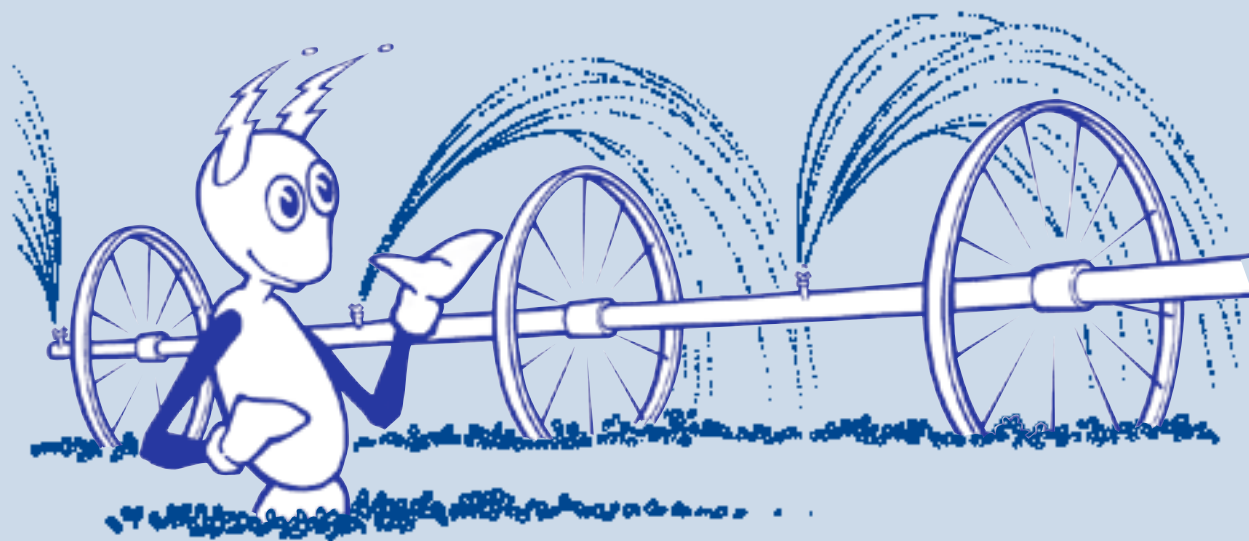


Efficiency *Plus* Irrigation Program



NorthWestern
Energy
Energy For Montana

In 2002, NorthWestern Energy's family of Efficiency Plus (E+) programs was expanded to include the new E+ Irrigation Program. This program helps irrigation customers become more energy-efficient through technical assistance and financial incentives. The National Center for Appropriate Technology (NCAT), a private non-profit organization based in Butte, Montana, administers the program. Irrigation specialists will work with you to evaluate your irrigation system, identify cost-effective improvements and offer incentives that will reduce your out-of-pocket expenses and help you get necessary work completed.

We've designed this program to make it as easy as possible for you to identify energy-saving measures and apply for funding. You can propose a project that is simple or complicated, conventional or innovative. In some cases, all you'll need to do is send in an application form, proof of purchase and a rebate request. For more elaborate projects, you'll be asked to provide more information, such as detailing how the measure will save energy. Since this is a pilot project, the rules and procedures are subject to change; the program is expected to evolve over time.

ABOUT NCAT

The National Center for Appropriate Technology (NCAT) is a private non-profit organization with headquarters in Butte, Montana. NCAT operates programs in Sustainable Agriculture and Rural Development, Sustainable Energy, and Sustainable Communities.

NCAT has promoted irrigation efficiency since 1987, auditing over 300 irrigation systems in Montana and researching new technologies that help irrigators become more efficient. Since 1993 NCAT has worked with about 75 ranches throughout Montana on scientific irrigation scheduling techniques and has assisted in the installation of over 60 state-of-the-art soil moisture monitoring systems.

NCAT actively promotes renewable energy and has helped install over 85 wind and solar energy systems in Montana since 1999.

NCAT's ATTRA project (Appropriate Technology Transfer for Rural Areas) operates a national information service on topics in sustainable agriculture. Agricultural producers are welcome to contact NCAT for assistance with questions related to their sustainable farming, research, and agribusiness needs.

