



Trees, animals, birds, plants, forests, mountains, lakes and rivers — everything that exists in Nature are in desperate need of our kindness, of the compassionate care and protection of human beings. If we protect them, they in turn will protect us.

- Amma

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GreenFriends is a global grassroots environmental movement which promotes environmental awareness and local participation in conservation efforts throughout the world.

GreenFriends is one of the projects of Embracing the World, a not-for-profit international collective of charities founded by internationally known spiritual and humanitarian leader, Mata Amritanandamayi (Amma)

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Saving the Earth's Resources

How To Keep Your House Warm In Winter But Use Less Energy

by Bob Freer

Part 1- Understanding the House as a System

According to the Alliance to Save Energy, the average U.S. household spent about \$2,100 on home energy in 2012. Energy use in houses accounts for about 20-30% of the total energy used in the United States. The average un-weatherized house in the U. S. leaks air at a rate equivalent to a four-foot-square hole in the wall. Weatherization provides the most benefit with the least effort and expense. By following the information in this article, you can reduce your heating bills and help save energy and reduce carbon emissions that contribute to greenhouse gases and global climate change.

The U.S. Department of Energy publishes many resources to help homeowners assess and reduce the energy use in their homes. Most of this information is applicable to any region in North America or any type of climate where heating is necessary. These resources are listed at the end of this article.

Basic Building Science

You don't have to know much about Building Science to recognize that your house is cold or drafty even though your furnace is running most of the time, but it is important to understand a few key points. As humans we've evolved from cave dwellers to occupants living in structures designed to protect us from the elements of nature.

The science of how to keep buildings comfortable has gone through a number of changes over the past century. New houses are much more energy-efficient than houses built even forty years ago. Houses are "tighter", better insulated and heating systems are more advanced. But if you live in an older, poorly insulated house, you are likely uncomfortable on cold or windy days.

In simple terms Building Science is about how to keep the cold "out" and how to keep the heat "in" during the winter season. It is also about the reverse in hot climates, but since we live in the Pacific Northwest, we'll address the need to keep warm in the winter rather than keep cool in the summer. The magic words to maintaining our house in a cold climate are "insulation", "air leakage" and "heating system".

You can have a well-insulated house, but if you also have air leaking through walls, ceilings or floors, the value of the insulation can be significantly reduced. Think: exterior doors, windows, fireplace flues, exhaust vents, heating vents in the floor or ceiling, recessed lights in top floor ceilings for areas of air leakage. When you add up all these small air leaks it can be the equivalent to having an opening anywhere from a few square inches up to the average of 4 feet square, and a lot of heat can be lost. Before we move on to air sealing, let's look at a few important factors related to heating systems.

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Heating Systems:



Most heating systems burn natural gas (or propane), furnace oil or wood. All types of furnaces, as well as gas fireplace inserts, fireplaces and wood or pellet stoves use combustion to generate the heat which in turn warms the air that is circulated around the house. For this reason it is important that the units be checked regularly by a reliable heating company. Keeping your heating system well-tuned is an important element in energy efficiency. Call your local gas (or other fuel) company for references.

Because furnaces and other appliances such as water heaters and gas stoves release carbon monoxide along with water vapor and other gases, these must be vented through a chimney or metal flue to the outdoors. Note that electric furnaces, baseboard heaters, in-wall heaters and heat pumps use electricity to create heat and are not considered combustion appliances.

Carbon Monoxide Detector:

In addition to the more common smoke detectors installed in the house, a CO Detector is important if you have a combustion furnace or any other type of combustion appliance in your house. A carbon monoxide detector will sound an alarm if there is a certain level of carbon monoxide released into the house. Utility companies recommend having one installed on each floor of the house in a hallway or common area.

