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Making Sound Renewable Energy Choices

A guide for submitting a renewable energy proposal to:

NorthWestern™ Energy

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contents...

program overview

This publication provides information on how to submit a proposal to NorthWestern Energy for a small-scale renewable electric energy generation project. It is intended to serve as a guide, and some of the material may not be relevant to your project or renewable energy (RE) system.

NorthWestern Energy provides incentive funds for small-scale renewable energy (RE) projects in Montana. To qualify for these funds, the customer must receive electric service from NorthWestern Energy. **NorthWestern Energy Montana electric customers with an average load greater than 1 megawatt (1,000 kW) are not eligible for these renewable energy incentive funds.**

The RE incentive funds are intended to offset a percentage of the cost of a renewable energy system. **Customers interested in receiving RE incentive funds must submit a proposal to NorthWestern Energy prior to purchasing or installing a RE system, or they will not be considered for RE incentive funds.** The proposal may be submitted at any time during the year and the application will be held by NorthWestern Energy until the next funding cycle. RE proposals are typically reviewed and selected for funding twice each year.

Residential electric customers interested in receiving RE incentive funds for a solar PV installation should not submit a RE proposal. Incentive funds for residential solar PV systems are offered through qualified installers. Contact NorthWestern Energy at (888) 700-6878 or e-mail E+programs at www.northwestern.com. Consult www.montanagreenpower.com or www.northwesternenergy.com for a list of qualified installers of solar PV systems that offer incentive funds.

NorthWestern Energy encourages customers to incorporate energy conservation measures into buildings, systems or processes prior to installing a RE system. Simple paybacks with energy savings for energy conservation measures typically range between one and five years. This compares with 10 to 40 years for most RE systems. Refer to NorthWestern Energy's Web site or call (800) 823-5995 for information on energy rebates and incentives for energy conservation measures.

Customers that apply for and receive RE incentive funds from NorthWestern Energy for solar PV or small-scale wind systems are required to use an installer that meets the NorthWestern Energy qualification requirements. Contact NorthWestern Energy at (888) 700-6878 or visit www.northwestern.com or www.montanagreenpower.com for a list of qualified installers of solar PV or small-scale wind systems. ■

getting started

Please read this entire publication before applying for USB funding from NorthWestern Energy. The greater your understanding of renewable energy, the more comfortable you will be living with it and sharing it with others. Although you do not have to be a RE expert, it is important that you have a basic understanding of RE, the installed costs for a system, potential cost savings, and proposal requirements.

The Frequently Asked Questions section is designed to address common customer inquiries. If you still have questions after reading this manual, please email E+programs@northwestern.com.

Qualifications listed in this brochure are specific to NorthWestern Energy's Montana electric distribution customers. To qualify for NorthWestern Energy's Universal System Benefits (USB) Renewable Energy funding, you must be a NorthWestern Energy electric distribution customer and your renewable energy project must benefit NorthWestern Energy electric distribution customers in some way. How your project might benefit other customers will be addressed in future sections. If you are the customer of another electric utility, please contact that utility about programs it may offer to its customers. ■

the value of conservation and efficiency

Prior to providing a summary of the specific renewable energy technologies applicable to Montana, it is important to include an overview of energy conservation and efficiency. Both are directed towards minimizing the amount of loss (and waste) from the point of generation to the end use application. Although the two terms are intertwined and sometimes inter-changed, there is a difference.

Energy efficiency is the ability to provide the same level of energy service using less energy. For example, if a light bulb had an output of 10 watts, 100% efficiency would mean that 10 watts of supplied electricity would power the bulb at its rated wattage. However, in using the example of an incandescent bulb, if it would take 100 watts of power input to provide 10 watts of output (light), the bulb would be considered 10% efficient.

Energy conservation is focused on reducing the use or instances of use for energy services. Conservation is most often achieved through behavior changes or choices. The term, "energy conservation" was popular in the late 1970's and early 80's, and is often identified with turning down thermostats or putting on sweaters. Energy conservation is still an extremely valid control mechanism today – what has changed is the ability to mesh efficiency and conservation through the use of improved technologies.

From a "real world" economic standpoint, end use conservation and efficiency are considered to be of very high value. Professionals estimate that one dollar spent on conservation and efficiency has the same value as three to five dollars spent on production.

NorthWestern Energy offers a wide variety of efficiency and conservation programs and services for residential and business customers. These can be accessed at northwesternenergy.com. In addition, the Database of State Incentives for Renewables and Efficiency (DSIRE) has a list of government incentives and tax credits. It can be accessed at DsireUSA.org.

NorthWestern Energy's conservation and efficiency programs include; product resources, workshops, audit information, energy calculators, and tours. In addition, there are a variety of rebates and incentives available for residential and business applications. Inquiring and learning about efficiency and conservation is encouraged for all customers debating a renewable energy installation.

