9 Farm Energy

Resource Kit for Nova Scotia Farmers

Improving energy sustainability through energy efficiency, energy conservation and the adoption of renewable energy options can reduce farm operating costs. However, when it comes to energy, it is better to reduce than produce, and energy conservation is the first step towards energy sustainability. A reduction in energy use can decrease the size (and cost) requirement for a renewable energy system. Also, some energy conservation options are low to no cost.

Energy Conservation

Energy efficiency and energy conservation are terms that are often lumped together. Efficiency means using less energy to provide the same outcome whereas conservation usually means using less energy overall. For example, compact fluorescent lights (CFLs) use less power to provide light to a room than incandescent lights and are considered an efficient option, but turning off the lights conserves more energy overall. One of the best ways to determine how to reduce energy use is through an energy review.

Energy Review / Audit

An energy review/audit is a process to determine and document current farm energy usage (how much energy is used and where is it used). It can then lead to the identification of opportunities to reduce energy consumption and save money. There are different levels of reviews, from basic to detailed. Basic reviews may only include a walkthrough of your operation and identification of obvious energy savings opportunities. They may also include a review of utility bills, an inventory of equipment and the identification of feasible energy savings opportunities (how much money will be saved and what is the payback). A more detailed review may involve measuring energy use and determining not only cost effective opportunities but also how to implement them.

Energy reviews can cost anywhere from hundreds of dollars to thousands of dollars. Many farms start off with a basic review and then proceed with a more detailed review. There is funding available for energy reviews under the NS Farm Investment Fund and the NSPI Industrial and Commercial Custom Program (see **Funding** for more details).

There are many different professionals who can offer different levels of energy review services. Contact the Farm Energy Specialist with the Nova Scotia Department of Agriculture for more information on how to find the right professional for what you want (see **Who Can Help**).

When hiring an energy reviewer, it is important to consider the following:

- What will the review include and exclude?
- What will be included in the final report?
- How much will the review cost?
- What are the reviewer's qualifications (e.g. P.Eng.) and experience (e.g. agricultural)?

Opportunities on the Farm

The energy review report should provide information on where to save money and energy on the farm. Typical energy savings opportunities include lighting changes, efficient motors, controllers and insulation. However, feasible opportunities vary by farm type and farm size. Contact the Farm Energy Specialist with the Nova Scotia Department of Agriculture for more information on opportunities on the farm (see **Who Can Help**). There is also more information in the **Additional Resources** section.

Opportunities At Home

An EnerGuide home evaluation (audit) can help identify opportunities for the farmhouse. An EnerGuide audit can reduce home energy expenses through decreased electrical and heating fuel consumption and improved home comfort. The Province of Nova Scotia and Nova Scotia Power Inc. offer funding through this program for various home improvements, from insulation to solar heating (see **Funding** for more details).

Renewable Energy

Renewable energy is energy that can be replenished. Unlike fossil fuels, energy sources such as the sun and wind do not have a limited supply. Renewable energy can be used for many different uses such as heating, cooling, light, mechanical energy and power generation. Types of renewable energy include passive solar, solar air, solar water, photovoltaic solar panels, wind, heat pumps, anaerobic digestion, biomass, hydroelectric and tidal generation.

Whether a renewable energy option is feasible for your farm depends on your situation. In general, small and large scale solar heating (water or air) projects can be feasible for on-farm applications. Small-scale electrical generation, using wind or photovoltaic, is typically not economically feasible for on-grid applications. However, large scale wind may be feasible. A wind assessment (a feasibility assessment or a wind resource assessment) may be required to access funding.

There is a provincial net-metering policy that you should take into consideration if you are thinking of generating electricity to offset on-farm use and you are connected to the grid. A net meter records the difference between what you generate and what you use. Contact the Farm Energy Specialist with the Nova Scotia Department of Agriculture for more information (see **Who Can Help**).

