



Energy Independent Communities: 25x25 Plan Grants Pilot Presentations 4th Quarter Report

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Osceola Energy Team
Village of Osceola & Osceola School District
Green Bay, WI
December 17th, 2009



Overview

What was measured? Why?

Discoveries/Surprises

Total Projects Considered

Pathways to 25 x 25

Projects Selected – Explanation

Potential Renewable Feedstocks

Existing Unknowns: Necessary Information for Future

Action Steps – Immediate & Long - Term

Energy Independence Team Members





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What was measured? Why?

Your 2008 energy usage baseline is **42,624** million (MM) Btus.
That baseline is comprised of 3,990,644 kWh,
214,800 therms,
16,716 gallons of gasoline,
and 39,247 gallons of diesel.

By assuming an annual growth rate of **1.00%** ,
in 2025 your energy use baseline will be **50,480** MMBtu.

Your 25% energy reduction goal
for 2025 is therefore **12,620** MMBtu,
or 30% of your 2008 consumption.

This translates into 3,698,712 kWh or
126,200 therms or
101,774 gallons gas or
90,791 gallons diesel or
some combination
of those fuels.



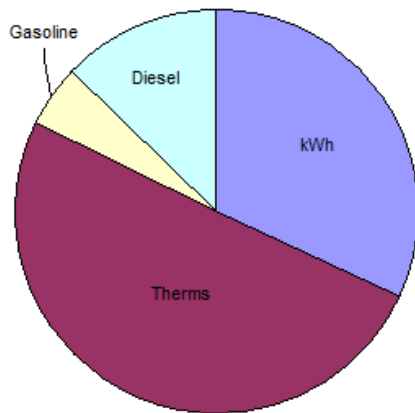


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What was measured? Why?

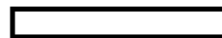
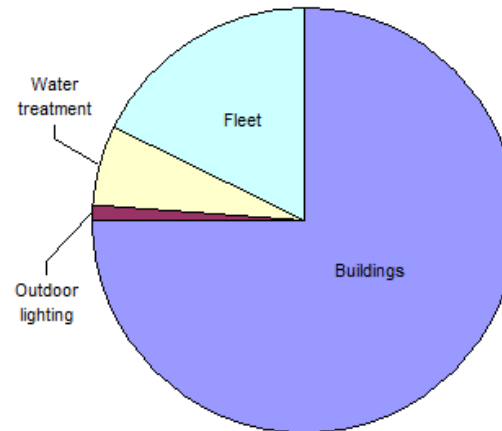
Total Consumption by Energy Type

Energy type	Percent of total Btus
Electricity	32%
Natural Gas	50%
Gasoline	5%
Diesel	13%



Total Consumption by End Use

Energy end use	Percent of total Btus
Buildings	75%
Infrastructure	7%
Lighting	1%
Water	6%
Fleet	18%



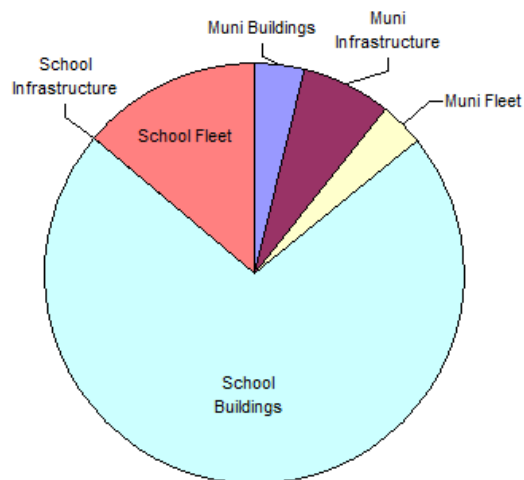


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What was measured? Why?

