility requirements:

EWEB will fund proposals that meet the grant program goal and benefit our customers and community.

Applicants must be one of the following:

- Tax-exempt organization under IRS Code Section 501(c)(3) or (4)
- Academic institution chartered by the State of Oregon
- Public institution referenced in ORS 174.109 through ORS 174/117

Funding is not provided for the following:

- Individuals
- Organizations that are in violation of state or federal laws
- Endowments
- For-profit businesses
- Programs with eligibility requirements contingent upon a stipulated religious or political affiliation.

Applications must be submitted electronically no later than Monday, May 31, 2021 to be eligible.

Evaluation Criteria:

To be considered for funding, the project or program must have a renewable energy or carbon reduction focus and benefit EWEB customers and/or the broader community.

Projects or programs could include, but are not limited to, any of the following:

- Installation of renewable energy systems including solar hot water heating, photovoltaic arrays or wind electric systems.
- Installation of battery storage systems to promote emergency preparedness and resiliency.
- Renewable energy research and feasibility studies that develop and strengthen an understanding of the origin, development and use of renewable energy sources.
- Projects or programs that support renewable energy education including curriculum development, workshops, career academies, etc.
- Efforts focused on reducing or offsetting carbon emissions including projects that support conversion from fossil fuel to clean energy sources.

When evaluating proposals we will also take the following into consideration:

- The grant application clearly describes how the grant funds will be used and what available matching funds or support will be made available. Preference will be given to projects that have secured additional funding sources in advance of the application deadline.
- Projects or programs that support underserved populations are highly encouraged. This includes but is not limited to senior, disabled and limited-income customers, as well as individuals or families without secure housing.
- Grant applications that involve the installation of renewable energy systems and battery storage must include the system requirements.

Application process:

Step 1: Be sure your project or program meets the eligibility requirements. If you have questions, please email Cheryl.Froehlich@eweb.org.

Step 2: Complete the grant application and provide all information requested using a maximum of ten pages not including attachments. The grant application and accompanying proposal are the primary documents the EWEB Greenpower Grant Evaluation Team will use to screen grant applications.

Step 3: Applicants will be informed of eligibility and selection results. If there are fewer than five eligible applications the Grant Team will select the winning proposals. If there are at least five eligible applications, current EWEB Greenpower customers will be invited to vote to determine the grant winners.

Please note: Applications may be made public during a voting process. Please specify if there is information you would like excluded prior to your application being made public.

Additional details:

Grant fund distribution will be divided into three parts and will be contingent on process in achieving stated outcomes/milestones:

1. Project kick-off

2. Mid-term report or milestone

3. Final evaluation or inspection

Projects should be completed within 18 months of first funding of the grant distribution. EWEB will consider multi-year funding requests but reserves the right to review a grantee's progress on an annual or more frequent basis to determine whether subsequent grant is appropriate.

Please note: Acceptance of EWEB Greenpower Grant funding may impact eligibility for other EWEB incentives or programs.

2021 EWEB GREENPOWER GRANT APPLICATION

Contact Information:

University of Oregon
NAME OF ORGANIZATION

Patricia K Carey, CRA, CPRA
CONTACT NAME

Sponsored Projects Administrator
CONTACT TITLE

c/o Sponsored Projects Services

5219 University of Oregon
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E-MAIL

https://research.uoregon.edu/
WEBSITE

Green Power Proposal
PROPOSAL TITLE

$28,610
GRANT AMOUNT REQUESTED

_____ May 25, 2021

SIGNATURE DATE

Email completed application and proposal to:
Cheryl Froehlich
Cheryl.Froehlich@eweb.org

Application deadline:
Must be submitted **no later than**
MONDAY, MAY 31, 2021

Questions?
Contact Cheryl Froehlich
cheryl.froehlich@eweb.org
541-685-7676

Proposal: Please write a proposal containing the following elements. Submit the proposal as a PDF with your application.

