



Transition STREETS

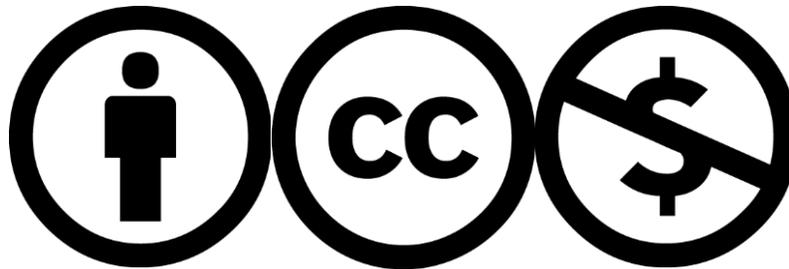
ACTIVITY BOOK

GUELPH, ONTARIO, CANADA

2015

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GETTING STARTED

WELCOME TO THE TRANSITION STREETS PROGRAM!

You are about to embark on your journey to a lower energy, higher connection lifestyle. This will help you save money, reduce your carbon dioxide (CO₂) emissions, and hopefully help minimize your household's reliance on fossil fuels.

The support of your fellow group members, and people in other Transition Street groups, will help keep you motivated and make the experience pleasurable as well as effective.

This workbook has been developed to help you and the people you live with to make simple, practical changes to your home and to your habits. It brings together in one place well over 40 money-saving actions. Each action gives clear, specific advice about how to carry it out, including lots of useful hints and tips.

It is not the intent of this program to duplicate all the sound, practical advice that is already available, but rather to bring it together into one simple program with a very local feel. Other sources that been used are referenced for further information.

The program is based on 7 group sessions. The first and the final sessions start and close the work, and the other 5 cover areas of our lifestyle where we can easily reduce energy use and save money: energy use in the home, water, food, waste, and transportation.

We encourage you to meet every 2 weeks for 2 hours, and for people in the groups take turns hosting the meeting at their home.

Transition Guelph and eMERGE Guelph are providing a trained facilitator to each group. It is important that the facilitator for the session keeps good time, as it's easy to get off track and not get through everything you mean to. At each of the 5 core sessions, the group can follow the suggested meeting outline provided. It's useful to have a note-taker at each session and to keep a record of decisions.

YOUR TRANSITION STREETS FACILITATOR IS:

SO NOW YOU CAN GET STARTED WITH THE FIRST SESSION

First of all, take a look at the rest of this workbook and start to get familiar with the sections and the layout. Once you've done that, work through the following section with the help of the next few pages and:

- Agree on the group schedule for the rest of the sessions
- Share contact information.
- Agree on some guidelines so your group will work well.
- Think about your main objectives.
- Complete the initial evaluation form.



- Find out about other support available.
- Review the agenda for future sessions.

INFORMATION TO RECORD

Things to decide up front (and record on the schedule):

1. How often will the group meet?
2. Where will it meet?
3. Who will be the host for each meeting? The host will convene the gathering and will call everyone before the next session to confirm attendance.

Date	Time	Host	Venue

It is also useful to share your contact details. Pass around a contact sheet or take time to share this information with each other.

AS YOU START TO WORK TOGETHER

GROUP AGREEMENTS

It is important to agree on some guidelines for how your group will work so it will be a more satisfactory experience for everyone. The following agreements are suggested to help ensure the overall success of your group.

They aim to support the coherence and stability of the group, and to create an atmosphere of mutual support and trust. It is important that all group members collectively agree to these at your first session. Add or amend these items as required.

Commitment: We commit to attend all sessions where possible and to let the other group members know when this is not possible. Someone else from our family can attend in our place

if we cannot come, but it is important that s/he knows what's been discussed previously. We also commit to reading the relevant workbook chapter before each session and to seriously consider taking on some actions each time.

Confidentiality: We agree to respect the privacy of any personal information shared within the meetings and to not discuss this information outside the group in a way that would mean a person could be identified.

Punctuality: We agree to arrive in time for each session to start promptly so that everyone can benefit from the full two hours.

Respect: We will endeavour to ensure that the time is shared equally between team members in terms of speaking and listening, and that differences of opinion can be allowed for and respected. Our abilities to change will vary, whether they be related to income or time, age or disability.

Support: Where possible we will offer practical and emotional support to any team member who is experiencing difficulty in attending the sessions or achieving the actions. If we encounter problems in maintaining the team, we will ask for support from the project coordinator.

SUGGESTED AGENDA

This suggested agenda can be used at the next 5 sessions – you can adjust it to suit yourselves.

For the next session, try this proposed timing and see how it works for the group. Since you are not starting your action plan until then, the first agenda item is not needed for the next session. You will probably use this “spare” time talking about the actions. We recommend that group members read each chapter in advance of the session it deals with.

<i>Section</i>	<i>Timing (2 Hours Total)</i>
Review actions & progress from previous session	15 minutes
Discuss the facts & the actions for this session	80 minutes
Write personal and group action plan	20 minutes
Re-confirm next meeting	5 Minutes

QUESTIONS TO DISCUSS

What do we need in order to take the first steps for living lighter and living richer?

What holds us back from taking these steps?

EMERGE GUELPH PATHWAYS

You may have heard of the broader eMERGE Guelph collaborative during your conversations about Transition Streets. eMERGE Guelph is a gathering point for homes, streets and neighbourhoods to accelerate progress on the ground. We work with teams of people to test innovative ideas, undertake sustainable actions and scale up projects across the city. Transition Streets is one pathway to getting involved in eMERGE Guelph. Another pathway available to residents is the Efficient Home Visit.

The one-hour Home Visit consultation (coupled with a free retrofit package and on-site expert advice) will give you easy-to-use information, resources and practical recommendations to jump start your steps toward living lighter every day. We will be looking through the lenses of energy, waste, water, alternative transportation and sustainable food choices.

In the visit you will receive:

- A room by room evaluation on your home's environmental well-being
- The latest tips, resources and incentives to help you take on green solutions
- Energy and water efficient devices installed on the spot, as needed
- Customized actions to start you saving right away

ACTIVITY:

Take time now to sign up members of the group to each receive their Efficient Home Visit online. It will provide a great baseline for the activities in the upcoming chapters.

NOTES

This workbook aims to bring together a wide range of credible, expert advice that covers cost savings, energy reduction, CO₂ emission reduction and general sustainability, across all areas in our lives. Our intent here is to compile it into a single localized reference source for use by people in the Transition Streets program – with clear links back to the source material used in each section.

We have listed references in each chapter, to whom we offer our thanks. A complete list of people and groups involved can be found on the Acknowledgments page.

If you have any questions about the program, the actions, or the other support available, please contact us using the information on pages 1 and 2 at the front of this section. We are willing and able to give advice to groups if you are concerned, frustrated or perplexed about the way your group is operating (or rather, not operating!)

SPEND LESS ON ENERGY

CHAPTER STARTING NOTES

By the end of this session, you will know:

- how Ontario creates its energy
- how to make a plan to increase your home efficiency
- the best practices in home heating and cooling

Is there anything I should know before we meet?

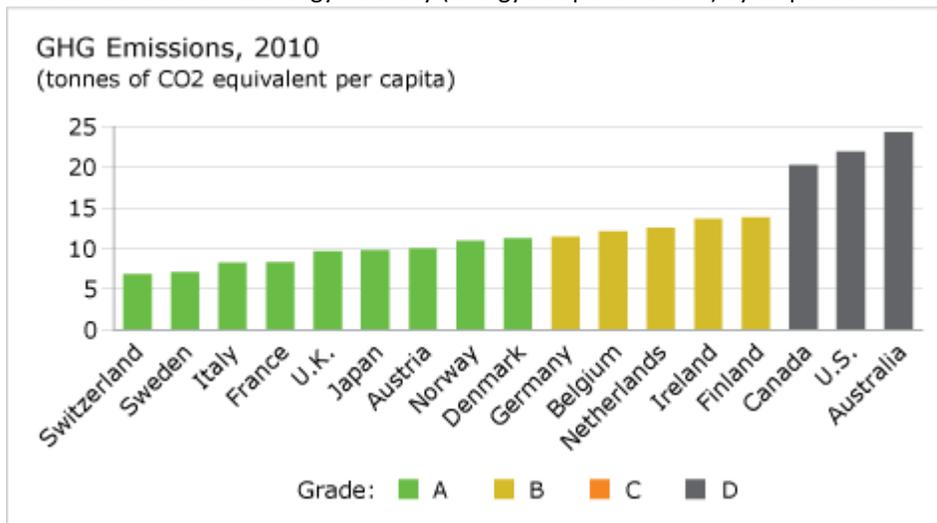
This topic has 4 web research articles to read that will be good to look at before your group meeting.

BACKGROUND

CANADA

Energy use has environmental impacts through the production of air pollution (e.g., smog) and greenhouse gas (GHG) emissions, expressed as tonnes of carbon dioxide, or CO₂. Excessive GHG emissions contribute to climate change.

Canada has reduced its energy intensity (energy use per unit GDP) by 39 per cent since 1971, but still emits



among the highest GHG loads per person in the world. We use a lot of energy per person. [1](#)

The largest contributor to this GHG production is the energy sector, including power generation, transportation and other miscellaneous sources.

Some of this is due to the cold climate, but when we compare ourselves to climatically similar nations like Norway and Sweden, we could be doing a lot better.

ONTARIO

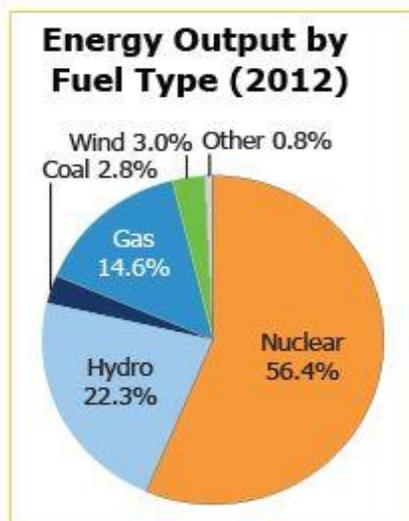
Learn more about how we get electricity in our homes with [Ontario Power Generation](#).

Energy prices in Ontario are generally going up rather than down. Using less electricity, gas or oil in our homes stops us from losing as much money. Often we lose a lot of energy without realizing, and there are generally significant costs to be recovered – without having sacrifice our comfort. Each action in this section of the workbook has a ‘Money

Recovered’ section.

The benefits go beyond home finances, though:

- Energy conservation reduces the need for expensive expansion of Ontario’s electrical infrastructure (“the grid”).
- Using less energy will also reduce the amount of carbon dioxide (CO₂) emitted from the fossil fuel-burning appliances in our homes, such as oil or gas burning furnaces and boilers. We also reduce carbon emissions and nuclear waste generation associated with the electricity generation.
- The less fossil fuel we use, the weaker the compulsion to run more pipelines across our communities.
- Energy conservation reduces incidences of imported energy and its associated carbon emissions: United States relies heavily on coal.



In Ontario in 2012, approximately 56% of our electricity was produced at nuclear power plants, and 22% via hydroelectric dams.² The remainder is a mix of wind, non-traditional, natural gas and coal. CO₂ emissions result from the natural gas-fired power stations and coal plants.

Coal is particularly dirty so Ontario has been phasing down that component and is scheduled to close down all coal generation by the end of 2013. It will be the first jurisdiction in North America to shutter all its plants. Nuclear energy suffers from the major issue of its radioactive nuclear waste.

When we shift our demand, i.e., use electricity at non-peak times, we reduce the need to start up these more polluting forms of energy, and the expense of building new generating facilities needed only at peak hours. On low-demand days, less than 1% of power is generated from coal, versus an annual daily average of 2.8%. The electrical grid has the capacity to generate as much as

9% of the total mix using fossil fuels.³ The more we, as Ontarians, show that we don’t need this, the more likely we are to fully close down all our polluting coal plants.

There is a finite supply of fossil fuels on this planet, whether “cleaner” sources like natural gas, or “dirtier” sources like coal and oil sands. Not using it depends on both developing cleaner technologies and reducing the amount of energy we need to use.

There are relatively little greenhouse gas emissions from Ontario electricity because most comes from a combination of nuclear and hydroelectric generation, however it is still important to lower our use to avoid

reliance on imported energy produced through burning fossil fuels (usually coal-based power from the northern USA), and to reduce the amount of radioactive waste generated.

Being more energy efficient in your home is one of the easiest ways to reduce your household costs, and your personal contribution to climate change.

Can we make a difference?

Yes – Homeowners, small businesses, schools and hospitals account for around 50% of the province’s electricity consumption.⁴ Here in Ontario individual households are responsible for about 20% of the province’s greenhouse gas emissions (GHG).⁵ Ontario is second only to Alberta in terms of GHG emissions, partly due to our population size, and our energy supply mix.⁶

Can we do it?

We already are! Let’s keep it up!

- Between 1990 and 2005, the number of households in Ontario increased by 29%, yet the total amount of energy used by all Ontario homes in 2005 was only 9% more than in 1990.
- Overall, the energy efficiency of Ontario homes, both new and existing, improved by 15% between 1990 and 2005.⁷

This is great news! It’s thanks to the efforts of people like you!

GUELPH

Between 2005 and 2010, Guelph reduced their per capita energy use by 13%, and GHG by 19%, in spite of a 19% increase in population.⁸

City of Guelph goals include reducing energy use per person to less than the current global average, and using less energy and water per person than comparable Canadian cities.

In 2005, Guelph used a total of 6,030,000 megawatt hours of energy (MWh) from fuels of all types, or 52.45 megawatt hours of energy (MWh) for every resident.⁹

20,000 Guelph residents volunteered to have Peaksaver devices installed on their central air conditioning in 2011. These gadgets allowed the utility to make small adjustments to the central A/C remotely during peak demand periods.¹⁰

Guelph Hydro’s programs for residents saved 645 kW off peak demand and 1,613,390 kWh in 2011.

One kilowatt hour (kWh) is 1,000 watts of electricity used in one hour. That's equivalent to the power required to light a 100-watt light bulb for 10 hours, or to operate a standard 5,000 watt electric clothes dryer for approximately 12 minutes.

HOW WE CAN MAKE IT EVEN BETTER

Each of the following actions can significantly reduce the amount of energy a household typically uses. Some cost you little or nothing and others can be paid for using grants. Even more costly measures will be offset by the reduction in your energy bill.

Each action is explained on the following pages. In your group have a brief chat about all of them, and then decide which ones you want to tackle and when. Record your own action plan on the page at the end of this section.

The actions listed above are the basic (but most cost-effective) things you can do in your home. At the end of the section are several other actions that you may wish to consider, once you've done the basics.

A quick note on the cost and carbon saving estimates...

Each action has a set of boxes at the top that give an indication of the potential costs, savings, effort and CO₂ savings. These should be seen as an indication only and useful for comparing different actions. They are based on a range of credible information.

Some actions, particularly related to food and transportation, are difficult to estimate due to the wide range of factors involved. However, for other actions in the project, we will convert your results into CO₂ savings and report back our overall project results. More information is available on request.

For all sections, the following estimates are used:

Cost Saved: **Low** (less than \$10), **Medium** (less than \$100), **High** (more than \$100)

Effort: **Low** - <2-3 hours, **Medium** – about a day, **High** – a day+

***Estimates based on a 3 bedroom semi-detached home

KNOW HOW MUCH YOU ARE USING

Cost: Low-Med

\$ Saved: Low-Med

Effort: Med

CO₂ Saved: Low

To reduce your energy use, you first need to understand how much you are using. Monitoring your energy consumption is an important first step. Measure it so you will be able to tell if it goes down.

Studies have shown that people who monitor their energy use typically see reductions of 5-10% per year (approximately \$40-80), just by being more aware of when devices are on, and how much each appliance uses. A recent study showed that by using a whole house power meter, participating families in British Columbia reduced their electricity consumption by up to 9.3% during the winter peak. ¹¹

There are 3 ways to measure your energy use:

1. Keep track of your energy usage by reading your utility bills.

2. Read your electric and gas meters. Most gas and electric meters have 4 or 5 small dials that read left to right that tell you how many units (kWh) of gas or electricity you have used. They may also be digital, especially if you have a smart meter.
 - a. Read your Gas Meter – Google “reading my gas meter”, and check out Fortis or Union Gas page.
 - b. Read your Gas Bill – Google “oeb your energy bill”
 - c. Read your Electricity Meter – Google “hydro one read my own meter”
 - d. Read your Electricity Bill – Google “oeb your energy bill”
3. Use a whole-house energy monitor
 - a. You can buy simple, safe devices that easily clip onto your meter’s cable. They give you up-to-the-minute information about how much electricity you are using and how much it is costing you (along with CO₂ emissions, as well). (These devices use an optical technology that may not be compatible with your meter. Call Guelph Hydro to find out if they will work before making the investment.)

ACTIVITY: KNOW HOW MUCH

In going through this checklist, you may find things that you are already doing. If you aren’t, give some honest thought as to what is keeping you from doing them, and then think about how you can change this before deciding on your pledge in the last column.

- Start recording your gas and electric meter readings or tracking usage from your utility bills.

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

- Compare your usage to previous periods to see if, and why, it has changed.

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

- Purchase or borrow an energy monitor to see exactly how much power each appliance and device uses when it is on, and when it is in standby mode (see next section for details). Identify your “big-ticket” devices and appliances. See Resources section for more information.

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

- Take it a step further and invest in a whole-house electricity monitor. They cost about \$150 and some include computer software (see Resources section). You may want to buy one and share it with the group.

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> • Yes _____ • No _____ 	<ul style="list-style-type: none"> • _____ • _____ 	<ul style="list-style-type: none"> • Yes _____ • No _____

RESOURCES

Whole Home meters

theenergydetective.com (TED 5000-G) ~\$200 USD plus tax & shipping

Cost EnviR – (via Amazon.com) - ~\$130 USD plus tax and shipping

Black and Decker Energy monitor – (via Amazon.com) - ~\$90 USD plus tax and shipping

PowerCost Monitor – (www.bluelineinnovations.com) – online e-stores

Efergy Elite Wireless Electricity In-home Display (~ \$120)

Simple “Kill-A-Watt” style meters

- Borrow for free from the Guelph Public Library
- Hampton Energy monitor (~\$20, Canadian Tire)
- Belkin Conserve Insight (~ \$30)

Not for the faint of heart: making your own! <http://openenergymonitor.org/emon/node/43>

Hydro One appliances calculator – online tool to gauge your home energy use based on appliances

Understand how to measure energy use

Kilowatts (kW) measure power – the rate at which we use energy (also called demand). Kilowatt hours (kWh) measure energy consumed. Power is akin to speed, and energy is akin to distance: as we all know, the faster you go, the more quickly you cover a given distance. Similarly, the more power you consume, the faster you consume a given amount of energy. So, if you consume power at 1kW, you will have consumed 1kWh after one hour. The units on your electricity meter measure kWh: one electricity “unit” is equal to one kWh.

Gas meters measure the volume of gas. Metric meters measure gas in cubic metres and imperial meters measure in hundreds of cubic feet.

BE A REAL TURN-OFF

Cost: None

\$ Saved: Med

Effort: Low

CO₂ Saved: Low

Leaving lights, TVs, computers, and radios on when there’s no one in the room is an obvious waste of money and energy. But even when we switch things off, some appliances go to “standby mode”, which can still consume a lot



of energy. Even some phone chargers, if left plugged in, will use a little energy, whether or not you're charging your phone. This is also called "phantom power" or "vampire power".

Unplugging one electric toothbrush or phone charger might not seem like such a big deal, but what about that DVD player...and the microwave, and the printer, and the games console, the desktop computer, and the digital radio? , If you have a lot of equipment on standby, particularly if it is older, it can add up to significant energy wasted over a year.

