



## **HOME ENERGY AUDIT PROGRAM**

Global Resource Efficiency Services

[www.yourhomeaudit.com](http://www.yourhomeaudit.com)

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## 1.Overview

The Home Audit Program is focused around a web based interactive web site. This is an exciting home based activity and includes information and educational resources for completing home audits, and making informed decisions on managing energy and water in homes.

The program can be delivered directly to homeowners and their community. The home audit is designed to educate users about:

- The amount of **energy** and **water** being consumed in their building;
- How much money, **energy** and **water** use is costing per month;
- What efficiency **measures** can be implemented to **reduce** consumption;
- Dollars **savings** after efficiency measures are implemented;
- The impact personal actions have on the environment by showing the amount of avoided greenhouse gases

The online activity is supported with print guides that are filled with ideas for making residences a more environmentally friendly and energy efficient place.

- Each homeowner or resident will be asked to conduct the online audit by going to the web site. Each home will have its own file and a database will track the number of occupants conducting the audit and the subsequent activities.
- After a specified period of time, an evaluation will be conducted to determine which home had the highest level of commitment and action.
- The total dollars saved and the accumulated avoided green house gases will then be calculated.
- There is also an opportunity to recruit local sponsors and provide recognition to the participants. Building competitions can also be combined with other educational events including environmental film series, speaker series, signing pledges, etc.

## **2. Home Audit Conversion Tasks**

As individuals complete the Home Audit, they are given the option of registering a commitment to reduce their energy and water consumption by undertaking certain simple lifestyle changes or basic home improvements. They are then encouraged to report back as they fulfill each of their commitments. The audit also has an administrative database that allows for the tracking of resident uptake of pledges and more. (See appendix one for details). The current GRES Home Audit is readily customizable, scalable and extendible for use in a service area.

The main tasks to be completed are:

Step 1: Conduct a needs assessment with key staff to determine what additional components are desired such as the addition of waste and transportation components. This will require the addition of new savings measures for each question added and update code to address additions of new questions. The needs assessment will also help determine the specific awareness objectives and the desired outcomes.

Step 2. Convert the formulas for energy and water units to local situation. Install new map component. (Map will be available on the login page for the users). Conversion work will include adjustments to climate zones to determine GHG values and utility costs to determine utility savings in energy units

Step 3. Customize the program to add logos and marketing styles to database. Another option can be the inclusion of actual utility data for the meter accounts.

Step 4. Translation of program from english and french.(Note: French and English versions available now)

Step 5. Beta test the new version and adjust as required. Install program onto the appropriate server.

## Appendix 1: Sample Screen Shot

**SHSC**  
**HOME AUDIT**

STEPS 1 2 3 4

Français

**GLOBE**  
GREEN LIGHT ON A BETTER ENVIRONMENT

**Occupancy and Use**

**Laundry Room**

energy  
water  
reduce  
savings  
measures  
environment

How many laundry rooms do you have in your dormitory?

What kind of lights do you have in your dormitory?  
 Incandescent  Fluorescent

Next Questions |

Laundry Room Living Room Kitchen Bedroom Bathroom

HOME | CONTACT US | UPDATE PROGRESS

## Occupancy and Use



- energy
- water
- reduce
- savings
- measures
- environment

### Kitchen



Do you have a dishwasher?

- Yes
- No

What type of setting do you normally use for the dishwasher?

- Normal
- Energy Saving
- Economy

What is the dishwasher load?

- Partial Load
- Full Load

Done



*your*

# HOME AUDIT

energy

water

reduce

savings

measures

environment

STEPS

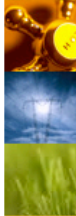
1

2

3

4

## Occupancy and Use



### Kitchen

Do you have a refrigerator?

Yes  No

When was the fridge purchased?

1970's  1980's

1990's  2000's

Do you have a second refrigerator?

