

# FARM ENERGY CALCULATORS

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Farm energy calculators are planning tools designed to help producers save electrical energy, fuel or fossil fuel-based fertilizers. In this handout, you'll find links to several energy calculators on the internet.

Keep in mind that each of the tools described here has its own unique uses and limits. Check them out to see which might work for your operation.

## USDA-NRCS Energy Estimator: Nitrogen

This NRCS energy consumption tool enables you to calculate the cost of nitrogen product use on your farm or ranch by evaluating options based on user input.

<http://nfat.sc.egov.usda.gov>

## USDA-NRCS Energy Estimator: Tillage

This tool estimates diesel fuel use and costs in the production of key crops in your area and compares potential energy savings between conventional tillage and alternative tillage systems.

<http://ecat.sc.egov.usda.gov>

## USDA-NRCS Energy Estimator: Irrigation

This tool enables you to estimate the energy costs of pumping water for irrigation based on your specific crops, energy prices, and pumping requirements. It estimates energy savings from implementing a selection of system improvements.

<http://ipat.sc.egov.usda.gov>

## USDA-NRCS Energy Estimator: Animal Housing

This tool calculates energy use and costs associated with swine, poultry or dairy cow operations, including savings from more efficient lighting, ventilation, and heating systems for swine, poultry, and dairy cow housing. The tool also estimates savings for more efficient ways to cool milk, heat water, and harvest milk for a typical dairy.

<http://ahat.sc.egov.usda.gov>

## Oregon Tilth and Oregon State University, Fertilizer Calculator

This organic fertilizer calculator will help you choose soil amendments based on cost effectiveness and soil and crop requirements. The zip file download [556 K zip] includes the Microsoft Excel calculator and instructions. Note that there are several worksheets within the calculator.

[www.tilth.org/Resources/index.html](http://www.tilth.org/Resources/index.html)

## Alliant Energy, Farm Energy Audit

This calculator estimates the electric energy use of farm equipment and appliances. The calculator also recommends energy-saving alternatives and estimates potential savings. Additional calculators from Alliant Energy analyze potential savings for: Electric Motors, Grain Dryers, Heat Reclaimers, Irrigation Systems, Lighting Equipment, Milking Equipment, Scroll Compressors, and Ventilation Systems.

<http://alliantenergy.com/docs/groups/public/documents/pub/p010003.hcsp>



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### **Farm Assessment Toolkit**

Developed jointly by the University of Wisconsin Extension and Focus on Energy, this on-line toolkit assesses your farm operation's energy efficiency, identifies areas for improvement, and suggests energy efficient equipment and management options.

[www.soils.wisc.edu/foe/login](http://www.soils.wisc.edu/foe/login)

### **Wisconsin Public Service Corporation, Savings Calculators for Farms**

These calculators estimate savings from installing energy efficient equipment for these specific applications: Tractor Engine Block Heaters, Vacuum Pumps, Ventilation Systems, and Milk Precoolers.

[www.wisconsinpublicservice.com/farm/calculators.asp](http://www.wisconsinpublicservice.com/farm/calculators.asp)

### **Montana State University Farm Energy Calculator**

This energy calculator helps Montana dryland grain farmers examine the costs and energy used in three different tillage systems and for a range of different crops: winter wheat, spring wheat, barley, canola, flax, lentils and camelina. In addition to the crop acres, some summer fallowed acres must be included in the crop mix. This calculator also helps farmers compare the costs of biodiesel and ethanol to petroleum diesel. This complex tool is a work in progress. Dr. Duane Griffith of MSU, the author, welcomes comments to make it an even more useful calculator.

[www.montana.edu/extensionecon/software/CropMixTillageEnergyPriceBioD.swf](http://www.montana.edu/extensionecon/software/CropMixTillageEnergyPriceBioD.swf)

### **Central Iowa Power Cooperative, Average Farm Energy Calculator**

This calculator allows you to input the types of electrical equipment you use on your farm and provides typical monthly electric use. The calculator lists ways to save energy, specific to your equipment.

[www.cipco.org/energyFarm.asp](http://www.cipco.org/energyFarm.asp)

### **Genesis Energy, Dairy Energy Calculator**

"Changes to water heating, milking systems, milk chilling and lighting can all help reduce costs. Use our Dairy Efficiency Calculator to enter your farm details and evaluate your saving opportunities."

[www.dairysavings.co.nz](http://www.dairysavings.co.nz)

### **DLtech, Inc., Dairy Farm Energy Calculators**

This page includes milk harvesting, milk cooling, lighting, ventilation and equipment calculators. These calculators complement DLtech's Dairy Farm Energy Management Guide, which discusses how to effectively manage energy costs.

[www.dairyfarmenergy.com/Chapter\\_PDFs/Calculators.doc](http://www.dairyfarmenergy.com/Chapter_PDFs/Calculators.doc)



## **GENERAL FARM-RELATED CALCULATORS**

### **Alberta Agriculture, Food & Rural Development**

A large selection of agricultural calculators including a fertilizer cost estimator and a farm machinery calculator, among many others.

[www.agric.gov.ab.ca/app19/calc/index.jsp?type=Crop](http://www.agric.gov.ab.ca/app19/calc/index.jsp?type=Crop)

### **Natural Resources Conservation Service, Tools by Landuse**

A large list of planning tools and spreadsheets including fuel use estimators, various irrigation system cost tools, and fencing cost calculators, among many others.