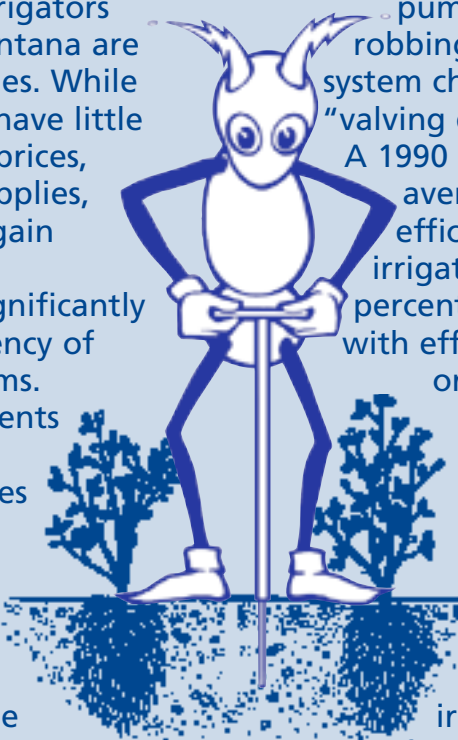
Correcting
Basic
Hardware
Problems

Increasing Irrigation Efficiency

Montana farmers and ranchers have historically looked for ways to make water and energy go farther. In today's world, efficiency has become a necessity. The past few years have demonstrated the unpredictability of energy prices, and irrigators in many parts of Montana are facing water shortages. While individual irrigators have little control over energy prices, weather or water supplies, many irrigators can gain better control of the irrigation process, significantly improving the efficiency of their irrigation systems. Hardware improvements and more intensive management practices are the keys to increasing efficiency.

Agricultural experts estimate that irrigation costs can be reduced by 10 to 20 percent, on average, through better hardware maintenance and more intensive and scientific management. Inefficient pumping plants, leaky or undersized distribution systems, high pressure, and over watering cost Montana farmers and ranchers thousands of dollars in wasted electricity each year. Besides wasting energy, these inefficiencies reduce crop yields and cause other problems such as erosion, leaching of nitrates and other chemicals into groundwater, and low stream flows that harm Montana's fisheries.

Many irrigators can increase efficiency by correcting basic hardware problems. No system can operate efficiently unless it has correctly-sized nozzles in good condition, proper pump pressure, a correctly-sized and well-maintained pump, no leaks, and no energy-robbing add-ons, substitutions or system changes such as extensive "valving down" to reduce pressure. A 1990 study by NCAT found that average pumping plant efficiency among Montana irrigators statewide was only 48 percent. This percentage compares with efficiencies of 65 to 70 percent or higher that are typical for a new or newly rebuilt pumping system.



The following chart illustrates the dollar value of good hardware maintenance. The example assumes that an irrigator pumps two acre-feet of water over 300 acres. As you can see, operating costs are thousands of dollars higher for a pump operating at 40 percent efficiency than they are for a pump operating at 70 percent efficiency:

Cost per kWh	40 Percent Efficiency	70 Percent Efficiency	Savings
\$ 0.02	\$ 3,900	\$ 2,212	\$ 1,688
0.03	5,850	3,375	2,475
0.04	7,800	4,425	3,375
0.05	9,750	5,625	4,125

From Montana DNRC: Saving Energy on Montana Farms and Ranches

Better Irrigation Management

A second important source of energy savings is irrigation management—deciding how much water to apply and when to apply it. Taking a fresh and scientific look at your assumptions can be an eye-opening experience. Scientific irrigation scheduling programs in Montana have yielded water and energy savings in the range of 10 to 20 percent. Some irrigators have achieved even more dramatic improvements in water-use efficiency. To quote one producer, "I've been doing this for 31 years and I thought there was nothing about irrigation that I didn't know... This has certainly changed the way I look at it all."

Advanced Options

If you already have basic hardware and management under control, you may be interested in looking at more advanced options. Significant savings may be available from measures such as converting from a wheel line to a pivot system, installing a variable-speed drive, installing surge valves, or using sophisticated soil moisture monitoring. Some irrigators in Montana are "pushing the envelope" with innovative techniques such as drip irrigation and incorporating wind energy into their irrigation systems.

Please read these instructions carefully before applying for Efficiency Plus Irrigation Program funding. If you still have questions after reading through this material, phone us toll free at 866-319-1669, e-mail us at irrigate@ncat.org, or find information and downloadable forms on the NorthWestern Energy website, www.northwesternenergy.com/energy.