Remember, one of the most important focuses of the renewable energy movement is sustainability – the premise that the earth and its resources can be maintained and be expected to benefit future generations. In a sustainable frame of reference, conservation and efficiency are significant factors because the end use value of powering a home with less energy means a significantly lower percentage of source energy had to be utilized – regardless of how it may have been produced. ■

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renewable energy and USB basics

Renewable Energy Introduction

The energy industry is rapidly changing. Costs are fluctuating, and environmental considerations are playing a greater role in our energy consumption habits. This publication is designed to guide consumers, step-by-step, through the process of integrating clean Renewable Energy (RE) into their (your) home or business. Financial assistance may be available from Universal Systems Benefits (USB) funds.

A variety of Montana residences, schools, businesses and municipalities already have taken advantage of the savings provided by USB programs. Some examples of Montana projects funded to date include:

- **Remote solar electric stock watering pumps for livestock.**
- **More than 400 solar PV electric grid-tied systems on residences throughout NorthWestern Energy's Montana electric service area.**
- **A Stirling Engine co-generation project at the Helena wastewater treatment facility that generates electric energy using methane gas recovered from the anaerobic digestor.**
- **Solar electric grid-tied systems in public schools and fire stations throughout NorthWestern Energy's electric service territory in Montana.**
- **Solar PV and small-scale wind systems on non-profit facilities and commercial buildings in NorthWestern Energy's Montana electric service area.**
- **Renewable energy training and hands-on installations for vocational students. Included in this is both technical and safety training.**
- **Primary support of the Montana Renewable Energy Association/OSHA Partnership promoting the quality and safety of installations in Montana.**

Almost all of the funded projects include public education or accessibility to enhance awareness about the opportunities and benefits of renewable energy. Renewable energy projects that have an education component, are highly visible, and/or benefit the public are preferred. Examples of this include a solar energy installation on a low-income qualified residence, or a wind turbine that provides a variety of educational resources to students, teachers, administrators and community members. In all of these applications, NorthWestern Energy customers have promoted the use of renewable energy and have realized a decrease in their electric energy costs. At various times of the day or night, a RE system can produce more power than the customer is using. Under these conditions, the electric meter "runs backwards" – and, with the use of a "net meter," a customer is credited for the excess power generated. For information regarding net metering, visit www.northwesternenergy.com or call (888) 700-6878.

renewable energy and USB basics continued...

What is USB?

The USB Program has its origin in the Montana Legislature's restructuring of the state's energy industry. The legislature agreed that a funding mechanism would be required to continue the operation of programs that provide funding for low-income energy assistance and weatherization programs, energy-efficiency activities, and development of small-scale renewable energy resources. The Legislature established the Universal System Benefits (USB) Program to provide for these needs and programs in a deregulated power market.

Under state law, all electric and natural-gas utilities are required to collect USB funds from their customers to fund energy-efficiency programs and activities. In addition, those funds support low-income energy assistance and renewable energy projects. This regulated charge is listed as "USBC" on your NorthWestern Energy billing statement NorthWestern Energy customers have contributed to energy efficiency and low-income energy assistance programs for many years. The typical NorthWestern Energy residential customer pays an average of $1 per month in electric USB charges.

How to Use This Publication

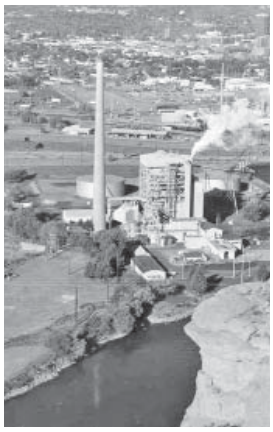
This publication is designed to make it easier for you to submit a proposal seeking funding for your RE project. As you continue reading, you will be prompted to take the next step, which will include making contacts, taking photographs, conducting research, and/or completing a site assessment. Each step will move you closer to your renewable energy goal in the shortest amount of time. The NorthWestern Energy proposal process may take anywhere from a few hours to a few weeks to complete.

Renewable Energy Basics

Before we begin, it is beneficial to have a basic understanding of what our clean energy options are and the benefits they provide. Renewable Energy (RE) is energy derived from natural sources such as sunshine (solar energy), wind (wind energy), geothermal and flowing water (low-impact hydro energy). Energy generated from these sources is converted directly to heat or to electric energy. It is considered "green" energy because it has few environmental impacts and does not deplete natural resources.

In contrast, traditional energy sources, such as fossil fuels or uranium, are considered non-renewable because they are both finite and can have negative environmental impacts. In Montana, most electricity generated comes from coal-fired plants and large-scale hydro plants.

RE systems can be costly, depending on the size, site specifics, and amount of contracted work. Typically, an installed residential grid-tied solar electric system may cost $10,000 to $40,000, while a commercial building system may cost $20,000 to $100,000. While this is a significant amount of money, many of our spending decisions are not based solely on economics, but include factors such as personal and societal values. ■



types of systems and technologies

Types of Renewable Energy Systems

There are basically three types of RE systems for residential or commercial use:

- A grid-tied system, or net-metered system, is one where conventional power lines – called the electric distribution system or the power "grid" – are connected to a building and the RE system is, in turn, connected to or runs with the serving utilities' distribution system. Battery storage is not required.

