

2009

Wisconsin Energy Independent

Community Partnership

25 x 25 Plan for Energy Independence

SPRING GREEN, WISCONSIN

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Overview

The Village and Town of Spring Green and the River Valley School District were selected to be one of the first of ten pilot communities in the Wisconsin Energy Independence Community Partnership to develop a “25 by 25” Plan to increase our use of renewable energy and fuels. We hope that our program design can serve as a model for other communities who have similar characteristics, such as population, administrative and management capacity, and levels of technical knowledge or resources.

Goal There are three ways of stating the goal.

1. Increase renewable energy sources by 25% by 2025.
2. Reduce usage of energy from fossil fuels by 25% by 2025.
3. Obtain 25% of energy from renewable sources by 2025.

The Village, Town and School boards all have passed resolutions of intent to try to achieve 25% of their energy from renewable sources by 2025.

Program Design Spring Green’s program design is intended to integrate renewable energy measures with energy efficiency, conservation and reduction measures. The premise is that if the goal is to obtain 25% of energy from renewable sources by 2025, one must first tackle reducing energy usage and maximizing energy efficiency. Then, one can properly size the renewable energy installations. Or vice versa, if there are limited opportunities for renewable energy installations, then the goal would be primarily to reduce or minimize the growth of energy usage.

The program design consists of 1) preliminary identification of priorities for renewable energy projects, 2) renewable energy site assessments of solar electricity and solar hot water installations, 3) assessment of the potential of solid and liquid waste, 4) walk-thru energy audits of all buildings, 5) cost feasibility studies of energy efficiency measures for the most complex building systems, and 6) exploration of potential for other renewable sources (wind, bio-fuel, bio-mass).

This design makes maximum use of the resources and incentives provided by the Schools and Local Government Program of Focus on Energy. These are delivered via a subcontract with the Cooperative Educational Services Association (CESA). It also uses the providers of renewable site assessments and commercial building energy efficiency engineers that are certified by the Midwest Regional Energy Association (MREA).

Outcomes

Goal 1: Spring Green’s Plan will increase existing renewable energy sources by 100% since there were no existing renewable, specifically solar electricity and hot water, energy installations.

Goal 2: Spring Green's Plan will reduce its dependence upon fossil fuel by 29% through combined energy efficiency, conservation and solar electricity and solar hot water measures.¹

Goal 3: Spring Green's Plan will reach 14% of its 25% goal of renewable or non-fossil fuel sources with solar electricity and hot water installations and bio-diesel.²

Spring Green EIC Team's analysis finds that combining energy efficiency measures with renewable solar installations, bio-diesel and the Wisconsin Renewable Source requirement, we can obtain 6.3% of total 2025 energy from renewable sources.

Spring Green's Energy Independence Team and the governing boards of the Village, Town and River Valley School District have gained substantial awareness of the interconnectedness of the Wisconsin EIC Partnership objectives cited above. They are also aware of their ability to substantially "pilot" the growth of their community's energy usage by utilizing both renewable sources and reducing or minimizing growth of their energy usage through becoming more energy efficient.

The Village of Spring Green has submitted its application for the 2009 Energy Efficiency and Conservation Block Grant (EECBG) to fund the swimming pool solar hot water system, and efficiency measures at the Public Works Garage and the Wastewater Treatment Plant.

What was measured? Why?

Energy Usage Energy usage for the previous three years (2006, 2007 and 2008) was obtained from utility bills for natural gas, electricity, liquid propane gas, natural gas and diesel fuel.

Inventory This included 17 *conditioned* structures, streetlights, tornado sirens and vehicles. Buildings included are:

Village Hall	River Valley High School
Public Works Garage	River Valley Middle School
Wastewater Treatment Administration/Lab	Spring Green Elementary School
Wastewater Treatment Sludge	Arena Elementary
Well Houses #1 and #2	Lone Rock Elementary
Swimming Pool	Plain Elementary
Library	Portable classroom
Town Hall/Garage	School storage warehouse

¹ Email December 16, 2009 from Sean Weitner, Energy Center of Wisconsin

² EIC Measures Spring Green v1, December 17, 2009, Sean Weitner, Energy Center of Wisconsin

We did not measure two village park shelters, school booster concession stand or the unheated storage building at the wastewater treatment plant.

The Village, Town and Schools combined have 12 diesel-powered and 11 gasoline-powered vehicles.

Diesel vehicles

2 dump trucks
1 sewer cleaner
1 street cleaner
1 loader
3 small groundskeepers
1 small tractor
1 tractor
2 snowplows

Gasoline vehicles

2 police cars
5 pick-up trucks
2 cargo vans
1 passenger car
1 riding mower

School buses were not included since the River Valley School District contracts transportation to Lamers Bus Services.

Analysis The Energy Center of Wisconsin's Baseline analysis found that our consumption was increasing at 14.5% a year! This was astonishing. We concluded that three years of data is insufficient to really understand what was happening. Two factors were identified: 1) the 2008 flood, and 2) heavy snow. The data were not normalized for temperature. The 2008 floodwater runoff and groundwater infiltration overloaded the wastewater treatment plant for four months. This required many residents to use Porta-Potties and minimize domestic water use. Snowfall in winter 2007 was TWICE the annual average.

The Energy Center of Wisconsin analyzed the proportion of energy from fossil fuel sources, proportion of energy use by type of building, and energy intensity (by volume) of selected buildings.

Spring Green's EIC Team identified our "Energy Guzzlers" by comparing kWh and Therm (converted to Btus) usage per building square footage as a rough indicator of efficiency. We also looked at the annual change in energy consumption for each of the 17 buildings. This caused the EIC Team to ask "why" and "what is happening in each building."

See Baseline Energy Consumption Data in the Appendix for the Energy Center of Wisconsin's analysis of energy usage. Also see Spring Green Usage Comparison charts also in the Appendix.

Discoveries/Surprises

The findings from the Energy Center of Wisconsin's Baseline data are:

1. School buildings account for 75% of total energy consumption.
2. Natural gas for heating comprises 59% of energy resources. Electricity comes in second at 34%.
3. Water, that is, pumping and treating fresh and wastewater, consumes 13% of total energy used. For the Village of Spring Green to affect this usage would require a major community education campaign on water conservation.
4. The least energy efficient (most energy intense--*all sources*) of selected buildings by volume, is:

Lone Rock Elementary School

River Valley Spring Green campus buildings:

River Valley High School

River Valley Middle School (includes district administrative offices)

River Valley Elementary School

Village Hall

5. The most energy efficient (least energy intense—*all sources*) of selected structures, by volume, are:

Town Hall/Garage

School warehouse

Village Public Works Garage

Library

The Spring Green EIC Team analyzed usage by square footage and type of energy. This further analysis helped pinpoint where energy efficiency/conservation measures identified by the Walk-Thru Audits are most effective.

1. Street lights were a major cost item and significant electricity usage for the village.

2. Energy Guzzlers for electricity are: Wastewater treatment

Well houses #1 and #2

Street lighting

High School

Lone Rock Elementary School

3. Energy Guzzlers for natural gas are: Village outdoor swimming pool

Village public works garage

Well house #1

High School
Lone Rock and Arena elementary schools

The two small buildings (portable classroom and warehouse) on the River Valley Schools spring Green campus, while inefficient for both electricity and natural gas, were quantitatively minimal users.

Total Projects Considered

Renewable Site Assessments Conducted– in priority order and why

H&H Solar Technologies, Madison, Wisconsin conducted renewable solar site assessments for the school and library sites. Their report assessed maximum capacity as well as cost-realistic options. Jewell Associates, engineers, conducted the swimming pool solar hot water assessment that was reviewed by Focus on Energy.

FIRST. Village outdoor swimming pool solar hot water. This is a huge cost for heating and a significant outlay in the Village budget.

SECOND. Spring Green Community Library solar electricity. While this building was an efficient energy user, its south-facing roof was ideal.

THIRD. River Valley High, Middle and Elementary schools were assessed for solar electricity. The Spring Green campus, where these schools are co-located, provided the greatest opportunity, with a lot of open land. Both cost/feasible sizing and maximum capacity were evaluated.

FOURTH. River Valley High and Middle schools were assessed for solar hot water.

FIFTH. Wastewater Treatment Plant. Could this possibly be converted to anaerobic digestion and produce enough heat for the plant itself, maybe more?

Renewable Site Assessments were not conducted for the following:

1. Town Hall/Garage. It is only used for meetings about 150 hours a year. The garage is occupied during working hours-except the one Patrolman is usually out. The total propane and electricity consumption was very small.
2. Village Hall. This 50-year-old cement block building is not conducive to retrofitting and the site is tiny. Future use is unknown.
3. Well Houses #1 and #2. Total consumption is small.

4. River Valley elementary schools of Arena, Plain and Lone Rock. In the next 15 years the District must face the question of whether (or which) to keep these schools open. District enrollment is declining overall.
5. The River Valley warehouse and portable classroom also consumed little energy, however inefficient they are.
6. River Valley School District obtained several years ago a wind assessment of the Spring Green campus that determined it was not feasible.
7. Geo-thermal heating was not considered, but could be an energy efficient measure when new construction or major renovations are undertaken.

Energy Efficiency - Walk-Thru Audits

We selected 15 of the 17 buildings for walk-thru audits:

Public Works Garage
Wastewater Treatment Control
and Sludge buildings
Village Hall
Library
Well Houses #1 and #2
Town Hall/Garage

River Valley High School
River Valley Middle School
Spring Green Elementary
Arena Elementary
Lone Rock Elementary
Plain Elementary

We were unable to get the Focus on Energy specialist on pumps (such as at the wastewater treatment plant and well houses) to schedule an audit in time for this report.

The remaining structures (pool house, school warehouse and portable classroom) are unheated or very small energy users.

All of the hundreds of energy efficiency/retrofits recommended by the Focus on Energy Auditors were considered.