This program is funded by NorthWestern Energy's Universal System Benefits fund. To qualify for this program, you must be a NorthWestern Energy electric distribution customer who is a designated irrigation customer, meaning that your power is billed at Irrigation Pumping & Sprinkling Service rates.

WHAT IS USB?

In addition to irrigation efficiency assistance, NorthWestern Energy's USB (Universal System Benefits) fund pays for low-income energy assistance, weatherization, energy-efficiency activities and the development of renewable energy resources such as wind and solar. Utility customers in Montana have long supported these activities through their electric and natural gas rates. When the Montana Legislature restructured Montana's energy industry, it agreed that these programs are important for Montanans and established the Universal System Benefits fund.

Under state law, all electric and natural gas utilities are required to collect USB funds from their customers. This regulated charge is listed as "USBC" (Universal System Benefits Charge) on your NorthWestern Energy billing statement. About \$8.6 million is collected annually through this charge. The 2001 Montana Legislature designated six percent of these funds – or about \$500,000 per year – to "reducing energy costs through conservation and efficiency measures for irrigated agriculture" in NorthWestern Energy's Montana service territory.

Three
Easy
Steps

Three
Easy
Steps

Decide which request makes the most sense for you and fill out the appropriate application.

Rebate Request Application

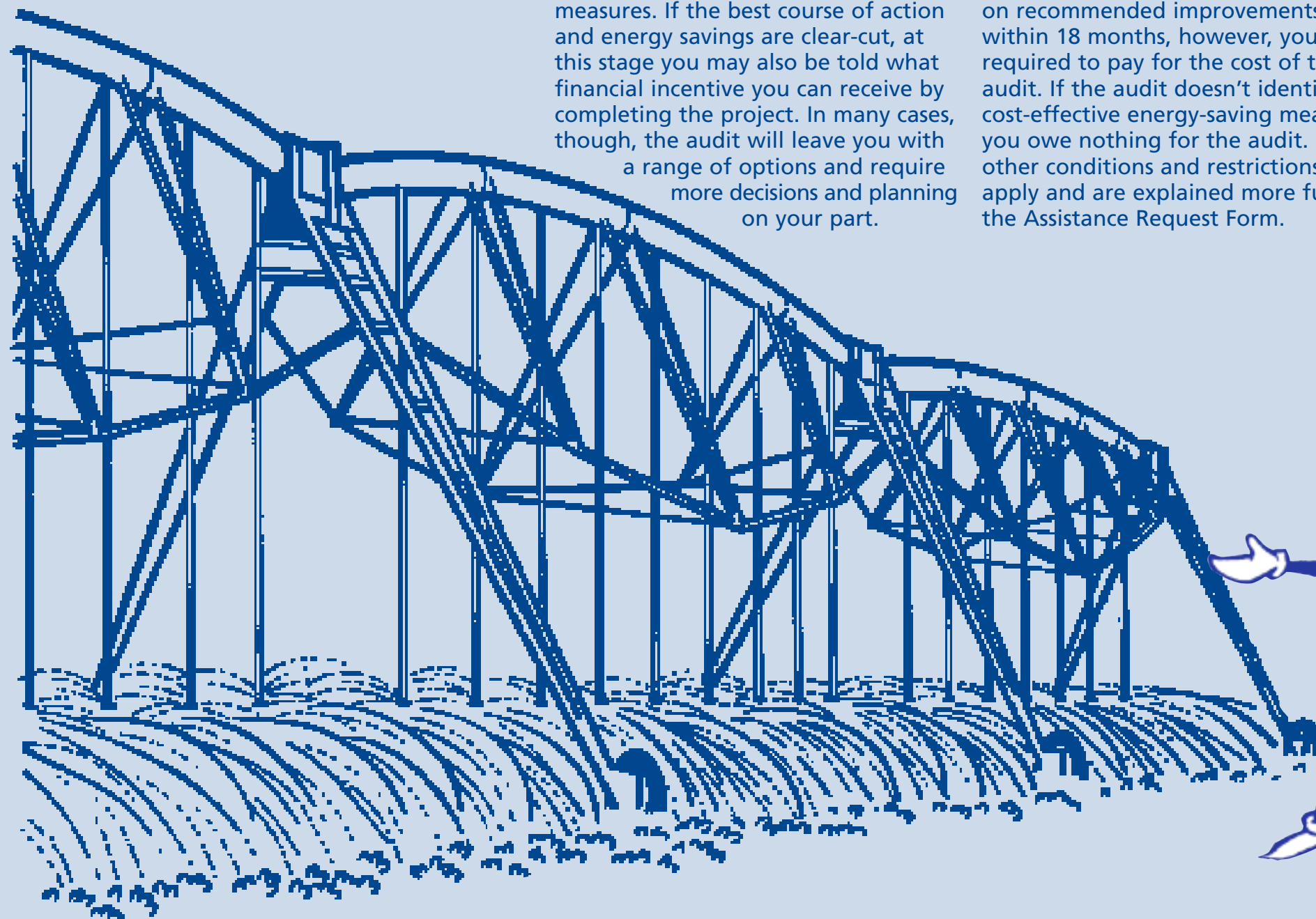
Do you want to implement a “tried and true” energy-saving measure as listed in the rebate schedule? If so, fill out a Rebate Request Form. Include itemized dated copies of your original invoice, clearly indicating the place of purchase as well as quantity and type of equipment purchased. We’ll process your request and send you a partial reimbursement. (See the Rebate Request Form for eligible items and cost-share amounts.) No cost share will be paid until equipment has been purchased.

