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COOL SOLUTIONS from COOL DAVIS

This planning guide is one in a series that offers Cool Solutions for home heating and cooling as well as energy efficiency. The full series of documents will be available on the Cool Davis website. This document is provided as general guidance and is not intended to be legal or technical advice.

Understanding Home Heating and Cooling

Most of us don't pay much attention to our home heating and cooling systems until they aren't working. But the age, condition, and management of these systems can make a big difference in family comfort and health, not to mention your budget!

Understanding the basics is essential when you're faced with repair or replacement decisions.

Start by getting to know your systems:

- What kind and how old are your heating and cooling systems?
- Where are they located?
- Do you have a ducted system for both heating and cooling?
- Is there any insulation around your ducts?
- Do you have an automatic or smart thermostat?
- When was the last time the system was checked or inpspected?

Get to know your house:

- What kind of insulation do you have in your attic and walls (roll-in, blown-in)?
- Do you have an attic? What about a crawl space?
- Do you have old, leaky windows or newer double pane windows?

Ask these key questions:

- Does it take a long time for your home to heat up or cool down?
- Are there any spaces that are always hotter or colder than the rest?
- Do your energy bills seem high and does that pattern change seasonally?
- Does your system have an air filter that needs periodic cleaning or replacement?

If you answered yes to these last questions, you might have air leaks, imbalances in your duct system, inadequate insulation, system size mismatch, or a system that is ready to fail. If you're forgetting to change out filters, your system is working harder and accomplishing less. To remedy these problems, it takes some

thoughtful planning and preparation. Take your next step by learning a bit more about your existing home heating and cooling systems and other options for heating and cooling.

What's a heating and cooling system?

Homes in Davis include a wide range of home heating and cooling systems, depending on when they were built and if they've been upgraded. Most older homes were built with only a heating system such as a furnace or individual room wall heaters. Later homes featured central heating and air conditioning systems with ducts in attics or walls to move air around the home. Some homes have been upgraded or only have window air conditioners.

If your home was built in the 1970's or later, it likely has a central heating and cooling system.

A "central" heating and cooling system, often referred to as an HVAC system (shorthand for Heating, Ventilation, and Air Conditioning), generally consists of a furnace (also called a heater) to heat your home, an air conditioner to cool your home, a fan blower and ducting to move air through your home, and a thermostat to control the system.

Sometimes the furnace and air conditioner are separate units, other times they're combined in a "packaged" system. If the systems are separate, the furnace is likely running on natural gas; if they're combined, they may both run on electricity.

Air distribution and thermostats

Centralized systems usually include ducts that distribute the heated or cooled air to multiple vents or "registers" throughout your home. Ducts are usually located in attics or walls but can also be found in crawl spaces and on roofs. Ducted systems usually have one or more "returns" – where filters are located – that return air from living spaces back to the system.

Finally, most systems have a thermostat that controls temperature "set points" (that determine your preferred high and low temperatures). Thermostats may be simple mechanical units that allow you to turn the heat or cooling off or on manually, or thermostats may automatically adjust to a single, set temperature. Programmable units give you the ability to set different temperatures based on the time and day of the week.

Different homes have different histories

Most homes built before 1970 did not come with central heating and air conditioning systems. Instead, they typically included one or more wall heaters and, later, a separate wall or window-mounted air conditioner each with a separate control and thermostat. Some homes may have been completely retrofitted with a modern centralized system since being built. Other older homes may not have air conditioning at all.

Generally, a new, efficient, and well-maintained HVAC system can heat and cool your home for a lot less than most older systems.

What other home heating and cooling systems and methods are there?

Some homes may have other systems and methods, or a mix of methods, for heating and cooling. These might be used separately, or in combination with a standard centralized system.

- Natural ventilation using windows
- Whole house fans that suck hot air out through attic vents when it cools down outside
- "Mini splits" or small ductless heating and cooling units with inside air handlers and an outside condenser
- "Swamp" or evaporative coolers that blow air over a water-soaked pad into your home
- Radiant heating and cooling systems that are usually embedded in flooring
- Passive solar to heat your home (including design methods to keep it cool in some cases)
- Alternative building methods like straw bale, cob, adobe, and packed earth that add insulation or thermal mass to your home

Every homeowner is different, just like every home. The methods you choose to heat and cool your home reflect your budget and your needs. Cool Davis wants you to have all the information possible to make the best possible choice for you and your family.

Learn more about your system

Energy.gov: Heat & Cool, Weatherize, and Design

https://www.energy.gov/energysaver

Energy.gov: Energy Saver Guide

https://www.energy.gov/sites/prod/files/2017/10/f37/Energy_Saver_Guide-2017-en.pdf

Smarter House: Home Systems + Energy

https://smarterhouse.org/home-systems-energy/building-envelope

EnergyStar.gov: Energy Savings at Home, Heat & Cool Efficiently

https://www.energystar.gov/index.cfm?c=heat_cool.pr_hvac

DID YOU KNOW? Heating your home uses more energy and costs more money than any other system in your home -- typically up about 42% of your utility bill. Source: Energy.gov

Other Cool Solutions Home Energy Efficiency Planning Guides

- Understanding Home Heating and Cooling
- Make a Home Heating and Cooling Plan … Now
- Help! My HVAC System Is Down!
- Home Comfort and Health Issues
- Working with Contractors
- Ways to Save, Ways to Pay for Home Energy Improvements
- Home Heating and Cooling Commonly Used Terms

What is Cool Davis?

Cool Davis is a local non-profit organization dedicated to helping Davis residents and businesses adopt more sustainable practices and reduce their greenhouse emissions. Cool Davis has partnered with the city since 2010 to offer resources, host events, and provide outreach and educational experiences for Davis residents.

To learn more about other Cool Davis projects related to energy, transportation, and consumption of goods and services, visit us at www.Cool Davis.org.

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