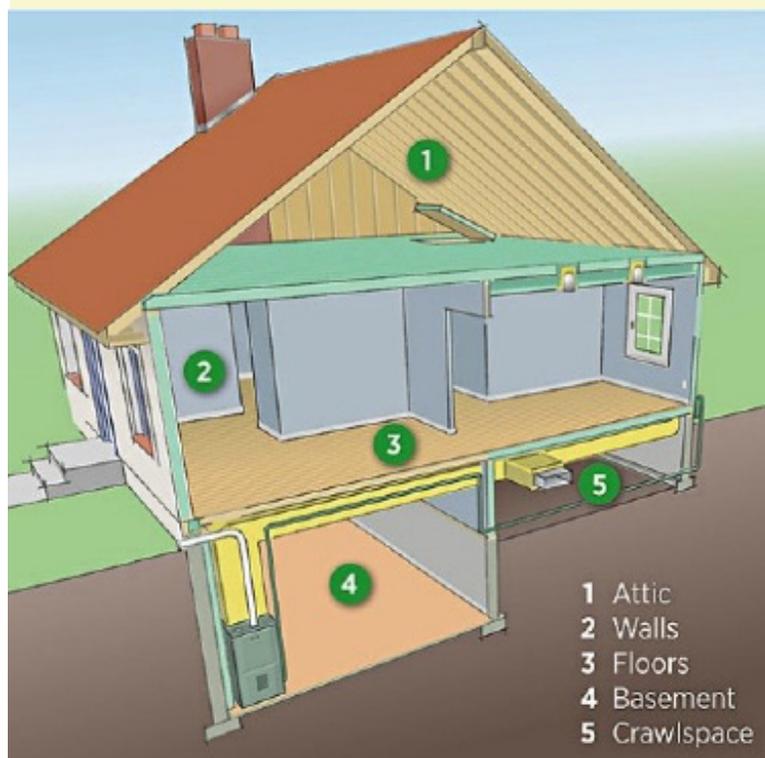
These can be purchased at most hardware stores and building supply stores. If the carbon monoxide alarm ever does go off, exit the house immediately since these alarms are set to go off when the carbon monoxide level is already at an elevated state. Mild carbon monoxide poisoning can induce nausea but at the extreme end, it can be fatal. Since carbon monoxide does not have any odor, a properly operating carbon monoxide detector is an essential safety device in any home that has any type of combustion appliance operating.

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Furnace Filters:

A decent quality filter should be installed in the furnace and replaced regularly during heating season. There is a vast array of filters these days but a good starting point is a simple pleated filter. Change the filter every 30-60 days or so depending on how dirty it is. If you are dealing with anyone in your household that has allergies or asthma, consider upgrading to a higher rated filter or have an electrostatic filter installed on the furnace-you'll need to have a heating company do this. Some people find that a small HEPA filter and ionizer are helpful in individual rooms.

Insulation:

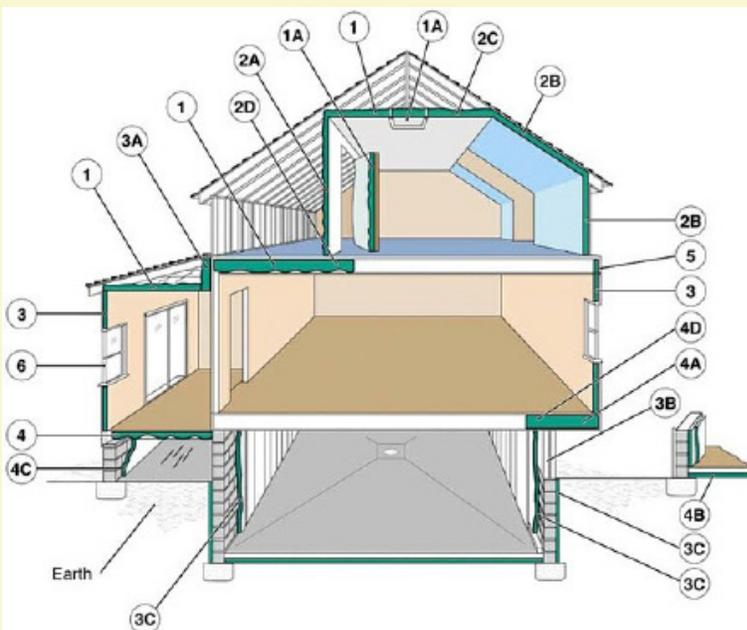


ons over a portion of the upper floor, as you can see in the diagram above, there are a lot of surface areas that need to be insulated.