Cost/Feasibility Studies

Following the recommendations of the walk-thru audits of the High and Middle schools, we obtained an HVAC Cost/Feasibility Study that was conducted by JDR Engineers, Madison. These were most the complex systems of all the 15 audited buildings, and the High School energy usage for heating is the largest of all. The Study found that considerable efficiencies could be obtained at the High School, but less efficiency could be realized at the Middle School.

Pathways to 25 x 25

First consideration is the Wisconsin Renewable Source requirement for Alliant Energy to generate 10% of electricity from renewable sources by 2015. One path that was not chosen by Spring Green entities is the purchase of renewable energy from Alliant Energy's Second Nature program. The reason is increased cost in a declining financial environment.

The second pathway is the site-based cost/feasible renewable solar energy installations. These would generate only 1.6% of projected 2025 Btus. The alternative of maximum capacity installations (regardless of cost/feasibility) would still only reach 3.7%.

Third, combining the first two results in 2.7% of 2025 Btus from renewable sources.

Fourth, the pathway to 25 x 25 must include reductions in current (2008) energy usage, to accommodate a projected growth of 5.2% by 2025.

- a. Energy efficiency measures alone would reduce 2025 energy consumption by 20%. Renewable sources would then constitute about 6% of total 2025 Btus.
- b. Combining the energy efficiency reductions and removing Btus from the usage with renewable sources, results in renewable energy sources comprising 6.3% of total 2025 Btus.

See Possible Measures spreadsheets in the Appendix.

Projects Selected – Explanation

Renewable Energy Projects Selected

We selected projects that achieved the greatest energy offset and were cost/feasible. Bio-diesel is the only source that costs less and generates a significant savings in fossil fuel usage.

<u>Project</u>	<u>Energy Offset</u>	<u>Year</u>
Village Outdoor Pool Solar Hot Water	33%	2010
Library Solar PV Electric	50-100%	2015
Bio-diesel	5%	2020
RV School Spring Green campus Solar PV		
Elementary	4.5%	Depends on
Middle	3 %	referendums
High	1.4%	and budget
High School Solar H ₂ O	< 1%	shortfalls.

Renewable Energy Projects Not Selected

Wastewater Treatment Plant Anaerobic Digestion. Larry Krom, contractor specialist in bio-digestion for Focus on Energy, indicated that the Gallons Per Day and amount of B.O.D. are too small to make it cost/feasible.

Maximum capacity installations of solar electric PV at the River Valley Spring Green campus generated significant offsets, but were prohibitively expensive. H&H Solar Technologies recommends that the schools install in phases.

High School offset would be 4.5%

Elementary School offset would be 20.1%

Middle School offset would be 32%

Middle School Solar Hot Water installation would offset 6.8%, of energy but is quantitatively less than that of the High School.

Energy Efficiency Measures Selected

All of the energy efficiency measures are included in our Plan. (See Appendix Possible Measures) They encompass maintenance, operations/occupant behavior, equipment replacement/purchasing, lighting, HVAC and domestic hot water. Most are not expensive and many require no monetary outlay.

The measures with the highest impact (from highest to lowest) are:

1. Replacing street lights with LED lamps/fixtures
2. Roof Insulation
3. Scheduling and staging ventilation with controls
4. Lighting occupancy sensors
5. Replacing CRT monitors with LCD monitors
6. Computer network controls

Potential Renewable Feed Stocks

Biomass Sauk County's biomass potential generally ranks in the top third of counties, according to the report Wisconsin Biomass Potential by County, by Brett Hulsey of Better Environmental Solutions. Here is the data stated in coal equivalent tons.

Corn Stover

33- 53,000 tons/year

CRP grass	6- 12,000 tons/year
Switch grass on CRP lands	50-100,000 tons/year
Wood slash	15- 33,000 tons/year

Total biomass potential is 62-87,000 tons/year.

There is a lack of processing and hauling capacity in the Spring Green area. Wood chipping enterprises and other biomass processing enterprises are needed. Muscoda, which is 30 miles distant, has a lumber company that supplies Meister Cheese Company located next door. TimberGrowers is a micro-managed forest company located in Spring Green but is small.

Bio-diesel Frontier Services Cooperative has a diesel fuel station located in Spring Green, but does not supply bio-diesel. Company executives have indicated an interest depending upon demand. This needs to be explored.

Dairy Animal Waste Manure Hanour, a large dairy enterprise in Sauk County, manages its manure in various ways. Several years ago Hanour's own cost-feasibility study concluded that energy in Wisconsin is so cheap it is not cost feasible to process their own manure. There is a nascent cooperative in Richland Center. None is accessible to Spring Green's government energy needs.

Existing Unknowns – Necessary Information for the Future

A realistic projection of growth in energy usage in Spring Green is unknown. The 14.5% average annual growth for the last two years contained in the Baseline Energy Consumption is not grounded in enough information. Even with our selected average annual rate of 0.3%, total increase would be 5.2%.

H&H Solar Technologies assumes an annual inflation rate for natural gas of 7.8% and 5.95% for electricity. In 2008, Spring Green spent \$635,784 for heating and electricity. Using the above rates, compounded, by 2025 energy costs will be simply financially unsustainable.

For purposes of this pilot 25 x 25 Plan, we excluded consideration of the following unknowns:

---Village Hall renovation/expansion or new construction addition to library.

---River Valley School District enrollment is declining. The current referendum expires in 2011.

This provides an opportunity to implement solar energy installations, but also to discuss the future of the elementary schools in Arena, Lone Rock and Plain and use of the Spring Green campus.

Economic activity such as Cardinal Glass expansion or success of Furthermore Brewery. Both are heavy water users. Unless the cost and efficiency of solar electric and hot water technologies are significantly reduced and increased, OR, the price of energy dramatically rises, the Village, Town and

Schools will likely only implement renewable energy projects at the time of major renovations, or construction of new buildings.

Another unknown is a significant increase in incentives or availability of grants. It will be necessary to reduce simple paybacks to less than half the life of the measure. The reason is so that the energy savings from the last half of the life can be utilized to eventually replace and upgrade the installation.

Public works garage and wastewater treatment could be assessed for solar electric. There is also potential to phase up to the maximum solar PV installations at the River Valley School District's Spring Green campus.

The potential to develop a wood waste economic sector is unexplored.

Action Steps – Immediate & Long – Term

1. River Valley School District will develop policies for occupant behavior and operations.
2. Train and set up U.S. EPA's online Portfolio Manager for River Valley Schools and the Village of Spring Green.
3. Suggest that the Village and River Valley School District and Town establish Energy Savings Accounts.
4. Pursue a bio-diesel supplier and do more education of Village and Town staff. Meet with Lamers Bus Service.
5. Initiate discussions with Alliant Energy on street lighting.
6. Investigate potential for creating wood chipping and hauling capacity sufficient to interest River Valley School District in a new wood slash/chip district heating system for the Spring Green campus.
7. Continue the EIC Teams in the schools, village and town.

Energy Independence Team Members

Village Team: Doug Feiner, Village Board of Trustees
 Ed Lilla, Jewell Associates, Spring Green, village engineer
 Paul Kardatzke, Avenue Architects, Spring Green
 Jenny Pappas, Village Deputy Clerk/Treasurer
 Greg Wipperfurth, Village Public Works Director

Town Team: Jerry Schmidt/John McKenna, Township Board of Supervisors
Doug Jones, a retiree from Johnson Controls
Brad Haas, Town Patrolman

School Team: Carl Hayek, Business Manager
Julie Kardatzke, Architect LLC
Amy Synnes, High School English teacher
Dennis Crowley, River Valley School Board

FOR FURTHER INFORMATION CONTACT:

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Appendix: Baseline Energy Consumption Data – Spreadsheets

In order to determine Spring Green's 2025 municipal energy use baseline, we need to estimate the rate at which we can expect Spring Green's energy usage to grow.

This value will differ for every community.

Possible values are listed below. To run this baseline tool, please select one of those values, or determine your own, and enter it (as a percent) into the green box.

0.3%

- 1.4% Spring Green's estimated population growth rate
- 0.3% Population growth rate discounted by percent of energy attributable to buildings
- 14.5% Annual growth rate of Spring Green municipal energy usage, 2006 to 2008

(As a way to perform a reality check on your estimate, an annual growth rate of 4.2% would mean doubling your energy consumption by 2025.)

Once you have entered a growth rate, please proceed to the next tab.

spring green ecw rev1.0
11-Sep-09

Your 2008 energy usage baseline is 34,486 million (MM) Btus.
That baseline is comprised of 2,996,352 kWh,
216,965 therms,
7,049 gallons of propane,
8,469 gallons of gasoline,
and 6,262 gallons of diesel.

By assuming an annual growth rate of 0.30%,
in 2025 your energy use baseline will be 36,288 MMBtu.

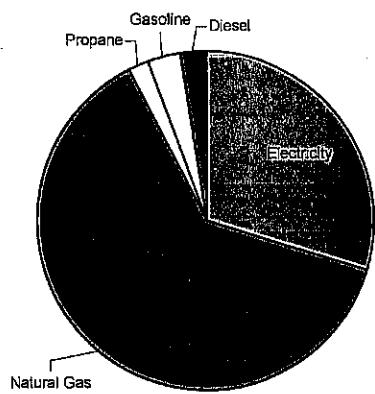
Your 25% energy reduction goal
for 2025 is therefore 9,072 MMBtu,
or 26% of your 2008 consumption.
This translates into 2,658,849 kWh or
90,720 therms or
73,161 gallons gas or
65,266 gallons diesel or
some combination
of those fuels.