Yes  No

Done

Utility Room



Living Room



Kitchen



Bedroom



Bathroom



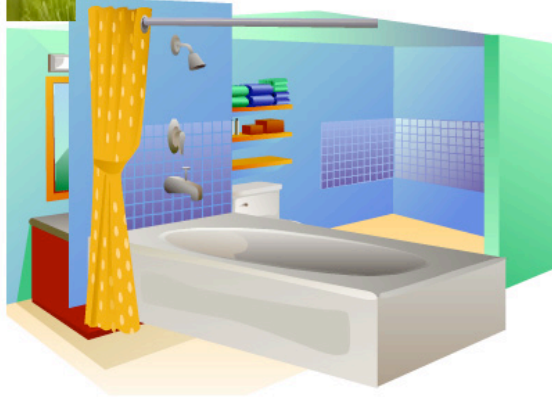
HOME | CONTACT US | SAVINGS RATINGS

## Occupancy and Use



- energy
- water
- reduce
- savings
- measures
- environment

### Bathroom



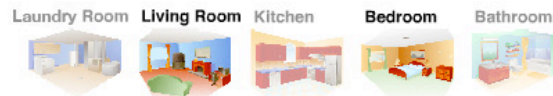
Do you take mostly showers or baths?

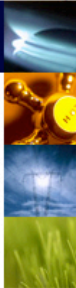
Baths  Showers

Do you have low flow showerheads?

Yes  No

Done |







## Identify Measures

- energy
- water
- reduce
- savings
- measures
- environment

Select the measures you wish to implement.

I will...	Measures	Annual Savings**	Reduction of Emissions per Year**		
Yes	No				
<input checked="" type="radio"/>	<input type="radio"/>	Replace my incandescent light bulbs with energy efficient fluorescent ones	\$45.00	450.00 kg	
<input type="radio"/>	<input checked="" type="radio"/>	Take short showers instead of baths	\$10.00	0.00 kg	
<input checked="" type="radio"/>	<input type="radio"/>	Invest in low-flow showerheads	\$20.00	0.00 kg	
		Total: \$	0	0	kg

You have selected 2 handprint(s) out of 3.

These 2 handprint(s) could reduce your annual ghg emissions by 450.00 kg and possibly save you \$65.00 per year. This would be equivalent to planting xxx trees.

By completing the selected tasks above, you will have effectively reduced your environmental footprint by xx%.

[Register Your Commitment](#) or [Continue Without Registering](#)

\* The savings shown on this page are on a per year basis.  
 \*\* The savings shown on this page are estimates only and may differ from those where you live.

## Appendix 2. Overview of the Home Audit Backend Database


Once an Administrator logs in they are greeted with an overall view of statistics. As an example, the Administrator of this site can see how many people have registered their commitment, the estimated money and emissions that could be saved per year, and the actual money and emissions saved to date. The actual money and emissions are based off what the users have checked off during a progress update. The same can be done for water.

Also on this page the Administrator can view Statistics for the past year.

your
logout

# HOME AUDIT

## ADMINISTRATION



View: Overall

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Overall Savings	# of Participants	Estimated Emissions saved per year	Estimated Money saved per year	Actual Emissions saved per year	Actual Money saved per year
Rainbow District School Board	5	12,749.00 kg	\$1,661.15	158.41 kg	\$19.35

	New Registrations	Progress Updates
Today	0	0
Past Week	0	0
Past Month	0	0
Past Year	5	1

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## Sample School view:

If the local schools decide to participate, the administrator can see how each school is doing with respect to other schools in the division. The same could be done for businesses and other institutions.

*your*

**HOME AUDIT**      **ADMINISTRATION**

 [logout](#)

View:

[Send Email](#)

Savings by School	# of participants	Estimated Emissions saved per year	Estimated Money saved per year	Actual Emissions saved per year	Actual Money saved per year
A.B. Ellis	1	2,281.65 kg	\$301.30	158.41 kg	\$19.35
Board Office	2	5,008.87 kg	\$753.85	0.00 kg	\$0.00
Long Lake	1	2,258.48 kg	\$286.00	0.00 kg	\$0.00
thevirtualschool.ca	1	3,200.00 kg	\$320.00	0.00 kg	\$0.00

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## Sample Individual view:

In this view, the stats are broken up even further to show the savings for each individual user who has partaken in the Home Audit. Clicking on the individuals name brings up a page where the Administrator can see statistics for each individual.