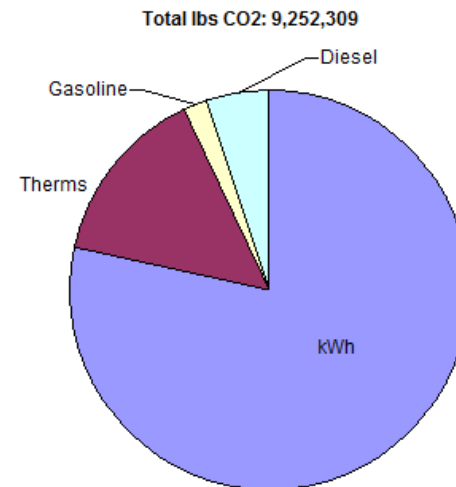
Total Consumption by End Use and Sector

Sector + Energy end use	Percent of total Btus
Muni Buildings	4%
Muni Infrastructure	7%
Muni Fleet	3%
School Buildings	72%
School Infrastructure	0%
School Fleet	14%



Total CO2 Emissions by Energy Type

Energy type	Percent of total CO2
Electricity	78%
Natural Gas	15%
Gasoline	2%
Diesel	5%





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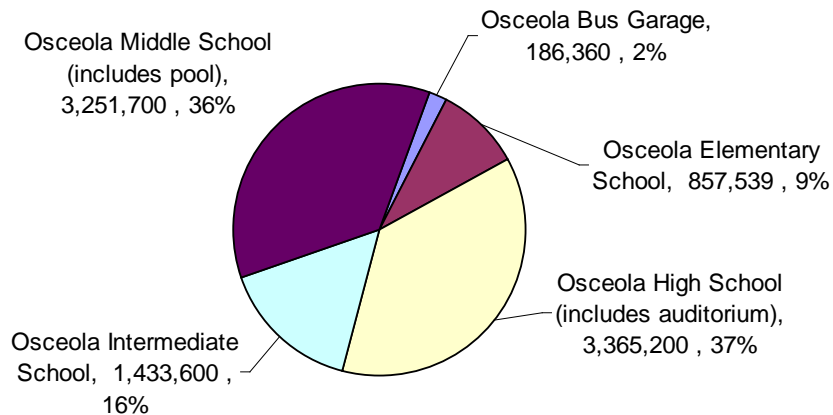
Discoveries/Surprises

- Total amount of energy used
- % of energy used by school buildings
- Low cost measures - 2.5% energy reduction per degree lowered
- Variation in bldgs. on a per sq. ft basis
- Energy used by the pool
- Cascading effect of conservation practices- solar collectors and thermal blankets on the school pool
- Conservation will only go a limited amount- need to look at generating renewable sources