Although there is some debate on which is the second or third priority of where to insulate-unfinished basement or crawlspace vs uninsulated walls, there is little doubt that adding insulation to either of these areas will improve heat retention. Keep in mind, though that controlling air leakage through cracks and openings around doors,

While the diagram gives you a general example of where to insulate, as with most things, we may initially think insulating a house is a simple matter. But, as the saying goes, "The Devil is in the Details". Here is a more detailed look at important areas that need insulation:

In general, the first priority in insulating or upgrading insulation in a home is the attic. (Remember, heat rises, so reducing heat loss through the ceilings and attic is of primary importance). In the Seattle area, the current code for insulating attics is R-49 (or about 21 inches of loose-filled insulation). If you have a partially finished attic space with knee walls, gables, bump-outs or add-



Saving the Earth's Resources (contd.)

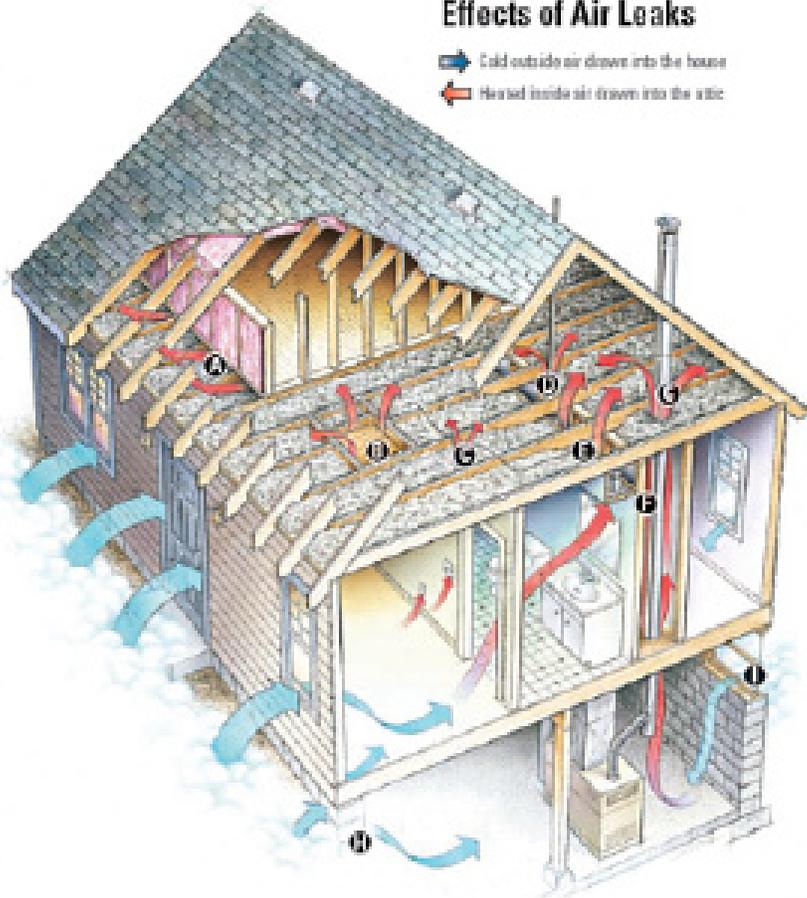
windows, recessed light fixtures, chimney flues is critical in keeping the heat indoors. Also, any house that has heating ducts located in unheated basement, crawlspace or attics should have the ducts sealed with mastic and insulated to avoid heat loss into these unheated areas.

For more details on where to insulate, visit: <http://energy.gov/energysaver/articles/where-insulate-home>

Finding and Sealing Air Leak

Effects of Air Leaks

-  Cold outside air draws into the house
-  Heated inside air draws into the attic



Common Household Air Leaks

- A** Behind Kneewalls
- B** Attic Hatch
- C** Wiring Holes
- D** Plumbing Vent
- E** Open Soffit (the box that hides recessed lights)
- F** Recessed Light
- G** Furnace Flue or Duct Chaseways (the hollow box or wall feature that hides ducts)
- H** Basement Rim Joists (where the foundation meets the wood framing)
- I** Windows and Doors

The diagram below shows the most common areas of cold air infiltration and air leakage resulting in a loss of heat in a winter heating environment.