Sent Sept 11, 2009
spring green ecw rev 1.0

Spring Green 2008 Energy Baseline: Additional Info

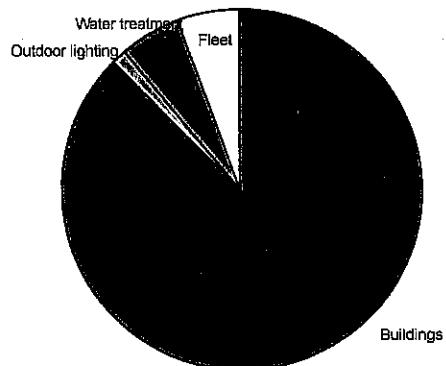
Total Consumption by Energy Type

Energy type	Percent of total Btus
Electricity	30%
Natural Gas	63%
Propane	2%
Gasoline	3%
Diesel	3%



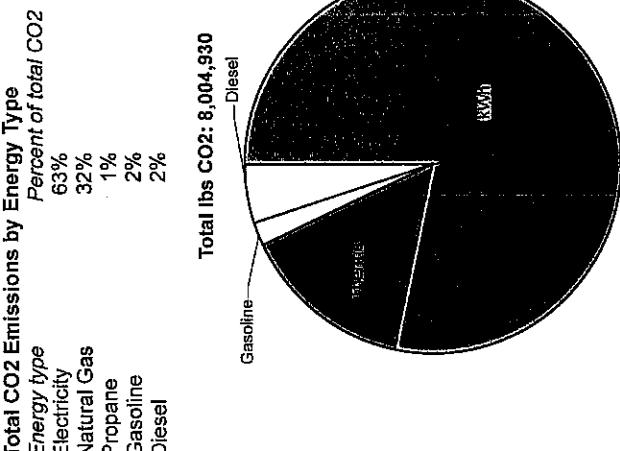
Total Consumption by End Use

Energy end use	Percent of total Btus
Buildings	87%
Infrastructure	7%
Lighting	1%
Water	6%
Fleet	6%

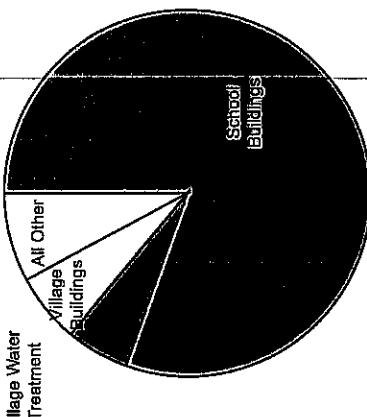


Spring Green 2008 Energy Baseline: Additional Info

Sector + Energy end use	Percent of End Use
School Buildings	8%
Village Water Treatment	6%
Village Buildings	6%
All Other	8%



Buildings	kWh/ft ²	therm/ft ³
Warehouse	2.33	2.13
Lone Rock Elementary	9.08	0.91
River Valley High School	7.26	0.85
Arena Elementary	4.27	0.70
Village Hall/Police Dept	5.34	0.56
Public Works Building	3.27	0.59
River Valley Middle School	6.93	0.41
Town Hall (offices, shop)	2.21	0.40
River Valley Elementary	6.24	0.35
Plain Elementary	4.43	0.29
Library	3.49	0.11



Energy use by year

		2006	2007	2008
kWh	Buildings	2,102,738	2,240,922	2,347,694
	Infrastructure	773,756	643,687	648,658
Therms	Buildings	142,983	186,307	215,788
	Infrastructure	815	851	1,177
Gallons propane	Buildings	6,427	5,580	6,364
	Infrastructure	355	180	685
Gasoline	Vehicles	7,065	7,842	8,469
Diesel	Vehicles	4,428	4,500	6,262
Dollars	Buildings	352,551	412,224	468,933
	Infrastructure	75,143	76,899	81,127
	Gasoline	18,645	22,358	27,609
	Diesel	12,416	13,590	24,484
MMBtus		26,307	30,684	34,486

Annual changes in MMBtu consumption

% growth	2006	2007	2008
2006 –		17%	31%
2007	–		12%
2008	–	–	–

2008 energy use baseline in MMBtus

	energy consumption of given type	in MMBtus	% of total	in lbs CO2	% of total
KWh	2,996,352	10,224	30%	5,069,828	63%
Therms	216,965	21,697	63%	2,540,226	32%
Propane (gallons)	7,049	646	2%	89,311	1%
Gasoline	8,469	1,050	3%	165,484	2%
Diesel	6,262	870	3%	140,081	2%
Dollars	602,153				
Totals		34,486		8,004,930	

2008 energy use baseline by end use

	MMBtu	
Buildings	30,172	87.49%
Outdoor lighting	470	1.36%
Water treatment	1,923	5.58%
Fleet	1,921	5.57%
Total	34,486	

2008 energy use baseline in MMBtu by sector

Sector	Fuel	energy consumption of given type	in MMBtus	% of total
School	kWh	2,193,630	7,485	22%
School	therms	203,036	20,304	59%
School	gasoline	3,212	398	1%
Town	kWh	12,960	44	0%
Town	propane (gallons)	2,367	217	1%
Town	gasoline	740	92	0%
Town	diesel	3,000	417	1%
Village	kWh	789,762	2,695	8%
Village	therms	13,929	1,393	4%
Village	propane (gallons)	4,682	429	1%
Village	gasoline	4,517	560	2%
Village	diesel	3,262	453	1%
Totals			34,486	100%

2008 energy use baseline by end use and sector

Sector	End Use	MMBtu	% of total
School	Buildings	27,788	81%
School	Fleet	398	1%
Town	Buildings	261	1%
Town	Fleet	509	1%
Village	Buildings	2,123	6%
Village	Lighting	470	1%
Village	Water Treatment	1,923	6%
Village	Fleet	1,014	3%
	Total	34,486	100%

Building Information

Schools

Type of energy consumed	Data	Sum of 2006 total	Sum of 2007 total	Sum of 2008 total	06-08 increase
electric \$ (inc. tax, fees)		173402.59	194879	211190	8%
heating \$ (inc. tax, fees)		142748.02	177343	211148	19%
kWh		0	0	0	
natural gas (therms)		1946670	2074546	2193630	6%
Grand Total		2393953.61	2618947	2819004	18%

Town

Type of energy consumed	Data	Sum of 2006 total	Sum of 2007 total	Sum of 2008 total	06-08 increase
electric \$ (inc. tax, fees)		1381.67	1402.01	1346.55	-3%
heating \$ (inc. tax, fees)		2157.39	3253	4436	106%
kWh		0	0	0	
kWh		12440	12680	12960	4%
propane (gallons)		1617	2157	2367	46%
Grand Total		17596.06	19492.01	21109.55	

Village

Type of energy consumed	Data	Sum of 2006 total	Sum of 2007 total	Sum of 2008 total	06-08 increase
electric \$ (inc. tax, fees)		15780.92	16740.65	15451.88	-8%
heating \$ (inc. tax, fees)		17080.49	18606.43	25360.5	36%
kWh		0	0	927.41	
kWh		143628	153696	141104	-2%
natural gas (therms)		11850	14128	12752	-8%
propane (gallons)		4810	3423	3997	-10%
Grand Total		193149.41	206594.08	199592.79	17%

Lighting information		Utility billing data			
Lighting ID	Type	Types of energy consumed	2006 total	2007 total	2008 total
		kWh	111456	121956	121956
SP-L01	Streetlights 010	kW	0	0	0
		electric \$ (inc. tax, fees)	\$17,687	\$20,665	\$21,129
SP-L02	N Wood Street Flasher 204955-010	kWh	376	389	401
		kW	0	0	0
		electric \$ (inc. tax, fees)	\$91	\$96	\$99
SP-L03	South Park Carpenter Ln 448786-010	kWh	188	544	388
		kW	0	0	0
		electric \$ (inc. tax, fees)	\$111	\$153	\$147
SP-L04	North Park Daley St 427926-010	kWh	8320	8160	9400
		kW	0	0	0
		electric \$ (inc. tax, fees)	\$945	\$953	\$1,120
SP-L06	E Siren State Road 23 670425-001	kWh	185	224	204
		kW	0	0	0
		electric \$ (inc. tax, fees)	\$116	\$121	\$124
		kWh	116	152	125
		kW	0	0	0
		electric \$ (inc. tax, fees)	\$108	\$113	\$115
SPL-08	Alley/D. Town Lights E Jefferson St 639352-001	kWh	220	240	240
		kW	0	0	0
		electric \$ (inc. tax, fees)	\$50	\$56	\$56
		kWh	5057	5296	5112
		kW	0	0	0
		electric \$ (inc. tax, fees)	\$283	\$287	\$292

Water information

Infrastructure ID	Type	Gallons per month	Number of stations	Utility billing data		Name of utility	2006 total	2007 total	2008 total
				kWh	Types of energy consumed				
SP-W01	VW Control Bldg. Carpenter Ln 321924-010			kW	Alliant Energy	210560	203120	212200	0
SP-W02	VW Sludge Transfer/Chemical Feed Ln 574419-001	7,836,090 Avg/Month Carpenter 261,203 Avg/Daily 300,000+/-	1	kWh electric \$ (inc. tax, fees) propane (gallons) heating \$ (inc. tax, fees)	Frontier FS-LP	\$20,778 355 \$486	20711.75 180 276	22290.01 685 1235	0
SP-W03	Well No. 1 137 N Albany St 362838-011			kWh electric \$ (inc. tax, fees) natural gas (therms) 1 heating \$ (inc. tax, fees)	Alliant Energy	163800	149000	164000	0
SP-W04	Well No. 2 W Jefferson St 257867-010	545		kWh electric \$ (inc. tax, fees) natural gas (therms) 1 heating \$ (inc. tax, fees)	Alliant Energy	71742 0 \$813	37399 0 851.18	11825 0 968.26	0
SP-W05	Sewage lift station 1 E Daley St 346867-010			kWh 1 electric \$ (inc. tax, fees)	Alliant Energy	180400	95000	95000	0
SP-W06	Sewage lift station 2 W Madison St 139927-010			kWh 1 electric \$ (inc. tax, fees)	Alliant Energy	9,580	10232.19	10389.31	0
SP-W07	Sewage lift station 3 N Cincinnati St 382741-010			kWh 1 electric \$ (inc. tax, fees)	Alliant Energy	273	232	494	0
SP-W08	Sewage lift station 4 Outlot 2 Sunrise Dr. 685505-001			kWh 1 electric \$ (inc. tax, fees)	Alliant Energy	\$445	378.56	793.73	0
SP-W09	Sewage lift station 5 E Hoxie St 289939-010			kWh 1 electric \$ (inc. tax, fees)	Alliant Energy	1137	1221	2410	0
SP-W10	Water Tower Peterson St 286896-010			kWh 1 electric \$ (inc. tax, fees)	Alliant Energy	\$209	212.78	353.16	0

