

Making Cents of Energy

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Energy Use 2011

Energy Use-2011													
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Avg.
Body Shop													
kw (0769650)	7520.00	6600.00	6520.00	4720.00	5000.00	5280.00	4800.00	5160.00	5440.00	4640.00	5560.00	5280.00	5543.33
therm(0697679)	1487.60	1193.20	750.40	344.30	103.30	17.10	9.00	1.00	74.60	214.60	628.90	936.70	480.06
Show Room													
kw (0795041)	181.00	158.00	122.00	163.00	107.00	3630.00	4168.00	2846.00	162.00	1471.00	126.00	134.00	1105.67
kw (0811754)	9880.00	8640.00	8000.00	7440.00	6080.00	5440.00	5160.00	5080.00	6840.00	7000.00	8480.00	9000.00	7253.33
SVC Building													
kw (0796648)	16280.00	16000.00	10280.00	11200.00	10040.00	10960.00	10960.00	9560.00	10400.00	9760.00	12160.00	13160.00	11730.00
kw (0826596)	2400.00	2468.00	1882.00	1906.00	2034.00	2061.00	2151.00	1857.00	1938.00	1971.00	2549.00	3079.00	2191.33
therm(9975710)	393.60	324.20	200.90	208.40	115.30	94.90	27.20	66.10	55.40	89.30	115.80	166.00	154.76
Offsite Lot													
kw(0892112)	1298.00	1201.00	579.00	1180.00	478.00	348.00	232.00	218.00	528.00	628.00	875.00	931.00	708.00
Solar Power kw	1400.00	2900.00	4100.00	3300.00	3800.00	4400.00	4900.00	4800.00	4600.00	4000.00	2600.00	1900.00	3558.33
Total Therms	1881.20	1517.40	951.30	552.70	218.60	112.00	36.20	67.10	130.00	303.90	744.70	1102.70	634.82
Total Therms / Total Sq. Ft	0.03	0.03	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.02	0.01
Total Kw	37559.00	35067.00	27383.00	26609.00	23739.00	27719.00	27471.00	24721.00	25308.00	25470.00	29750.00	31584.00	28531.67
Total Kw / Total Sq. Ft	0.69	0.64	0.50	0.49	0.43	0.51	0.50	0.45	0.46	0.47	0.55	0.58	0.52

Benchmarking

- **Benchmark 1994 to 1997**
- **What we used—**
 - 30,300 sq ft
 - 29,500 kWh/month
 - 2265 Therms/month
 - \$40,000 annual energy bill
- **What we disposed of –**
 - 10,000 gallons of waste liquids annually
 - 125 tons of solid waste annually
(24 yards of waste/week @ 200 pounds/yard)
- **Established goals to reach by 2013**

Energy Goal – 50% reduction

Liquid Recycling Goal – 50% reduction

Solid Waste Goal – 25% reduction

- **Conducted Audits (Where; How Much; When)**
- **Rolling Five Year Plan**
 - **Low cost - High pay off (LCHP)**
 - **High cost – High pay off (HCHP)**
 - **Low cost – Low pay off (LCLP)**
 - **High cost – Low pay off (HCLP)**
- **Three Month Assessments**
- **Steady Progress**
- **The First Decade**
 - **25 energy saving initiatives**
 - **12 recycling initiatives**
 - **7 environmental initiatives**

Energy Efficiency/Conservation Initiatives

- **Waste oil furnaces (HCHP)**
- **Climate control of work areas (LCHP)**
- **Overhead door seals (LCHP)**
- **Timers for outside lighting (LCHP)**
- **Timers for shop equipment (LCHP)**
- **Ceiling fans for air circulation (LCHP)**
- **HE indoor fluorescent lighting (HCHP)**
- **Polymer blinds (HCHP)**
- **Insulation added to walls and roof (HCHP)**

Energy Efficiency/Conservation Initiatives (cont)

- **Replaced doors and seals at entry points (HCHP)**
- **Sky light tubes for natural lighting (LCLP)**
- **Programmable power strips (LCLP)**
- **Compressor air line inspection schedule (LCHP)**
- **On demand air compressors (HCHP)**
- **Tied shop equipment turn off with lights (LCHP)**
- **Replace lot lights with LED lighting (HCHP)**
- **Installed de-stratification fans (LCHP)**

