Angola Wastewater Treatment Plant

Who we are

The Angola Wastewater Treatment Plant (WWTP) is a 1.7 million gallon per day (MGD) conventional activated sludge treatment plant with nutrient removal, aerobic sludge digestion and ultraviolet disinfection. It serves a population of approximately 8,200. A staff of eight employees is responsible for maintaining the treatment plant as well as over 50 miles of sanitary sewers and 20 pump stations. The treatment plant is can handle peak flows in excess of 4.1 MGD with 2.5 million gallons of flow equalization for wet weather flows. Located in northwest Indiana, the WWTP discharges to Pigeon Creek, a zero low flow stream within the Great Lakes Basin.

Angola WWTP

Electricity Usage

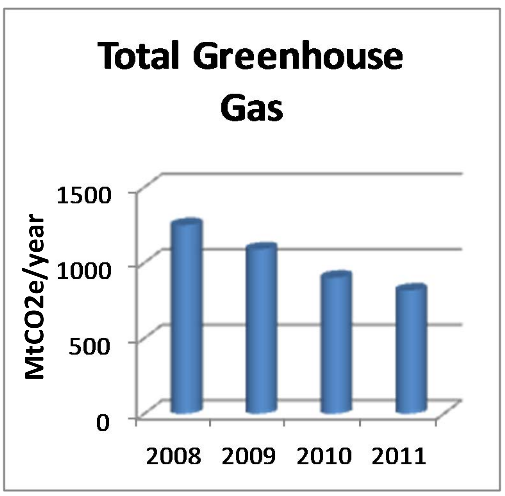
2008: 1.771 mWh

2009: 1.546 mWh

2010: 1.276 mWh

2011:1.156 mWh

Greenhouse gas (GHG) avoided as a result of improvements: 433 metric tons carbon dioxide equivalent (2008 baseline compared to 2011).*

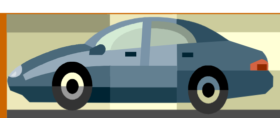


Project Success Story

Staff at the Angola WWTP are proactive about energy improvement and plant performance. At the start of the Pilot in 2009, the WWTP was aerating activated sludge tanks with multi-stage centrifugal blowers that were more than twenty years old and nearing the end of their useful life. These blowers consumed approximately 500,000 kilowatt hours (kWh) of energy annually and accounted for more than 30% of the plant's energy usage. With support from an Energy Efficiency Conservation Block Grant (EECBG) issued by the Indiana Office of Energy Development, Angola replaced these blowers with high-efficiency Turblex blowers and targeted a 20% reduction in net energy consumption by December 2011. In addition to the new blowers, meters and control valves were added at each aeration basin to more closely monitor and adjust airflow to meet target dissolved oxygen concentrations.

In 2010, Angola hired Wastewater Solutions, Inc. (WSI) to conduct a process optimization audit of the WWTP and identify further energy-saving opportunities. The audit identified potential electrical savings of $31,000 to $55,000 annually by (1) configuring the new Turblex blowers to aerate the digester as well as to activated sludge, (2) add process flexibility to enhancing nitrification/dentrification with less blower demand, (3) improve sludge yield by optimizing return and waste activated sludge rates, (4) improve digester capacity, and (5) reduce the volume of wet weather flows requiring equalization, pumping and aeration.

Greenhouse gas emissions avoided are equivalent to



Removing 84.9 vehicles from the road for a year

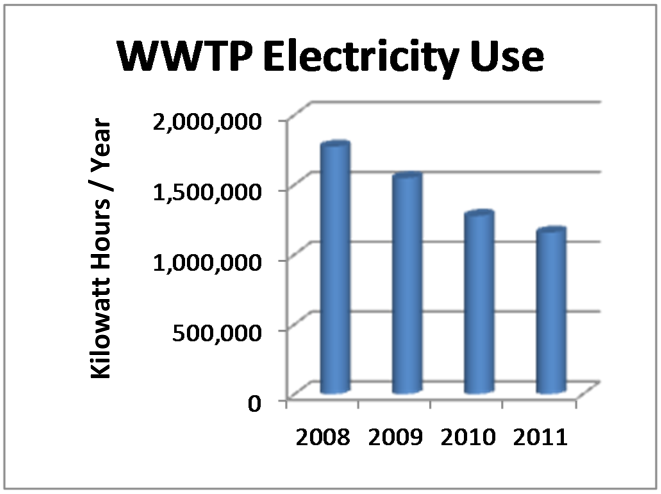
Electricity for 54 homes for a year

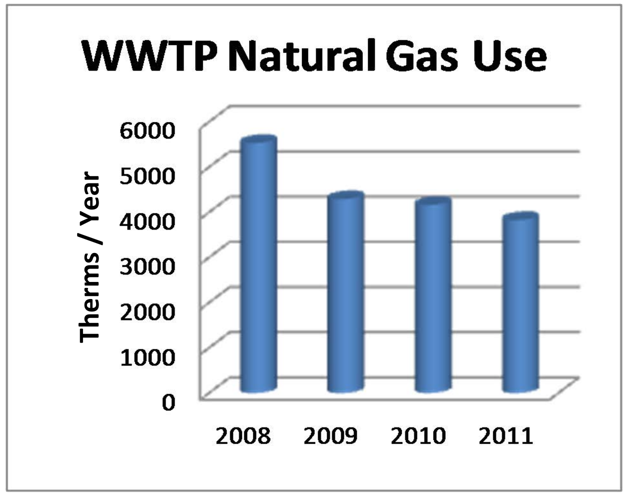
2.4 Railcars of coal

1,007 Barrels of Oil

*Green house Gas Equivalencies calculated using USEPA calculator (http://www.epa.gov/cleanenergy/energy-resources/calculator.html

Documented Results





Key Improvements

Goal	Improvement Process	Annual energy saving (kWh)	Implementation cost	Annual cost saving	Simple pay-back, years
Lighting and General Energy Reduction	Replace all fixtures to high efficiency T8 fixtures, with occupancy sensors in selected areas.	20,000	$0	$160	10 Years*
Season heating of "Dry Can" pump stations	To keep exposed pipes from freezing during cold weather, the control room is heated to ~45 F, reduced from 70 F.	31,250	$0	$2,500	Immediate
Digesters Supplemental Aeration	SOP to control when second blower is brought online.	30,000	$0	$2,500	Immediate
Flow Equalization-Aeration	Issue SOP to control when and how the EQ Blowers are operated	84,000	$0	$6,700	Immediate
	TOTAL PROJECT	165,250		$11,860	

*(Funded 100% DOE Grant, act. Payback = 0 years)

2009-2011 INDIANA ENERGY MANAGEMENT PILOT

IDEM

United States Environmental Protection Agency

City of Bloomington Utilities Blucher Poole Wastewater Treatment Plant

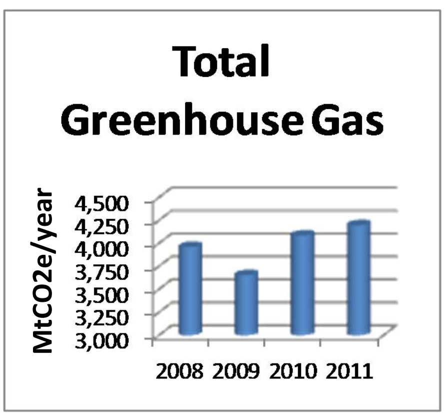
Who we are

The City of Bloomington Utilities Blucher Poole Wastewater Treatment Plant (CBU Blucher Poole) is a complete-mix activated sludge facility with ultraviolet light disinfection (a chlorine system is available for back-up), aerobic sludge digestion, sludge storage tanks, and sludge thickening/dewatering via gravity belt thickener. It treats wastewater generated in the northern part of the Bloomington and serves a population of 8,605. Built in 1968, CBU Blucher Poole was upgraded in 1998. The collection system is 100 percent sanitary. In 2011, CBU Blucher Poole treated an average flow of 4.62 million gallons per day (MGD). The plant has a design capacity of 6 MGD and a peak hydraulic capacity of 12 MGD. It employs 13 staff.

Natural Gas Usage

2008: 36,559 Therms
2009: 34,960 Therms
2010: 33,622 Therms
2011:25,040 Therms

Greenhouse gas (GHG) avoided: N/A. Metric tons CO2 equivalent increase (2008 baseline compared to 2011).*



Project Success Story

CBU Blucher Poole improved process operation and reduced energy consumption by better blower control. Prior to November, 2011, operators determined aeration needs and set blowers accordingly. It was determined that this practice often resulted in more aeration than needed. Therefore, in November 2011, the plant superintendent implemented a standard operating procedure (SOP) to optimize aeration with the added benefit of keeping dissolved oxygen levels more consistent across shifts.

