

## Greening the Office: Survey of the Events Management Office Discretionary Loads



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## **Abstract**

The Events Management Office of Smith College has expressed interest in having their office surveyed to estimate how much energy they use and what office members can do to reduce their environmental impact. After recording power usage of items in the office, conducting a questionnaire to obtain information on usage of items by office members, and calculating total annual energy usage and cost of energy, a list of recommendations was assembled for the office members' consideration. While the office is already doing a lot to reduce energy consumption, results show that there are more areas where they can improve. Ultimately, the goal of this project is to demonstrate what actions members of the office can take to reduce their environmental impact and share this information with other offices on campus, in hopes that they would also adopt green office habits.

## **Introduction**

On Smith College campus, students, faculty, and staff are committed to contributing to sustainability efforts and decreasing energy consumption. Most attention has been focused on student behavior and much has been done to promote energy conservation and recycling in student housing and academic buildings. To extend further beyond focus on students, however, examination of energy use and paper waste generated from office buildings on Smith campus can also contribute to Smith's conservation efforts. The Events Management Office has expressed strong interest in take steps to decrease their environmental impact and doing their part to promote green office habits on campus.

The Events Management Office (EMO) is responsible for planning events on campus and providing assistance to faculty, staff, and students. The events professionals are also in charge of creating guidelines and policies for campus events. A student is already working on evaluating aspects of campus events that can show improvement to increase energy efficiency and decrease waste. In addition, the EMO would like to have a student audit the office and provide suggestions on where they can cut back on energy use and what office habits they would possibly be able to change without encumbering their everyday work. Thus, the main purpose of this project is to identify what can members of this office, as well as any other office, do to decrease their environmental impact. The ultimate goal of this project and subsequent ones with the Events Management Office is to pass on this information to other offices in hopes that they would also consider these suggestions and adjust office habits to save energy and reduce waste.

## Methodology

I began the project consulting with Dano Weisbord, the Environmental Sustainability Director at Smith, to discuss how to measure power usage for different electronic items in the office and borrow a power-measuring device. The most accurate way of measuring any item's energy use would be to leave it plugged into a power-measuring device and record how much power was used over time<sup>1</sup>. However, it was decided that, because of limited resources and time to complete the project, different items in the office need to be measured differently depending on how it uses energy.

I first measured how much power is used by items with constant draw, meaning the amount of energy it draws at any given moment when it is in use is constant or mostly stable. Some examples of these items include lamps, fans, speakers, air purifier, and computers. After recording energy use of these items, I conducted a survey to obtain information on how many hours a day or per week do each office member use these items and to understand general practice in the office (for a complete list of questions in the survey, see Appendix I). For items with constant draw, I can use the answers from the survey to calculate annual usage, but for items with fluctuating draw, I had to leave the power-measuring device plugged in for over a period of more than one working day to see how much energy those items use per day. The energy use of these items vary tremendously between the resting state and the active state. Some examples of items include, printers, refrigerators, fax machines, microwaves, and other similar electronics.

With this information, I was able to calculate and estimate annual power usage and cost for each individual and the office as a single body. After initial calculations and

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<sup>1</sup> Dano Weisbord

review of information, I conducted a follow-up questionnaire to ask for clarification and elaboration, as necessary, for answers previously provided. I, then, compiled this information and made calculations to come up with total energy use and cost in a year. With these figures, I assembled a report with all the results and a list of recommendations for what the members of the office can do to reduce energy consumption.

### **Results**

The EMO consists of six events professionals, each having their individual offices. In addition, the office also consists of a conference room, a common workspace, a reception area, and a kitchen (see Appendix II). The calculations are organized according to energy use of each room and each person. It is estimated that the Events Management Office uses 4901 kilowatt-hours per year, which costs \$800.34. The cost is calculated with the value of \$.1633 per kilowatt-hour. The energy use and cost for each person and each room are listed in Table 1 (For complete list of values for items in each room, refer to Appendix III).