The three primary ways that air moves in and out of your house are:

1. Wind blowing in through cracks, bringing in cold air and forcing out warm air.
2. The "stack effect" (sometimes called the "chimney effect") which results from warm air rising through cracks or openings in the upper part of the house and allows cold air to be drawn in at the lower levels of the house.

Saving the Earth's Resources (contd.)

3. Negative air pressure happens when combustion appliances such as a furnace decrease the air pressure in your house, or when air is expelled via exhaust fans or the clothes dryer.

Part 2 - Tips for Weatherizing Your House

Since this article is about keeping your house warm and using less energy, here are some quick, budget-friendly tips for making your house more comfortable and using less energy.

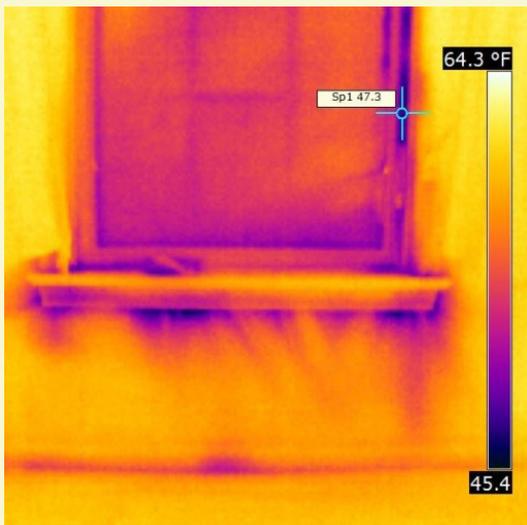
First, start by finding the air leaks in your home. To do so, here is a simple approach. Turn off your heating system for a short time, and turn on all bath and kitchen exhaust fans. Light a stick of incense and take a tour around your house, starting at the bottom level and working your way to the top. Take a piece of paper and a pen to write down some notes.

Check around your windows, doors, electrical outlets and switches, plumbing fixtures, heating vents, recessed lights, attic hatches, and other places where air may leak. You will notice that the smoke starts traveling sideways rather than upward when there is air leakage. Don't forget the obvious. If there is a loose covering over a hole in one wall, or a window that has a broken pane of glass or that doesn't close properly, then there will be air leakage in these areas.

Caulking and weather stripping will take care of the majority of your weatherizing needs. Caulk is used to permanently seal air leaks between stationary surfaces like the frame around your front door and the side of your house. (There are some removable caulks that can be used seasonally and then removed). Weather stripping is used to eliminate gaps between moving surfaces such as your front door and the door frame.

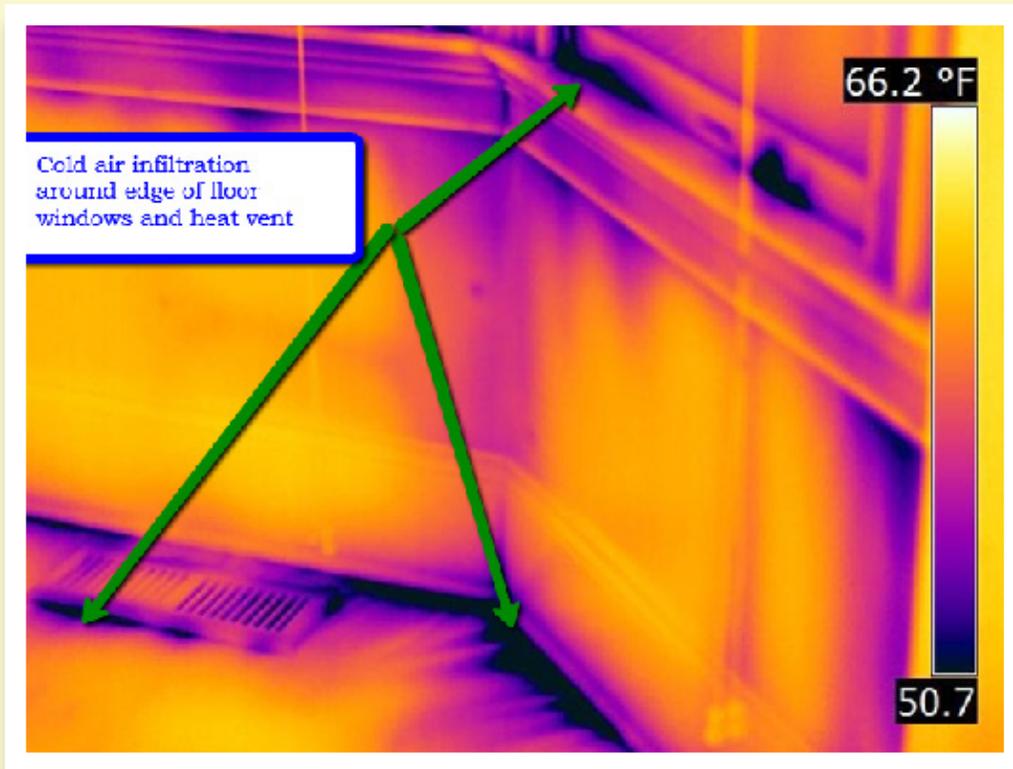
- Caulk and weather strip doors and windows that leak air.