Adhering to the blower SOP was key factor in reducing 64,921 kilowatt hours electricity when November 2010 is compared to November 2011. This reduction is even more impressive considering that flow in November 2011 was 12.5 MG greater than in November the previous year. Correspondingly, the November 2011 electricity bill was $3,612 less than November 2010.

CBU Blucher Poole Digester

Greenhouse gas emissions avoided are equivalent to

Removing — vehicles from the road for a year

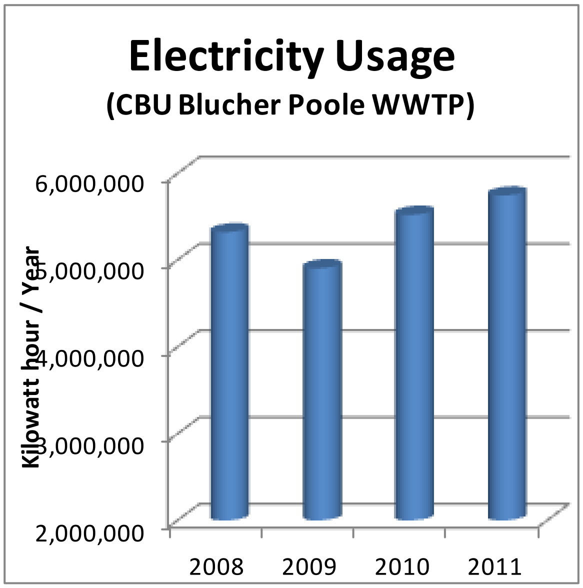
Electricity for — homes for a year

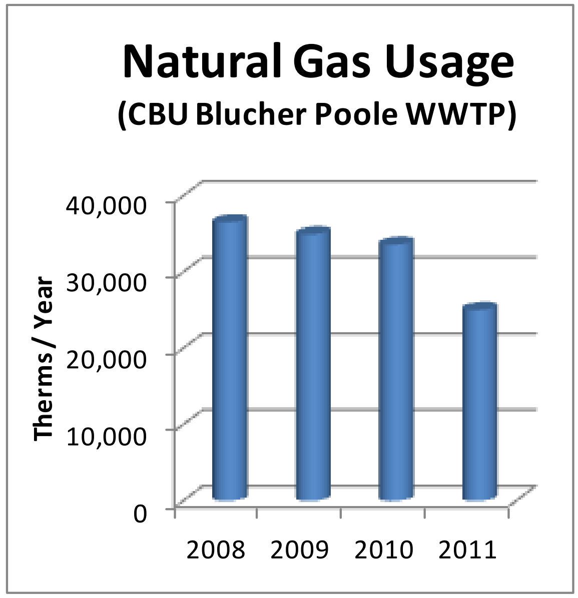
— Railcars of coal

— Barrels of Oil

Green House Gas Equivalencies calculated using USEPA calculator (http://www.epa.gov/cleanenergy/energy-resources/calculator.html

Documented Results





Key Improvements

Goal	Improvement Process	Annual energy saving (kWh)	Implementation cost	Annual cost saving	Simple pay-back, years
Reduce aeration requirement in secondary treat-ment by increas-ing BOD removal in primary treat-ment	A 10% increase in average BOD removal in primary treatment will reduce the use of aeration equip. and reduce energy bills by about 35,000 kWh/month	420,811 kWh	$0	$17,000	0

CBU Blucher Poole Centrifugal Blowers

2009-2011 INDIANA ENERGY MANAGEMENT PILOT

Lafayette Wastewater Treatment Plant

Who we are

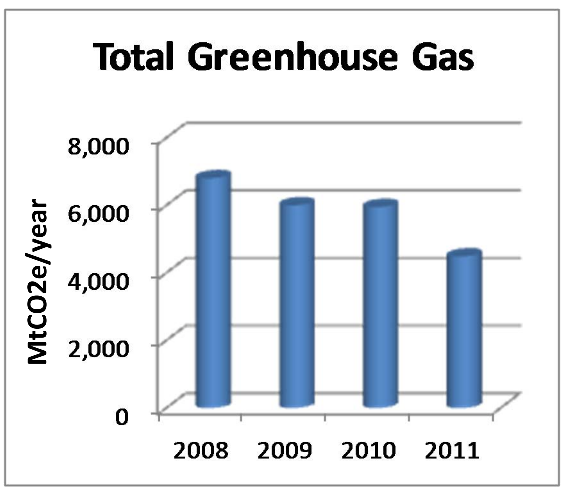
The Lafayette wastewater treatment plant (WWTP) has a design average flow of 26 million gallons per day (MGD). The plant was upgraded in an extensive 60 million dollar renovation and upgrade project that was completed in 2004. Renovation included a new pump station, grit removal, primary clarifiers, additional aeration tanks, additional final clarifiers, sludge thickening, digesters, process air blowers, and disinfection. The upgrade enhanced efficiency, reliability and quality of treatment.

Lafayette Wastewater Treatment Plant

Electricity Usage

2008: 8.923 mWh
2009: 8.244 mWh
2010: 8.187 mWh
2011: 6.185 mWh

Greenhouse gas (GHG) avoided:
1,888 metric tons carbon dioxide equivalent (2011 compared to 2009 baseline).*



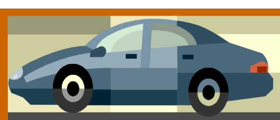
Project Success Story

In 2007, Lafayette WWTP management made a commitment to reduce operational cost and improve treatment. The plant hired a consultant to perform a process audit for optimization. The consultant looked at the whole system and optimized the treatment process to reduce energy consumption, chemical use, maintenance needs, and to increase process stability. This fact sheet focuses on energy-saving options identified.

Many options involved low-cost no-cost operating changes. Using the Deming cycle (plan, do, check, act) WWTP personnel methodically verified that each change gave the desired results. Measures implemented include changes in equipment programming to reduce cycle times or frequency, to reduce recycle flows, and to thicken solid streams. Action was taken to switch lights off in un-occupied areas and turn exhaust and supply air fans down when not needed. In addition, the audit recommended capital improvements such as a high-efficiency blower which was installed late in 2010.

Control measures resulted in a reduction in electrical consumption of 21.6% when comparing 2007 consumption to 2010 (see attached graphs). Natural gas consumption is down 50.1% for the same period. Polymer use is down approximately 50%. With the changes in the process final effluent is a higher quality and the treatment process is more stable.

Greenhouse gas emissions avoided are equivalent to



Removing 336 vehicles from the road for a year

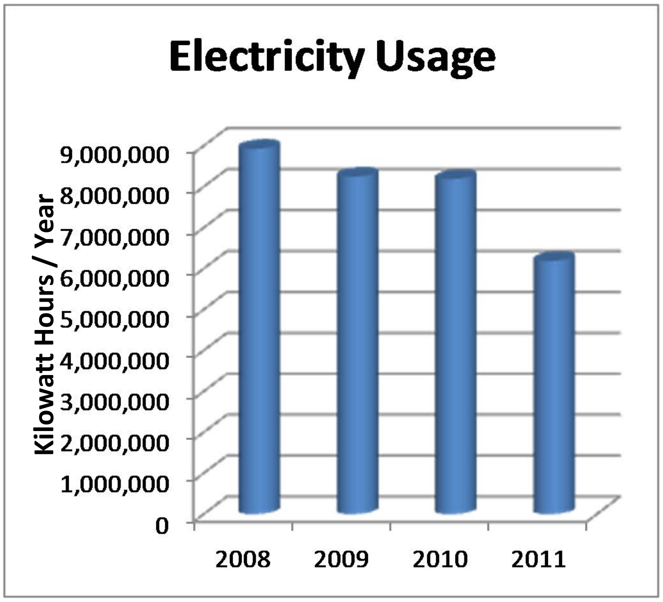
Electricity for 214 homes for a year

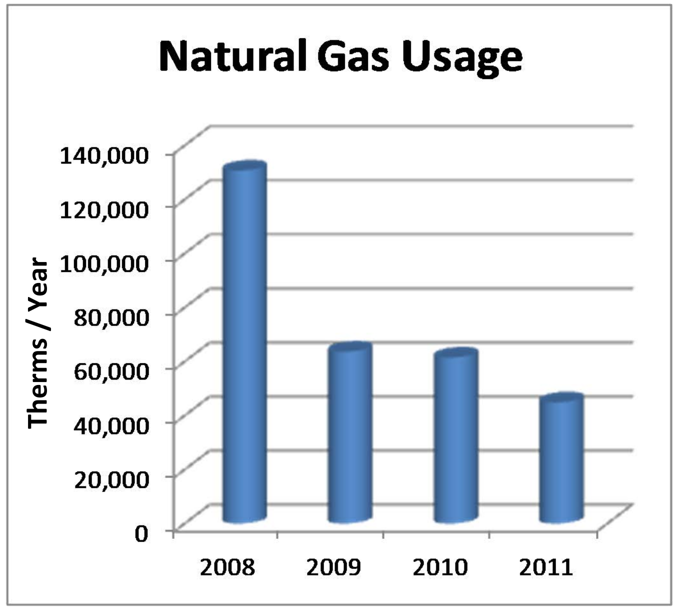
9.3 Railcars of coal

3,983 Barrels of Oil

Green House Gas Equivalencies calculated using USEPA calculator (http://www.epa.gov/cleanenergy/energy-resources/calculator.html

