



Staying Cool - Without Breaking The Bank

First, let me apologize for not writing about summer cooling yet this season. It's been so cool so far this year it's hard to think about cooling! But I hear it'll be warming up soon, so it is time to cover this subject thoroughly! While I've touched on some of these subjects in various past articles, this time I want to cover the Motherlode "suite" of cost-effective cooling opportunities for our Foothills climate.

First off it's important to appreciate where the heat is coming from. Stopping it from entering in the first place is much easier and cheaper than trying to get rid of it after the fact. It's sort of like an unwanted salesman – best to say "no thank you" while they're still outside your door, before letting them in!

While every home is different, in most cases the predominant sources of unwanted heat comes from three sources – leaks in your homes outside "envelope" and ducts, sun streaming in through your windows, and heat conducted through your roof/ceiling surfaces from the sun beating down from above. And in most cases, it's likely to be in that (#1, #2, #3) order.

Leaks in your homes outside "envelope" – mostly those in floor and ceiling surfaces – can be difficult to find and seal. In addition to the envelope, ducted systems associated with forced-air type heating/cooling systems are also major culprits.

For those of you with ducted (forced air type) air conditioning systems, if your home wasn't built in the last 4 years you need to know about tight ducts. That's because it's only been since the 2005 California Energy Code went into effect that heating and cooling contractors paid attention to tight ducts. Did you know that the average duct system in California leaks about 1/3 of the air the fan is trying to move through your home?

Since your return ducts are "sucking" air, a leaky return duct pulls in air from your damp, moldy crawlspace, your superheated attic, or both depending on their location. Having fixed air duct leaks myself, I can tell you I've also found rat and mice scat in ducts along with fiberglass particles and other things you probably don't want to hear about (after all, you could be eating breakfast while reading this – sorry about that).

On the supply duct side of your system the leaks are blowing cold air (and hot air in winter) into your crawl space, attic, or both depending on where they're located. While most complaints about comfort or performance issues with heating/cooling systems are duct related, 99 times out of 100 a heating contractor will put in a larger system instead of fixing the ducts. Having spent more time than I'd care to recall in attics and crawlspaces I can't blame them, but larger equipment – about 99 times out of 100 – doesn't solve the problem. It actually makes it worse.

Of the last four duct systems in homes I audited, three of them had disconnected or partially

disconnected ducts. I'm not suggesting this is valid for statistical purposes but it does point out how common this can be. These types of leaks are severe; they're very bad for your health, physiologically and economically!

The best solution to the leakage problem is to hire a Building Performance Contractor. These folks are professionals in this area. They have the tools to check the leakage of your home and ducts before and after an upgrade. Unfortunately our local phone book doesn't have a section for them yet but Power-Up NC's web site (<http://powerup-nc.org>) lists three. Ask your HVAC contractor if they have the tools and/or skills too. As always, I recommend getting three (comparable) bids.

If you don't have air conditioning consider evaporative cooling instead. Done properly, it is very effective in our climate. In addition to our company I know Grass Valley Air Conditioning installs the Breezair (advanced) evaporative cooler (<http://www.breezair.com>). Ask your HVAC contractor if they do. I also really like the Oasys two-stage (indirect-direct) evaporative cooler because it delivers even colder air than the Breezair (<http://www.oasysairconditioner.com>). These systems work off thermostats so you don't need to manually turn the cooler on and off. And they use "up-dux" for automatic exhausting of humid air via your attic so you don't need to open and close windows or be concerned with security. Lastly, with their sophisticated water management systems, they don't waste water like your typical swamp cooler does with it's constant bleed-off of water whenever the pump is running.

Solar or sun screens are also crucial to lowering your bill and increasing your comfort level. Many companies in Nevada County provide these (see their ads in The Union or your local Yellow Pages). These screens go on the outside of your window and are amazingly effective on any window that gets any significant amount of direct sun in the summertime. They're more than twice as effective at reducing solar heat gain through windows into your home when compared to the common white interior shade, and they let in more light and allow for some view as well. I'm constantly surprised to find people are not familiar with them, considering the difference they can make!

Lastly, in terms of heat conducting through your roof or ceiling surfaces, once the leaks are plugged I recommend insulation. In our climate it should be at least R-38. Most homes built before 2000 have R-30; homes built before 1990 probably have R-19 or less. While I'm a fan of radiant barriers, in our climate I recommend more insulation over a radiant barrier. Blown-in cellulose insulation is very inexpensive and readily available from a number of companies. Just be sure to get your ducts fixed and leaks in your ceiling sealed first, before getting your attic blown full of cellulose – it's mighty tough to do afterwards!



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