Funding

There are a number of funding programs for energy conservation and renewable technologies for Nova Scotia farmers, all with their own eligibility requirements and levels of funding. The following are a few examples:

- The Programs and Business Risk Management Division, NS Department of Agriculture administers federal and provincial funding under the Farm Investment Fund (FIF). There is up to 50% funding assistance (up to $20,000/yr, $40,000 maximum, depending on gross farm income) for various energy conservation and renewable energy technologies for the farm. There is up to 75% federal funding (up to $2000) for energy reviews. Farms must have a completed Environmental Farm Plan (EFP) to receive funding for energy conservation items, but the EFP needs only to be initiated for most of the renewable technology items. *The minimum gross farm receipt eligibility requirement is waived for new entrants*. www.gov.ns.ca/agri/prm/programs/fifguide.shtml
- Nova Scotia Power Inc. provides up to 50% funding for measures that reduce electrical consumption under their Commercial and Industrial Custom Program. Funds available include up to $1000 for an audit, up to $15,000 for a feasibility study and up to $500,000 for implementation. The total project should save at least 20,000 kwh/yr. Typically, this program is for medium and large industrial customers, but any farm operation not billed on residential rates may qualify. *At least one year's worth of electrical billing data is required to participate in this program.* www.nspower.ca/cicustom

- Nova Scotia Power Inc. provides up to 80% funding for efficient lighting upgrades through the Small Business Lighting Solutions Program. A free lighting review is included in this program. This program is intended for businesses that use less than 300,000kwh/yr in electricity. www.nspower.ca/en/home/energysavings/programs/smallbusiness/default.aspx
- The ecoENERGY Retrofit Incentive for Industry is a federal program that provides an incentive of up to 25% ($50,000 max per application) to help small- and medium-sized industrial facilities implement energy-saving projects. This program runs until March 31, 2011. http://oee.nrcan.gc.ca/industrial/financial-assistance/retrofit/index.cfm
- EnerGuide for Houses program provides access to up to $1500 in provincial funds, as well as additional rebates from NSPI. As previously mentioned, it is a home energy audit program that costs about $150 (no cost for low income homes). The program is designed with energy efficiency improvements in mind, but NSPI has provided incentives for renewable energy (i.e. $2500 for Ground Source Heat Pumps and $1250 for Solar Water). www.conservens.ca/energuide/ www.nspower.ca/en/home/energysavings/programs/energuideexisting/default.aspx

A Renewable Energy Fact Sheet is available through the Nova Scotia Department of Agriculture describing even more funding options for renewable energy projects on the farm in Nova Scotia. www.gov.ns.ca/agri/rs/envman/pub.shtml

Who Can Help

There are many energy considerations and options and it can be confusing and difficult to determine what to do. There are specific eligibility requirements to access funding and many different technology choices when buying new or renovating/retrofitting. The Farm Energy Specialist is the main contact for Nova Scotia farmers for information on energy conservation/efficiency options, renewable energy options, energy audits, programs and funding. In particular, you should contact the Farm Energy Specialist before applying to the FIF for energy-related funding. Julie Bailey, P.Eng. is the Farm Energy Specialist and can be contacted at: tel: 902-896-4473; cell: 902-956-1734; e-mail: baileyja@gov.ns.ca

Additional Resources:

The Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) has many fact sheets on energy conservation and renewable energy generation:
www.omafra.gov.on.ca/english/engineer/con_energy.htm
www.omafra.gov.on.ca/english/engineer/energy.html

AgEnergy Co-operative and Firefly Energy have produced a document summarizing the results of several energy audits conducted on Ontario farms. The document, called "54 Energy Savings Technologies for Agriculture," lists a variety of energy-saving technologies, along with the estimated annual savings for each one:
www.farmenergyonline.com/
Click "Case Studies" and follow the link at the bottom of the webpage.

The Integration of Renewable Energy on farms (IRef) website is meant to be a one-stop shop for on-farm renewable energy information. It has technical information and online tools to help assess viability of renewable options. IReF was created in partnership with Natural Resources Canada (NRCan), Agriculture and Agri-Food Canada and more than 20 agricultural and energy organizations across Canada. The Canadian Federation of Agriculture currently administers the website.
www.farm-energy.ca/IReF/

[Written by Julie Bailey, Farm Energy Specialist, Nova Scotia Department of Agriculture, June 2010.]

157 College Rd.
Truro, NS
B2N 5E3

tel: (902)893-5649
fax: (902)893-2757
website: www.gov.ns.ca/thinkfarm