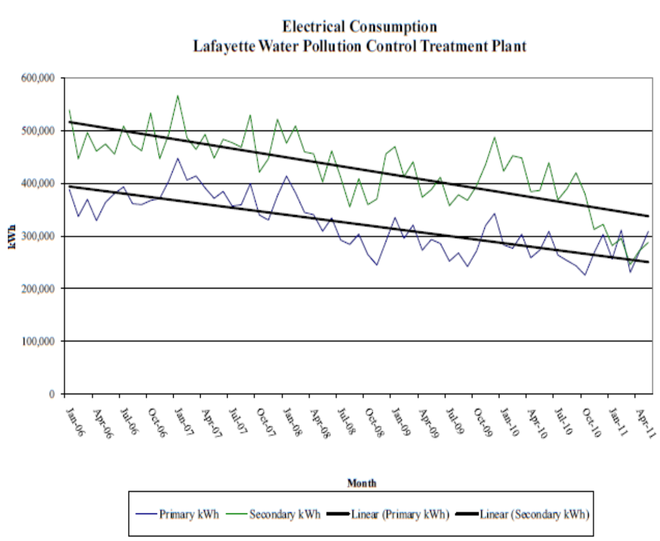
Documented Results

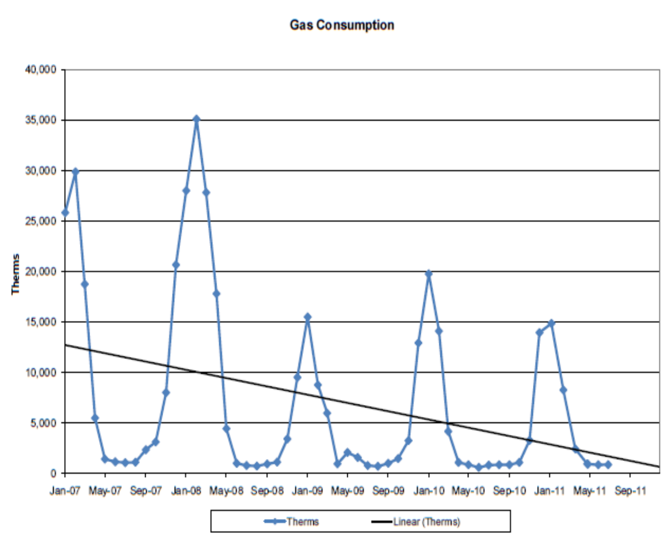




Key Improvements

Goal	Improvement Process	Annual energy saving	Implementation cost	Annual cost saving	Simple payback
Reduce intake and exhaust fan speed when work area is unoccupied	Reprogrammed automatic controls	353,000 kWh/yr 65,000 therms/yr	$0.00	$24,000 electrical	0
Reduced back pressure on aeration diffusers	Cleaned diffusers	384,000 kWh/yr	Appx. $6,000	$26,800	3 months
Reduced cost of supplying compressed air	Installed high efficiency blower	1,700,000 kWh/yr	$794,000 (Includes a $500,000 grant for this project)	$121,000	6.5 years





2009-2011 INDIANA ENERGY MANAGEMENT PILOT

Logansport Municipal Utilities Wastewater Treatment Plant

United States Environmental Protection Agency

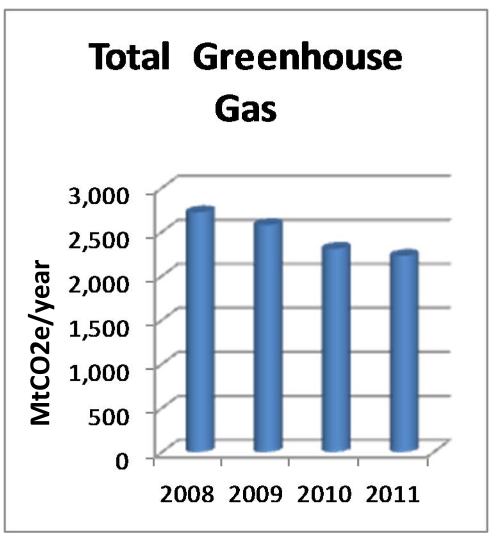
Who we are

Logansport Municipal Utilities (LMU) operates an activated sludge wastewater treatment plant (WWTP) with effluent chlorination/dechlorination. Primary sludge and waste activated sludge are gravity thickened, dewatered via filter press landfilled. The WWTP design average flow is 9.0 million gallon per day (MGD) and has a peak design flow from the combined sewer system of 18 MGD.

Electricity Usage

2008: 3.749 mWh
2009: 5.430 mWh
2010: 4.873 mWh
2011: 4.915 mWh

Greenhouse gas (GHG) avoided: 414 metric tons of carbon dioxide equivalent (2900 compared to 2008 base-line) .*



Project Success Story

LMU completed and funded two major projects during the Pilot: an upgrade to influent (raw sewage) pumps and improvements to the secondary aeration system. An Energy Efficiency Conservation Block Grant (EECBG) from the Indiana Office of Energy Development helped fund these projects.

The influent pump project included an overhaul of the pumps, reconditioning of the electrical motors, and installation of new control systems for the three units. Typically, two units operate at any one time, with the third unit designated as an emergency back-up. Equipment staging is rotated each month. For the project, each pump unit was pulled one at a time. The pump was cleaned, inspected, and verified to be operating at factory specifications. The motor was overhauled and rewound to accept the new energy control system. The motor control center was gutted and new variable frequency drive (VFD) controls were added in place of the existing control mechanism. An automatic controller and monitoring system were installed in the wet-well of the plant headworks, which was connected to pump VFD controllers by way of the existing supervisory control and data acquisition system.

The air blower system was similar in that four air blowers were taken off-line one at a time. Typically, one to two blowers are running at any time, with the remaining two blowers serve as emergency stand-by units. During summer months two air blowers are used while during winter months one blower is usually enough to meet oxygenation needs. Each blower assembly was cleaned, inspected, and verified to be working at factory specifications. The motor was replaced with a high-efficiency unit capable of being controlled by VFD. The motor control panel for each unit was gutted and replaced by VFD control units.

Greenhouse gas emissions avoided are equivalent to

Removing 76 vehicles from the road for a year

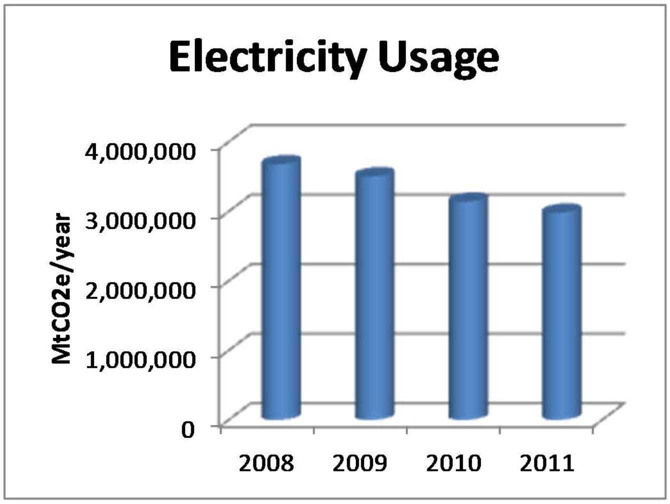
Electricity for 48.3 homes for a year

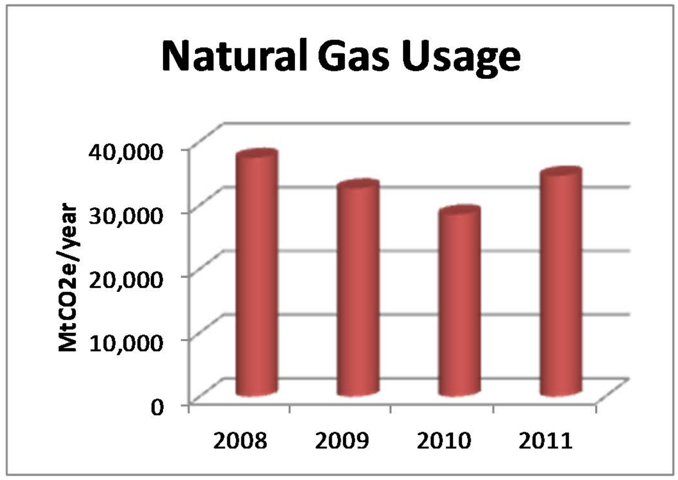
2.1 Railcars of coal

901 Barrels of Oil

*Green House Gas Equivalencies calculated using USEPA calculator (http://www.epa.gov/cleanenergy/energy-resources/calculator.html

