

2009
**Wisconsin Energy Independent
Community Partnership**

25 x 25 Plan for Energy Independence

SPRING GREEN, WISCONSIN

Report completed by:

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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.



- 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

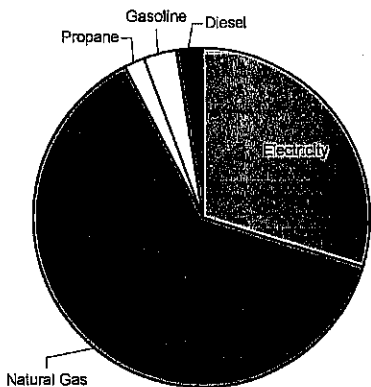
Your 2008 energy usage baseline is	34,486 million (MM) Btus.
That baseline is comprised of	2,996,352 kWh,
	216,965 therms,
	7,049 gallons of propane,
	8,469 gallons of gasoline,
and	6,262 gallons of diesel.
By assuming an annual growth rate of	0.30% ,
in 2025 your energy use baseline will be	36,288 MMBtu.
Your 25% energy reduction goal	9,072 MMBtu,
for 2025 is therefore	26% of your 2008 consumption.
or	
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

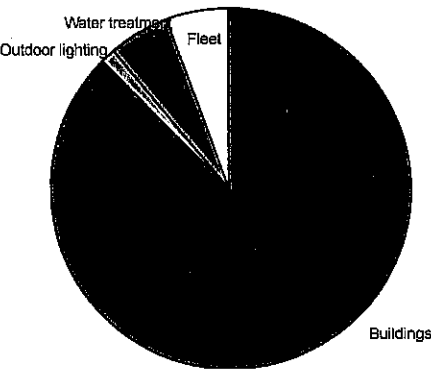
Total Consumption by Energy Type

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



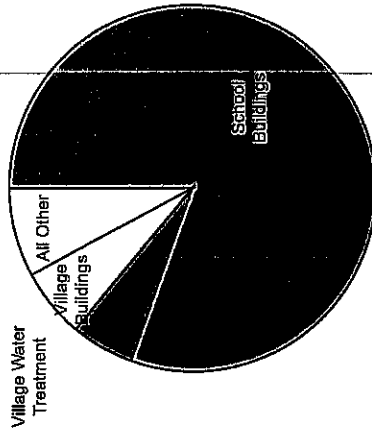
Total Consumption by End Use

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



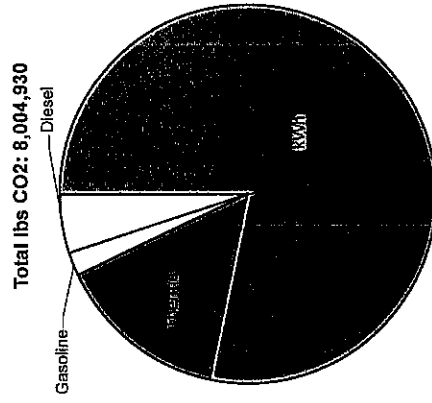
Spring Green 2008 Energy Baseline: Additional Info

Total Consumption by End Use and Sector	
Energy end use	Percent of total Btus
School Buildings	81%
Village Water Treatment	6%
Village Buildings	6%
All Other	8%



Energy Intensity of Selected Buildings	
Building	kWh/ft ²
Warehouse	2.33
Lone Rock Elementary	9.08
River Valley High School	7.26
Arena Elementary	4.27
Village Hall/Police Dept	5.34
Public Works Building	3.27
River Valley Middle School	6.93
Town Hall (offices, shop)	2.21
River Valley Elementary	6.24
Plain Elementary	4.43
Library	3.49

Total CO2 Emissions by Energy Type	
Energy type	Percent of total CO2
Electricity	63%
Natural Gas	32%
Propane	1%
Gasoline	2%
Diesel	2%



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
Therms		216,965	21,697	63%	2,540,226
Propane (gallons)		7,049	646	2%	89,311
Gasoline		8,469	1,050	3%	165,484
Diesel		6,262	870	3%	140,081
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
electric \$ (inc. tax, fees)	173402.59	194879	211190
heating \$ (inc. tax, fees)	142748.02	177343	211148
kW	0	0	0
kWh	1946670	2074546	2193630
natural gas (therms)	131133	172179	203036
Grand Total	2393953.61	2618947	2819004

06-08 increase
22%
48%
13%
55%
07-08 increase
8%
19%
6%
18%

Town

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

06-08 increase
-3%
106%
4%
46%
07-08 increase
-4%
36%
2%
10%

Village

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

06-08 increase
-2%
48%
-2%
8%
-17%
07-08 increase
-8%
36%
-8%
-10%
17%

Lighting information		Utility billing data			
Lighting ID	Type	Types of energy consumed	2006 total	2007 total	2008 total
SP-L01	Streetslights 407888-010	kWh	111456	121956	121956
		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
		E kWh	185	224	204
		kW	0	0	0
		electric \$ (inc. tax, fees)	\$116	\$121	\$124
SP-L06	Siren State Road 23 670425-001	kWh	116	152	125
		kW	0	0	0
		electric \$ (inc. tax, fees)	\$108	\$113	\$115
		kWh	220	240	240
		kW	0	0	0
		electric \$ (inc. tax, fees)	\$50	\$56	\$56
SPL-08	Alley/D. Town Lights E Jefferson St 639352-001	kWh	5057	5296	5112
		kW	0	0	0
		electric \$ (inc. tax, fees)	\$283	\$287	\$292