This design is usually the least expensive way to incorporate RE into your lifestyle, and it is becoming the most popular type of system. It allows you to lower your power bill with your own clean energy source. If you're a NorthWestern Energy customer, you may receive these benefits by delivering any extra power your RE system generates back to the electric company for credit.

Depending on the size of your system and your energy use, you may be able to offset some of your electricity use. You still pay the monthly distribution service fee to the utility, any demand charges (for commercial buildings), and for any electric energy (kWh) which you used that was not offset by your own system. The utility electric system still provides electricity when you need it. Power outages may still occur with a grid-tied system, and the rates charged by the utility are still regulated.

- The second type of RE system (use) is the stand-alone, in which 100 percent of electricity comes from a clean source which is completely separate of the utility. This approach is used where conventional power line extensions are expensive or a residence or business wishes to be completely independent of the power grid.

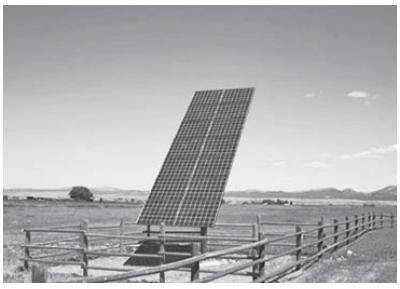
Stand-alone systems have higher up-front costs because a battery bank and controls are needed to store and regulate electricity when conditions are not favorable for RE power production. These include night-time or cloudy conditions for solar electric, calm times for wind generators, or low-flow periods for micro-hydro. Stand-alone systems generally are designed to provide the full electricity needs of the home or business.

⚠ *Note: Stand-alone systems are not available for USB funding.*

- Uninterruptible Power Supplies are a combination of the Grid-tied and Stand-alone systems, where the home or business is still connected to the grid, but battery backup is available in case of a loss of utility power. Usually, appliances that serve critical needs in a household or business – computers, water pumps, refrigerators – will be inter-connected to the battery. With this configuration customers have the security of clean backup electricity while having benefits of unlimited power from the serving electric utility (the grid). These systems tend to be the most expensive because they include utility charges as well as the expense associated with RE components and a battery storage system.

Renewable Energy System Technologies

Which clean power source is right for you? The following summaries can help you choose.



Solar

There are three basic solar technologies: solar electricity (PV), solar hot water and passive solar space heating.

Photovoltaics (PV) convert the sun's light into electricity. When sun strikes a PV panel, an electrical current is created. The electricity produced is clean and silent. A typical supplemental solar electric system for a conventional home would be one to two kW (one kilowatt (kW) =1,000 watts) and two to 50 kW for a business. Since an average residential customer uses 9,000 kWh/yr., an average 2 kW system would offset approximately 30% (2,600 kWh/yr) of electricity use.

Solar hot-water heaters, sometimes called "solar domestic hot water systems," use the sun's heat to produce hot water. Usually a heat-transfer fluid, such as a water-glycol antifreeze mixture, is used in solar collectors that are mounted on a roof. The heated fluid in the collectors is used to heat water in a secondary tank – similar to a conventional gas or electric water tank. The solar resource and system size will determine the amount of solar

types of systems and technologies continued...

space and water heat produced. A typical supplemental hot water system consists of one or two 4-feet-by-8-feet panels with a pump and a storage tank with a heat exchanger. Solar hot-air panels also may be used in a similar manner for space heating.

Passive solar systems incorporate a combination of building components to reduce or sometimes eliminate mechanical heating and/or cooling, as well as aiding the home by providing additional daytime light. It is predicated on using a home's windows, floors and walls to collect, store and distribute heat. A well-designed building also addresses summer sun characteristics and has controls to limit unwanted seasonal solar radiation.

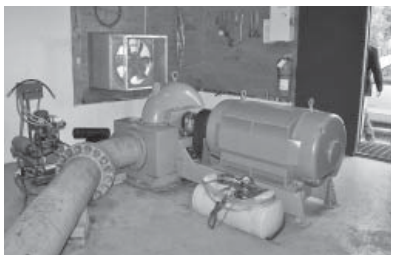
"True" passive solar design doesn't utilize pumps or fans to circulate heat; instead the design incorporates glazing and construction materials that passively receive and release solar radiation. Most designs also take advantage of natural sunlight through designated windows and floor plans to illuminate the home's interior.

Wind

Wind is caused by the sun's warming of the earth, the earth's rotation and topography. Traditionally, wind power was used primarily to grind grain or to pump water. Today's technology uses blades shaped like airplane wings that spin in the wind to drive generators and produce electric energy. The more wind, the higher the potential for electric power generation. Like most forms of RE, smaller wind generators can be grid-tied directly to your existing home or business. Larger generators can be grouped together to form "wind farms" to power communities and small cities. Supplemental wind generation for a home will range from 1 to 10 kW, while larger applications use machines that are 65kW to 4MW (megawatts) in size.