1. Background*:*

- Mission of the organization
- The needs your organization addresses
- The population your organization serves
- A brief description of your current programs and operating budget

2. Project Description

- Statement of the primary purpose of the project and its relationship to EWEB's mission
- The population you plan to serve and how they will benefit from the project
- Strategies you will employ to implement the project

3. Project Evaluation

- Your criteria for a successful project
- The results you hope to achieve by the end of the funding period
- The method by which you will measure effectiveness

4. Budget and Timeline

- A budget for the project for which funds are requested, **including any additional funding which has been secured at the time of application.**
- Timeline of the project

5. Attachments

- Proof of nonprofit status (copy of IRS letter)*
- List of board of directors*
- One-paragraph resumes of key staff working on the project
- Amount and source of any other funding support previously received from EWEB (if applicable)
- Proof of ownership or authority to install equipment at or otherwise modify building, if request for facility construction project

*Optional or not needed for public and academic institutions.

2021 Green Power Proposal Attachments:

Personnel

Frank Vignola:

Frank Vignola has more than forty years of experience in solar resource assessment field and has participated in over 100 papers on the subject. He is a past president of Oregon Solar Energy Industries Association and helped pass legislation on Oregon's net metering legislation and laws in Oregon facilitates the deployment of solar system in Oregon. His director of the University of Oregon Solar Radiation Monitoring Laboratory that studies the solar resource in Oregon and the Pacific Northwest, a lead author on a text/reference book on solar radiation monitoring, and participated in several international studies on solar resource assessment. In 2020, he received the Charles Greeley Abbot award from the American Solar Energy Society for his contribution to solar energy.

Frank has worked with state, regions, and nation organizations promoting solar energy, has a photovoltaic system on his roof and drives an electric vehicle. Since the mid 70's, he has been pushing for the deployment of renewable energy systems and is encourage by the trends towards a sustainable renewable energy future. More information about him can be found at http://solardat.uoregon.edu/FV.html.

Josh Peterson:

Josh Peterson's research interests are focused on sustainable energy development with practical applications. Josh joined the University of Oregon Solar Radiation Monitoring Lab 2012. In the lab, Josh is involved in all aspects of the lab's performance. A few of the key areas where he has made significant contributions to the lab include:

- Calibrating the many instruments of the various SRML sites.
- Studying the spectrum of incident light through the use of a spectroradiometer and a multi-filter rotating shadowband radiometer.
- Organize and streamline the various data sets the SRML manages.
- Public relations promoting the SRML and University of Oregon.

Josh originally hails from central Wisconsin. Since moving to Oregon in 2012, he loves exploring the beautiful state with his family. Josh is an avid outdoors enthusiast and participates in many of the wonderful outdoor adventures that Oregon has to offer. When he is not measuring the sun from the roof of Pacific hall, Josh is probably walking down a trail in the woods.

Rich Kessler:

Rich Kessler graduated from the University of Southern Maine with a Bachelor's degree in Geology in 1989. Just after college, he worked for a short time with a mining company before landing a position with the US Geological Survey (USGS) Water Resources Division (WRD) in the U. S. Virgin Islands. After 4 years in the Virgin Islands he was transferred to the USGS-WRD office in Raleigh, North Carolina and after that he went to work at the USGS Geologic Division office in Vancouver, Washington. He worked throughout this time with a wide variety of measuring equipment and was a contributor to a number of papers over a 10 year period working for USGS.

In 2000 Rich Kessler came to work for the University of Oregon Solar Radiation Monitoring Lab (UOSRML). He designed and built data stations that were added to the established UOSRML network. He has been responsible for maintaining and upgrading the stations in the network and conducting calibrations of the instruments at the sites. He has also done many years of data analysis. In the past 5 years, Rich has also been working part-time for Solar Assist, Inc. where he is responsible for establishing links between PV systems in the Eugene area to the various manufacturer web portals. He periodically checks and analyzes these data coming in from a number of sites.

Past funding from EWEB:

Past funding for the UO SRML has been significant, running up to about $40,000 per year before it ended.

In 2017, the UO SRML receive $10,000 from a green power project that installed a PV system at Kalapuya High School for educational purposes.

