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Farm Energy: Tracking the energy use on your farm

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FARM ENERGY

Tracking the energy use on your farm

You receive your energy bills. You read information about the importance of saving energy. You follow the tips to reduce energy use and costs. But how do you really measure your efforts? You might want to consider using an energy log. This is an easy and inexpensive method of tracking your energy use, studying costs, and comparing use and costs from month to month. We have provided a simple form ([energy log](#)) that you can download for use with Excel™, or simply print the log and enter by hand.



How do I use an energy log?

This is a simple format. For the more advanced user, rows and formulas can be added to customize your energy log.

Electricity

From your electric utility bill, enter the number of kWh used and your total cost for electricity. The form will automatically calculate your cost per kWh.

Diesel, gasoline, propane

Depending on the time of year and the amount used, you may not enter information for every month. Keep it simple. Only enter this information when you receive a bill. At that point, you can record gallons used and total cost. The Excel sheet will calculate your price per gallon for you.

Natural gas

Many farms are not on a natural gas line. This item may not be relevant to your farm. If you are a natural gas customer, record your use similar to electricity. Enter the cubic feet and the cost.

Total energy cost

Your monthly total energy cost will automatically be calculated. To the far right of this form, year-end total use and cost for each energy input will also be calculated.

Where do I find this information?

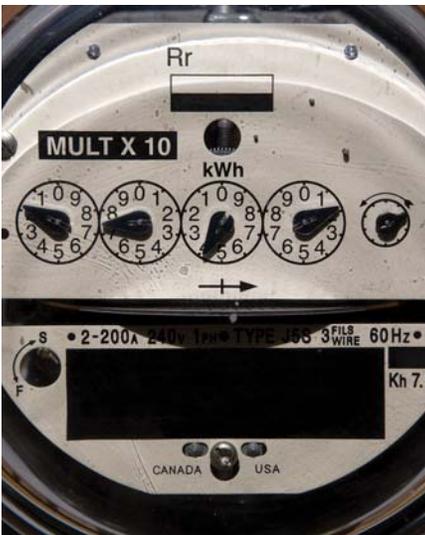
This might be a good time to review the materials provided by your utility companies on "how to read your bill." Contact your local provider with any questions regarding your bill or for help with reading your bill in order to find the information necessary for the energy log.

	January	February	March	Total
Electricity				
kWh	4750	4314	4980	14044
price per kWh	\$0.1000	\$0.0948	\$0.0900	
Total electric cost	\$475	\$409	\$448	\$1,332
Diesel				
gallons		892		892
price per gallon		\$2.35		
Total diesel cost		\$2,096		\$2,096
Gasoline				
gallons				
price per gallon				
Total gasoline cost				
Propane				
gallons	613		834	1447
price per gallon	\$1.30		\$1.22	
Total propane cost	\$796		\$ 1,017	\$1,813
Natural gas				
cubic feet				
price per cubic feet				
Total natural gas cost				
TOTAL ENERGY COST	\$1,271	\$2,505	\$1,465	\$5,241



How much electricity DOES it use?

Although it's relatively easy to relate diesel or propane with a specific use such as tillage or crop drying, subdividing the total kilowatt hours (kWh) you used as listed on a monthly bill can be more challenging. What does leaving your lights on all day cost? How much does that fan motor use? The answers to these questions can be found pretty simply if you have some basic information. First of all, what is the wattage rating (W) of the item? Light bulbs generally have the wattage rating stamped on them. Other items, such as motors, can generally be assumed to use about 1 kW (1000 watts) per horsepower (hp). The other critical information needed is how long it is used.



Swine – Example 1

As an example, your 1200 head swine finishing barn has fifty-six 100 W incandescent lights. Your normal practice is to turn the lights on when you enter the building at 7 am and turn them off after checking pigs in the evening at 5 pm. Your total electric usage is 4750 kWh for the month at a cost of \$.10 per kWh. How much of this is due to the lights?

The basic equation is: kW x hours = kWh

Power usage = 56 lights x 100 W/light = 5600 W or 5.6 kW

On time = 7 am to 5 pm = 10 hours per day

Monthly usage = 5.6 kW x 10 hrs/day x 30 days/month = 1680 kWh

Monthly cost = 1680 kWh x \$.10/kWh = \$168/month

An additional 3070 kWh (= 4750 kWh – 1680 kWh) are being used by other electrical devices. If you decided to try to cut back by only using the lights one hour in the morning, and one hour in the evening, how much could be saved?

Monthly usage = 5.6 kW x 2 hrs/day x 30 days/month = 336 kWh

Savings = 1680 kWh – 336 kWh = 1344 kWh or \$134.40/month



Grain Drying – Example 2

Hours of "on" time for electric motors can be approximated to help sub-divide electrical usage. For example, a 20 hp motor on a grain drying fan is estimated to operate 15 hr/day for 24 days during a monthly billing period.

Power usage = 20 hp x 1kW/hp = 20 kW

On time = 15 hrs/day x 24 days = 360 hrs

Usage during the month = 20 kW x 360 hrs = 7200 kWh x .10 kWh = \$720/month



Fans – Example 3

If a minimum ventilation fan with a ½ hp motor runs continuously, what is the monthly electrical usage?

Power usage = ½ hp x 1 kW/hp = 0.5 kW

On time = 24 hrs/day x 30 days = 720 hrs

Monthly usage = 0.5 kW x 720 hrs = 360 kWh

Monthly cost = 360 kWh x \$.10/kWh = \$36/ month

Prepared by Mark Hanna, extension ag engineer; Jay Harmon, professor, ag and biosystems engineering; and Jane Flammang, program coordinator, Farm Energy Conservation and Efficiency Initiative; Iowa State University Extension. Sponsored by the Iowa Energy Center.

... and justice for all

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