



How To Reduce Your Air Conditioning Costs

The last few issues of Going Green focused on changes you can make to reduce the cost of cooling your home. They covered things you can do to your roof and window areas to reduce cooling costs and increase comfort. Another covered advanced evaporative cooling. If you missed either of these feel free to email me and I'll send you a copy. In this issue we will focus on common problems with (ducted) air conditioning systems. So if you're sweating over your PG&E bill, the temperature inside your home or commercial building, or both, this issue is for you!

A simple way to appreciate the actual efficiency of your heating & air conditioning system is to recognize that it's a two part "system". Your duct system, like your furnace or air conditioner, has an efficiency associated with it too. For example let's say you have a "high efficiency" furnace – the label says it's rated at 90%. A duct system operating at an average efficiency of 60% (not so uncommon) means that your actual system efficiency is just 54% (60% of 90%). Most people don't appreciate how large of an impact their duct system has but, as this example shows, it can be huge!

It turns out that the topic for this week's issue, like most past issues, is the result of whatever's on the top of my mind based on what's been going on in my life. And lately I've been inundated – more than usual – with calls from people unhappy with their central air conditioning systems performance and/or cost. So let's jump right into the list of things that are typically responsible for those high bills, comfort problems, or both.

Substandard Duct System

A substandard duct system is the most common problem I find and it's one of the least understood problems.....for anyone but a building performance contractor that is. Most heating and air conditioning contractors just don't "get it"! Here's a typical scenario: a building owner with comfort problems calls a contractor and they're sold larger equipment. More often than not this doesn't solve the problem because the real problem was the duct system. Here's a list of the problems I see in about 95% of all installations:

- Undersized ducts; not enough air is delivered relative to what the unit is capable of delivering.
- Flexible (accordion-like) ducts aren't fully extended; bunched up ducts significantly reduce air flow.
- Flexible ducts taking an unnecessarily long path; sharp turns; compressed/squashed flex ducts. These problems also cause less air to flow.
- The ducts are leaking a large percentage of the air trying to get to your supply registers and back from your return grilles.
- The duct system is poorly insulated; some areas may be un-insulated altogether.
- Insufficient quantity, size, or poor selection of supply registers and/or return grilles.
- Dirty filters – yea! Here's an easy one you can address with help from your local hardware store!

As building performance contractors we specialize in fixing these problems. If you mention this list to

your heating and air conditioning contractor and he looks at you sideways with a blank stare – or there’s a long pause on the phone and he doesn’t know how to respond – this is a bad sign! But that said, keep in mind that the person you’re speaking with on the phone – or a technician visiting your building – may not be the person in the organization with the most wisdom on these issues. If so, ask to speak with the person(s) most knowledgeable in these areas.

Oversized Equipment

Contrary to popular belief, as well as popular practice, bigger isn’t better when it comes to central air-conditioners, heat pumps, or furnaces for that matter. Proper sizing of the equipment as well as the duct system is key to maintaining comfort and reducing operating costs. Oversized systems will also have more maintenance and replacement costs over time. Rules of thumb – like one “ton” of air conditioning per 500 square feet of home – should never be used. An accurate, room by room calculation of heating and cooling required – based on the area and insulation level of the various surfaces and other factors - is the recommended practice.

Improper Refrigerant Charge

A technician we work with recently checked the refrigerant charge for a homeowner who had just paid (one of the largest, best known) heating & air contractors in town to make sure their system had the correct amount of refrigerant in their system. But it was several pounds short of the proper refrigerant charge just one week later! A pressure test confirmed the system didn’t leak, so obviously the technician sent to the home either did nothing or didn’t do it right.

The proper way to check refrigerant charge is a two-step process involving what’s called a “Superheat” AND a “Subcool” test. Ask to be sure your technician does the right tests and ask for a written pre- and post-test result. Again, if you get a “clueless” response from your service contractor ask to speak with the person(s) knowledgeable in these areas before your time, money or patience is wasted!

Heating and air conditioning equipment should be checked periodically for these problems and more. If you haven’t had your system checked in a few years, call your heating contractor and ask them what they charge and if they know how to deal with problems like the ones mentioned here. If they don’t “let your fingers do the walking” until you find one that does. And as always, I recommend you ask for a few comparable, competitive estimates.

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