Documented Improvement





Key Improvements

Goal	Improvement Process	Annual energy saving (kWh)	Implementation cost	Annual cost saving	Simple pay-back, years
Install influent pump VFD	Raw influent pumps				
Install aeration blower VFD	Aeration blowers				
	TOTAL PROJECT	~ 500,000	$238,000.	~ $25,000	~ 9.5 yrs.

Project Results

LMU measured energy consumption (both pre- and post-project) to quantify improvements. A notable reduction in energy consumption was realized as a result of these two projects. Greenhouse gas emissions were reduced and the plant's Energy Star™ performance rating improved. A large improvement in power factor (energy demand) was attained with improvements going from the mid-seventies to the mid-nineties percentile in terms of power efficiency. Improvements in treatment efficiencies for both of these stages were equally realized.

Flow through the plant was much more efficiently controlled which allowed for better treatment (instead of large, immediate changes), better use of the plant's design hydraulic capacities, improvements of the hydraulic conditions in the collection system, and much less wear-and-tear on the pumps, motors, and controls from the constant pre-project start-stop cycling. The blower project allowed the WWTP to dial-in *exact* air requirements which allows it to use only one blower at all times of the year, as well as improved treatment efficiencies by no longer over-aerating the wastewater. The treatment efficiencies achieved by these two projects are as desirable as the energy savings recorded thus far.

Overall, the WWTP reports that participating in the Pilot has been a very rewarding experience in terms of knowledge about energy efficiency programs and ideas to further expand on these two energy conservation measures. It brought a together a network of resources and professional contacts which to support continuous improvement. Results achieved in energy efficiency, money savings, and treatment plant improvements exceeded expectations.

2009-2011 INDIANA ENERGY MANAGEMENT PILOT

Mishawaka Wastewater Treatment Plant

Who we are

The Mishawaka wastewater treatment plant (WWTP) is an 11 million gallon per day (MGD) conventional activated sludge plant with advanced nitrogen and phosphorus removal and anaerobic sludge digestion. It serves a population of 50,000. Annual peak wet-weather flow from the combined sewer system is in the range of 59 MGD. With a staff of 26 employees, the Mishawaka Wastewater Division is responsible for the proper operation of its wastewater treatment facility as well as the City's 29 lift stations and 23 combined sewer overflow (CSO) structures. It also is responsible for administering the city's combined sewer control plan.

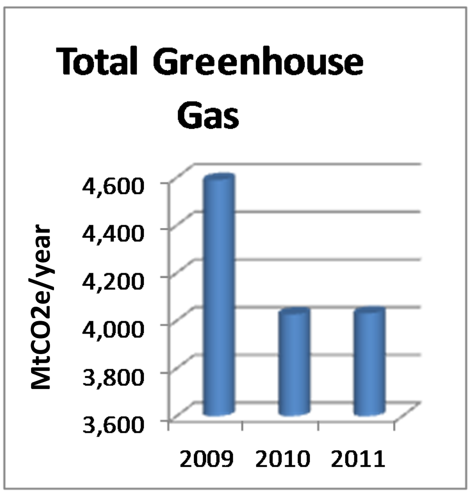
Electricity Usage

2009: 5.430 gWh

2010: 4.873 gWh

2011: 4.915 gWh

Greenhouse gas (GHG) avoided: 559 Metric tons carbon dioxide equivalent (2011 compared to 2009 baseline)



Project Success Story

A major facility upgrade and expansion in 2008 included energy-efficient features such as fine bubble diffusers and a high efficiency turbo blower. The expansion included premium efficiency motors and VFDs on all large pump applications. Since then, electrical energy intensity has been consistently around 1,200 kilowatt hours per million gallons (kWh/MG). The high electrical energy performance and biogas utilization to offset purchased natural gas are reflected in the facility's EnergyStar™ Portfolio Manager rating of 85.

Aeration is energy-intensive process. Close monitoring of dissolved oxygen is essential.

The 2008 upgrade included two new boilers and heated draft-tube digester mixers. The facility was fully converted from steam heat to a hot-water system. New boilers use biogas as fuel for buildings and process heat. One boiler burns natural gas. The facility set a goal to reduce natural gas use and started to fine-tune building and process heat loads using a central supervisory control and data acquisition (SCADA) system, also installed during the upgrade. The SCADA system helps staff manage and monitor building, process, electric, heating, and air-handling systems, reducing labor and energy costs. In all, the upgrade and optimization reduced natural gas consumption by over 26% (2011 compared to 2009), which is impressive considering the upgrade added heating needs by an estimated 35% due to increased building area, safety code-mandated increases in building ventilation, and the addition of an anaerobic digester.

Greenhouse gas emissions avoided are equivalent to

Removing 110 vehicles from the road for a year

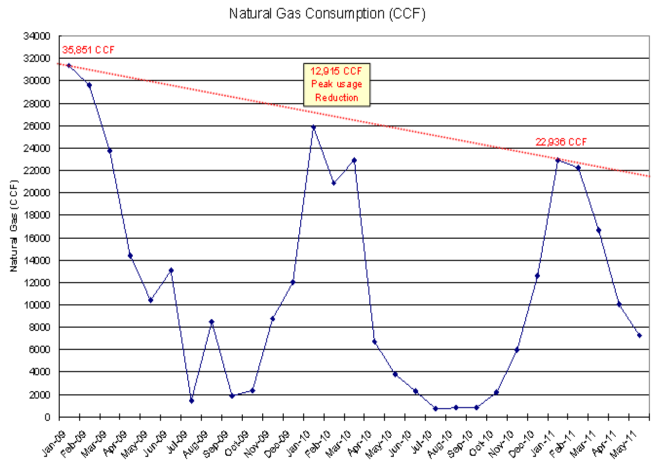
Electricity for 70 homes for a year

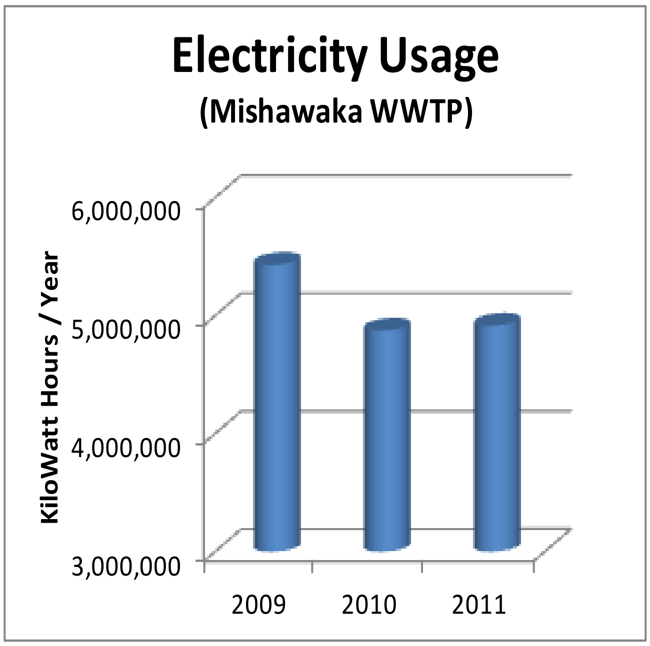
3 Railcars of coal

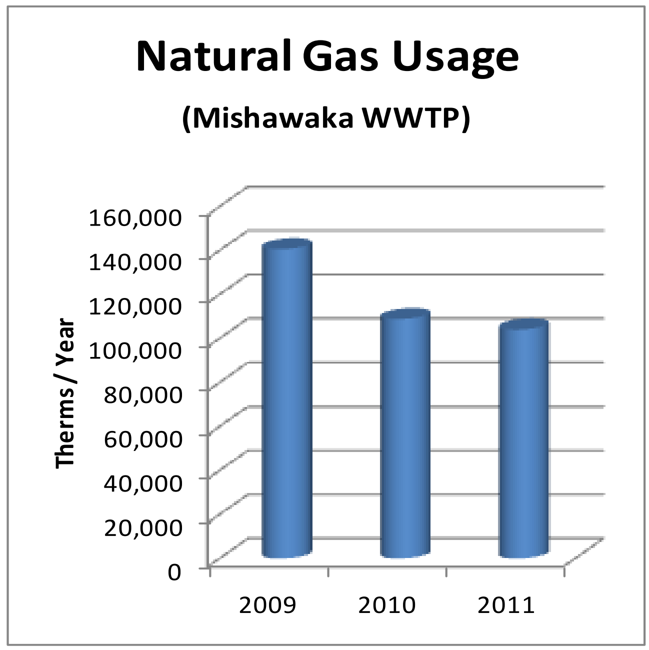
1,300 Barrels of Oil

Documented Results

Facility staff monitor the energy gains of new high-efficiency turbo blower.