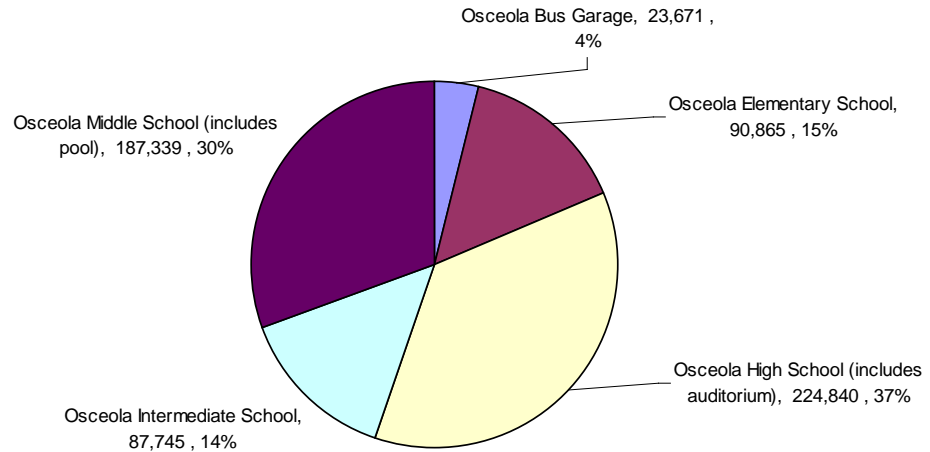
SCHOOLS 3-YEAR TOTAL ELECTRIC USAGE



Building name/purpose	2006 total	2007 total	2008 total	3- year total	% of total
Osceola Bus Garage	58,800	63,400	64,160	186,360	2%
Osceola Elementary School	303,677	277,842	276,020	857,539	9%
Osceola High School (includes auditorium)	1,182,400	1,095,800	1,087,000	3,365,200	37%
Osceola Intermediate School	498,000	486,000	449,600	1,433,600	16%
Osceola Middle School (includes pool)	1,112,500	1,061,600	1,077,600	3,251,700	36%
Grand Total	3,155,377	2,984,642	2,954,380	9,094,399	100%



SCHOOLS 3-YEAR TOTAL NATURAL GAS USAGE



Building name/purpose	Sum of 2006 total	Sum of 2007 total	Sum of 2008 total	Sum of 3-year total	BTU/Sq Ft.
Osceola Bus Garage	6,751	8,352	8,568	23,671	0.476
Osceola Elementary School	30,328	28,687	31,850	90,865	0.398
Osceola High School (includes auditorium)	67,083	77,970	79,787	224,840	0.457
Osceola Intermediate School	28,010	28,837	30,898	87,745	0.363
Osceola Middle School (includes pool)	65,354	58,288	63,697	187,339	0.616
Grand Total	197,526	202,134	214,800	614,460	



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Total Projects Considered (a list)

- Generating electricity from wastewater treatment plant outfall
- Additional insulation for all village and school buildings
- Low hanging fruit- economical driving practices for bus drivers, police staff, village crew; energy conservation practices
- Hybrid & electric vehicles for school and village
- Replace gas and diesel fuels with SVO or CNG
- New roofs for school and village buildings
- Anaerobic digester or community gasifier
- School funded study on renewable energy sources-solar, wind, geothermal, biomass



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Pathways to 25 x 25

5 Priority items had been identified

- Additional conservation of energy in buildings
- Geothermal application for the schools
- Anaerobic digester for producing electricity
- Replacement of fossil fuel with alternative fuels
- Replace school roof





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Projects Selected – Explanation

- Economical energy saving practices- reduce temperature in school buildings, computer energy control programs, lights, bus driver educational programming- low cost
- Thermal blankets installation on middle school pool- 40% annual ROI
- Geothermal application for high school middle school, and intermediate school buildings. Largest users of natural gas



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Potential Renewable Feedstocks

Wind

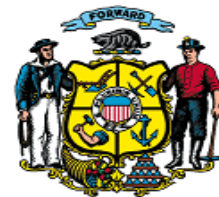
Solar

Biogas (landfill, agriculturally-based)

Biomass (wood, prairie grasses, other)

Hydro

Other



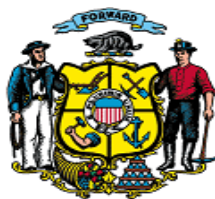
Osceola Pool Solar Panels & Blankets

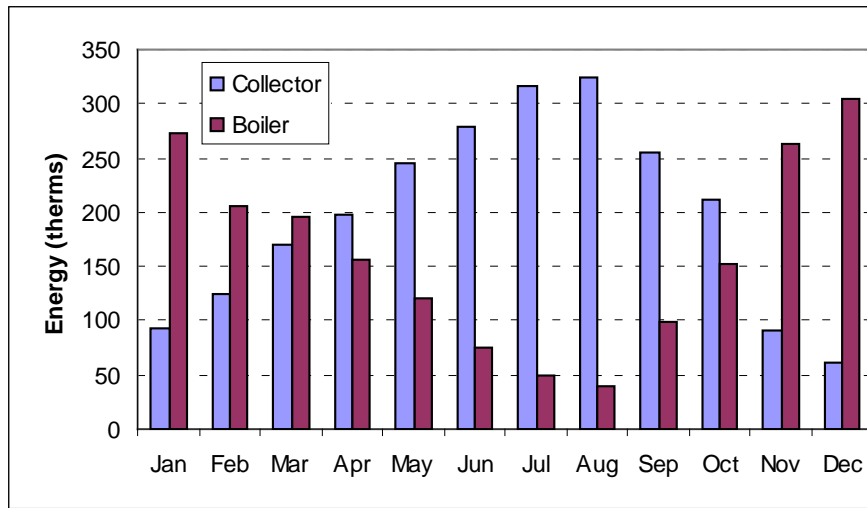
- 32 Panel *Solar Skies* glycol-based closed drain back system
- Heat exchangers transfer heat to hot tub, wading pool, lap pool and domestic hot water
- Thermal blankets cover each pool
- Cost of solar panels was \$155,000 with a \$47,000 FOE grant
- Cost of thermal blankets \$70,000 with a \$10,000 FOE grant