Water information			Utility billing data					
Infrastructure ID	Type	Gallons per month	Number of stations	Types of energy consumed	Name of utility	2006 total	2007 total	2008 total
SP-W01	WW Control Bldg. Carpenter Ln 321924-010	7,836,090 Avg/Month 261,203 574419- Avg/Daily 300,000+/-		kWh		210560	203120	212200
				kW	Alliant	0	0	0
				electric \$ (inc. tax, fees)	Energy	\$20,778	20711.75	22290.01
				propane (gallons)	Frontier FS-	355	180	685
				heating \$ (inc. tax, fees)	LP	\$486	276	1235
SP-W02	WW Sludge Transfer/Chemical Feed Ln 574419- 001			kWh		163800	149000	164000
				kW	Alliant	0	0	0
				electric \$ (inc. tax, fees)	Energy	\$16,641	15199.96	17293.04
				1 heating \$ (inc. tax, fees)		0	0	0
						\$0	0	0
SP-W03	Well No. 1 137 N Albany St 362838-011			kWh		71742	37399	11825
				kW	Alliant	0	0	0
				electric \$ (inc. tax, fees)	Energy	\$4,283	3877.53	1463.52
				natural gas (therms)	Alliant	542	619	683
				1 heating \$ (inc. tax, fees)	Energy	\$813	851.18	968.26
SP-W04	Sewage lift station 1 E Daley St 010	545		kWh		180400	95000	95000
				kW	Alliant	0	0	0
				electric \$ (inc. tax, fees)	Energy	\$9,580	10232.19	10389.31
				natural gas (therms)	Alliant	273	232	494
				1 heating \$ (inc. tax, fees)	Energy	\$445	378.56	793.73
SP-W05	Sewage lift station 2 W Madison St 010			kWh		1137	1221	2410
				kW	Alliant	0	0	0
				1 electric \$ (inc. tax, fees)	Energy	\$209	212.78	353.16
				kWh		671	810	1598
				kW	Alliant	0	0	0
SP-W06	Sewage lift station 3 N Cincinnati St 382741-010			1 electric \$ (inc. tax, fees)	Energy	\$158	187.39	270.72
				kWh		1028	1088	2127
				kW	Alliant	0	0	0
				1 electric \$ (inc. tax, fees)	Energy	\$197	199.19	320.54
				kWh		153	398	399
SP-W07	Sewage lift station 4 Outlot 2 Sunrise Dr. 685505-001			kWh		0	0	0
				kW	Alliant	0	0	0
				1 electric \$ (inc. tax, fees)	Energy	\$42	127.8	128.3
				kWh		17200	17080	19720
				kW	Alliant	0	0	0
SP-W08	Sewage lift station 5 E Hoxie St 010	289939-		1 electric \$ (inc. tax, fees)	Energy	\$1,915	1948.56	2287.11
				kWh		1147	1610	1553
				kW	Alliant	0	0	0
				1 electric \$ (inc. tax, fees)	Energy	\$204	252.67	252.15
				kWh		0	0	0
SP-W09	Water Tower Peterson St 286896-010			1 electric \$ (inc. tax, fees)	Energy	\$204	252.67	252.15
				kWh		0	0	0
				kW	Alliant	0	0	0
				1 electric \$ (inc. tax, fees)	Energy	\$204	252.67	252.15
				kWh		0	0	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	0	0	0

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 gallons 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
TOWN OF SPRING GREEN

	2006	2007	2008
Total gasoline purchases (gallons)	740	740	740
Total diesel purchases (gallons)	3000	3000	3000
Total number of plug-in electric vehicles in operation	0	0	0

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 gallons per year
Tractor	Case IH	90JU	1	300 HOURS	300 HOURS	300 HOURS	diesel	400
Snow Plow	International	7400	1	7000	7000	7000	diesel	1500
Snow Plow	Peter Bilt	340	1	7000	7000	7000	diesel	1500
Riding Mower	Ahrens	1540	1	36	36	36	gasoline	40
Pickup/Van/Light truck	Ford	F150	1	10000	10000	10000	gasoline	700

