

Improving Farm Energy Efficiency

A Guide to Navigating the Process



A PUBLICATION OF

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The Minnesota Project
651.789.3330
www.mnproject.org

ABOUT THE MINNESOTA PROJECT The Minnesota Project is a nonprofit organization championing the sustainable production and equitable distribution of energy and food in communities across Minnesota. The organization focuses on three areas: the development and efficient use of clean renewable energy, promotion of sustainable agriculture practices and production, and consumption of local, sustainably grown food.

Founded over 30 years ago, today's team works toward establishing a sustainable Minnesota by 2039 through policy research, education and outreach, as well as developing key ground-up, grassroots initiatives targeted at empowering communities and their leaders.

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INTRODUCTION



Why Energy Efficiency?

Improving energy efficiency means implementing technological upgrades or personal conservation practices that reduce an individual's, or operation's, energy use without reducing the quality of the original energy using process. The basic goal of energy efficiency may vary based on who is pursuing it.

Environmentalists may pursue energy efficiency as a way to conserve natural resources and improve the quality of the environment. Public utilities may pursue energy efficiency to avoid building costly energy producing facilities, or to meet legislative mandates informed through public policy. Consumers and business owners, including farmers, can use energy efficiency to decrease their operating costs through reducing the amount of energy demand their particular operation garners on a monthly basis.

Energy efficiency on farms is especially important because of the tight operating margins farmers often deal with and the large amounts of energy needed to make farms work. In order for farms to remain viable as input costs inevitably rise, farmers need to find ways to reduce the amount of inputs altogether. We believe energy efficiency can help farmers take these steps. By implementing improvements to a substantial part of the farm budget (energy use), farmers can decrease the size of these budgeted costs, saving money that can be reinvested to improve the farm in additional ways. In that way, today's efficiency improvements will power tomorrow's farms.

This guide attempts to assist farmers interested in investigating energy efficiency improvements through helping them navigate the various steps any such investigation would likely include. This guide does not provide specific advice on the energy efficiency improvements that are best for you. The ultimate decision making process is best left to the parties with the most knowledge of the subject area: energy efficiency experts and you, the farm operator. It is geared to instruct the reader on how to become more knowledgeable about energy use on the farm and to use this knowledge to cut costs and save energy.

We hope this guide provides information that is useful in your decision making process and as a result, makes your farm operation an energy efficient, cost cutting, productive operation moving into the future.

Chapter 1: Get Educated

Making your farm energy efficient is a long term project. Just like any other long term project, it's important to take this process one step at a time. In order to do that, you'll need to educate yourself to learn the range of efficiency options available to you. Not all efficiency improvements will be economically viable for all operations. However, with the appropriate amount of research, there's sure to be a good number of efficiency improvements that can save you money. While the vast array of subjects may seem intimidating at first, you'll quickly learn which topics are most important to you and your bottom line, and focus on those.

After you've become familiar with the basic ideas behind energy efficiency, you'll need to become acquainted with how energy consumption and conservation relates specifically to your farm. As business managers in their own right, most farmers likely have a good handle on their monthly energy bill. However, in order to enact the best efficiency improvements, you might need to delve a little deeper than your monthly statements. What are your most energy intensive farm applications, and how much energy are you using on a routine basis? These questions can be answered by analyzing the energy consumption of your operation, either on your own via a self assessment, or with the help of a qualified third party, by way of an energy audit.

Gathering Energy Efficiency Resources

As most readers of this document likely know, the size, type, and variety of farms across Minnesota run the spectrum; from large to small, new to old, livestock to crops. As a result, administering general advice in a publication such as this regarding which efficiency improvements to implement is difficult to do with any degree of specificity.

Fortunately, there are a number of good sources of information available to help navigate these resources in all stages of your information gathering process. Generally speaking, the more localized information you can find, the better. Local information has a better chance at addressing issues specific to your farm and doesn't need to concern itself with answering all possible scenarios, something that can hurt the depth of information from wider scale organizations.