	kwh/year	Cost
Ken Molnar's Office	483.60	\$78.97
Steve Campbell's Office	381.90	\$62.36
Peg Pitzer's Office	198.36	\$32.39
Piper Foreso's Office	289.43	\$47.26
Kathy San Antonio's Office	622.75	\$101.70
Karen Brunette's Office	431.60	\$70.48
Conference Room	237.02	\$38.70
Common Workspace	1236.10	\$201.86
Reception	234.32	\$38.26
Kitchen	785.92	\$128.34
<b>Total Office Use:</b>	<b>4901.01</b>	<b>\$800.34</b>

Table 1. Total energy use and cost

The data in Table 1 shows that energy usage and cost for each individual's office vary considerably. With closer examination, the difference between usage by each individual can be explained by difference in use of lighting. When comparing total energy use of each individual's office and their energy consumption from lighting, the values match in proportions (Figure 1). Lighting constitutes 39%, the biggest category, of total energy use in the office (Figure 2). In fact, the largest consumption of a single item in the office is the ceiling lights in the common workspace, which uses 798 kwh/yr and costs \$130 per year to power. Furthermore, this comparison corresponds with survey answers, where members of the office with the least energy use from lighting have stated that they use a desk lamp and floor lamp instead of ceiling lights, and use natural lighting for the majority of the day and whenever it is sufficient. This indicates that change in use of lighting can have a considerable impact on each person's total energy consumption.

