

# Energy Conservation Toolkit

2016-2017



**THOMPSON  
RIVERS  
UNIVERSITY**

Sustainability  
Office

This toolkit will help you to work with the people in your department to conserve energy used by equipment, lights, and heating & cooling systems

# Background



TRU uses approximately 16,000,000 kilowatt hours (kWh) of electricity per year; enough electricity to power almost 1500 BC homes for a year. While BC currently benefits from clean hydro power to meet electricity needs, demand is expected to outstrip our current capacity by 40% in the next two decades. How can BC close this gap? Significant energy savings can be achieved by being smart with how we use energy, and at the same time reduce harmful greenhouse gas emissions\*. Conservation is key!

## The Toolkit

This toolkit contains campaign implementation steps for 3 different areas of conservation.

1. **Plug Load**
2. **Lighting**
3. **Heating & Cooling**

To keep people engaged, focus on one of these areas at a time and build off of your successes and lessons learned to improve the implementation of each successive campaign.

## The Big Picture

This toolkit is part of a broader initiative to reduce TRU's electricity use and related expenses, and to foster a workplace culture where everyone works together to help reduce the energy demand of electronic equipment.

### 'Dirty BC' - Did You Know? ...

Although BC is blessed with the capacity to produce one of the cleanest forms of electricity there is relative to other major forms—hydro-- that when water levels are low and electricity demands can't be met by BC's dams, BC still imports one of the dirtiest forms of electricity there is: coal-fired! This is another reason why power conservation is so important.

\*Yes, BC's 'clean' hydro electricity still produces greenhouse gases. TRU's annual electricity use (16,000,000 kWh) is equal to 160 metric tons of carbon dioxide being pumped into the air. The same amount that 34 passenger vehicles produce in a year! (<http://1.usa.gov/1PMhIPI>).

# 1. Plug Load

This section will help you to work with people in your unit to reduce the amount of electricity used by equipment and devices that are unnecessarily plugged into wall outlets.

## Plug Load & Phantom Load

A “plug load” refers to **any electronic device or equipment that is plugged into a wall outlet**. In a university setting, plug loads include everything from lab equipment to computer monitors, and cell phone chargers used by staff in your unit or office. In total, 8 to 20 % of energy use in a university or office setting comes from plug loads.

A “phantom load” is the amount of energy certain devices consume while in ‘stand-by’ mode or ‘sleep’ mode. For example, some devices need power to keep an internal clock or touchpad active even while switched ‘off’ (but they’re not fully off). When these devices remain plugged into the wall, they draw roughly **5 %** of the energy consumed while in operation. Unplugging these devices when not in use saves energy... and it’s so easy to do!

## 8 Steps to Success

### Step 1 – Get your Manager / Supervisor Involved

Speak with your supervisor about running your campaign. Get them on board first. Here are some key talking points to help you make the case.

- TRU uses approximately 16,000,000 kWh of electricity per year - enough electricity to power about **1500 BC homes for a year**
- Up to 5% of office equipment energy consumption comes from stand-by or sleep mode.
- Together we can work to easily reduce this demand by turning off and unplugging non-critical electronic devices and equipment when not in use.

### Step 2 – Assess your Work Area and Equipment

Use the Plug Load Calculator tool and simple observation over one to three days to conduct a baseline assessment of the equipment in your unit or office. *What equipment is left on and/or plugged in when it doesn't need to be?*

The **Plug Load Calculator tool** can help you calculate how much energy each piece of equipment uses. This will help you gather a baseline and give you an idea of how much can be saved. You can also conduct your

**Plug Load Consumption Calculator**

Add your unit and the date data into the gray cells.