Key Improvements

Process	Targeted goal	Improvement	Annual energy saving	Implementation cost ($)	Annual Saving ($)	Simple Payback (years)
Boiler / Heating System	Reduce natural gas usage 5%	Fine tune and make seasonal adjustments	41,093 kWh (35% reduction)	$0	$32,282	0
Electric Supply	Reduce electrical cost	Changed tariff rate and implemented aeration blower SOP	0	$0	$72,000	0

Energy meter on main feed

"*After we started this program, we started tracking our energy usage more closely. Smart meters record our peak demand and when it occurred.*"

Green House Gas Equivalencies calculated using USEPA calculator (http://www.epa.gov/cleanenergy/energy-resources/calculator.html

2009-2011 INDIANA ENERGY MANAGEMENT PILOT

Valparaiso Elden Kuehl Wastewater Treatment Plant

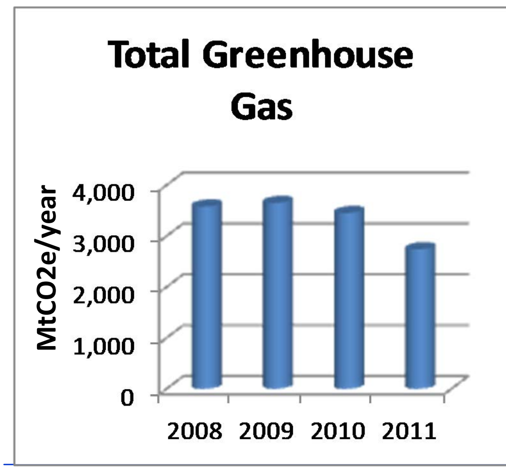
Who we are

The Valparaiso Elden Kuehl Pollution Control Facility (EKPCF) is a Class IV single-stage activated sludge wastewater treatment plant (WWTP) with a design average flow of 8.0 million gallons per day (MGD) and peak hydraulic capacity of 18.0 (MGD). In addition to the WWTP, the plant's three combined sewer overflow detention basins are large enough to capture and hold wet weather flows up to 4.5 MGD prior to treatment. Treated effluent discharges to Salt Creek, which is designated as a salmonid fishery and is a tributary to Lake Michigan.

Electricity Usage

2008: 4,367,920 kWh
2009: 4,727,040 kWh
2010: 4,425,600 kWh
2011: 3,976,440 kWh

Greenhouse gas (GHG) avoided:
437 metric tons carbon dioxide equivalent (2011 compared to 2009 baseline).*



Project Success Story

To further its goal of reducing energy inputs through optimization and improvement, in April 2010, the Valparaiso Water Reclamation Department applied for an Energy Efficiency and Conservation Block Grant (EECBG) through the Indiana Office of Energy Development. The EECBG project included installation of two 200-horsepower (HP) premium efficiency motors with variable frequency drives along with blower modifications. The grant was awarded in June 2010 for $240,160.

The project was successfully completed in December of 2010, and the WWTP continues to reduce its power consumption and energy costs while meeting stringent water quality objectives. Due to installation of new variable frequency drives and premium efficiency motors, the WWTP anticipates saving on average $30,000 per year for electricity or about 8 to10 % of its current electrical operating budget

Greenhouse gas emissions avoided are equivalent to

Removing 85.7 vehicles from the road for a year

Electricity for 54.5 homes for a year

2.4 Railcars of coal

1,016 Barrels of Oil

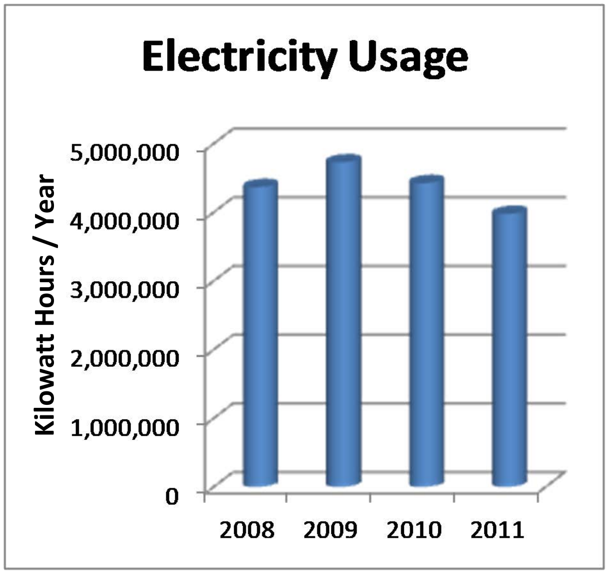
*Green House Gas Equivalencies calculated using USEPA calculator (http://www.epa.gov/cleanenergy/energy-resources/calculator.html

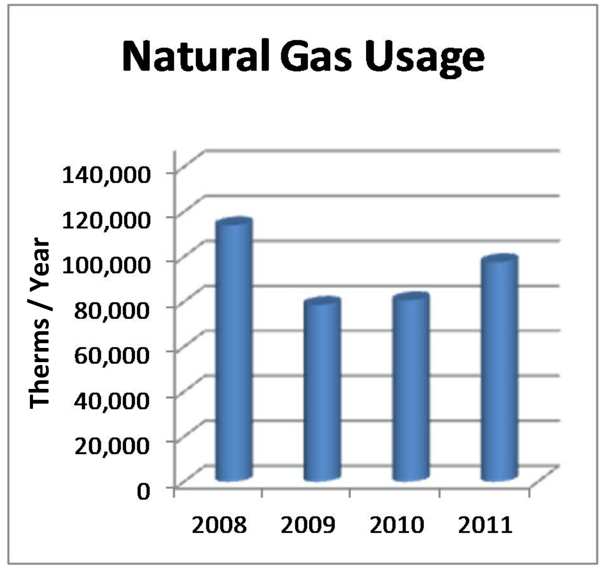
Documented Results

Previous/historic blower operation: 200 HP *0.746*24 hours/day =~ 3600 kWh/day
New Variable Frequency Drive Blower operation over the first 2 quarters of 2011 =

a. 12 hours * 130 amp/216 full load amp *200 HP *0.746 = 1080 kWh/day PLUS
b. 12 hours * 180 amp/216 full load amp *200 HP * 0.746 = 1500 kWh/day
c. Total kWh =~ 2600 kWh/day

Net savings as of June 30, 2011 = ~1000 kWh/day or 90,000 kWh per month
Using $0.08/kWh, net savings = ~ $14,000

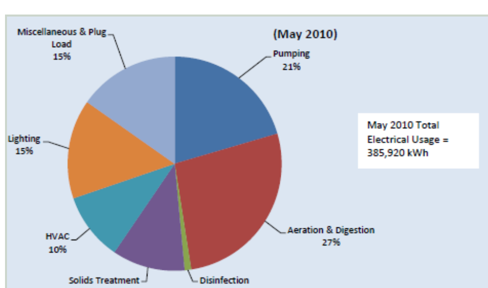




Key Improvements

Process Targeted / Goal	Improvement and estimated saving	Annual Energy Saving, kWh	Implementation cost, $$	Annual cost saving, $	Simple payback, years
Activated Sludge System	Optimize Multistage Blowers with VFD and high efficiency motor installation	360,000 kWh	$240,000 OED Grant	$30,000	8 Years 0 Due to Grant
Anaerobic Digestion Mixing	Reduce digester mixing cycles/ optimization via SCADA	113,880 kWh	$O-Internal Optimization	$9,000	0
Main Pumping Station	Exhaust Fans-Install PLC program to run fans when needed	TBD	TBD	TBD	TBD

Energy Snapshot



Valparaiso WWTP Electrical Usage
"Energy Snapshot" taken May 2010
by Purdue University, Technical Assistance Program

2009-2011 INDIANA ENERGY MANAGEMENT PILOT

West Lafayette Wastewater Treatment Plant

Who we are

The West Lafayette Wastewater Treatment Plant (WWTP) is a 9 million gallon per day (MGD) activated sludge plant with four 415,000 gallon aeration basins equipped with fine bubble diffusers. The West Lafayette WWTP belongs to the EPA Green Power Partnership, a voluntary program that encourages "green power" as a way to reduce the environmental impact associated with energy use. "Green power" at West Lafayette comes from an innovative waste-to-energy treatment system that co-digests fats, oils and grease (FOG), food scraps, and sludge in anaerobic digesters and then uses the biogas generated to power microturbines. Electricity and heat generated by microturbines are used by the WWTP in a combined heat and power system that conserves energy.