Assessing Photovoltaic System Performance over Time

The University of Oregon Solar Radiation Monitoring Laboratory (SRML) has been measuring the solar resource in the Pacific Northwest starting in 1975. The mission of the SRML is to provide sound, accurate information on the solar resource for decision makers and utilities to appropriately integrate solar electricity into the region's energy mix. Providing solar resource information for solar electric systems is similar to providing stream flow data for hydroelectric facilities.

As more solar electric systems are installed, the value of solar resource information increases. However, high quality solar radiation data are most beneficial in the future. In the meantime, the SRML provides a website (http://solardat.uoregon.edu) with information for those interested in solar energy. For example, photovoltaic (PV) system shade analysis forms for Eugene and other locations are available on our website and are used by those who install or want to install PV systems in Eugene.

When a PV system is installed, one important question is how much electricity will be produced by the system. Those who initially installed systems were pioneers. Today, many people consider it a way to address climate change. However, more and more people want to know how much electricity will be produced and are concerned about financing and the payback of the system over time. The target audience for the performance information is the people or companies that are considering installing a PV system, installers who want to provide accurate information, financers who want to provide loans at proper rates, and utility planners who want to understand how much the distributed solar electricity will contribute to the grid.

The costs and incentives for a PV system are well established. However, it is not easy to get realistic estimates of system performance and how this performance changes with time. The purpose of this study is to get realistic numbers of how PV system performance changes over time so that more realistic system payback information can be obtained. The SRML is proposing to provide performance analysis of selected PV systems in the Eugene area. The project is estimated to cost $~~25~~28,610~~,000~~.

Project Description

The main goal of this project is to provide on the ~~ground~~ measured information on how the performance of PV systems change over time. This is more than just reading an electrical meter because the electricity produced each year is dependent on the number of sunny days and when they occur. Other factors also affect the electricity produced, such as cleaning of the panels and increased shading from growth of trees. Our plan is to study a variety of photovoltaic systems from around the area, model their performance over time and see what factors influence their performance and by how much. General trends can be established and people can obtain a better idea of how their system will perform and how often cleaning the panels is worthwhile.

This information will be gathered and examined for changes in performance of existing PV systems that have production records. One of EWEB's goal is to promote a commitment to a healthy environment and the betterment of the community by increasing awareness and use of solar energy sources. This project will provide better and more complete information on the performance of solar electric ~~facilities~~ system so that the people of Eugene can make sound decisions ~~on the installation of PV system~~on the benefits of solar electric systems.

The project will spend the initial effort to identify PV systems in Eugene that have several years of production information and obtain this information. The system size and orientation will then be gathered. With the solar radiation data gathered by the University of Oregon SRML in Eugene, an estimate of the solar production will be made. Using the same system specs, the performance during the initial year of the installation and the latest year of the installation will be calculated. This information can then be used to evaluate the change in performance over time.

~~Already six~~Below are examples of two types of systems that have ~~installations have~~ been identified as willing to participate in the study. They are:

1. Large a~~Westminster Presbyterian~~rray on Church on ~~,~~ Coburg Road~~Coburg Rd~~
2. ~~Corbin~~ Household system on~~,~~ E 38th Ave

~~2.~~ Of course the information from these and other systems have to be vetted to ensure proper information is available. We also hope to use information on large array such as the one at the EWEB facilities in West Eugene as a bench march in the study.

~~3.~~

Those who cooperate with the project will be asked if or how often they have cleaned their system or if there have been any changes over time that may affect the system performance. ~~Those who~~The ~~participat~~participants~~e~~ in the study will be given ~~the~~ performance data on how the~~about the~~ir system changes ~~performance~~ over time ~~and possibly a~~that, for example, can be used to obtain a recommend~~ed~~ed~~ation on a~~ cleaning schedule for the PV system.~~.~~

The idea is to gather information from a variety of PV systems and users. A dozen systems would give a good idea of PV systems in Eugene perform over time. Participants will initially be solicited from information provided by installers in Eugene. The installers would best know which installations have performance monitoring systems.