Energy Use in the Pool

- Energy Center of Wisconsin model predicts 6,750 therms of energy needed for the pool complex
- Solar panels are producing 4,000 therms historically
- Blankets are predicted to save 2,445 therms
- 6,500 therms saved equal about \$32,500 annually
- Total cost should be paid for in 5-6 years
- Additional savings from the blankets:
 - Reduced evaporation of 20,000 to 25,000 gallons a month
 - Reduced chemical usage
 - Reduced dehumidifier operations
 - Reduced energy needed for domestic hot water
 - Expected surface area benefit in the pool area due to less chemical evaporation and humidity





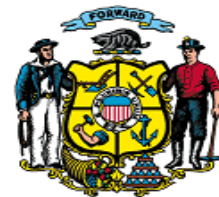
	With Cover		
	Collector	Boiler	Load
	therms	therms	therms
Jan	93.10	272.60	365.70
Feb	124.70	205.60	330.30
Mar	170.00	195.70	365.70
Apr	197.40	156.50	353.90
May	245.00	120.70	365.70
Jun	278.10	75.90	354.00
Jul	316.80	48.90	365.70
Aug	325.20	40.50	365.70
Sep	254.10	99.80	353.90
Oct	212.50	153.20	365.70
Nov	90.70	263.30	354.00
Dec	61.50	304.20	365.70
Annual	2369.10	1936.90	4306.00

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Existing Unknowns: Necessary Information for Future

- Drill wells for geothermal system to have a better understanding of energy transfer potential
- Study of feedstock availability for a village/school operated anaerobic digester
- More complete information on wind and solar energy production feasibility for electricity production



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Action Steps – Immediate & Long - Term

- Turn down thermostats in school buildings
- Continue to replace light bulbs, lamps and computer controls
- Do a study with test wells for geothermal systems
- Research feedstock's for anaerobic digester
- Joint Village- School Board meeting in January to discuss findings and next steps
- Host a community event to discuss 100% sustainable community with Natural Step participants
- Finalize the plan on December 18th



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Energy Independence Team Members

Neil Soltis- Village of Osceola Administrator

Jim Schmidt- Village Grounds & Operations Manager

Roger Kumlien- School Superintendent

Bob Schmidt- School Grounds and Maintenance Supervisor

Pete Kammerud- School District Fleet Supervisor

Holly Walsh- Community representative & TNS member

Kelly Cain- UW RF SCISCD Director

Trudy Popenhagen- XCEL Energy

Nathan Deprey- Osceola Public Library

Bob Kazmierski- Polk Co. UW CNRED EX Agent

Doug Johnson- EEI Inc. St Paul, Mn.

Wally Piszczek- Village Trustee

Timm Johnson- Energy Coordinator



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Additional Comments, Observations, Recommendations

- The Osceola Schools are considering a multimillion dollar referendum to invest in energy reduction practices as a package- maybe 11-2010
- Potential exists of low interest or 0% bonds are available for financing
- Interest from other schools, YMCA's, and community's in what we have achieved
- Very beneficial to do a baseline energy audit and create an energy team for your business, organization, government body, etc.
- Focus on Energy has been a very valuable partner
- Extremely worthwhile exercise!

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