**Area:** \_\_\_\_\_

**Hours of Operation:**  24  18  12  8  6

**Table 3: Inventory of Office Electronic Consumption per Office Employee**

Device	Quantity	Estimated Power Rating	Hours of Operation	Electricity Consumption (kWh)	Cost/yr	kg CO2e/yr
<b>Computers &amp; Electronics</b>						
Monitor (23" active/passive)	15		0	\$0	0	
Monitor (23" flat)	4		0	\$0	0	
Monitor (23" active/passive)	15		0	\$0	0	
Monitor (23" flat)	2		0	\$0	0	
Smart Printer (color/monochrome)	100		0	\$0	0	
Printer (color/monochrome)	10		0	\$0	0	
Printer (color/monochrome)	25		0	\$0	0	
Scanner	10		0	\$0	0	
Fax	100		0	\$0	0	
Smartphone	200		0	\$0	0	
Tablet (Apple iPad, Amazon Kindle Fire, etc.)	1,000		0	\$0	0	
Smartwatch	4		0	\$0	0	
Smartwatch - Off	1,75		0	\$0	0	
Smartwatch	100		0	\$0	0	
Fine	12		0	\$0	0	
<b>Other Equipment</b>						
Blackboard	1000		0	\$0	0	
Temperature Management	1000		0	\$0	0	
<b>Small Appliances</b>						
Coffee Maker	1000		0	\$0	0	
Water (boiler heating)	1000		0	\$0	0	
Refrigerator	100		0	\$0	0	
Refrigerator	1000		0	\$0	0	
Freezer	100		0	\$0	0	
Large Fridge	100		0	\$0	0	
Water cooler	10		0	\$0	0	
Microwave	100		0	\$0	0	
<b>Total</b>						

\*Based on data from the Environment Canada Office of Energy Efficiency, AFCE, sources: Berkeley National Laboratory and Power Data Analytics

**Table 4: Results**

Total Annual kWh (kWh)	10
Total Annual kWh (kWh)	10
Total Annual kWh (kWh) (CO2 equivalent)	10

own research by measuring key pieces of equipment in your unit with a plug meter. After the campaign has been running for a while, you can do a second measurement with the calculator to track any changes in electricity consumption.

For help on using the Plug Load Calculator, contact James Gordon, Environmental Programs and Research Coordinator, at [jgordon@tru.ca](mailto:jgordon@tru.ca) or 250-852-7153.

### Step 3 – Select Key Pieces of Equipment as the Focus

Select the equipment that will be the focus of your campaign. Focusing on a couple items will help people remember to turn them off and/or unplug them. The Plug Load Calculator tool can be used to determine which equipment draws the most power. Select the equipment that will have the greatest impact on the energy bill and ensure that the equipment chosen is controllable by staff.

You will most likely need to modify your campaign strategies based on the different pieces of equipment that are selected (see additional action ideas at the end of the toolkit).

### Step 4 – Communicate the Plan & Build Your Team

We all work in different contexts, and you will know best what kind of strategy will work best in your unique workplace. As you design your campaign it will help to think about how people share information at your workplace. Use your creativity and have fun! Here are some ideas:

#### **Staff meeting**

At the next staff meeting raise the issue of energy reduction and help to generate awareness of this toolkit. If your work area is shared by a variety of groups who meet separately, offer to do presentations at smaller team meetings.

#### **‘Point-People’**

Identify the people who are most likely to leave your unit at the very end of the day, and ask them to volunteer to ensure equipment is turned off or unplugged (but, remember that some equipment can be unplugged throughout the day too).

## Other Ideas & Tools for Action

- Use timers to automate savings
- Include staff kitchens, break rooms and other areas in your campaigns
- Use plug meters to measure electricity use
- Organize a day to ‘Make the Switch’ to using power bars

See page 5 for more information on these actions.

If necessary, walk them around to show them the location of all the equipment and power bars (see more about adding power bars to your campaign below).

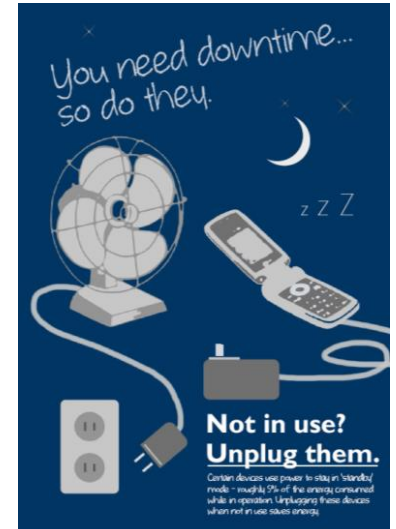
Find volunteers or nominate people to adopt the various common spaces or other 'orphan' areas (such as a kitchen, break room, copy room, meeting rooms, storage room, bathrooms, etc.) and designate them to turn off or unplug equipment in those areas if other people forget.