FLEET INFORMATION
SG VILLAGE

	2006	2007	2008
Total gasoline purchases (gallons)	3113	3890	4517
Total diesel purchases (gallons)	1428	1500	3262

Total number of plug-in electric vehicles in operation
--

Vehicle type/ category	Make	Model	Number of vehicles of this model	Total miles traveled 2006	Total miles traveled 2007	Total miles traveled 2008	Fuel type	Total gallon per year
Dump truck	1994 International	4700 DT408	1				diesel	
Dump truck	2001 International	4700 DT466E	1				diesel	
Other medium truck	2002 Chevrolet	3500	1				gasoline	
Other medium truck	2005 Chevrolet	2500	1				gasoline	
Other medium truck	2005 Chevrolet	1500+	1				gasoline	
Jet Vac Sewer cleaner	1987 Ford	L800	1				diesel	
	S-6737-S							
Street Cleaner	1986?2000?Elgin	Pelican	1				diesel	
Loader	Deere	444	1				diesel	
Small diesel/Groundskeeping	1997 Deere	935	1				diesel	
Small diesel/Groundskeeping	ExMark	Laser XS	1				diesel	
Small diesel/Groundskeeping	Deere	1435	1				diesel	
Small Tractor	Kabota	L3410	1				diesel	
Police car	2005 Ford	Crown Victoria	1	30000	30000	30000	gasoline	1387
Police car	2007 Dodge	Charger	1	12000	12000	12000	gasoline	571

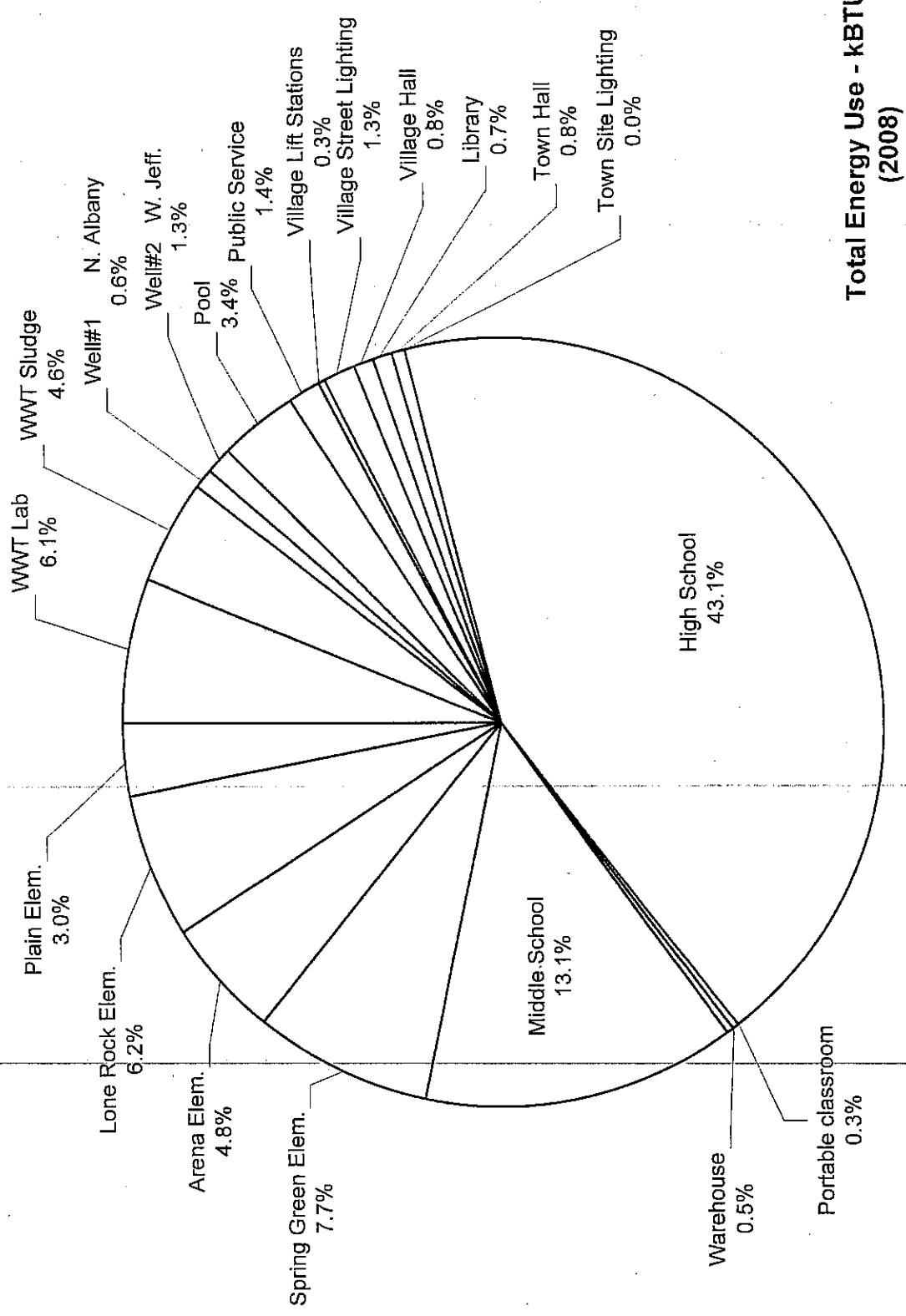
Fleet information
RIVER VALLEY SCHOOLS

	2006	2007	2008
Total gasoline purchases (gallons)	3212	3212	3212
Total diesel purchases (gallons)	0	0	0

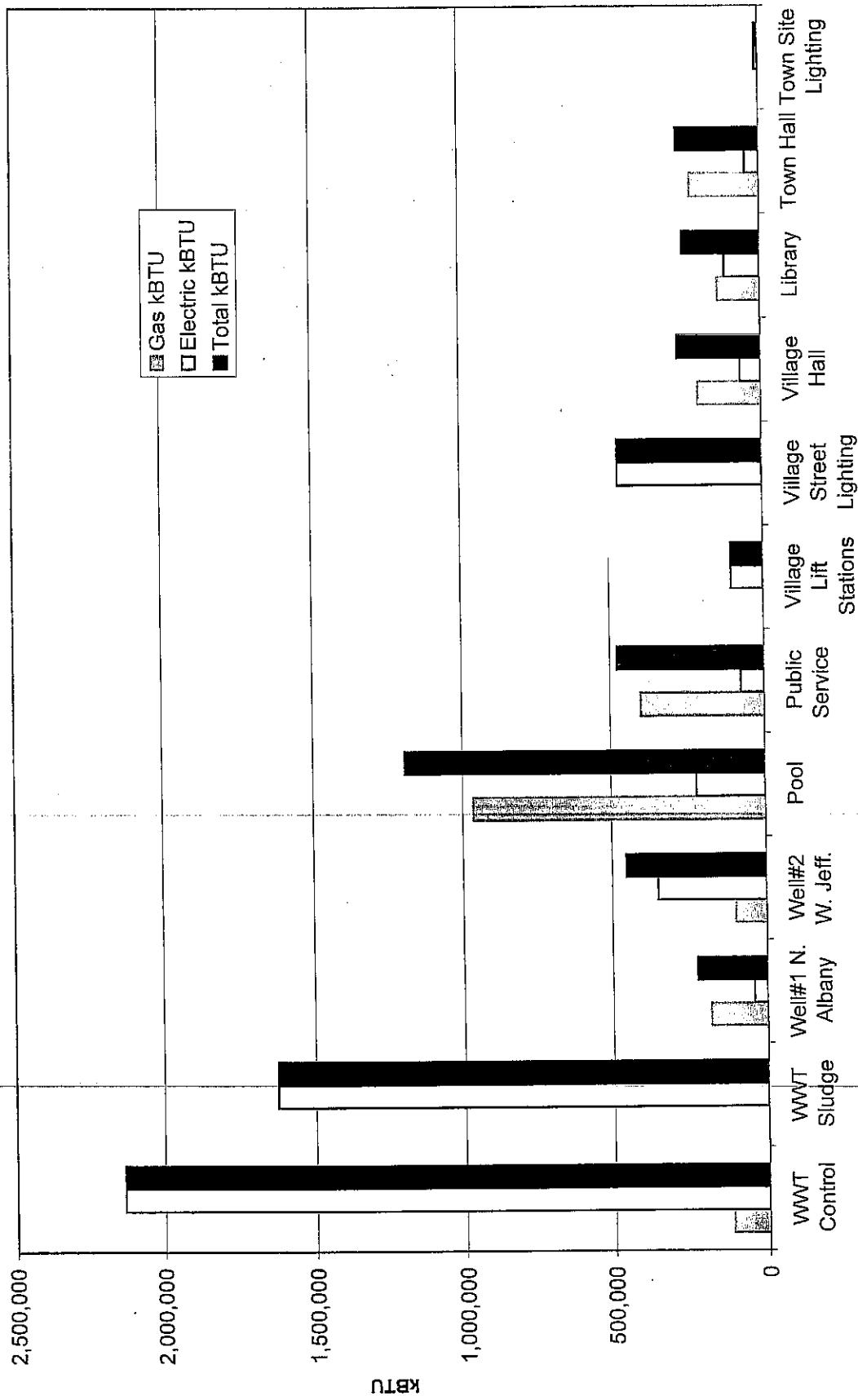
Total number of plug-in electric vehicles in operation

