

Heating and Cooling Options for the Environmentally Sensitive

by Andrew Eriksen

Heating and cooling a house with minimal exposures to EMF and noxious fumes is a challenge. This article covers a number of methods that have been employed successfully.

The Problem with Gas Heat

Propane and natural gas are used in many households for heating and cooking. In cities, natural gas is normally piped directly into each house. Propane is used more in rural areas, where it is delivered to a tank by a truck. Propane is also used from portable tanks in barbecue grills and in travel trailers. In remote areas without electricity, propane may be used for lighting.

These gasses are odorless by themselves, but the manufacturers add a fragrance so people can smell a leak. Sensitive people can often smell if gas is used in a household from the minute gas leaks and what is released by furnaces, water heaters and stoves.

Using gas is problematic for anyone with MCS. Dr. William Rea, a prominent MCS physician, once told me that he wasn't aware of any of his patients who had gotten better while living in a house heated with gas.

A friend of mine is a senior engineer at a large company which manufactures furnaces. He had a long dispute with Dr. Rea about that issue. He claimed that a well-built, sealed combustion furnace would be safe, and that nothing from the combustion could enter the house. To prove Dr. Rea wrong, he installed one in his own home. He had to take it out again and admit defeat.

Another friend once lived in a remote cabin in Alaska, without any electricity. The only options were propane or firewood for heating. She installed a direct-vent, sealed combustion heater (EcoTherm brand) and a good quality wood stove. The wood stove won.

It is extremely difficult to build a truly airtight heating system, as the metal expands and contracts with the change in temperature. Seals will leak over time. Even if the furnace is located outside, pollutants will still enter the air stream if using a forced-air system.

The other problem is that gas lines tend to leak, even a miniscule amount can be problematic. It is thus not sufficient to not use gas appliances, the pipes must be plugged as well.

Electrical Systems

Many EIs are bothered by standard forced-air heating and cooling systems. There can be problems with the buildup of dust and other things in the air ducts, mold and fried dust. Some people are also bothered by the noise, the air movement and the EMF.

Electrical space heaters are popular in EI homes. They are easy to install and cost little to buy, but then can have problems with fried dust, high levels of EMF and be costly to run.

A very popular choice is the SoftHeat brand, which features

- All steel and copper design, with baked on enamel. Most people do well with them after a 24-48 hour burn in. Some remove the little plastic bushing inside.
- The heating element is enclosed in a liquid-filled copper pipe, which drastically reduces the EMF radiation.
- The surfaces do not get very hot, which minimizes fried dust problems.

The SoftHeat models are available in various sizes, at 110 and 220 volt, both for permanent wall mounting and as portable space heaters.

Some people may do better with the 220 volt models, as the EMF is lower (due to less current), while the electric field is higher (higher voltage).

They used to be called Intertherm and are made by Cadet (1-800-442-2338, www.cadetco.com). They are available from some hardware stores, or Electric Supply Online (1-610-449-8702, www.electricsupplyonline.com).

Some ceramic heaters are also popular. They should be low EMF and low toxic, but costly. One source is Nirvana Safe Haven (1-800-968-9355) and The Living Source (1-254-776-4878). The author is not really familiar with them.

Another option is the Marvin Quartz heaters, which are cheaper than the SoftHeat and ceramic heaters. They have plastic housing and make some noise, but seem very tolerable. They give off radiant heat, which directly heats people and furniture, like the sun does. Radiant heaters are especially good for large, hard-to-heat rooms, and areas with poorly insulated walls. Marvin Quartz heaters are available from Northern Tools (1-

800-533-5545, NorthernTool.com) and Electric Supply Online (1-610-449-8702, www.electricsupplyonline.com).

A heating and cooling option that is both low in EMF and toxicity is the mini-split system. A heat pump is located outside the building, with refrigerant lines going to a small heating and cooling unit in each room. There are no air ducts and the only inside EMF source is the small fan in each wall unit. Do be aware that some models have fungicides in them to combat mold.

One vendor is Fujitsu General of America (1-973-575-0380, www.fujitsugeneral.com).

Another low-EMF heating/cooling option is to locate a heat pump away from the house, with a long air duct going into the house. This could work well for a house with an attached garage. The other issues with ducted systems (mold, dust, noise) are still there, however.

Swamp coolers are used extensively in the summer in areas with low humidity, such as the western USA. They require much less electricity to run than an air conditioner, though they are not able to produce the arctic blasts some people prefer. The fan motor can be a problem for some people, and the units tend to get moldy if not maintained well. Some people add grapeseed extract to the water as a natural mold killer.

Because of the high humidity created in the house, houses with a swamp cooler will tend to get as moldy as if they were placed in a humid climate.

Hydronic Systems

A hydronic system is one where water carries the heat and coolness, instead of using air. Hydronic heating is common in Canada, the northeast United States and Scandinavia. Such a system can be designed to be completely free of noise, moving air and EMF, but they are costly.

A boiler (which can be a regular water heater in some cases) heats up the water, which is pumped around by a small circulation pump. If desired, the boiler can be located in a shed outside the house, even away from the house. The boiler can then use either electricity or gas (propane or natural gas). If using gas, it is best to locate the shed down wind from the house.

The hot water coming into the house can either circulate through a slab floor (in-floor heat), through radiators, or go through a heat-exchanger mounted in a conventional forced-air system. When retrofitting an existing house, upgrading an existing forced-air system may be the most economical choice.

If using radiators, make sure they have a baked-on powder coating. Painted enamel and simple cast iron radiators are apparently not well tolerated.

A special type of radiator can both be used to heat and cool a room. Burnham Hydronics (1-888-432-8887) makes the Duo-Rad, which requires a fan to run continuously. Edwards Engineering (1-800-526-5201, www.edwards-eng.com) makes the very sleek looking Valance system, which does not require any fan at all. The author is not aware of any EI person who has actually used either of these two systems.

Passive Solar Heating and Cooling

Using the sun for heating is an option in large parts of the United States. The idea is to use a careful design of south-facing windows, heavy building materials, good insulation, roof overhangs and other features to let sunshine and the coolness of the night work together to create a comfortable indoor temperature, even in the winter. It is mostly used in the southwestern USA, but features of it are applicable in any climate. It may require some daily participation from the people living in the house, and the house design must be carefully considered — just putting a lot of windows on the south wall is not sufficient, and may make the house too hot during the day. A well designed house can dramatically cut the need for artificial heating and cooling. A backup heat source will always be needed, though.

There are many books on this subject, such as *The Solar House* by Daniel Chiras. The magazines *Home Power* (www.homepower.com for free downloads, 1-800-707-6585 for subscriptions) and *Back Home* (1-800-992-2546, www.BackHomeMagazine.com) frequently have articles on the subject.

A lot of experimentation was done in the 1970s. Many mistakes were made, and some are still repeated. Examples are using rock bins (a few tons of rock in the basement) and earth tubes (a long underground tube through which air is drawn into the house). Both will get moldy over time, even in the driest climate.