The average North American home has 25 devices that use standby power, some of which may use up to 20 watts of standby power. As a result, standby power can add up to 10% of the average North American home's power consumption.¹²

¹³

Just by turning off appliances on standby, you can stop wasting up to \$64 - \$80 per year.

Yes but...There are some devices I can't turn off.

Some cable boxes, digital video recorders, modems, and other devices cannot be turned off without losing connection. Plug all other devices into a power bar and turn off just those devices that can be turned off. Energy Star qualified devices use less energy on standby.

ACTIVITY: TURN-OFF

- Keep a scoreboard on the fridge for every time someone turns off a light or TV that was left on with no one there. Great for kids!

I do this!
•Yes _____
•No _____

Why not?
•
•

I will do this!
•Yes _____
•No _____

- Place "Turn me off" reminders beside the "big-ticket" items to help remember when you leave the room for more than a few minutes.

I do this!
•Yes _____
•No _____

Why not?
•
•

I will do this!
•Yes _____
•No _____

- Unplug "big-ticket" and infrequently used appliances when not in use.

I do this!
•Yes _____
•No _____

Why not?
•
•

I will do this!
•Yes _____
•No _____

- Use a power bar with a switch to turn off multiple devices at the touch of one button. (Leave out devices which need to be on all the time like routers, sensors, etc.)

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

- Avoid using power - dry clothes in the sun or on a rack rather than the dryer.

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

- Avoid using power - only wash full loads of clothes.

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

- Wash clothes in cold water.

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

SEE THE LIGHT

Inefficient incandescent bulbs waste 90% of the energy they use- it is given off as heat, not light! Switching over to

Cost: Med

\$ Saving: Med

Effort: Low

CO₂ Saved: Med

energy-saving light bulbs will reduce your bills, as they use about a quarter of the power of incandescent bulbs. For example, a 15W energy-saving bulb (compact fluorescent lamp, or CFL) is equivalent to an old 60W incandescent one.

Divide the wattage of your current incandescent bulb by 4 to get an estimate of the correct energy-saving equivalent. It's worth buying Energy Star qualified products, which are verified to be more energy efficient, rather than the discounted brands, which often perform less well, and can take a long time to reach full brightness. Choose "warm white" "2700k" bulbs for a less harsh light. Buy ones that last 10 years (equal to 10,000 hours) to save the most. Typically energy-saving bulbs last up to 10 times longer.

Not all energy efficient bulbs are the same. For the best lighting quality, replace existing bulbs with the most equivalent alternative. For example, instead of exposed compact fluorescent lamps in the bathroom, install covered globe CFLs.

The following energy saving light bulbs are available:

- Compact fluorescent lamps (CFLs): These are most common and are available in stick or candle shape, and small or medium screw-in bulb and bayonet fittings.

Yes but... I have dimmer switches.

If you have a dimmer switch you can buy special dimming energy-saving light bulbs (though they can be quite expensive). Energy-saving light bulbs can now be found in a variety of shapes, sizes, and strengths to suit nearly every outlet and purpose.

- Energy-saving halogen light bulbs and/or lower wattage: A good option if you have halogen lights in your home. They consume around 30% less electricity than standard halogen bulbs. You can often replace 50W halogens with 20W ones – they will still provide plenty of light in most situations, if you are unable to change to compact fluorescent halogen replacements. Be sure to install appropriate bulbs for the fixtures and read the labels to avoid safety hazards.
- LED lights: This technology is progressing rapidly and can now sometimes replace existing halogens. They are best used where you have lights that are on most of the time (e.g., a hallway for safety reasons).

MONEY RECOVERED

Changing a light that is on all the time to an energy saving light bulb can save you about \$34 per year. Energy – saving light bulbs are a little more expensive than old incandescent or halogen ones – typically costing around \$2 each – but you'll easily make back the difference on your electricity bill. There are coupons available through Guelph Hydro (look in your mail, visit a retailer or go online to Guelph Hydro.) An average home has 25 light bulbs; if all incandescent bulbs were replaced with energy-saving bulbs you would save about \$45 per year.

ACTIVITY: SEE THE LIGHT

- Have the eMERGE Guelph team lead you through the lighting section of the eMERGE Home Visit.

I've done this!
•Yes _____
•No _____

Why not?
•
•

I will do this!
•Yes _____
•No _____

- Install automated (e.g., timed or sensor) lighting in suitable areas (outside, hallways).

I've done this!
•Yes _____
•No _____

Why not?
•
•

I will do this!
•Yes _____
•No _____

- When an existing bulb burns out, see if you can live (safely) without replacing it at all!

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

Make the most out of **NATURAL LIGHT**

Daylight is the cheapest and most pleasant light source you can have in your home. Some houses are better than others when it comes to utilizing natural light, but there are a few steps you can take to make the best of the light you have, helping you save energy and increase comfort.

Some steps you can take from least expensive to more costly:

- Rearrange your furniture to make the most of your southern exposure.

I've done this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

- Use Venetian blinds to control the light. Angling the blinds towards the ceiling can light up a room without unwanted glare.

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

- Paint walls and ceilings lighter colours to reflect more daylight.

I've done this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

- Install light tubes to efficiently direct sunlight into an interior or north facing room (e.g., Solatube, Skytube, Sun Tunnel Skylight).

I've done this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

- If you build a new home or undertake an extensive renovation, implement passive solar design strategies.

I've done this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

CONTROL YOUR HEAT

Cost: None

\$ Saved: Med

Effort: Low

CO₂ Saved: Med

Space and water heating accounts for over 80% of the energy used in the Ontario homes.¹⁴ A slight change in the setting of your heating and hot water equipment can have a big impact.

You may already have a full set of heating controls in your home – but are you getting the most from them? Take a little time to find out what each control does by referring to the instruction manuals that came with them. If you don't have any manuals on hand, copies can usually be downloaded from the manufacturer's website, or call and ask them to send you a printed copy. (See the summary guide of common controls systems in "Control Your Heat - Definitions".)

MONEY RECOVERED

For every 2°C you reduce your heating, you can save about 5% on your heating bill. Turning down or programming the thermostat to go down by 5° at night can save 10%. If your monthly heating bill is \$200, that's \$20 a month that's currently being wasted – you could be spending only \$180.

If you optimize your heating controls, you can typically save around 17% of your heating bill in total.

ACTIVITY: CONTROL YOUR HEAT

- Find the manual or download instructions for the central heating thermostat.

I did this!
<ul style="list-style-type: none"> •Yes _____ •No _____

Why not?
<ul style="list-style-type: none"> • •

I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____

- Set your thermostat to 21°C – With a sweater and slippers on, you can go down to 19°C.

I do this!
<ul style="list-style-type: none"> •Yes _____ •No _____

Why not?
<ul style="list-style-type: none"> • •

I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____

- When you are away or asleep, set it to 15°C. (It helps you nod off and promotes deeper sleep.)

I do this!
<ul style="list-style-type: none"> •Yes _____ •No _____

Why not?
<ul style="list-style-type: none"> • •

I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____

- Set the heating to turn up 20 minutes before you wake up, and turn down 15 minutes before you leave home.

I do this!
•Yes _____
•No _____

Why not?
•
•

I will do this!
•Yes _____
•No _____

- Set your domestic hot water tank thermostat at 55°C or 130°F. Any higher is a waste of energy and can scald; any lower may risk the formation of legionella (a bacteria). On a gas water heater, “hot” is often equivalent to 140°F. Readjust for comfort.

I did this!
•Yes _____
•No _____

Why not?
•
•

I will do this!
•Yes _____
•No _____

- Upgrade to a more intelligent digital thermostat. It will cost between \$25 and \$100 depending on its features.

I did this!
•Yes _____
•No _____

Why not?
•
•

I will do this!
•Yes _____
•No _____

- Heat the rooms you use most, rather than the whole house. Use thermostatic radiator valves (TRV’s) if your home is heated with radiators.

I do this!
•Yes _____
•No _____

Why not?
•
•

I will do this!
•Yes _____
•No _____

- Turn the heating down when on holiday.

I do this!
•Yes _____
•No _____

Why not?
•
•

I will do this!
•Yes _____
•No _____

- Keep curtains and furniture away from furnace vents, radiators and electric baseboards to let heat circulate.

I did this!
•Yes _____
•No _____

Why not?
•
•

I will do this!
•Yes _____
•No _____

- Close doors to rooms that are not in use.

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> • Yes _____ • No _____ 	<ul style="list-style-type: none"> • _____ • _____ 	<ul style="list-style-type: none"> • Yes _____ • No _____

CONTROL YOUR HEAT - DEFINITIONS

What is a whole-house programmable thermostat?

Programmable thermostats allow you to set when the heating comes on and goes off again. By installing a programmable thermostat, and heating your home only as necessary, you will save energy and money, and never have to worry about manually adjusting your home temperature.

What is a room thermostat?

A room thermostat constantly measures the air temperature of a limited space and can be set to whatever temperature suits you best. They are usually in halls, stairs or landing areas. When the temperature falls below the setting, the thermostat switches on the central heating; once the room reaches the set temperature, the thermostat switches the heating off.

What is a programmable room thermostat?

A programmable room thermostat lets you choose the times you want individual rooms heated if you have a zoned heating system, such as electric baseboards.

What is a domestic hot water thermostat?

A domestic hot water thermostat keeps a constant check on the temperature of the water in a hot water storage tank. It switches the heat supply on and off as necessary to keep the water at a set temperature.

KEEPING IT COOL

Air conditioning, whether window, room or central, uses a lot of electricity and cost you even more if used ineffectively. According to the Ontario Power Authority, air conditioning can add up to 50% of your household electricity consumption in summer.¹⁵ Using fans instead of room air conditioners can reduce your electricity bills. A room air conditioner can use 3X or even 5X the amount of energy a fan uses.

Many Ontario cities now offer a “PeaksaverPLUS” program. If you have central a/c, they will give you a free central thermostat and home energy monitor. In return, you agree to allow them to make minor adjustments to your home a/c on peak demand days, never for more than 4 hours per day. This usually takes the form of cycling on/off rather than a degree-based adjustment.

If you are considering buying room or window air conditioners, be sure to choose Energy Star appliances, and choose one that is appropriately sized for the space you need to cool. Choosing an overpowered one can create moisture problems.

ACTIVITY: KEEPING IT COOL

- Keep your a/c off – use a fan or go for a swim if you can.

I do this!
•Yes _____
•No _____

Why not?
•
•

I will do this!
•Yes _____
•No _____

- Turn it off – don't cool your home when you aren't there (or set it to 29°).

I do this!
•Yes _____
•No _____

Why not?
•
•

I will do this!
•Yes _____
•No _____

- Turn it "up" to 25° when you're at home. It dehumidifies, so even though 25° may look warm, it won't be as "sticky".

I do this!
•Yes _____
•No _____

Why not?
•
•

I will do this!
•Yes _____
•No _____

- Use ceiling fans instead of, or along with your A/C.

I do this!
•Yes _____
•No _____

Why not?
•
•

I will do this!
•Yes _____
•No _____

- Sign up for PeakSaverPLUS – you will receive a free programmable thermostat and energy monitor.

I do this!
•Yes _____
•No _____

Why not?
•
•

I will do this!
•Yes _____
•No _____

- Plant deciduous trees on the East and West sides of your home for shade.

I do this!
•Yes _____
•No _____

Why not?
•
•

I will do this!
•Yes _____
•No _____

HOT WATER TANK AND PIPE INSULATION

Many hot water tanks and pipes in our homes are not sufficiently insulated. This means that heat is continually

Cost: Med	\$ Saved: Med	Effort: Med	CO₂ Saved: Med
------------------	----------------------	--------------------	----------------------------------

being lost, and your water tank has to work harder to keep the stored water at the desired temperature. Heat is also lost from pipes that carry hot water around your house, leading to unnecessary and expensive heat loss, as well as less hot water for your shower.

Both tank and pipe insulation will keep your water hotter for longer by reducing the amount of heat that escapes – by up to 75%. This reduces your utility bill and gets back wasted money. Wrapping hot pipes in foam sleeves stops them from losing heat through contact with cold air. Both tank and pipe insulation is cheap and easy to fit, so this is a DIY option even if you’re renting.

A hot water tank blanket costs less than \$40 and can have a payback of less than a year.

ACTIVITY: HOT WATER

- Insulate your electric hot water tank.
 1. Check your tank manual to see if the manufacturer warns against insulating.
 2. Touch your hot water tank. If it feels warm, it needs a blanket. If it is hot, a blanket is only a temporary fix until you can get a new tank.
 3. Make a note of the volume of the tank (50gal, 60gal, etc.).
 4. Most hardware stores carry tank insulation. Purchase one that fits your tank.
 5. If you have an electric tank fit the tank yourself.

I do this!	Why not?	I will do this!
•Yes _____ •No _____	• •	•Yes _____ •No _____

- If your water heater uses gas or oil consider consulting a professional. An improperly installed blanket can interfere with the burner and create a safety hazard.

I do this!	Why not?	I will do this!
•Yes _____ •No _____	• •	•Yes _____ •No _____

- Feel your water pipes and insulate those that are hot – buy foam pipe wrap and fit to the pipes. (These cost less than a dollar per 3 foot segment.)

I do this!	Why not?	I will do this!
•Yes _____ •No _____	• •	•Yes _____ •No _____

DRAFT PROOFING

If you can feel cold air coming in your home it means that warm air is escaping. Sitting in a draft doesn't just give you a pain in the neck; in a typical home 25-40% of all heat loss is through air leakage and drafts.¹⁶ In many homes, draft-proofing is the most cost-effective way to prevent heat loss and increase comfort.

Draft-proofing simply fills gaps in the exterior walls and roof of your home, and decreases the amount of cold air entering and warm air leaving your home. Once your home has been draft-proofed, you'll stop losing cash and creating excess CO₂, and you'll feel warmer and more comfortable.

A drafty house is quickly and cheaply remedied by a visit to the local hardware store. There are several types of materials from DIY stores including caulking, foams, gaskets, weather-stripping, sealants, and shaped rubber or plastic. Make sure you are using the appropriate product for each particular application, and check the quality of the products, as it will affect their performance and durability.

ACTIVITY: DRAFT-PROOFING

- Have the eMERGE Guelph team lead you through the building section of the Home Visit.

I do this!
<ul style="list-style-type: none"> •Yes _____ •No _____

Why not?
<ul style="list-style-type: none"> • •

I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____

- Measure up external doors and windows and buy weather-stripping from the hardware store. Weather-stripping is usually made from self-adhesive foam, rubber or brush material.

I do this!
<ul style="list-style-type: none"> •Yes _____ •No _____

Why not?
<ul style="list-style-type: none"> • •

I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____

- Seal your mail slot. If you receive mail through your mail slot, install a draft guard. These come in several different styles so look at what your local hardware store offers. If you do not use your mail slot, you can completely seal and insulate the opening by cutting a piece of Styrofoam and fitting it into the opening.

I do this!
<ul style="list-style-type: none"> •Yes _____ •No _____

Why not?
<ul style="list-style-type: none"> • •

I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____

- Seal unused chimneys with a chimney balloon (aka fireplace plug) which inflates to block up the flue. Remember to take it out again if you decide to use your chimney.

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

- Draw your curtains at dusk for extra draft exclusion, and keep them behind radiators (otherwise you're just heating the window).

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

- Curtains wearing thin? Sew a layer of heavy lining material inside them or pay someone to do it for you. Thrift shops often have cheap curtains.

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

- If you have wooden floorboards, fill the gaps between and around them with an acrylic sealant.

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

ATTIC INSULATION

Attic insulation acts as a blanket, trapping hot air rising from the house below. In an un-insulated home, 25-50% of your heat is lost through the roof. The attic is often the simplest starting point with insulation work because attics are generally easily accessible and have plenty of space to insulate. Insulating your attic is a simple and effective way to reduce your heating bills and you can even do it yourself.

In order to insulate an attic, insulating material is simply laid over the floor of the attic, between and then over the joists if they are visible. You should aim for R50 in your attic if possible. As a rule of thumb, attic insulation should be double the depth of the attic joists. Protective clothing, gloves and masks should be worn. Try not to compress the insulation in tight corners or eaves, as compression will reduce its thermal resistance. Walk boards can then be laid over the joists to provide safe access from the attic hatch to any service points (if present). Additionally, make sure that your insulation job includes air sealing, otherwise you can cause moisture problems in the attic. Attic insulation can be carried out as a DIY task or by a professional installer. There are rebates available to help you pay for the attic insulation.

MONEY RECOVERED

Installing attic insulation can cut 20% to 60% off your current energy bills, depending on how much insulation you currently have and how much you add. If you are planning on upgrading insulation and your heating system, do your insulation first since a better-insulated house requires a smaller heating system, preventing you from spending even more money. Do it in spring or summer, so that your home is ready for the following winter, although insulation also helps keep a house cooler in summer.

1. Inspect the electrical wiring and replace any frayed or torn wiring before insulating.
2. Identify the existing air and vapour barrier. Any holes in the vapour and air barrier will have to be sealed before insulating. An insulated attic means a colder attic, which can cause increased condensation. It is important to properly seal the attic before insulating.
3. It is vital to ensure your attic is properly ventilated. Make sure you do not cover existing vents with insulation. Many older homes may require additional vents to be added to ensure sufficient ventilation.
4. Do not to leave even the smallest gaps in your insulation.
5. If you are having any renovations or additions done to your home, it is a great opportunity to insulate at only a small extra cost.
6. Do not cover pot lights that are protruding into the attic – it is better to replace these if possible.

ACTIVITY: ATTIC INSULATION

- Have the eMERGE Guelph team lead you through the building section of the Home Visit.

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

- Decide whether you want to install attic insulation yourself or get a professional to do it. Consider which material you prefer.

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

- Check your eligibility for rebates and grants.

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

WALL INSULATION

Most houses in Ontario have frame walls, which means there is sometimes space between your outside wall and your inside wall that is either already insulated or can be insulated further. Walls can account for 10% to 30% of heat loss from a house. If your home has uninsulated or poorly insulated walls, a considerable slice of your energy

bills will be spent heating the air outside. Wall insulation is a simple, fantastic way to significantly reduce the amount of energy you need to heat your home.

Filling the cavity between the two walls of a house with an insulating material significantly decreases the amount of heat that escapes through the walls. It will help create a more even temperature in your home, help prevent condensation on the walls and ceilings, and can also reduce the amount of heat building up inside your home during summer hot spells.

The procedure for insulating your walls varies if you have a wall other than a frame wall (e.g., brick walls, not to be confused with brick veneer). Insulation can often be applied from the outside through small holes drilled in the wall. It's a simple process and is completed within a few hours, without damage or mess to your house or garden. It does entirely depend on the construction of your house's walls, so be sure to get advice from a reputable installer who offers a long-term guarantee.

MONEY RECOVERED

Greatest savings from wall insulation occur when there was no existing insulation. When there is no existing insulation, you can have insulation blown in through small holes made on the outside of the house. Upgrading wall insulation can take about 15% off your current energy bills.

ACTIVITY: WALL INSULATION

- Identify what kind of wall your home has.

I do this!
<ul style="list-style-type: none"> •Yes _____ •No _____

Why not?
<ul style="list-style-type: none"> • •

I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____

- Have the eMERGE Guelph team lead you through the building section of the Home Visit.

I do this!
<ul style="list-style-type: none"> •Yes _____ •No _____

Why not?
<ul style="list-style-type: none"> • •

I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____

- Have your walls insulated.