Fleet information
RIVER VALLEY SCHOOLS

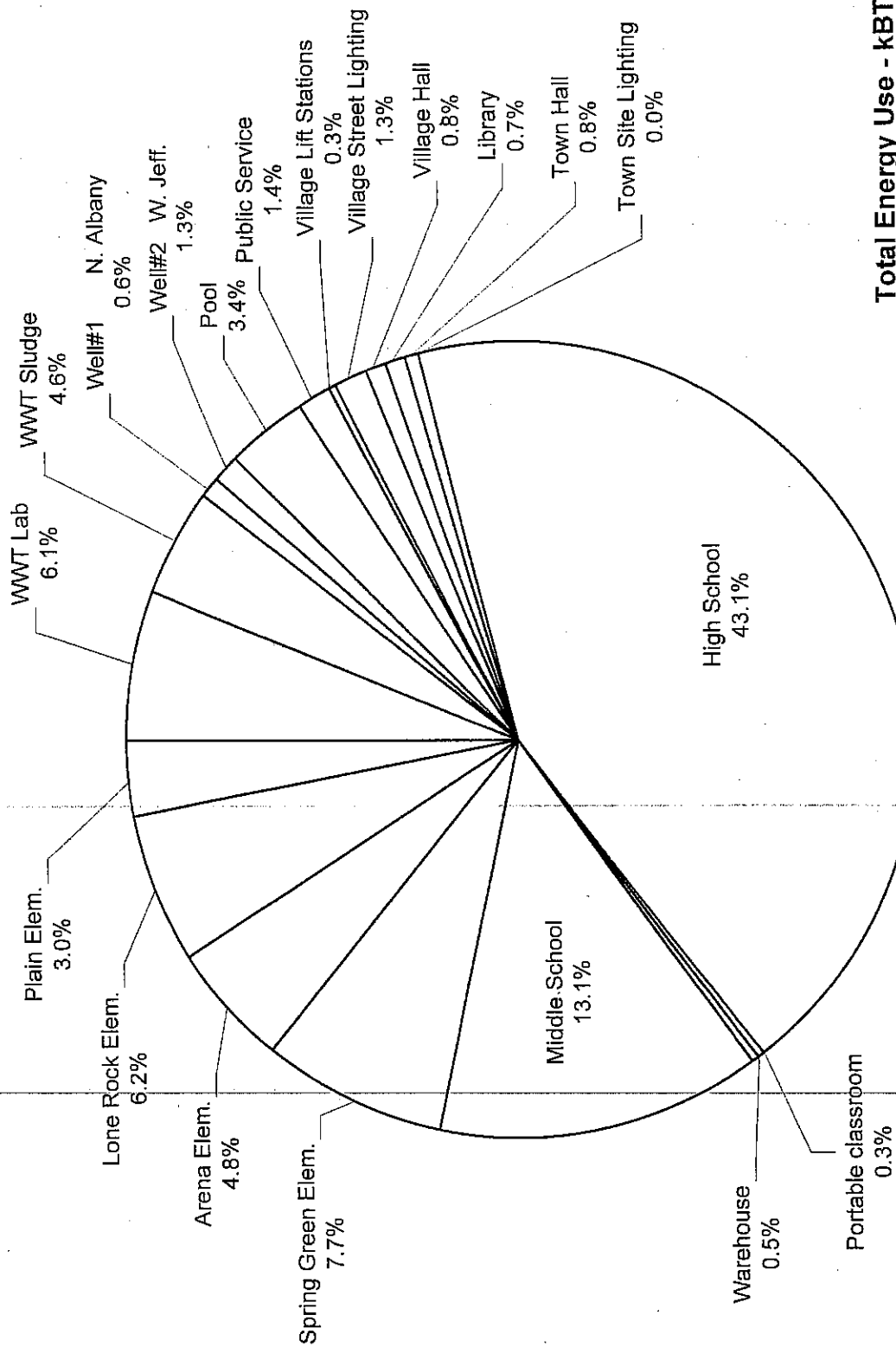
	2006	2007	2008
Total gasoline purchases (gallons)	3212	3212	3212

Total diesel purchases (gallons)	
----------------------------------	--

Total number of plug-in electric vehicles in operation	0	0	0
--------------------------------------------------------	---	---	---

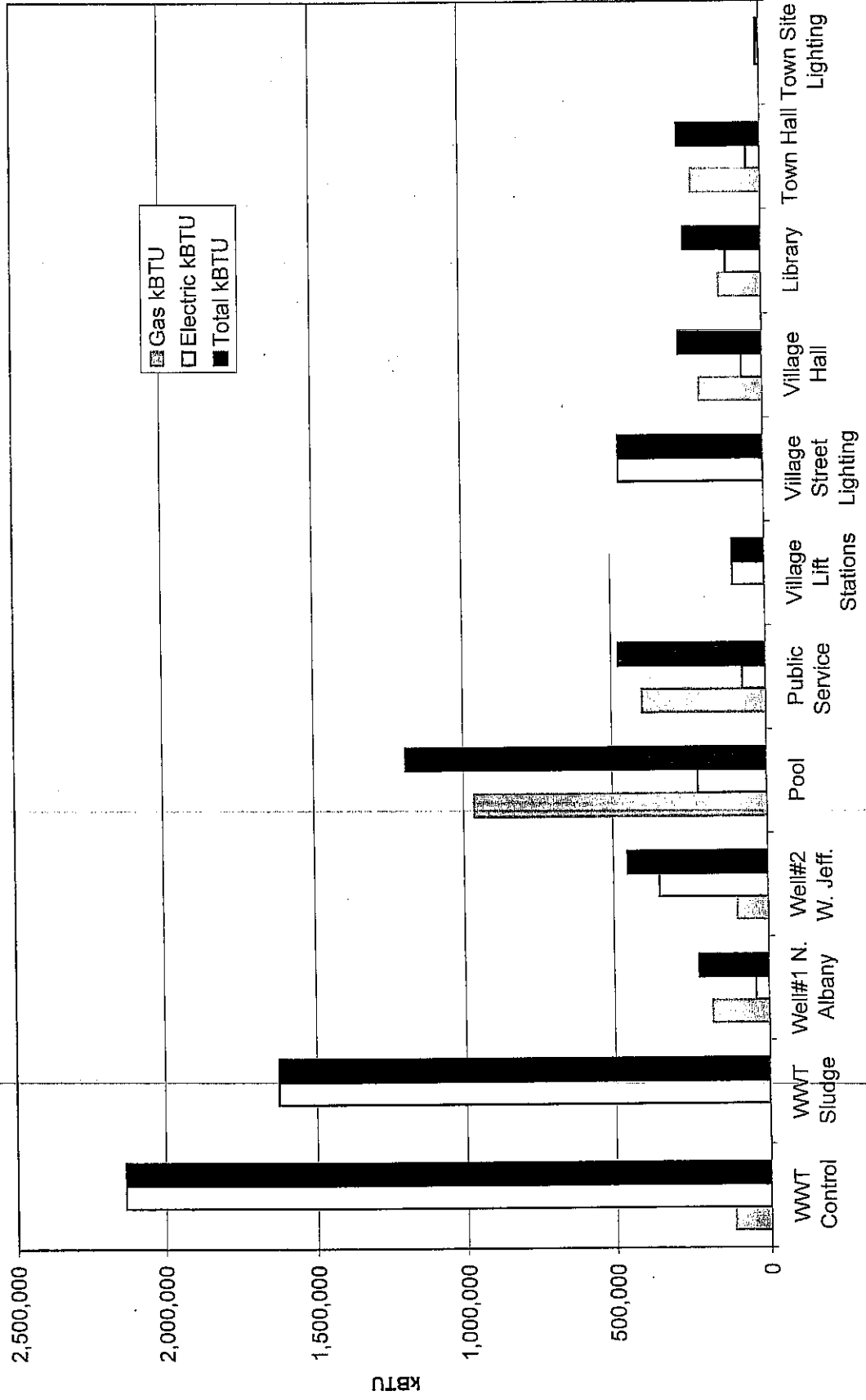
Vehicle type/ category	Make	Model	Number of vehicles of this model	Total miles traveled 2006	Total miles traveled 2007	Total miles traveled 2008	Fuel type	Total gallon per year
Pickup/Van/Light truck	1994 Chevrolet	K-20 Pickup	1	180	155	139	Gasoline	180
Pickup/Van/Light truck	2002 Ford	Cargo Van	1	6480	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

