

School Energy Information

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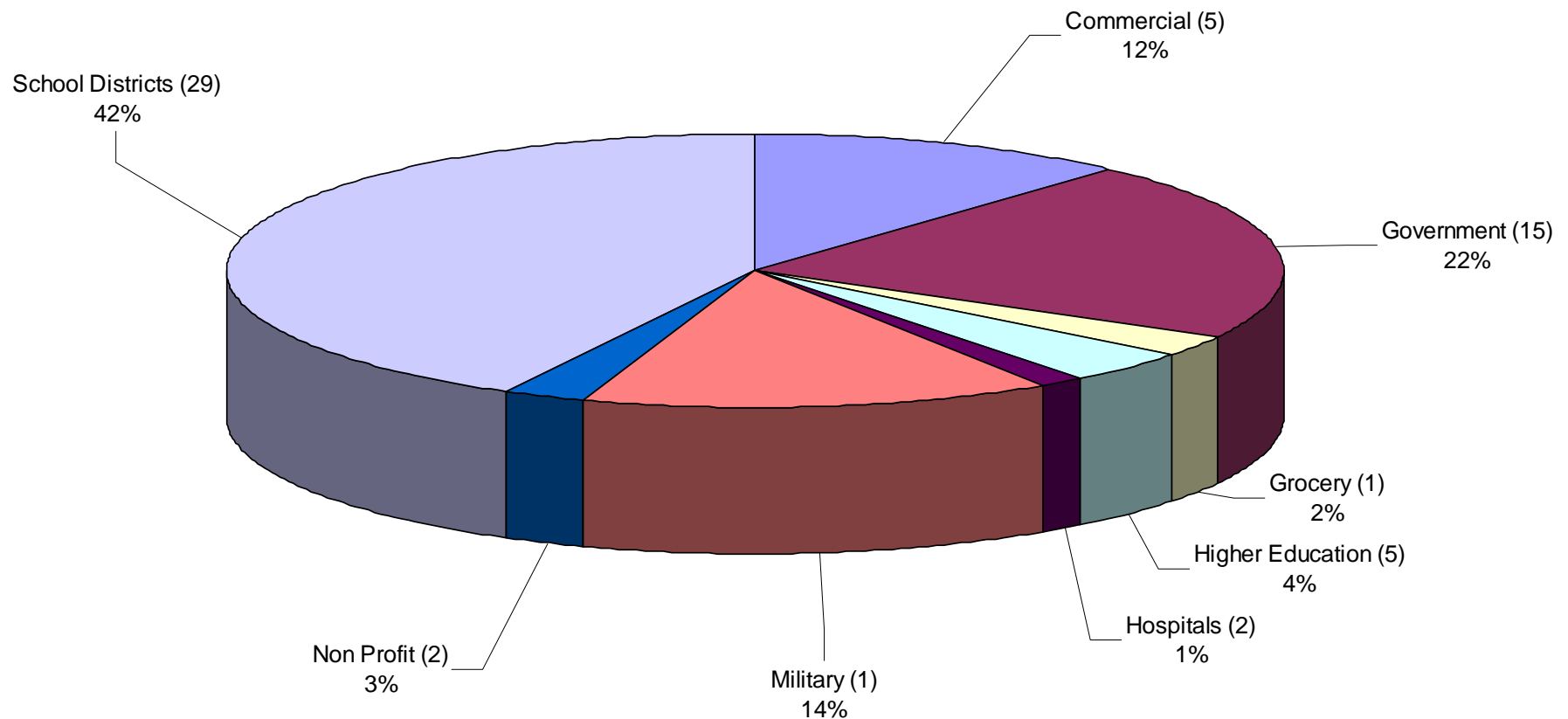
August 20, 2008