Utilities

An obvious first step in becoming educated on farm energy efficiency issues is to contact your local utility. In Minnesota, utilities are required to spend a certain amount of their budgets every year on energy efficiency programs (called Conservation Improvement Programs, or CIP), and so will generally be supportive of any questions you may have surrounding specific energy saving measures. CIP programs provide money to energy consumers for energy efficiency improvements mainly in the form of grants, rebates, and low-interest loans.

Utilities should be your first contact when considering a farm energy audit. Furthermore, since utilities serve local populations, they'll also have good, practical advice concerning the best equipment or services available for your specific operation. Most Minnesota utility websites contain good basic information and their member services employees are usually quite generous with their time and eager to chat about the information, programs, and services they offer.

Local Businesses

Local businesses, much like your local utility, will be eager to hear about your interest in energy efficiency improvements. Each of these parties will bring specific expertise for your energy efficiency consideration. Equipment dealers in your region can help choose the right energy efficient product for your operation. Local banks can go over the various financing options available for a specific project. Local contractors can talk with you about the challenges and benefits of implementing a new technology into your existing operation.

Be proactive in engaging these parties at the early stages of your planning. It's important to keep these lines of communication flowing back and forth through the duration of your decision making process, so various ideas, from people looking at the situation from all angles, can be exchanged throughout. Furthermore, the knowledge you've developed through your energy audit or self assessment process will go a long way towards enabling these local businesses to help make your project a success.

Education and Advocacy Organizations

While it sometimes seems like there's an organization dedicated to every imaginable farm or energy related topic, the fact remains there are some great learning opportunities available to parties interested in engaging various non-profit organizations. Below is a quick description of some of the organizations most involved in farm energy efficiency, though there are certainly many more. Sometimes a well placed phone call to an organization, or a general internet search will the most yield valuable information related to your specific area of interest.

ATTRA – The National Sustainable Agriculture Information Service

<http://attra.ncat.org>

- Funded by the United States Department of Agriculture, this organization has produced a number of great publications surrounding energy efficiency and has likely addressed most questions an interested producer may have. If you have a question or information request that ATTRA has not addressed, they provide a toll-free number individuals¹ may call to request advice or future publications on areas they are interested in. Their ag experts are very helpful in pointing you in the right direction.

Database for State Incentives for Renewables and Efficiency (DSIRE)

<http://dsireusa.org>

- This resource provides up to date information on all available financial incentives, broken down by state. The site even contains the energy efficiency programs provided by all utilities throughout the state. It's a great resource to utilize when you're compiling all available resources to help finance a project. Not everything here is tailored to farm energy efficiency, however.

¹ For information requests, call ATTRA at 1-800-346-9140 or email them using their online form at <http://attra.ncat.org/ask.php>⁵

IMPROVING FARM ENERGY EFFICIENCY

Other Farm Energy Efficiency Organizations

- **Center for Ecological Technology (CET)**
http://www.cetonline.org/FarmBusiness/Farm_Energy.php
- **Farmenergy.org**
<http://www.farmenergy.org>
- **Energy Solutions for Independent Farms**
www.agenergysolutions.org
- **Wisconsin's Agribusiness Focus on Energy**
<http://www.focusonenergy.com/Business/Agribusiness/default.aspx>

Gathering Energy Use Information On Your Farm

Undoubtedly, farmers have a better understanding of their farm's total energy use than a typical energy consumer. However, in order to achieve significant energy efficiency gains, you'll need to know, in a decent amount of detail, which farm processes require the most energy and how much energy each process typically consumes. This information can be gathered through the use of a self assessment or by taking part in an on-farm energy audit.

Tracking energy use information on your farm will provide you with insight into how your use stacks up against average operations of similar size, and will help determine whether making efficiency improvements will be cost effective for your operation. The following provides an overview of the two general approaches to diagnosing your energy consumption, professional energy audits and individually administered self-assessments.