I do this!
<ul style="list-style-type: none"> •Yes _____ •No _____

Why not?
<ul style="list-style-type: none"> • •

I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____

OUR DECISIONS

Go back through your ideas, find the things you said you will do, and “SMARTify” them. Do this both for individuals, and find things that the group can commit to together. Remember to think “SMART” – **S**pecific, **M**easurable, **A**chievable, **R**esults-oriented and **T**ime-delimited. Also, break down big goals into smaller, SMART steps.

EXAMPLES

Non-SMART: “Use a power bar” → SMARTification → “I will buy a power bar for the entertainment centre and we as a family will figure out all the plugs before next the group meeting.”

- Non-SMART: “Insulate my walls” → SMARTification →
 - “1 – Price blown foam vs. blown cellulose by the end of this week.
 - 2 – Call two contractors for quotes by end of next week.
 - 3 – Choose a contractor and book appointment by end of month.”

MEMBERS

GROUP

ENERGY RESOURCES AND TAKING IT FURTHER

Keeping It Cool

<http://www.bhg.com/home-improvement/advice/measuring-materials/window-air-conditioner-size-calculator/>

Draft Proofing

<http://oee.nrcan.gc.ca/publications/residential/8668>

Wall and Attic Insulation

- Keeping the Heat In, Chapter 4 – Roofs and Attics
<http://oee.nrcan.gc.ca/residential/personal/heat/keeping-heat-in-chap4.cfm>
- Keeping the Heat In, Chapter 6 – Insulating the Walls
<http://oee.nrcan.gc.ca/residential/personal/heat/keeping-heat-in-chap6.cfm>
- http://www.bchydro.com/etc/medialib/internet/documents/Power_Smart_FACT_sheets/FACTS_Insulating_for_Energy_Efficiency.Par.0001.File.A10_241_Insulation_PS_Tip_Sheet.pdf

Heating Your Home Differently

You may want to explore these actions once you've done the basics outlined in this workbook. They tend to take more effort and/or more investment with a longer payback period. However, they can significantly reduce your energy use and your carbon footprint.

- Buy a new energy efficient heating system. Your best option will depend on what system you currently have in place.
- Air source heat pumps are a very efficient way to heat your home using electricity, as they move heat from one place to another rather than generating it. Heat pumps can be added to a new or existing gas or electric furnace or air handler. There are also ductless systems which work best in homes without existing ductwork.

For more information:

http://www.bchydro.com/guides_tips/green-your-home/heating_guide/Install_A_Heat_Pump.html

- If you have an old boiler, replace it with a condensing boiler. Condensing systems gain higher efficiencies (over 90%!) by extracting heat from the combustion gases. By installing a new high efficiency condensing boiler and improving your heating controls, you will significantly cut your home's carbon dioxide emissions.

See: <http://oee.nrcan.gc.ca/residential/personal/maximizing-efficiency-boilers.cfm?attr=4>

Solid wall insulation

Solid walls (e.g. concrete walls) can lose heat just like cavity walls; the only way to reduce this heat loss is to insulate them on the inside or (much better) on the outside. It's not cheap, but you will soon see the benefits on your heating bill, and it can also help you play your part in reducing carbon dioxide (CO₂) emissions. There are two types of solid wall insulation: external and internal. See "Keeping the Heat In": <http://oee.nrcan.gc.ca/residential/personal/heat/documents/keeping-heat-in-e.pdf>

Foundation Insulation

Insulating your basement walls or crawlspace is an effective way to cut your energy use and make your home more comfortable. Basement walls can be insulated from the inside or outside. However, in most renovation situations it

is easier and cheaper to insulate the interior by framing the foundation walls from floor to ceiling. You can insulate your crawlspace either by insulating the walls and floor, or insulating the ceiling above the crawlspace.

Learn more: Keeping the Heat In – Chapter 5 - Basement Insulation

<http://oee.nrcan.gc.ca/residential/personal/heat/keeping-heat-in-chap5.cfm?attr=4h>

Explore options for renewable energy

Renewable energy technologies like solar panels (for hot water or for electricity), wind turbines, and biomass heaters are becoming increasingly popular in the home. These are effective alternatives to fossil fuels and will help you to meet your own energy requirements and reduce your home's CO2 emissions. They can be more expensive than some of the previous options, with longer periods. Consult the BC Sustainable Energy Association (<http://www.bcsea.org/>) for information on renewable energy technologies. For information on solar hot water, a growing technology in BC, see Solar BC (<http://www.solarbc.ca>).

Ontario has a “MicroFIT” program that allows customers to connect a small renewable energy generating unit to the Ontario electricity grid. When excess power is produced on site from technologies such as solar photovoltaic panels, small scale wind turbine, or microhydro, it gets transferred to the grid and the power authorities purchase the electricity you produce at a guaranteed rate for 20 years.

More information:

<http://www.guelphhydroinc.com/en/developingsustainableenergy/ontariofeedintariffprograms.asp>

Replace old windows with energy efficient windows

Installing energy efficient windows can save up to 20% on your energy bills. Although windows are often not the most cost effective place to start upgrading the energy efficiency of your home, they are an important component to obtaining the maximum efficiencies possible. Replacing windows can also increase the comfort of your home by reducing indoor cold surfaces. Remember, if you do not have the resources to fully replace windows, you can seal gaps, install storm windows or install clear plastic sheets to increase their energy efficiency instead.

More info: http://www.bchydro.com/guides_tips/green-your-home/heating_guide/energy_efficient_windows.html

TRIMMING OUR WASTE

CHAPTER STARTING NOTES

By the end of this session, you will know:

- how well Canada, Ontario and Guelph are recycling
- how to make a plan to reduce waste at home
- the basics of home composting

Is there anything I should know before we meet?

This topic has 1 video and 1 article that will be helpful to watch or read before you meet with the group.

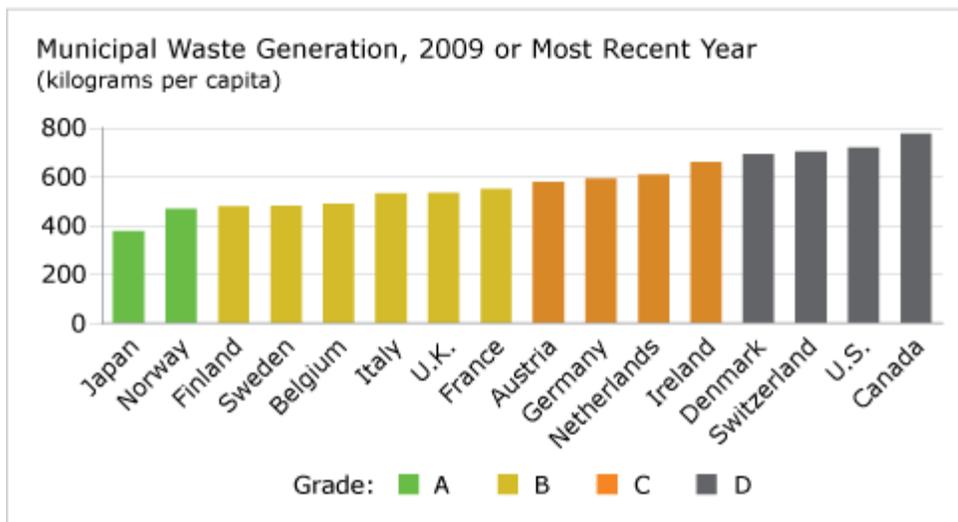
BACKGROUND

CANADA

Given access to recycling, the vast majority - 97% - of Canadian households will participate in their local recycling program.¹⁷

Worldwide, Canada does not perform as well as other nations at producing less waste, although we are getting better at recycling and composting. And municipal waste management is expensive. Municipal governments in Canada spent more than \$1.8 billion on waste collection, transport, and disposal in 2008.¹⁸ There is an opportunity for us to help out by reducing the amount of waste we produce at all (reduction).

In contrast, Norway generated 470 kg per capita in 2009 – how can we get there?



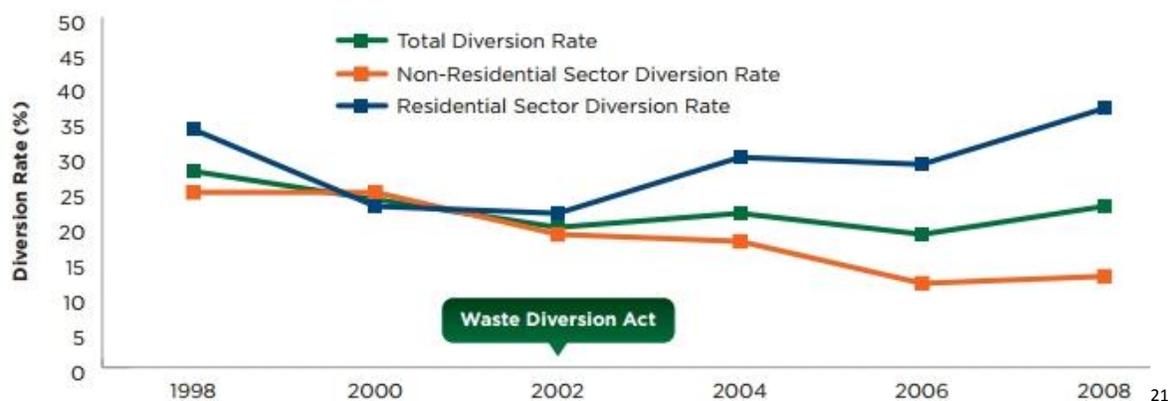
Each Canadian generated on average 777 kilograms of municipal solid waste - or around 60 garbage bags - in 2008, of which about one-third was recycled or otherwise diverted from landfills.¹⁹

In total an estimated 4.4 million tonnes were recycled or otherwise diverted. That means of those 60 bags, 20 were recycled or composted. The Canadian municipal recycling rate went from about 20 to 33% from 2002 to 2008.

ONTARIO

Ontario's recycling rate has also been improving. In 2008, Ontarians generated 9.63 million tonnes of waste (3.2M residential and 6.4M non-residential), and recycled or composted 2.8 million tonnes, or 22.6%. The Ontario residential recycling rate rose from 19.8 to 22.6% from 2006 to 2006. The average amount of recycling per capita in 2008 was 217 kg.²⁰ This is more Manitoba, Saskatchewan and Alberta, but less than Nova Scotia, New Brunswick, Quebec and BC. The Canadian average is 254kg, and the highest is New Brunswick with 358kg.

Figure 1. Residential, Non-Residential & Combined Diversion Rates in Ontario¹⁰



GUELPH

Since implementing the 2008 Solid Waste Management Master Plan, the City's residential diversion (recycling, composting and other household recovery) rate increased from 39 to 68% in 2012.²² This sets us ahead of the city-wide goal of 65% by 2016, a remarkable accomplishment, and fits with Guelph's long history of being a leader in waste management.

Guelphites like Rene Van Acker and family (pictured below) have even embarked on more intense journeys, such as keeping all their trash to see how much it added up to.

The Van Ackers' 10-week total was 17 paper bags of yard waste, 22 blue bags of recyclables, 9 clear bags of waste, 7 rolls of carpet and a roll of underpad.

They were allowed to put out non-compostable wet waste for their regular pickup as long as they weighed it all first. In total, they composted 31.4 kg of organic waste and put 30 kg out for pickup.

The 2008 Solid Waste Plan was reviewed over 2013-2014 – because we met our goal and we know we can do it again by working together. Do you think we can get over 75% by 2021?



The family reports that the main benefit was learning just how important composting was to reducing the amount they piled up in the garage.

THE STORY OF STUFF

The Story of Stuff (don't need it? don't buy it.) - learn more about the impacts of our excess consumption (of course, we need to buy essentials!) and see if this affects your buying decisions.

<http://www.youtube.com/watch?v=gLBE5QAYXp8>

“From its extraction through sale, use and disposal, all the stuff in our lives affects communities at home and abroad, yet most of this is hidden from view.”

The Story of Stuff is a 20 minute, fast-paced, fact-filled look at the underside of our production and consumption patterns. The Story of Stuff exposes the connections between a huge number of environmental and social issues, and calls us together to create a more sustainable and just world. It is American but entirely relevant for Canada too.

“It'll teach you something, it'll make you laugh, and it just may change the way you look at all the stuff in your life forever.”

ACTIVITY

Having watched the video, discuss the following questions in your group (but keep an eye on the time - spend no more than 15 minutes on your discussion):

- People in Western society work longer hours now than we did in the middle ages. Why is this the case? What are some ways that we could change our economy to work less and live more? How can we hasten these changes?
- “The American economy's ultimate purpose is to create more consumer goods.” Do you think this applies here in Canada? Can we/should we each contribute to turning this around by changing our buying patterns? How can we get our government to focus on things more valuable than consumer goods, be they sustainability, justice or healthcare?

HOW CAN WE MAKE IT EVEN BETTER?

Each of these actions will help us reduce the amount of waste that we produce. In your team, have a brief chat about each item and then decide which ones you want to tackle and when. Record your own action plan in “Our Decisions” on the page at the end of this section.

The options for dealing with waste in order of preference, are:

RETHINK - Cut our spending. (Don't need it? Don't buy it.)

REDUCE, REUSE & REPAIR – Do I need as much of it, can it be fixed, used by others?

RECYCLE – Can it be broken down and used again?

COMPOST – Will it decompose (pleasantly) in my yard? – For anyone who loves to grow things and is ready to take care of their own compostable waste.

LANDFILL AND INCINERATION – The last resort.

RETHINK – CUT OUR SPENDING

Cost: None

\$ Saved: Med

Effort: Low

CO₂ Saved: Low-Med

Recycling is important, but it is even more important that we try to use less stuff in the first place. Make sure everything passes the “do I really need it?” test. This is one of the greatest ways to really cut your spending. Is something necessary, or just adding to clutter? Is the overseas-factory-produced, cheap toy in the Xmas stocking still making us laugh after 3 years? Or is it already headed for the trash? The effects of making it will be around for a long time.

REDUCE, REUSE & REPAIR

Cost: None

\$ Saved: Low-Med

Effort: Low

CO₂ Saved: Low-Med

In going through this checklist, you may find things that you are already doing. If you aren't, give some honest thought as to what is keeping you from doing them, and then think about how you can change this before deciding on your pledge in the last column.

- Take re-usable shopping bags wherever you go, and save money in most grocery stores. Take them on other shopping trips too!

I do this!
•Yes _____ •No _____

Why not?
• •

I will do this!
•Yes _____ •No _____

- Get off the junk mail hit list – 1-416-391-2362 – Tell them your address and you will be removed from mailing lists.

I do this!
•Yes _____ •No _____

Why not?
• •

I will do this!
•Yes _____ •No _____

- Use rechargeable batteries instead of throwaway ones – they pay for themselves quite quickly.

I do this!
•Yes _____ •No _____

Why not?
• •

I will do this!
•Yes _____ •No _____

- Use bottles that can be used again instead of disposable drink cartons or cans.

I do this!
•Yes _____ •No _____

Why not?
• •

I will do this!
•Yes _____ •No _____

- Buy things made of recycled materials.

I do this!
•Yes _____ •No _____

Why not?
• •

I will do this!
•Yes _____ •No _____

- Give away household items online – someone will want it! Try Freecycle Guelph, or organize a clothes swap with friends and neighbours. Donate to local charity shops, like the ones listed in “Resources”.

I do this!
•Yes _____ •No _____

Why not?
• •

I will do this!
•Yes _____ •No _____

- Buy or get free 2nd hand stuff online and in charity shops, second-hand stores, or consignment shops in Guelph. A small list of consignment shops follows in “Resources”.

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

- The City of Guelph hosts an online directory for citizens to find out where they could donate, exchange, and sell their unwanted items. Be sure to check out the Take It Back directory listed in “Resources”.

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

- Buy products with little/no packaging; leave it at the store if you’re feeling bold.

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

- Repair, mend, fix it!

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

RESOURCES

- Canadian Marketing Association – 1-416-391-2362
- DIYode
- FreeCycle Guelph
- Kijiji
- Ebay
- Craigslist
- <http://guelph.ca/living/environment/waste-reduction/take-it-back-directory/anything-and-everything/>
 - Findings (497 Woolwich St. 519-763-8153)
 - Merry Go Round Guelph Inc. (219 Silvercreek Pkwy N. Unit 29. 519-822-8771)
 - Wyndham Exchange (97 Wyndham St. N. 519-821-2274)
 - Celebs (259 Grange Rd, 519-836-0001)
- Charity Stores
 - St. Vincent de Paul (Elizabeth St)
 - Salvation Army Store (Woodlawn Rd)
 - Goodwill Store (Woodlawn Rd)
 - Bibles for Missions (Victoria Rd)

Yes, but... if Wal-mart is selling toasters for less than \$20 it will likely cost me more to get it fixed – plus where can I get it done?

If watching DIY fix-it videos on YouTube is not your thing, drop in to Fix-It Fridays at DIYode downtown. It's \$5 to see if they can fix it, and they'll take on almost any challenge!

WHAT DOES YOUR RECYCLING BIN LOOK LIKE TODAY?

Cost: Low

\$ Saved: None-Low

Effort: Low

CO₂ Saved: Low-Med

Now we have thought about not buying as many things in the first place, let's look at how best to dispose of the stuff we do actually need. Recycling as much as you can will help conserve our valuable natural resources and energy supplies. It reduces the impacts of climate change and avoids losing valuable materials to landfill. It does make a difference.

The precise benefits of recycling depend on the material you're recycling – for example, recycling aluminium saves 95% of the energy of making it from scratch, while recycling glass saves 25%. That said, glass can be recycled again and again without losing its clarity or purity – unlike other materials.

The materials we recycle may seem like trash to us, but they are valuable commodities to manufacturers. For additional reading, check out <http://www.guelphmercury.com/news-story/3883596-increasing-competition-for-guelph-s-blue-bin-commodities/>

Yes, but... I just don't have room to put it all.

Make space next to your trash can for recycling containers – then it's as simple to recycle as it is to throw it away. For convenience, you can use cardboard boxes lined with the appropriate sack, or get stacking plastic containers, then transfer into your larger blue cart on garbage day.

Tips and Hints for Recycling

In going through this checklist, you may find things that you are already doing. If you aren't, give some honest thought as to what is keeping you from doing them, and then think about how you can change this before deciding on your pledge in the last column.

- Glass jars – just give them a rinse and recycle them with your other glass. Don't worry about removing labels.

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

- Shampoo and shower gel bottles are important to remember – rinse out those empty bottles while you're in the shower.

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

- Mark your collection days on a calendar in the kitchen.

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

- Drop your off your unwanted electronic, construction and other miscellaneous waste at the Waste Resource Innovation Centre.

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

ACTIVITY

Where is our closest e-waste depot? Is it the WRIC, or is there a non-profit or private business that takes unwanted and broken computers and appliances?

Field trip! Gather our stuff and take it out together!

RESOURCES

- guelph.ca/wetdry - full sorting lists for all your detailed needs
- Waste Resource Innovation Centre (110 Dunlop Drive, 519-767-0598)
- guelph.ca/living/garbage-and-recycling/public-drop-off
- <http://www.recycleyourelectronics.ca>

FOOD WASTE AND COMPOST

Cost: Low

\$ Saved: Low

Effort: Med

CO₂ Saved: Low

Bring your food back to life! If we throw away food, we waste money and create landfill gas. However, food waste is a resource, and can be transformed into a nutritious diet of homemade compost for your garden – a climate-friendly alternative to store-bought, peat-based versions.

The first benefit of composting that you'll notice is a flourishing garden or window-box. Compost improves the nutrient levels of your garden's soil. It also reduces erosion and increases its water retaining capacity. It will reduce your dependency on expensive, store-bought products which can deplete valuable, carbon-storing peat bogs.



