



Is my heating system the correct size for my house?

Just like athletes are fastest in perfectly sized shoes, your house performs best with the properly sized heating system. Oversized heating systems are inefficient and cost more, both upfront and in ongoing maintenance, than a heating system that fits your home.

Heating appliances are sized by the amount of heat they can provide in one hour. This heating capacity is measured in BTUs per hour (one BTU is the amount of energy produced by burning one match).

The heating capacity of your system should match the peak hourly demand of the house. Peak hourly demand is the maximum heat required by a house in one hour on the coldest day of the year. For a rough estimate, a well-insulated, two-story house in Fairbanks might require 60,000 BTUs per hour on the coldest day of the year, so a heating appliance should be rated to produce that much heat.

A properly sized heating system will run continuously on the coldest day in order to keep the home at its set temperature. This means the system is running at its steady-state efficiency, the stride it hits after warming up. Steady-state efficiency is like the miles-per-gallon your car gets cruising on the highway as opposed to riding in stop-and-go traffic.

Oversized systems, on the other hand, tend to cycle on, produce lots of heat, and turn off. The cycling on and off wastes fuel (as the appliance repeatedly ramps up and cools down) and causes wear and tear on the mechanical system (which ultimately requires more maintenance).

Wood- and coal-fired devices can also be oversized. When a wood stove is too large, residents tend to burn fires at a low smolder to prevent overheating the house, which is not only less efficient but also emits more particulates than a hot fire.

Domestic hot water systems should also be properly sized. Storage water systems are sized by their First Hour Rating (FHR), the amount of hot water in gallons the heater can supply per hour, starting with a full tank of hot water. The FHR (determined by the size of the water tank, source of heat, and size of the burner or element) should be within a few gallons of a building's peak hourly hot water demand. For example, a household of three who routinely shower at night while running a dishwasher may have a peak hourly demand of about 45 gallons. So the house would need a domestic hot water heater with a First Hour Rating of 40-50 gallons.

The size of a heating system is directly related to the efficiency of your home. So if you make any building envelope upgrades to your home, you'll require a smaller heating system—a good reason to make upgrades before replacing your heating appliance.

Sizing your system

Contractors in Alaska should use one of two methods to determine the proper size of your heating system:

- ACCA Manual J by The Air Conditioning Contractors of America
- AKWarm software, maintained by the Alaska Housing Finance Corporation, provides sizing methods for heating systems.

You can calculate your peak hourly demand at the U.S. Department of Energy website on hot water heaters:
http://www.energysavers.gov/your_home/water_heating/index.cfm/mytopic=12990