

## **Community Climate Corner - November 2010**

Last Sunday at the Hall, the Local Trust Committee hosted a Workshop on Efficient Wood Heating. It featured a grand line up of all-local speakers and a yummy all-local food potluck. In this article I will attempt to summarize the information and ideas shared at the workshop for those of you who were not able to be there.

Susan M. and Gail F. started out the workshop by talking about selecting wood burning appliances.

- Chose an air tight stove with secondary burn.
- Susan recommends the Pacific Energy Stove
- If you have a water jacket to heat your hot water, install it in your chimney, not the fire box.
- Choose a stove that is properly sized for your home, so that you can burn it hot without over- heating your house. The size of home an appliance is designed for is generally written on the stove.
- Currently wood cook-stoves in the US are exempt from EPA air pollution standards, so cook-stoves produce more air pollution than EPA-approved heaters. That exemption will end in 2012, so new designs are expected that will be EPA certified.
- When using a cook stove, you should bring it up to temperature before diverting the heat for baking. You should close the damper when not using the cook stove so that it doesn't waste energy heating up the oven.
- The taller your chimney the better, minimize bends in the chimney.
- Any stove you use is only as good as the wood you burn: Burn only dry wood. This is the most important thing when trying to minimize pollution.

Boris K. taught us about the science of combustion and about masonry stoves.

- Wood is an appropriate fuel to use to heat our homes because it is abundant, renewable (unlike fossil fuels), has decent calorific value and can be burned cleanly.
- The first step is minimizing your need. Well designed, well insulated and non-draughty houses reduce your need for burning (and splitting, hauling and stacking!) wood significantly.
- Wood should be seasoned for two years. It should be split and stacked (not left in a pile) and left to dry, covered yet well ventilated. It is ready to burn when it has less than 20% moisture.

- Masonry stoves reduce the amount of wood you need significantly, they burn hot and cleanly without over heating your house. They heat by radiation, so the temperature at the floor and ceiling are more similar than if you heat with a wood stove. The disadvantages are that they don't work well in poorly insulated houses, don't work well for occasional use, as they take a very long time to heat up once allowed to get cold.

Doug Hopwood gave a presentation about forest's role in carbon storage and about how to select trees for fuel and manage our forests for carbon sequestration.

- Green plants take carbon-dioxide and water from the air and the soil and, using energy from the sun, turn these into glucose (sugar). Oxygen is released. The glucose is the basic building block for wood (cellulose and lignin) as well as other plant tissues, such as starch. When wood is burned the chemical reaction is similar to digesting food. Oxygen is consumed, energy is released, the products are carbon dioxide and water.
- The climate impact of burning fossil fuel cannot be compared to burning biomass (wood). One cord of wood produces about 1.5 tonnes of CO<sub>2</sub>, equal to one round trip flight to Hawaii, or burning 490 litres of gas (7500 km driving in a Toyota Corolla). But if you re-grow a tree to replace the one you burned, the CO<sub>2</sub> from combustion is eventually recycled back into the tree. There is no viable technology at present to put the CO<sub>2</sub> from fossil fuel back in the ground.
- When selecting firewood, burn wood that was going to rot anyway. That includes mill and construction scraps, or trees that are dying or dead (but not yet rotten). Trees that will continue to live and sequester carbon should be left to do so. Better to burn wood from fast-rotting species (e.g., alder, maple, balsam) than from trees that would last a long time, such as cedar or old growth Douglas-fir. It is also important to leave some down logs and standing dead trees in your forest for wildlife.
- The goal of clean, efficient wood burning is complete combustion. Incomplete combustion, which occurs with wet wood, with older or poorly designed wood heaters and in open fires, produces tars, carbon monoxide and methane. Methane is a much more powerful green house gas than carbon dioxide (contributes more to climate change).
- Old style heaters control the rate of burn by restricting the air supply which causes incomplete combustion. The better alternatives are a heater with secondary burn (e.g. Pacific Energy) or a masonry stove that burns hot and quickly with full air supply, then stores the heat in the masonry.
- Avoid shutting down your stove and causing smouldering. Smoke coming out of your chimney represents wasted energy and contributes to climate change. When complete combustion is achieved, the only thing that comes out the chimney is carbon dioxide (invisible) and water vapour, which appears as clear "heat waves" at the chimney outlet.

- Don't burn slash, because slash burning produces tars and methane, and releases CO<sub>2</sub> much more quickly than rotting. Pile your slash and let it rot, creating berms and eventually soil instead of pollution.
- Don't burn driftwood as the salt in it releases toxic dioxins when burned. Also avoid painted wood or wood treated with preservatives.
- Make sure the forest remains well stocked with growing trees. Look for vigorous trees that can be "released" (given more light and growing space) by removing an older or dying tree nearby, or plant new trees in the gap created by harvesting.
- A forest managed on long rotations (e.g. growing trees to 100 years or more before cutting) stores much more carbon than typical short rotations (40 to 70 years) of industrial forestry.
- Wood lumber incorporated into buildings represents one way to continue storing carbon after the tree has died. If the tree is alive and healthy, better to leave it. But after the tree dies it will start to rot and release CO<sub>2</sub>. So the best time to harvest a tree (whether for lumber or firewood) is just before it dies.
- An important thing we can do here on Lasqueti for mitigating climate change is to avoid permanent deforestation. Clearing one hectare (2.5 acres) of forest produces CO<sub>2</sub> emissions about equal to 700 round trip flights to Mexico. We can selectively, sustainably harvest wood for fuel and building materials while maintain carbon stored in our forests.

Written by Jen Gobby and Doug Hopwood