Today, Southern Ontario's peat bogs are threatened through peat extraction for garden compost. Dragonflies, butterflies and birds depend on these bogs for their survival and gardeners can choose alternatives. Across the globe, peat covers about 3% of global land surface, yet the amount of carbon stored within it is enormous – equivalent to twice that of all the world's forests combined. Peat develops very slowly (1-2 mm per year), and so when peat is mined for garden compost it can take up to 500 years to replace every metre that is taken away.²³

Yes but... I only have pots and window-boxes, not a garden.

You don't need to have a garden to make and use your own compost. Technology has caught up with modern compact living and today's bins and worm bins are totally sealed and come in a range of sizes. Once the composting stage is over, add the mix to a window-box or give it to a gardening neighbour.

Composting at home is more efficient than hauling it around the city in green bins. You can make or buy a traditional backyard composter, or use a worm bin. There are many containers now on the market for

making compost, although simple ones can be constructed from scrap timber, bricks or wire mesh. Advice on making a composter is widely available: the City of Guelph provides an excellent online resource on how to create your ideal compost material, where to set the composter, along with many helpful tips that will make the experience of home composting rewarding. See references below. Start a community compost project with help from Solid Waste Services at the City of Guelph – 519-767-0598.

Do Compost	Don't Compost
Fruit and vegetable waste and peelings	Cat or dog excrement
Tea bags and coffee grounds	Meat, bones – attracts vermin and flies
Crushed egg shells	Dairy produce – attracts vermin and flies
Grass cuttings, leaves	Fish – attracts vermin and flies
Shredded paper and soft cardboard	Disposable napkins
Human and animal hair	Printing paper
	Hard objects like fruit stones

A worm bin is a container housing a colony of special types of worm – red wigglers (*Eisenia fetida*). Worm bins can be kept indoors (with careful management), and are ideal for households with no garden, as they produce only a small quantity of compost and a liquid, which forms a concentrated plant food. A relatively local source of worm products and worms themselves is Cathy's Crawly Composters.

RESOURCES

<http://guelph.ca/living/environment/waste-reduction/home-composting/>

- Includes locations to buy subsidized \$40 composters

<http://www.cathyscomposters.com/products.htm>

OUR DECISIONS

Go back through your ideas, find the things you said you will do, and “SMARTify” them. Do this both for individuals, and find things that the group can commit to together. Remember to think “SMART” – **S**pecific, **M**easurable, **A**chievable, **R**esults-oriented and **T**ime-delimited. Also, break down big goals into smaller, SMART steps.

EXAMPLES

Non-SMART: “Use rechargeable batteries” → SMARTification → “I will buy 4 AA rechargeables for the entertainment centre remote and install them before the next group meeting.”

- Non-SMART: “Start composting” → SMARTification →
 - “1 – buy an outdoor composter next weekend and install it before Monday.
 - 2 – buy an indoor food scrap collector the following week.
 - 3 – set it up and show the family how to use it before Friday of that week.”

MEMBERS

GROUP

SPEND LESS ON WATER

CHAPTER STARTING NOTES

By the end of this session, you will know:

- how much water Canadian residents use
- why it is important to conserve water
- how to make a plan to conserve water in your household

Is there anything I should know before we meet?

- There are 2 web links to view before meeting.
- There are 2 links to optional background readings

BACKGROUND

CANADA

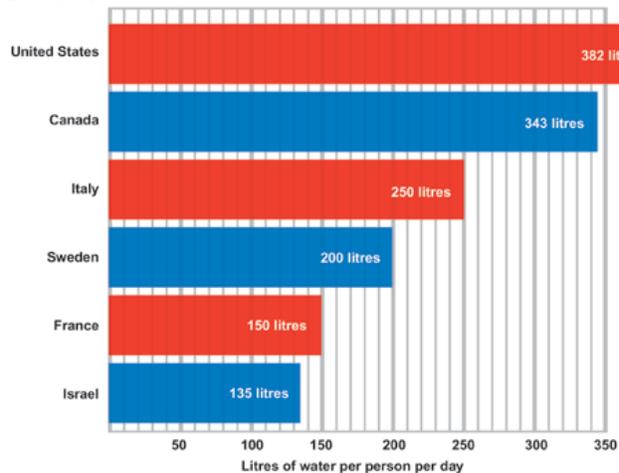
Canada possesses a significant amount of fresh water at 7% of the world's renewable freshwater supply. Water is considered a renewable resource, "renewable" referring to that portion which circulates back and forth in the [hydrologic cycle](#).²⁴ However, pressures on the resource are growing. The perception that Canada is blessed with an abundance of fresh water has led to misuse and abuse of the resource: from household toilets that use 20 litres per flush where 6 litres would do, to industrial plants -- and some municipalities -- that use water bodies as convenient sewers.

Increasing pollution of surface and groundwater is further reducing the supplies of readily available, clean water. Our water use almost always leads to some degree of deterioration in water quality; the less water we withdraw, the less we upset the natural balance of our aquatic ecosystems. This also means we would spend less to restore the water quality to an acceptable standard for public use.²⁵

The fact that 84% of the population lives in a narrow southern band, while 60% of our water supply flows north to the Arctic Circle, also contributes to further complications in acquiring and further contaminating water supply through transport.²⁶

Canadians are also large water consumers from an international perspective. In 2001, Canada ranked 28th out of 29 industrialized countries in per capita water consumption, only ahead of the United States.²⁷

Average daily domestic water use (per capita)

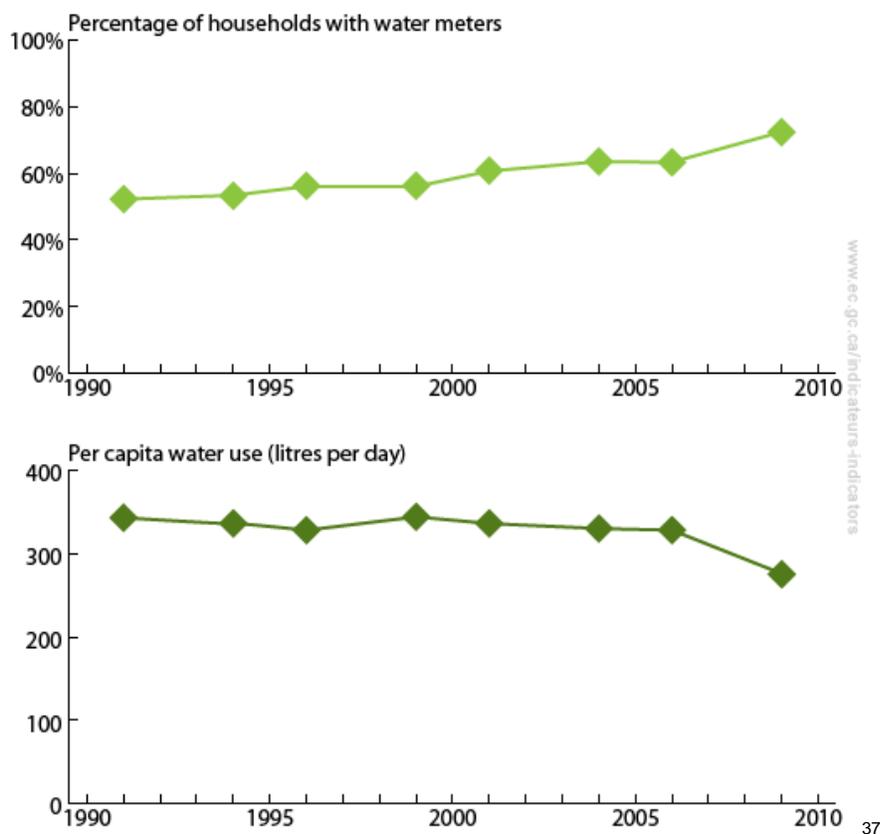


28

More than half of municipal water is used by the residential sector.²⁹ Residents working together can therefore make a big impact in conserving water. On average, each household can reduce water use by 40% or more.³⁰

At the residential level, we are seeing vast improvements in water consumption. Both total and per capita water use showed a significant drop over 2006 to 2009. The 2009 average residential water use was 274 litres per capita per day (Lcd), a 53 Lcd drop from 2006.³¹

Research shows that household metering and volume-based pricing increase consumer awareness about water use and provide a financial incentive to conserve water.³² In 1999, water use was 70% higher when consumers faced flat rates rather than volume-based rates. Only about 56% of Canada's urban population was metered in 1999.³³ In 2009, 72% of Canadian households were equipped with water meters.³⁴ Unmetered households used a daily average of 376 litres per person (or 39% higher) compared to 229 litres per person by metered households.³⁵ Additionally, overall, over the same period, average daily water use dropped from 342 litres per person in 1991 to 274 litres per person in 2009.³⁶



ONTARIO

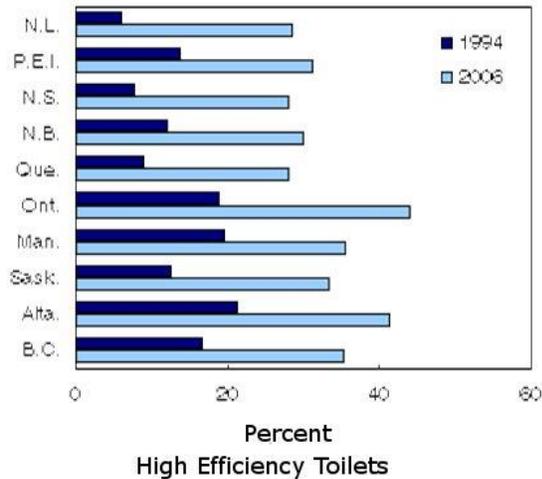
Ontario is situated among 4 of the 5 Great Lakes with more than a quarter of a million lakes, rivers and streams and rich groundwater resources³⁸. Over 95% of Ontario's population lives and takes its water from the Great Lakes Basin, which can put an enormous strain on our water resources³⁹. However, almost one third of municipalities in Ontario with water supply systems reported shortages⁴⁰.

For household water use alone, the average Ontarian consumes about 270 litres of water per day, roughly twice as much as the average European. When you factor in all the other uses of water – for agriculture, electricity production, manufacturing goods – and divide it in on a per capita basis, the average Ontarian indirectly uses thousands of litres of water per day.⁴¹

Of the provinces, Ontario has one of the lowest total water uses per capita.⁴²

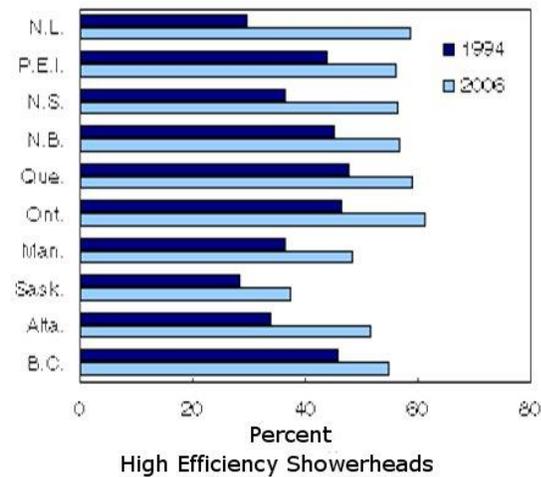
In 2006, Ontario had the highest proportion of households using water-saving fixtures. Use of high-efficiency showers rose from 46% in 1994 to 61% in 2006, while use of high efficiency toilets more than doubled from 19% to 44%.⁴³

Households in Ontario and the West lead the way on high-efficiency toilets



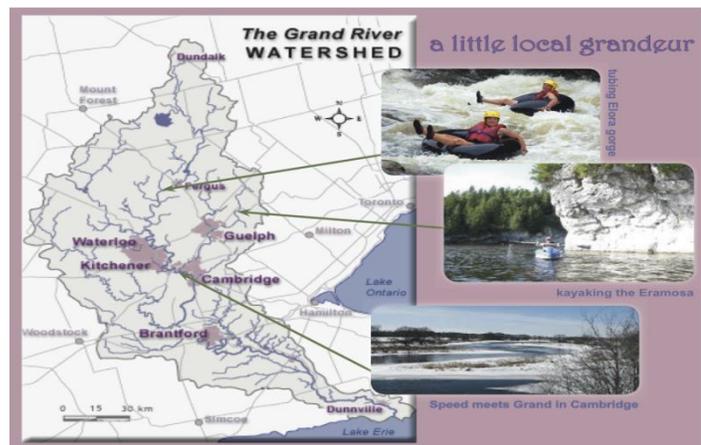
Households in Eastern provinces more likely to use high-efficiency shower heads

44



GUELPH

The Grand River Watershed is the biggest inland water system in Southern Ontario, with the four main channels including the Nith, Conestoga, Speed and Eramosa Rivers⁴⁵. The confluence of the Speed and Eramosa rivers is in Guelph⁴⁶. The Grand River Watershed is responsible for supplying water to a large population outside Guelph. Guelph's water and wastewater network is linked with this watershed where residents rely on groundwater from the watershed for their water supply.⁴⁷ Guelph relies on groundwater for its water supply.⁴⁸



Since 2001, Guelph has added over 15,000 new citizens, but decreased water use by nearly 10,000 cubic metres per day. That is close to 15,000 cubic metres of water less than projected!⁴⁹

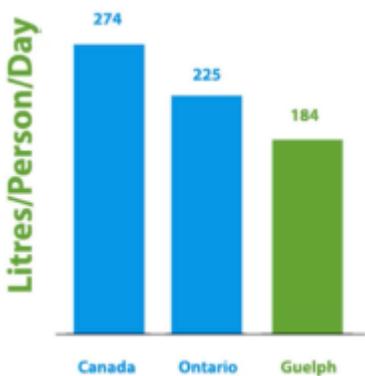
Since 2007, residents of Guelph have reduced their water use by 17 litres per person per day. For the average Guelph household, this means a savings of 18,615 litres of water per year or more than \$50 on the average water bill.⁵⁰

2014 water/wastewater charges

CHARGES	2012	2013	2014	CHANGE
WATER VOLUME – \$/CUBIC METRE (m ³)	\$1.30	\$1.38	\$1.43	\$0.05
WATER BASIC – \$/day	\$0.22	\$0.24	\$0.25	\$0.01
WASTEWATER VOLUME – \$/CUBIC METRE (m ³)	\$1.41	\$1.52	\$1.59	\$0.07
WASTEWATER BASIC – \$/day	\$0.30	\$0.31	\$0.31	\$0.00

The average residential annual bill (based on 200 m³ consumption, the estimated annual volume consumed by a family of 3) will go up by \$27 or 3.5%.⁵¹

Based on a household size of three people, Guelph's average household water consumption is 200 m³ per year; the average residential daily water consumption is 184 litres per person. This is significantly lower than the Canadian national average of 274 litres of water per person per day and the Ontario provincial average of 225 litres per person per day. Good job, Guelph!⁵²



We've taken great strides to meet our city's water needs, but there's lots left to do.⁵³

In May 2009, Guelph City Council endorsed an update to the City's Water Conservation and Efficiency Strategy. This new strategy's goal is to reduce Guelph's total water usage by 10,600,000 litres per day by 2025 and to reduce total residential water use by 5,035,000 litres per day by 2025.⁵⁴

55

per year.⁵⁶

If we each decrease our water use by another 17 litres per day by 2019, we'll meet our community goal. That's only 2 litres per person,

HOW WE CAN MAKE IT EVEN BETTER

KNOW HOW MUCH YOU'RE USING

DRIPS AND LEAKS

TAPS

FLUSHING THE TOILET

SHOWERS AND BATHS

WASHING CLOTHES

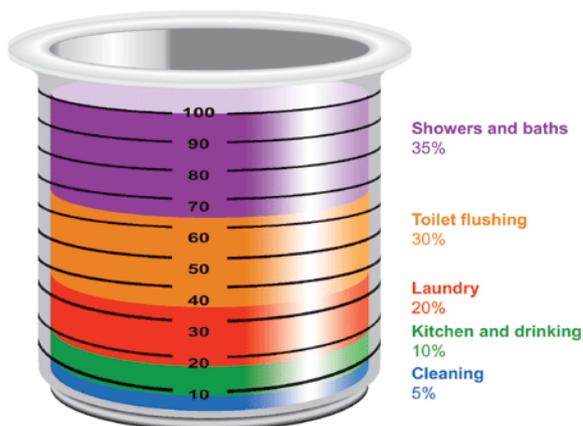
KITCHEN

OUTDOOR USE

KNOW HOW MUCH YOU'RE USING

The first step is to identify where you use water in the home. After this has been identified you need to decide on what to do to reduce the amount of water used, either by eliminating wasteful practices and habits, or by improving the efficiency of water-using fixtures and devices.

Water use in the home



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Water can be conserved through consumption reduction or maintenance and repair. Reducing the consumption of water can be carried out through a number of ways including turning off water taps when brushing your teeth, adjusting load size settings on washing machines, and taking shorter showers. The repair and maintenance of faucets, toilets and other sources of water will greatly contribute to conserving water.

ACTIVITY

Use a daily water usage calculator help get an idea of your water habits and their total impacts:

- <http://www.cbc.ca/pei/features/watercalculator/>

- <http://www.csgnetwork.com/waterusagecalc.html>

READING YOUR WATER BILL

Most homes in Guelph are billed for their water usage through Guelph Hydro. In some cases, water may not be metered individually, like in condominiums, some rental homes, and apartments.

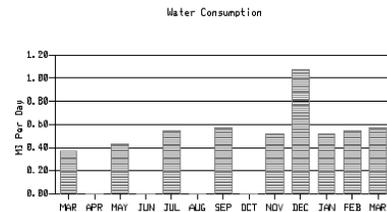
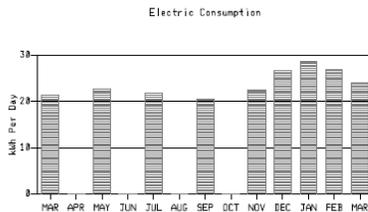
Water is measured in cubic metres. Guelph charges for both potable (drinkable) water used, and for the water that is discharged to the sewage system, as both these systems have different costs to run and maintain.

Your bill will show you how much water you have used, in cubic metres (m³), as well as have a graph that compares your average daily use to previous months' (billing periods) use. This way you can see which season you use more water in, and gauge progress from year to year.

