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**NORTHWEST SUSTAINABLE DAIRIES**

**ENERGY**

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## INTRODUCTION

Responsible use of energy sources, identifying energy conservation strategies, and developing new renewable and sustainable energy options are all high priority topics, whether it be in government circles, environmental groups, or in the dairy industry. The energy discussion also goes hand in hand with discussion about greenhouse gas emissions and the carbon footprint resulting from business operations or lifestyles.

Electrical energy use on dairy farms typically accounts for 2 to 5% of total production costs. Of that, milk production can account for 50 to 70% of this energy used on the farm. The majority of the electrical energy is used for milk collection, powering motors and vacuum pumps, and cooling milk. Dairies also use electricity to heat milking equipment wash water, ventilate animal housing areas, and light buildings.

Other energy uses on the farm include fuel and fertilizer. Fuel includes diesel, gasoline and natural gas. Diesel tractors are generally used on a daily basis for routine duties such as feeding, cleaning, bedding, handling manure, and working in fields. Natural gas can be used to heat water in lieu of electricity. In some cases, synthetic fertilizers can be used to supplement organic fertilizer sources. Since synthetic fertilizer is either from fossil fuels (nitrogen based) or mining (phosphorus based), the use of it increases the energy demand of a dairy farm and also can increase air emissions.

Northwest dairy farms also rely on renewable energy sources to power their operations. A few dairy farms in Oregon and Washington have invested in anaerobic digesters, collecting gas from manure and using it to generate electricity. Capturing what would otherwise result in greenhouse gas emissions and turning it into energy production benefits everyone.

Through *energy analysis*, *energy conservation*, *energy efficiency* and promotion of *renewable energy* sources, dairy farms can use energy efficiently, reduce the cost of doing business, conserve energy resources and benefit the environment.

This document details the commitment to responsible energy use on Northwest dairy farms.



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# ENERGY MANAGEMENT

**Guiding Principle:** Energy should be used responsibly on dairy farms, and opportunities to conserve energy or utilize renewable energy should be promoted.

## A. ENERGY ANALYSIS

**Expectation:** Dairy farm owners should complete an energy self assessment and/or an on-farm energy audit performed by a qualified individual.

**Background:** Energy analysis is the very first step towards reducing energy usage and the costs associated. Self assessments and/or energy audits can help identify effective ways to reduce energy use on the farm. Self assessments can be completed by using online calculators. Energy audits can be completed by hiring an independent, qualified third party. Either method will provide information about the current use of energy as well as estimate potential energy saving opportunities. Understanding the farm's energy helps make energy improvement decisions, such as upgrading equipment.

*Note: Self assessments of energy use on dairy farms can be completed by using one of the following online calculators: [144.92.31.19/conservation/dairy/default\\_dairy.aspx](http://144.92.31.19/conservation/dairy/default_dairy.aspx) and [energyexperts.org/](http://energyexperts.org/). An NRCS Energy Consumption Awareness Tool is available at [ahat.sc.egov.usda.gov/](http://ahat.sc.egov.usda.gov/).*

*Contact your local PUD or utility provider to determine if energy audits are available. Federal grant money is available to offset some energy upgrade costs from the Farm Bill and available through USDA.*

**Verification:** Check for completed self assessment and/or energy audit.

Finding ways to use energy efficiently and focus on energy conservation is important not only for general sustainability of agriculture, but can provide significant cost savings for dairies.

Energy analysis of current energy use can help identify potential energy savings and efficiency improvements.

Renewable energy opportunities exist for dairy farms. A few dairies in the Northwest already use anaerobic digesters to convert methane gas from manure into "green" electricity.



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## B. ENERGY CONSERVATION

**Expectation:** Dairy farms should promote energy efficiency through conservation practices.

**Background:** The easiest way to improve energy conservation practices may be to change current behavior. Behavior changes can include such things as turning off lights when they are not in use, using fuel-saving practices (i.e. reducing tractor idle time), cleaning and maintaining equipment, and applying fertilizers at appropriate, agronomic rates. Efforts should be made to make changes that will conserve energy.

*Note: For more information about on-farm energy use and conservation refer to the “Energy Savings Guide for Dairies”.*

*Verification:* Visit with manager(s).

## C. ENERGY EFFICIENCY

**Expectation:** Dairy farms should use energy efficiently through responsible use.

**Background:** Energy efficiency can go beyond basic conservation practices and emphasize the performance of normal activities while using minimal energy input. Cost savings is often found as a result of using more energy efficient equipment. Major efficiency improvements that may prove valuable on a dairy farm include the use of variable speed drives on vacuum pumps, in-line milk coolers, or scroll compressors. Other changes may be as simple as installing more efficient washing machines, water heaters, and lights. More efficient irrigation scheduling can reduce pumping energy use. Considering more efficient crop rotations and production systems can conserve nitrogen, tractor fuel, and other precursors to gas emissions.

*Note: To learn more about the equipment and technologies available to improve dairy farm energy efficiency refer to “Best Practices: Energy Savings for Your Dairy”. In addition, online self assessment calculators may be used to calculate potential energy savings with equipment upgrades.*

*Verification:* Visit with manager(s).



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## D. RENEWABLE ENERGY

**Expectation:** Dairy farms should consider renewable energy options when feasible.

**Background:** Renewable resources are those that can be naturally replenished. Northwest dairy farmers are actively looking for ways in which renewable energy production can be incorporated on the farm. Solar power is a feasible means to power an electric fence or a pump for livestock watering. Anaerobic digesters, a newer example of renewable energy being used on several Northwest dairy farms, capture methane gas from manure and use the gas to heat water or generate electricity. The byproduct from anaerobic digesters can be used as a good crop fertilizer with fewer odors than most dairy manure. Depending on their location, dairy farms can also use solar, wind, hydro, or geothermal energy for direct heating or to offset electricity use.

*Note: Information about renewable energy can be found in “Renewable Energy and Energy Efficiency: Opportunities for Oregon’s Agricultural Producers”.*

**Verification:** Visit with manager(s).



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## REFERENCES

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**For more information, please contact Northwest Sustainable Dairies ([www.northwestsustainabledairies.org](http://www.northwestsustainabledairies.org)).**

