

Creating your high- performance home

The Green Living Show 2009
Village Technologies

Conversation between Mary Wiens and Andy Barry: Greening up; CBC Radio April 9 2009

Andy Barry: *“The GTA has more commercial building space than any other major city in NA other than NYC”*

Mary Wiens: *“Yes, 250M ft² – it’s extraordinary. Much of it built in 50’s, 60’s, 70’s when energy was cheap, so this stuff is very energy inefficient. Our buildings have not really kept up with technological advances. It leaves us with dumb buildings.”*

AB: *“So that would make us the dumb building capital of NA. What a great new slogan!”*

MW: *“Yes. And our problem and our opportunity, as they so often are, are one in the same. The fact we have more dumb buildings than anyone else gives us the chance to become the experts in turning dumb buildings into smart buildings. We have the worst climate in the world with humid summers and cold winters, you can market that expertise around the world.*

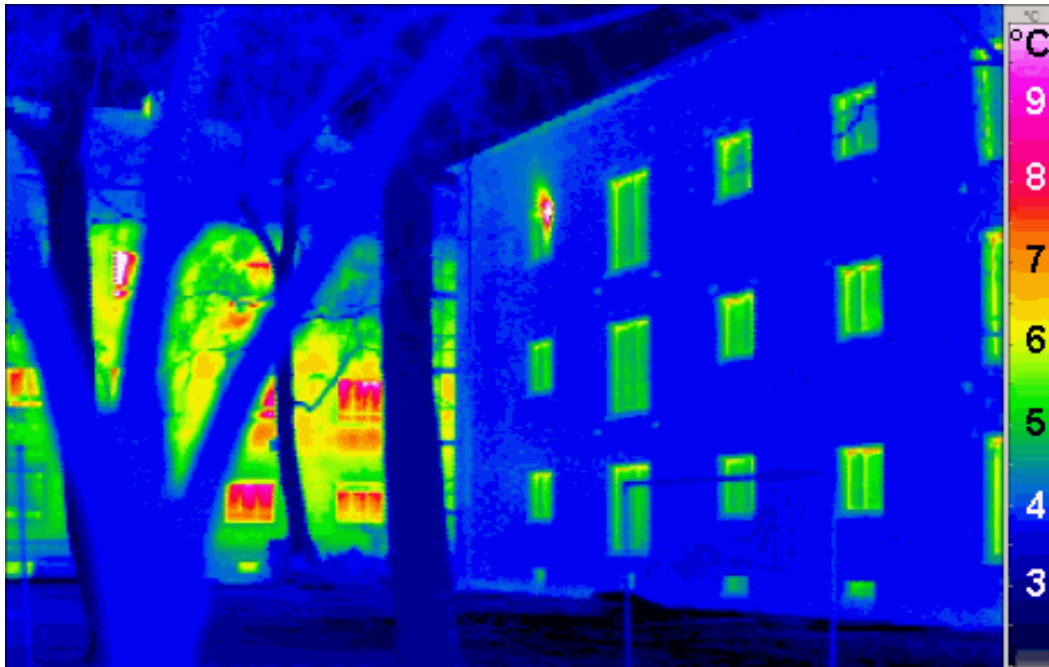
We often hear that recessions are times when economies are destroyed but also new ones built. Greening Up is that kind of story.”

We're glad this isn't your house. But it is someone's.



Thermographic image of a typical home

An alternative vision



Thermogram of a **passive house** in the foreground and a conventional building in the background.

(**Passivhaus** in German). Refers to the rigorous, voluntary, Passivhaus Standard for energy efficiency in buildings. It results in ultra-low energy use building that require little energy for heating or cooling.

The standard routinely hits efficiency targets of 90% less energy use for heating than buildings designed to meet conventional standards.

5 steps to your high performance home

5 steps to your high performance home

Step 1) Determining your objectives

5 steps to your high performance home

Step 1) Determining your objectives

Step 2) The Discovery Process

5 steps to your high performance home

Step 1) Determining your objectives

Step 2) The Discovery Process

Step 3) The Possibilities Process

5 steps to your high performance home

Step 1) Determining your objectives

Step 2) The Discovery Process

Step 3) The Possibilities Process

Step 4) Creating your plan

5 steps to your high performance home

Step 1) Determining your objectives

Step 2) The Discovery Process

Step 3) The Possibilities Process

Step 4) Creating your plan

Step 5) Moving from vision to execution

Step 1) Determining your objectives

- What are your objectives?
What's important to you?
- What is your timeline? How long will you be in your current home?

Determining your objectives and time horizon is a good way to begin shaping your plan.