Energy Efficiency/Conservation Initiatives (cont)

- **Installed vestibules for door entry points (HCHP)**
- **Inside seal on overhead doors (LCHP)**
- **Maintenance program on door seals (LCHP)**
- **LED sign lighting (HCLP)**
- **Implemented semi-annual facility inspection (LCHP)**
- **Installed room occupancy sensors in lightly used areas (LCHP)**
- **Timers on office equipment (LCLP)**
- **Replace interior lighting with LED fixtures (HCLP)**

Recycling Initiatives

- **Waste oil storage system (HCHP)**
- **Cardboard recycling (LCLP)**
- **Metal recycling (LCHP)**
- **Wooden pallet collection (LCLP)**
- **Battery collection (LCLP)**
- **Antifreeze collection (LCLP)**
- **Magazine/newspaper collection (LCLP)**
- **Bulk shredding of important papers (HCHP)**
- **Reclaim paint and solvents (HCHP)**
- **Water based parts washers (HCHP)**
- **Plastic collection (LCLP)**
- **Computer equipment recycling (LCHP)**

Environmental Initiatives

- **Rerouted floor drains (HCHP)**
- **Indoor drains at garage doors to eliminate run off (HCHP)**
- **Heated water for wash bay to reduce water consumption (HCLP)**
- **Planted 100+ trees (HCLP)**
- **Surface drains to control water (HCLP)**
- **Stabilized drainage ditch (HCLP)**
- **Water separators for equipment (HCHP)**

Energy Results (2008)

- **Objective –**
 - 50% reduction in energy use
- **Results -**
 - 80% increase in building space (30,300 to 54,600 sq ft)
 - 60% decrease in gas (2,265 to 900 Therms/mo.)
 - 45% increase in electric (29,500 to 42,800 kWh/mo.)
 - 65% increase in annual energy bill (\$45K to \$75K)

Recycling Results

- **Objective –**
 - 50% reduction in liquid waste
 - 25% reduction in solid waste
- **Result –**
 - 99% reduction in liquid waste
(10,000 gallons recycled or used)
 - 50% reduction in solid waste to land fill
(An annual reduction of 62 tons)

What's Next?

- **Solid job reducing our use of natural gas.**
- **We need to reduce our use of electricity.**
 - **Since 1997 cost of electricity has increased at a rate of 2.6% per year.**
 - **Increasing pressure on the use of electricity given the proliferation of electronic devices**
- **Our focus to reduce consumption has been efficiency and conservation—no power generation.**
- **We want to control expenses.**
 - **Refine efficiency & conservation measures to save energy**
 - **Generate electricity from renewable sources**

Generation Choices

- **Where?**
- **How much?**
- **When?**
- **Our analysis—**
 - **Showroom (9K kWh, Summer, Day)**
 - **Service Building (25K kWh, Summer, Day)**
 - **Body Shop (7K kWh, Winter, Day)**
 - **Off Site Lot (1K kWh, Winter, Night)**

Solar Plant – 6.0 kW System



Design: 500 kWh per month

Actual Production: 750 kWh per month

ROI: 18.5 years w/grant

Conservation/Efficiency or Production?

- **Continuing to implement measures to conserve or be more efficient**
 - New technologies
 - Further refinement of current initiatives
 - Foster partnerships to exchange ideas
- **Expanding solar grid**
 - Solar Energy Credits (SREC) generates additional income
 - Planned expansion to 100 kW by 2020