PUGET SOUND ENERGY
The Energy To Do Great Things

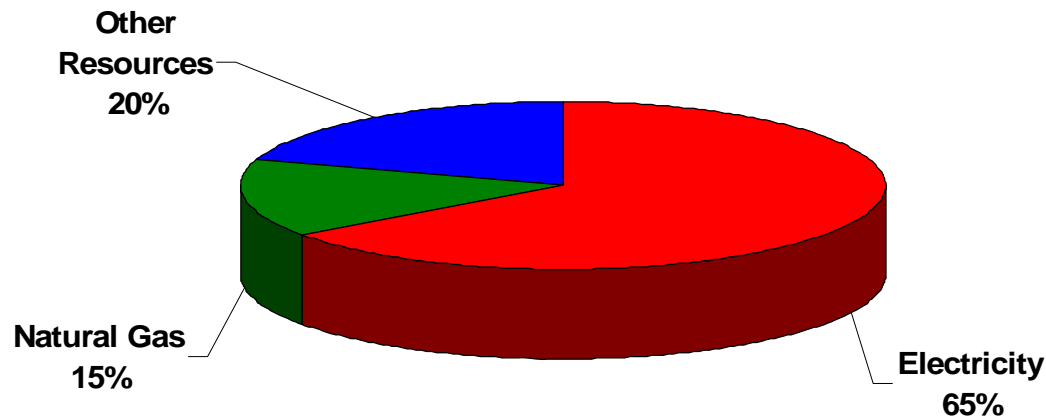
PSE RCM Program as of 2008

- ◆ 60 Customers; 120 million square feet



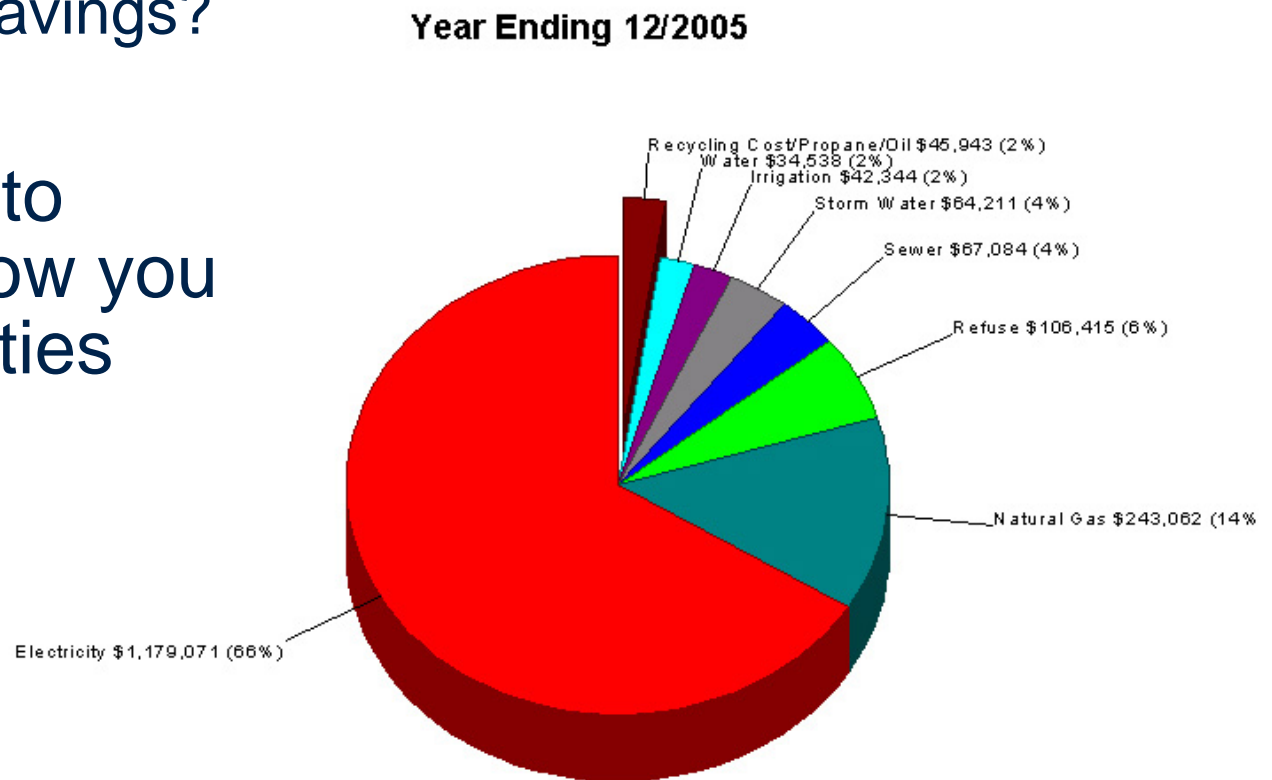
Typical Energy Costs

- ◆ Typical RCM customers spend \$2 to \$3 million per year
- ◆ Energy is about \$1.00 /sq. ft.
- ◆ RCM program targets a 5% reduction per year
 - ◆ For a school district, a 5% reduction in total energy can be enough savings to power a whole school



Establishing Your Target

- ◆ Where would you focus to achieve the most?
 - ◆ Energy is typically the largest share of utility costs
 - ◆ Potential for savings?
- ◆ Important for management to understand how you set your priorities



Biggest Bang for Your Buck

- ◆ Energy is typically the largest share of utility budgets
- ◆ ENERGY = Power x Time
- ◆ Reduce energy consumption by:
 - ◆ Less Time
 - ◆ Lower Power

Energy Using Systems

- ◆ Heating System
 - ◆ Combustion Efficiency
 - ◆ Distribution System
 - ◆ Controls
 - ◆ Hours of Operation
 - ◆ Envelope
- ◆ Ventilation
 - ◆ Amount of Outside Air
 - ◆ Night & Warm-up Operation
 - ◆ Demand Controlled
 - ◆ Exhaust System Interaction
- ◆ Lighting
 - ◆ Operation Time
 - ◆ Lamp Efficiency
 - ◆ Light Levels
- ◆ Service Hot Water
 - ◆ Temperatures
 - ◆ Distribution System
- ◆ Pumps & Motors
 - ◆ Sizing
 - ◆ Energy Efficient
 - ◆ Maintenance

Typical School Energy-Use Breakdown

Energy Use in Schools	Range (%)	Norm (%)
