Wood Burning in your Home

Is wood burning a source of air pollution?

Most wood burning heaters, such as woodstoves and fireplaces, release far more air pollution, indoors and out, than heaters using other fuels. In winter, when we heat our homes the most, cold nights with little wind cause smoke and air pollutants to remain stagnate at ground level for long periods.

What pollutants are contained in wood smoke?

Wood smoke contains the following major air pollutants:

- Carbon Monoxide (CO) – Produced in large amounts by burning wood with insufficient air; CO reduces the blood's ability to supply oxygen to body tissues.
- Oxides of Nitrogen (NOx) – Impairs the respiratory system and its ability to fight infection.
- Volatile Organic Compounds (VOCs) – Evaporated carbon compounds react with NOx in sunlight to form ozone (smog); ozone injures the lungs and makes breathing difficult.
- Toxic Pollutants – Cancer-causing substances, such as benzene and formaldehyde, can be found in wood smoke.
- Particulate Matter (PM_{10} and $PM_{2.5}$) – Tiny particles can be inhaled into the lungs and can aggravate a number of respiratory illnesses.

How can I reduce pollution from wood burning?

It's best to eliminate wood burning altogether; however, if you do burn, there are ways to limit the amount of wood smoke produced.

- Start your fire with softwood kindling. Softwoods (pine, fir) are generally low in density, ignite easily, burn fast and hot, and will heat the firebox and flue quickly.
- Burn longer and cleaner with hardwood. Hardwoods (oak, cherry) are denser and burn slower and more evenly, producing less smoke.
- Burn only "seasoned" firewood. Firewood should dry or "season" a minimum of 6 to 12 months after splitting. Hardwoods dry more slowly than softwoods and may take over a year to dry. To speed drying, split and stack logs in a crosswise fashion to get good air circulation and store a foot or more above the ground in a sunny area away from buildings. Cover the top to keep dew and rain off the wood, but leave the sides open to breezes.
- Be careful when buying wood advertised as "seasoned". Check for
  - ✓ Dark colored, cracked ends with cracks radiating from the center like bicycle spokes.
  - ✓ Light in weight, meaning there is little moisture left.
  - ✓ Cracking sound (like a bat hitting a baseball) when you hit two pieces together. Wet wood makes a dull "thud".
  - ✓ Easily peeled or broken bark. No green should show under the bark.
- Build a small hot fire first...
  - ✓ Open damper wide, allowing maximum air in to fuel the fire.
  - ✓ Start small and hot adding increasingly bigger kindling a few at a time as the fire grows.
  - ✓ Position the next logs close enough together to keep each other hot but far apart enough to let sufficient air move between them.
- Refuel while the coals are still hot!

- Don't burn anything but clean, seasoned wood, fireplace logs, and non-glossy white paper. Do not burn anything else - no garbage, treated wood, or plastics.
- Maintain your fireplace properly. Periodic inspection is essential to ensuring its safe and clean-burning operation.

Are there some cleaner alternatives?

Clean up your dirty fireplace by using one of these alternate heating methods:

- Use an electric fireplace
  Electric fireplaces can be installed anywhere, and no vent is required.
- Switch to gas
  Gas fireplaces look like a real wood fire. They are self-contained units, which can be fitted into your existing (vented) fireplace. They send less of your heated air up the chimney.
- Install a certified wood burning fireplace insert
  Fireplace inserts have been developed which meet federal emission standards and provide high fuel efficiency. They provide excellent fire viewing and heat output with very little smoke.
- Try a pellet stove
  Pellet stoves are the most efficient and least polluting of the new stove designs. The fuel, which is made from compressed wood waste and formed into pellets, automatically feeds into the firebox.

Where can I find more information?

Both the U.S. Environmental Protection Agency (www.epa.gov) and the California Air Resources Board (www.arb.ca.gov) are good sources of information on wood burning and smoke.