Hydro

Hydropower uses water wheels or turbines to convert flowing and falling water into mechanical or electrical power. While large hydro dams are renewable, they have their own set of environmental concerns mostly focused on their impacts on aquatic and riparian wildlife. On the other hand, in an appropriate location, low-impact or micro-hydro is considered a reasonable RE power source. These smaller systems may be designed to lessen the impacts on habitat and wildlife while supplying abundant energy. System size depends on location and available water flow.



Geothermal

If you have ever been to a natural hot spring or spa you have experienced geothermal energy. Geothermal technology uses heat from deep in the earth, in the form of pressurized steam or hot water, to turn turbines and to produce electric energy. Two types of geothermal resources are being tapped: hydrothermal fluid resources and earth energy. Hydrothermal fluid resources (reservoirs or streams of very hot water) are well-suited for electricity generation. For heating and cooling, ground-source heat pumps also are an option that may save significant energy compared to using electric-resistant heat or air-source heat pumps.

Biomass

Biomass, or bioenergy, is the use of energy that is stored in green plants and other organic matter to create electricity. Biomass electric facilities burn sawdust, agricultural wastes, urban yard waste, or crops grown especially as an energy source, including some kinds of trees and grasses. Methane gases from landfills, ethanol and biodiesels also may be used to generate mechanical and electrical power. In limited applications, biomass projects may qualify for USB renewable energy assistance. ■

completing your proposal

The following section provides the steps to complete your proposal. For additional assistance please review the sample proposal in the back of this publication.

Basic Steps

1. Determine which RE system is appropriate for you.
2. Estimate a cost and evaluate the economics of your RE system.
3. Write your proposal and submit it to NorthWestern Energy.

Step One

Once you're sure you are a NorthWestern Energy Montana Electric Distribution Customer or are in NorthWestern Energy's Montana Electric Service Territory, you need to establish which RE source is right for you. Performing a site assessment is critical to the success of a RE installation.

A site examination would determine what RE source would be most compatible with your particular environment. For example, if your property has a southern exposure that's not obstructed by trees or buildings, solar electric or thermal may be a good choice for your application. If your site seems excessively windy, wind generation may be the obvious and best choice for your project. Similarly, if a creek, spring or river flows through your property, you may benefit from the installation of a micro-hydro system. Or, if you have access to a large supply of agricultural byproducts, you may be a candidate for a bioenergy plant. A site assessment makes all the difference between the success or failure of a RE system.

If you are unsure which RE source is right for you, there are two things you can do:

1. **Conduct additional research using the resources listed on www.montanagreenpower.com.**
2. **Contact one of the dealers who have experience in site assessment and design. A list of dealers is available at www.montanagreenpower.com. NorthWestern Energy does not endorse any one dealer, but recommends that you shop around to compare dealers, prices, warranties, and experience. Be sure that contractors provide proof of insurance, appropriate bonding, and a current business license.**

How long will these preliminary steps take? Site assessments, system design and equipment bids can take anywhere from two hours to a year. They largely depend on the availability of the designer and installer, as well as the scope of the project. Here are a few tips to help the process along:

1. **While most RE dealers in Montana are small-business owners and often busy, you may get a quicker response if you fax or e-mail detailed bid requests to the dealers and follow up with a phone call.**
2. **Consider travel times when contacting dealers. It may not be practical to hire a dealer located 200 miles from your home or site.**
3. **When possible, keep it simple. Any special code or engineering, environmental assessments, or architectural considerations may extend the proposal period.**

Step Two

After you have completed a site assessment to determine your best RE source, the next step is to get a component and installation bid. The site assessment often is part of the design and installation bid, but not always. Consult with a dealer for site-specific information.

Along with a bid sheet, you need to look into zoning restrictions, lease agreements, insurance policy modifications, or engineering issues that are relevant to the proposed installation. You'll also be required to obtain building and electrical permits, along with commercial permits relating to fire, building, electrical and plumbing codes. These vary by geographic location. A reputable dealer/installer should be aware of what is necessary.

completing your proposal continued...

Your dealer's bid sheet will have a breakdown of the actual costs of the system. A copy of this sheet must be included with your proposal.

While you are waiting for the bid to be completed, take some photographs of the installation site. You can consider submitting pictures of your site with your proposal.

Also consider that projects which demonstrate benefits for more than one public purpose are preferred. These include: physical benefits, high visibility, educational program development and green market advertising.

Step Three

With your bid sheet, project details, and proposal ideas in hand, you now are ready to complete and submit your proposal. In the material you will be sending to NorthWestern Energy, please include:

- **A Proposal following the RFP format, with all questions answered, including a cover letter.**
- **A copy of your bid sheet showing the expected equipment and installation costs.**

⚠ *Note: If you have any further questions please refer to the Frequently Asked Questions (FAQ) section on pages 11 and 12 of this brochure before calling. After submitting your proposal, you may call the USB Renewables Program at (888) 700-6878 or e-mail E+programs at www.northwestern.com to confirm its arrival.*

When NorthWestern Energy receives your proposal, we may call you with questions or clarifications. If, upon review, we think your proposal has little chance of being funded, we'll notify you and discuss the reasons why. It may be you simply need to submit a revised proposal.