Window showing cold air infiltration



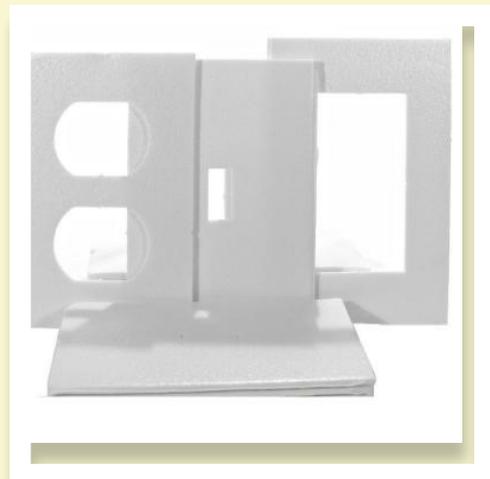
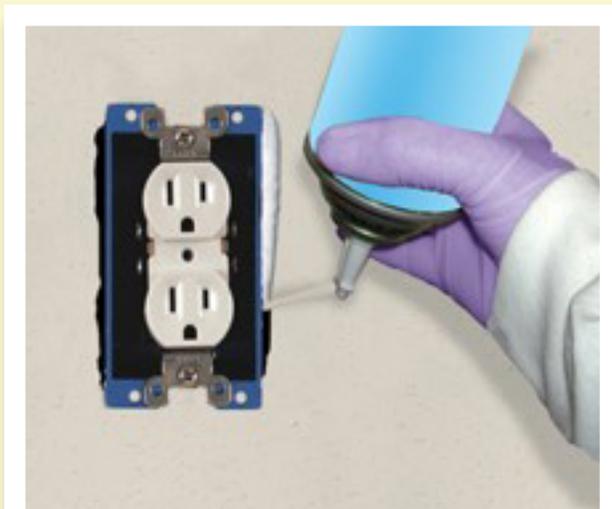
Saving the Earth's Resources (contd.)

- Caulk and seal air leaks where plumbing, ducting, or electrical wiring comes through walls, floors, ceilings, and soffits over cabinets.



Multiple areas of cold air infiltration indicated by the dark blue & black areas

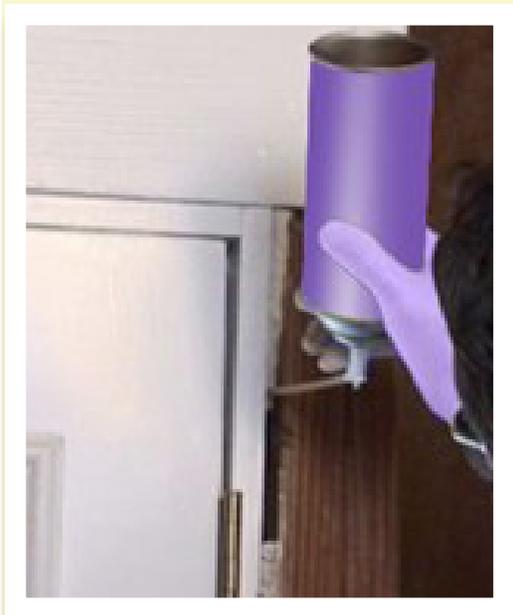
- Install foam gaskets behind outlet and switch plates on walls and seal around gaps with foam or caulk.



