

FOCUS ON ENERGY



ENERGY SAVINGS ASSESSMENTS – FOCUS ON ENERGY PARTNERSHIP WITH US DEPARTMENT OF ENERGY

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Large Energy Users Program

Industrial Energy Efficiency/CHP

October 24, 2014



focus on energy™

Partnering with Wisconsin utilities

OVERVIEW - WisconSEN

Save
ENERGY
Now



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Partnering with Wisconsin utilities



What's the connection?

- Focus on Energy
- WisconSEN
- Participant survey



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WHAT IS FOCUS ON ENERGY?

Wisconsin utilities' statewide program for energy efficiency and renewable energy



Partnership of Wisconsin's investor- and municipally-owned utilities, and most electric cooperatives

One statewide energy efficiency and renewable energy program

PROGRAMS FOR MANUFACTURERS

Business Incentive Program

- Wisconsin Businesses with peak monthly electric demand of **up to 1000 kW**
 - Cabinet and Furniture Makers
 - Custom Manufacturers
 - Maintenance Shops
 - Metal Fabricators
 - Agribusinesses
 - Machine Shops
 - Sawmills



PROGRAMS FOR MANUFACTURERS

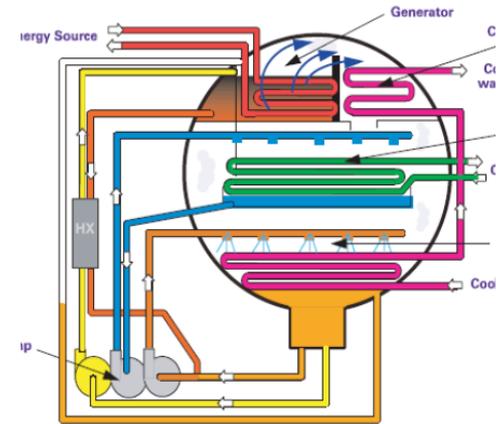
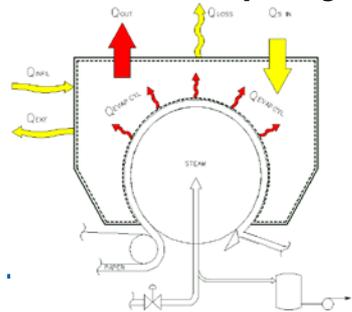
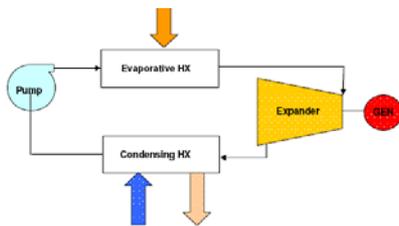
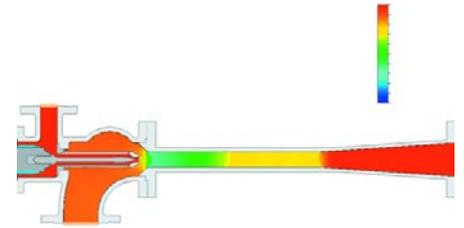
Large Energy User Program

- Wisconsin businesses with peak monthly electric demand >1000 kW , or natural gas >100,000 Therms, or combined monthly energy utility bills >\$60,000
 - Pulp and Paper
 - Metal Casters
 - Plastics Processors
 - Food Processors
 - Ethanol Plants
 - Water and Waste Water



WHAT DOES LEUP OFFER MANUFACTURERS?