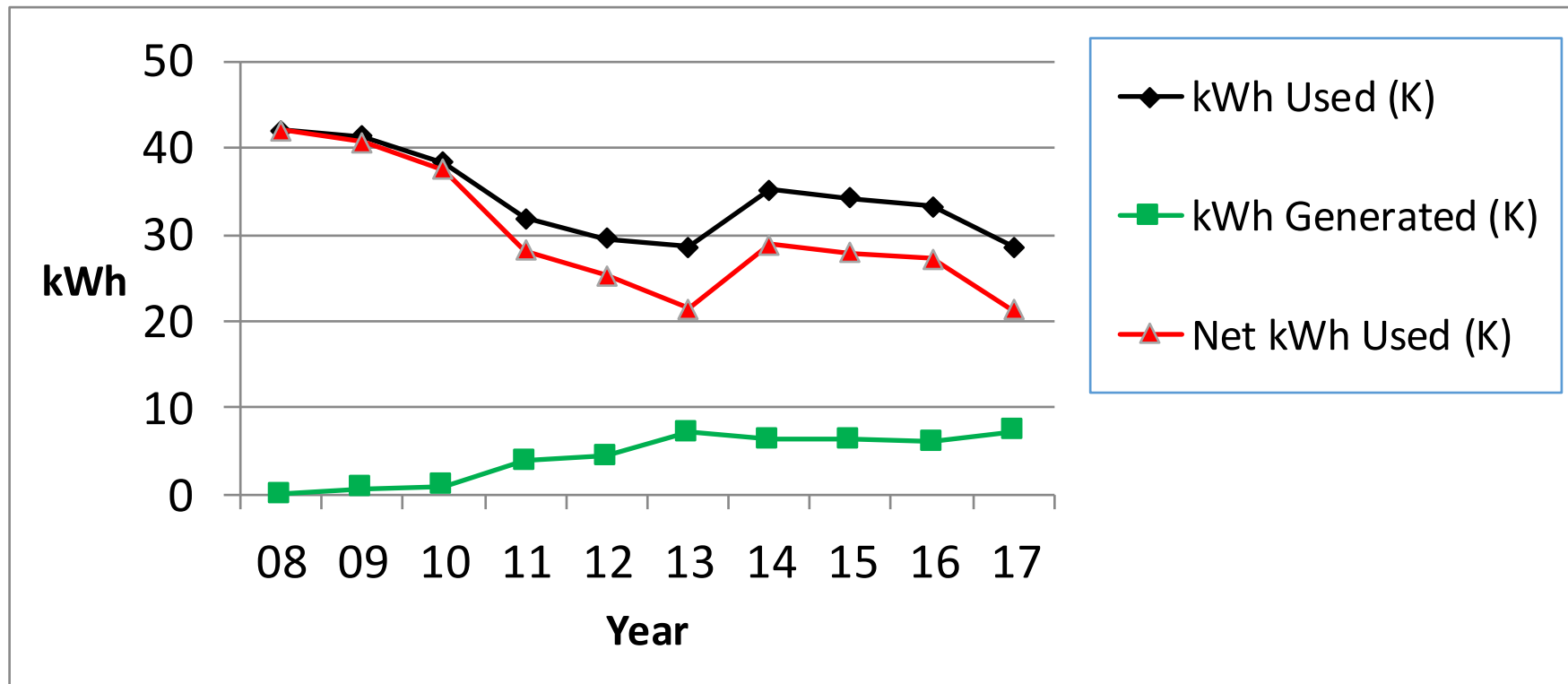
Solar Plant



95.1 kW System of 350 Solar Panels Completed 07/17
Generating 8+ MWh/month
Annual SREC Revenue of \$30,000+

