

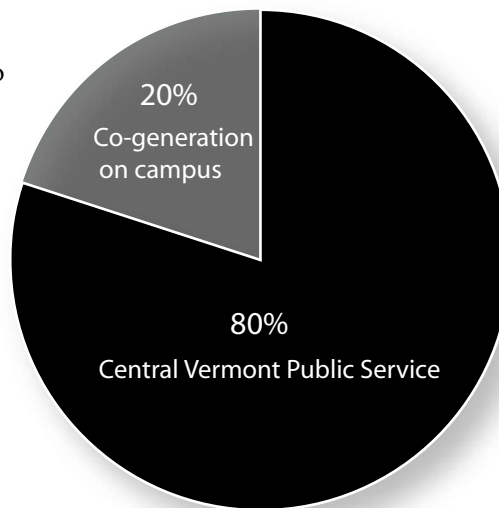
Did you know that we use **22 million kilowatt-hours** of electricity per year at Middlebury and that this costs us **\$2,112,000**?

HOW MUCH CAN YOU TAKE OFF?

Power Strip

Where does Middlebury's electricity come from?

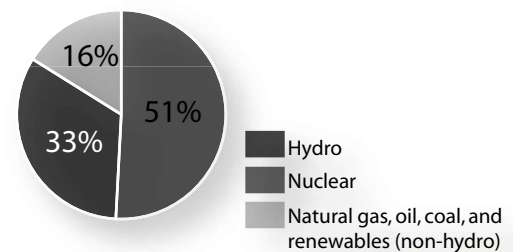
At Middlebury, 20% of the electricity we use is generated in the steam plant next to McCullough. Wood chips and fuel oil generate steam, which powers a turbine to generate electricity before the steam is distributed across campus. The other 80% we purchase from Central Vermont Public Service Corporation who in turn purchases it from various power suppliers.



How does this affect our carbon footprint?

Electricity currently accounts for 2% of Middlebury's carbon footprint. This is a relatively small percent because high carbon electricity from coal powered plants are only a small fraction of our electricity sources. However, this could change in the next few years depending on what happens with Vermont's nuclear power supply and the renewal of our contracts with Quebec Hydro-Electric.

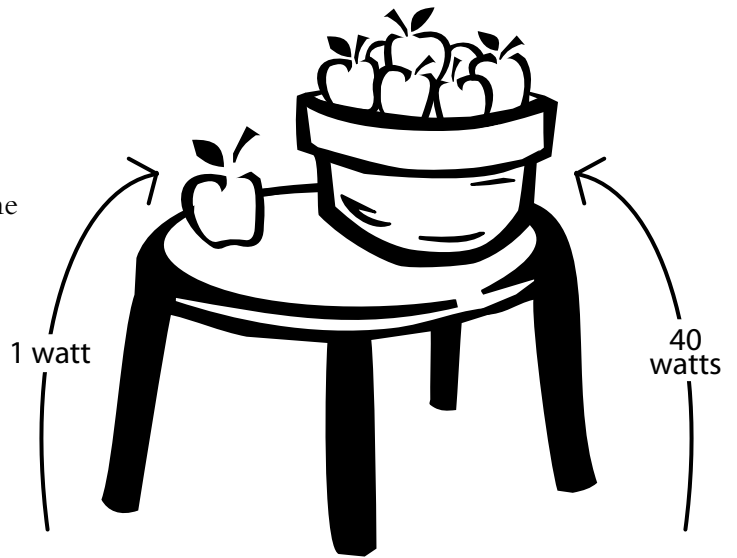
Additionally, during summer months demand for electricity rises, increasing the amount of electricity we get from coal. This means that electricity use during summer months has a greater impact on Middlebury's carbon footprint.



GUIDE TO ELECTRICITY

What's a Watt?

A **watt** is the measure of how much work can be done by the release of energy in one second. Lifting an apple from the ground to a tabletop takes about 1 watt of energy. Lifting 40 apples to the table top would take about 40 watts of energy. This is about the same amount of watts needed to run a laptop. A **kilowatt** is 1000 watts.



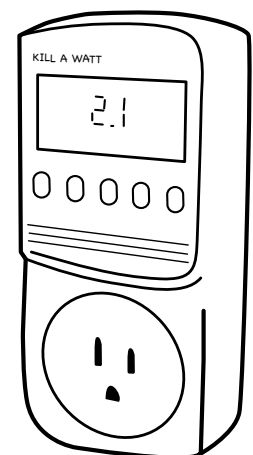
1000 watts for 15 minutes
= 0.25 kilowatt-hours

What's a kilowatt-hour?