- Experienced, credible, unbiased expertise to reduce technical risk
- Savings and payback calculations
- Project approval support (internal and Program)
- Practical Energy Management[®] training and Energy Team facilitation
- Financial incentives to buy down project costs
- Cost-share incentives to flesh out project details



FINANCIAL INCENTIVE TYPES

- **Standard “Prescriptive”** – incentives vary by technology and apply deemed savings
- **Custom** – incentives are formula-based (energy savings, payback limits, project cost limits, customer cap)



- **RFP** – annual, targeted markets, stretch custom limits, distinct need
- **Project Assessment** - 50% cost share, performance-based
- **Special financing** – positive cash-flow

FOCUS ON ENERGY ADVISORS



- Energy Advisor is primary Program contact for Large Energy Users
- Support of energy management through:
 - KPI/baseline
 - Energy Management Plan
 - Energy Team facilitation
 - On-site, immediate technical support
 - Incentive application support

FOCUS ON ENERGY ADVISOR OUTREACH

Direct contact by Energy Advisors of customers, utility Key Account Representatives, and Trade Allies is LEUP's key strategy

Through August 2014	Contacts
Energy Team	152
Site Assessment	154
Project Development	3545
Other Outreach	1438
Grant Administration	1052
Total	6341



PROGRESS ON LEUP GOALS - 2014

More than 350 of the 750 LEUP-eligible customers have participated in 2014, to date.

	YTD Total	Target
Incentives	\$9 million	\$12 million
MW	14.25	13.40
Lifecycle kWh	1,420 million	1,210 million
Lifecycle Therms	140 million	147.6 million



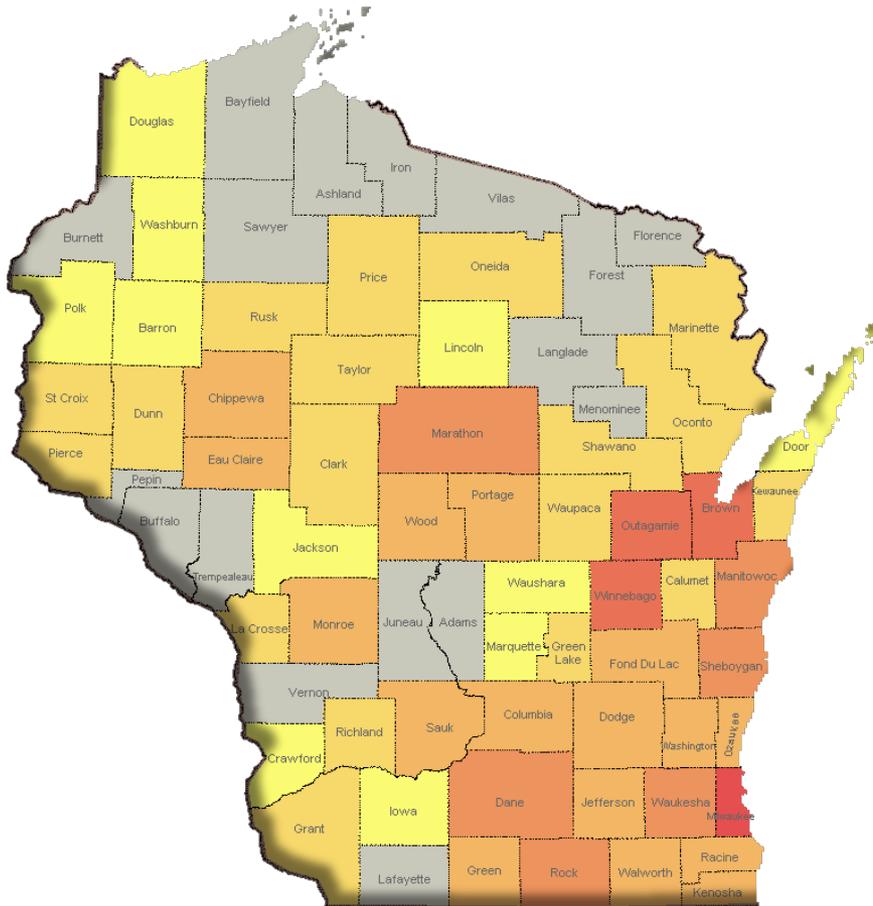
LEUP PROJECT DISTRIBUTION

2014 LEUP Participation

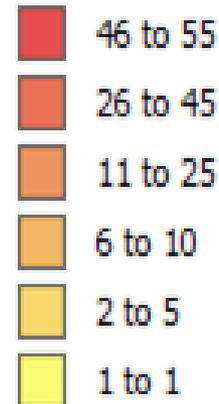
>350 customers

~500 customer facilities

>1,400 projects



2014 Participating Customer Sites



LEUP participation – Customer Base

More than 400
eligible
participants since
start
(750 eligible)