The longer you intend on staying in your home, the greater the financial benefits of your plan.

Step 2) The Discovery Process

- Gather up your energy bills for the past year. Try to get two years if you can.
- Take a look at your furnace and water heater. How old are they? What efficiency level are they rated for? Conventional water heaters are generally good for 11 years. Furnaces, 15 - 20 years.
- How much are you paying in monthly rentals?
- What shape is your insulation in? Windows and Doors?

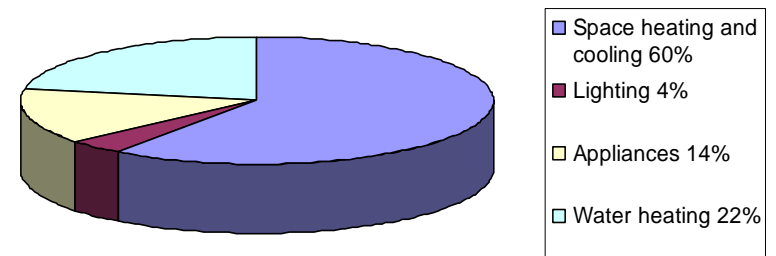
Step 2) The Discovery Process - cont'd

1) Gather up your bills and put them in a spread sheet by month.

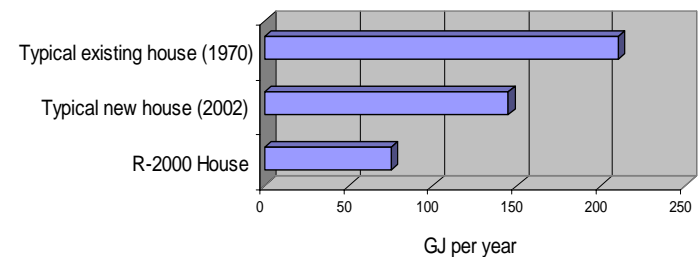
2) Itemize by month how much you are spending on electricity and natural gas. Also, itemize how much you used. Itemize electricity in kWh and natural gas in m³.

3) Using the energy profile of a “typical” Canadian home, you can begin getting a sense of how you are spending your energy dollar and what the opportunities might be.

Breakdown of residential energy use (Natural Resources Canada)



Annual Heating Consumption of Houses Constructed to Different Standards (NRCAN)



Step 3) The Possibilities Process

Book an ecoENERGY audit.

Every homeowner in Ontario qualifies for \$10,000 in federal and provincial grants for efficiency upgrades. The ecoENERGY audit costs \$350, half of which is rebated by the province.

The audit will give you more baseline information that will further inform decision making and it will register you for the grant program.

You have 18 months in which to do your work. The program is scheduled to be retired March 2011.

Details can be found on the Natural Resources Canada (NRCAN) Office of Energy Efficiency (OEE) website.

Step 3) The Possibilities Process – cont'd

Begin researching the efficiency strategies, options and technologies available to you.

Step 3) The Possibilities Process – insulation systems

Most generally, improving your insulation is the place to start.

By improving your insulation, you reduce the energy base-load of your home.

By reducing the base-load requirements of your home, you require less energy. And, when you install new heating and cooling systems, they can be smaller, thereby reducing capital costs.



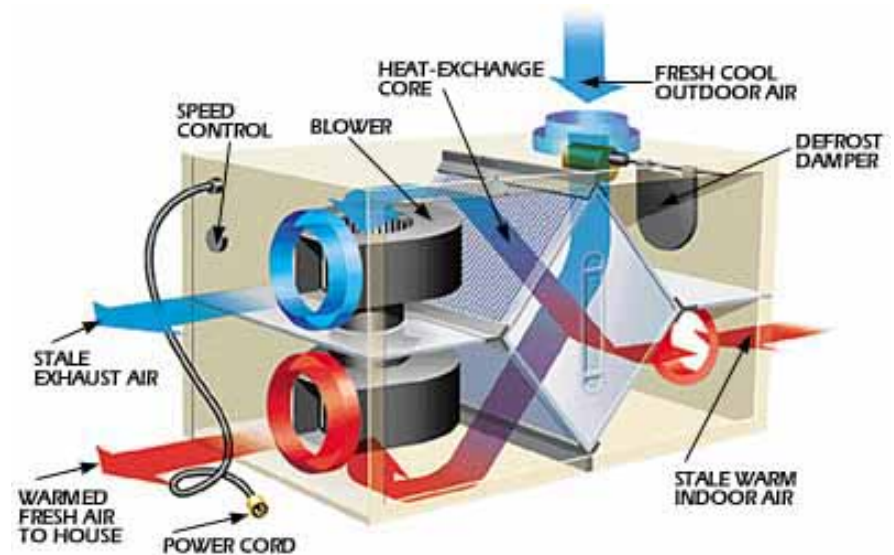
Step 3) The Possibilities Process – energy recovery ventilators and enhanced air handlers

Enhanced air treatment systems like an Energy Recovery Ventilator (ERV) can further improve energy efficiency and create a healthier home.

