

Saving Energy and Money Through Behavioral Changes

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We all know saving money is good. But what about saving energy when it comes to college campuses? How do you go about making changes to bring about a good amount of savings? So our project focused on saving energy and money through behavioral changes. We wanted to come up with strategies for the best energy saving methods to use on the Kansas State campus. In order to come up with these strategies we focused on three research questions which are summarized below. For each question we did literature reviews, then turned our focus to question 1 so that we could come up with potential savings for Kansas State.

Research Questions

How much can we save?



After we compiled all the data from our literature review and Throckmorton hall, we estimated potential savings by using some of the methods from our research. The research shows that we can save anywhere from \$100 to \$30,000 in just one building by using behavioral methods best suited for office spaces.

How do we change behavior and Implement

Behavioral programs?



We think the Fogg Model is the best approach to changing behaviors.

Ability/Simplicity, Motivators and Triggers are the components of the model. Make the behavior as easy as possible, communicate the importance of changes, and facilitate it into action.

Based on our research education is the best way to get programs up and running.

Teaching others about how and why behaviors changes that lead to better energy consumption are beneficial, then they will be more likely to follow. Reward/Incentive systems are the most effective.

How do we measure what we actually save?



Viewers can see energy use being played as times-series graphs. The graphs show the average kilowatts used during a particular time interval. Someone visiting the building can see how much energy was consumed during the time they were there. The web site also refreshes the data every 20 seconds. By using this measurement system they were able to calculate and communicate energy savings.

Survey and Data on K-State Campus

What we wanted to do was look more at question 1 and how to apply it to K-state. So we visited offices throughout Throckmorton Hall, surveying for a collection of 21 types of appliances with a large degree of occupant control. Based on the data gathered from 55 offices we came up with an average number for each room of the ten most common appliances for the total 145 offices. Then we calculated the total yearly cost from these devices. It shows that there is room for potential savings.

Chart shows assumed hours ran

Appliances	Assumed Hours	Watts	kWh
Desktop Computer	8 Hrs	150	1.2
Laptop Computer	8 Hrs	50	.4
Individual Printer	5 Hrs	35	0.175
Mini Fridge	Plugged in 24/7 but cycles about 6 Hrs	120	.72
Main Fridge 20 cu feet	Plugged in 24/7 but cycles about 6 Hrs	800	4.8
Space Heater	4 Hrs	1500	6
Television	7 Hrs	300	2.1
Coffee Machines	7 Hrs	1200	8.4
Office Phones	24 Hrs	17	.408
Projectors	8 Hrs	250	2

Equation: (Watts) x (Assumed Hours) / 1000 = kWh

Chart showing Individual appliance Yearly cost

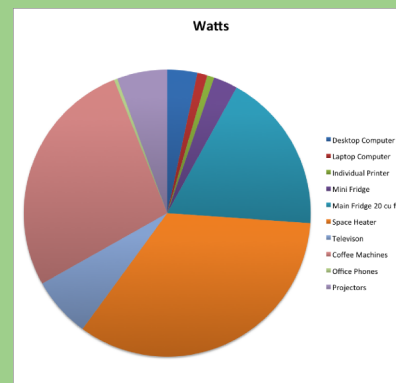
Appliances	kWh	Yearly Cost
Desktop Computer	1.2	\$33.73
Laptop Computer	.4	\$11.24
Individual Printer	.175	\$4.91
Mini Fridge	.72	\$20.24
Main Fridge 20 cu feet	4.8	\$134.90
Space Heater	6	\$168.63
Television	2.1	\$59.02
Coffee Machines	8.4	\$236.08
Office Phones	.408	\$11.47
Projectors	2	\$56.21

Equation: (kWh) x (cents per kWh) x 365 = Yearly cost to run Individual Appliance

Chart shows the count of each Appliance in throckmorton and theYearly cost

Appliances	Count in Throckmorton (145 offices)	Yearly Cost
Desktop Computer	189	\$6,374.97
Laptop Computer	61	\$685.64
Individual Printer	84	\$412.44
Mini Fridge	29	\$586.96
Main Fridge 20 cu feet	16	\$2,158.40
Space Heater	23	\$3,878.49
Television	48	\$2,832.96
Coffee Machines	52	\$12,276.16
Office Phones	62	\$711.14
Projectors	42	\$2,360.82
Total		\$32,277.98

Equation: (count) x (yearly cost per individual appliance) = Total yearly cost of all appliances in Throckmorton.



Pie Chart Showing Watt Consumption of top 10 Appliances in our survey

Survey of Appliances

Appliances	Number of Appliances	Mini Fridge	11
Desktop Computer	50	Main Fridge	5
Laptop Computer	30	Floor Lamp	0
Projector	16	Desk Lamp	3
Central Printer	4	Floor Fan	2
Individual Printer	1	Desk Fan	1
Central Fax	4	Space Heater	9
Individual Fax	0	Television	18
		Power Strip	35
		Toaster	2
		Microwave	14
		Office Phones	24
		Shredders	4
		Phone Chargers	4