## Step 5 – Put up Posters/Stickers

After you have identified the devices or equipment that you want to target, put "Turn It Off" stickers on all equipment that can be turned off, and "Unplug It" stickers on all equipment that can be unplugged when not in use. Place energy saving posters around your unit in prominent locations to act as reminders.

## Step 6 – Send an Email

Have your manager send out an email similar to the one below asking people to turn off or unplug particular pieces of equipment when they are not in use, or send the email yourself. Use the data you collected in your assessment to report on when equipment is left on and how much more energy could be saved. It is a good opportunity to remind people that everyone is responsible for electricity use in the workplace.



## Email Template

**Subject: Not in use? Unplug it**

TRU uses approximately 16,000,000 kilowatt hours (kWh) of electricity per year; enough electricity to power almost 1500 BC homes for a year.

Around 5% office equipment electricity consumption is from stand-by or sleep mode. Together we can work to reduce this demand by turning off and unplugging non-critical electronic devices and equipment when not in use.

At the moment, [INSERT percentage ] % of [INSERT Equipment]in [insert area] are left on at the end of the day.

You might have noticed posters up to help you remember to "Unplug It."

Help us meet our energy reduction targets and reduce our carbon footprint by joining in our campaign to [INSERT request for action].

## Step 7 – Evaluate the Campaign

After the campaign has been running for a few weeks, use the plug load calculator template to compare your findings of the number of electronic devices and equipment left on from the initial baseline info that you collected. Determine what energy savings may have been achieved from improvement in conservation behaviour.

### If there isn't a big change, what do I do?

Keep in mind that not all campaigns will be immediately successful. Some will take time and require you to think about barriers and adapt strategies when needed. Talk to James Gordon, our Environmental Programs and Research Coordinator, about tools for uncovering barriers to change.

Send your findings to [jgordon@tru.ca](mailto:jgordon@tru.ca).

## Step 8 – Celebrate Success

Report the results of the campaign back to the staff. Celebrate the campaign with awards, food or a simple “thank you” at the next staff meeting.

## Additional Ideas for Action

### Use Timers to Automate Savings

Timers can be an effective low cost solution to reduce electricity use by activating an appliance only during the time that it is needed. Timers can be installed at the plug and can be reset as needed. Use them on large coffee makers and water coolers overnight to save energy. Set them to turn on in the early morning to ensure hot water is hot and cold water is cold.

### Include Staff Kitchens, Break Rooms and Other “Orphaned” Areas in your Campaigns

Some of the best places to implement a plug-load campaign are the areas with multiple pieces of non-critical equipment. These communal areas, like staff kitchens and break rooms, are areas where electrical devices are consistently left on when not in use, because no one person has the responsibility to turn them off. After providing power bars to hold multiple pieces of equipment in each area, recruit a staff member to adopt the “orphaned” area and make sure that the power bar is switched off at the end of the day or shift.

## Use Plug Meters to Measure Electricity Use

Plug meters are devices that plug into the wall socket and measure how much electricity each piece of equipment uses. You can request one of these plug meters from the Program Coordinator. Use the plug meter to determine which equipment uses the most amount of electricity by comparing the number of watts each piece uses.



## Organize a Day to 'Make the Switch'

For many offices, each work station often has its own set of equipment. Rather than unplugging each device individually, plugging them into a power bar can make “unplugging” a simple act each day by hitting the on/off switch on the power bar. As a first step in the campaign, organize a day in which everyone sets up their devices to plug into their own power bar and demonstrate how it can be used.

- Computers should not be included in this campaign because they are required to be left on by IT staff.

## 2. Lighting



This section will help you to work with the people in your department/unit to reduce the amount of electricity used by lighting.