Saving the Earth's Resources (contd.)

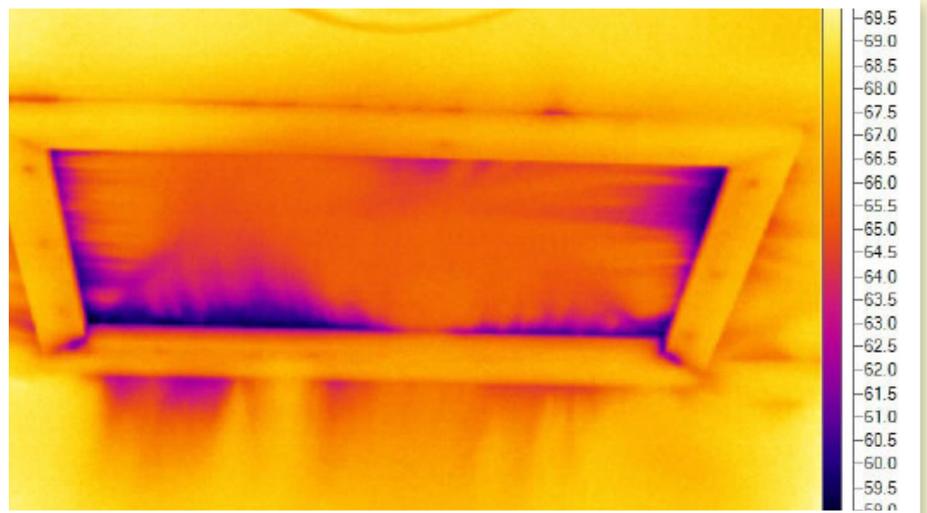


- Cover single-pane windows with storm windows or replace them with more efficient double-pane low-emissivity windows. A good temporary solution is to buy a window kit, consisting of clear plastic film with a self-adhesive tape, from a hardware or building supply store. This is a cheap and easy way to reduce heat loss through windows in winter. Another option to consider is heavy drapes. Heavy drapes can indeed help conserve warmth, but make sure drapes don't block any floor registers, radiators or baseboard heating units.



- Use foam sealant on larger gaps around windows, baseboards, and other places where air may leak out.

Cold air infiltration around an attic hatch



- Install weather stripping around the attic hatch opening.

Saving the Earth's Resources (contd.)



- Replace door bottoms and thresholds with ones that have pliable sealing gaskets.

- Keep the fireplace flue damper tightly closed when not in use. Fireplace dampers are notorious for air leakage. If you don't use your fireplace, consider covering the

entire opening with a glass door, or install a piece of plywood and paint it to match your decor. Another option is to purchase a "chimney balloon" that is inserted above the fireplace damper and then inflated to seal the chimney from air loss. Note that this should not be used with any chimney that has a gas fireplace insert that has a pilot light.

(<http://www.chimneyballoon.us>, or on Amazon.com)



- Seal air leaks around chimneys, furnaces, and gas-fired water heater vents with fire-resistant materials such as sheet metal or furnace cement caulk.



- Set back the temperature on your heating thermostat at night and during times when no one is home. Typically, setting your heating back to 58 degrees F results in a reasonable savings. Don't make the mistake of turning the heat off completely since the cost to reheat the house may be more than what you save. Consider installing a programmable thermostat to automatically set back the temperature at night and other times during the day when the house is empty.

• Space heaters can be an energy-efficient option in a poorly insulated house when you only need to heat a small area, for instance, if you and your family tend to gather in one room for a few hours. However, unvented combustion space heaters are not recommended since emit contaminants that can be hazardous. They are banned in some jurisdictions because of health risks. There are various types of electric space heaters that are better options. Keep in mind that there should be a 3-foot zone around the space heater and it should never be plugged into an extension cord.