 Guelph Hydro Electric Systems Inc.	395 Southgate Drive Guelph, Ontario N1G 4Y1 Office Hours 8:00 AM to 4:30 PM Monday to Friday	Tel: (519) 822-3010 Fax: (519) 822-0960 Website: WWW.GUELPHHYDRO.COM																																				
	Your Bill																																					
<table> <tr> <td>Amount of last bill</td> <td>\$199.39</td> </tr> <tr> <td>Payments</td> <td>\$199.00-</td> </tr> <tr> <td>Adjustments</td> <td>\$.00</td> </tr> <tr> <td>Balance forward (If already paid please disregard)</td> <td>\$.39</td> </tr> </table>		Amount of last bill	\$199.39	Payments	\$199.00-	Adjustments	\$.00	Balance forward (If already paid please disregard)	\$.39	<table> <tr> <td>Account Number:</td> <td></td> </tr> <tr> <td>Service Address:</td> <td></td> </tr> <tr> <td>Billing Date:</td> <td>MAR 27, 2014</td> </tr> </table>	Account Number:		Service Address:		Billing Date:	MAR 27, 2014																						
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<table> <tr> <td colspan="2">Your Electricity Charges</td> </tr> <tr> <td>TOU OnPeak Winter 126.90kWh @ 12.9¢/kWh</td> <td>\$16.37</td> </tr> <tr> <td>TOU MidPeak Winter 110.04kWh @ 10.9¢/kWh</td> <td>\$11.99</td> </tr> <tr> <td>TOU OffPeak Winter 439.21kWh @ 7.2¢/kWh</td> <td>\$31.62</td> </tr> <tr> <td>Delivery</td> <td>\$36.63</td> </tr> <tr> <td>Regulatory Charges</td> <td>\$4.10</td> </tr> <tr> <td>Debt Retirement Charge</td> <td>\$4.73</td> </tr> <tr> <td>Your Total Electricity Charges</td> <td>\$105.44</td> </tr> <tr> <td colspan="2">HST (Registration number 89120 8613 RT0001)</td> </tr> <tr> <td></td> <td>\$13.71</td> </tr> <tr> <td colspan="2">Water Charges: City Water Dept. 837-5627</td> </tr> <tr> <td>Water Basic</td> <td>\$7.00</td> </tr> <tr> <td>Water Consumption 16.00 M3 @ 143.00 ¢/M3</td> <td>\$22.88</td> </tr> <tr> <td>Waste Water Basic</td> <td>\$8.68</td> </tr> <tr> <td>Wastewater Treatment 16.00 M3 @ 159.00 ¢/M3</td> <td>\$25.44</td> </tr> <tr> <td>Total Water Charges</td> <td>\$64.00</td> </tr> <tr> <td>Total current charges</td> <td>\$183.15</td> </tr> <tr> <td>Sub total</td> <td>\$183.54</td> </tr> </table>		Your Electricity Charges		TOU OnPeak Winter 126.90kWh @ 12.9¢/kWh	\$16.37	TOU MidPeak Winter 110.04kWh @ 10.9¢/kWh	\$11.99	TOU OffPeak Winter 439.21kWh @ 7.2¢/kWh	\$31.62	Delivery	\$36.63	Regulatory Charges	\$4.10	Debt Retirement Charge	\$4.73	Your Total Electricity Charges	\$105.44	HST (Registration number 89120 8613 RT0001)			\$13.71	Water Charges: City Water Dept. 837-5627		Water Basic	\$7.00	Water Consumption 16.00 M3 @ 143.00 ¢/M3	\$22.88	Waste Water Basic	\$8.68	Wastewater Treatment 16.00 M3 @ 159.00 ¢/M3	\$25.44	Total Water Charges	\$64.00	Total current charges	\$183.15	Sub total	\$183.54	<p align="center">Conservation Message</p> <p>CONSERVATION TIPS To help keep the heat inside your home close your drapes and blinds at night, and make sure your draperies and furniture are not blocking the registers throughout your home.</p> <p>Effective March 31, 2014, Paymentus will no longer accept VISA credit card payments. MasterCard credit card payments will still be accepted. For a complete list of options to pay your bill, please visit the "Payments" page on our website at www.guelphhydro.com. Please review our Conditions of Service for more information on the annual reconciliation for Equal Payment Plan (EPP). The Independent Electricity System Operator (IESO) has released Ontario's System-Wide Electricity Supply Mix data for 2013. To see the supply mix chart please visit our website at www.guelphhydro.com.</p> <p>LATE PAYMENT CHARGES</p>
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Metering Information

Service	Billing Period	Days	Meter #	Multiplier	Units	Current Reading	Previous Reading	Metered Consumption	Adjustment Factor	Adjusted Consumption	
Electric	2/11/14	3/11/14	28	GH132744	1.0000	KWH	27031.67	26355.50	.00	1.0209	.00
Electric	2/11/14	3/11/14	28	GH132744	1.0000	10N	.00	.00	126.90	1.0209	129.55
Electric	2/11/14	3/11/14	28	GH132744	1.0000	2MID	.00	.00	110.04	1.0209	112.33
Electric	2/11/14	3/11/14	28	GH132744	1.0000	3OFF	.00	.00	439.21	1.0209	448.38
Water	2/10/14	3/10/14	28	WT54509	1.0000	M3	649.00	633.00	16.00	1.0000	16.00



Explanation of electricity terms on your bill

DRIPS AND LEAKS**DETECTING LEAKS**

You can also use your water meter (commonly located in the basement) to detect leaks directly. Most meters will have a small symbol that will slowly turn if there is a flow running through the meter.

Photos showing the variety of meter types and the symbol to look for are found here:

<http://guelph.ca/wp-content/uploads/WaterMetersinGuelph.pdf>



1. Ensure no water is being used in the home and look to see if the meter is moving at all. If it is, it means there is water actively leaking somewhere.

2. To detect a slow leak, record your meter at the end of the day and then again the next morning. If the water meter shows usage overnight, when no water was used, there is a slow leak somewhere in your house.

Low Flow Water Indicator

FIXING LEAKS

A tap with a steady drip can waste up to 55 litres of water in just 24 hours. If not looked after, it could add up to 20,075 litres per year.⁵⁸ You can fix some faucets by opening the faucet or handle and replacing a washer, but if you have more complex faucets, it can be best to have a plumber repair it if you don't have the right tools.

Toilets are among the most common sources of leaks. A toilet that continues to run after flushing, if the leak is large enough, can waste up to 200,000 litres of water in a single year! You could take 4 full baths per day with that water. A common source of toilet leaks is the flapper. The flapper is the device inside the tank that opens when you push the flush handle to allow water to run into the bowl.⁵⁹

To test for flapper leaks, or other leaks between the tank and the bowl, drop a leak detector tablet (supplied by Guelph Hydro or eMERGE Guelph) or a few drops of coloured food dye into the tank; wait 15 minutes. If the coloured dye has seeped into the water in the bowl, without having flushed the toilet, there is a leak. You can find simple instructional videos to learn how to fix leaks, like this one: "How to Fix a Toilet - Flapper Valve Replacement" <https://www.youtube.com/watch?v=3W3u2O1dZws>

ACTIVITY: FIXING LEAKS

In going through this checklist, you may find things that you are already doing. If you aren't, give some honest thought as to what is keeping you from doing them, and then think about how you can change this before deciding on your pledge in the last column.

- Test your toilets for leaks.

I do this!
<ul style="list-style-type: none"> • Yes _____ • No _____

Why not?
<ul style="list-style-type: none"> • •

I will do this!
<ul style="list-style-type: none"> • Yes _____ • No _____

- Fix any toilet leaks

I do this!
<ul style="list-style-type: none"> • Yes _____ • No _____

Why not?
<ul style="list-style-type: none"> • •

I will do this!
<ul style="list-style-type: none"> • Yes _____ • No _____

- Repair any leaky or dripping faucets.

I do this!
<ul style="list-style-type: none"> • Yes _____ • No _____

Why not?
<ul style="list-style-type: none"> • •

I will do this!
<ul style="list-style-type: none"> • Yes _____ • No _____

TAPS

Taps can add up to be a significant user of water, both from how they are built, and from how we use them. You can control the flow of water coming out of the tap by installing an aerator on the faucet that will reduce wasted water by 25-50%. A faucet with a rating of less than 8.5 litres per minute (2.25 gpm) is considered to be water efficient and meets the requirements of the plumbing code of Ontario.⁶⁰ eMERGE Guelph can supply free aerators for bathroom and kitchen faucets through the Efficient Home Visit program. They are also available at most hardware stores, like Home Depot or Canadian Tire. They usually cost between \$5 and \$12 before tax.

ACTIVITY: TAPS

In going through this checklist, you may find things that you are already doing. If you aren't, give some honest thought as to what is keeping you from doing them, and then think about how you can change this before deciding on your pledge in the last column.

- Turn off the water while brushing teeth or shaving

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> • Yes _____ • No _____ 	<ul style="list-style-type: none"> • _____ • _____ 	<ul style="list-style-type: none"> • Yes _____ • No _____

- Install aerators on bathroom faucets

I did this!	Why not?	I will do this!
<ul style="list-style-type: none"> • Yes _____ • No _____ 	<ul style="list-style-type: none"> • _____ • _____ 	<ul style="list-style-type: none"> • Yes _____ • No _____

FLUSHING THE TOILET

Older toilets can consume 18 litres of water per flush. Assuming 4 flushes per person per day, this translates into nearly 30,000 litres of clean, fresh water per year just to get rid of 650 litres of body waste. A high-efficiency 6 litre flush toilet only uses about 10,000 litres to do the same task.⁶¹ High-efficiency toilets are available for around \$160 at most plumbing supply stores. Dual flush toilets are more likely to be \$239 and up. Dual flush toilets use the same as high-efficiency toilets on the "full" (solid waste) flush, and only half that on the "half" (liquid waste) flush.

If a new toilet is not in your financial future, there are many toilet devices that can be installed in an existing toilet to reduce water usage in a flush cycle:

1. Water retention devices (toilet dams)
2. Water displacement devices (plastic bottle filled with rocks; toilet tank banks)

3. Alternate flushing devices (dual-flush converters)⁶²

If you choose to install a device, make sure it is compatible with your current toilet flushing mechanism. For example, most dual flush converter kits are designed to work with compact fill valves, not the older diaphragm or plunger type fill valves (also known as ballcocks).

Compact fill valve



Plunger or diaphragm fill valves



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Also, only use displacement and retention devices in older toilets that use more than 13 litres per flush, as with modern high-efficiency toilets they can impact performance, and may cause people to use multiple flushes – cancelling out your water savings!⁶⁴ Never use a porous, heavy item like a brick – it can damage your toilet.

Toilet Dam



Displacement device

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REPLACING AN OLD INEFFICIENT TOILET

Look for a new toilet with a high Maximum Performance (MaP) score⁶⁶, which indicates flushing performance. The higher the MaP, the more grams of waste the toilet can remove in one flush. Initiated in 2003 by municipalities and other interested organizations in Canada, the Maximum Performance (MaP) Testing program was a cooperative effort between Canadian and

American municipalities and water agencies. If you install a new WaterSense-approved high-efficiency toilet, be sure to review the requirements for the Royal Flush Rebate from the City of Guelph to get

receive a \$75 rebate for up to two old, inefficient toilets. Commercial facilities and multi-residential buildings can also apply for \$75 rebates. guelph.ca/royalflush

ACTIVITY: TOILETS

In going through this checklist, you may find things that you are already doing. If you aren't, give some honest thought as to what is keeping you from doing them, and then think about how you can change this before deciding on your pledge in the last column.

- Install a toilet dam to reduce water use in an existing toilet

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> • Yes _____ • No _____ 	<ul style="list-style-type: none"> • _____ • _____ 	<ul style="list-style-type: none"> • Yes _____ • No _____

- Place an item (water bottle filled with rocks; toilet tank bank; toilet tummy) in tank of existing toilet(s) to displace water

I did this!	Why not?	I will do this!
<ul style="list-style-type: none"> • Yes _____ • No _____ 	<ul style="list-style-type: none"> • _____ • _____ 	<ul style="list-style-type: none"> • Yes _____ • No _____

- Convert your existing toilet(s) to a dual-flush toilets.

I did this!	Why not?	I will do this!
<ul style="list-style-type: none"> • Yes _____ • No _____ 	<ul style="list-style-type: none"> • _____ • _____ 	<ul style="list-style-type: none"> • Yes _____ • No _____

- Install high-efficiency toilets

I did this!	Why not?	I will do this!
<ul style="list-style-type: none"> • Yes _____ • No _____ 	<ul style="list-style-type: none"> • _____ • _____ 	<ul style="list-style-type: none"> • Yes _____ • No _____

SHOWERS AND BATHS

Short showers use less water than baths, however, limiting the time spent in the shower to around 5 minutes will further conserve water.⁶⁷ If you prefer baths, fill the tub only one-quarter full for regular bathing. Using WaterSense® labeled showerheads ensures that what you are using is water-efficient (i.e. the product has passed independent testing, achieving water savings without sacrificing quality in use).

Standard showerheads have efficiency ratings ranging from 2.5 to 4.5 gpm (9.5 to 17 litres per minute).⁶⁸ A high-efficiency showerhead will have a rating of 1.5 to 2.0 gallons per minute (5.7 to 7.6 litres per minute).⁶⁹ A high-efficiency (HE) showerhead (costs start around \$10) can reduce water waste by half and still provide proper shower performance, and is available at most hardware stores. You can get free HE showerheads as part of the eMERGE Guelph Home Visit. You can also get specialty models online at places like: <http://www.conservationmart.com/>

ACTIVITY: SHOWERS AND BATHS

In going through this checklist, you may find things that you are already doing. If you aren't, give some honest thought as to what is keeping you from doing them, and then think about how you can change this before deciding on your pledge in the last column.

- Take shorter showers – aim for 5 minutes

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> • Yes _____ • No _____ 	<ul style="list-style-type: none"> • _____ • _____ 	<ul style="list-style-type: none"> • Yes _____ • No _____

- Take smaller baths

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> • Yes _____ • No _____ 	<ul style="list-style-type: none"> • _____ • _____ 	<ul style="list-style-type: none"> • Yes _____ • No _____

- Install high-efficiency showerheads

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> • Yes _____ • No _____ 	<ul style="list-style-type: none"> • _____ • _____ 	<ul style="list-style-type: none"> • Yes _____ • No _____

WASHING CLOTHES

Use Energy Star products for washing machines. New washing machines can be up to 50% more water efficient than older top-loading models. Depending on how efficient a home's washing machine is, about 20% of a home's water use is due to laundry. Replacing your old machine can qualify you for a \$100 rebate from the City of Guelph through the Smart Wash program, guelph.ca/smartwash.

ACTIVITY: WASHING CLOTHES

In going through this checklist, you may find things that you are already doing. If you aren't, give some honest thought as to what is keeping you from doing them, and then think about how you can change this before deciding on your pledge in the last column.

- Replace your washing machine with a high-efficiency (Energy Star) model.

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

KITCHEN

Hand washing a full load of dishes actually uses more water than using a dishwasher! Replacing your old dishwasher with an ENERGY STAR® model can save even more in water and energy than a standard dishwasher.⁷⁰ Scrape dishes instead of rinsing before putting them into the dishwasher. Newer dishwashers have been designed to eliminate the need for pre-rinsing.

ACTIVITY: KITCHEN

In going through this checklist, you may find things that you are already doing. If you aren't, give some honest thought as to what is keeping you from doing them, and then think about how you can change this before deciding on your pledge in the last column.

- Wash produce in the sink or a container rather than running water

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

- Keep a container of water in the fridge rather than running the tap for cold water

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

- Turn off the water while hand-washing dishes

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

- Replace your dishwasher with a high-efficiency model

I did this!	Why not?	I will do this!
<ul style="list-style-type: none"> • Yes _____ • No _____ 	<ul style="list-style-type: none"> • _____ • _____ 	<ul style="list-style-type: none"> • Yes _____ • No _____

OUTDOORS

While lawns require a lot of water, much of this water is wasted -- lost due to over-watering and evaporation.

Watering equipment also plays a part in how much water is saved and lost. Sprinklers should be suited to the size and shape of the lawn. That way, you avoid watering driveways and sidewalks. Install timers on outdoor faucets. Models run from \$15 for a simple timer to around \$80 for more complex system.

Sprinklers that lay water down in a flat pattern are better than oscillating sprinklers which lose 50% of what they draw from your pipes through evaporation. Drip irrigation systems which apply water only to the roots zone are the most efficient alternative. Simple soaker or drip hoses are \$20-25 for 75-100'.

The water you use to water your lawn doesn't have to come out of a tap. A cistern, which captures and stores rainwater, can be used as a source of irrigation water. A rain barrel can adequately fulfil this function.

Finally, consider a low-maintenance landscape, called xeriscaping, one which requires little more water than nature provides.

ACTIVITY: OUTDOORS

In going through this checklist, you may find things that you are already doing. If you aren't, give some honest thought as to what is keeping you from doing them, and then think about how you can change this before deciding on your pledge in the last column.

- Wash vehicles in a car wash or with a pail (not a hose)

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> • Yes _____ • No _____ 	<ul style="list-style-type: none"> • _____ • _____ 	<ul style="list-style-type: none"> • Yes _____ • No _____

- Use rain barrels to collect rainwater and water your garden or lawn

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

- Water lawns in morning and evening to avoid evaporation losses

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

- Fix leaks in hoses and irrigation systems

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

- Use lawn moisture sensors to control irrigation systems

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

- Plant drought-tolerant plants in gardens

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

- Replace your lawn or part of your lawn with drought-tolerant native plants (xeriscaping)

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

OUR DECISIONS

Go back through your ideas, find the things you said you will do, and “SMARTify” them. Do this both for individuals, and find things that the group can commit to together. Remember to think “SMART” – **S**pecific, **M**easurable, **A**chievable, **R**esults-oriented and **T**ime-delimited. Also, break down big goals into smaller, SMART steps.

EXAMPLES

Non-SMART: “Take shorter showers” → SMARTification → “I will bring a timer into the bathroom with me the next time I shower to see how long I take, then aim for 1 minute less the next time.”

- Non-SMART: “Replace your dishwasher with a high-efficiency model” → SMARTification →
 - “1 – Price 3 new dishwashers by the end of this week.
 - 2 – Research installation requirements the following week.
 - 3 – Choose a contractor and book installation by end of month.”

MEMBERS

GROUP

RESOURCES AND FURTHER READING

WATER IN THE HOME

Fixing Leaks

<http://guelph.ca/living/environment/water/water-conservation/fix-a-leak/>

[|Toilet Devices](#)

<http://eartheasy.com/toilet-tank-bank>

Guide to Energy Star Products in Canada (Natural Resources Canada)

<http://oee.nrcan.gc.ca/residential/10759>

Watersense Program

<http://www.epa.gov/watersense/>

Watersense Toilets

http://www.epa.gov/WaterSense/docs/het_suppstat508.pdf

Outdoor Tap Timers

<http://www.burkesbackyard.com.au/factsheets/Around-the-House/Tap-Timers/969>

Rainwater Harvesting System Rebate Program

guelph.ca/rainwater

Greywater Reuse Pilot Program

guelph.ca/greywater

GETTING AROUND

CHAPTER STARTING NOTES

By the end of this session, you will know:

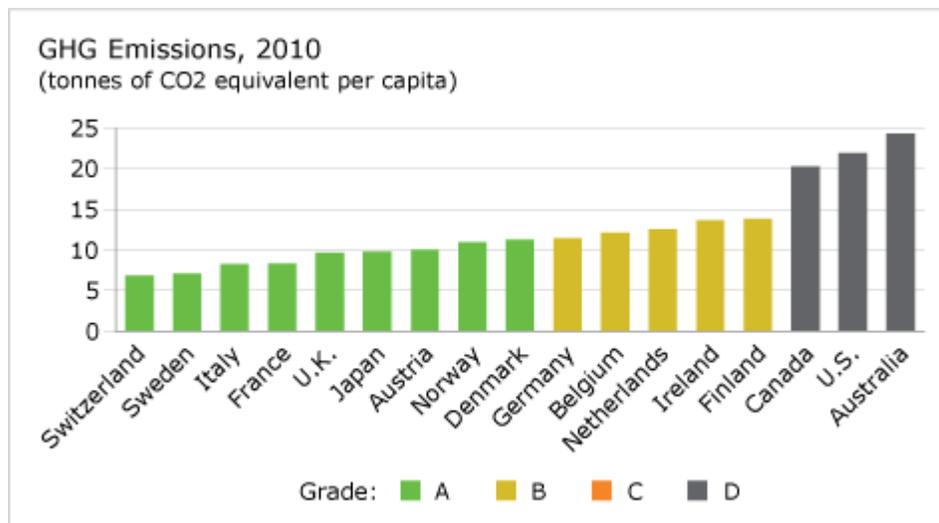
- How much households contribute to greenhouse gas emissions
- How to tap into local resources to shift to active transportation

BACKGROUND

CANADA

Transportation is a major source of both air pollution (e.g., smog) and climate-disrupting greenhouse gas (GHG) emissions, expressed as tonnes of carbon dioxide, or CO₂. Excessive GHG emissions contribute to climate change.

