

What to Consider When Selecting a New Heating System or Major Appliance

??? Consumers ask for recommendations on the different types of furnaces and appliance.

It Depends On:

- ❖ The availability of different fuel sources
- ❖ The cost of those fuels
- ❖ The types of existing equipment
- ❖ The type of existing distribution system
- ❖ Your current energy bills
- ❖ The length of payback you are willing to accept
- ❖ Is it time to replace the equipment any way

General Discussion

If it is time to replace a piece of equipment, it's a golden opportunity to improve the efficiency of your home by selecting energy efficient equipment. Look for the Energy Star logo as an indication of superior efficiency. But don't wait until it breaks to do the research on what new piece of equipment to buy. If you do, you will likely be forced to get something in quickly and your opportunity will be lost.

You don't have to wait for equipment failure to make a smart move. If you have old, inefficient equipment it can be cost effective to replace it with new efficient equipment. A proper analysis is needed to determine the potential savings. Don't be fooled by exaggerated claims which are everywhere with energy costs on the rise.

Heating Systems

It is important to perform a cost-benefit analysis on any replacement. This must look at life-cycle costing, which not only looks at the initial cost, but maintenance of the equipment and the changes in energy use and fuel costs. This analysis determines whether it is better to do nothing, the cost of the system is too high to justify its savings over its life, or to replace the equipment because the cost of the system and its maintenance costs will be paid for by the energy savings within the life of the equipment. This is important, because your current equipment may not be as bad as you think, higher efficiency equipment usually costs more than mid-efficiency equipment, and you may find there are better opportunities to reduce your energy use. This analysis is also important if you are changing fuel sources for your HVAC equipment. You must include the cost of the new service if needed, changes to the distribution system, changes to venting systems, and effects on other equipment, etc.

- Example: You want to install a new 90%+ efficient gas furnace. You currently have a 70% efficient gas furnace and an atmospheric gas water heater venting in a common vent (chimney).
 - You have your cost for the new furnace
 - You must add additional cost because the vent now needs to be lined so it is properly sized for the water tank by itself
 - Is it better to line the chimney or replace the water heater with a direct vent unit



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- Example: You want to change from an air source heat pump to a ground source heat pump.
 - You have your cost for the new inside unit
 - You will have additional cost for the well field or ground loops
 - Do the savings in utility bills offset the added cost of the well field or ground loops

- Example: You want to switch from an electric furnace to a gas furnace.
 - You have the cost of the new furnace which will have to be a direct vent, sealed combustion 90+ furnace because there is no chimney
 - You need to run a gas line to the house if one doesn't exist
 - If there is no access to natural gas, you may only have propane as an option

If you are planning on switching fuel types, you must determine the heating load of your building so you can estimate the energy use of the new system. Your current bills should give you an estimate of what the building requires for energy. You can then convert to Btu's so that you can estimate the amount of heat the new system will be required to deliver. Remember that the efficiency of the current system and the efficiency of the new system must be factored into the analysis. If you are planning other energy efficiency retrofits, you will need to work with someone that can model the usage of the retrofitted building because it should be less than your current usage. First, the retrofitted home may be so efficient that replacing the heating system is no longer cost-effective. Second, the new equipment should be smaller than the old and you have an opportunity to reduce the size of the new equipment to save additional costs.

Always have the new system properly sized by conducting a heat loss calculation like the Manual J (http://www.energystar.gov/index.cfm?c=heat_cool.pr_properly_sized). Over sizing of equipment can lead to inefficient operation, higher initial cost, and comfort issues. Also keep in mind the total energy used by the system. A gas furnace doesn't only consume natural gas, it also consumes electricity for its electronics and distribution fan. This is why it makes sense to opt for the ECM (electrically commutated motor) even with a gas furnace as it can reduce the electrical consumption of the new unit.

Appliances

Almost all new appliances are more efficient than ones built over 10 years ago. Late 1970s and 1980s appliances are prime candidates for replacement with new efficient appliances. This is especially true for refrigerators, freezers, clothes washers, and dish washers. When replacing old appliances, make sure they are recycled in an environmentally sound manner. Don't just plug them in the garage or basement. Don't give them to a friend or relative, you are not doing them a favor.

There are low cost energy monitors available that can be used to meter appliances, like refrigerators, for usage. It is then easy to determine if it will be cost effective to replace an appliance. Appliances like clothes washers not only use power to drive the motors, but also use hot water. The cost effectiveness of the replacement of these types of appliances will be based on



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the number of loads done per day. Again, the larger the number of loads, the more cost-effective it will be to replace the unit.

What to do?

- ✓ Have a cost benefit analysis done which includes the life cycle cost of the retrofits
- ✓ Always compare your options against Energy Star equipment options
- ✓ Make sure all aspects of the project are reflected in the analysis including additional work that may be required
- ✓ Make sure a proper sizing calculation is done to make sure the new unit is the right size for your home
- ✓ Get more than one bid, but make sure you specify what you want so you can compare quotes
- ✓ Be realistic about your fuel options

Outcomes

- ❖ The best combination of efficiency and initial investment that will result in the most cost effective retrofits.
- ❖ Improved health and safety by installing sealed combustion appliances.



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