Electricity Usage

2008: 4.771 mWh

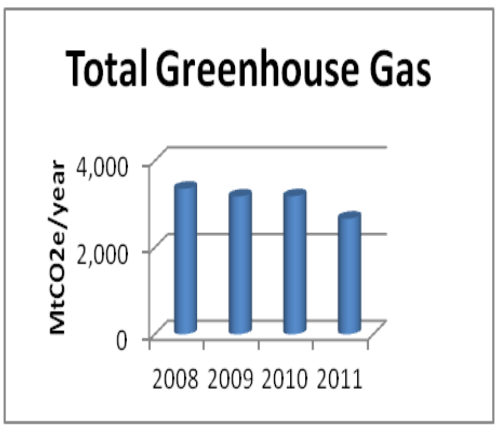
2009: 4.396 mWh

2010: 4.328 mWh

2011: 3.641 mWh

Greenhouse gas (GHG) avoided:

691 metric tons carbon dioxide equivalent (2011 compared to 2008 baseline).*



Project Success Story

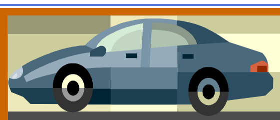
Prior to a 2009 upgrade of the primary sludge withdrawal system, one blower was adequate to meet aeration needs. Either one 350 HP unit or one 250 HP unit was used. After the upgrade, however, it was often necessary to run two blowers simultaneously.

As with most WWTPs, blowers draw more energy than any equipment in the plant. Running two blowers, instead of one, was costing the WWTP money and electricity so it was vital to discover why aeration demand had increased and then to mitigate or eliminate this impact.

Operating and laboratory data showed that the removal efficiency of primary clarifiers had deteriorated since the 2009 upgrade of the sludge withdrawal system. Specifically, primary sludge was not being removed quickly enough by the new pumping system. As a result, primary effluent contained higher solids and biological loading which contributed to increased oxygen demand in the aeration tanks.

To correct the problem, the WWTP altered the automation program to increase the amount of sludge pumped from primary clarifiers. This greatly improved the removal efficiency of the primary clarifiers, and reduced the loading on the aeration basins. The reduced loading translated to a more balanced oxygen demand, allowing the WWTP to once again operate with one blower. Operating one blower, instead of two is estimated to save the WWTP $48,400 a year. There was no cost in implementing the change to primary sludge handling so an immediate payback was realized for these improvements.

Greenhouse gas emissions avoided are equivalent to



Removing 135 vehicles from the road for a year

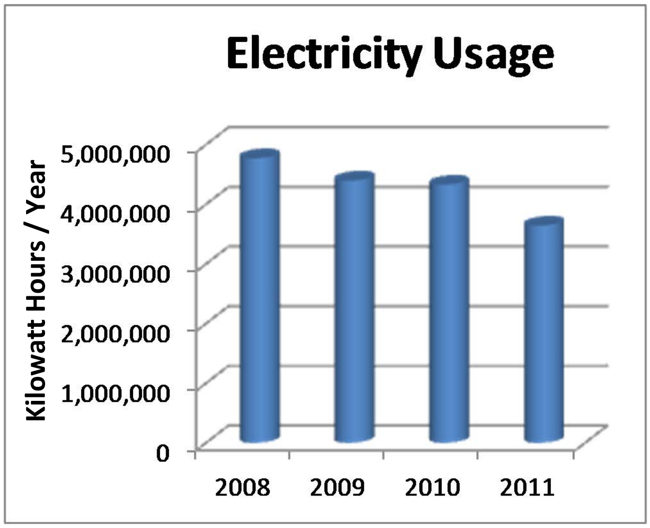
Electricity for 86.2 homes for a year

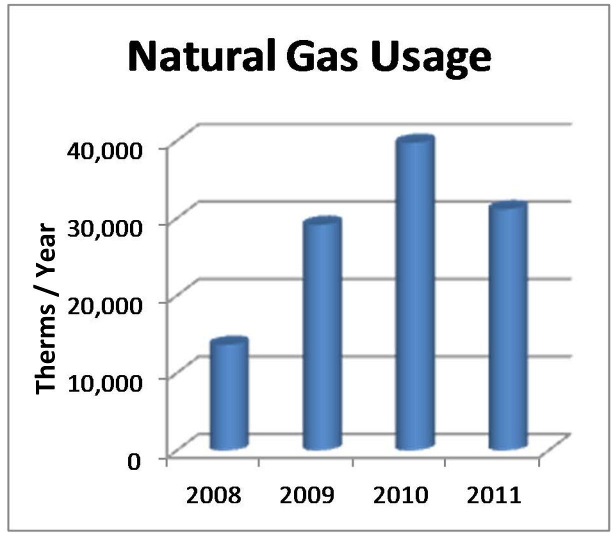
3.8 Railcars of coal

1,607 Barrels of Oil

Green House Gas Equivalencies calculated using USEPA calculator (http://www.epa.gov/cleanenergy/energy-resources/calculator.html

Documented Results





Key Improvements

Process Targeted / Goal	Improvement and estimated saving	Annual Energy Saving, kWh	Implementation cost, $$	Annual cost saving, $	Simple payback, years
Primary Effluent BOD / Aeration Blower Demand	Reduce BOD loading to Aeration Basin, thereby reducing air demand. Run only one blower, instead of two. $48,400 Estimated Annual Savings	(691,696 projected)* So far, 324,819 kWh saved in 2011.*	$0	($48,400 projected)* So far, $22,700 saved in 2011*	0
Wet Weather Building Chemical Room Exhaust Fans	Install VFD to reduce fan speed when building is not occupied. $337 Estimated Annual Savings	4821 kWh*	$3,900	$337*	11.5

*Above kWh & cost savings are calculations, based on equipment runtimes and the following conversion factor:
1 horsepower = 0.745699872 kW

2009-2011 INDIANA ENERGY MANAGEMENT PILOT

City of Bloomington Utilities Monroe Drinking Water Plant

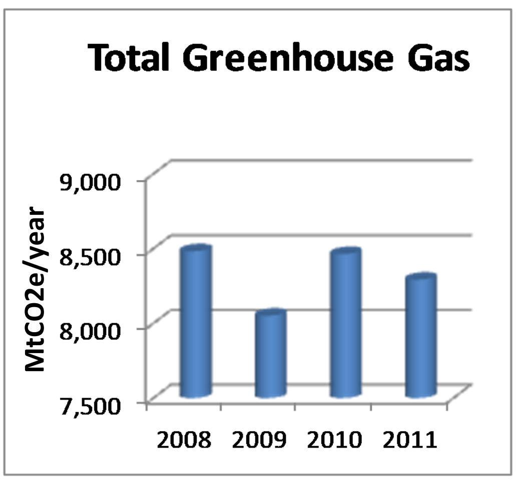
Who we are

The City of Bloomington Monroe Water Treatment Plant (CBU Monroe) was originally built in 1967 and currently serves a population of 110,000. It is one of two water treatment plants operated by CBU and serves a total population of 69,000. In 2010, CBU Monroe treated and delivered an average of 448.36 million gallons (MG) per month of drinking water.