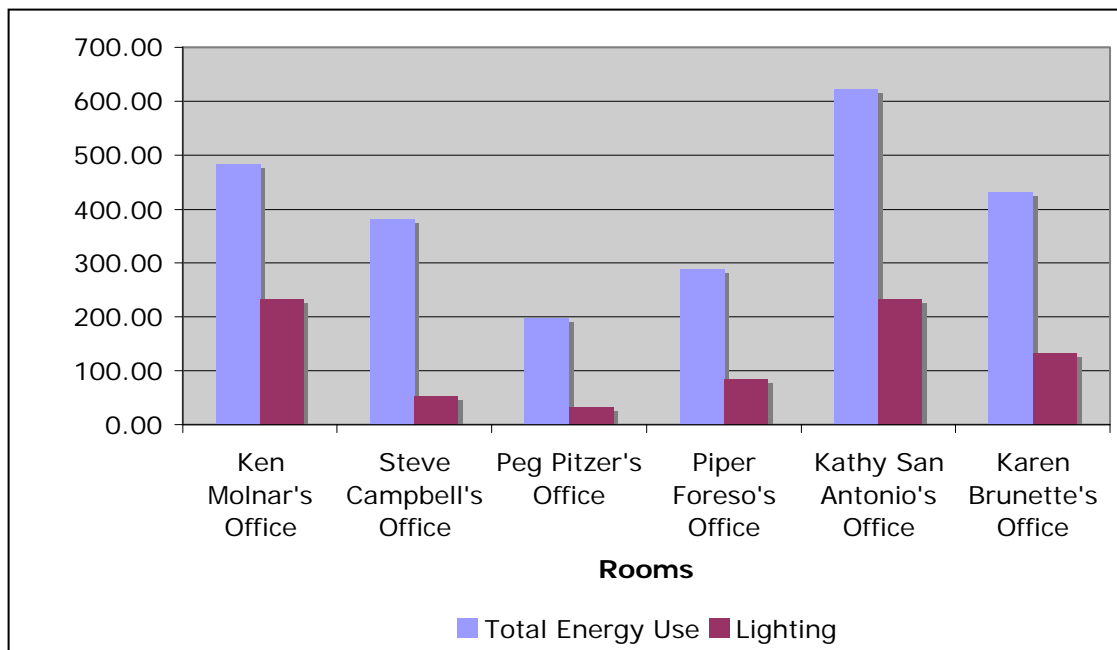


Figure 1. Lighting and total energy use comparison

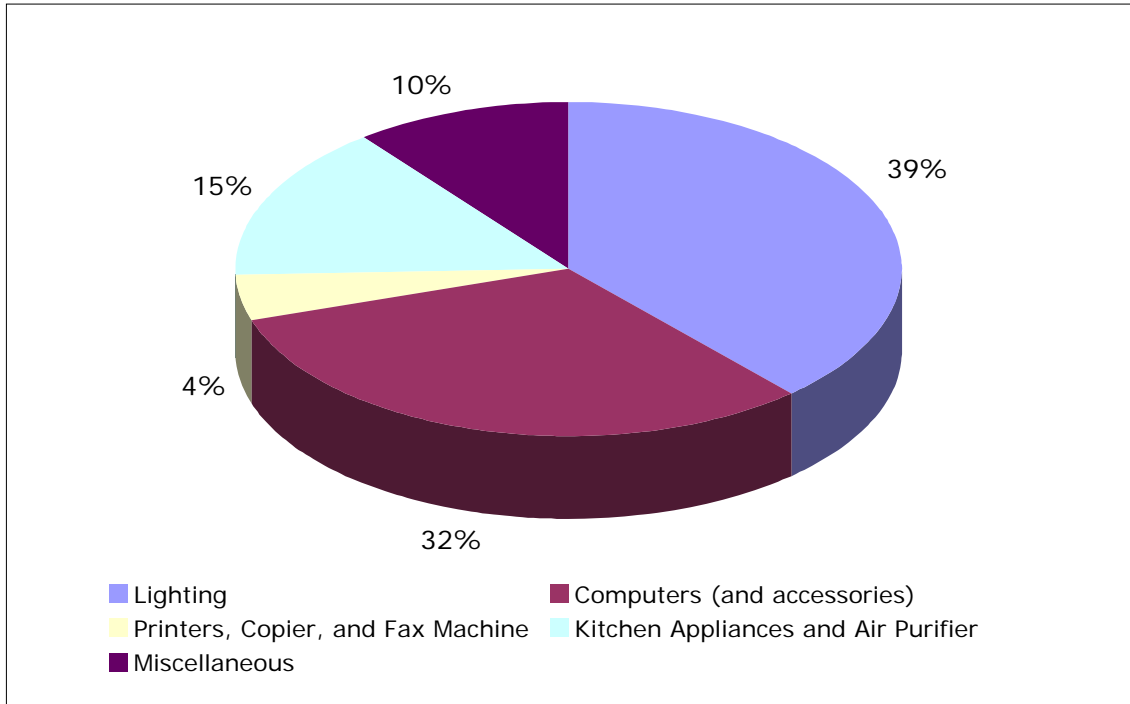


Figure 2. Total energy use by categories of items.

Results also show that the office has a number of items that are not often used but draw energy even when off or on but not in use. The total energy consumption by these items when not in use is 512 kwh/yr, costing \$70.96 per year to power (Table 2).

According to survey, these items are seldom used out of a year or used only infrequently in a week.

<i>Item</i>	<i>kwh/yr</i>	<i>cost/yr</i>
Television	113.36	\$18.51
VCR	83.72	\$13.67
Speakers	40.56	\$6.63
Walkie Talkies	173.12	\$18.96
Radio	18.35	\$3.00
Scanner	41.48	\$3.51
Labor Writer	25.32	\$4.14
Sharpener	15.60	\$2.55
<b>Total:</b>	<b>511.51</b>	<b>\$70.96</b>

Table 2: Energy use and cost of items not in use

## Discussion

After auditing the personal offices and speaking to the office members, it was clear that they are already taking measures to reduce their energy and paper consumption. One of the questions I asked in the survey was “what are some things that the EMO is already doing to reduce energy use and office waste?”. Some of the answers to this question were leaving the lights off when there's enough natural light, printing double-sided when possible, cutting up waste paper for scrap, turning off the lights when they leave a room, and sending documents through email rather than paper copies when possible. These are all valuable practices and it is worth noting all the good habits that the office members are already adapting.

Even so, there is still more that the office can do, some easily and others requiring a little more determination. Firstly, there are quite a few items that the office can easily unplug to save energy and money. These items draw energy when they are not turned on or when turned on but not in use. In the conference room, the television and video player can be unplugged, since according to the survey, they are only used a few times a year. Other things that draw energy when not in use are speakers, the pencil sharpener, the radio, and the scanner. Survey responses indicated that external speakers are used very infrequently. Thus, if they are not an essential item to the office, office members can consider using internal speakers in the computer instead. For the pencil sharpener, radio and scanner, they can be unplugged for the majority of the time and be plugged back in whenever they need to be used. There were mixed responses to the number of hours the air purifier is left on, some saying 8 hours a day while others saying all day and all night. By making sure to turn off the air purifier at night, the amount of energy it draws can be

reduced by more than half (unless it is left on for health purposes). When left in the charging dock, the Walkie-Talkies use twice as much energy as when removed.