Customer Sector	Partic	Non-part	Total LEUP	Partic %
General Industrial	77	74	151	51%
Dairy/ Food Proc	65	37	102	64%
Healthcare	42	56	98	43%
P&P/ For Prod	54	24	78	69%
Metal Cast / Heat Treat	47	22	69	68%
Commercial (Offices)	20	34	54	37%
Plastics/Chemical	22	25	47	47%
Constr/ Mining / Trans	18	17	35	51%
Inst'l (Colleges, Fed)	18	10	28	64%
Energy	7	15	22	32%
Printing	9	11	20	45%
WWTF	10	9	19	53%
Pharma / Electronics	8	7	15	53%
TOTALS	397	341	738	53.8%



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STRATEGIC ENERGY MANAGEMENT (SEM) PILOT

- **Seven Large Energy Users committed to SEM Leaders Pilot**
- **Customized assistance to help companies upgrade their energy management plans**
 - Energy Performance Indicators (EPIs)
 - Project incentives
 - Metering and development of baseline energy use model
 - EPI progress tracking
- **Currently designing the 2015 initiative**
- **LEUP is seeking 30 SEM 2015 participants**

WisconSEN – Wisconsin Save Energy Now!

- US DOE award to Wisconsin State Energy Office and SAIC (Leidos)
- Best Practice support to large energy users from 2010 to 2013
- Leveraged to support Focus on Energy activities

WisconSEN – FOCUS ON ENERGY PARTNERSHIP

2006-2010

- Over 100 ESAs with Focus on Energy cost-share

2010-2013

- Multi-year contract with Wisconsin's State Energy Office
- U.S. DOE grant – ARRA funds
- Deliverables
 - 50 ESAs– cost-shared with Focus on Energy
 - Superior Energy Performance
 - Emerging Technologies
 - Best Practice Training

FOCUS ON ENERGY VALUE - WisconSEN

- Enhance expert technical support to customers
- Increase in-plant technical capacity
- Lower customers' technical barriers
- Leverage Program energy savings
 - Incentivize cost-effective projects
 - Identify no/low cost claimable savings



ENERGY SAVINGS ASSESSMENTS PROCESS

- Recruited and selected high quality candidates
- Arranged facility visits by U.S.DOE Certified Experts
- 3-day, on-site evaluation/training + written report
- Critical industrial systems



Multi-technology	21
Compressed Air	11
Process Heat	10
Steam	4
Fans/Blowers	3
Pumps	1



ESA RECOMMENDATIONS

Each ESA Report has 5 to 10 recommendations



Measure Description	Savings (\$)	Electric Savings	Therm Savings	Installed Cost	Payback	Incentive Available
1. Heat melt furnace charge just before charging furnace	\$12,550	43,500 kWh	20,900	<\$3,000	3 Mo	No
2. Manage off-peak power use to reduce annual demand charge	\$12,000	0 kWh/ 700 kW	---	-	Immediate	No
3. Maximize off-peak metal melting	\$8,700	0 kWh/ 60 kW	---	-	Immediate	No
4. Change from 2,500 LB charges to 3,700 LB charges as standard practice	\$8,600	192,500 kWh	---	-	Immediate	No
5. Reduce cost of AO system cabinet cooler operation	\$1,000	1,370 kWh/ 3 kW	---	\$2,000	2 Yr	Yes
6. Install cooling water on/off solenoid valve on backup air compressor	\$3,800	---	---	<\$200	1 Mo	No
7. Install temperature controlled discharge valve on 75 HP VFD air compressor	\$1,000	---	---	<\$200	3 Mo	No
8. Control melt furnace demand to whole plant demand metering	\$9,600	0 kWh/ 100 kW	---	\$20,000	2 Yr	No
9. Use #5 air compressor cooling water to preheat winter make-up air	\$4,600	-6,750 kWh/ -2 kW	6,750	\$14,000	3 Yr	Yes
10. Install a VFD on the melt furnace cooling pump	\$2,900	39,000 kWh 6 kW	---	\$6,000	2 Yr	Yes
11. Recover heat in the winter from the furnace cooling water	\$4,900	-18,000 kWh -3 kW	13,350	\$15,000	3 Yr	Yes
TOTALS	\$69,000	257,000	41,000	\$61,000	1 Yr	---