HVAC	45-80	65
Lighting	10-20	15
Food Service	5-10	7
Hot Water	2-5	3
Special Functions	0-20	10

Recording Energy Information

- ◆ Start with 12 to 24 months of utility data
- ◆ Read dates - days in billing period
- ◆ Fuel consumption - kWh, therms, gallons
- ◆ Actual electric demand - kW
- ◆ Total fuel costs including service charges
- ◆ Convert all fuels to BTUs per month
- ◆ Calculate annual totals
- ◆ Calculate Energy Use Indices (EUI)

Spreadsheet Setup

Energy Accounting Form															
Facility Name:															
Facility Type:															
Electric Utility:								Electric Meter #				Electric Rate Schedule:			
Gas Utility:								Gas Meter #				Gas Rate Schedule:			
Gross Square Footage:															
YEAR:	ELECTRICITY							NATURAL GAS				TOTALS		ENERGY USE INDEX	
MONTH	# Days	ELECTRIC	ELECTRIC	ELECTRIC	ELECTRIC	ELECTRIC	LOAD FACTOR	GAS	GAS	GAS	GAS	(A)	(B)	(C)	(D)
	In Billing	USAGE	DEMAND	COST	UNIT COST	MMBTU	$\frac{\text{kWh}}{\text{kW} \times \text{Days} \times 24}$	USAGE	COST	UNIT COST	MMBTU	MMBTU	COST OF	EUI	COST
	Period	kWh	kW	\$	kWh/\$	kWh x .003413		THERMS	\$	Therms/\$	Therms x .10	CONSUMED	ENERGY	Btu/Sq.Ft.	\$/Sq.Ft.
JAN															
FEB															
MAR															
APR															
MAY															
JUN															
JUL															
AUG															
SEP															
OCT															
NOV															
DEC															
Annual Totals															