Vehicle type/ category	Make	Model	Number of vehicles of this model	Total miles traveled 2006	Total miles traveled 2007	Total miles traveled 2008	Fuel type	Total gallon per year
Pickup/Van/Light truck	1994 Chevrolet	K-20 Pickup	1	180	155	139	Gasoline	180
Pickup/Van/Light truck	2002 Ford	Cargo Van	1	6480	6480	6480	Gasoline	1800
Pickup/Van/Light truck	1996 Ford	Cargo Van	1	1500	1600	1700	Gasoline	800
Private passenger	1997 Chevrolet	Geo Prism	1	7200	7200	7200	Gasoline	432

Spring Green Usage Comparison Charts

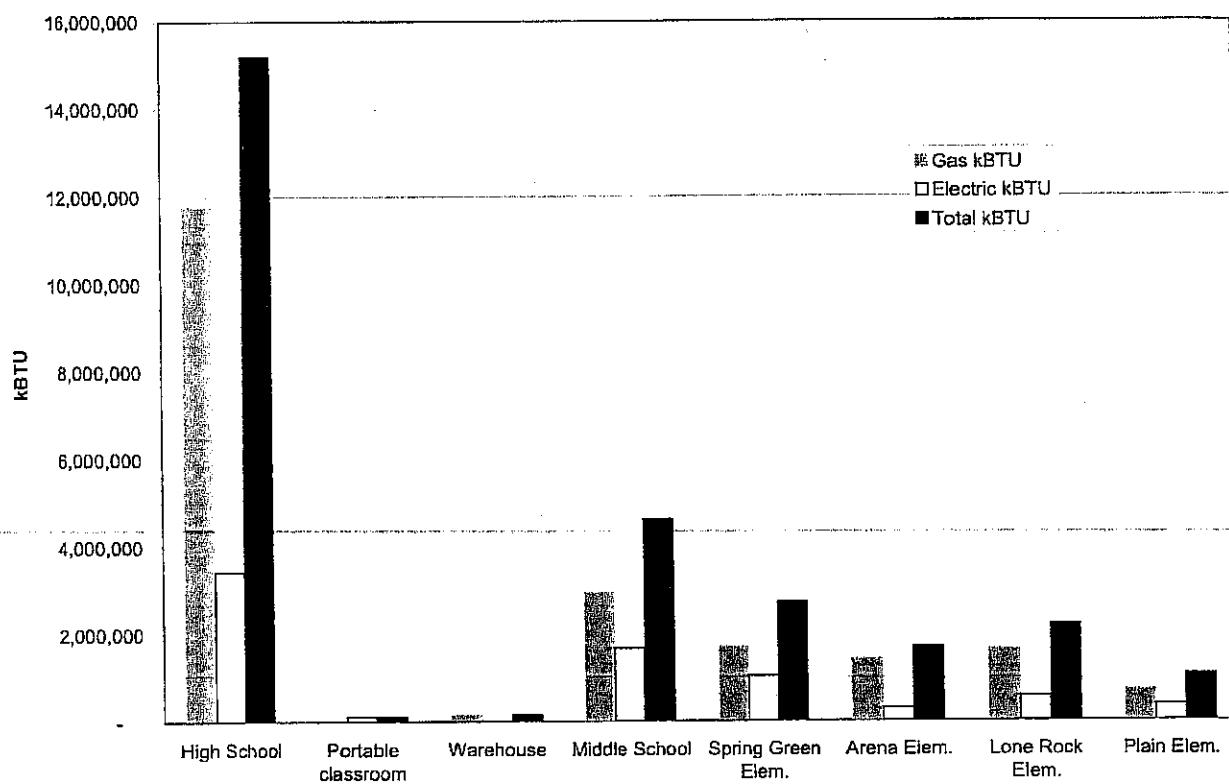


Total Energy Use - Village and Township (2008)



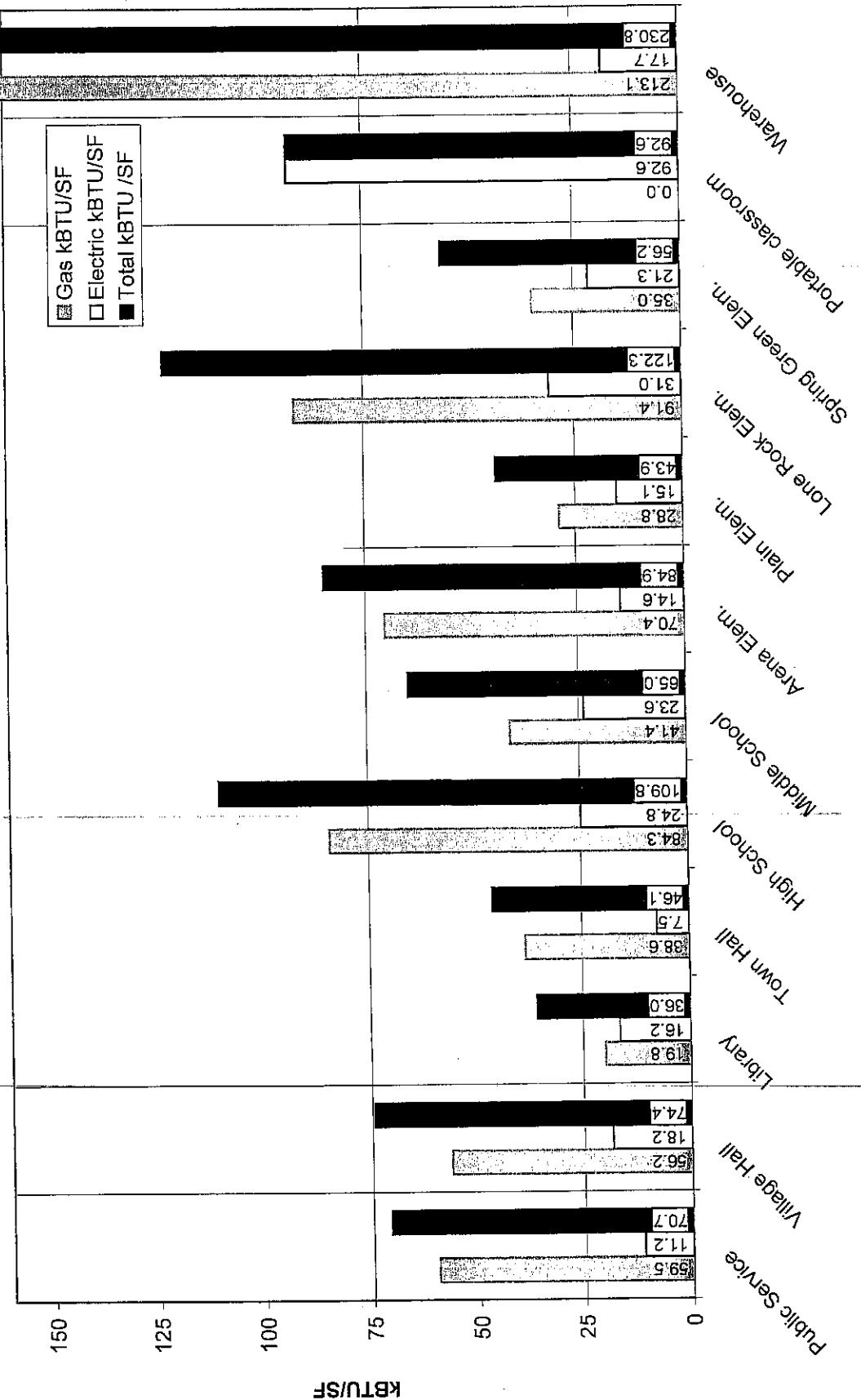
5/26/2009

Total Energy Use - Schools (2008)



5/22/2009

Energy Use per Area - Occupied Buildings (2008)



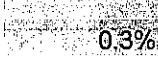
12/10/2009

ENERGY CENTER OF WISCONSIN SPRING GREEN MEASURES ANALYSIS Assumptions

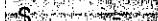
2008 Energy Usage, Rates and Generation

	Usage	Index	2008 rates	Existing generation
electricity	2,996,352 kWh	4	\$ 0.1022 /kWh	0 kWh
natural gas	216,965 therms	7	\$ 1.0574 /therm	0 therms
unleaded gasoline	8,469 gallons	9	\$ 3.2600 /gal	0 gallons
diesel fuel	6,262 gallons	5	\$ 3.9100 /gal	0 gallons
gallons propane	7,049 gallons	10	\$ 2.0583 /gal	0 gallons