Therefore, if possible, it would be better to unplug any not often in use and to not recharge them overnight, but to charge them during the working hours. The same idea can be applied to the chargeable mouses.

The biggest energy expense in the office is lighting. Some members of the office are already using very little lighting and relying on natural light whenever possible. This is a valuable habit that can greatly reduce energy consumption of the whole office and could be given consideration by the rest of the office members, since each personal office has at least one window. Using table lamps and floor lamps (with fluorescent light bulbs) demand much less energy than ceiling lights. As mentioned above, the biggest consumer of energy is the ceiling lights in the common workspace when turned on for six hours a day. Thus, it would be very effective to turn off those lights whenever possible.

According to survey responses, many members of the office are concerned that the office's paper waste are not actually being recycled despite it being discarded properly into a recycling bin. If this problem persists, members of the office should contact Physical Plant and voice their concerns about this issue. In addition, the office should request updated guidelines for what paper and plastic products can and cannot be recycled, and also where light bulbs, batteries, electronics, and ink cartridges can be recycled, if this information is not already available. A survey response also raised the question of the benefits of using silverware and mugs over plastic utensils and cups, considering the amount of water and paper towels used to dry those items. While this is a thoughtful consideration, it is still more environmentally friendly to use silverware and

mugs than plastic goods due to the extremely slow rate of disintegration of plastic in landfills. Therefore, to address the concern of using too much paper towels, office members can consider buying a drying rack for the office.

In addition to the recommendations made above, it is also essential for members of an office to simply be more aware of where they can cut back and eliminate unnecessary energy consumption. As mentioned before, it is evident that the members of the EMO are already doing a great deal to reduce their energy consumption and waste generation and thinking seriously about the environmental impact of their everyday work activities. Their efforts are inspiring and their enthusiasm can hopefully encourage other offices across campus to do the same and contribute to Smith's commitment to sustainability.

This project should be viewed as the first part of a series of tasks to complete. Ideally, there will be students who can continue working with the Events Management Office to continue looking at what other changes can be made to the office's discretionary loads. During the summer, each individual's office in the EMO has an air-conditioner installed, but usage by each office member will vary. Thus, it would be important to measure energy use of the air-conditioners to complete the annual usage and cost figures. Most importantly, a second survey should be conducted to estimate impact, if any, of changes in actions. Ultimately, this information and recommendations can be shared with other offices so that they would also know what steps they can take to reduce the energy consumption and waste generation of their office.

## **Acknowledgments**

I would like to thank all the members of the Events Management Office for their enthusiasm for the project, cooperation with answering questions, and patience with my sporadic presence in the office. I would also like to thank Dano Weisbord for providing help and guidance for the project. And finally, I would like to thank Professor David Smith for giving me the opportunity to complete a practical project before graduating from Smith College.

## Appendix I

### Questionnaire

1) How many hours a day (or per week), on average, do you use the following items in your office? (Not all may apply to you, and please give any additional information you feel necessary).

- Computer
- Table Lamp
- Speakers
- Floor Lamp
- Coffeemaker
- Chargeable Mouse
- Electric Footwarmer
- Calculator
- Radio
- Small Fan
- Walkie Talkie
- Ceiling Lights

2) Of the above items, which do you turn off (or unplug) at the end of the day?

3) How often do you use the following items in the common area?

- Printer
- Scanner
- Copier
- Microwave
- Coffeemaker
- Water Cooler
- Toaster

4) In the conference room, how often are the television and VCR used?

5) How many hours a day are the air purifiers turned on? Are the air purifiers turned off at night?

6) Are paper and plastic recycling bins available?  
If so, do you recycle your paper and plastic waste?  
Do you ever feel unsure of what can and cannot be recycled?

7) Do you use your own mug and set of utensils?

8) What are some things that the EMO is already doing to reduce energy use and office waste?

## Appendix II

### Events Management Office Floor Plan