It is NorthWestern Energy's procedure to clarify, validate and organize proposals until enough have accumulated for presentation to the USB renewable energy advisory committee, which typically meets twice a year. The sub-committee will take one of the following actions:

1. **Advise to accept the proposal at the requested funding amount or at an amount less than requested.**
2. **Reject the proposal.**
3. **Ask for more information.**

If your proposal is accepted, NorthWestern Energy will draft a contract with you in which a start and completion date will be established. You may need to provide NorthWestern Energy with additional information, including a certificate of insurance in some cases.

Congratulations and good luck on making clean energy a part of your life!

New Distributed Renewable Resources

NorthWestern Energy encourages the use and development of renewable energy resources for current and future electricity needs. The Universal System Benefits Charge (USBC) funds new and existing energy conservation activities, renewable resource projects and applications, and provides low-income energy assistance. For the purposes of this program, new renewable resource projects are identified as technologies that create electricity, or useful work that replaces distributed electricity from virtually inexhaustible energy sources.

Projects, applications, and education leading to promoting technologies that encourage the use of renewable energy may qualify for incentives. Purchase of electric supply derived from renewable sources may qualify for cost sharing by NorthWestern Energy. All USB monies invested in renewable energy technologies shall benefit NorthWestern Energy distribution customers.

Renewable Energy Certificates (RECs) or Green Tag Credits (GTCs) are marketable environmental attributes of electric energy generated using renewable fuel sources. Customers that receive a renewable energy incentive payment from NorthWestern Energy are not allowed to sell the GTCs associated with their RE system. Customers may retain their GTCs or they may donate them to NorthWestern Energy. All GTC revenues collected on USBC incentive funds by NorthWestern Energy will be used to fund additional RE programs and projects.

Specifications for USBC Funded Renewable Energy Projects

1. **Project description:** If you are submitting a proposal for a small-scale wind or solar PV system, please include a brief cover letter that describes the project and the sector (general public, non-profit, private) that will benefit from the system. Include a brief discussion or mission statement for non-profit organizations.

   If you are submitting a proposal for a "non-typical" project, provide a detailed cover letter describing the project, the proposed technology and the benefiting party. Examples include: an algae farm to produce biofuel for generating electric energy, a binary cycle turbine for use with a geothermal source, or a diesel engine driven generator run off used vegetable oil.

   Identify the source and the use of the new renewable energy (for example, wind, solar photovoltaic, micro hydro, biomass, other). Also include information such as component manufacturer(s), and mounting type (for solar PV) or tower height (for wind power).

2. **Project location:** Indicate address that is the physical address of installation, not PO box. Specify if there are multiple locations.

3. **Project parts list and costs:** Include bid sheet or spec sheet for self installations (show full detailed parts list and costs).

4. **Project design costs:** If design costs are incurred, list amount and design contractor(s)' names and contact information.

5. **Project labor costs:** Include labor costs, when applicable.

6. **Project total costs:** Total parts, design, and labor costs (total lines 3 + 4 + 5).

7. **Amount of funding requested:** List amount and/or percentage of funding requested from NorthWestern Energy.

8. **Other sources of funding:** Include other funding sources that will support the project.

9. **Past projects:** List other projects that were funded using USB renewable funding (not required if applicant is a dealer or installer). Have you received USB RE funds in the past for a project? If so, describe the project and give the project location.

request for proposals (RFP) continued...

10. **Nameplate capacity of system:** System capacity in watts or kilowatts.
11. **Projected system capacity factor:** Percentage of output expected from system.
12. **Projected yearly output of system:** List in annual kilowatt hours (kWh).
13. **Projected life expectancy of system:** List in years.
14. **Projected lifetime output of system:** List in kilowatt hours (kWh).
15. **Will this system be used in tandem with any other source of non-grid generation?** Yes, No. If answering yes, please list other system type (i.e. – gas generator or other renewable technology).
16. **Describe monitoring and verification plan for the technology:** What methods will be used to track kWh production and how will system performance be determined?
17. **Is there a plan in place for system maintenance?** Yes, No. If yes, please list (along with warranty information). If no, explain reasons for no maintenance and/or system warranty.
18. **What permits and permit jurisdictions are applicable to this project?** List the type of permit and jurisdiction (i.e. Electrical permit, City of Bozeman).
19. **How will the balance of the project be paid for?** Please list (i.e. – self funded, State of Montana Alternative Energy Revolving Loan Grant, other). List amounts.
20. **Identify the customer group the project will most benefit.** List the primary group (i.e. – residential, commercial, low-income, government).
21. **List environmental impacts of the project.** List impacts both positive and negative (i.e. – greenhouse gas reductions, visual impact of installations).
22. **Will the project require net metering?** Yes, no.
23. **Have you selected a contractor?** If so, who? Answer yes, no. If yes, list name and address of contractor.