RESULTS – ESA RECOMMENDATIONS

Identified Benefits

MW	kWh	Therms	Savings(\$)	CO ₂ (MT)
8.3	52,150,000	4,464,162	\$5,925,000	80,500

- Typically, about 20% of recommendations are implemented
- Some recommendations are not feasible for customer
- Project cycle often requires several years
- Actual projects often vary from recommendations and may be difficult to recognize

ESA PARTICIPANT SURVEY

- **Firm characteristics**
 - Energy management features (team, budget, meetings, corporate mandate, utility interaction, allies, Focus participation, etc.)
- **Energy efficiency investment decision-making**
 - Energy priority
 - Who makes decisions
 - Capital budget cycle
- **Progress on ESA recommendations**
 - Status
 - Specific barriers encountered
 - Additional needs
 - Factors leading to success

ESA PARTICIPANTS SURVEY - BARRIERS

What are the current barriers to your energy project development?

- Initial cost is too high
- Project payback is too long
- Budget for non-production related investment is limited
- Severe competition for internal capital
- Unable to get sufficient external financing
- Cannot carry additional finance projects on our books
- Lack internal expertise to manage energy projects
- External expertise is insufficient or too expensive
- Insufficient staff time to lead and manage projects
- Proposed technology seems too risky
- Threats to production (interruptions, product quality)
- Poor timing/responsiveness with respect to our planning cycle
- Current business conditions for our industry are not optimistic enough
- Other?

ESA PARTICIPANTS SURVEY - BARRIERS

What additional business factors would you need to get your projects implemented?

- Higher confidence in savings estimates
- Equipment specifications from business ally
- More internal leadership and support
- More staff time to manage projects
- Greater certainty that the project will not interfere with productivity
- Greater access to internal capital
- Greater access to financing
- More positive business outlook
- Other? _____

ESA PARTICIPANTS SURVEY - BARRIERS

What additional potential program resources or factors would you need to get these projects moving?

- More specificity in the ESA report recommendations
- More staff time to manage projects
- Greater certainty in energy savings estimates
- More external funding
- Higher incentives than what the Program offers
- Incentives that can reduce the payback below one year
- Financing that allows energy savings to pay for the loan
- Other _____
- None

SUMMARY

What's the connection?



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Questions?

QUESTIONS?

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ENERGY BENCHMARKING

Top performance quartiles and best practice benchmarks for Wisconsin wastewater facilities