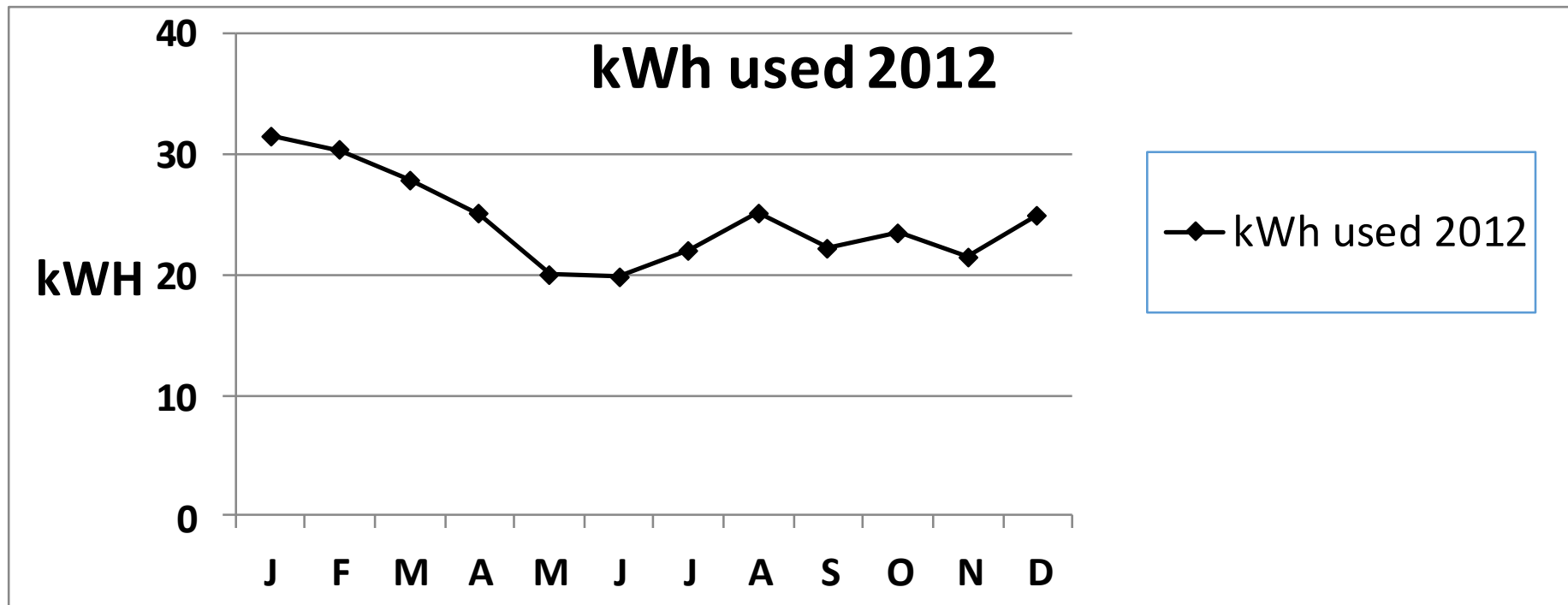
Electricity . . .

What We Use . . . What We Produce



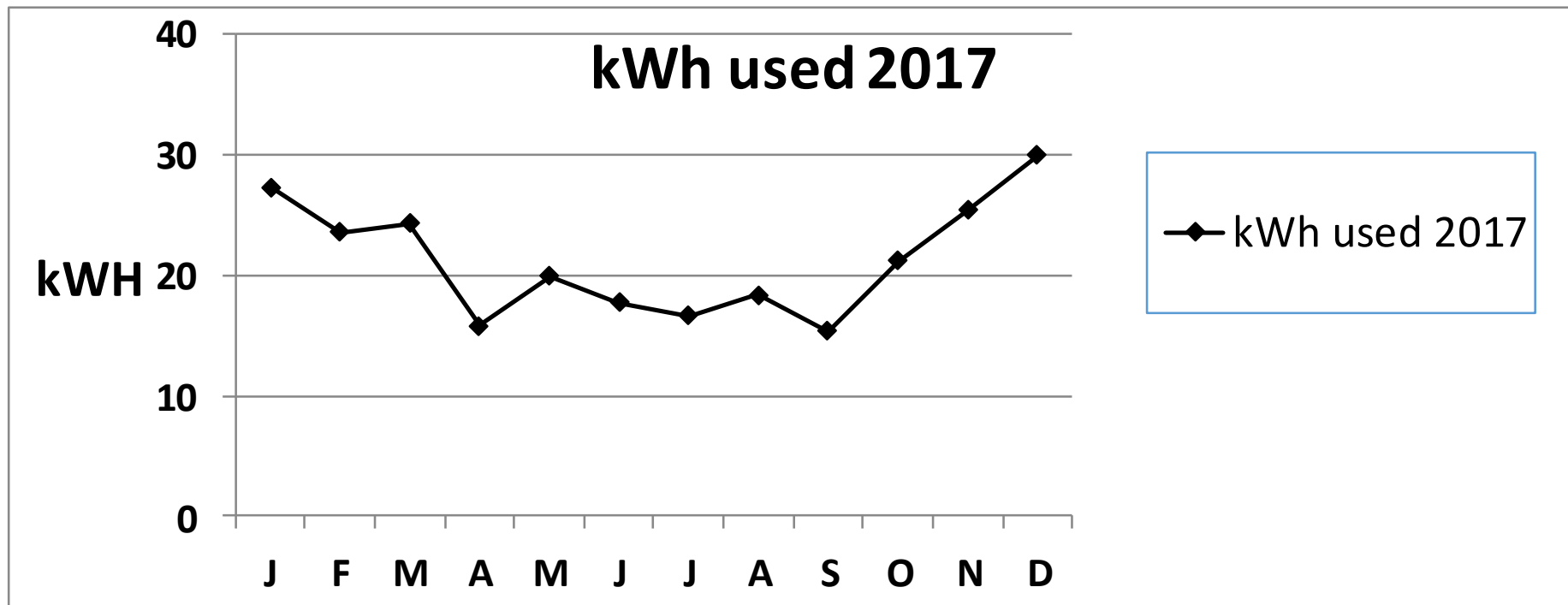
Electricity . . .