For Education or Combination Generation/Education Proposals, Please List the Following:

1. **Projected costs for educational seminars, media, tours, and publications.** List type and projected cost.
2. **Projected number of people impacted.** List both the direct and indirect contact statistics.
3. **List target audience group(s).** List all types (i.e. students, general public, industry professionals).
4. **How will you verify project success?** List how contact statistics will be verified – if seminars or education, how will the success be verified?

green $ENSE
frequently asked questions

Q: How do I know if a renewable energy source will work for me? By having a site assessment you should be able to determine whether RE may be incorporated into your lifestyle or not.

Q: What is the payback time for an installed system? Is it economical? At current energy prices, the simple payback with savings using solar PV or small-scale wind typically ranges from 10 to 40 years. Presently, most RE installations are based on personal values, resource conservation and environmental considerations rather than simple payback periods.

Q: Will using renewable energy on my house reduce my power bills? Yes – the amount of savings is dependent on the size of the system and the amount of wind or solar potential at the site, especially if efficiency measures are included. Adding insulation, changing to compact fluorescent lights and efficient appliances can dramatically lower your power bills. Many customers are able to witness their electricity meter run backwards as their homes deliver electricity to the system at times when their own energy needs are low.

Q: Will NorthWestern Energy pay me for producing more electricity than I use? NorthWestern Energy will not give you a check for the electricity that you produce from your own home or business. However, it will credit your bill at the price that you pay for electricity. At the end of the year, the best you can do is zero out the energy portion (kWh related charges) of your bill. Any extra power from you goes onto the grid for other customers to use.

Q: Is there any maintenance involved with having a solar or wind grid-tie? If your system does not include a battery back-up, then any manufacturer-recommended maintenance is relatively minor. Solar and hot-water systems also are virtually maintenance-free. We suggest you always follow manufacturer's recommendations.

Q: Will NorthWestern Energy fund my entire proposal or part of it? Each RFP is reviewed on its unique characteristics and how it fits with the mix of renewable projects already funded. NorthWestern Energy, with advice from an external committee, seeks a broad variety of projects. In almost every case, some cost must be borne by the system owner, whether it is co-funding, providing labor, educational programs, and/or research and development. Funding is negotiable.

Q: Do I need to modify my homeowners insurance if I install a grid-tie system? Major insurance companies insure solar systems as a part of the home without special provisions. For wind and other RE sources, consult your insurance representative.

Q: Why is NorthWestern Energy encouraging me to use less of their power? Universal System Benefits programs are intended to encourage energy conservation and renewable resources. USB also pays for low-income energy assistance and weatherization. NorthWestern Energy has long encouraged wise and efficient use of energy and is committed to implementing USB programs to maximize the benefits to NorthWestern Energy customers.

Q: Are there any federal or state tax breaks or credits for installing renewable energy on a structure? There may be some state tax credits for wind energy producers, low-interest loans, and federal energy credits that include PV, solar thermal, and other sources. Legislation always is changing; consult your accountant regarding your specific circumstances.

Q: When will I know if my proposal has been accepted or rejected? Proposals are accepted at any time – however the USB advisory committee meets twice yearly. Depending on the timing of the submission, the wait could be up to six months.

Q: Will I have to open up my home or business to the public in order for my renewable proposal to be accepted? It depends on your proposed project. For research and development or a private business, it may be inappropriate to open the door to the general public. Many proposals involve demonstrations and tours as a component of the proposal. Others provide data, which, while not including the site location and owner information, will be used to promote other renewable energy projects. It all depends on the project.

frequently asked questions continued...

Q: How long will my contract period with NorthWestern Energy run if my proposal is accepted? Depending on the terms of your proposal and negotiated contract, it could be anywhere from one year to several years.

Q: Does NorthWestern Energy provide net-metering? Yes. Net-metering is a special installation that allows any surplus energy generated by the customer's system to go back on the utility electric system and allows the customer to receive credits for the electricity put back on the system at retail rates. The customer's meter measures the electricity the customer uses from the utility system minus the electricity the customer's system puts back.

Q: Can I tour other USB funded RE projects before I submit a proposal? The best place to get an idea of other projects that have been funded is to visit www.montanagreenpower.com. This site is funded through USB and features many renewable energy projects throughout the state of Montana.

Q: If I'm not a NorthWestern Energy customer, am I eligible for USB funding? Projects funded by USB funds collected from NorthWestern Energy customers must benefit NorthWestern Energy customers. If your proposal is for a project "off-grid" or outside NorthWestern Energy territory, you will have to provide compelling evidence that the project will benefit NorthWestern Energy electric distribution customers. If you are served by a different electric utility, check with that utility as to what USB renewable activities they may offer.

Q: I'm a NorthWestern Energy gas customer but not an electric customer. Am I eligible for USB funding? USB funds many programs for NorthWestern Energy customers. Gas USB funds income-qualified weatherization programs and billing assistance. To find out programs you may be eligible for, call (888) 700-6878 or e-mail: E+programs@northwestern.com.