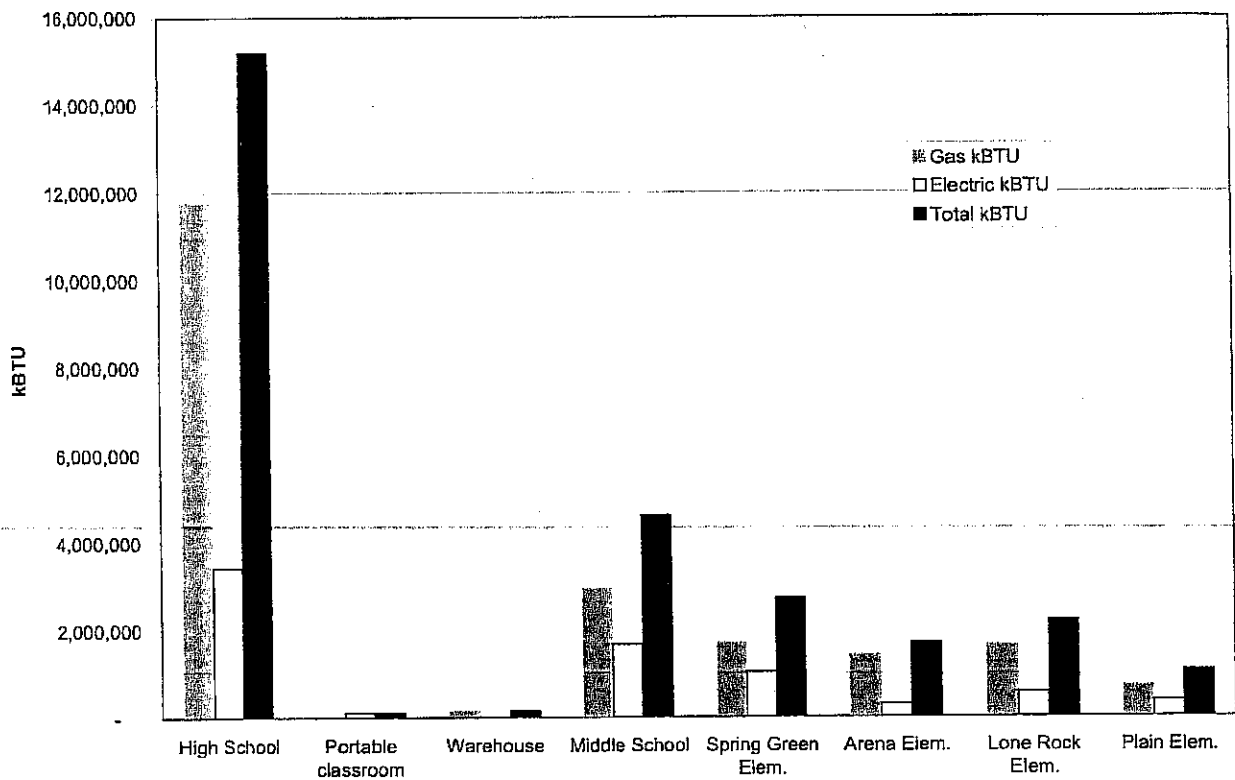


Total Energy Use - kBTU
(2008)