Globally, Canada produces approximately 2% of the world's greenhouse gas emissions. However, per capita, we are one of the most "intense" producers of GHGs. That is, the average person in Canada is the cause of more CO₂ than the average person in, for example, Denmark.



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Households contribute to greenhouse gas (GHG) emissions in Canada in two ways.

Direct (produced then-and-there) emissions from motor fuel use and residential fuel use account for about one-third of household emissions, while indirect (created during the production of the item) emissions from the goods and services that households consume make up the remainder.

Together, direct and indirect household emissions accounted for 46% of Canada's total GHG emissions in 2004.⁷² This means that households can have a large impact when choosing to make reductions in their environmental impact, and indeed, have. Between 1990 and 2004, household GHG emissions intensity decreased by 22%.

About 13% of Canada's carbon dioxide emissions are attributed to the use of cars and light trucks.⁷³ While the average household's emissions from motor fuel use increased by 29% between 1990 and 2004, recent fuel economy regulations will help reverse the trend.

The fuel economy of new passenger vehicles is projected to improve from 7.9 L/100km in 2010 to 6.0 L/100km in 2020 and to 5.0 L/100km by 2025. Likewise, emissions from freight are expected to decrease as a result of various federal, provincial and territorial programs. The recently announced Heavy Duty vehicle regulations will improve the average fuel efficiency of trucks from 2.5 litres/100 tonne-km to 2.1 litres/100 tonne-km by 2020. That means it requires 2.1 litres of fuel for one tonne of goods to travel 100 kilometres".

TRANSIT

Census data between 1996 and 2006 show a slight increase in the proportion of commuters using public transit as their main mode of travel to work – from 10% to 11% in that decade⁷⁴.

In 2007, 68% of Canadian households reported having access to public transit within five minutes of their home. 15% of households used public transit regularly as one of their main modes of transportation to work.⁷⁵

ONTARIO

The major highways in Ontario range from 45,000 to 177,000 vehicles per hour.⁷⁶ In some areas of Toronto, the count can reach as high as 450,000. The installation of high-occupancy vehicle lanes (HOV) lanes has eased this traffic snarl somewhat: highways 403 and 404 showed increases in carpooling rates ranging from 15 to 26% points.⁷⁷

Ontarians have the capacity to make a big difference in reducing emissions. Private vehicles in Ontario emitted 22,384 kilotonnes (kt) of GHGs from the combustion of gasoline and diesel in 2007, the highest of all the provinces. Quebec, Alberta and British Columbia followed with 12,274 kt, 7,073 kt, and 6,802 kt respectively. Prince Edward Island had the lowest emissions, at 251 kt.

GUELPH

The City of Guelph's Community Energy Initiative (CEI) was developed in 2007. Its target is to reduce both the energy consumption and GHG emissions in Guelph by 50% from 2005 levels by the year 2031. More specifically, the initiative aims to reduce transportation energy use by 25% through urban

planning, efficient vehicle technologies, and alternative transportation.⁷⁸ In 2031 we would be producing less greenhouse gas per capita than the current global average.

Guelph's Cycling Master Plan aims to triple city-wide bicycle use by improving the cycling network, enhancing road safety, and fostering a better understanding among cyclists and motorists about sharing the road.⁷⁹ The City of Guelph's Transportation Demand Management program also reviews development plans to ensure new construction is pedestrian, transit and bike-friendly.

According to the Guelph Wellington Transportation Survey, 35% of the respondents indicated a willingness to use transit for travel in general.⁸⁰

HOW WE CAN MAKE IT EVEN BETTER

The following actions will help us reduce CO₂ emissions. In your team, have a brief chat about each item and then decide which ones you want to tackle and when. Record your own action plan in "Our Decisions" on the page at the end of this section.

The options for minimizing CO₂ emissions in order of most impact, are:

FLYING - can you take the bus to a close location instead of flying?

CAR - can you upgrade your car or improve your driving to reduce CO₂ emissions?

CARSHARE - can you reduce your household's vehicle ownership by joining a local carshare service?

CARPOOL - can you and your family take one car to your destination? What about neighbours or colleagues?

PUBLIC TRANSPORT - will taking transit free up travel time you can use for reading or work?

BIKE/WALK - Use your commute or errand trips to stay active and healthy.

FLYING

Cost: Med

\$ Saved: High

Effort: Med

CO₂ Saved: High

Flying is a huge contributor to our carbon footprint. Emissions are high and an upper-atmosphere phenomenon called "radiative forcing" magnifies their effect. One short flight between Toronto and New York City would result in 4% of our annual target emissions (the current global average of about 5 tonnes/capita/year).

The decision to fly or use other modes is often based on the time spent travelling and cost. Plan ahead and research how long it takes via train, bus or car instead of plane.

CARBON OFFSETS

Carbon offsets either invest in technologies that reduce our reliance on fossil fuels, or help capture existing carbon dioxide. Look for Gold Standard to ensure high quality, environmentally-assessed projects. Otherwise you risk supporting ineffective and less reputable projects. The David Suzuki Foundation has a detailed consumer guide to carbon offsets, available here:

<http://www.davidsuzuki.org/publications/resources/2009/purchasing-carbon-offsets/>

ACTIVITY: FLYING

- Drive, take the bus or train instead of flying to close-by locations (ex. Ottawa, Montreal, New York)

I do this!
•Yes _____
•No _____

Why not?
•
•

I will do this!
•Yes _____
•No _____

- Conduct conference calls via Skype instead of physically flying to location for a brief meeting

I do this!
•Yes _____
•No _____

Why not?
•
•

I will do this!
•Yes _____
•No _____

- Buy carbon offsets to mitigate your flight's impacts

I do this!
•Yes _____
•No _____

Why not?
•
•

I will do this!
•Yes _____
•No _____

CAR

Cost: None

\$ Saved: Low-Med

Effort: Low

CO₂ Saved: Low-Med

Since the average car emits 1 tonne of carbon dioxide every 5,000 km, driving can account for up to half your personal GHG emissions. A poorly tuned vehicle can double your emissions and use considerably more gasoline. And cars are costly: the average Canadian family spends at least \$9,000 a year per car. We have lots of opportunity to reduce both emissions and costs.

ACTIVITY: DRIVING

In going through this checklist, you may find things that you are already doing. If you aren't, give some honest thought as to what is keeping you from doing them, and then think about how you can change this before deciding on your pledge in the last column.

- Drive more efficiently: avoid excessive braking/accelerating and keep a steady pace (as per the speed limit)

I do this!
•Yes _____
•No _____

Why not?
•
•

I will do this!
•Yes _____
•No _____

- Avoid idling over a minute, even in cold temperatures

I do this!
•Yes _____
•No _____

Why not?
•
•

I will do this!
•Yes _____
•No _____

- Travel light: every extra 100 pounds reduces fuel efficiency by up to 2%

I do this!
•Yes _____
•No _____

Why not?
•
•

I will do this!
•Yes _____
•No _____

- Use cruise control on flat surfaces - highways and some parts of city limits

I do this!
•Yes _____
•No _____

Why not?
•
•

I will do this!
•Yes _____
•No _____

- Open up a window instead of using air conditioning if you're going 60km or under

I do this!
•Yes _____
•No _____

Why not?
•
•

I will do this!
•Yes _____
•No _____

- Avoid unnecessary short trips where you could walk or bike instead

I do this!
•Yes _____
•No _____

Why not?
•
•

I will do this!
•Yes _____
•No _____

- Get regular tune ups: tire pressure, motor oil, air filter and other general vehicle maintenance

I do this!	Why not?	I will do this!
•Yes _____ •No _____	• •	•Yes _____ •No _____

- Use a fuel consumption display; you get instant feedback on fuel use (Scanguage is a good model to use)

I do this!	Why not?	I will do this!
•Yes _____ •No _____	• •	•Yes _____ •No _____

- Use alternative fuels e.g., ethanol, bioethanol, biodiesel (see Resources for locations)

I do this!	Why not?	I will do this!
•Yes _____ •No _____	• •	•Yes _____ •No _____

- Switch to 2 wheels, such as motorcycle, scooter or bicycle

I do this!	Why not?	I will do this!
•Yes _____ •No _____	• •	•Yes _____ •No _____

- Buy a fuel efficient car (See resources for NRCan's fuel efficiency database)

I did this!	Why not?	I will do this!
•Yes _____ •No _____	• •	•Yes _____ •No _____

CARPOOLING AND CARSHARING

Cost: Low

\$ Saved: Low - High

Effort: Med

CO₂ Saved: Med

Carpooling reduces carbon dioxide emissions. Check with co-workers and neighbours for timing and routes similar to yours. Online sites such as carpool.ca, carpooltool.com, carpoolworld.com, and even kijiji can help find matches. Ask your employer if there is an internal ride-matching service; larger companies often offer this service.

Carshares, co-ops that jointly own vehicles, can cut your transportation bill. Members pay a small monthly administration fee to cover fixed costs. When they use a car, they pay low fees by the hour or kilometre. See the resources section for some local carshares.

ACTIVITY: CARPOOLING

- Organize carpooling with family and neighbours during week days

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

- Join a carpooling organization (ideas listed in Resources)

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

- Organize carpooling with friends when going to the same place together

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

ACTIVITY: CARSHARING

- Reduce the number of household cars to 1.

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

- Research local carshare options.

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

- Join a carshare.

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

PUBLIC TRANSPORT

Cost: Low	\$ Saved: Low-Med	Effort: Low	CO₂ Saved: Med
------------------	--------------------------	--------------------	----------------------------------

Using public transit is easier than ever with Google maps and Nextbus schedules. If you have a smartphone, check out Guelph Transit apps for Google Maps and Nextbus. Guelph’s buses offer lower prices for students, seniors and others with limited income as well as a convenient monthly pass for regular bus users. A book of tickets is cheaper per trip than cash fares.

The Go Train can be handy for Toronto commuters. Greyhound bus is also an economical and flexible option for inter-city travel. Via Rail from Guelph connects to Canada-wide trains in Toronto.

ACTIVITY: PUBLIC TRANSPORT

- Take the bus to work every day

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

- Take the bus when going to Toronto and other nearby cities for errands and small vacations

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

- Take the bus or train to other destinations around Ontario

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

BIKE RIDING/ WALKING

Cost: None

\$ Saved: Low-Med

Effort: Med-High

CO₂ Saved: High

Biking and walking are not only GHG emission-free but also good for your physical and mental health. And cheap – no insurance or gas. Biking just takes a bit more time than driving but you can combine it with the bus. Install baskets, proper lighting and a comfortable seat for shopping or commuting.

ACTIVITY: BIKING/WALKING

- Join active school travel (details in Resources)

I do this!
•Yes _____
•No _____

Why not?
•
•

I will do this!
•Yes _____
•No _____

- Try to bike/walk to work/school at least once a week

I do this!
•Yes _____
•No _____

Why not?
•
•

I will do this!
•Yes _____
•No _____

- Optimize your bike for your comfort

I do this!
•Yes _____
•No _____

Why not?
•
•

I will do this!
•Yes _____
•No _____

- Walk to closer destinations

I do this!
•Yes _____
•No _____

Why not?
•
•

I will do this!
•Yes _____
•No _____

- Bike/walk around the city for leisure and to go for short errands/trips, like to go to the bank or for coffee.

I do this!
•Yes _____
•No _____

Why not?
•
•

I will do this!
•Yes _____
•No _____

- Work with your landlord to get a bike rack for your building

I do this!
•Yes _____ •No _____

Why not?
• •

I will do this!
•Yes _____ •No _____

OUR DECISIONS

Now that you are full of ideas of what to do next and how to do it, write down what each member plans to work on, and any group commitments you feel would be comfortable next steps. Remember to think “SMART” – **S**pecific, **M**easurable, **A**chievable, **R**esults-oriented and **T**ime-delimited. Also, break down big goals into smaller, SMART steps.

EXAMPLES

Non-SMART: “Take the bus to work” → SMARTification → “For the month of February, I will take the bus 2 days of every week.”

- Non-SMART: “Start biking” → SMARTification →
 - “1 – look up a bike before Monday.
 - 2 – visit a bike store by Friday.
 - 3 – buy a bike by next Monday.
 - 4 - look up bike trails by next Thursday.
 - 5 - take a bike ride by next Sunday.”

MEMBERS

GROUP

RESOURCES

ACTIVE AND SAFE SCHOOL TRAVEL

<http://www.saferoutestoschool.ca/getting-started%E2%80%A6>

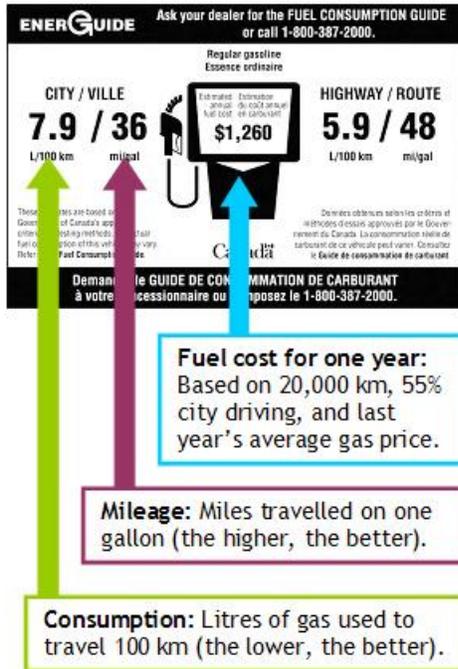
Active School Travel is Green Communities Canada's response to the growing need to create more walkable/bikeable communities for personal and ecosystem health. The initiative refers to any form of transportation that requires physical activity to get to school. It is encouraged through Active and Safe Routes to School activities such as International Walk to School (IWALK) Month in October, Walk / Wheel On Wednesdays or Walk Once a Week, Winter Walk Day, Spring into Spring, the IWALK Club and the Walking School Bus. When whole communities embrace the active school travel concept and combine it with the School Travel Planning process of devising a school-based Transportation Plan, regular active transportation to school becomes a feasible choice for a greater number of children.

The Centre for Sustainable Transportation produced *The Child and Youth Friendly Land Use and Transport Planning Guidelines for Ontario* to help municipal/school board planners encourage active transport for all ages. Parents can find out if their child's school has a School Travel Plan by speaking to the principal. ASRTS develops plans for up to 6 elementary schools in the Wellington-Dufferin-Guelph region each year.

BUYING FUEL EFFICIENT CARS

Size matters. In 2013, the a compact model cost an estimated \$1,692 a year for gas, while a mid-size model cost around \$1,942, and a crossover \$2,075.⁸¹ Choosing a compact car can save on average \$383.

The Government of Canada's official Energy Guide Label allows valid comparisons. Ask your car dealer to show you the label and talk you through it.



Research first: NRCAN offers many resources for current and past models of cars and light trucks.

Most efficient 2014 models

<http://www.nrcan.gc.ca/energy/efficiency/transportation/cars-light-trucks/buying/7479>

Past Fuel Consumption Guides

<http://www.nrcan.gc.ca/energy/efficiency/transportation/cars-light-trucks/buying/7487>

<http://www.ecodriver.org/pages/BuyingAFuelEfficientCar.php>

NEW TECHNOLOGIES

A hybrid car, by storing energy that is normally lost while braking, can reduce both fuel and carbon dioxide emissions by as much as 37% below that of equivalent gasoline-only vehicles.

E3fleet is a Canadian program that helps public and private sector fleets of vehicles meet green standards for performance.

Fuel for a Light Electric Vehicles (e.g. electric bikes and scooters) costs 7.8 cents per 100 kilometers.

Examine savings for buying hybrid cars: <http://www.e3fleet.com/about.html>

- <http://www.mto.gov.on.ca/english/dandv/vehicle/electric/electric-vehicles.shtml>

- For more information about the benefits of hybrid/electric vehicles please see:
<http://www.mto.gov.on.ca/english/dandv/vehicle/electric/plan-greener-ontario/ev-pub-en-june-2011.pdf>

INCENTIVE PROGRAMS

Electric vehicles have been recognized as something vital for the future of Canada and the plan for a greener Ontario. The Ontario Ministry of Transportation has an incentive program towards the purchase or lease of a new plug-in hybrid electric or battery electric vehicle. The rebates are based on the retail sales tax. The EV incentive program applies to new, highway capable, plug-in hybrid eligible electric vehicles (PHEVs) or battery electric vehicles (BEVs) [12]. The value of the incentive is based on the vehicle's battery capacity and ranges from \$5000 for a 4kWh battery to \$8500 for a 17kWh battery. The value of the incentive for leased vehicles is scaled to the term of the lease.

- EV Incentive program:
[http://www.forms.ssb.gov.on.ca/mbs/ssb/forms/ssbforms.nsf/GetFileAttach/023-2096E~3/\\$File/2096E_Guide.pdf](http://www.forms.ssb.gov.on.ca/mbs/ssb/forms/ssbforms.nsf/GetFileAttach/023-2096E~3/$File/2096E_Guide.pdf)
- The application form for the incentive program is found here:
[http://www.forms.ssb.gov.on.ca/mbs/ssb/forms/ssbforms.nsf/GetFileAttach/023-2096E~1/\\$File/2096E.pdf](http://www.forms.ssb.gov.on.ca/mbs/ssb/forms/ssbforms.nsf/GetFileAttach/023-2096E~1/$File/2096E.pdf)
- www.Plugndriveontario.ca

OTHER VEHICLE EMISSION INFORMATION

- National Inventory Report. Environment Canada (2010).
http://www.ec.gc.ca/publications/A91164E0-7CEB-4D61-841C-BEA8BAA223F9%5CExecutive-Summary-2012_WEB-v3.pdf
- <http://www.mto.gov.on.ca/english/dandv/vehicle/electric/plan-greener-ontario/many-benefits.shtml>
- <http://www.mto.gov.on.ca/english/dandv/vehicle/electric/plan-greener-ontario/index.shtml>

ALTERNATIVE FUELS

Biodiesel – Available at B100 fueling station at Ignatius Jesuit Centre

Biodiesel – Available through Everpure Biodiesel Coop <http://www.everpurebiod.ca/>

Biodiesel - <http://www.rothsaybiodiesel.ca/> - No retail sales.