Relate it to Your Business

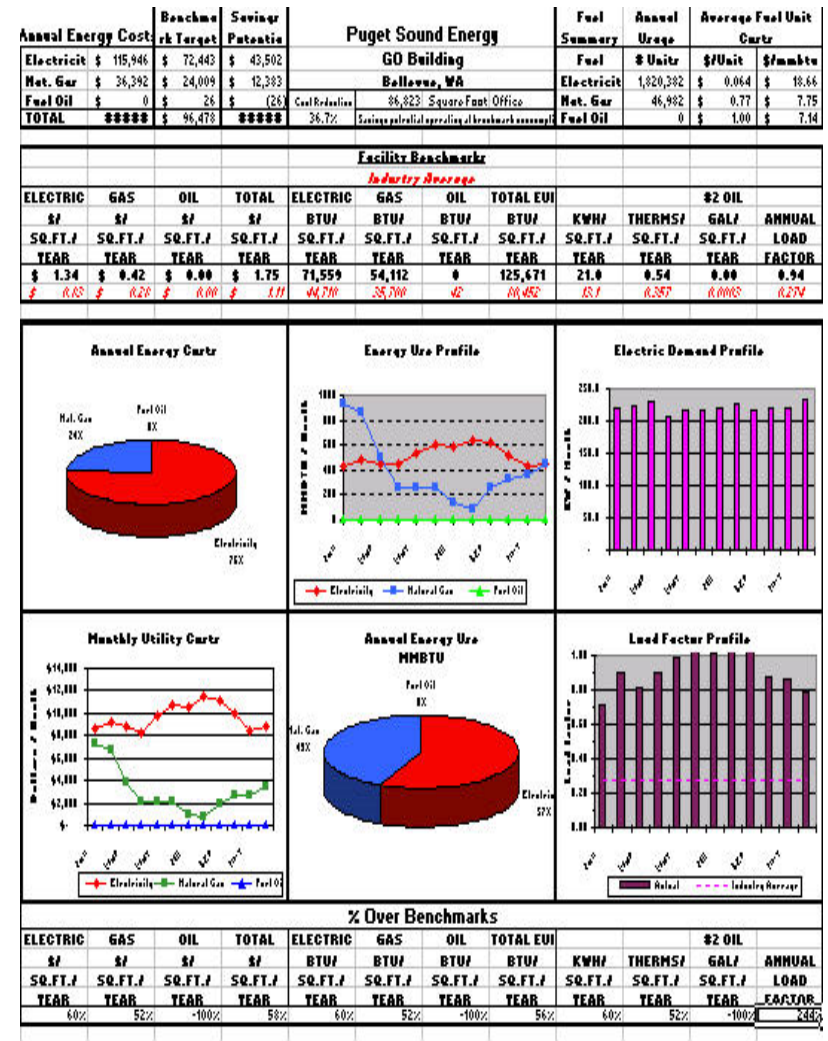
<i>School Type</i>	<i>non-labor allocation per student</i>	<i>average utility costs per student</i>
<i>Elementary</i>	\$91	\$129
<i>Junior High</i>	\$102	\$172
<i>Senior High</i>	\$96	\$210

Communicate Goal

	<i>non-labor allocation per student</i>	<i>average utility costs per student</i>	<i>10% savings per student</i>
<i>Elementary</i>	\$91	\$129	- \$13
<i>Junior High</i>	\$102	\$172	- \$17
<i>Senior High</i>	\$96	\$210	- \$21
District Totals		\$5,460,000	- \$370,000

How Much Can We Save?

