

Energy Conservation: Impact on the Bottom Line

What is an Energy Audit?

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What is a Farm Energy Audit?

A Farm Energy Audit is an essential management tool in developing a comprehensive energy plan for your farm or rural business.

- It can pinpoint areas for **reducing energy costs** and energy use.
- It helps **prioritize implementation projects** based on energy efficiency improvements, payback period, capital outlay or implementation duration and complexity.
- A farm energy audit can also **improve operational efficiency** as well as identify potential areas for renewable energy application.
- Certified Farm Energy Audits are required for participation in **State, Federal and Utility energy efficiency programs**.

Farm Energy Audit Standards

Not All Audits Are The Same

Energy Audits

1. Farm/Rural Business Energy Audit (PE, CEM, State Certified Auditor)

ANSI/ASABE S612 (July 2009) – level I & level II

Type 1 Audit: An evaluation and report of farm enterprise energy use that considers, at a minimum, the major activities. A Type 1 Audit is not required to address individual components.

Type 2 Audit A more detailed evaluation and report of farm enterprise energy use that considers all major activities and components, as applicable.

2. Industrial/Commercial Energy Audit (PE, CEM)

Industry Standards – level I, II, III

3. Home/Residential Energy Audit

BPI, RESNET, Homeworks w/ Energy Star

Expectations On Our Energy Audits

An energy audit is an important management tool. However, implementation of the recommended ECM's to save energy or increase productivity is the ultimate goal.

It integrates mgmt.'s preferences and uses a “whole enterprise” approach in developing ECM's or operational adjustments.

An energy audit must be conducted “with eyes on-site” by the certified auditor. Remote auditing via surveys/questionnaires or third party representatives (despite training) does not adequately capture the management and operational/situational uniqueness inherent in all enterprises.

We strive to develop energy audits that attain type 2 level standards based on the ASABE and ANSI S612 standards for farm energy audits.

Integration of Federal, State and Utility funding options. Auditor and farmer feedback.

Energy Conservation Measures - sample

Description	Existing Usage (kWh)	Existing Energy Costs	Energy Savings (MMBtu)	Energy Savings (kWh)	Annual Cost Savings	Costs to Implement	Payback (Years)	Comments
Lighting								
Heifer Hoop Barn	1,734	\$250	4.7	1,388	\$200	\$300	1.5	With timers
Exterior Lights	4,335	\$624	8.9	2605	\$375	\$750	2.0	5 lights
E-W Free Stall Barn	11,869	\$1,711	20.2	5930	\$854	\$180	<1	Long-day lighting
N-S Free Stall Barn	7,919	\$1,140	13.5	3959	\$570	\$120	<1	Long-day lighting
Lighting Subtotal	25,857	\$3,725	47.4	13,888	\$1,999	\$1,350	1.5	
Milk Rec Pump - VSD			28.7	8,400	\$1,210	\$5,300	4.4	
Block Heater	1,080	\$156	2.6	810	\$117	\$20	<1	
Pre-cooler Water Reuse						\$1,000	< 1	EQUIP \$5,872
Total	26,937	\$3,881	78.8	23,098	\$3,326	\$7,670	2.3	

Farm Energy Audit Process



Certified Farm Energy Audit

Confidential Certified Energy Audit Report

Alternative Energy

Anaerobic digesters
Biomass
Geothermal
Wind
CHP

Set priorities & implement suggestions

Certified Energy Audits (ASABE S612)

Professional Engineer (PE)

Certified Energy Manager (CEM)

State Certified Farm Energy Auditor

USDA-NRCS Technical Service Provider

Not all audits are the same.

Selling Points For A Type 2 Farm or Rural Business Energy Audit

Selling Point #1:

Reduced Energy
Costs/Increased Profits



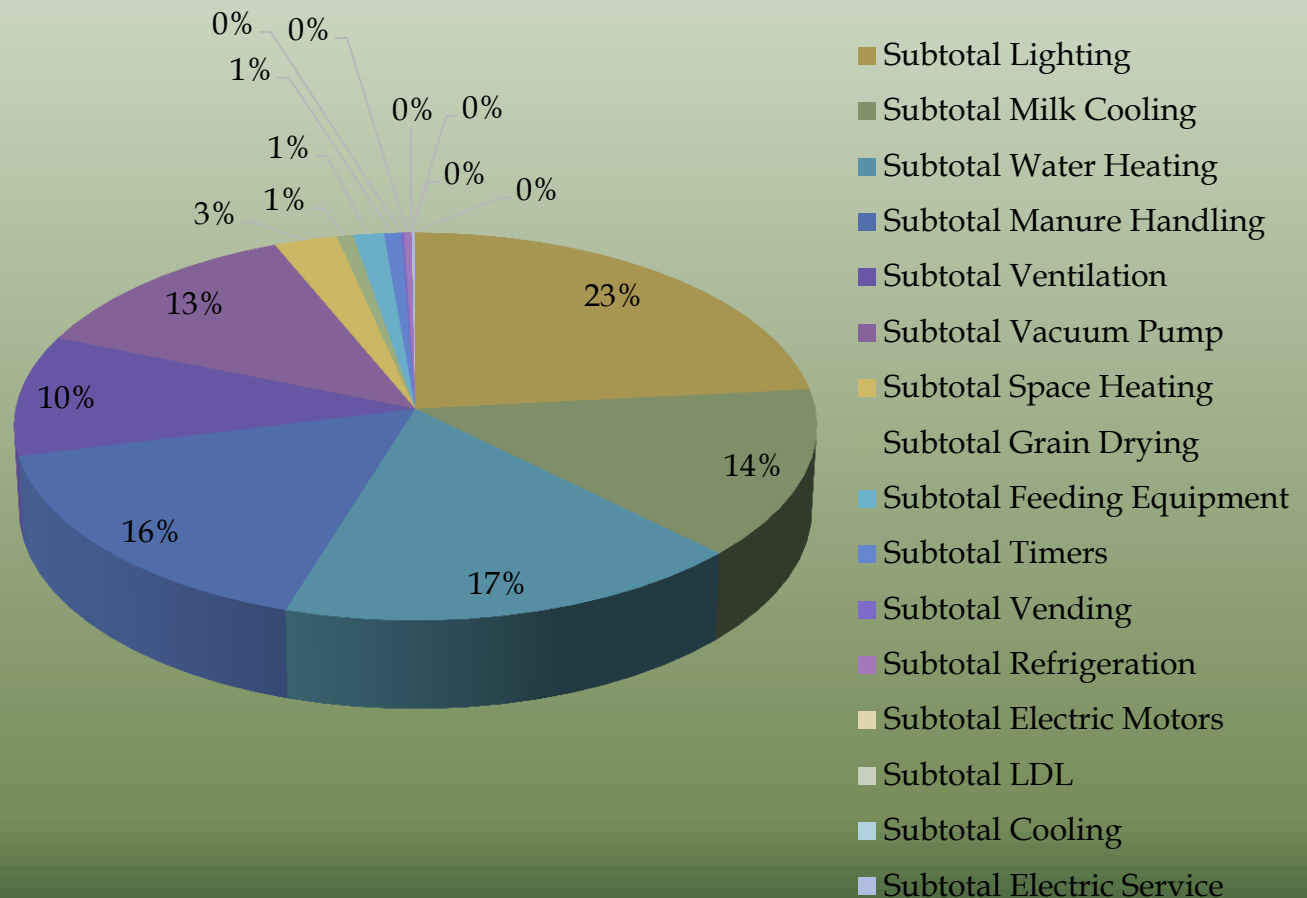
Energy Savings across Enterprises

Type	TOTAL # of Audits	Energy Used (kWh/yr)	Energy Saved (kWh/yr)	% Savings	Cash Savings (\$/yr)	Implementation Cost (\$)	Payback (years)
Greenhouse	23	52,468,438	20,360,909	39%	\$766,843	\$2,876,720	3.8
Grain Dryers	29	19,584,310	6,943,806	35%	\$454,958	\$3,620,927	8.0
Dairy Farms	106	16,757,061	8,155,051	49%	\$871,635	\$2,314,633	2.7
Rural Business	24	33,038,866	12,530,249	38%	\$642,638	\$1,389,679	2.2
Food Processing and Market	21	3,535,414	1,282,559	36%	\$175,551	\$852,108	4.9
Hogs	3	696,536	161,135	23%	\$14,235	\$48,623	3.4
Poultry	1	331,149	725,641	219%	\$29,826	\$119,979	4.0
Beef	3	57,079	28,187	49%	\$3,782	\$14,357	3.8
Crops	6	305,351	125,097	41%	\$42,850	\$93,319	2.2
Irrigation	9	2,327,465	1,708,715	73%	\$130,558	\$504,954	3.9
TOTAL AUDITS	225	129,101,669	52,021,350	40%	\$3,132,877	\$11,835,299	3.8

Energy Savings in MI Dairy

Energy audits on 106 Michigan dairy farms from 2010 to 2013 shows a potential energy efficiency savings of 49% of over \$8,223 annually. Additional saving from reduced fossil fuel use can be further achieved with the incorporation of alternative energy options.