FLYING HABITS

- Flight emissions calculator: <http://www.travelnav.com/flight-emissions/>

- http://environment.about.com/od/greenlivingdesign/a/fly_vs_drive.htm
- Other carbon footprint calculator: <http://www.carbonify.com/carbon-calculator.htm>
- <http://www.davidsuzuki.org/issues/climate-change/science/climate-change-basics/air-travel-and-climate-change/>
- Buying carbon offsets
 - climatecare.org
 - <http://www.davidsuzuki.org/publications/resources/2009/purchasing-carbon-offsets/>

DRIVING HABITS

- <http://www.ecodriver.org/downloads/EcoDriverFuelEffDrivingTips.pdf>
- Tips for fuel efficient driving: <http://www.ecodriver.org/pages/Fuel-EfficientDriving.php>
- Buying a fuel efficient car:
<http://www.ecodriver.org/downloads/EcoDriverBuyFuelEffVehicle.pdf>

CARPOOLING AND CARSHARING

- <http://communitycarshare.ca/>
- <http://www.carsharing.net/where.html>
- <http://autosshare.com/>
- http://www.coopscanada.coop/assets/firefly/files/files/Microsoft_Word_-_CAR_SHARING_REPORT_FINAL.pdf
- http://www.ontario.coop/edirectory/grand_river_carshare
- <http://communitycarshare.ca/grandriver/about-carshare/other-carsharing-organizations/>
- http://guelph.ca/uploads/ET_Group/engineering/GWTS_chapter4.pdf
- <http://www.tc.gc.ca/eng/programs/environment-ecomobility-projects-ridehome-eng-614.htm>

PUBLIC TRANSIT

- <http://www.gotransit.com/>
- <http://guelphtransit.ca>
- <https://www.greyhound.ca>

CYCLING

Guelph Cycling map:

- <http://guelph.ca/bike>

Guelph Area Trails for Tourism: <http://guelphtrails.blogspot.ca/>

Transportation Plans

- Guelph's Cycling Master Plan
<http://guelph.ca/plans-and-strategies/cycling-master-plan-bicycle-friendly-guelph/>

- Guelph-Wellington Transportation Master Plan:
<https://guelph.ca/wp-content/uploads/GuelphWellingtonTransportationStudy.pdf>
- Wellington County Active Transportation Plan
<http://www.wellington.ca/en/business/resources/ExecutiveSummary-September2012.pdf>
- Guelph cycling programs and organizations:
<http://guelph.ca/living.cfm?itemid=78472&smocid=2562>

Biking shops:

<https://www.google.ca/search?q=list+of+Bike+shops+in+Guelph&aq=f&oq=list+of+Bike+shops+in+Guelph&aqs=chrome.0.57j0l3.28870&sourceid=chrome&ie=UTF-8>

More bike shops:

http://www.manta.com/world/North+America/Canada/Ontario/Guelph/sporting_goods_stores_and_bicycle_shops--B63AD/

Local Food: Eat Well, Be Well

CHAPTER STARTING NOTES

By the end of this session, you will know:

- Which organic foods to prioritize
- How to find local food and work it into your regular life

BACKGROUND

GUELPH-WELLINGTON'S LOCAL FOOD SYSTEMS

Wellington County has a strong local farming sector framed by a rich agricultural history and with a large consumer market nearby. Adding strength to the sector is the history of working with the University of Guelph, the Ontario Ministry of Agriculture and Food, the Wellington Federation of Agriculture, and commodity partners. Wellington County represents 4.5% of the farms in Ontario and 8% of dairy, hog, and poultry operations. Out of the ten counties in Western Ontario, Wellington County has the 4th largest vegetable growing region and 6th largest fruit growing region. ⁸²

The food producing and processing industry as well as the market for fresh, quality local food products has been steadily growing in Guelph. As of December 2010, 62 food manufacturers existed in Wellington County and Guelph. Local organizations such as the Workforce Planning Board, FarmStart, and Taste Real have been working to expand the local food system in Wellington County. ⁸³

Wellington's agricultural labour force has been experiencing a 16% increase in growth since 2006 where food services and drinking places increased by 2.4% in Wellington and Guelph between June 2009 and June 2010.

Taste Real (formerly the Guelph-Wellington Local Food group) provides leadership for local food businesses through networking, promotion, and events in order to help citizens and business procure local food in a sustainable manner. Since 2005, Taste Real has worked with many community partners including farmers, government, non-profit organizations, businesses and other stakeholders to highlight the benefits of local and create a prosperous local food system.

In 2011 Taste Real received funding from the Greenbelt Fund. With support from the Ontario government, the Greenbelt Fund is helping to increase the amount of Ontario food served in daycares, schools, universities and colleges, hospitals and long-term care facilities through the Broader Public Sector Investment Fund: Promoting Ontario Food.

Guelph and its surrounding regions have been lacking in ethnic diversity of food within the agri-industry; Wellington County farmers show potential in cultivating such ethnic crops such as okra, Chinese hot peppers, and Asian eggplant based on its regular growing seasons.

Provincially speaking, Ontario has not been a leading province for food innovation. The past 10 years, Ontario's food sector has been experiencing growths of 2-3%, with a diverse range of foods consisting of over 200 agricultural commodities. Yet Ontario's direction towards major multinational food companies operating in Ontario like Campbell Soup Company, Coca-Cola Company (Minute Maid), Kellogg Company, Kraft Foods Inc., Maple Leaf Foods Inc., Cadbury Schweppes plc, The Hershey Company and H.J. Heinz Company among others has impacted Ontario's food sector through a variety of unsustainable factors for health, environment and corporate rationalization.⁸⁴

A CLOSER LOOK AT SUPERMARKETS

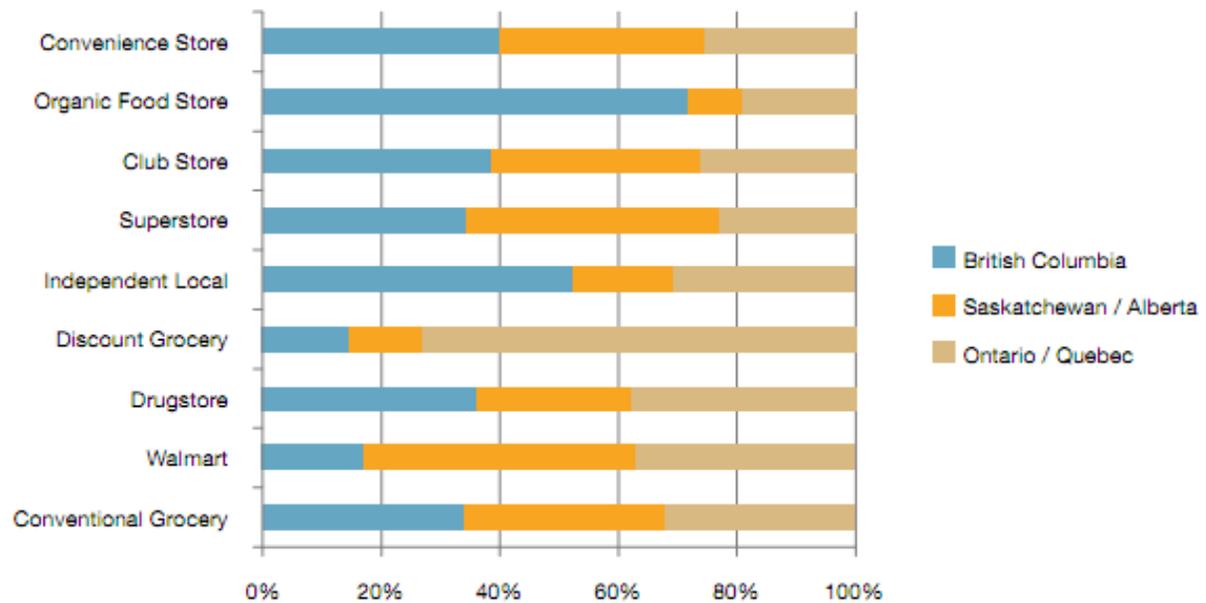
In 2010, the number one manufacturing industry in Canada was the food and beverage processing industry. Canadian households spent nearly 10% of their budget purchasing food in stores.⁸⁵ The 3 largest retailers are:

1. Loblaw Company Limited (\$31 billion revenue)
2. Sobeys Inc. (\$15.5 billion revenue)
3. Metro Inc. (\$11.3 billion revenue for stores in Ontario and Quebec)

Grocery sales statistics in Ontario: http://www.omafra.gov.on.ca/english/stats/food/food_ind.htm

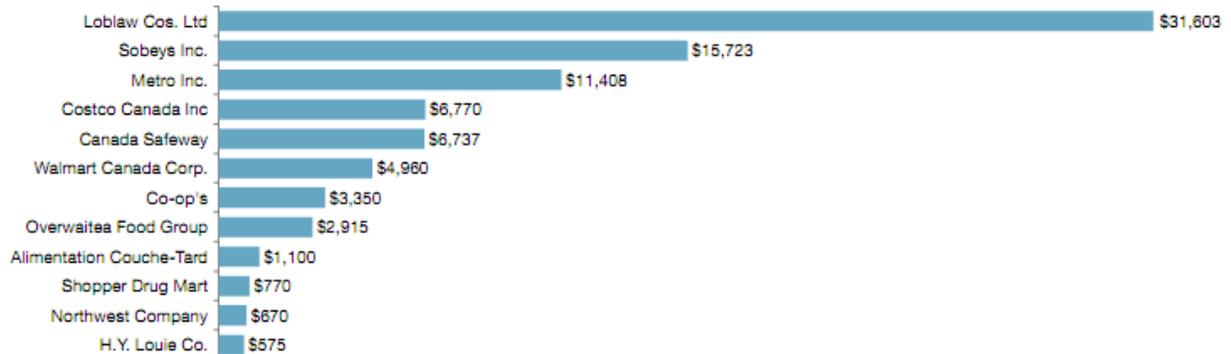
In Canada, 60% of food sales are made at supermarket chains.

Regional Grocery Trends by Shopping by Channel.



Source: Fresh Intelligence, 2009 Annual Grocer Survey

Top Canadian Food Retailers 2010 (\$ millions).



Source: CIBC World Markets, Estimated 2010 Food Sales

LOCAL FOOD BUSINESSES

Mapleton's Organic is an example of an Ontario (Moorefield) farm that began in the early 1980s that functioned based on a chemical-pesticide system of use within the artificial-fertilizer industry. The farm transformed itself into an organic farm for the niche market of organic ice creams and yogurts made with fresh local ingredients. After attracting media attention, their market expanded to areas

where there is more consumer demand for organic products. Companies like Mapleton’s have allowed Ontarians an alternative for food sources as opposed to conventional supermarket by maintaining its local roots and building closer ties between the farmer and consumer.⁸⁶

Backyard Bounty is an example of a local urban farming business in Guelph. Backyard Bounty’s goal is to increase awareness about sustainable urban gardening and organic food production. Robert Orland, the founder of Backyard Bounty, began by transforming the lawns of residents of Guelph to gardens thereby allowing the individuals of the land to grow their own food for themselves and their community.

HOW CAN WE MAKE IT EVEN BETTER?

- **BUY LOCAL, SEASONAL FOODS**
- **MINIMISE FOOD WASTE**
- **TRY ORGANIC**
- **GROW YOUR OWN**
- **CARING CARNIVORES**

BUY LOCAL, SEASONAL FOODS

The **Guelph Wellington Local Food Map** (updated annually) is a free map and directory of local businesses that feature local food including farms, markets, restaurants, caterers and many others. It can be found online at www.guelphwellingtonlocalfood.ca

The map and guide can also be picked up at Guelph and Wellington libraries, tourism outlets and select retail and business locations. The map includes a handy seasonal availability guide so that you will know exactly when your favorite fruits and vegetables are in season.

The brand “Taste Real from the Ground Up” is used to identify food from the Guelph Wellington Region.

Community Supported Agriculture is a system that directly links consumers to farmers through the upfront purchase of a share in the harvest. Most CSAs collect the full cost of the share and distribute seasonal harvest once a week throughout the growing season to consumers at local drop-off point. See the Resources section for a listing of many of the local CSAs in the Guelph-Wellington region.



ACTIVITY: BUY LOCAL, BUY SEASONAL

In going through this checklist, you may find things that you are already doing. If you aren't, give some honest thought as to what is keeping you from doing them, and then think about how you can change this before deciding on your pledge in the last column.

- Learn what foods are in season.

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> • Yes _____ • No _____ 	<ul style="list-style-type: none"> • _____ • _____ 	<ul style="list-style-type: none"> • Yes _____ • No _____

- Go to a farmer's market 1 more time per month than usual.

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> • Yes _____ • No _____ 	<ul style="list-style-type: none"> • _____ • _____ 	<ul style="list-style-type: none"> • Yes _____ • No _____

- Get a copy of the local food map.

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> • Yes _____ • No _____ 	<ul style="list-style-type: none"> • _____ • _____ 	<ul style="list-style-type: none"> • Yes _____ • No _____

- Buy directly from local farmers or from businesses that support local farmers.

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> • Yes _____ • No _____ 	<ul style="list-style-type: none"> • _____ • _____ 	<ul style="list-style-type: none"> • Yes _____ • No _____

- Join a CSA.

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> • Yes _____ • No _____ 	<ul style="list-style-type: none"> • _____ • _____ 	<ul style="list-style-type: none"> • Yes _____ • No _____

- Look for the "Taste Real" brand when selecting restaurants.

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> • Yes _____ • No _____ 	<ul style="list-style-type: none"> • _____ • _____ 	<ul style="list-style-type: none"> • Yes _____ • No _____

- Look for "Product of Ontario" before buying produce at the grocery store.

I do this!	Why not?	I will do this!
•Yes _____ •No _____	• •	•Yes _____ •No _____

- When shopping, choose local stores and products when possible.

I do this!	Why not?	I will do this!
•Yes _____ •No _____	• •	•Yes _____ •No _____

- Aim for 10% more of your purchases being local compared to your current level.

I do this!	Why not?	I will do this!
•Yes _____ •No _____	• •	•Yes _____ •No _____

MINIMIZING FOOD WASTE

Statistics Canada has found that “waste at home” contributes to 51% of Canada’s total wasted food.⁸⁷ Plan your meals ahead of time so that you don’t spontaneously purchase a head of cabbage without knowing what you’re going to do with it.

ACTIVITY: MINIMIZE FOOD WASTE

In going through this checklist, you may find things that you are already doing. If you aren’t, give some honest thought as to what is keeping you from doing them, and then think about how you can change this before deciding on your pledge in the last column.

- Avoid overbuying - buy only what you need. Make a list before shopping and stick to it.

I do this!	Why not?	I will do this!
•Yes _____ •No _____	• •	•Yes _____ •No _____

- Freeze leftovers that you don’t plan on eating in the next two days.

I do this!	Why not?	I will do this!
•Yes _____ •No _____	• •	•Yes _____ •No _____

For dealing with food scraps, see the Trimming Our Waste section on composting.

TRY ORGANIC

Organic farming prevents the use of harmful chemicals for pest control and of artificial fertilizers for the soil. Conventional agriculture produces emissions of three greenhouse gases (GHG): carbon dioxide, methane, and nitrous oxide. Carbon dioxide comes from fossil fuel combustion in farm machinery and losses in soil organic matter. Methane comes from livestock manure and ruminant animals. Nitrous oxide comes from fertilizer usage, crops and manure. All three greenhouse gases sourced from agriculture accounts for 10% of all Canadian GHG emissions.

Agriculture sector: emissions (Mt CO₂e)

Emission category	2005	2008	2010
Fuel Use	12	13	12
Other agri-sources	62	63	63
Total	74	76	75

⁸⁸

Read Labels Carefully

Greenwashing happens when a company attempts to look more ecologically friendly than they are, without supporting the claim legitimately. Look for certified organic products bearing symbols of the QAI, USDA, or Canada Organic standards. If the product uses some other label, it may not be properly certified.



The following chart shows produce that has been found to have more problems with non-organic pesticides, and those that have the least pesticide residue.⁸⁹

The Dirty Dozen (in order of contamination)

Apples
Celery
Sweet bell peppers
Peaches
Strawberries
Nectarines

The Clean 15 (in order of least contamination)

Onions
Sweet Corn
Pineapples
Avocado
Cabbage
Sweet peas

Grapes
Spinach
Lettuce
Cucumbers
Blueberries
Potatoes

Asparagus
Mangoes
Eggplant
Kiwi
Cantaloupe
Sweet potatoes
Grapefruit
Watermelon
Mushrooms

Yes but, isn't organic food more expensive?

It can be, as the processes are often more labour intensive. You don't have to buy all organic. To compromise, aim to switch some of your purchases toward organic versions.

ACTIVITY: TRY ORGANIC

In going through this checklist, you may find things that you are already doing. If you aren't, give some honest thought as to what is keeping you from doing them, and then think about how you can change this before deciding on your pledge in the last column.

- Switch at least 2 "Dirty Dozen" fruits or vegetables to organic purchases.

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

- Increase your organic purchases by 10% more than your usual.

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

GROW YOUR OWN

Growing your own food is the ultimate in local, organic eating. You know exactly what went in and on your food, and can even use your own composted food waste to complete the cycle. Although full scale

gardening isn't for everyone, even if you have a little space and enough sun, you can grow simple crops like herbs, salad greens, and container veggies. As a bonus, growing these things from seed can often be far cheaper than buying fresh from a grocery store.

Beginning a food garden instead of just ornamental flower beds can be a highly rewarding experience for those who like working outdoors. Guelph's Healthy Landscapes program has a Guide to Gardening Naturally that goes over some of the basic soil fertility and garden design steps important to know in the region. It doesn't have detailed information on vegetable gardening, but the Guelph Wellington Food Round Table has tip sheets and recommended links (see Resources, under Community Gardens).

If you don't have the space, sunlight or time to maintain your own garden, look into one of Guelph's many community gardens. Several neighbourhood groups and churches have plots, and the Ignatius Jesuit Centre also rents land for homeowners without access to their own garden space.

ACTIVITY: GROW YOUR OWN

In going through this checklist, you may find things that you are already doing. If you aren't, give some honest thought as to what is keeping you from doing them, and then think about how you can change this before deciding on your pledge in the last column.

- Learn to grow a few of your favourite vegetables and fruits.

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

- Begin a food garden.

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

- Join or start a community garden. (See Resources section for links.)

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

CARING CARNIVORES

You don't need to become a complete vegetarian or vegan, but meat production generally does have higher fossil fuel and greenhouse gas production, pound for pound, compared to produce. Eating both local and vegetarian can prove a bit of challenge, however, so striving for balance is once again a good compromise. The David Suzuki Foundation and the Union of Concerned Scientists identified eating less meat as one of the most effective environmental actions a household can take.⁹⁰

We can also make the effort to choose ethically-produced meat and animal products. Starting the conversation about where and how livestock was raised at a store quickly moves from challenging to an easy habit. The Guelph-Wellington Rural Romp, an annual self-guided farm tour, also affords community members a chance to get out and visit local farms to learn more. The Guelph-Wellington Local Food Map provides a good source of locally produced farms, which can be a good starting point for this conversation as well.

Canada has voluntary Codes of Practices around livestock and meat production, but does not have third-party verified standards or labels around ethical meat or egg production. The exceptions are the organic standards mentioned above.

LOCAL ETHICAL PIONEERS

Rowe Farms – “Quality with a Conscience”

“At Rowe Farms, being a conscientious company means treating animals with respect and dignity. All of our animals are raised in humane and low-stress environments, without the use of antibiotics or growth promoting hormones. They have open access to food and water, and eat strictly vegetarian diets.

Respect and dignity also guide us in our dealings with farmers. All our animals are raised locally, right here in Ontario by our dedicated conscientious farmers. We work in close partnership with our farmers to develop a sustainable agricultural model that is economically viable for them. In doing so we are able to keep local farmers on their land supplying our customers with healthy food. And on top of that we are legitimately able to produce a better tasting product. Our selection of meats is known for its excellent flavour and superior quality - stop by one of our retail stores to see for yourself!

Following in the tradition started by Dr. Ken Rowe in 1967, our farming team has banded together to promote conscientious farming. Our animals are raised locally, right here in Ontario by the dedicated men and women who are our conscientious farmers.

Ensuring that our farmers remain committed to our farming model is critical. In order guarantee Rowe Farms' strict environmental and animal welfare protocols are upheld. Each farm receives:

- Four annual Rowe Farms inspections
- Annual Rowe Farms audit
- Annual third party audit
- CFIA review
- Farmer signed affidavits”

ACTIVITY: CARING CARNIVORES

In going through this checklist, you may find things that you are already doing. If you aren't, give some honest thought as to what is keeping you from doing them, and then think about how you can change this before deciding on your pledge in the last column.

- Eat meat-free meals one day per week.

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

- Ask your butcher, grocery store, farmer or meat supplier how their livestock is raised.