Q: If I'm leasing a space for my business, what is the process for making modifications to the building to accommodate RE? Any modifications to a structure should be made with the full written consent and cooperation of the building owner. This provision also applies to rental properties. ■

other northwestern energy RE publications

Publication/ Media Type	Technology	How to Obtain
Consumer's Guide to Small Wind and Solar PV (Print and Video)	Wind, Solar PV	Direct mail
Video (Consumer's Guide to Small Wind and Solar PV)	Wind, Solar PV	Direct mail
Field Guide to Photovoltaic Systems	Solar PV	Direct mail, downloadable PDF
Consumer's Guide to Solar Air and Water Heating	Solar Heat	Direct mail
Consumer's Guide to Small Scale Hydro	Micro-hydro	Direct mail
Funding Renewable Energy Systems	All	Direct mail
Renewable Energy Grant Process	All	Direct mail

These publications can be obtained by calling NorthWestern Energy at (888) 700-6878.

Anywhere, MT Library
555 Douglas Street
Anywhere MT

October 30, XXXX

NorthWestern Energy Renewable Energy Department,

Attached is the relevant information and bid sheets for the proposed 10kW Wind Turbine at the Anywhere Library. Thank you for the opportunity to present this proposal.

Prior to seeking funding from the USB program, the Anywhere Library formed a study group to research and evaluate renewable energy technologies suitable to our facility. Because we are in the "wind belt" of Montana, wind energy emerged as the best choice; both for production and educational value. The contractor we chose, Windy Brothers Energy, is the oldest and most respected firm in our area, and they have successfully installed over 20 of the Turbines locally.

Prior to working on this project, we have spent the last three years taking advantage of NorthWestern Energy's various energy conservation programs. To date we have updated all lighting, improved the building's HVAC system, and added a number of devices including programmable thermostats and occupancy sensors. The Library staff believes the building is as efficient as possible.

We would also like to point out that as one of the primary gathering places in Anywhere County, the turbine will serve as a town showpiece. And since our area is home to a number of commercial wind generation sites, it gives both locals and visitors an opportunity to observe a smaller turbine up-close. We plan on having informational material available about the turbine and other sites in the area.

Thank you very much for your consideration of this proposal. If we can answer any questions or need to submit further information, please contact us. We look forward to your review and funding of our project.

Sincerely,

Jane Doe

Jane Doe
Chairman
Anywhere Library Turbine Study Group

sample proposal continued...

Anywhere Library Project Question Sheet

1. Project Description: This project is to install a 10 kW Turbine at the Anywhere Library in Anywhere, Montana. The turbine will be mounted next to the library on an 80 ft. tilt down tower. The tower is an engineered structure that is part of the package provided by the manufacturer.
2. Project Location: Anywhere Library, 555 Douglas Street, Anywhere, Montana 59555.
3. Project Parts List and Costs: Please see attached bid sheets from Windy Brothers Energy. They are an authorized dealer and installer. The total parts cost for the project are $47,000.
4. Project Design Costs: None. Turbine type and design are pre-engineered and in accordance with all local codes.
5. Project Labor Costs: $22,000 (Includes assessment costs, installation and five-year maintenance plan).
6. Project Total Costs: $69,000.
7. Amount of Funding Requested: The Anywhere Library Foundation is asking NorthWestern Energy for $10,000 to help fund the project.
8. Other Sources of Funding: The following funding plan will cover the remaining $59,000.
   a. Proceeds from 2009 Student Windpower Fund-raiser - $4,000.
   b. State of Montana Renewable Energy Revolving Loan (Approved) - $27,000.
   c. Funds from Anywhere Library operations and maintenance budget - $16,000.
   d. Donation from Private benefactor - $12,000
9. Past Projects: None
10. Nameplate Capacity of System: 10 kW. Literature attached.
11. Projected System Capacity Factor: 17%.
12. Projected Yearly Output of System: 14,892 kWh.
13. Projected Life Expectancy of System: 20 years.
14. Projected Lifetime Output of System: 297,840 kWh.
15. Will This System Be Used in Tandem With Any Other Source of Non-Grid Generation? Yes. The library has a back-up diesel generation system that is approximately 15 years old. Windy Brothers Energy will tie the systems together although the diesel system is meant only for emergencies.
16. Describe the Monitoring and Verification Plan for the Technology? As part of the project, the system performance is linked to the library's computer system. This is done through software provided from the manufacturer and is meant to allow students and library patrons to review performance.
17. Is There a Plan in Place for System Maintenance? The labor costs include a five year maintenance plan. After that time period, the library management will review maintenance needs and act accordingly. This may include renewing the contract with Windy Brothers Energy.
18. What Permits and Permit Jurisdictions are Applicable to This Project? A building and electrical permit are required by Anywhere County. The area is zoned commercial with no height restrictions. All preliminary contacts and the permitting process have been communicated among the Anywhere Library, Windy Brothers, and Anywhere County.
19. Is This a Self Installation or Will a Renewable Energy Installer be Utilized? Installer - Windy Brothers Energy.
20. How Will the Balance of the Project be Paid For? As listed above, library and private funding coupled with a $27,000 State of Montana Renewable Energy Revolving Loan.
21. Identify the Customer Group the Project Will Most Benefit? Anywhere Library customers, students and townspeople.
22. List Environmental Impacts of the Project?
    a. Fewer greenhouse gas emissions and decrease in fossil fuel use.
    b. Use of the available wind resource in Anywhere County.
    c. Visual introduction for students and others regarding green energy.
23. Have You Selected a Contractor? Yes - Windy Brothers Energy.

glossary of terms

Alternating Current (AC): electricity delivered by U.S. utilities at 60 Hz, and 120 volts.