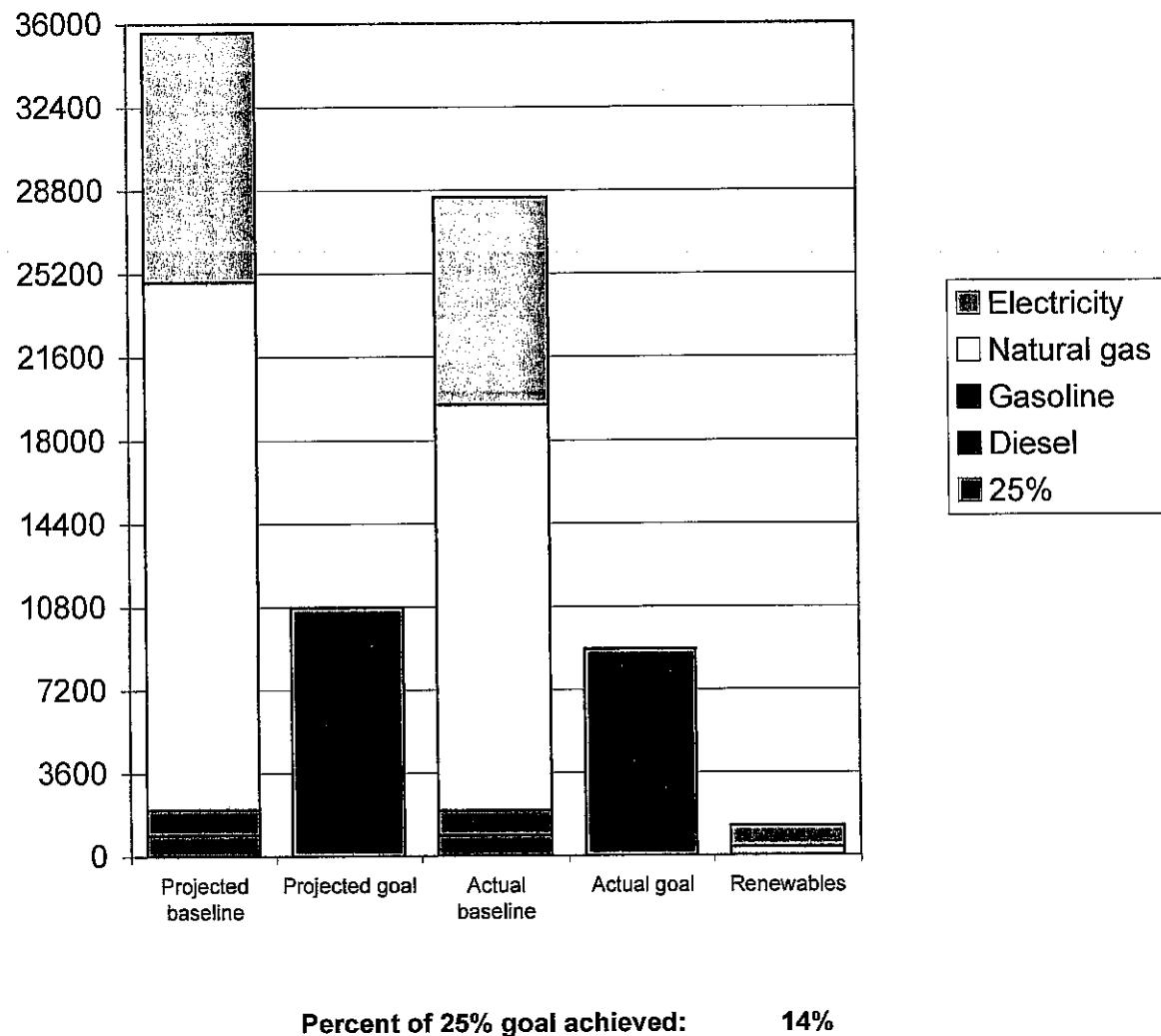
Factors

Estimated annual growth rate
for municipal energy  0.3%

Purchase renewable electricity from utility

Block size  0 kWh
Incremental cost per block  \$ 0.0000

2025 Energy Use



Measures	Name	Savings-to-investment ratio	Installed cost before incentives	Present value cost with incentives		Lbs CO2 1,209
				Incentive amounts	Incentive amounts	
10% R	Wisconsin RPS	—	\$ 715 kWh	\$ 96,250.00	\$ 96,250.00	-
O R	Purchased renewable electricity	0.01	0 kWh	\$ 16,250.00	\$ 16,250.00	36,788
On R	Pool Solar Hot Water	0.01	3143 therms	\$ 99,000.00	\$ 49,980.00	1,979
On R	Pool Bath House Solar Hot Water Heater	0.01	169 therms	\$ 99,000.00	\$ 42,304.26	29,955
On R	Library Solar Electricity	0.32	17704 kWh	\$ 19,200.00	\$ 7,320.00	2,195
On R	High School Solar Hot Water	0.02	187.5 therms	\$ 103,680.00	\$ 43,864.00	23,952
On R	High School Solar Electricity	0.02	14156 kWh	\$ 103,680.00	\$ 43,864.00	23,952
On R	Middle School Solar Electricity	0.02	14156 kWh	\$ 70,560.00	\$ 35,280.00	21,507
On R	Spring Green Elementary Solar Electricity	0.04	12711 kWh	\$ 70,560.00	\$ 35,280.00	21,507
On E	Bio-Diesel Fuel	0.46	221 gallons diesel	\$ 884.00	\$ 710.29	4,944
On E	#DIV/0!	42805.50	6182 kWh	\$ 12,400.00	\$ 12,400.00	10,460
On E	Energy Efficiency Public Works	1.14	330 therms	\$ 3,800.00	\$ -	3,864
On E	Energy Efficiency Village HVAC Upgrade	1.99	844 therms	\$ 6,250.00	\$ -	9,882
On E	Energy Efficiency SG Village Infiltration	1.01	5170 kWh	\$ 5,485.00	\$ -	8,748
On E	Energy Efficiency Village Hall Lighting	1.29	3000 kWh	\$ 2,500.00	\$ -	5,661
On E	Energy Efficiency Wells Houses #1 and #2	1.29	1.9 kWh	\$ 280.00	\$ -	3
On E	Energy Efficiency Town Hall	0.00	1.7 kWh	\$ 500.00	\$ -	815.50
On E	Energy Efficiency in Library	0.00	73500 kWh	\$ 108,600.00	\$ -	80,798.40
On E	Street Lights	0.33	29496 kWh	\$ 1,00	\$ 2,00	49,907
On E	Energy Efficiency River Valley Schools-Delamp	17619.70	54032 kWh	\$ 15,000.00	\$ 30,000.00	161,370
On E	Energy Efficiency Schools Scheduling	2.15	114378 kWh	\$ 136,030.00	\$ 1,727,042.32	0
On E	Energy Efficiency Schools Staging & Occupancy HVAC Controls	0.08	3460 kWh	\$ 300,000.00	\$ 198,300.00	86,803
On E	Energy Efficiency RV High School HVAC System Upgrade	0.03	7331 kWh	\$ 80,000.00	\$ 52,880.00	12,404
On E	Energy Efficiency RV Middle School HVAC	0.01	8260 kWh	\$ 19,350.00	\$ 236,922.17	13,976
On E	Energy Efficiency RV Schools Lighting Occupancy Sensors & Multi-Level Switching	0.04	40300 kWh	\$ 11,440.00	\$ 147,328.90	68,323
On E	Energy Efficiency RV Schools CFL's	0.33	39000 kWh	\$ 26,000.00	\$ 138,424.00	65,988
On E	Energy Efficiency River Valley Schools- Parking Lot Lighting	0.10	33800 therms	\$ 47,000.00	\$ 41,538.60	39,339
On E	Energy Efficiency River Valley Schools Insulation	1.10	1550 therms	\$ 1,550.00	\$ 5,330.27	18,147
On E	Energy Efficiency River Valley Schools Infiltration	2.47	256 therms	\$ 400.00	\$ 4,908.40	2,987
On E	Energy Efficiency River Valley Schools Domestic Hot Water Temperature Control	0.66	4900 kWh	\$ 1,055.00	\$ 13,442.81	8,291
On E	River Valley Schools Motor Replacement	0.44	78720 kWh	\$ 35,680.00	\$ 455,000.28	133,194
On E	Energy Efficiency River Valley Schools Replace CRTs and Manage Network	0.21	2790 kWh	\$ 165.00	\$ 330.00	4,721
On E	Energy Efficiency River Valley Vending Machines	10.10	53877 kWh	\$ 1.00	\$ 2,00	91,160
On E	Energy Efficiency River Valley Schools Clean Light Fixtures	32183.91	100 kWh	\$ 2,300.00	\$ 1,711.20	169
On E	Energy Efficiency River Valley Schools Appliance Replacement	0.02	223 gallons unleaded	\$ 25,000.00	\$ 289,325.00	4,357
On E	Energy Efficiency River Valley Schools Vehicle Replacement	0.04	1591 gallons propane	\$ 118,930.00	\$ -	20,158
On E	Energy Efficiency Public Works	0.00	15 therms	\$ 12,850.00	\$ -	176
On E	Energy Efficiency Wastewater Treatment Plant	204.29	4520 kWh	\$ 4,200.00	\$ 48,606.60	7,648
On E	Energy Efficiency River Valley Schools Domestic Hot Water	0.09				
	Total:	\$ 1,350,051.00	\$ 288,958.00	\$ 2,273,455.20	\$ 620,040	
	Baseline Lbs CO2:	7,915,619				
	New Lbs CO2:	7,295,579				
	Reduction:	8%				

POSSIBLE MEASURES FOR 25x25 PLAN
Version 3 (12.15.09)

PROJECTED GROWTH IN ENERGY USAGE FROM 2008-2025

**Total
Percent Change**
 $\frac{2008}{34,486} = 2025$
 $36,288$
 In millions of Btus

5.2% or 0.3% Increase each year if we continue as usual.
 Actual annual growth for last 2 years has been 14.5% each year!
 Which would mean by 2025 our usage would be off the charts.