*your*

**HOME AUDIT** **ADMINISTRATION**

 [logout](#)

View:

[Send Email](#)

Individual Savings	School Name	Estimated Emissions saved per year	Estimated Money saved per year	Actual Emissions saved per year	Actual Money saved per year
<a href="#">ackroyd</a>	A.B. Ellis	2,281.65 kg	\$301.30	158.41 kg	\$19.35
<a href="#">mike</a>	Board Office	2,886.35 kg	\$498.00	0.00 kg	\$0.00
<a href="#">sandi</a>	Board Office	2,122.52 kg	\$255.85	0.00 kg	\$0.00
<a href="#">David</a>	Long Lake	2,258.48 kg	\$286.00	0.00 kg	\$0.00
<a href="#">Josee Courtemanche</a>	thevirtualschool.ca	3,200.00 kg	\$320.00	0.00 kg	\$0.00

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## Sample Administrator View

Finally, this section allows the administrator to see measures that the user has committed to as well as each measure that the user has actually completed to doing. This view also provides details on when they registered; last logged in to report their progress, and when the last time an email has been sent to the user.

*your* logout

**HOME AUDIT** **ADMINISTRATION**

Stats for: Test Case  
Email: [test@case.ca](mailto:test@case.ca)

Registered on: Wednesday August 30th, 2006 MDT  
Last progress update: Wednesday August 30th, 2006 MDT  
Last email sent to user: Never

Implemented	Measure	Estimated Emission Savings	Estimated Savings
✓	Replace your incandescent light bulbs with energy efficient fluorescent ones	450.00 kg	\$45.00
X	Invest in a new energy efficient fridge	500.00 kg	\$50.00
✓	Get rid of second fridge or replace it with a newer model	800.00 kg	\$80.00
X	Start using the microwave to cook foods	200.00 kg	\$20.00
X	Use the energy saving or economy setting on your dishwasher	300.00 kg	\$30.00
✓	Turn off the computer after each use	400.00 kg	\$40.00
X	Turn off the computer screen after each use	200.00 kg	\$20.00
X	Lower your thermostat temperature to a temperature of 20°C or lower	512.00 kg	\$160.00
X	Lower thermostat at night or while away	256.00 kg	\$80.00
X	Close fireplace damper after each use	153.60 kg	\$48.00

Estimated Savings: \$573.00    Actual Savings: \$165.00  
Estimated Emissions Savings: 3,771.60 kg    Actual Emissions Savings: 1,650.00 kg

[Go Back](#)

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### Appendix 3: Sample of a Data Base Conversion Task

**Window Factor** = (window pane factor) x (window area factor)

**Window Pane Factor** = [single pane => 1.23]  
[double pane => 1.00]  
[triple pane => 0.98]

**Window Area Factor** =  $1 + (\% \text{ of window} - 10) \times 0.023$

**Heating Energy Use** = (House-type EUI) x (floor area) x (heat climate factor) x fuel factor) x (**window factor**)

**Cooling Energy Use** = (House-type EUI) x (floor area) x (% AC / 100) x (cool climate factor) x (**window factor**)

E.g. A house with 2 pane windows occupying 15% of wall space. Using electric heat.

Window Area Factor =  $1 + (15 - 10) \times 0.023$

Window Pane Factor = 1.00

Window Factor =  $1.115 \times 1.0$

Heating energy use =  $(25) \times (1600 \text{ sq.ft.}) \times (1.0) \times (0.7) \times (1.115)$   
= 31,220 ekWh / year

Heating GHG emissions =  $31,220 \times 0.918$  [electricity ghg factor]  
= 28,659.96 kg CO2 per year

Tree equivalence =  $190 \text{ kg CO}_2 \text{ per year} / 28,659.96 \text{ kg CO}_2 \text{ per year}$   
= 150.84 trees

E.g. A house with 3 pane windows occupying 15% of wall space. Using electric heat.

Window Area Factor =  $1 + (15 - 10) \times 0.023$

Window Pane Factor = 1.00 (no, it should be the less than 1 value for 3 pane i.e. 0.93 as shown below)

Window Factor =  $1.115 \times 0.93$   
= 1.03695

Heating energy use =  $(25) \times (1600 \text{ sq.ft.}) \times (1.0) \times (0.7) \times (1.03695)$   
= 29,034 ekWh / year

Heating GHG emissions =  $29,034 \times 0.918$  [electricity ghg factor]  
= 26,653.76 kg CO2 per year

Tree equivalence =  $190 \text{ kg CO}_2 \text{ per year} / 26,653.76 \text{ kg CO}_2 \text{ per year}$   
= 140.28 trees planted.