PROFESSIONAL ENERGY AUDITS

An obvious first step in becoming educated on farm energy efficiency issues is to contact your local utility. In Minnesota, utilities are required to spend a certain amount of their budgets every year on energy efficiency programs (called Conservation Improvement Programs, or CIP), and so will generally be supportive of any questions you may have surrounding specific energy saving measures. CIP programs provide money to energy consumers for energy efficiency improvements mainly in the form of grants, rebates, and low-interest loans.

Pros

- Provides thorough, accurate information concerning farm energy use.
- Provides specific information regarding which areas of the farm will provide the best return on investment.
- Auditors provide a wealth of experience dealing with energy efficiency issues.
- Results of audit are usually prepared in an easy to read report-type format.
- Highly customizable to individual farms.

Cons

- May be some cost associated with audit.

The Minnesota Project!

To help aid in the process of sifting through loads of information related to farm energy efficiency, The Minnesota Project has gathered and categorized the most relevant resources related to this subject area in one central location. The Minnesota Project's "Farm Energy Efficiency Resource Center" contains documents gathered from a multitude of competent research advocacy organizations, all focused in one way or another on improving energy efficiency on farms.

The Minnesota Project's Resource Center can be accessed at:

- http://mnproject.org/e-EE_ResourceCenter.html

Finally, in addition to this Implementation Guide, be sure to check out the Minnesota Project's "Energy Efficient Farms: Identifying the Proper Improvements" publication, which outlines in greater detail the best efficiency choices for all different types of farms.

Generally speaking, an energy audit can be defined as any process that tracks and characterizes a home, farm, or other entity's typical energy use and describes practices or changes that could reduce energy consumption and/or cost.² Using this definition, an energy efficiency self assessment, described below, could be categorized as a type of energy audit. For our purposes, however, we'll use the phrase "energy audit" to describe the process of working with experienced energy efficiency professionals to determine what energy efficiency improvements make the most sense for your operation.

Professional Audit Processes

All types of energy audits work to compile energy use information about your farm through varying levels of investigation. A professional energy audit adds the most value to this process by providing valuable feedback regarding your energy use. This feedback typically includes discussion of areas requiring the most efficiency improvements, equipment available to improve energy efficiency, and information regarding cost and eventual cost savings. One advantage of working with an energy efficiency expert is that you can tailor your energy audit to your preference of sophistication and focus.

While the discussion below lays out a number of ways an energy audit can take shape, it's important to remember that an energy audit can be customized in any way you see fit to meet your farm's needs. Farmers should be proactive in defining what they hope to accomplish through an energy audit, this will help to shape the depth and focus of any audit you begin. Describing the types of changes you're most interested in pursuing - along with an approximate energy efficiency budget - at an early stage will help make your energy audit a successful one.

Engaging An Energy Auditor

Typically, most energy customers begin the process of an energy audit through their local utility, and with good reason. Most utilities offer energy audits, or energy audit assistance, as part of their state mandated energy efficiency programs. These energy audits vary in depth and sophistication. Some utilities have in house staff that can perform the simpler walk through processes. Other utilities have contracted with a third party to provide energy audits to their customers for free or on a reduced fee basis. Because of the wide variety of approaches taken to energy audits, farmers are best served contacting their local utility to inquire about what is offered in their service territory.

It is possible to engage third party energy auditors independent of your local utility, although finding a qualified energy auditor with specific experience on the farm outside of your local utility can be challenging. While many organizations have developed robust commercial and residential energy audit programs, development of energy audit programs with farm specific experience has been slower. USDA Rural Development provides a list of independent energy auditors on their website, though three of the five listed individuals are from Iowa.³ While third party companies like these are certainly qualified, a farmer must account for transportation costs and local familiarity challenges that may present themselves throughout a comprehensive farm energy audit.

² Farm Energy Audits: Availability, Usefulness, and Cost, National Center for Appropriate Technology, p.5. (Sept. 2009).