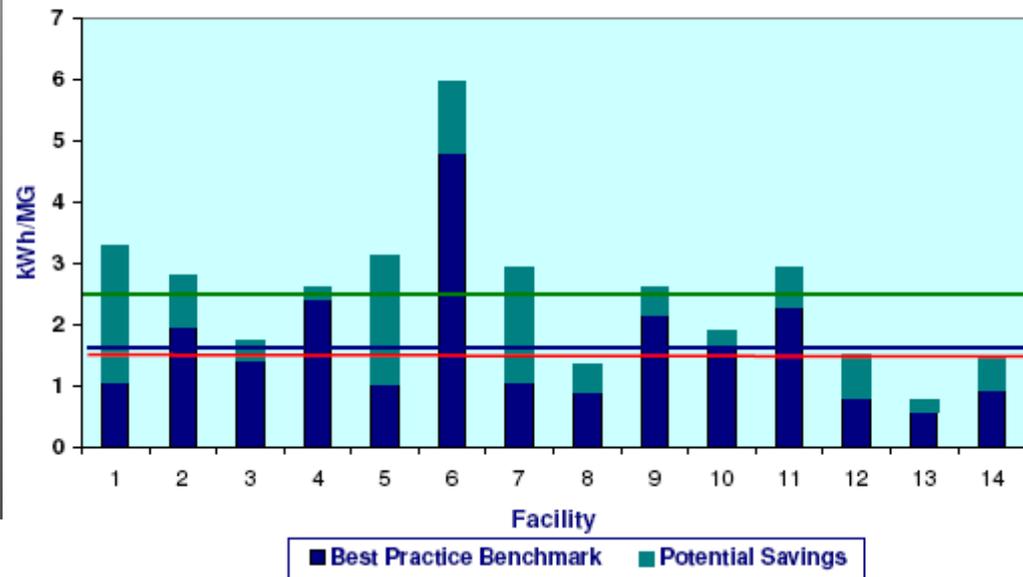
Facility Type	Flow Range (MGD)	Average Energy Use (kWh/MG)	Top Performance Quartile (kWh/MG)	Best Practice Benchmark (kWh/MG)	Average Potential Savings ¹
Activated Sludge	0 - 1	5,440	< 3,280	3060	44%
	1 - 5	2,503	< 1,510	1650	34%
	> 5	2,288	< 1,350	1760	23%
Aerated Lagoon	< 1	7,288	< 4,000 ²	3540	51%
Oxidation Ditch	< 1.2	6,895	< 4,000 ³	4320	37%

MG = million gallons
MGD = million gallons per day

ENERGY MANAGEMENT - BENCHMARK

DEVELOP A
BENCHMARK

Current Energy Use and Potential Savings at Surveyed Activated Sludge Facilities in Wisconsin (1 - 5 MGD)



EXAMPLE – VARIABLE SPEED DRIVE



VSD on a pump

Project cost: \$10,600
Energy savings: \$4,600 (75,000 kWh and 12 kW)
Focus grant: \$3,200 (prescriptive)
Payback: 2.3 years down to 1.6 years

Pay only for what you use

EXAMPLE – ADD ECONOMIZERS

Add chiller economizers to process chillers;

Add compressed air heat recovery to a 120 hp compressor

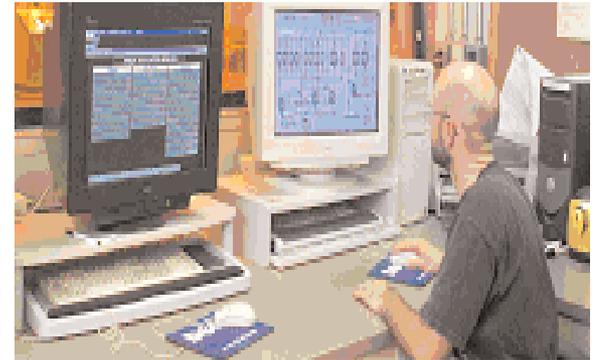


Project cost:	\$70,000
Energy savings:	\$23,000 (250,000 kWh)
Focus grant:	\$\$18,000 (custom)
Payback:	3.1 years down to 2.3 years

Recover and reuse energy when you can

EXAMPLE - DATA ROOM COOLING

Chilled water loop to IT cabinet PLUS “free-cooling”



Project cost:	\$390,000
Energy savings:	\$60,000 (900,000 kWh)
Focus grant:	\$50,000 (custom)
Payback:	6.3 years down to 5.5 years

*Life-cycle costing for
energy efficiency investments*

EXAMPLE – AUTOMATIC CONTROLS

Process controls on fan system of scrap collection system



Project cost:	\$380,000
Energy savings:	\$100,000 (760,000 kWh and 60,000 therms)
Focus grant:	\$65,000 (custom)
Payback:	3.8 years down to 3.1 years

Shut systems down when not in use

EXAMPLE – PROCESS CONTROLS

Custom process controls for ethanol production:
→ **fractionation and drying**



Project cost:	\$1.3 million
Energy savings:	\$690,000 (775,000 kWh and 800,000 therms)
Focus grant:	\$250,000 (custom)
Payback:	1.9 years down to 1.5 years

Manage your processes