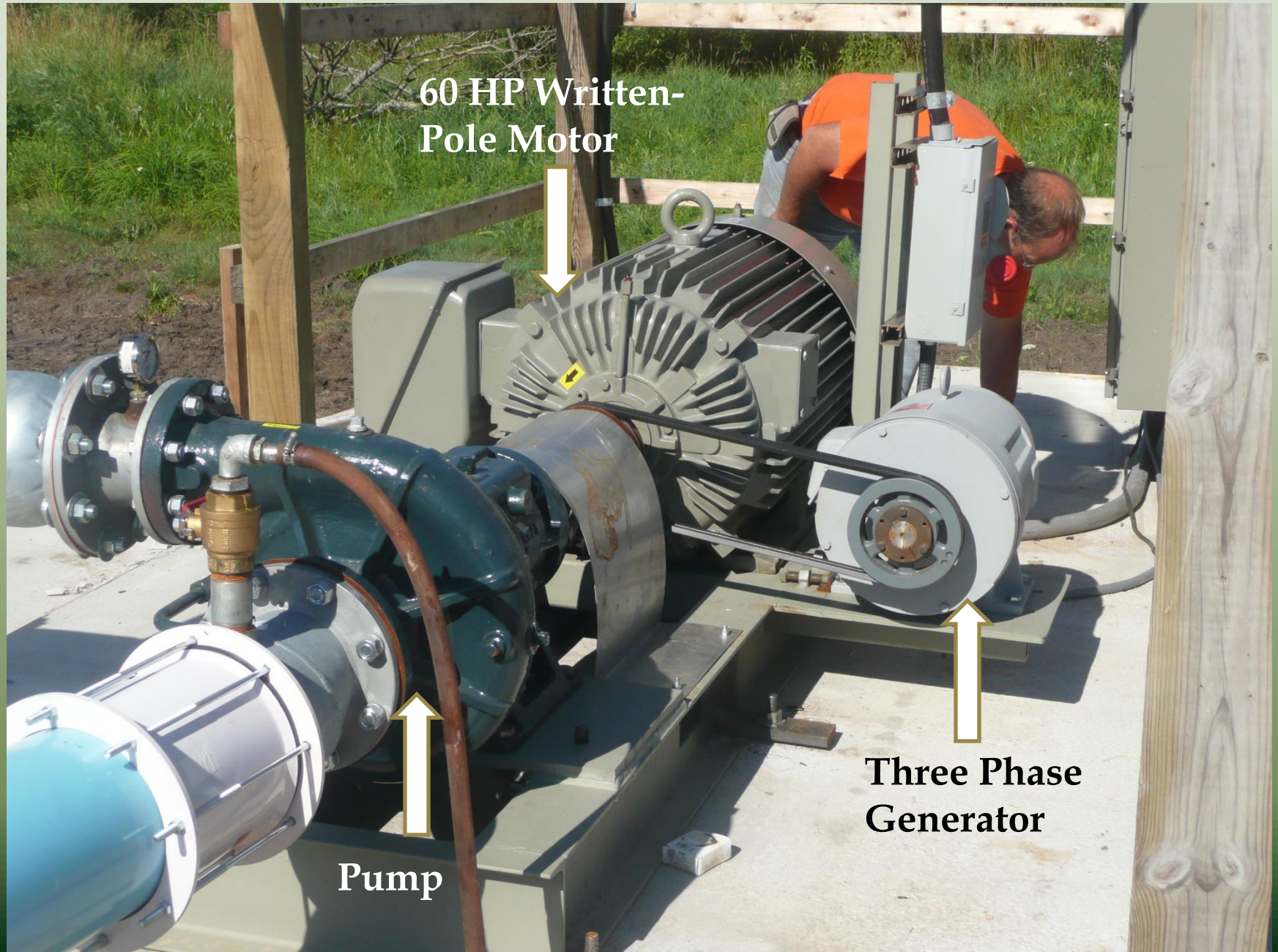
Dairy Farm Energy Savings



Selling Point #2:

Operations Solutions by
auditors who understand the
farm operations.