³ To view this list visit: <http://www.rurdev.usda.gov/mn/RBS/Section%209006%20Renewable%20Energy%20Program.htm> and click on 'Energy Auditors. The list was last updated in December of 2009.

Energy Audit Cost

Many farmers are concerned about the cost of an energy audit compared to the ease of conducting a ‘free’ self assessment. However, it is important to remember that for most farmers who are unfamiliar working with specific energy consumption data, a self assessment can be quite time consuming – a substantial cost in itself. Additionally, many local utilities offer energy audits or walkthroughs for free as part of their state mandated energy efficiency programs. Some utilities require a small fee to be paid by the farmer, to ensure the farmer is serious about making energy efficiency improvements. In these instances, utilities often pay for the majority of the audit and may pay a larger portion if the farmer eventually decides to implement some suggested energy efficiency improvements.

It is difficult to give an estimate of the average cost of a farm energy efficiency audit due to the level of customization and segmentation described above. However, audits examining a specific technology (such as motors and pumps, or lighting) can range from \$150 - \$350, while audits conducted for a specific REAP project application can cost up to the \$1000 - \$2000 range. A comprehensive audit addressing the energy consumption of your entire farm can cost even more.

Audit Depth and Focus

Walkthrough Audits

On the most basic level, an energy efficiency expert can be engaged to complete a simple walk through of your farm, where the auditor visually inspects your facilities, analyzes your typical energy use and compares your energy use to other farms of similar size and industry. In a walkthrough audit, after information had been gathered, a walkthrough audit would likely be able to provide you with some basic energy conservation tips and immediate low-cost equipment upgrades. Any estimates of rate of return on investment for larger energy efficiency improvements using a walkthrough audit would likely be fairly generalized, due to the lack of specific energy use data gathered on a walkthrough.

In Depth Audits

Alternatively, energy audits can be much more in depth and provide very specific information. An energy audit can be customized to delve into the energy consumption and efficiency losses of particular systems or pieces of equipment on your farm. A more in depth audit could also include a thorough economic analysis of various energy efficiency implementation plans, prolonged on farm energy tracking and testing, and even the use of computer programs and simulations to predict average future use and the effect energy efficiency improvements will have on your operation for years to come.⁴

Audit Focus

In addition to depth of study, energy audits can also be customized in their relative focus. A farmer could engage an energy audit that considers every single piece of equipment used on his or her operation. Alternatively, a farmer could use an energy audit to examine a specific part of his operation, such as irrigation, lighting, grain drying, or ventilation. This type of segmented

⁴ [Farm Energy Audits](#), NCAT, p. 6. (2009).

customization can help address the most significant efficiency concerns on your farm, while saving some cost on the energy audit by keeping its focus narrower than your entire farm operation. If unsure of where to start, perhaps implementing parts of a self assessment, outlined below, would be a useful exercise to help you understand your farm's general energy consumption.

Final Thoughts

An energy audit is the best way for farmers serious about making significant energy efficiency improvements to begin the process of learning about their respective energy consumption. Well run energy audits partner the energy efficiency experience of qualified professionals with the in depth farm knowledge of a farmer to produce a knowledge base of energy consumption that is valuable in identifying the areas of your farm that would be most valuable to improve from an energy efficiency standpoint. Energy auditors also provide information on how to follow up on an energy audit and can be used as a jumping off point to realize significant energy savings on your farm.

SELF ASSESSMENTS

Pros

- Low cost.
- Can conduct assessment on own schedule.
- Farmer has knowledge of farm as a whole, integrated operation.
- May be only economical option for small operations.

Cons

- Time consuming.
- Self help tools and energy worksheet assumptions not specifically tailored to your operation.
- Return on Investment and energy efficiency technology information gathering left solely to the farmer.
- No energy efficiency expert advice to supplement farmer knowledge.