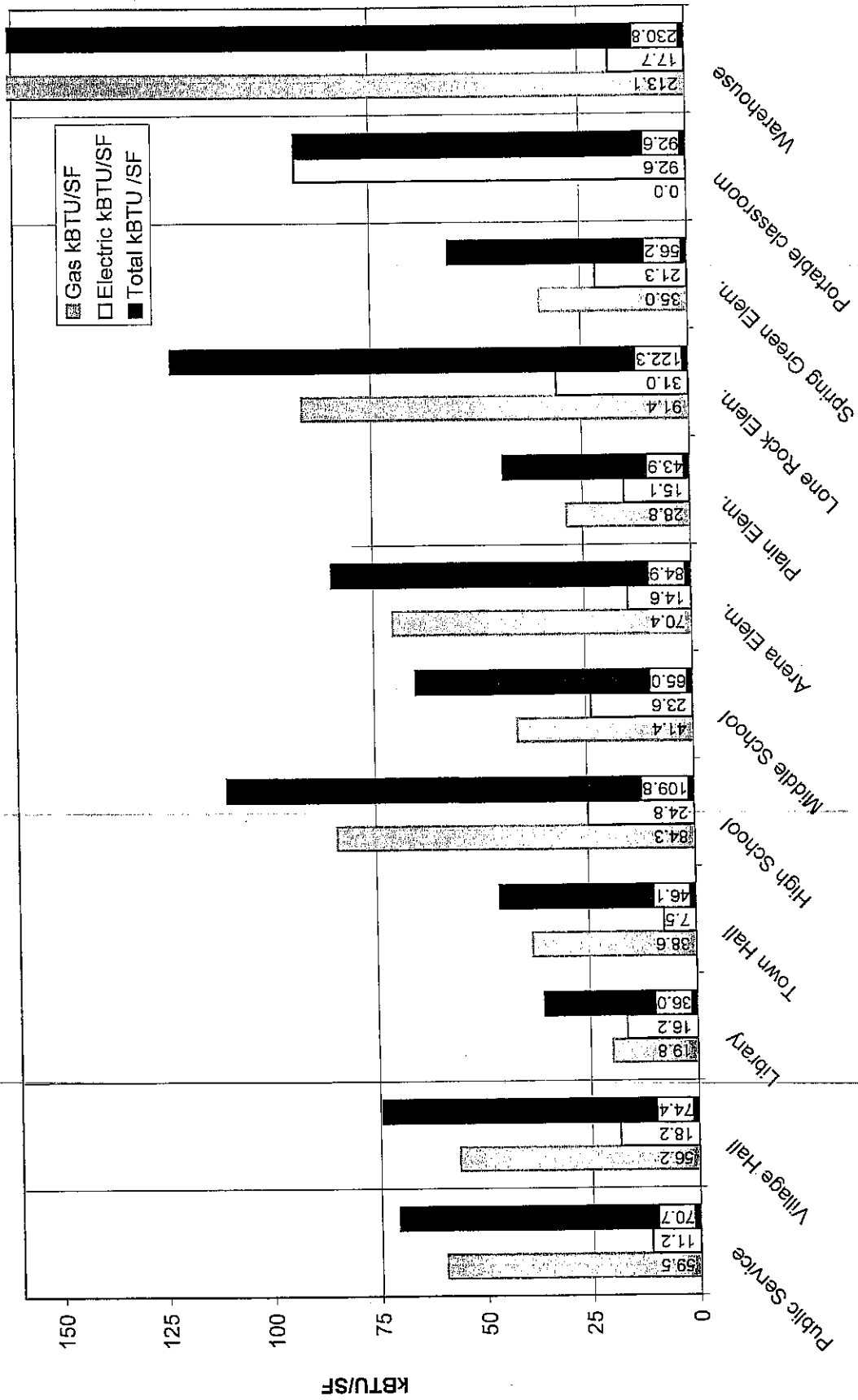
Total Energy Use - Village and Township (2008)



Total Energy Use - Schools (2008)



Energy Use per Area - Occupied Buildings (2008)



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

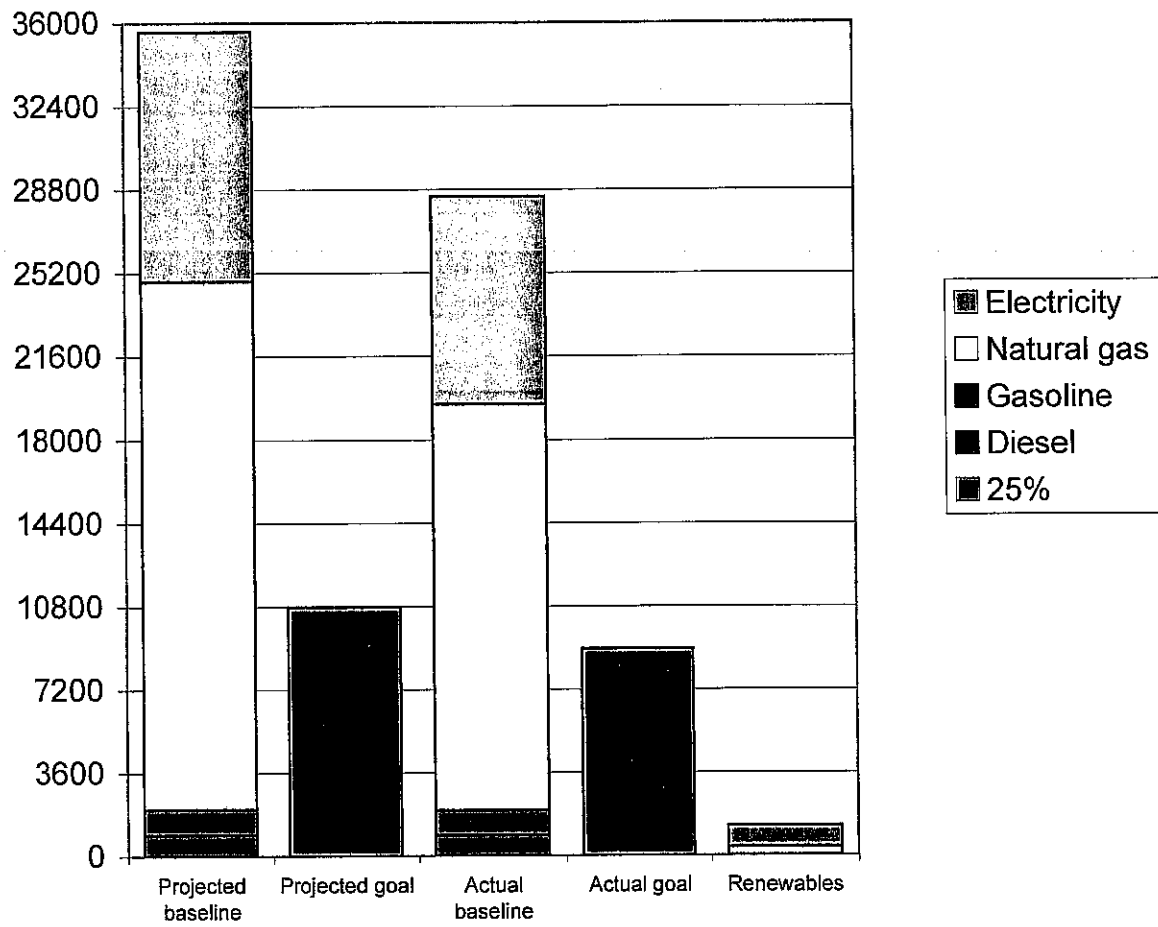
Estimated annual growth rate
for municipal energy 0.3%