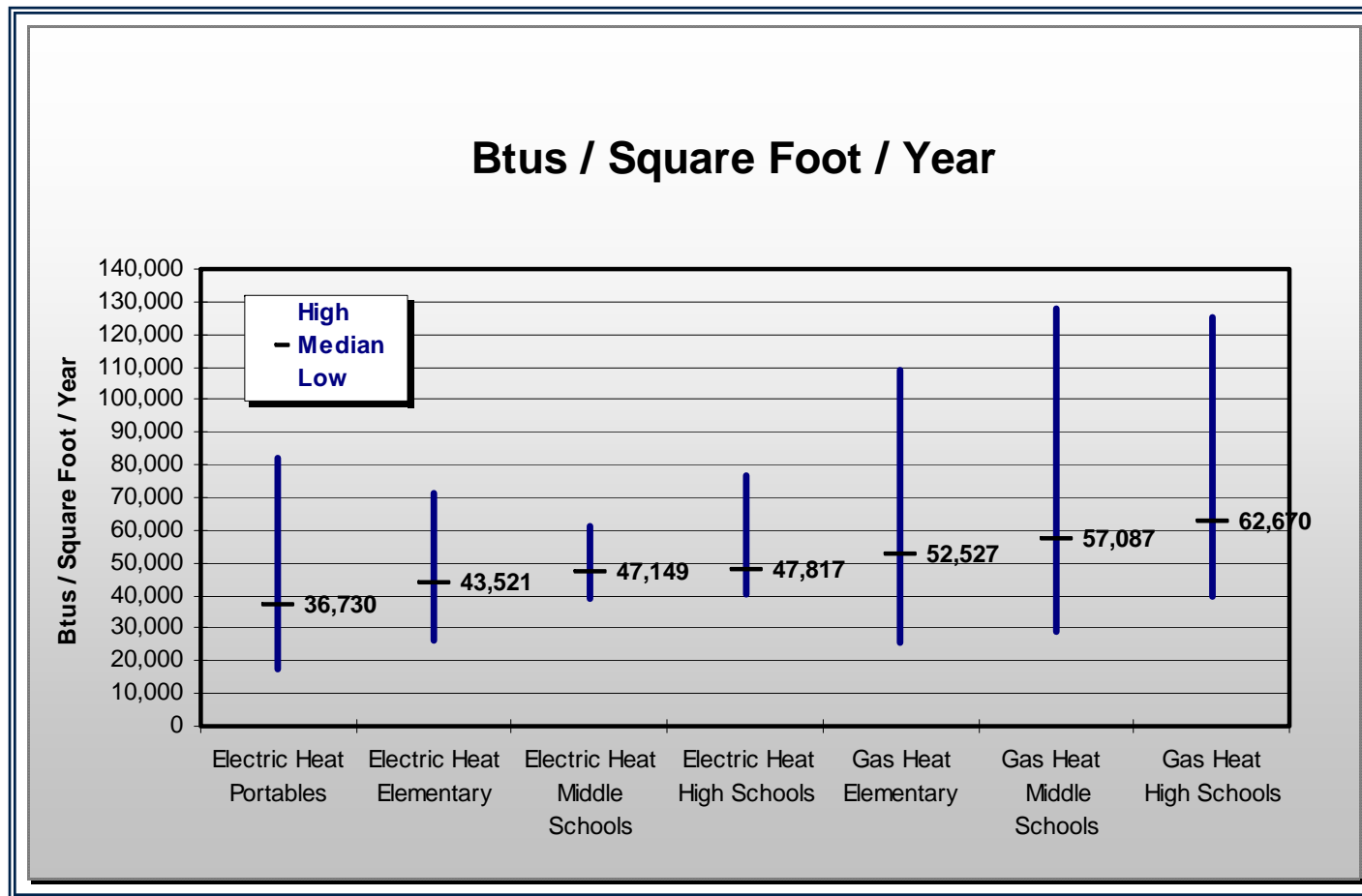
- ◆ Depends on your resource profile
- ◆ Benchmark your organization
- ◆ Compare this to the average benchmark for your organization type