Using 1000 watts of energy for one hour equals one **kilowatt-hour**. Most electric bills are based on kilowatt-hour usage. A typical microwave uses one kilowatt (1000 watts), which means that in order for it to be running, it needs one kilowatt of electricity constantly. So, if you ran your microwave for 15 minutes you would use 0.25 kilowatt-hours.

What does the Kill-a-Watt measure?

The *Kill-a-Watt* meter measures the amount of electricity being drawn by the device(s) plugged into it. It can measure this power in various ways. For the purpose of the Power Strip challenge we are most interested **watts** and **kilowatt-hours**. The meter shows how many watts your devices are currently using, and it records the amount of electricity you use over time in kilowatt-hours.



INSTRUCTIONS

Get ready!

- Organize a team, designate a team leader, and contact the Sustainability Integration Office at klscott@middlebury.edu or x2536.
- Team leaders pick up kits between 1 PM and 5 PM on Monday and then distribute to their team so that they can be ready to start Tuesday morning.
- There are two parts to the Power Strip challenge. During the first six-day period teams measure their baseline electricity consumption. During the second six-day period teams compete to reduce their electricity usage.
- Use a power strip to hook up more than one device into the Kill-a-Watt meter. If you don't have a power strip you can use the one provided- just don't use the blue control outlet during the first week!
- As a team decide what time the challenge will start and stop. (ex: Start Tuesday 9 AM, end the following Monday 9 AM)
- Kits MUST be turned in to the Sustainability Integration Office (Room 109, Franklin Environmental Center at Hillcrest) by 11AM the Monday your challenge ends, otherwise they won't be available for the next team.

Go!

Week 1: Baseline

Monday afternoon

- Team leader picks up kits and distributes them to team members.
- Choose a time of day for the challenge to begin and end (if you haven't already). For each week, the challenge should start Tuesday morning and end the following Monday morning.

Tuesday morning

- Plug in Kill-a-Watt meters at designated time. (Be careful not to unplug the meter after you start collecting data. The meter will reset to zero if it is unplugged).

Wednesday- Sunday

- Each day write down the cumulative kilowatt-hours and the number of hours the meter has been plugged in using the worksheet provided. There is also a space for how much electricity you use per day (difference between cumulative readings).
- Use the pink button to toggle between hours and kilowatt-hours.

Week 2: Conservation

Monday

- Take final baseline reading at designated time.
- Connect with your team- in person or via email to discuss conservation strategies.
- Use the smart power strip (provided) to make sure everything gets turned off, and to decrease your phantom load.

Tuesday morning

- Unplug meter to reset it to zero.
- Plug in everything again in designated time.

Wednesday- Sunday

- Each day write down the cumulative kilowatt-hours and the number of hours the meter has been plugged in using the worksheet provided. There is also a space for how much electricity you use per day (difference between cumulative readings).
- Use the pink button to toggle between hours and kilowatt-hours.

Monday

- Take final conservation reading.
- Each team member completes worksheet.
- Turn in kits and completed worksheets.

INSTRUCTIONS

Rules

Students are expected to act fairly and with respect towards each other and those on other teams. Inappropriate behavior may result in your team being disqualified from competition.

All devices plugged in during the first week must also be plugged in for the second week.

If your group has a communal space such as a kitchen, you can designate a team member to cover that area instead of their own dorm/office space.

Kits with power strips and kill-a-watt meters must be returned to the Sustainability Integration Office by 11am the Monday your challenge ends.

Spring 2009 Competition Schedule

First Round	March 2- March 16
Second Round	March 30- April 13
Third Round	April 13 – April 27
Forth Round	April 27- May 11

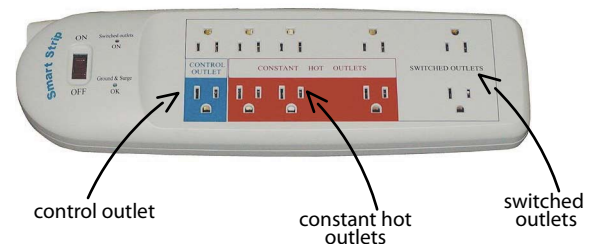
What's in the kit?

Kill-a-Watt meter- plugs into outlet and measures electricity drawn through the meter. Use the pink button to toggle between kWh and the number of hours the meter has been plugged in. When you unplug the meter it resets, deleting all your data.

Smart Strip power strip- eliminates the hassle of turning off your power strip. The device that you plug into the blue control outlet becomes the control switch, so that turning this device on/off turns the white outlets on/off at the same time. The red outlets are for devices that need constant power, such as a fax machine or mini-fridge.

Guide to Electricity- explains where Middlebury gets electricity as well as key terms you need to know about electricity.

Guide to Winning the Race Together- describes Middlebury's efforts in reaching carbon neutrality by 2016.