Purchase renewable electricity from utility

Block size 0 kWh

Incremental cost per block \$

2025 Energy Use



Percent of 25% goal achieved: 14%

Measures	Savings-to-investment ratio	Name	Savings	Installed cost before incentives	Incentive amounts	Present value cost with incentives	Ibs CO2
10%	-	Wisconsin RPS	715 kWh	-	-	\$ -	1,209
0	#DIV/0!	Purchased renewable electricity	0 kWh	96,250.00	\$ -	\$ -	36,798
On	42805.50	Pool Solar Hot Water	3143 therms	16,000.00	\$ -	\$ 10,576.00	1,979
On	0.01	Pool Bath House Solar Hot Water Heater	169 therms	99,000.00	\$ -	\$ 42,304.26	29,955
On	0.32	Library Solar Electricity	17704 kWh	19,200.00	\$ -	\$ 7,852.68	2,195
On	0.02	High School Solar Hot Water	187.5 therms	103,680.00	\$ -	\$ 39,538.38	23,952
On	0.02	High School Solar Electricity	14156 kWh	103,680.00	\$ -	\$ 39,538.38	23,952
On	0.02	Middle School Solar Electricity	14156 kWh	103,680.00	\$ -	\$ 39,538.38	23,952
On	0.04	Spring Green Elementary Solar Electricity	12711 kWh	70,560.00	\$ -	\$ 23,320.08	21,507
On	0.46	Bio-Diesel Fuel	221 gallons diesel	884.00	\$ -	\$ 710.29	4,944
On	7385.75	Energy Efficiency Public Works	6182 kWh	12,400.00	\$ -	\$ -	10,460
On	1.14	Energy Efficiency Village HVAC Upgrade	330 therms	3,800.00	\$ -	\$ 3,713.36	3,864
On	1.99	Energy Efficiency SG Village Infiltration	844 therms	6,250.00	\$ -	\$ 5,770.00	9,882
On	1.01	Energy Efficiency Village Hall Lighting	5170 kWh	5,485.00	\$ -	\$ 5,172.36	8,748
On	1.29	Energy Efficiency Wells Houses #1 and #2	3000 kWh	2,500.00	\$ -	\$ 2,357.50	5,661
On	0.00	Energy Efficiency Town Hall	1.9 kWh	290.00	\$ -	\$ 2,763.70	3
On	0.00	Energy Efficiency in Library	1.7 kWh	500.00	\$ -	\$ 815.50	85
On	0.33	Street Lights	73500 kWh	108,600.00	\$ -	\$ 80,798.40	124,362
On	17619.70	Energy Efficiency River Valley Schools-Delamp	29496 kWh	1,000.00	\$ -	\$ 2.00	49,907
On	2.15	Energy Efficiency School's Scheduling	54062 kWh	15,000.00	\$ -	\$ 30,000.00	161,370
On	0.08	Energy Efficiency RV Schools Staging & Occupancy HVAC Controls	114376 kWh	136,030.00	\$ -	\$ 1,727,042.32	0
On	0.03	Energy Efficiency RV High School HVAC System Upgrade	300,000.00	300,000.00	\$ -	\$ 188,300.00	86,803
On	0.01	Energy Efficiency RV Middle School HVAC	7331 kWh	80,000.00	\$ -	\$ 52,880.00	12,404
On	0.04	Energy Efficiency RV Schools Lighting Occupancy Sensors & Multi-Level Switching	8260 kWh	19,350.00	\$ -	\$ 236,922.17	13,976
On	0.33	Energy Efficiency RV Schools CFLs	40380 kWh	11,440.00	\$ -	\$ 147,328.90	68,323
On	0.10	Energy Efficiency River Valley Schools- Parking Lot Lighting	39000 kWh	26,000.00	\$ -	\$ 138,424.00	65,988
On	1.10	Energy Efficiency River Valley Schools Insulation	3350 therms	47,000.00	\$ -	\$ 41,538.60	39,339
On	2.47	Energy Efficiency River Valley Schools Infiltration	1550 therms	1,550.00	\$ -	\$ 8,530.27	18,147
On	0.66	Energy Efficiency River Valley Schools Domestic Hot Water Temperature Control	256 therms	400.00	\$ -	\$ 4,908.40	2,987
On	0.44	River Valley Schools Motor Replacement	4900 kWh	1,055.00	\$ -	\$ 13,442.81	8,291
On	0.21	Energy Efficiency River Valley Schools Replace CRTs and Manage Network	78720 kWh	35,680.00	\$ -	\$ 455,000.28	133,194
On	10.10	Energy Efficiency River Valley Vending Machines	2790 kWh	165.00	\$ -	\$ 330.00	4,721
On	32183.91	Energy Efficiency River Valley Schools Clean Light Fixtures	53877 kWh	1.00	\$ -	\$ 2.00	91,160
On	0.02	Energy Efficiency River Valley Schools Appliance Replacement	100 kWh	2,300.00	\$ -	\$ 1,711.20	169
On	0.04	Energy Efficiency River Valley Schools Vehicle Replacement	223 gallons unleaded	25,000.00	\$ -	\$ 289,325.00	4,357
On	0.00	Energy Efficiency Public Works	1591 gallons propane	118,930.00	\$ -	\$ -	20,158
On	204.29	Energy Efficiency Wastewater Treatment Plant	15 therms	12,860.00	\$ -	\$ 176	176
On	0.09	Energy Efficiency River Valley Schools Domestic Hot Water	4520 kWh	4,200.00	\$ -	\$ 48,606.60	7,648
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 25x 25 PLAN
Version 3 (12.15.09)