Natural Gas Usage

2008: 24,745 Therms
2009: 25,200 Therms
2010: 18,298 Therms
2011: 12, 182 Therms

Greenhouse gas (GHG) avoided as a result of improvements: 12.6 metric tons of carbon dioxide equivalent (2008 baseline compared to 2011).*



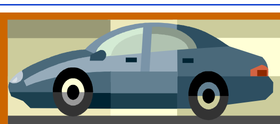
Project Success Story

As a result of the 2009-2011 Indiana Energy Pilot, CBU Monroe staff and management began to focus more closely on energy billing, cost of energy and its impact on the overall budget. CBU began evaluating energy use and energy billing in 2011. Prior to that, energy bills were viewed by the accounting department and as a result CBU staff did not evaluate energy use patterns and/or corresponding energy charges.

After educating staff and critically analyzing energy bills, CBU requested that the energy provider to do a rate structure comparison for all of the rates the CBU Monroe was eligible for. The rate structure comparison showed that the rate currently used was not on the most cost-effective. On May 05, 2011, the rate was changed from a High Load Factor (HLF) rate to a Low Load Factor (LLF) rate.

Changing the energy billing rate structure at the CBU Monroe resulted in a savings of $6,651.79 over 2 billing cycles. This change, which required no financial investment, could result in an estimated annual savings of over $39,000. The evaluation of rate structures will be requested of energy providers on an annual basis.

Greenhouse gas emissions avoided are equivalent to



Removing 2.5 vehicles from the road for a year

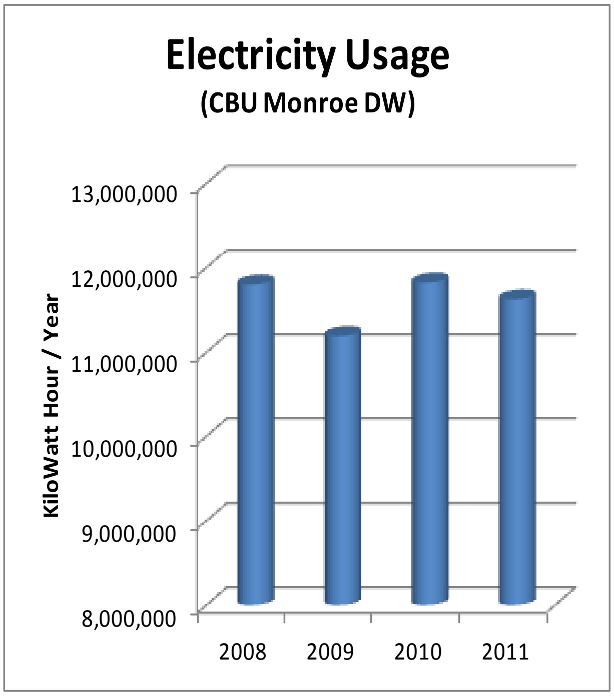
Electricity for 1.6 homes for a year

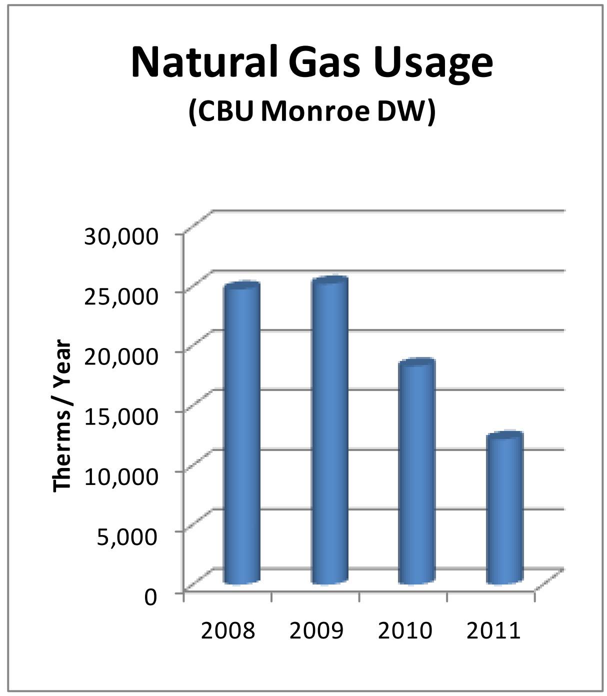
0.69 Railcars of coal

29.3 Barrels of Oil

*Green House Gas Equivalencies calculated using USEPA calculator (http://www.epa.gov/cleanenergy/energy-resources/calculator.html

Documented Results





Key Improvements

Goal	Improvement Process	Annual energy saving (kWh)	Implementation cost	Annual cost saving	Simple pay-back, years
Energy billing rate structure change (HLF to LLF)	Reduction in energy bill of ~$2,500/month	N/A	$0	$30,000	0
Pump water based on previous day's demand	Reduction in peak kW usage and subsequent reduction in demand-based energy bill charges	N/A	$0	$4,800 to $12,000	0

2009-2011 INDIANA ENERGY MANAGEMENT PILOT

Mishawaka Drinking Water Plant

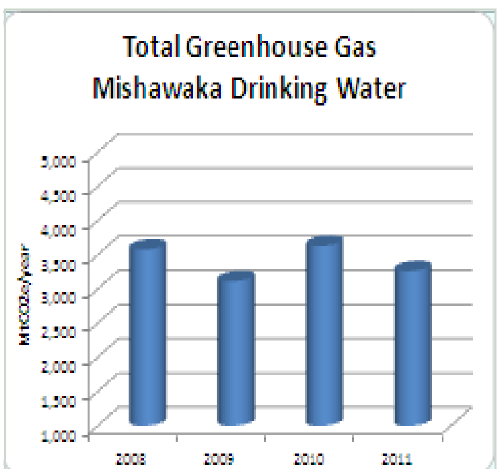
Who we are

The Mishawaka municipal drinking water treatment plant/well system underwent its last major upgrade in 2002. It currently serves a population of about 47,620 using a groundwater supply drawn by a system of 3 well fields that together handles 8.0 million gallons per day (MGD) on average. The plant has a peak daily capacity of 30.0 MGD. Groundwater is finished by rapid sand filters and chemical addition and then transported via the system's high service pumps to the distribution system where elevated and ground storage is available for 10.0 million gallons of finished water.

Electricity Usage

2008: 3.352 gWh
2009: 3.115 gWh
2010: 3.631 gWh
2011: 3,263 gWh

Greenhouse gas (GHG) avoided: 315 metric tons carbon dioxide equivalent (2011 compared to a 2008 baseline).*



Project Success Story

For this Pilot, energy consumption at the Mishawaka Water Division is the sum of energy at well fields, the treatment plant, high service pumps, booster stations and water towers. This includes the Water Division office building.

The City of Mishawaka has been proactive about energy efficiency and had all city departments and utilities inspected for energy-saving opportunities. Lighting was among the suggestions for the Water Division prior to 2009 and led to a project completed in the spring of 2011 to change all overhead lighting at the main Water Division office to energy-efficient fluorescent bulbs with automatic timers. The building houses 21 offices, a lunchroom, warehouse, a main garage area, maintenance areas, storage areas, locker rooms and restrooms.

The Maintenance Department noticed that the rooftop air conditioning unit at the Water Division office was not operating efficiently due to two failed compressors. So in 2011, a new air conditioner unit was installed with a seasonal energy efficiency rating of 13 to deliver better energy performance at reduced operating cost. Mishawaka Water Division plans to continue its energy efficiency efforts with improved lighting, air conditioning and pumping efficiency at booster stations and/or elevated tanks.