ELECTRICITY MYTHS AND TIPS

Myth 1: Screen savers save electricity

It is a common misconception that screen savers save electricity. In fact, they use as much electricity as when you are actively using the computer. Additionally, most people now have LCD monitors, which don't even need screen savers. It is best to turn off your monitor when it is not in use, both to reduce wear and to reduce electricity.

Myth 2 : Devices that are turned off don't use power.

In the average home, 75% of the electricity powering home electronics is consumed while the products are turned off. These devices include chargers with adaptor boxes (cell phone and laptop chargers), items that can be turned on instantly (TV, stereo), and appliances with clocks (microwave, coffeepot). You can eliminate these "phantom loads" by unplugging items, or by using a power strip and turning it off.

Myth 3: Switching a computer on/off shortens its lifespan

Many people mistakenly believe that computer equipment will wear out faster if it is turned on/off frequently. Leaving your computer on all day and night will not make it last longer and it will waste electricity. To reduce electricity, use the power saving options for your computer and shut it down at the end of the day.

Myth 4 : Lights should not be turned on/off frequently because this reduces their lifespan.

Always turn off incandescent bulbs, even for short periods of time. Frequent on/off doesn't affect them. However, turn off compact fluorescents (CFLs) if they will remain off for more than 15 minutes. Turning CFLs on and off does reduce their lifespan, but so does leaving the light on. Since CFLs are more expensive and more sensitive to being turned on/off, there is a tradeoff between paying for electricity to run the bulb versus the cost of replacing the bulb. When it's time to replace the CFL, be sure to handle properly—see below.

Myth 5 : People shouldn't use compact fluorescents (CFLs) because they aren't really "green."

CFLs do contain a minute amount of mercury that remains safely sealed when the bulb is intact. But because they require 75% less electricity than incandescents, using CFLs greatly cuts emission of mercury (and greenhouse gases) into the atmosphere by coal-fired power plants. Handling CFLs carefully and wrapping them for recycling avoids any mercury exposure.

So, If your CFL burns out, drop it off in any Commons office, the Service Building stock room, or the Franklin Environmental Center at Hillcrest.

If it breaks, call Facilities immediately. All custodial teams have toxin clean-up kits.

ELECTRICITY MYTHS AND TIPS

Enable power saving options on your computer.



Select the power saving options in your computer settings so that the monitor will automatically turn off and computer will go to sleep mode when it's not in use. Avoid screen savers because they keep your computer running at full power.

Share a Fridge (or unplug it).

Refrigerators use lots of electricity, especially when they are empty. Empty fridges take more energy to stay cool, so help keep it full by sharing with a roommate or someone from your office. If it is empty for long periods of time, unplug it! Also, you can save electricity by adjusting the temperature setting on your fridge.



Turn it off and use it less.

It might seem obvious, but turning things off when you are not using them saves money and reduces CO₂. Find creative ways to use electronic devices less, like air drying your hair.



Use a Smart Strip

Try out the smart power strip in your kit. When you turn off the control device (such as a computer or desk lamp) it automatically shuts off power to the rest of the outlets. This helps ensure that items don't get left on and it decreases your phantom load. It also saves you the hassle of unplugging individual items, as well as crawling under your desk to switch off the power strip.

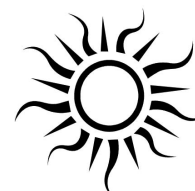


Get a compact fluorescent light bulb.

If each person on campus replaced one incandescent bulb with a compact fluorescent, we would save nearly \$30,000 over nine months and eliminate 10 tons of CO₂ emissions.

Use sunlight.

Do your lights need to be on when it's bright outside? Turn off lights when you don't really need them.



WORKSHEET

Participant Name: _____ Location: _____

Team Name: _____

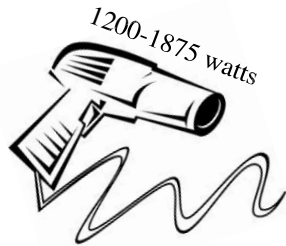
Dorm ☐

Team Leader: _____

Office ☐

Campus House ☐

What's plugged into your meter?



Week 1			
Baseline Data			
	kWh (cumulative)	kWh (per day)	hours (cumulative)
Tues.	----	---	---
Wed.			
Thurs.			
Fri.			
Sat.			
Sun.			
Mon.			
TOTAL			

Week 2			
Conservation Data			
	kWh (cumulative)	kWh (per day)	hours (cumulative)
Tues.	---	---	---
Wed.			
Thurs.			
Fri.			
Sat.			
Sun.			
Mon.			
TOTAL			

comments/suggestions



Power Strip

HOW MUCH CAN YOU TAKE OFF?

WORKSHEET

Comments/suggestions