### Lighting Rule of Thumb

Lighting accounts for 18% of electricity costs at TRU\*. Shutting off lights when they're not in use can have a big impact on energy and cost savings—and it's so easy! Everyone can help conserve electricity by turning off all unused lights when they are not in use. As a good rule of thumb, when a light is not being used for more than 10 seconds, turn it off! Going to the washroom? Having a coffee break? Last to leave a classroom? Turn off the lights!

### 7 Steps To Success

#### Step 1 – Get you Manager / Supervisor Involved

Speak with your supervisor about running your lighting campaign. Get them on board first. Here are some key talking points to help you make the case.

- TRU uses approximately 16,000,000 kilowatt hours (kWh) of electricity per year; enough electricity to power almost 1500 BC homes for a year.
- Up to 18% of office energy consumption comes from lighting\*.
- Shutting lights off when they're not in use will save energy, money and additional maintenance costs 18(since light bulbs and other equipment will last longer).

#### Step 2 – Assess your Work Area and Equipment

Locate all your workplace light switches. Complete your baseline energy audit by using the Energy Assessment Tool checklist. Fill out the audit checklist 3 different times in the day (roughly morning, lunch and end of day); the audits do not need to be done on the same day, but should be done within one week, and then completed again after 4 weeks around the same times. By comparing the results between the first and second audit, you'll be able to tell if the campaign is having an effect at different times with different staff.

\*From a Prism Engineering assessment of TRU's electricity use in 2010. All figures are estimates.



### Step 3 – Put up Stickers and Posters

Before rolling out the toolkit, contact Environmental Programs and Research Coordinator James Gordon (jgordon@tru.ca) to request stickers & posters be sent to your office.

Take a look at [BC Hydro's posters](#) for some inspiration, or we can help you make some custom posters for your area.

Place “Turn it Off” stickers next to all the light switches to prompt co-workers to shut lights off when they’re not needed. You can also place energy saving posters around your unit in prominent locations to act as reminders.

### Step 4 – Get Everyone Involved

At the next staff meeting raise the issue of energy reduction and help to generate awareness of this toolkit. Identify the people who are most likely to leave your department at the end of the day and work with those people to ensure lights and equipment are tuned off. Designate them as responsible for ensuring things are turned off. If they will not be around on a particular day, get them to ask someone else to have the responsibility on that day.

Find volunteers or nominate people to adopt the various common spaces or other ‘orphan’ areas (such as a kitchen, break room, copy room, meeting rooms, storage room, bathrooms, etc.) and designate them to turn off the lights or other equipment in those areas when other people forget.

### Step 5 – Send an Email

Have your manager send out an email similar to the one below asking people to turn off lights when they are not in use, or send the email yourself. Use the data you collected in your assessment to report on when lights are unnecessarily left on and how much more energy could be saved. It is a good opportunity to remind people that everyone is responsible for electricity use in the workplace.

## Email Template

**Subject: Not in use? Turn lights off!**

TRU uses approximately 16,000,000 kilowatt hours (kWh) of electricity per year; enough electricity to power almost 1500 BC homes for a year. Everyone can help conserve electricity by turning off all unused lights when they are not in use for longer than 10 secs .

At the moment, [INSERT percentage ] % of [INSERT Equipment]in [insert area] are left on at the end of the day.

You might have noticed stickers and posters up to help you remember to shut the lights off.

Help us meet our energy reduction targets and reduce our carbon footprint by joining in our campaign to [INSERT request for action].

### Step 6 – Evaluate the Campaign

Compare your findings of the number of lights and equipment left on (from the initial baseline from the Energy Audit Tool) and from after the campaign has been running for 4 weeks. Determine any improvement in ‘Turning It Off’ behaviour.

Make sure to talk to staff in each area you are assessing to identify any additional barriers and benefits to behaviour change.

### If there isn't a big change, what do I do?

Keep in mind that not all campaigns will be immediately successful. Some will take time and require you to think about barriers and adapt strategies when needed. Talk to James Gordon, Environmental Programs and Research Coordinator, about tools for uncovering barriers to change.