The immediate beneficiaries of this study will be those who plan to install solar systems and are looking into the costs and benefits. This information will provide an estimate of the system financial payback based on actual measured data.

Other beneficiaries of the study are the owners of solar electric systems. They will be able to see what causes system performance to decrease over time and give them an opportunity to address these issues. If vegetation is growing taller, the system owner can decide if the additional system performance is worth the cost or benefit of trimming the taller vegetation.

EWEB customers will benefit because EWEB will have a better idea how solar electric system performance decreases over time in their territory. This will help for more accurate estimate of the solar electricity added to the electric grid and aid in EWEB's planning and decision making in regard to distributed solar electric systems. With the improved planning, all EWEB customers will benefit.

Project Evaluation

A successful project would provide analysis of ~~12~~ approximately 12 PV systems in Eugene. From this information generalizations characterizations of solar electric systems in the EWEB service territory can

be made. The first milestone will be the identification of the PV systems that will be used in this study. The goal is to have variety of solar electric systems from small commercial to home systems. Solar electric systems with well documented data are scare. Some systems will like just have monthly average production data and others may have more detailed information. This study is designed to use systems with monthly average production data, but systems with more detail production data could provide more insight into system performance. The initial search will be for systems with more detailed information and then other systems will be added to provide the variety of systems desired.

The second milestone will be the analysis of the systems at different time periods, early performance and data from the most recent time period. If there is a significant change, data from the intervening years will be studied. Studies at the UO SRML showed that a PV panel over 30 years decreased in performance of about 22% and the decrease in performance after the panel was washed was only 4%. This was a panel manufactured around 1980 and the panel was not part of a PV system. However, these changes give an approximate range of changes the study will likely see. From clear a decrease of about 1% per year and from panel degradation about 0.1% per year. Therefore one might expect a solar electric system performance to decrease from 0.5% to 5% over five years. Of course other factors may change these results.

A final report will be sent to EWEB and to the participants in the study. A meeting (virtual if necessary) will be held to discuss the results.

Solar Data

The UO SRML has run a 14 station solar monitoring network in the Pacific Northwest. The Eugene station, has gather high quality solar radiation data since 1977 and has the longest continual high quality solar radiation database in the United States. Data from this database will be used to normalize the system performance data for comparison over time. Detail information about the UO SRML can be found at its website http://solardat.uoregon.edu.

The UO SRML developed solar electric site analysis forms for the Energy Trust of Oregon and EWEB. Apps have replaced these paper site analysis forms, but these forms are occasionally used throughout the state. Current Eugene data and the procedures used to develop these forms will be used in the analysis of system performance.

For many years, the UO SRML solar monitoring network was supported by EWEB, BPA, and other regional utilities plus other entities. With changes at BPA and the electric industry, EWEB dropped its sponsorship of the UO SRML.

~~**Time Budget:**~~**Time Budget for analysis of 12 solar electric sites:** ~~**for 12 sites**~~

Finding 12 suitable sites: **48 hours**, phone calls, emails, follow up emails (4 hours per site)

12 site visits: (8 hours per site) = **96 hours**. Planning for arrangements, initial visit follow up visit. Travel time. Time at the site. Roof. Gathering information on site. Talking with the owners, obtaining system specs

Process data to analyze the performance of the 12 PV sites - 20 hours per site = **240 ~~hours)~~hours)**

Process ~~participants~~participant's data sets and develop PV system performance estimates (4 hours per site) (**48 hours**)

Create summarized results **20 hours**

Follow up discussion with owner on results = (2 hours per site) = **24 hours**

Write report of Findings to EWEB **(8 hours)**

Total: 484 hours

Total budget: $28,610

Time Table:

Project time table	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Completion
Selection of sites					
Site Interviews					
Confirm site selection					
Process system analysis					
Develop PV system performance					
Create summarized results/publicize					
Follow up discussion with participants					

~~Total hours:~~

~~48 + 96 + 240 + 48 + 20 + 24 + 8= 484 hours~~