During the 2012 heat wave our electric consumption was at a twenty year low!



Electricity . . .

monthly consumption for 2017



The Value of Investment in 2010

Assumptions:

- Size is based on 28 panels costing \$40,000
- Panels produce 840 kWh/month
- Electricity costs \$.12/kWh
- Each SREC is reimbursed at a rate of \$250/SREC
- Tax credit of 30% = \$12,000
- Excluded from the calculation: depreciation and grants

Calculation without SREC

- $840 \text{ kWh} \times 12 \text{ months} = 10,080 \text{ kWh} \times \$0.12 = \$1,210 / (\$40,000 - \$12,000) = \$1,210 / \$28,000 = 4.32\%$
- ROI is 23 years

Calculation with SREC

- $10,080 \text{ kWh} / 1,000 = 10 \text{ SREC's}$
- $10 \text{ SREC's} \times \$250 = \$2,500 + \$1,210 = \$3,710 / (\$40,000 - \$12,000) = \$3,710 / \$28,000 = 13.25\%$
- ROI is 7.6 years

(Note: 2.5% increase in electric rate reduces ROI by one year)

Value of Investment in 2017

Assumptions:

- Size is based on 28 panels costing \$25,000
- Panels produce 1,060 kWh/month
- Electricity costs \$.12/kWh
- Each SREC is reimbursed at a rate of \$450/SREC
- Tax credit of 30% = \$7,500
- Net metering allows a 10% reduction in electric consumption
- Excluded from the calculation: depreciation and grants

Calculation without SREC & without net metering

- $1060 \text{ kWh} \times 12 \text{ months} = 12,720 \text{ kWh} \times \$0.12 = \$1,526 / (\$25,000 - \$7,500) = 8.7\%$
- ROI is 11.5 years

Calculation without SREC & with net metering

- $1060 \text{ kWh} \times 12 \text{ months} = 12,720 \text{ kWh} \times \$0.12 = \$1,526 + \$153 = \$1,679 / (\$25,000 - \$7,500) = 9.6\%$
- ROI is 10.5 years