They are like the lungs of the house. They bring in fresh air and replace stale air.

A heat transfer core pre-treats the incoming fresh air with the outgoing stale air. By doing so, we are recycling your conditioned air in the summer and your heated air in the winter.

Budget planning figure: \$4,000



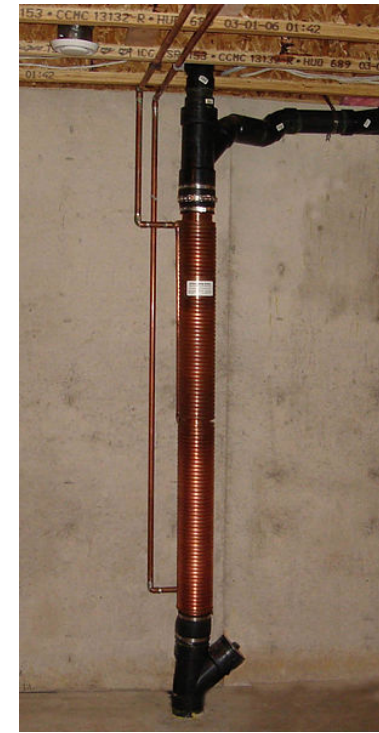
Step 3) The Possibilities Process – energy recycling with drain heat recovery

Recycling what you have already paid for is a great strategy.

Drain heat recovery systems are simple copper plumbing run that use heat exchange to recapture 60% to 70% of the heat going down you drain from things like showers. They do not re-use your water but instead capture the heat in the water.

Drain heat systems generally pay for themselves through cost savings in about 3 - 5 years.

Budget planning figure: \$1,500 installed



Drain heat recovery

Step 3) The Possibilities Process – other efficiency systems; on-demand water heating

Other efficiency systems can be readily installed into most homes to further improve efficiency.

An on-demand water heater can replace your traditional water heating tank. A traditional water heating tank acts as a 'kettle' that heats water even when you don't need it. On-demand systems only heat water when you turn on the tap. According to Enbridge, an on-demand water heater will use approximately 40% less energy than a traditional tank system.

Budget planning figure: \$3,500 installed



On-demand water heater

Step 3) The Possibilities Process – solar

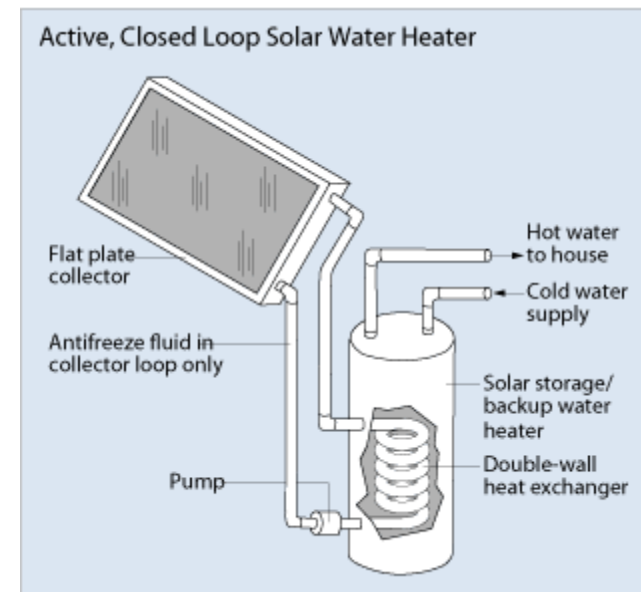
There are two types of solar technologies. One type generates electricity (photovoltaic) and the other type is used to heat things (like solar water heating). The accompanying diagrams are of a solar water heating system for a home.

A solar water heating system uses panels to pre-heat water used for showers, baths and doing the dishes so that your traditional water heating system does less work thereby reducing energy use. A solar water heating system will generate an ROI of about 9% - 13% (for a residential system).

With the new Ontario feed-in tariff, solar PV (electric) systems will generate a return of roughly 9% - 10%

Budget planning figure: Approx \$7,000 to \$8,000 for solar water heating.

Approximately \$10,000 to \$11,000 for 1 kW solar PV array.