Assistance Request Application

Maybe you’ve only got a rough idea of where to begin, or you’ve identified a problem, but you want a second opinion on measures that may help. In this case send in an Assistance Request Form. We’ll review your application. If your application is approved, in most cases we’ll start by conducting an audit on your irrigation system.

Project Proposal

Have you already designed a project? In this case send in a Project Proposal. We’ll review your application. You or your consultant will need to include enough detail so that we can calculate project costs and energy savings. In some cases we may need to conduct an energy audit on your irrigation system before an incentive can be offered.



Have an irrigation audit.

An irrigation audit provides accurate information about how your irrigation system operates, allows a prediction of energy savings, and helps you identify or evaluate promising energy-saving measures. Technicians will evaluate your distribution system and measure your pumping rate, discharge pressure, suction water level, and energy consumption. Based on the results of this audit we’ll give you recommendations for energy-saving measures. If the best course of action and energy savings are clear-cut, at this stage you may also be told what financial incentive you can receive by completing the project. In many cases, though, the audit will leave you with a range of options and require more decisions and planning on your part.

Please note that this program won’t perform an audit unless it seems likely to result in substantial energy savings. Audits require skilled labor and specialized equipment, at an average cost of \$500 to \$1000 per audited system. Before the audit takes place you’ll be told the cost of the audit. If you spend this amount (or more) on recommended improvements within 18 months you’ll owe nothing for the audit. If you don’t spend this amount on recommended improvements within 18 months, however, you’ll be required to pay for the cost of the audit. If the audit doesn’t identify any cost-effective energy-saving measures you owe nothing for the audit. Some other conditions and restrictions also apply and are explained more fully on the Assistance Request Form.

Three
Easy
Steps

Refine your proposal, if necessary, and find out what incentive is available.

We'll review your proposal. Your proposal must demonstrate that your project is cost-effective and will lead to actual energy savings. In many cases, the necessary information will come directly from the results of your irrigation system audit. For more complicated projects, you may need to provide design specifications, drawings, or calculations by someone with expertise in irrigation system design. When we've gathered sufficient information to evaluate your project we'll tell you what financial incentive or cost-share you can receive by completing the project.

3. The incentive amount is designed to provide a rate of return substantially better than what conventional investments would provide – in other words, a rate that substantially shortens your payback period.
4. In the case of more complex projects, incentives will be negotiated on a project-specific basis.

Innovative energy-saving projects are strongly encouraged. Besides promoting energy savings, this program also encourages projects with benefits to soil, water, fisheries, wildlife, or other benefits to NorthWestern Energy customers.