Calculation with SREC & with net metering

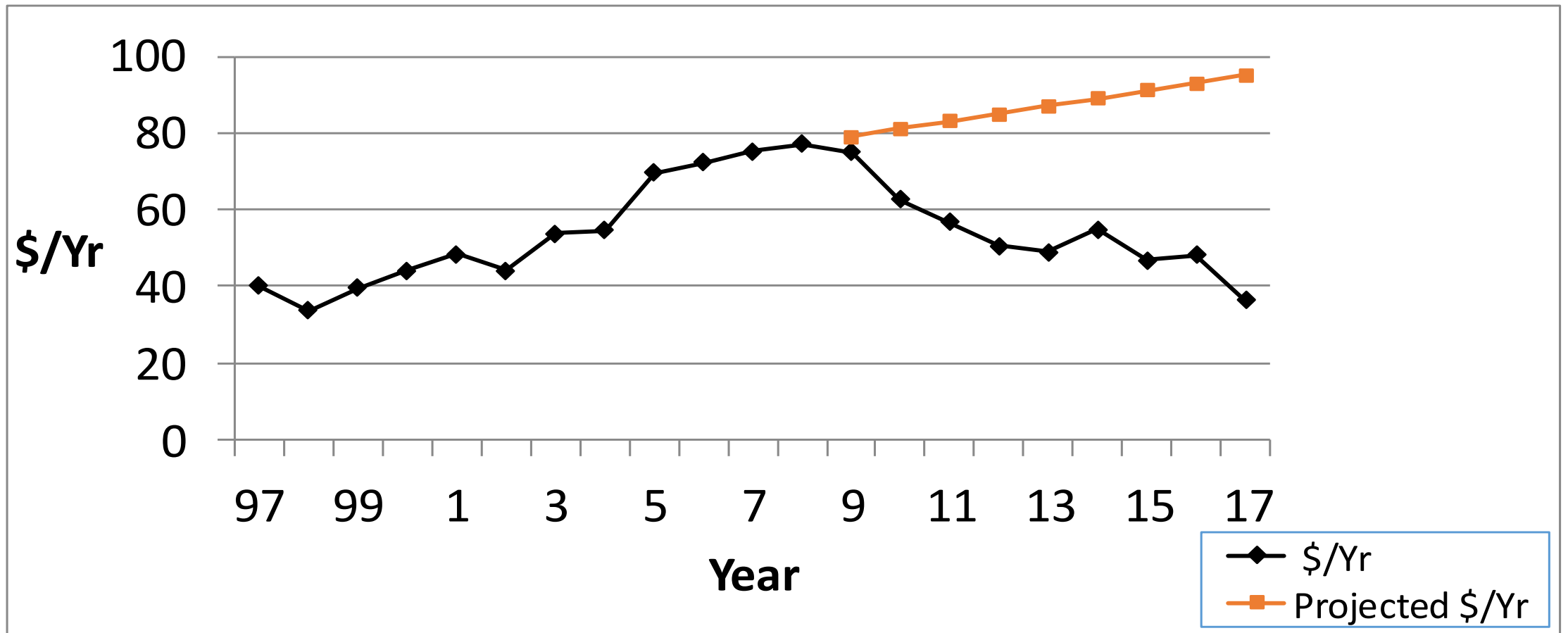
- $12,720 \text{ kWh} / 1,000 = 12 \text{ SREC's}$
- $12 \text{ SREC's} \times \$450 = \$5,400 + \$1,526 + \$153 = \$7,079 / (\$25,000 - \$7,500) = 40.4\%$
- ROI is 2.5 years

(Note: 2.5% increase in electric rate reduces ROI by one year)

Impact on our Utility Bill.

Note: 2017 utility bill had we done nothing---\$90,000+.

2017 actual utility bill---\$36,200.



2017 Energy Results

- **Objective –**
 - 50% reduction in energy use ('94 – '97 benchmark)
- **Results 20 years later -**
 - 80% increase in building space (30,300 to 54,600 sq ft)
 - 74% decrease in gas use (2,265 to 590 Therms/mo.)
 - 28% decrease in electric use (29,500 to 21,300 kWh/mo.)
 - 10% decrease in annual energy bill (\$40K to \$36.2K)

2017 Energy Results

- **Objective –**
 - 50% reduction in energy use ('94 – '97 benchmark)
- **Results adjusted for building increase of 80% -**
 - 86% decrease in gas use (4,077 to 590 Therms/mo.)
 - 60% decrease in electric use (53,100 to 21,300 kWh/mo.)
 - 50% decrease in annual energy bill (\$72K to \$36.2K)

Employee Benefit

Energy Conservation & Efficiency Fund

- Established in March 2009**
- Employee Completes Home Energy Audit**
- Employee Presents a Plan to Save Energy**
- Employee is Reimbursed 35% of cost up to a maximum of \$700**

Employee Benefit

Energy Conservation & Efficiency Fund

- **Since March 2009** (as of 01/18)
 - **434 home improvement projects completed**
 - **\$13,000 reimbursed to employees**
 - **\$74,000 in home energy improvements**

Does Solar Make Sense in Indiana?

Top Solar Installed Capacity in 2016

- #1 – China 78,100 MW
- #2 – Japan 42,800 MW
- #3 – Germany 41,200 MW
- #4 – USA 40,300 MW

Latitude

- Tokyo - 35.69° N
- Evansville - 37.97° N
- Peking - 39.90° N
- Chicago – 41.87° N
- Seattle – 47.60° N
- Frankfurt – 50.11° N

Top Solar Power Capacity per Capita

- #1 – Germany – 400 MW
- #14 – Japan – 55 MW
- #20 – USA – 25 MW
- #28 – China – 6 MW

% of Total Consumption

- #2 – Germany – 6.5% (#1 - Italy)
- #3 – Japan – 4.9% (UK, Spain, Australia, France)
- #8 – USA – 1.4%
- #9 – China – 1.1%