GOAL OF 25% FROM RENEWABLE SOURCES

RENEWABLE ENERGY SOURCES RECOMMENDED

	Average annual 2007-2008	Avg. Ann \$ 07-08	Annual Savings (Offset)		Toward 25x25 Goal		Cost After Incentives	Years to Recover \$	Years until Replacement	Install Date	
			Therms	%	MM Btus	Installed \$					
Pool H2O	10,315 Therms	\$10,992	3143	33%	\$4,023	314.3	\$96,250	\$0	40-50	2013	
Library PV Elec (roof)	36,398 kWh	\$4,113	17704	50%	\$2,001	57.1	\$99,960	\$49,980	18	30-50	
HS PV Elec (8.64 kWh) ground	958,000 kWh	\$91,968	14156	1.4%	\$1,359	48.3	\$103,680	\$43,638	25	30-50	
ES PV Elec (awning on wall)	282,467 kWh	\$27,116	12645	4.5%	\$1,214	42.5	\$70,560	\$35,280	19	30-50	
MS PV Elec (8.64 kWh) ground	474,080 kWh	\$43,615	14156	3%	\$1,302	48.3	\$103,680	\$43,854	25	30-50	
HS H2O (roof)	2,050 Therms		232	<1%	\$211	23.0	\$19,200	\$7,230	\$11,970	21	40-50
Bio-diesel avg. 5% blend	4425 6150/5000 Btus	-	307,538	5%		30.8	Cost/gallon of 2% is \$0.05 less than diesel fuel.				
TOTAL RECOMMENDED RENEWABLE SOURCES	58661	3682.5			\$10,110		564 million Btus	\$216,862	21.5		
% of 2025 Projected Energy Btus							1.6%				
Utility Renewables Required by Law by 2015							416.7 million Btus				
10% of 2025 kWh (multiply 2008 kWh of 2,347,694 x 5.2% /293 to convert to MM Btus)								981 million Btus			
COMBINED TOTAL % of 2025 Projected Energy Btus								2.7%			

**ALTERNATIVE - MAXIMUM PHYSICAL CAPACITY INSTALLATION
REGARDLESS OF COST AND YEARS TO RECOVER COST**

	kWh	%	MMBtus
Pool H2O			314.3
Library PV Elec (28.56 kWh) roof	35408	100.0%	120.8
HS PV Elec (28.8 kWh) ground	47188	4.9%	161.0
ES PCV Elec (45.36 kWh) roof	56903	20.1%	194.2
MS PV Elec (92.16 kWh) ground	151000	32.0%	515.2
Bio-diesel			30.8
TOTAL			1336 million Btus
% of 2025 Projected Energy Btus		3.7%	
With Utility Renewables			2317 million Btus
% of 2025 Projected Energy Btus		6.4%	

THIS IS MAXIMUM POTENTIAL TO GENERATE FROM RENEWABLES
NEED TO DO ENERGY EFFICIENCIES, CONSERVATION & RETROFFITS

**ENERGY EFFICIENCY REDUCTIONS
SPRING GREEN VILLAGE AND TOWN**

	Savings (Offset) kwh	Therms	\$	Reduction in MM Btu\$	Installed \$	Incentive \$	Cost: After Incentives	Years to Recover Cost	Years until Replacement	Install Date
Village Garage										
Replace Heating, Ventilation, & Controls	420			42	\$ 60,000	EECBG & FOE	\$ 0 or ?		20	2010 or 2012
Insulate Ceiling	1161		\$804	116	\$ 41,800	EECBG & FOE	\$ 0 or ?		30	2010 or 2012
Replace Lighting & Controls	6162	304		20	\$ 12,400	EECBG & FOE	\$ 0 or ?		20	2010 or 2012
Weatherstrip Doors				30	\$ 600				5	2010
Wastewater Treatment Plant	8000		\$830	27	\$ 2,332	EECBG & FOE	\$ 0 or ?		20	2010 or 2011
Upgrade A/C in Lab										
Insulate Walls (clerestory & trombe)	300		\$91	30	\$ 10,000	EECBG & FOE	\$ 0 or ?		30	2010 or 2011
Replace Lighting & Controls	874	80		3	\$ 1,800	EECBG & FOE	\$ 0 or ?		20	2010 or 2011
Weatherstrip Doors				8	\$ 200				5	2010 or 2011
Village Hall/Police Station										
Replace Boiler	200		\$220	20	\$ 2,800	REMAINDER ARE UNKNOWN				
Remove thru-wall A/C	20		\$22	2	\$ 500					
Weatherstrip Doors	80		\$88	8	\$ 200					
Replace Lighting	2770		\$316	9	\$ 2,985					
Replace Lighting Controls	2400		\$274	8	\$ 2,500					
Upgrade HVAC Controls	130		\$143	13	\$ 1,000					
Replace Doors	260		\$286	26	\$ 4,500					
Village Well Houses 1 and 2										
Ventilation Controls	3000	50	\$433	15	\$ 2,500					
Weatherstrip Doors	100		\$146	10	\$ 250					
Replace Lighting & Controls	2200		\$264	8	\$ 1,500					
Library										
Replace electric water heater w/ on-demand gas - as needed	290	7	\$52	1.7	\$ 500					
Village Street Lighting										
Replace with LED Fixtures (assumed 50% savings)	69000		\$11,500	235	\$ 105,600					
Town Hall										
Delamp Meeting Room	230		\$27	0.8	No Cost					
Florescent Lighting										
Replace Exterior Security & Exit Lights with LED Bulbs	324		\$38	1.1	\$ 290					
Town Street Lights										
Remove US14/Hwy23 pole	1180		\$70	4.0	No cost					
Replace with LED Fixtures for 3 street lights assumes 50% savings	4500		\$75	15.4	\$ 3,000					
REDUCTION OF 2008 ENERGY USAGE	100950	3112	\$15,677	653.0	\$ 257,257					16.4

**ENERGY EFFICIENCY REDUCTIONS
RIVER VALLEY HIGH SCHOOL**

	Savings (Offset) kwh	Therms	\$	Toward 25x25 Goal MM Btus	Installed \$	Focus on Energy Incentive \$	UNKNOWN Cost After Incentives	Years to Recover Cost	Years until Replacement	Install Date	(Payback)
MAINTENANCE											
Replace weatherstripping											
Clean Light Fixtures annually	25120	84	\$84	8.4	\$200	2.4	0.0	15	2010		
			\$2,261	85.7	\$0						
EQUIPMENT REPLACEMENT/PURCHASING											
Repair Incandescents with CFLs-as needed assuming 60)	8400		\$756	28.7	\$480	1.0	15	2010-2015			
Install NEMA premium efficiency motor-as needed	1200	2300	\$108	4.1	\$300	3.0	15	2010-2015			
Increase roof insulation with reroofing			\$2,300	230.0	\$31,500	13.7	25	2010-2025			
Replace HID with CFLs-as needed	1900		?	6.5	\$200			15	2010-2025		
HVAC											
Reschedule of AC-1 through AC-5	42400	3330	\$7,255	478.0	\$5,000	0.7	2010				
AC-2(Gym)-Staged Ventilation	800	17630	\$17,049	1766.0	\$10,000	0.6					
AC-2(Gym) - Supply fan VFD	71370	-570	\$6,267	187.0	\$10,000	1.6					
AC-3(Weight-Wrestling Rm)-Staged Ventilation	33310	5010	\$8,004	615.0	\$10,000	1.2					
AC-3(Weight-Wrestling Rm)-Supply Fan	43590	-30	\$4,134	146.0	\$10,000	2.4					
VFD	-44340	7785	\$3,260	627.0	\$10,000	12.3					
AC-4(locker Rm)- Energy Recovery System Upgrade-Existing Classroom	10660	3928	\$4,800	429.0	\$150,000	31.3					
Warm Air Furnace											
System Upgrade-Existing Gym/Band Warm Air Furnace	-7200	2985	\$2,186	274.0	\$150,000	68.6					
LIGHTING											
Damp where appropriate	4000		\$360	13.7	\$0	0.0	2010				
Occupant sensors-general	40000		\$3,600	136.5	\$16,000	4.4					
Multi-level switching	7900		\$711	27.0	\$1,600	2.2					
LED Parking lighting - SG campus											
assuming 26 fixtures	39000		\$3,510	133.1	\$26,000	7.4	2020				
DOMESTIC HOT WATER											
Circulation pump time clock on H2O system	2300		\$207	7.8	\$3,000	14.5					
Pre-rinse sprayer; low flow			\$230	23.0	\$400	1.7					
Bosser water heater fuel conversion	1000		\$90	3.4	?						
OTHER											
Install Vending Miser or disconnectamps (assuming 3 machines)	1320		\$119	4.5	\$0	0.0	2010				
Replace one district car with electric car (180 gal/yr @ \$2.50/gal Gas Priced)	?	223	\$450	22.3	\$25,000	need a new car anyway	15	2012			
TOTAL REDUCTION OF 2008 ENERGY USAGE											
	282730	325635	\$6,741	5256.7	\$489,680	7.2					
	kWh	Therms		million Btus							
	\$0.09 per kWh for Electricity										
	\$1.00 per Therm of Natural Gas										

Source of Data: Walk-Thru Audits by Focus on Energy School and Local Government Program Energy Advisors.

EXCEPT: HVAC data is from IDR Engineers Cost-Feasibility Study

**ENERGY EFFICIENCY REDUCTIONS
RIVER VALLEY MIDDLE SCHOOL**

	Savings (Offset) kwh	Therms	\$	In MM Btus	Reduction	UNKNOWN	Cost Incentive \$	Focus on Energy Incentive \$	Years to Recover Cost	Years until Payback)	Install Date
Maintenance											
Replace weatherstripping assume 6 doors	84	\$84	8.4	\$200					2.4	15	2010
HVAC pipe insulation		?		\$100					7		
Clean light fixtures annually (assumed 5% savings)	12306	\$1,108		42.0	staff time				0	1	2010
EQUIPMENT REPLACEMENT/PURCHASING											
Replace incandescents w/ CFL's as needed (assume 40)	5600	\$504	19.1	\$320					0	15	2010-2015
Replace CRT monitors with LCD-as needed (assume 64)	23040	\$2,074	78.6	\$11,200					5.4	15	2015-2025
Switch from electric to gas water heater-as needed	520	\$47	1.8	\$500					10.6	15	2010-2025
Install NEMA premium efficiency motor-as needed	1200	\$108	4.1	\$300					2.8	15	2010-2015
HVAC											
Staged Gym Ventilation	776	1229	\$1,229	123.0	\$7,500				6.1		
Optimize Gym Start-Stop	4653	31	\$101	6.0	\$0				0		
Optimize Furnace Start-Stop		401	\$820	56.0	\$0				0		
Optimize Kitchen Ventilation Start-Stop	403	279	\$315	29.0	\$0				0		
Exhaust Fan Scheduling	5716		\$514	20.0	\$10,000				19.4		
Air Cooled Condensing Unit Replacement	7331		\$660	25.0	\$80,000				121.3		
LIGHTING											
Delamp where appropriate (assume 5% savings)	14000	\$1,260	47.8	\$0					0	15	2010
Install occupancy sensors - general	14000	\$1,260	47.8	\$5,000					4	15	2012
Replace T12's with T-8's	8000	\$120	27.3	\$4,000					5.6	15	2012
Multi-level switching		\$144	5.5	\$300					2	15	2012
DOMESTIC HOT WATER											
Booster water heater fuel conversion	500	\$45	1.7	\$500					11	15	2012
OTHER											
Install Vending Miser or disconnect lamps (assumes 3 machines)	1320		\$119	4.5	\$0				0	2010	
TOTAL REDUCTION OF 2008 ENERGY USAGE											
\$0.09 per kWh	100965	102989	\$11,111	547.6	\$119,920				10.8		
\$1.00 per Therm											

Source of Data: Walk-Thru Audits by Focus on Energy School and Local Government Program Energy Advisors.