PSE Benchmark Spreadsheet

PSE Energy Use Index

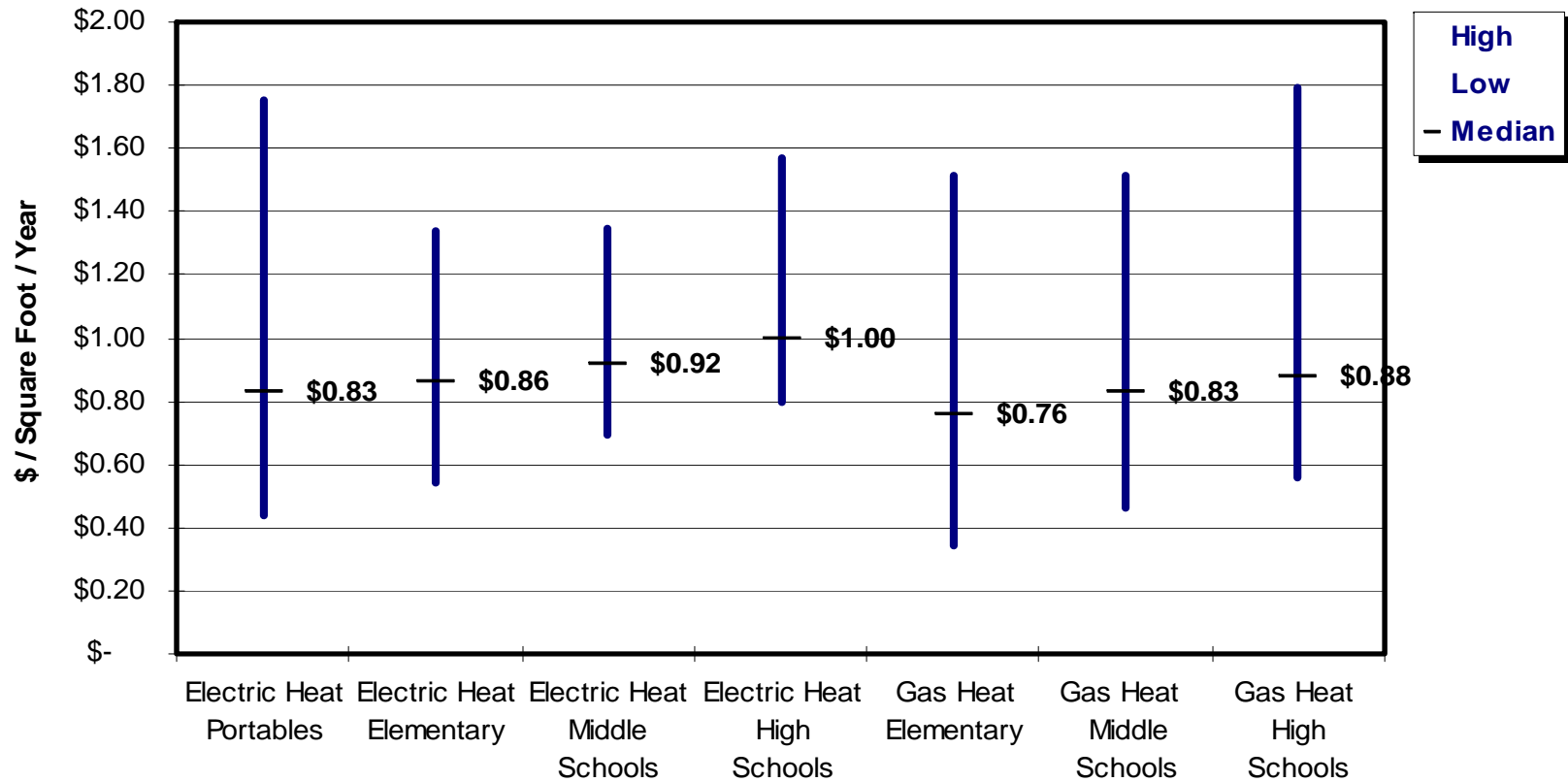
- ◆ Schools in PSE service territory



- 2003-2004
- 13 Districts
- 413 Schools

PSE School Cost Benchmarks

Dollars / Square Foot / Year



How to Save? Focus on Simple First

Saving energy means using energy when we need it and not using it when we don't. Paying attention to the energy we use saves money and minimizes environmental damage. If every employee takes a few minutes to reduce waste, the savings will add up!