Conducting an Energy Use Self Assessment

An energy efficiency self-assessment is basically a do-it-yourself energy audit. Using this method, a farmer attempts to estimate the energy use on his farm, while making particular note of areas that may be ripe for improvement. While this method allows the farmer the most flexibility into how and when he wishes to conduct the assessment, the information gleaned from these types of assessments is usually much less specific than a conventional farm audit ran by an experienced professional. Nonetheless, many farmers find self assessments useful for gaining an understanding of their energy use, with an eye toward improving their day to day energy consumption practices, future efficiency improvement implementation, or even in conjunction with a professional audit.

Energy Audits for REAP Grants

Many farmers are likely aware of the Rural Energy for America, or REAP, program administered by USDA Rural Development. This program, described in greater detail below, provides grants and loan guarantees for both energy efficiency and renewable energy projects. To receive federal dollars under these programs, however, various audits and assessments are required. For energy efficiency improvements with greater than \$50,000 in total project costs, an energy audit is required. For energy efficiency improvements with less than \$50,000 in total project costs, an energy assessment is required.

The difference between these two types of efficiency examinations essentially breaks down to the depth of the examination and the qualifications of the individual approving the examination. Be sure to talk with your local USDA Rural Development representative, or utility member services representative, before conducting an audit for purposes of receiving assistance from the REAP program.

Self Assessment Worksheets

To aid with the process of tracking your energy use, many organizations have developed energy guide worksheets that list common farm energy users, along with the average amount of electricity each of these applications use. The farmer then needs only to fill in his estimated use for a given period of time to determine how much money it takes to run the particular piece of equipment on a monthly or yearly basis. A couple of examples of these types of worksheets can be found at right. Your local utility likely has similar tools for you to use.

A few examples of energy consumption worksheets:

- CET Online's Dairy Farm Collection Sheet:
 - http://www.cetonline.org/FarmBusiness/Collection_sheet.doc
- Freeborn Mower Cooperative's "Farm Energy Estimator":
 - <http://www.fmcs.coop/farmenergy.htm>
- Minnesota Valley Rural Electric Cooperative's "Farm Equipment Worksheet":
 - <https://www.mnvalleyrec.com/conservation.php>

Self Assessment Step 1: Track Energy Use

The first step in conducting a self assessment on your farm is tracking your typical energy use. Tracking energy use on a farm, with any degree of useful specificity, can be tricky because of the many different farm applications that use electricity. One suggested approach when attempting to characterize your energy consumption use is to divide your energy use into categories that can contain various applications. Categories could include lighting, fans and ventilation, heating, pumps and motors, and so on. By designating various types of energy use, you will begin to see a manageable list of energy categories develop, rather than a generalized jumble of various energy uses.⁵ Then, when the time comes to implement energy efficiency improvements, you'll know which parts of the farm use the most energy, and can begin implementing energy efficiency improvements one step at a time, rather than all at once, reducing strain on both time and material resources.

As you inventory various pieces of equipment around your farm, keep track of the size and capacities of motors, pumps, and other technologies for future comparison to similarly sized energy efficient equipment. You'll also need to track the amount of time each piece of equipment is used on a daily basis. By multiplying the amount of time a given piece of equipment is used throughout the month by the amount of energy it draws per hour, you'll begin to get an idea of the most energy intensive pieces of equipment on your farm.

Self Assessment Step 2: Analyze Your Energy Use Data

Once a farmer has developed a baseline understanding of typical energy use on the farm, he needs to determine how his energy use stacks up against an average operation of similar size, and more specifically, how each piece of equipment stacks up against its energy efficient counterpart. This information is important to determine whether your operation is running in an energy efficient manner. Upon making these comparisons, a farmer can start to understand the potential energy savings, and potential rate of return, possible from efficiency upgrades.

While this process can become a bit complicated, there are some useful tools available to farmers to help aid in the analysis and decision making process of whether energy efficiency improvements make economic sense. These tools vary widely in the amount of detail they provide, but generally require the user to input information regarding their farm operation's energy use. The tools then provide analysis on how to maximize energy conservation on the farm and how much energy could be saved with energy efficient equipment. The most repeated complaints about these energy tools are that few of them provide specific advice regarding energy efficient equipment costs and rate of return on any potential investments. A few of the more popular tools are laid out below.