[www.economics.nrcs.usda.gov/technical/tools/index.html#Irrigation](http://www.economics.nrcs.usda.gov/technical/tools/index.html#Irrigation)

### **Martindale's Calculators Online Center: Agriculture**

This website includes an extensive collection of on-line calculators and design tools, including many with relevance to farm energy usage.

[www.martindalecenter.com/Calculators1\\_2\\_A.html](http://www.martindalecenter.com/Calculators1_2_A.html)



## WIND ENERGY CALCULATORS

### National Renewable Energy Laboratory, Wind Energy Finance Calculator

This online tool, developed for the National Renewable Energy Laboratory, uses wind and power data entered by the user to calculate a wind project's capacity factor. WEF provides quick, detailed economic evaluation of potential utility-scale wind energy projects.

<http://analysis.nrel.gov/windfinance/login.asp>

### Windustry Wind Project Calculator

This spreadsheet was developed to assist farm owners and operators in evaluating the economics of installing a wind turbine on their farms to provide electricity for the farm and home. The program will estimate the cash flows for investing in a wind turbine and the rate of return on the cash investments. This is a Microsoft Excel spreadsheet that uses macros.

[www.windustry.com/calculator/default.htm](http://www.windustry.com/calculator/default.htm)

### Iowa Energy Center – Wind Turbine Output Calculator

This calculator allows you to estimate wind output for a number of turbine types and sizes for selected counties in Iowa during various times of the year.

[www.energy.iastate.edu/renewable/wind/assessment/](http://www.energy.iastate.edu/renewable/wind/assessment/)

### RETScreen International Wind Energy Project Model

The RETScreen Wind Energy Project Model can be used world-wide to evaluate the energy production, life-cycle costs and greenhouse gas emissions reduction for central-grid, isolated-grid and off-grid wind energy projects, ranging in size from large scale multi-turbine wind farms to small scale single-turbine wind-diesel hybrid systems.

[www.retscreen.net/ang/g\\_win.php](http://www.retscreen.net/ang/g_win.php)

### Wind Powering America – Job and Economic Development Impact (JEDI) Model

The Job and Economic Development Impact (JEDI) model is an easy-to-use model to analyze the economic impacts of constructing and operating wind power plants. Users enter basic information about a wind project (including the state location, the year of construction, and the size of the facility) to determine project cost (i.e., specific expenditures) and the income

(i.e., wages and salary), economic activity, and number of jobs that will accrue to the state (or local region) from the project. To the extent the user has and can incorporate project-specific data and the share of spending that is expected to occur locally (a critical input), the more localized the impact analysis will be.

[www.eere.energy.gov/windandhydro/windpoweringamerica/filter\\_detail.asp?itemid=707](http://www.eere.energy.gov/windandhydro/windpoweringamerica/filter_detail.asp?itemid=707)

## SOLAR ENERGY CALCULATORS

### National Renewable Energy Laboratory, PV Watts

Researchers at the National Renewable Energy Laboratory developed PVWATTS to permit non-experts to quickly obtain performance estimates for grid-connected PV systems. Version 2 can be run for locations within the 48 Contiguous States, Alaska and Hawaii.

<http://rredc.nrel.gov/solar/calculators/PVWATTS/version2/#directions>

## GENERAL ENERGY CALCULATORS

### National Renewable Energy Laboratory

This page contains links to four calculators developed by NREL including a Renewable Energy Conversion Calculator, a Renewable Energy Growth Estimator, a PV Land Area Estimator and a Wind Power Land Area Estimator.

[www.nrel.gov/analysis/power\\_databook\\_3ed/calculators.html](http://www.nrel.gov/analysis/power_databook_3ed/calculators.html)

### Alliant Energy, Energy Efficiency Calculators

A list of energy efficiency calculators for residential, small business, commercial and industrial equipment that includes air conditioning and lighting calculators

[www.alliantenergy.com/docs/groups/public/documents/pub/p013446.hcsp](http://www.alliantenergy.com/docs/groups/public/documents/pub/p013446.hcsp)

### Texas State Energy Conservation Office, Energy Calculators and Software

This site includes a PV system economics calculator, a solar water heating calculator, and two greenhouse gas pollution calculators.



[www.infinitepower.org/calculators.htm](http://www.infinitepower.org/calculators.htm)

#### **USDA Fuel Value Calculator**

The Fuel Value Calculator is a tool that can be used to compare typical unit costs of various fuels including wood, natural gas, electricity, switchgrass and propane, among others.

[www.fpl.fs.fed.us/documnts/techline/fuel\\_value\\_calculator.pdf](http://www.fpl.fs.fed.us/documnts/techline/fuel_value_calculator.pdf)

#### **Penn State Energy Cost Calculator**

Energy Cost Calculator is an Excel spreadsheet with two worksheets. On the first worksheet, Energy Costs, you need to enter the costs in Column E for the various fuels in your area. If you do not know the price of some of the fuels, just use the numbers that are already listed.

<http://energy.cas.psu.edu/costcomparator.html>

#### **Agriculture Cost Estimator**

The Agriculture Cost Estimator allows you to quickly compare the costs of using propane gas to the cost of using other energy sources in your operation for grain drying and irrigation pumping.

[www.agweb.com/Propane\\_Calc.aspx](http://www.agweb.com/Propane_Calc.aspx)

#### **University of Vermont, Energy Cost Calculator**

This calculator developed by the University of Vermont allows you to adjust fuel prices to determine the cost per million BTU. It also provides the energy content and heat conversion efficiency information for varying fuels.

[www.uvm.edu/~uvmext/energy/costcalculator.xls](http://www.uvm.edu/~uvmext/energy/costcalculator.xls)