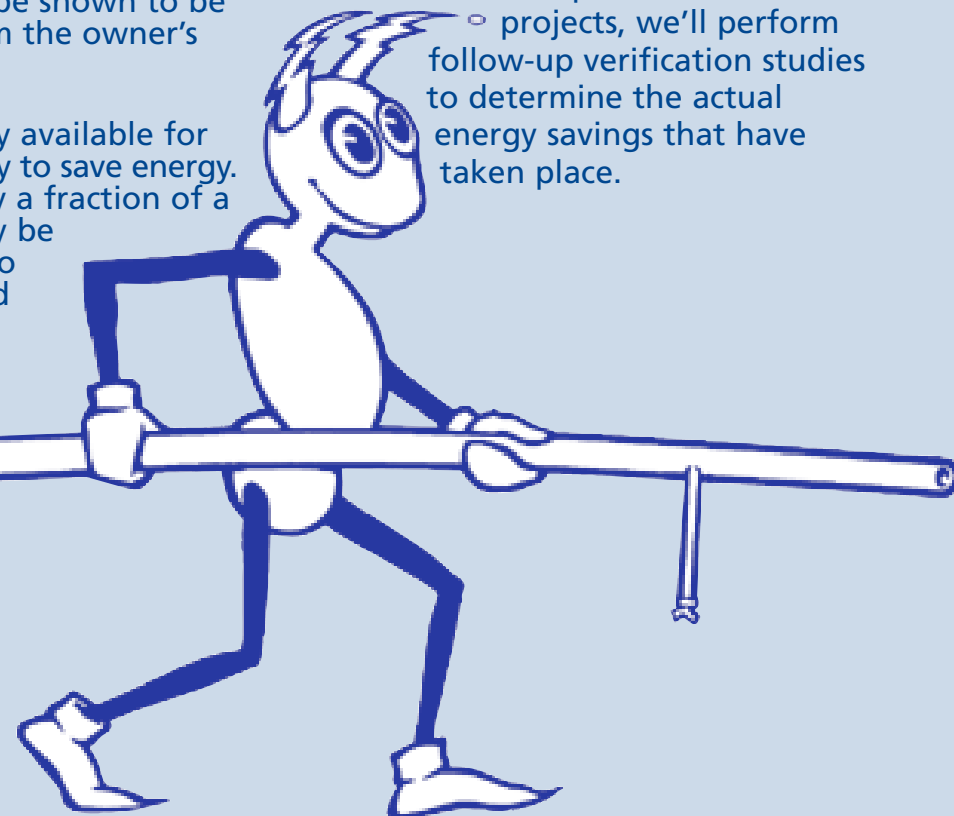
Here are four basic guidelines that apply to incentives:

1. Based on program requirements, the system retrofit or improvement must pass a life-cycle cost test for cost-effectiveness. This program will only provide incentives for projects that can be shown to be cost-effective from the owner's point of view.
2. Incentives are only available for measures necessary to save energy. In some cases only a fraction of a larger project may be directly relevant to saving energy, and only that portion would be eligible for incentives.

You will receive your incentive payment after the measures are operational and we have your completed documentation, including project receipts.

In 25 percent of all projects, we'll perform follow-up verification studies to determine the actual energy savings that have taken place.

Anyone who handles metal irrigation pipe needs to use extra caution. Accidental contact with overhead power lines can mean serious injury, even electrocution. Don't take chances with your safety. Never raise either end of irrigation pipe higher than your head. And please store pipe in a location well away from power lines.



Who is Eligible?

To be eligible for incentives under this program, you must meet the following requirements:

1. You must be a NorthWestern Energy electric irrigation customer.
2. You must be a designated irrigation customer, meaning that your power is billed at Irrigation Pumping & Sprinkling Service rates.

3. If you are making improvements to an existing irrigation system, the system must have been in use during at least two of the past four years.
4. You must agree to permit NorthWestern Energy or its designated representative to review electricity consumption records for your irrigation system and inspect or test the system for 24 months after the installation is complete.

What Equipment is Included?

Incentives are available only for equipment that is specifically required to reduce energy requirements for an irrigation system. Each proposed project will be reviewed and approved on an individual basis.

The following list includes equipment NOT covered under the provisions of this program:

- non-electric (e.g. natural gas or diesel-powered) irrigation systems
- new laterals
- well drilling or well casing

- column additions
- suction sump, head gate, or ditch equipment
- painting or refinishing of equipment
- structural equipment on pivots
- flow meters, weirs, and other flow measurement devices

The above list is not all-inclusive. Retrofits must meet NorthWestern Energy's cost-effectiveness criteria and **all projects must be approved prior to purchase or installation.**

FREQUENTLY ASKED QUESTIONS

Q: Why is NorthWestern Energy encouraging me to use less of its power?

A: Universal System Benefits fund programs encourage energy conservation and renewable resources. The USB fund 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 its customers.

Q: What other benefits besides energy savings are considered in evaluating a proposal?