⁵ A Suggested Approach to Farm Energy Audits, Richard S. Hiatt, P.E., p. 1.

USDA/NRCS Energy Conservation Tools

The USDA partnered with the University of Wisconsin to create these energy assessment tools. The tools address energy conservation measures surrounding livestock operations, dairy operations, grain drying, greenhouses, irrigation, lighting, ventilation, waterers, potato storage and even maple syrup production. For some of the tools, a large amount of data is needed, but the tools provide good information on the potential for energy savings in each of the aforementioned areas.

- <http://www.ruralenergy.wisc.edu/conservation/default.aspx>

USDA/NRCS Energy Estimators

The USDA/NRCS also developed four tools for demonstrating the amount of energy used in four specific applications, and the potential for savings in each area. These energy estimators cover the subjects of Animal Housing, Irrigation, Nitrogen, and Tillage.

- <http://energytools.sc.egov.usda.gov/>

Focus on Energy's Farm Assessment Tool Kit

Developed by Wisconsin's Focus on Energy Program, these interactive online tools provide energy saving tips based on specific information a farmer provides about his farm.

- <http://www.soils.wisc.edu/foe/login>

Alliant Energy's Energy Conservation Tools

Alliant Energy is a utility in southern Minnesota that serves its largest customer bases in Iowa and Wisconsin. The site below contains energy conservation calculators for electric motors, milk house heat reclaimers, automatic milker take offs, milk precoolers, irrigation systems, and ventilation systems.

- <http://www.alliantenergy.com/UtilityServices/ForYourFarm/EnergyConservation/index.htm>

Even More Energy Assessment Tools

Penn State University – College of Agricultural Sciences's Smart Energy Decisions Tools:

- <http://energy.cas.psu.edu/smartdecisions.html>

Agricultural Pumping Efficiency Program:

- <http://www.pumpefficiency.org/pumptesting/costanalysis.asp>

Wisconsin Public Service's Farm Savings Calculators (Quick links on right side of page):

- http://www.wisconsinpublicservice.com/business/saving_calculator.aspx

Chapter 2: Implement your Energy Efficiency Improvements

After conducting a sufficient amount of research into your energy consumption habits and the best ways to improve your energy efficiency, it's time to implement the changes that will save you money. After all, education and information gathering by themselves do little to save energy use and improve your bottom line.

Energy Efficiency Implementation Evaluation Questions

There are many factors that will influence your ultimate decision on which energy efficiency improvements are right for you. Here are a few questions to help facilitate your thought process:

- What is the Rate of Return on each potential efficiency improvement? How long will it be until the improvement pays itself off?
- Will the efficiency improvement have other positive, non energy related, effects on my operation? Many building improvements will also positively affect livestock growth and quality of life.
- How often do I use this piece of equipment? Even if a piece of equipment is operating at less than ideal efficiency, if it is only use once or twice a year, it's not likely worth replacing.
- What is the current state of my existing equipment? Many energy efficiency upgrades make economic sense regardless of the current state of your existing equipment – they pay for themselves through their energy savings. Others may be more feasible based on the operating efficiency of equipment that has been used on your farm for a long period of time.
- How long will my operation be around? Will future generations benefit from my improvements? While this question most directly affects a farmer's return on investment, it also influences how you'd like to leave your operation for future operators and/or family members.
- What are my priorities related to energy efficiency? Am I primarily concerned with the cost savings associated with the energy efficiency improvements? Am I interested in saving energy for any environmental, political, or moral reasons?