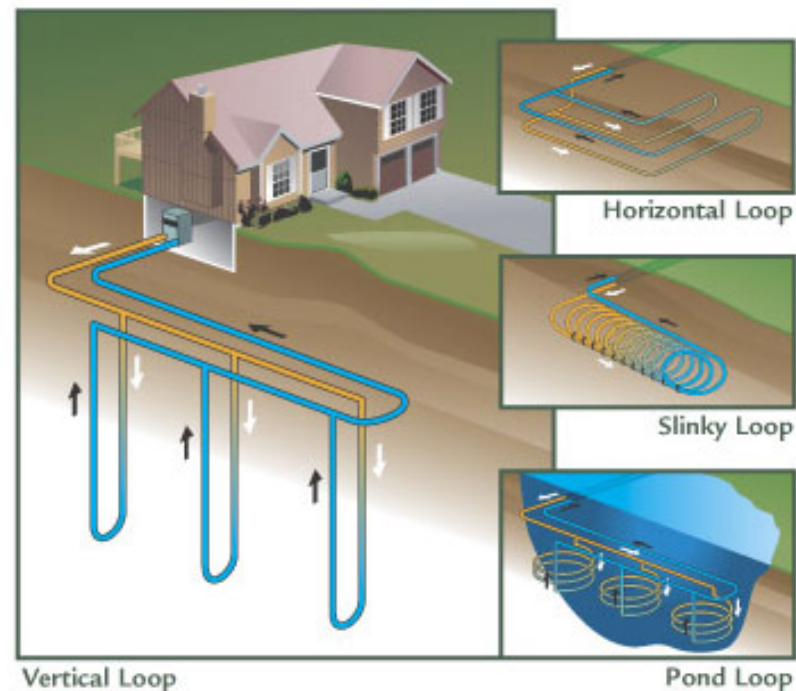
Step 3) The Possibilities Process – geothermal heating and cooling

Uses refrigerator technology (pumps, compressors and fans) to draw heat out of the ground in the winter (to heat your home) and to draw heat out of your home in the summer (cools your house like an air conditioner) and puts this heat back into the ground.

Runs on electricity and replaces your furnace, air conditioner and also provides hot water pre-heating (for showers, baths and dishwashing).

Will reduce energy costs by 50% or more forever.

Budget planning figure: \$35,000 - \$40,000 with generous grants available for retrofits.

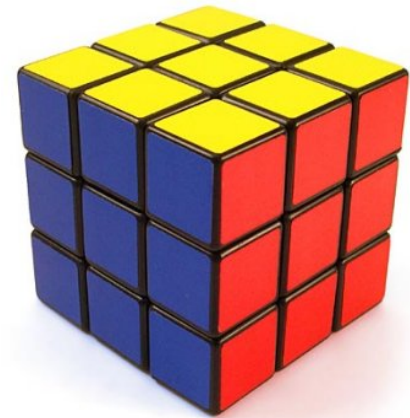
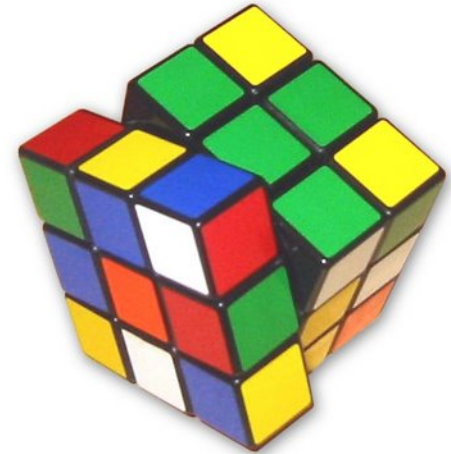


Step 4 and 5) Creating your plan and moving to execution by selecting your team

Now that you have some information, you have to create your plan.

Creating your plan is comprised of:

- Considering your objectives
- Determining your priority areas as informed by your research
- Determining your budget
- Creating scenarios
- Choosing the best scenario
- Selecting your team / contractors



Village Technologies is a high-performance building design and efficiency system integration company.

With all the various technologies available today – solar, geothermal, building controls, ventilation systems, building audits, insulation and financing solutions – we help our clients figure out this “Rubik’s Cube”. By determining the optimum combination of all the options available, we help our clients make design decisions and create their plan with an eye on getting the most out of their budget, reducing their energy costs and enhancing the comfort of their homes.

Village Technologies
743 Queen Street East
Toronto, Canada
416.465.0729
www.villagetechnologies.ca

Gabriel Draven

+

Greg Bonser

Find us at booth 2115 in the
Energy and Green Building Section
with our friends
Modus Vivendi Contracting