Amp: electrical current; measure of flowing electrons.

Amp-hour: measure of flowing electron for a period of time.

Audit: an energy audit seeks energy inefficiencies and prescribes improvements.

Battery: a collection of cells which store electrical energy; each cell converts chemical energy into electricity or vice versa, and is interconnected with other cells to form a battery for storing useful quantities of electricity.

BTU: British Thermal Unit, the amount of heat required to raise the temperature of one pound of water one degree Fahrenheit; 3,411 BTUs equals one kilowatt-hour.

Compact fluorescent Light (CFL): a modern form of light bulb with an integral or modular ballast using a fraction of the electricity used by a regular incandescent light bulb.

Direct current (DC): the complement of AC, or alternating current, presents one unvarying voltage to a load. This is standard in automobiles.

Efficiency: a narrow mathematical concept describing the proportion of a resource that can actually be converted into useful product or work; for example, sunlight falling on a PV module contains a given amount of energy, but the module can only convert a percentage of it into electricity.

Electronic ballasts: an improvement over core/coil ballasts used to drive fluorescent lamps.

Embodied: of energy, meaning literally the amount of energy required to produce an object in its present form; an inflated balloon's embodied energy includes the energy required to manufacture and blow it up.

Generator: any device that produces electricity.

Grid: a utility term for the network of wires that distribute electricity from a variety of sources across a large area. The "grid" powers most homes and offices across the country.

Heat exchanger: device that passes heat from one substance to another; in a solar hot water heater, for example, the heat exchanger takes heat harvested by a fluid circulating through the solar panel and transfers it to domestic hot water.

Hydronic: contraction of hydro and electronic, usually applied to radiant in-floor heating systems and their sensors and pumps.

Incandescent bulb: a light source that produces light by heating a filament until it emits photons.

Insolation: rate of delivery of solar radiation per unit of horizontal surface. Also called incident solar radiation.

Insulation: a material which keeps energy from crossing from one place to another: on electrical wire, it is the plastic or rubber that covers the conductor; in a building, insulation makes the walls, floor, and roof more resistant to the outside (ambient) temperature.

glossary of terms continued...

Inverter: the electrical device that changes direct current (DC) into alternating current (AC).

Kilowatt: 1,000 watts.

Kilowatt/hour: one kilowatt of power used for one hour. A typical house uses 750 kW/hrs per month.

LED: Light Emitting Diode. A very efficient source of electrical lighting, typically lasting 50,000 to 100,000 hours.

Load: an electrical device, or the amount of power required by such a device.

Megawatt (MW): 1,000,000 watts.

Modules: the manufactured panels of photovoltaic cells; a module typically houses thirty-six cells in an aluminum frame covered with a glass or acrylic cover and provides a junction box for connection between itself, other modules in the array, and the solar electric system.

Net metering: a desirable form of buy-back agreement in which the grid-tied house's electric meter turns in the utility's favor when grid power is being drawn, and in the system owner's favor when the house generation exceeds its needs and electricity is flowing into the grid. At the end of the payment period, when the meter is read, the system owner pays the utility the difference between what was used and what was produced.

"Off-the-grid": not connected to the power lines: electric self-sufficiency.

Passively heated: a shelter that has its space heated by the sun without using any other energy.

Petroleum: an oily flammable liquid composed of a complex mixture of hydrocarbon occurring in many places in the upper strata of the earth. A fossil fuel.

Phantom loads: appliances which draw power 24 hours a day, even when you turn them off. TVs, VCRs, microwave ovens with clocks, and plugs with the integrated little black box all contain phantom loads.

Photovoltaics (PV): A technology for using semiconductors to directly convert light into electricity.

R-value: resistance value, used specifically for materials used for insulating structures. Three inches of fiberglass insulation has an R-value of 11.

Renewable energy (RE): an energy source that renews itself without effort; fossil fuels, once consumed, are gone forever, while solar energy is renewable in that the sun we harvest today has no effect on the sun we can harvest tomorrow.

Renewables: shorthand for renewable energy or material sources.

Sustainable: material or energy sources that, if managed carefully, will provide at current levels indefinitely.

Volt: measure of electrical potential. 110-volt house electricity has more potential to do work than an equal flow of 12-volt electricity.

Watt: measure of power (or work) equivalent to 1/746 of a horsepower.

contact...

NorthWestern Energy
Customer Contact Center (888) 467-2669

Obtain Publications:
NorthWestern Energy (888) 700-6878

Please Respond with your proposal to:
Danie Williams
NorthWestern Energy
Renewable Energy Program
40 East Broadway Street
Butte, MT 59701

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