Greenhouse gas emissions avoided when 2008 is compared to 2011 are equivalent to

Removing 62 vehicles from the road for a year

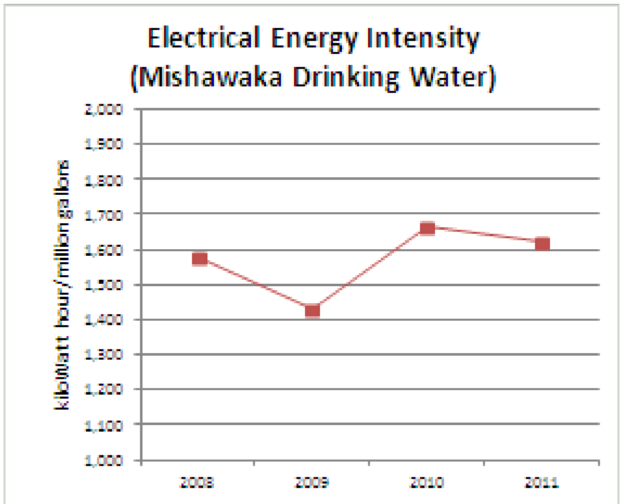
Electricity for 39 homes for a year

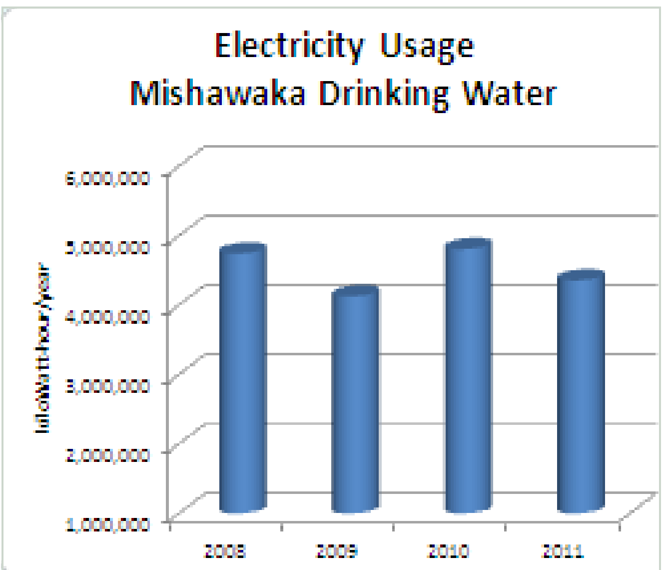
1.57Railcars of coal

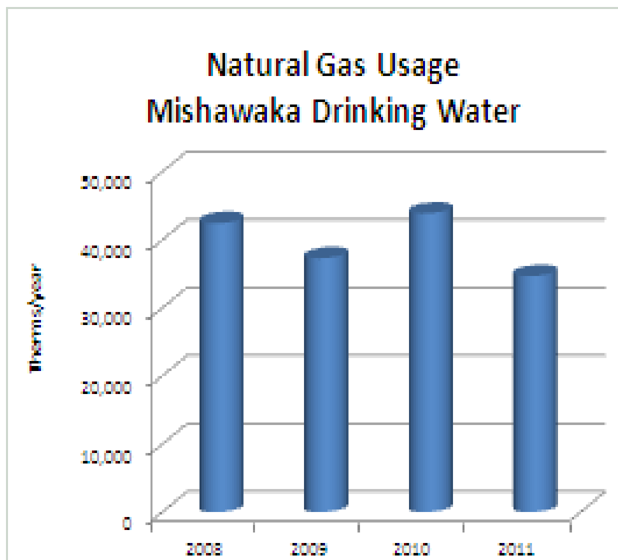
733 Barrels of Oil

Green House Gas Equivalencies calculated using USEPA calculator (http://www.epa.gov/cleanenergy/energy-resources/calculator.html

Documented Results







Key Improvements

Process	Targeted goal	Annual energy saving	Implementation cost ($)	Annual Saving ($)	Simple Payback (years)
Lighting improvements in the main office building.	Reduce electrical cost by Summer 2011.				
Replace air conditioning unit for main office building.	Reduce electrical cost by Summer 2011.				
Lighting changes at booster stations and elevated tanks.	Reduce electrical use by 45% by May 2012.				
Improve pumping efficiency.	Reduce energy used by pumps by 5% by October 2011.				

2009-2011 INDIANA ENERGY MANAGEMENT PILOT

Valparaiso Flint Lake Drinking Water Plant

Who we are

The Valparaiso Water Department provides two drinking water treatment plants: the Airport (AP) Plant built in 1963 and expanded in 1977, and the Flint Lake (FL) Plant originally built in 1885. The present FL Plant was constructed in 1993 and expanded in 2004. The FL Plant is the focus of efforts during the Indiana Energy Management Pilot and is the subject of this fact sheet. It includes three well fields (total of 15 wells) that provide water to the FL filtration plant where 5 pressure filters remove iron and manganese out of raw water. Liquid chlorine is added during the treatment processes. Fluoride and phosphate are also introduced to produce finished water.

Electricity Usage

2008: 1,760,987 kWh

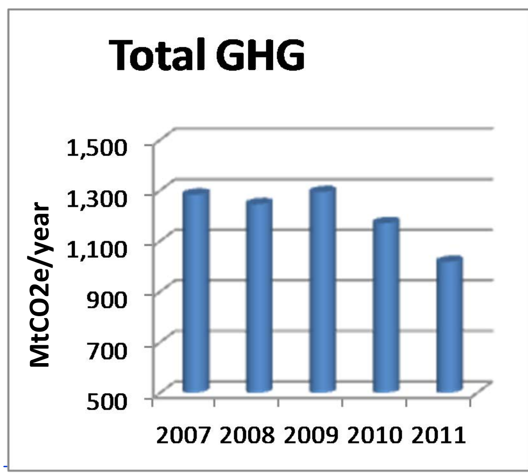
2009: 1,828,730 kWh

2010: 1,654,485 kWh

2011: 1,438,880 kWh

Greenhouse gas (GHG) avoided:

228 metric tons carbon dioxide per year (2011 compared to 2008 baseline).*



Project Success Story

In December 2010, Northern Indiana Public Service Company (NIPSCO) regional manager informed Valparaiso drinking water utility staff that NIPSCO customers are eligible to change their rate tariffs if the current ones are not the most beneficial. The water utility did a full rate analysis based on historical electricity usage and concluded that the FL Plant was not being billed at the lowest rate by NIPSCO.

The water utility contacted NIPSCO and requested that NIPSCO confirm the finding, which it did. This led to a rate tariff change in January 2011. After switching to the new rate tariff, the water treatment plant has seen a reduction of $1,000/ month ($12,000/year) on electricity bill. This change of rate tariff did not reduce electricity usage. However, water operations successfully reduced its expenses.

Greenhouse gas emissions avoided are equivalent to

Removing 445 vehicles from the road for a year

Electricity for 29 homes for a year

1 Railcar of coal

530 Barrels of Oil

*Green House Gas Equivalencies calculated using USEPA calculator (http://www.epa.gov/cleanenergy/energy-resources/calculator.html

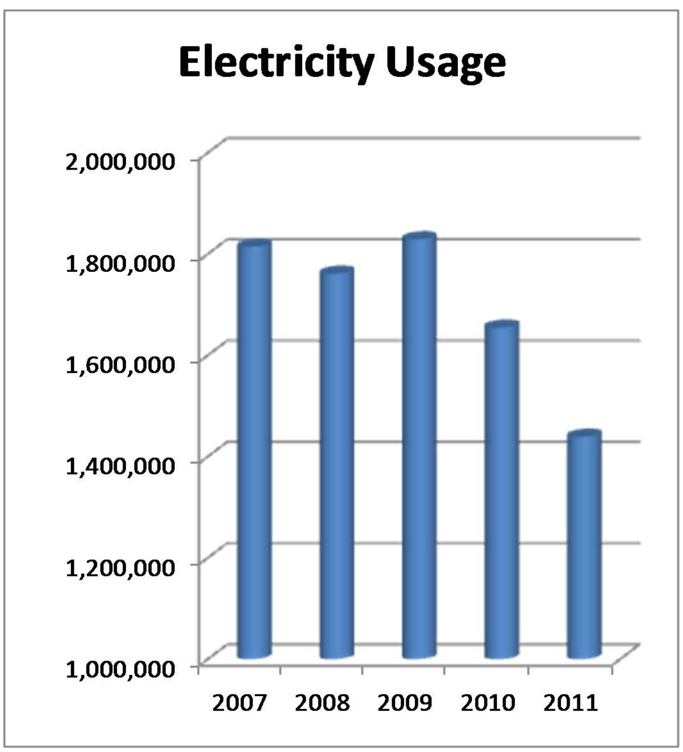
Key Improvements

The Valparaiso Water Department has reduced electrical energy use by implementing numerous strategies.

Process Targeted / Goal	Improvement and estimated saving	Estimated annual energy saving, kWh	Implementation cost, $	Annual cost saving,	Simple pay-back, years
Lighting	Reduced number of lighting hrs by 40%	7488	No cost. Turn lights off	$749	0
Lighting	Will replace T12 with T8 bulbs and fixtures	1,098		$110	No esti-mate
High service pumps	Replacing high service pumps with premium efficiency ones at both plants	34,640	$52,400	$3,464	15.1
HVAC[1]	Purchased portable HI-E dehumidifiers to replace the gas burning dehumidifier.	36,000	$500	$13,600	1
Rate Tariff	Worked with NIPSCO to apply the best rate tariff to water operations	NA	NA	$12,000	0

1. The gas burning dehumidifier cost more in natural gas than electricity. This cost saving includes the estimated saving of $10000 on natural gas.

Documented Results



High Pressure Filtration, Flint Lake Drinking Water Plant

Storage, Flint Lake Drinking Water Plant