Finalize Your Efficiency Improvement Decisions

Hopefully, by this stage of the process, you've already begun to communicate with local equipment dealers and installation contractors about the products and services they offer. Your energy audit or self assessment will have focused your improvement efforts on those efficiency upgrades that provide the largest energy savings for the cheapest price, giving you the largest return on your investment. From there it's just a few short steps to deciding on, purchasing, and installing the right energy efficiency improvements for your operation. A few quick tips to guide you through the process:

- **Keep it simple.** Don't overlook the simplest measures of energy efficiency, like lighting and insulation improvement, for the flashier technologies. These simple technologies are often the cheapest and provide the largest energy savings. Follow the results of your energy audit/assessment, which will provide guidance on which improvements are most needed.
- **Work together.** Share your base of information regarding the current state of your equipment and the general energy efficiency of your farm with local equipment dealers and service providers. These businesses can help you find the products and services that will best remedy your energy efficiency needs. They'll be motivated to assist you in this process in hopes of securing your business as the project moves forward.
- **Run the numbers.** Simply put, not every possible energy efficiency improvement will make economic sense on your operation. However, some efficiency improvements will assuredly improve your bottom line by helping your farm cut energy costs. Make the right decisions by calculating costs and benefits of each improvement compared to your current farm processes.
- **Facilitate communication.** Encourage your equipment providers and contractors to communicate with your local utility about the respective products/services and efficiency rebate programs they have available. The more these parties are able to communicate the more they'll be able to design an economical project that works for all involved parties, including you.
- **Stay involved.** After the dust has settled and your efficiency improvements are up and running, continue to track and monitor your energy use and newly minted energy savings. Aside from neighborly bragging rights, this information will be valuable to document the true impact your energy efficiency improvements had on your operation.
- **Practice foresight.** Looking ahead, when considering new construction or expanding your operation, keep the benefits of energy efficient technologies in mind. Planning efficient technologies into new construction can start saving you energy costs right from the start.

Chapter 3: Securing Financial Resources

Determining which energy efficiency improvements to make on your farm, while laborious, is often the fun part of your planning process. The next step is finding a way to afford these valuable, though sometimes initially costly, energy efficiency improvements. In addition to resources you may have devoted to your energy or operation improvement budgets; there are a number of other ways to improve the economics of implementing efficiency improvements on your farm.

Whether through a grant, loan, or other financing option, securing additional economic resources can often mean the difference between a stalled or successful project. This section will help you identify some valuable resources as you explore the financial options available for your project. For future reference, the Database for State Incentives for Renewables and Efficiency (DSIRE) is the leader in providing the most current and comprehensive information related to energy efficiency incentives.⁶ DSIRE's website contains an overview of federal, state and even utility based incentives for improving the energy efficiency of your farm. It's updated on a regular basis and is laid out in an easily navigable format. The programs described herein can all be found on the DSIRE website, and the site will serve as a valuable tool as various programs develop, recruit, and ultimately retire.

Federal Financing Opportunities

Rural Energy for America Program (REAP)

- The Energy Efficiency Improvement Program, part of the USDA's overarching REAP program, is the primary federal program intended to help farmers with energy efficiency improvements on their operations. Assistance can be made in the form of grants, loan guarantees or both.
- Most rural projects that reduce energy use and result in savings for the agricultural producer are eligible as energy efficiency projects.
- Grant amounts can amount to a maximum of 25% of the project costs, with a minimum grant amount of \$1500 and a maximum grant amount of \$250,000.
- Contact your local USDA Rural Development office for more information or visit: <http://www.rurdev.usda.gov/rbs/busp/9006grant.htm>

Energy Efficient Commercial Buildings Tax Deduction

- This federal program provides tax deductions for commercial buildings which employ specified energy efficiency improvements.
- Tax deductions can be up to \$1.80 per square foot of the building, if it is able to meet specified energy savings goals.
- For more information visit: <http://www.efficientbuildings.org>

⁶ Visit: <http://www.dsireusa.org/incentives/index.cfm?re=1&ee=1&spv=0&st=0&srp=1&state=MN> for the latest incentives related to Minnesota.