Written- Pole Motors



60 HP Written-
Pole Motor



Three Phase
Generator

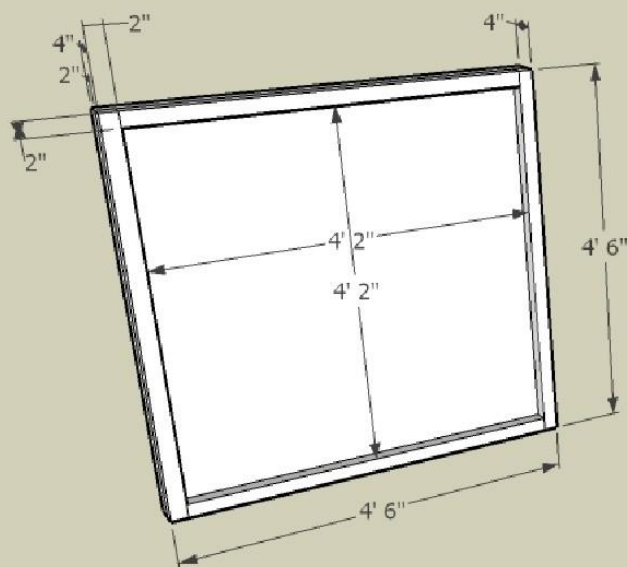


Pump

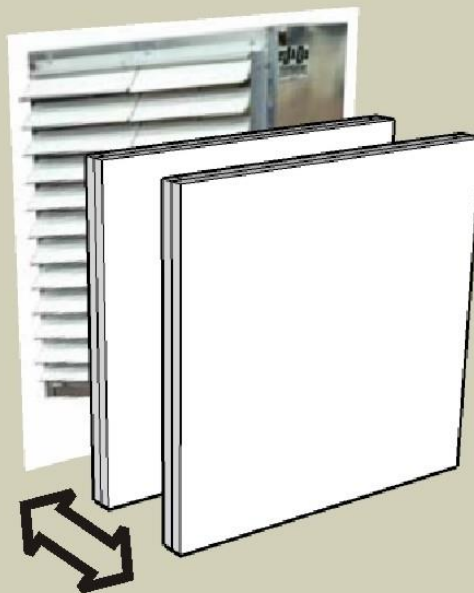


Ventilation Vent Caps

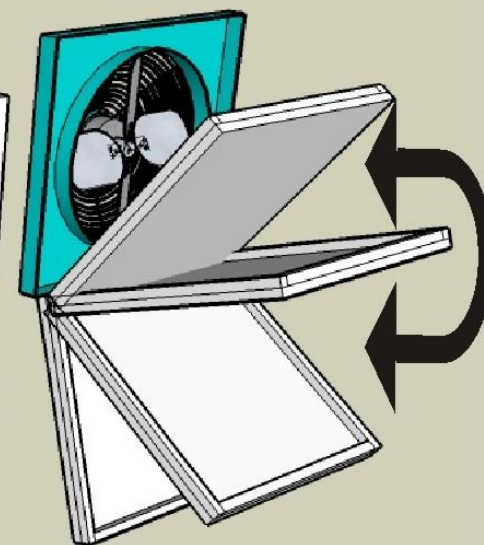
Hardened-removal insulated fan-vent caps



Stock and
Custom sizes



Push on
To Latch



Flip up-down hinge
with Snap latch

Overheating motor on ventilation fan



The motor on the left ventilation fan was leaking oil and operating at 19.5°F greater than normal.

Selling Point #3:

Financially Options
to Ease the Burden

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Efficiency/ Renewable Energy Funding

- USDA-REAP
- USDA-NRCS
- DOE/State Energy Agencies
- University Programs/Extension
- Utility Companies and Electric Coops
- State Agencies

Selling Point #4:

Reduce the Operation's
Carbon Foot Print and Be
Environmentally Responsive



MICHIGAN FARM ENERGY AUDIT PROGRAM

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