PROJECTED GROWTH IN ENERGY USAGE FROM 2008-2025

Total	2008	2025
	34,486	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.	
	9,072 million Btus	

GOAL OF 25% FROM RENEWABLE SOURCES

RENEWABLE ENERGY SOURCES RECOMMENDED

Average annual 2007-2008	Avg. Ann \$ 07-08	Annual Savings (Offset)		Toward 25x25 Goal MM Btus	Installed \$	Incentive \$	Cost After Incentives	Years to Recover \$	Years until Replacement	Install Date
		kWh	Therms %							
Pool H2O	\$10,992	10,315 Therms	3143	33%	\$4,023	\$96,250	\$96,250	\$0	0	40-50
Library PV Elec (roof)	\$4,113	36,398 kWh	17704	50%	\$2,001	\$99,960	\$49,980	\$49,980	18	30-50
HS PV Elec (8.64 kWh) ground	\$91,968	958,000 kWh	14156	1.4%	\$1,359	\$103,680	\$43,688	\$59,816	25	30-50
ES PV Elec (awning on wall)	\$27,116	282,467 kWh	12645	4.5%	\$1,214	\$70,560	\$35,280	\$35,280	19	30-50
MS PV Elec (8.64 kWh) ground	\$43,615	474,080 kWh	14156	3%	\$1,302	\$103,680	\$43,864	\$59,816	25	30-50
HS H2O (roof)	2,050 Therms		232	<1%	\$211	\$19,200	\$7,230	\$11,970	21	40-50
Bio-diesel avg. 5% blend	4425 61507/5000 Btus	-	307,538	5%		30.8 Cost/gallon of 2% is \$0.05 less than diesel fuel.				

TOTAL RECOMMENDED RENEWABLE SOURCES
% of 2025 Projected Energy Btus

58661	3682.5	\$10,110	564 million Btus	21.5
			1.6%	

Utility Renewables Required by Law by 2015
10% of 2025 kWh
(multiply 2008 kWh of 2,347,694 x 5.2% /293 to convert to MMBtus)