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

- Join a meat share.

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> •Yes _____ •No _____ 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> •Yes _____ •No _____

HEALTH & COMMUNITY

Eating for a resilient, sustainable and ethical future involves more than just eating organic and local food. Diverse organizations around the world are also advocating for a right to healthy, nutritious food. Food is also a founding part of culture and community, and the Transition movement aims to strengthen community ties, both locally and internationally.

Food swaps are “part pop-up marketplace, part silent auction, all fun.” Organizing a food swap can bring us closer together as a community, allow us to share things we have made at home with others and meet cool, creative new people. They're also free. Because no money changes hands, there are no food inspections required. For more information, see <http://gofoodswap.tumblr.com/info>. Although the organizer doesn't maintain the site anymore, you can get a good idea of what's involved in a food swap.



Fair Trade is both a movement and an international standard. At its core is a commitment to increasing the economic self-sufficiency of the world's producers, especially in developing countries. Look for the Fairtrade logo on products such as sugar, coffee, chocolate, tea, fruit, honey, rice and more.

The Guelph Wellington Food Round Table is a non-profit organization in Guelph that works toward the goal of everyone in Guelph-Wellington having access to nutritious, healthy food that is produced and distributed in ways that enable local communities, food producers and natural living systems to flourish.

They work through advocacy, action, planning, education, networking and coordination, to build a thriving regional food system that is socially, economically and environmentally sustainable so that we have nourishment for everyone.

Among numerous other resources, they have developed a Food Charter for Guelph-Wellington that is a tool to show policy makers, organizations and businesses that Guelph cares about our local food systems.

ACTIVITY: HEALTH AND COMMUNITY

In going through this checklist, you may find things that you are already doing. If you aren't, give some honest thought as to what is keeping you from doing them, and then think about how you can change this before deciding on your pledge in the last column.

- Take healthy cooking classes (offered through Guelph Family Health Team, some local businesses).

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> • Yes _____ • No _____ 	<ul style="list-style-type: none"> • _____ • _____ 	<ul style="list-style-type: none"> • Yes _____ • No _____

- Cook more meals at home.

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> • Yes _____ • No _____ 	<ul style="list-style-type: none"> • _____ • _____ 	<ul style="list-style-type: none"> • Yes _____ • No _____

- When grocery shopping, try to stick to the outside perimeter, where there are fewer processed foods.

I do this!	Why not?	I will do this!
<ul style="list-style-type: none"> • Yes _____ • No _____ 	<ul style="list-style-type: none"> • _____ • _____ 	<ul style="list-style-type: none"> • Yes _____ • No _____

- Try new fruits and vegetables.

I do this!	Why not?	I will do this!
•Yes _____ •No _____	• •	•Yes _____ •No _____

- Learn how to read nutrition and ingredient labels. (See Resources for links)

I do this!	Why not?	I will do this!
•Yes _____ •No _____	• •	•Yes _____ •No _____

- Incorporate more vegetables and fruit into your weekly meals.

I do this!	Why not?	I will do this!
•Yes _____ •No _____	• •	•Yes _____ •No _____

- Start a healthy snack or lunch program at your child's school or your workplace.

I do this!	Why not?	I will do this!
•Yes _____ •No _____	• •	•Yes _____ •No _____

- Teach children how to cook healthy foods.

I do this!	Why not?	I will do this!
•Yes _____ •No _____	• •	•Yes _____ •No _____

- Eat dinner with your family more frequently.

I do this!	Why not?	I will do this!
•Yes _____ •No _____	• •	•Yes _____ •No _____

- Attend local food festivals and events.

I do this!
•Yes _____ •No _____

Why not?
• •

I will do this!
•Yes _____ •No _____

- Attend a food swap.

I do this!
•Yes _____ •No _____

Why not?
• •

I will do this!
•Yes _____ •No _____

- Buy fair trade when possible.

I do this!
•Yes _____ •No _____

Why not?
• •

I will do this!
•Yes _____ •No _____

- Sign the Guelph-Wellington Food Charter.⁹¹

I did this!
•Yes _____ •No _____

Why not?
• •

I will do this!
•Yes _____ •No _____

OUR DECISIONS

Go back through your ideas, find the things you said you will do, and “SMARTify” them. Do this both for individuals, and find things that the group can commit to together. Remember to think “SMART” – **S**pecific, **M**easurable, **A**chievable, **R**esults-oriented and **T**ime-delimited. Also, break down big goals into smaller, SMART steps.

EXAMPLES

Non-SMART: “Eat new vegetables” → SMARTification → “.”I will add one new vegetable the next time I go grocery shopping.”

- Non-SMART: “Cook more meals at home” → SMARTification →
 - “1 – I will make a weekly meal plan for next week’s meals on Sunday
 - 2 – I will go shopping after work on Monday
 - 3 – We will take turns being the lead chef and helping each on that week’s planned meals.”

MEMBERS

GROUP

RESOURCES

FINDING LOCAL FOOD

- **2012/ 2013 Guelph Wellington Local Food Map** – a free map and directory of local business that feature local food including farms, markets, restaurants, caterers and many others can be found here: <http://www.guelphwellingtonlocalfood.ca/find-local-food>
Direct link to the map:
http://www.guelphwellingtonlocalfood.ca/files/www/2012_Map/Local_Food_Map_Web_version_2012.pdf
- Ontario “Eat Local” groups divided by central, east, GTA/golden Horseshoe, North, and southwest: <http://sustainontario.com/resources/ontario-eats-local>
- The Garden Fresh Box (from Guelph Community Health Centre) <http://www.guelphchc.ca/healthy-living/food-health/garden-fresh-box>
- Slow Food: Guelph - South Ontario <http://slowfoodguelph.ca/SFGL.htm>
- Wholesale Local Food Map
http://www.guelphwellingtonlocalfood.ca/files/www/Food_Finder/WHOLESALE_copy.pdf
- Local Pick your own Farms – Southwest Ontario and other regions
 - http://www.harvestontario.com/urban_center.php?id=590
 - <http://www.pickyourown.org/canadaonsw.htm#Southwest>
 - <http://www.summerfunguide.ca/2/9/southwestern-ontario/farms-pyo-artisanal-foods-markets.html>

FARMERS’ MARKETS OF GUELPH-WELLINGTON

ABERFOYLE FARMERS' MARKET

23 Brock Road South & Wellington Rd 34, Aberfoyle
519-823-1695 or 416-888-7829
www.afma.ca

ELORA FARMERS' MARKET

Bissell Park (Summer), Grand River Raceway (Winter),
Elora
519-846-1396
www.elorafarmersmarket.com

ERIN AGRICULTURAL SOCIETY FARMERS' MARKET

190 Main St., Erin
519-833-2808
www.erinfair.ca/erin-agricultural-soicety-farmers-market

THE CORN STAND

1027 Gordon St. S (Home Hardware Plaza Kortright)
& 515 Edinburgh Rd. N (Close to Woodlawn)., Guelph
519-763-2223
www.thecornstand.ca

MINTO FARMERS' MARKET - Palmerston Location

160 William St (Palmerston Railway Museum),
Palmerston
519-338-2511 ext. 241
www.mintofarmersmarket.ca

GUELPH FARMERS' MARKET

Gordon St. at Waterloo Ave., Guelph
519-837-5628 ext. 2244
www.guelph.ca/farmersmarket

<p>MINTO FARMERS' MARKET - Harriston Location 235 Elora St. S (Harriston Motors), Harriston 519-338-2511 ex 241 www.mintofarmersmarket.ca</p>	
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TASTE REAL

- Information about Taste-Real partnerships:
http://www.guelphwellingtonlocalfood.ca/files/www/Taste_Real/2012_taste_real_Partnership_Kit.pdf
- Applications for Taste-Real Partnerships can be found here:
http://www.guelphwellingtonlocalfood.ca/files/www/Taste_Real/2012_taste_real_New_Partnership_Application.pdf
- Taste Real events:
http://www.guelphwellingtonlocalfood.ca/files/www/Taste_Real/2012_taste_real_events.pdf

GUELPH-WELLINGTON CSA FARMERS

Ontario CSA directory: <http://csafarms.ca/CSA%20farmers.htm>

Everdale Harvest Share

EVERDALE FARM & LEARNING CENTRE
5812 6th Line, Erin
519-855-4859

www.everdale.org

Whole Circle Farm CSA

WHOLE CIRCLE FARM
8786 Wellington Rd # 50 Acton ON
519-856-1384

www.wholecirclefarm.ca

reroot organic CSA

REROOT ORGANIC FARM
5642 Line 11, Harriston
519-820-1891

www.reroot.ca

Backyard Bounty

8 Islington Avenue
Guelph ON N1E 6K7
519 803 2539

www.backyardbounty.ca

COMMUNITY GARDENS

List of Community Gardens

<http://www.gwfrrt.com/working-groups/community-gardens>

Community Garden Best Practices

<http://www.gwfrrt.com/wp-content/uploads/2012/12/GWFRT-CG-Best-Practices-Toolkit.pdf>

Growing your own food

<http://www.gwfrrt.com/wp-content/uploads/2010/02/CGN-Garden-Tips-final-with-contact-info.pdf>

Food Swap

<http://gofoodswap.tumblr.com/info>

EATING HEALTHY

Ontario's Guide to Nutrition Labels

<http://www.eatrightontario.ca/en/Articles/Nutrition-Labeling/Decoding-the-Nutrition-Label.aspx>

Canada's Guide to Nutrition Labels

<http://www.healthycanadians.gc.ca/eating-nutrition/label-etiquetage/index-eng.php>

GWFR Collective Kitchen

<http://gwfrt.com/wp-content/uploads/2010/02/collective-kitchen-manual-deb2.pdf>

LEARNING MORE

The Everdale Organic Farm and Environmental Learning Centre is a place with information that deals with various issues pertaining to food systems including workshops and school programs for agri-food, farmer training and animal welfare policies. <http://everdale.org/>

Agriculture Food and the
Environment

[Ontario Environmental
Farm Plan](http://www.omafra.gov.on.ca/english/environment/efp/efp.htm)

<http://www.omafra.gov.on.ca/english/environment/efp/efp.htm>

[Organic Agriculture
Standards](http://www.tpsgc-pwgsc.gc.ca/ongc-cgsb/programme-program/normes-standards/internet/bio-org/principes-principles-eng.html)

<http://www.tpsgc-pwgsc.gc.ca/ongc-cgsb/programme-program/normes-standards/internet/bio-org/principes-principles-eng.html>

[Sustain Ontario](http://sustainontario.com/)

<http://sustainontario.com/>

Farm Organizations

[Ecological Farmers
Association of Ontario](http://www.efao.ca/)

<http://www.efao.ca/>

[National Farmers' Union](http://www.nfuontario.ca/)

<http://www.nfuontario.ca/>

[Ontario Federation of
Agriculture](http://www.ofa.on.ca/)

<http://www.ofa.on.ca/>

Ontario Soil and Crop Improvement Association <http://www.ontariosoilcrop.org/default.htm>

Food Safety

Ontrace <http://www.ontraceagrifood.com/main.cfm>

Food Security

FoodNet Ontario <http://foodnetontario.ca/wp/>

Ontario Food Security and Nutrition Network <http://www.hc-sc.gc.ca/hcs-sss/pubs/hisp-phis/ontario-food-and-security/index-eng.php>

The Ontario Healthy Communities Coalition <http://www.ohcc-ccso.ca/en/tags/community-food-security>

General Agriculture and Food

Ontario Agricultural Statistics <http://www.omafra.gov.on.ca/english/stats/welcome.html>

Agritourism in Guelph-Wellington County <http://guelph.ca/uploads/VCS/PDFs/CGTDGWVistorGuide07Rural.pdf>

Socioeconomic profile of Wellington County (June 2011) <http://www.wellington-north.com/uploads/userfiles/files/wellington%20county%20socio-%20economic%20profile%20june%202011.pdf>

WRAPPING UP AND MOVING FORWARD

THANKS FOR BEING PART OF THE TRANSITION STREETS PROGRAM!

You are wrapping up your first steps on your journey to a lower energy, higher connection lifestyle. Hopefully, you have saved money, reduced your CO₂ emissions, and lowered your household's reliance on fossil fuels.

We hope you have enjoyed getting to know your neighbours better, and enjoyed making change with the support of your fellow group members, and people in other Transition Street groups.

STAYING IN TOUCH

You've shared contact information and been seeing each other regularly – does the group agree that it is okay to keep each other posted from time to time on new ideas and events?

Although the official activities are over, do you want to keep meeting, formally or informally, in the future? Maybe the neighbourhood wants to form a new group, or just plan on an annual street party or BBQ.

ACTIVITY

Take the time now to brainstorm more social things you could do together in the future.

CREATE YOUR OWN ADVENTURE

Moving forward, are there some household or lifestyle changes that you feel you didn't get a chance to discuss within the topics offered by the Transition Streets program? That's great! You don't have to stop here. If you are eager to keep making change on your street and don't have any burning ideas, we've put together a small "Menu" of possible next steps that you may want to look into as a household or a street group.

Creating your own adventure will work better if you have a small plan, or vision, rather than just grabbing at a single event.

Remember to:

- Think about your main objectives. ("Why are we doing this?")
- Attach timelines to your plans.
- Find out about other support available.

ACTIVITY

My Next Adventure:

My goal:

When will I do this:

Who will help me:

MENU OF POSSIBLE NEXT STEPS
eMERGE Home Visits

1-hour personalized consultation on home energy, water, waste, food, transportation

Cost: Free!

Project Neutral

Online carbon footprint calculator that provides a road map to action and allows comparisons with neighbours and the broader community.

Cost: Free!

GEERS

A complete home retrofit package with no upfront cost, rebates, and trusted contractors.

Contact eMERGE to get put on the "Us first, please!" list.

Cost: varies

Guelph Wellington Time Bank

A volunteering system that exchanges skills and help, as a way of building community.

It's also a complementary currency system that uses time instead of dollars.

Cost: Free!

TG and eMERGE newsletters

Stay in touch with Transition Guelph and eMERGE by signing up for the e-newsletters. Visit the websites to find out how.

Cost: Free!

What would you like to see next?

REFLECTING ON WORKING TOGETHER

- What was my favourite activity?
- A thing I liked most:
- A thing I liked least:
- What do we want to do next?
- How has this impacted my life?

HELP US MAKE IT BETTER

- Complete the final evaluation form.

REFERENCES

- ¹ <http://www.conferenceboard.ca/hcp/details/environment/greenhouse-gas-emissions.aspx>
- ² <http://www.ieso.ca/>
- ³ http://www.ieso.ca/imoweb/media/md_newsitem.asp?newsID=6323
- ⁴ http://www.ieso.ca/imoweb/siteShared/power_system.asp
- ⁵ <http://www.energy.gov.on.ca/en/ltep/making-choices/>
- ⁶ http://www.ec.gc.ca/Publications/253AE6E6-5E73-4AFC-81B7-9CF440D5D2C5%5C793-Canada's-Emissions-Trends-2012_e_01.pdf
- ⁷ http://www.chba.ca/uploads/policy%20archive/2008/2008-09-30_03.pdf
- ⁸ http://guelph.ca/wp-content/uploads/report_energyUse-GreenhouseGasEmissions_2010.pdf
- ⁹ http://guelph.ca/wp-content/uploads/report_communityEnergyInitiative.pdf
- ¹⁰ http://www.guelphhydro.com/en/residential/resources/Guelph_2011_Annual_CDM_Report.pdf
- ¹¹ <http://www.bluelineinnovations.com/documents/pr-ceati.pdf>
- ¹² http://www.bchydro.com/powersmart/residential/guides_tips/green-your-home/electronics_guide/surge_protectors.html
- ¹³ <http://standby.lbl.gov/>
- ¹⁴ Natural Resources Canada. Energy Use Data Handbook Table.
<http://oee.nrcan.gc.ca/corporate/statistics/neud/dpa/showTable.cfm?type=HB§or=aaa&juris=ca&rn=2&page=6&CFID=31085150&CFTOKEN=4ce8b2306537aae8-289BA67F-BACA-BCED-8D304679331A3AA1>
- ¹⁵ <http://www.powerauthority.on.ca/news/ontarios-chief-energy-conservation-officer-suggests-choosing-most-efficient-central-air-conditi>
- ¹⁶ <http://oee.nrcan.gc.ca/publications/residential/8668?attr=4#c>
- ¹⁷ 2006 HOUSEHOLDS AND THE ENVIRONMENT SURVEY (HES), conducted as part of the Canadian Environmental Sustainability Indicators project , referenced in <http://www.statcan.gc.ca/pub/16-002-x/2007001/article/10174-eng.htm>
- ¹⁸ Statistics Canada, WASTE MANAGEMENT INDUSTRY SURVEY: BUSINESS AND GOVERNMENT SECTORS 2008 (Ottawa: Statistics Canada, 2010), Catalogue no. 16F0023X, 8.
- ¹⁹ http://www.conferenceboard.ca/hcp/details/environment/municipal-waste-generation.aspx#_ftn3
- ²⁰ [Statistics Canada 2008 Waste Survey: Ontario](#)
- ²¹ <http://www.owma.org/Publications/OWMAReportsandPolicies/tabid/180/ctl/DisplayAttachment/mid/624/AnnotationId/9b3991b7-0bd2-e211-9cac-00155d607900/ShowOpenSaveDlg/1/Default.aspx>
- ²² <http://guelph.ca/2013/07/city-review-to-gauge-progress-and-explore-the-future-of-waste-management-in-guelph/>
- ²³ <http://www.organicgardening.com/learn-and-grow/questioning-peat-moss?page=0,1;>
<http://www.peatmoss.com/blog/environment/environmental-faq>
- ²⁴ Environment Canada <http://www.ec.gc.ca/eau-water/default.asp?lang=En&n=F25C70EC-1>
- ²⁵ Environment Canada <http://www.ec.gc.ca/eau-water/default.asp?lang=En&n=F25C70EC-1>
- ²⁶ Environment Canada <http://www.ec.gc.ca/eau-water/default.asp?lang=En&n=F25C70EC-1>
- ²⁷ Statistics Canada <http://www.statcan.gc.ca/pub/16-002-x/2008003/article/10686-eng.htm#f9>
- ²⁸ Environment Canada <http://www.ec.gc.ca/eau-water/default.asp?lang=En&n=F25C70EC-1>

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- ²⁹ Environment Canada <http://www.ec.gc.ca/eau-water/default.asp?lang=En&n=F25C70EC-1>
- ³⁰ Environment Canada <http://www.ec.gc.ca/eau-water/default.asp?lang=En&n=F25C70EC-1>
- ³¹ Environment Canada <https://www.ec.gc.ca/doc/publications/eau-water/COM1454/survey2-eng.htm>
- ³² Environment Canada <https://www.ec.gc.ca/indicateurs-indicators/default.asp?lang=en&n=7E808512-1>
- ³³ Environment Canada <http://www.ec.gc.ca/eau-water/default.asp?lang=En&n=F25C70EC-1>
- ³⁴ Environment Canada <https://www.ec.gc.ca/indicateurs-indicators/default.asp?lang=en&n=7E808512-1>
- ³⁵ Environment Canada <https://www.ec.gc.ca/indicateurs-indicators/default.asp?lang=en&n=7E808512-1>
- ³⁶ Environment Canada <https://www.ec.gc.ca/indicateurs-indicators/default.asp?lang=en&n=7E808512-1>
- ³⁷ Environment Canada <https://www.ec.gc.ca/indicateurs-indicators/default.asp?lang=en&n=7E808512-1>
- ³⁸ Ontario Ministry of the Environment. <http://www.ene.gov.on.ca/environment/en/category/water/index.htm>
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