the POWER is in your hands

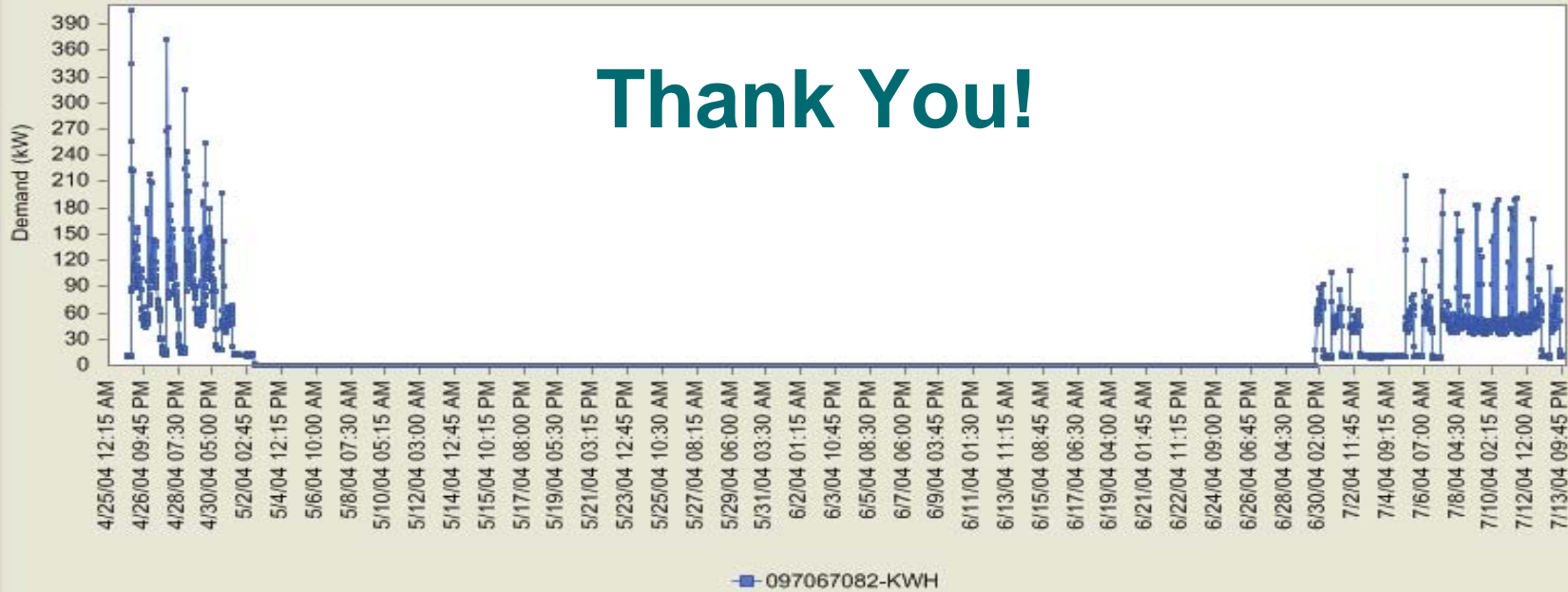
King County

- 1 Shut down computers at night and turn off monitors when not in use**
FACT: Shutting down a computer at the end of each day and before each weekend can save more than \$35 a year.
- 2 Turn off lights in unoccupied spaces**
FACT: Turning the lights off in a typical meeting room for just one hour a day can save more than \$10 a year.
- 3 Turn off office equipment at the end of each day**
FACT: Copy machines use heat to fuse an image to paper. Many machines have a standby mode that partially shuts down the copier when it is not being used. By enabling this feature, energy consumption can be reduced by as much as 70 percent.
- 4 Use window blinds to help heat and cool**
FACT: Natural daylight provides free lighting and free heating, and has been shown to have positive health effects on employees in the workplace.
- 5 Take your personal appliances home**
FACT: A typical dormitory-sized refrigerator consumes 350 watts of energy. This equates to roughly \$120 a year in energy costs.

King County Employee Energy Awareness Campaign <http://dnr-wab.metrokc.gov/ResourceConservation/ResourceCon.htm>

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Thank You!



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