Saving the Earth's Resources (contd.)

Here are two very good articles that have details about weatherizing your House.

Weatherizing Your House by Alliant Energy:

http://www.alliantenergy.com/wcm/groups/wcm_internet/@int/@powerhousetv/documents/document/bnrf/mdaw/~e-disp/int_000491.pdf

A DO-IT-YOURSELF GUIDE TO SEALING AND INSULATING WITH ENERGY STAR:

http://www.energystar.gov/ia/partners/publications/pubdocs/DIY_Guide_May_2008.pdf

Part 3 – If You Need Help

If you live in an old, drafty house and you need more than a little help, or you think you need to replace your heating system, there are programs available to help you get started. Most utility companies offer rebates and incentives to reduce energy use in houses, so the first place to check is your local utility company.

If you live in the City of Seattle, start with Seattle City Light (<http://www.seattle.gov/light/>). They offer substantial rebates. Currently they also offer a whole house energy audit for a reduced rate of \$125. A whole house audit involves using diagnostic equipment to determine “whole house” energy efficiency. They will check air leakage, insulation, heating system and ventilation using a blower door, combustion analyzer and an Infrared camera to determine exactly what is happening with your house. You can contact a Seattle City Light “Energy Advisor” at 206.684.3800. The other major utility company in Western Washington is Puget Sound Energy (<https://pse.com/Pages/default.aspx>). While you won't get the same discounted price on an energy audit, they have similar levels of rebates and incentives. You can start by talking to a P.S.E. “Energy Advisor” by calling 800-562-1482.

Both Seattle City Light and P.S.E. also maintain a list of qualified heating contractors, insulation contractors and other weatherizing professionals, so by contacting them you can get referrals for companies that have been vetted by them and have passed their quality control standards.

If you live outside of the metropolitan Seattle area, or in Canada, contact your local utility company to inquire about rebates and contactor referral. Most utility companies have some type of energy saving programs.

As “Green Friends”, we pledge to reduce our impact on the earth and help maintain the earth's resources. Making your house more energy efficient is a great way to show your commitment and also increase the comfort in your home.

Repurposing/Upcycling

Altar of Altoids by Nika and Satyavati



An idea was lingering within us for years until it finally came together. It started by Kumuda not throwing out Altoids boxes and other similar looking metal candy boxes. She gave them to Satyavati, who then brought them to Nika.

Then Satyavati had a precise idea: "Let's make travel altars out of them!" The first step was to clean and spray paint the boxes. We contemplated the many materials we had on hand and worked to make a box that was sturdy and beautiful.

Slowly the process evolved. We began to use some lovely images of our beloved Amma and Sri Ganesha as a focal point.

The altars will be available for sale at the Seattle Winter Fundraiser. The proceeds will go towards our Pacific Northwest Amma Center.



Repurposing/Upcycling (contd.)



Followup Stories from Our Readers

From Sharadamba in Shelton:

Here is a picture of the apple tree that came from a seed that Amma gave me this past summer! This photo was taken in October.

JUNE 2014



AUGUST 2014



OCTOBER 2014



PNW Litter Project

PNW Litter Project Stats:

As of November 30, 2014 we had **371** members. **30** members and their guests reported picking up **72.34** hours of litter during November 2014. The average pick up time was: **2.4** hours; the range was **1 minute to 30 hours** and the median was **1** hour.

Members of the project have picked up litter for **5912** hours since the project began in July 2011. TerraCycle credited us with turning in **139,534** cigarette butts in 2013.

We have turned in **55,200** butts so far this year for a total of **194,734** butts since we started sending them to TerraCycle in January 2013. (We also collected the 5 gallon jar of cigarette butts we use for the litter project display.)

From Kaarisa in Renton:

An eight year old boy I babysit for is used to me stopping to pick up litter. He was surprised the other day when I didn't stop and commented on it. I didn't realize he was that interested or aware of what I was doing. He knows about our "club" and thinks it is somehow related to the Mother Nature club that he formed to help the environment.