EXCEPT: HVAC data is from JDR Engineers Cost-Feasibility Study

ENERGY EFFICIENCY REDUCTIONS ELEMENTARY SCHOOLS SPRING GREEN

	Reduction			UNKNOWN			(Payback)		
	Savings (Offset) kwh	Therms	\$	in MM Btus	Installed \$	Focus on Energy Incentive \$	Cost After Incentive	Years to Recover Cost	Years until Replacement
Maintenance									
Replace weatherstripping-as needed assume 3 doors	42	\$42	4.2	\$100				2.3	15
Clean light fixtures annually-assume 5% savings	7560	\$680	25.8	staff time				0.0	2010
OPERATIONS / OCCUPANT BEHAVIOR									
Turn off computers & monitors at night/on weekends	590	\$53	2.0	\$0				0.0	2010
Building Scheduling	1100	1000	\$1,099	14.7	\$0			0.0	2010
Lighting Schedule-manual-to reduce operating hours	3600	\$324	12.3	\$0				0.0	2010
EQUIPMENT REPLACEMENT/PURCHASING									
Replace incandescents w/ CFLs-as needed (assumes 20)	2800	\$252	3.8	\$160				0.0	15 2010-2015
Replace CRT monitors w/ LCD-as needed (assumes 32)	11520	\$1,037	39.3	\$5,600				<1	2010-2025
Increase roof insulation when re-roofing-as needed	290	\$290	29.0	\$4,000				13.8	25 2010-2025
Replace refrigerator with Energy Star model - as needed	56	\$5	0.2	\$800				160.0	20 2010-2025
LIGHTING									
Delamp whether appropriate (assumes 5% savings on lighting)	7560	\$680	25.8	\$0				0	2010
Occupancy sensors-throughout building	14000	\$1,260	47.8	\$5,500				4.4	15 2011
HVAC									
Occupancy-based outside air system	1100	\$239	5.1	\$800				3.3	2010
Variable speed drive on HVAC	3200	\$288	10.9	\$1,000				3.5	2010
REDUCTION OF 2008 ENERGY USAGE	53086	1472	\$6,250	220.9	\$17,960			2.9	

\$0.09 per kWh
\$1.00 per Therm

Source of Data: Walk-Thru Audits by Focus on Energy School and Local Government Program Energy Advisors

**ENERGY EFFICIENCY REDUCTIONS
ELEMENTARY SCHOOLS ARENA**

Area	Savings (Offset) Therms (kwh)			Reduction in MM Btus			UNKNOWN Cost After Incentive \$			(Payback) Years until Replacement		
	Savings (Offset) Therms	\$	Installed \$	Focus on Energy Incentive \$	Cost Recover Cost	Years to Recover Cost	Incentive %	Years until Replacement	Install Date			
ARENA												
Maintenance												
Replace weatherstripping (assumes 3 doors)	42	\$42	4.2	\$100				2.3	15	2010		
Clean light fixtures annually (assumes 5% savings on lighting)	2136	\$192	7.3	\$0			0,0	0,0	1	2010		
OPERATIONS/OCCUPANT BEHAVIOR												
Implement heating/cooling schedule	330	960	\$990	33.0	\$0			0.0		2010		
PC network energy management system (assumes 32 computers)	9600		\$864	32.8	\$2,080				10	2011		
EQUIPMENT REPLACEMENT/PURCHASING												
Replace incandescents with CFLs- as needed (assuming 10)	1400		\$126	4.8	\$80			0.0		15 2010-2015		
Replace CRT monitors with LCD - as needed (assuming 32)	11520		\$1,037	39.3	\$5,600			5.4		2010-2025		
Increase roof insulation with renofing- as needed			270	\$270	27.0	\$4,000			14.8	25 2010-2025		
LIGHTING												
Delamp where appropriate (assumes 5% savings on lighting)	2136		\$192	7.3	\$0			0.0		2010		
HVAC												
Repair leaking steam trap Occupancy-based outside air system	330	140	\$170	15.1	\$500			2.9	15	2010		
TOTAL REDUCTION OF 2008 ENERGY USAGE	27452	1652	\$4,123	194.7	\$13,060			3.2				

\$0.09 per kWh
\$1.00 per Therm

Source of Data: Walk-Thru Audits by Focus on Energy School and Local Government Program Energy Advisors.

ENERGY EFFICIENCY REDUCTIONS ELEMENTARY SCHOOLS LONE ROCK

	Savings (Offset) kwh Therms	Reduction in MM Btus	Installed \$	Focus on Energy Incentive \$	UNKNOWN Cost After Incentives	Years to Recover Cost	(Payback)	Years until Replacement	Install Date
MAINTENANCE									
Replace weatherstripping as needed (assuming 3 doors)	42	\$42	4.2	\$100			2.4	15	2010
Clean light fixtures annually (assuming 5% savings)	4087	\$368	13.9	\$0			0.0	1	
OPERATIONS/OCCUPANT BEHAVIOR									
Maintain minimum temperatures in unoccupied spaces	330	\$330	3.3	\$0			0.0		2010
EQUIPMENT REPLACEMENT/PURCHASING									
Replace Incandescents with CFL's -exterior canopy lights	3000	\$270	10.2	\$400			1.5	2010-2015	
Replace CRT monitors with LCD - as needed (assuming 32)	11520	\$1,037	39.3	\$5,600			5.4	2010-2025	
Increase roof insulation when reroofing - as needed							13.6	2010-2025	
Install NEMA premium efficiency motor - as needed	1200	\$108	4.1	\$300			2.8	15	
Replace refrigerator&freezer with Energy Star - as needed	44	\$4	0.2	\$1,500			378.8	25	
LIGHTING									
Delamp where appropriate	1600	\$162	6.1	\$0			0.0		
Replace HID with T8 or T5 - gym	4900	\$441	16.7	\$3,000			6.8	15	2015
Replace T12 with T8 fluorescent lamps	1800	\$162	6.1	\$1,000			6.2	15	2015
Replace HID with T8 or T5 - ?	780	\$70	2.7	\$500			7.1	15	2015
HVAC									
Cost/feasibility study needed							1.5	15	2016
Linkageless boiler control	990	\$990	9.9	\$1,500			2.0		
Steam trap survey	150	\$150	1.5	\$300			2.8	15	2016
Reduce air infiltration-greenhouse	160	\$160	1.6	\$450			2.8	15	2016
Install ventilation controls- kitchen	990	\$990	9.9	\$2,800					
DOMESTIC HOT WATER									
Booster water heater fuel conversion	110	\$10	0.4	\$100			10.1	15	2015
OTHER									
Install Vending Miser or disconnect ballasts	150	\$14	0.5	\$0			0.0		2010
TOTAL REDUCTION OF 2003 ENERGY USAGE									
	29391 kWh	2992 Therms	\$5,637	164.0 million Btus	\$22,050		3.9		
					\$0.09 per kWh				
					\$1.00 per Therm				

Source of Data: Walk-Thru Audits by Focus on Energy School and Local Government Program Energy Advisors.

ENERGY EFFICIENCY REDUCTIONS
ELEMENTARY SCHOOLS PLAIN

	Savings (Offset) kwh	Therms	\$	Reduction in MM Btus	Installed \$	Focus on Energy Incentive \$	UNKNOWN Cost After Incentiv	Years to Recover Cost	Years until (Payback)	Replacement	Install Date
M A I N T E N A N C E											
Caulk windows (assumes 10%)	90	\$90	9.0	\$100	1.1	15	0				2010
Reduce hot water tank temperature	26	\$26	2.6	\$0	0						2010
Clean light fixtures annually assumes 5% savings on lighting	2668		\$240	9.1 staff time	0						2010
O P E R A T I O N S											
Implement lighting schedule	170		\$1.5	0.6	\$0						2010
E Q U I P M E N T R E P L A C E M E N T / P U R C H A S I N G											
Replace incandescent with CFL's - as needed	1800		\$162	6.1	\$300				1.8		2010-2015
Replace CRT monitors with LCD - as needed (assuming 32)	11520		\$1,037	39.3	\$5,600				5.4		2010-2015
Increase roof insulation with retrofacing - as needed									17.6		2010-2025
Install NEMA premium efficiency motor - as needed	1300		\$117	4.4	\$280				2.4		2010-2025
L I G H T I N G											
Occupancy sensor in gym	1500		\$135	5.1	\$150				1.1		2010
Replace HID with T8 or T5 lamps Multi-level switching	790 3600		\$71 \$324	2.7 12.3	\$500 \$800				7.0 2.5		2015 2015
H V A C											
Cost/Feasibility Study					\$5,000						
Occupancy-based outside air system	2100	430	\$61.9	11.5	\$2,000				3.2		2018
Variable speed drive on HVAC	1300		\$117	4.4	\$400				3.4		2018
Replace constant volume with VAV	840	340	\$416	36.8	\$6,000				14.4		2018
Reduce air infiltration-greenhouse		85	\$85	0.3	\$300				3.5		2012
D O M E S T I C H O T W A T E R											
Booster water heater fuel conversion	110		\$10	0.4	\$100				10.1		2015
T O T A L R E D U C T I O N O F 2 0 0 8	27698	1141	\$3,634	162	\$24,530	6.7					
E N E R G Y U S A G E											
\$0.09 per kWh											
\$1.00 per Therm											

Source of Data: Walk-Thru Audits by Focus on Energy School and Local Government Program Energy Advisors.