416.7 million Btus

COMBINED TOTAL
% of 2025 Projected Energy Btus

981 million 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 & RETROFITS

ENERGY EFFICIENCY REDUCTIONS SPRING GREEN VILLAGE AND TOWN

	Savings (Offset) kwh	Therms	Reduction in		Installed \$	Incentive \$	Cost After Incentives	Years to Recover Cost	Years until Replacement	Install Date
			\$	MM Btus						
<u>Village Garage</u>										
Replace Heating, Ventilation, & Controls		420		42	\$ 60,000	EECBG & FOE		\$0 0 or ?	20	2010 or 2012
Insulate Ceiling		1161		116	\$ 41,800	EECBG & FOE		\$0 0 or ?	30	2010 or 2012
Replace Lighting & Controls	6182		\$804	20	\$ 12,400	EECBG & FOE		\$0 0 or ?	20	2010 or 2012
Weatherstrip Doors		304		30	\$ 600				5	2010
<u>Wastewater Treatment Plant</u>										
Upgrade A/C in Lab	8000		\$830	27	\$ 2,332	EECBG & FOE		\$0 0 or ?	20	2010 or 2011
Insulate Walls (derestory & trombe)		300		30	\$ 10,000	EECBG & FOE		\$0 0 or ?	30	2010 or 2011
Replace Lighting & Controls	874		\$91	3	\$ 1,800	EECBG & FOE		\$0 0 or ?	20	2010 or 2011
Weatherstrip Doors		80		8	\$ 200				5	2010 or 2011
<u>Village Hall/Police Station</u>										
Replace Boiler		200	\$220	20	\$ 2,800			12.7	20	2009
Remove thru-wall A/C		20	\$22	2	\$ 500			22.7	50	2010
Weatherstrip Doors		80	\$88	8	\$ 200			2.3	5	2020
Replace Lighting	2770		\$316	9	\$ 2,985			9.5	20	2012
Replace Lighting Controls	2400		\$274	8	\$ 2,500			9.1	20	2012
Upgrade HVAC Controls		130	\$143	13	\$ 1,000			7.0	20	2012
Replace Doors		260	\$286	26	\$ 4,500			15.7	30	2020
							REMAINDER ARE UNKNOWN			
<u>Village Well Houses 1 and 2</u>										
Ventilation Controls	3000	50	\$433	15	\$ 2,500			5.8	30	2012
Weatherstrip Doors		100	\$146	10	\$ 250			1.7	5	2015
Replace Lighting & Controls	2200		\$264	8	\$ 1,500			5.7	20	2020
<u>Library</u>										
Replace electric water heater w/ on-demand gas - as needed	290	7	\$52	1.7	\$ 500			9.7	15	2020
<u>Village Street Lighting</u>										
Replace with LED Fixtures (assumed 50% savings)	69000		\$11,500	235	\$ 105,600			9.2	20	2020
<u>Town Hall</u>										
Delamp Meeting Room Florescent Lighting	230		\$27	0.8	No Cost			0.0	N/A	2009
Replace Exterior Security & Exit Lights with LED bulbs	324		\$38	1.1	\$ 290			7.6	10	2010
<u>Town Street Lights</u>										
Remove US14/Hwy23 pole Replace with LED Fixtures for 3 street lights assumes 50% savings	1180 4500		\$70 \$75	4.0 15.4	No cost \$ 3,000				N/A	2010
								40.0	15	2020
REDUCTION OF 2008 ENERGY USAGE	100950	3112	\$15,677	653.0	\$ 257,257			16.4		

[illegible]

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

MAINTENANCE

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

ENERGY EFFICIENCY REDUCTIONS ELEMENTARY SCHOOLS SPRING GREEN

	Savings (Offset) kwh	Therms	Reduction in		Installed \$	Focus on Energy Incentive \$	UNKNOWN Cost After Incentive	(Payback) Years to Recover Cost	Years until Replacement	Install Date
			\$	MM Btus						
MAINTENANCE										
Replace weatherstripping-as needed assume 3 doors		42	\$42	4.2	\$100			2.3	15	2010
Clean light fixtures annually- assume 5% savings	7560		\$680	25.8	staff time			0.0	1	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 reroofing-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 wheter 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	140	\$239	5.1	\$800			3.3	15	2010
Variable speed drive on HVAC	3200		\$288	10.9	\$1,000			3.5	15	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

ELEMENTARY SCHOOLS ARENA										
	Savings (Offset)		Reduction in MM Btus	Installed \$	Focus on Energy Incentive \$	UNKNOWN Cost After Incentive	(Payback)		Install Date	
	kwh	Therms					\$	Years to Recover		Years until Replacement
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	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			2.4	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 reroofing- 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		240	\$240	24.0	\$700			2.9	15	2010
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

ELEMENTARY SCHOOLS LONE ROCK	Reduction		Focus on Energy Incentive \$	UNKNOWN Cost After Incentives	(Payback)		Years until Replacement	Install Date
	Savings (Offset) kwh	Therms \$			In MM Btus	Installed \$		
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	15	2010-2015	
Replace CRT monitors with LCD - as needed (assuming 32)	11520	\$1,037	39.3	\$5,600	5.4	15	2010-2025	
Increase roof insulation when reroofing -as needed	330	\$330	33.3	\$4,500	13.6	15	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	1800	\$162	6.1	\$0	0.0	15	2010	
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	15	2016	
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 2008 ENERGY USAGE	29391 kwh	2992 Therms	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 \$	UNKNOWN		(Payback)		Install Date
						Focus on Energy Incentive \$	Cost After Incentive	Years to Recover Cost	Years until Replacement	
MAINTENANCE										
Caulk windows (assumes 10)		90	\$90	9.0	\$100			1.1	15	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		
OPERATIONS								0.0		2010
Implement lighting schedule	170		\$15	0.6	\$0					
EQUIPMENT REPLACEMENT/PURCHASING										
Replace incandescent with CFL's- as needed	1800		\$162	6.1	\$300			1.8	15	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 reroofing - as needed		170	\$170	17.0	\$3,000			17.6	15	2010-2025
Install NEMA premium efficiency motor - as needed	1300		\$117	4.4	\$280			2.4	15	2010-2025
LIGHTING										
Occupancy sensor in gym	1500		\$135	5.1	\$150			1.1	15	2010
Replace HID with T8 or T5 lamps	790		\$71	2.7	\$500			7.0	15	2015
Multi-level switching	3600		\$324	12.3	\$800			2.5	15	2015
HVAC										
Cost/Feasibility Study					\$5,000					
Occupancy-based outside air system	2100	430	\$619	11.5	\$2,000			3.2	15	2018
Variable speed drive on HVC	1300		\$117	4.4	\$400			3.4	15	2018
Replace constant volume with VAV	840	340	\$416	36.8	\$6,000			14.4	15	2018
Reduce air infiltration-greenhouse		85	\$85	0.3	\$300			3.5	15	2012
DOMESTIC HOT WATER										
Booster water heater fuel conversion	110		\$10	0.4	\$100			10.1	15	2015
TOTAL REDUCTION OF 2008 ENERGY USAGE	27698	1141	\$3,634	162	\$24,530			6.7		

\$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.