Send your findings to [jgordon@tru.ca](mailto:jgordon@tru.ca).

### Step 7 – Celebrate Success

Report the results of the campaign back to the staff. Celebrate the campaign with awards, food or a simple “thank you” at the next staff meeting.

## 3. Heating and Cooling



This section will help you to work with people in your unit to reduce the amount of electricity used by your building's heating and cooling systems.

### Shutting the Blinds - Summer Air Conditioning Savings

Many of us waste more energy trying to regulate temperature in the office than we need to. With some easy changes, we can keep comfortable at work while saving energy.

Closing the blinds assists in maintaining a cooler room temperature. By limiting the amount of sunlight that enters the room, less air conditioning--and therefore less energy--is required to maintain a comfortable room temperature.

- During warmer months (May 1st to October 31st), blinds should be closed at the end of the day and especially over the weekend.
- Even during winter months (November 1 to April 30), closing blinds at night is a good idea since they can help to keep warm air trapped in the room.

### 6 Steps To Success

#### Step 1 – Get your Manager/Supervisor Involved

Speak with your supervisor about running your 'Shutting the Blinds' campaign. Get them on board first. Here are some key talking points to help you make the case.

- TRU uses approximately 16,000,000 kilowatt hours (kWh) of electricity per year; enough electricity to power almost 1500 BC homes for a year.
- Up to 38% of office energy consumption comes from HVAC\*
- Minor improvements can save energy and money, and maintain comfort in offices

#### Step 2 – Assess your Work Area

Complete a baseline investigation by simply observing the office for a few days at the end of the day to see if any blinds are left open.

\*From a Prism Engineering assessment of TRU's electricity use in 2010. All figures are estimates.

### Step 3 – Point-People

Locate all your workplace windows that have blinds or roller shades. At the next staff meeting, raise the issue of energy reduction and help to generate awareness of the initiative. Identify the people who are most likely to leave your department at the end of the day and work with those people (your ‘point-people’) to ensure that blinds are shut when they leave. If they will not be around on a particular day, get them to ask someone else to take on the responsibility that day.

Find volunteers or nominate people to adopt the various common spaces or other ‘orphan’ areas (such as a kitchen, break room, copy room, meeting rooms, storage room, bathrooms etc.) and designate them to shut the blinds at the end of the day.

### Step 4 – Send an Email

Have your manager send out an email similar to the one below asking people to shut the blinds at the end of the day, or send the email yourself. Use the data you collected in your assessment to report on when lights are unnecessarily left on and how much more energy could be saved. It is a good opportunity to remind people that everyone is responsible for electricity use in the workplace.

#### Email Template

**Subject: *Shut the Blinds* campaign**

TRU uses approximately 16,000,000 kilowatt hours (kWh) of electricity per year; enough electricity to power almost 1500 BC homes for a year.

Everyone can help conserve electricity by shutting the blinds at the end of the work day. By limiting the amount of sunlight that enters the room, less air conditioning, and therefore less energy, is required to cool the building.

At the moment, [INSERT percentage ] % of [INSERT blinds]in [insert area] are left up at the end of the day.

Help us meet our energy reduction targets and reduce our carbon footprint by joining in our campaign to [INSERT request for action].

## Step 5 – Evaluate the Campaign

Compare your findings of the number of shut blinds from the initial investigation and from after the campaign has been running for 4 weeks. Determine any improvement in behaviour.

Make sure to talk to staff in each area you are assessing to identify any additional barriers and benefits to behaviour change.

### If there isn't a big change, what do I do?

Keep in mind that not all campaigns will be immediately successful. Some will take time and require you to think about barriers and adapt strategies when needed. Talk to James Gordon, Environmental Programs and Research Coordinator, about tools for uncovering barriers to change.

Send your findings to [jgordon@tru.ca](mailto:jgordon@tru.ca).

## Step 6 – Celebrate Success

Report the results of the campaign back to the staff. Celebrate the campaign with awards, food or a simple “thank you” at the next staff meeting.