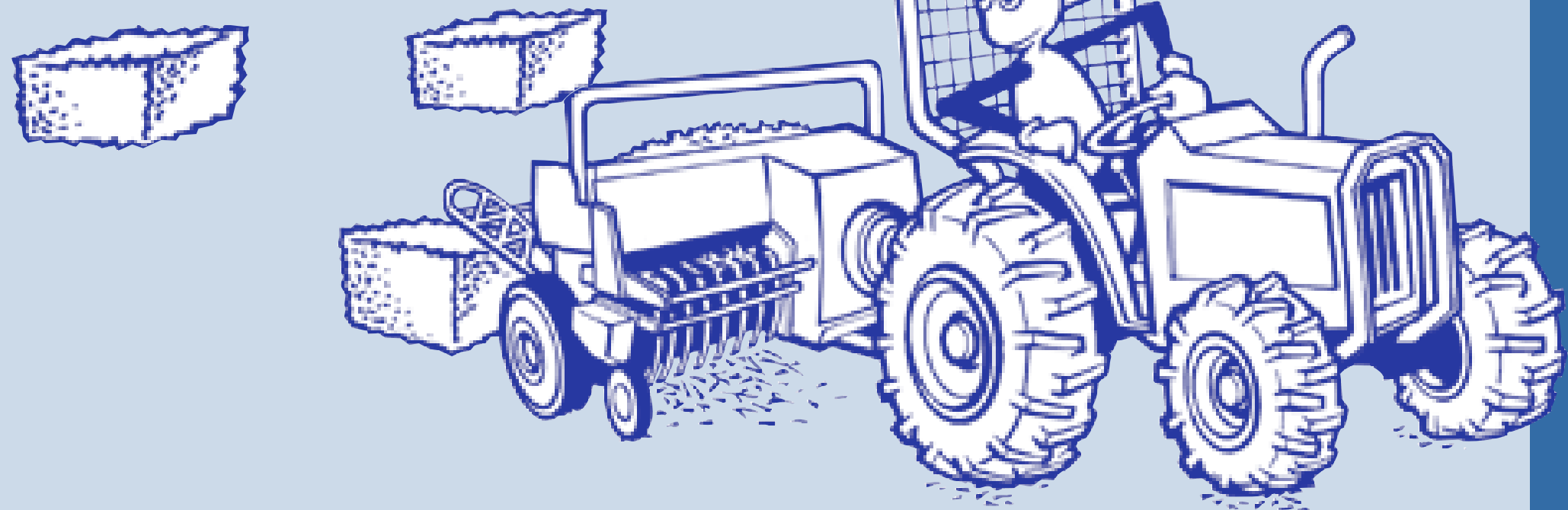
A: While energy efficiency is the primary focus of this program, other benefits are also considered seriously. These include soil conservation, water conservation, crop yield improvements, water quality benefits, instream flows, and benefits to fish and wildlife.

Q: I have an innovative energy-saving idea. Will the program consider innovative proposals?

A: Innovation is strongly encouraged within this program.

Q: Am I allowed to install used equipment?

A: Yes. Many irrigators are comfortable buying and installing used equipment, and there's no reason why this can't deliver substantial energy savings. In some cases preference may be given for newer and higher-efficiency equipment, or the program may suggest that you install this kind of equipment. Make sure that your project cost estimates accurately reflect the price for used equipment, if that's what you decide to purchase and install.



FREQUENTLY ASKED QUESTIONS

Q: Are non-electric (gas or diesel-powered) irrigation systems eligible for audits or incentives?

A: No, you must be a NorthWestern Energy electric customer and your irrigation system account must be billed at Irrigation Pumping & Sprinkling Service rates.

Q: Who decides what items are put on the rebate list?

A: Items on the rebate list are well-known energy saving devices that have been field-tested in Montana. The program welcomes suggestions for items that should be included on future rebate schedules.

Q: Can I request rebates in addition to making a project proposal?

A: Yes. You can request rebates at any time, and these do not preclude you from making a proposal. You are limited to one rebate request per NorthWestern Energy irrigation account per year, and the minimum rebate request is \$50.00.

Q: Can a ditch company, irrigation district, or other group of irrigators propose a project?

A: Yes, but only if all of the irrigators who are applying are NorthWestern Energy irrigation customers. This program is funded by NorthWestern Energy's Montana electric distribution customers, and all projects must directly benefit NorthWestern Energy irrigation customers.

For more information
about the E+ Irrigation Program:
Call Toll Free 1-866-319-1669
E-Mail irrigation@ncat.org
Visit www.northwesternenergy.com/energy



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