State Financing Opportunities

Agricultural Improvement Loan Program

- This program, administered by the Minnesota Department of Agriculture through the Minnesota Rural Finance Authority (RFA), provides low interest loans to farmers for improvements or additions to permanent agricultural facilities that increase production, efficiency and farm income.
- For more information on this program visit:
<http://www.mda.state.mn.us/en/grants/loans/improvement.aspx>

Sustainable Agriculture Loan Program

- This program, also administered by the Minnesota Department of Agriculture, provides low interest loans to farms making capital expenditures which enhance the economic and environmental viability of a farm, including energy use reductions or efficiency improvements.
- For more information visit: <http://www.mda.state.mn.us/en/grants/loans/esaploan.aspx>

Local Financing Opportunities

As stated, your quest for assistance concerning your energy efficiency improvement program should always begin at the local level. Securing financing for your energy efficiency improvement project should be no different. It's always easiest to secure assistance from local institutions than to attempt to access sometimes administratively burdensome federal dollars.

Utilities

Your local utility likely has the most relevant programs tied to making energy efficiency improvements economically attractive. While virtually all utilities offer a plethora of rebate programs on a wide array of energy efficient technologies, many utilities provide grant programs for larger efficiency projects and loan programs to help finance other energy efficiency improvements.

Utilities are eager to assist interested parties in finding a way to help finance planned projects. Oftentimes, if utilities don't have a specific program designed that fits your planned project, they will work with you to design a customized program that fits your needs. Once again, frequent communication with your utility will enhance the effectiveness of your search for suitable financial assistance with your project. Energy Efficiency programs vary from utility to utility, so the best way to become informed is talk with your local member services representative.

Local Banks/Credit Unions

Additionally, communicate with your local banks and credit unions about the possibility of helping you to finance your project. Remember to be prepared with the potential cost savings and rate of return information you've gathered through the initial stages of this project. While you may need to educate your local lender on the benefits of energy efficiency improvements, the potential economic benefits of properly planned projects should speak for themselves.

IMPROVING FARM ENERGY EFFICIENCY

Economic Development Organizations

Additional financial assistance may also be found with the many economic development organizations scattered across the state. These organizations, based on the city, county or regional levels, can provide a wealth of resources for farmers interested in making energy efficiency improvements. Based on their relative resources and areas of specialization, these organizations can provide small grants, loans, or valuable services like business planning or grant writing assistance that are necessary to secure some of the larger grants available on the federal level.

- To research the economic development organizations active in your area of the state visit: <http://www.ecodevdirectory.com/minnesota.htm>

Clean Energy Resource Teams (CERTs)

CERTs is a public-private partnership consisting of local community residents and University, Non-Profit (including the Minnesota Project), and Government support. CERTs connects community members in its seven different regions with resources to identify and implement energy efficiency and renewable energy projects. Through its mini-grant initiative CERTs awards funding (generally \$1000-\$5000) for sustainable energy projects across Minnesota.

For more information visit:

- www.cleanenergyresource.org

Minnesota's Six Initiative Foundations

Created by the McKnight Foundation in 1986, Minnesota's six regional initiative foundations work to promote increased economic stability throughout greater Minnesota. While these foundations are just one example of the many charitable foundations located throughout the state, they provide a strong regional presence in the areas they represent. These foundations coordinate smaller regional foundations, provide grants and loans to support economic development, and help small businesses (like farms) achieve greater economic stability.

While specific programs vary from region to region, these foundations are always worth investigating as an excellent source of project planning information. To find the Initiative Foundation that serves your area, visit:

- <http://www.mcknight.org/greatermn/index.aspx>

the
MINNESOTA
PROJECT

ADVANCING SUSTAINABILITY FOR COMMUNITIES ACROSS MINNESOTA

1885 University Avenue West
St. Paul, MN 55104-3462
651.645.6159
mnproject@mnproject.org
www.mnproject.org



Minnesota Department of Commerce
85 7th Place East, Suite 500
St. Paul, MN 55101
651.296.5175
Energy.info@state.mn.us
www.energy.mn.gov