



RE-ENERGIZE YOUR HOME

ENERGY EFFICIENT HEATING

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RE-ENERGIZE YOUR HOME, YOUR HEATING, YOUR SAVINGS

A warm home is a comfortable home for you and your family, yet your heating system can account for more than half of the energy use for a typical Pacific Northwest household. Being energy efficient can go a long way toward making your family's budget comfortable as well.

About Puget Sound Energy

Washington state's oldest local energy utility, Puget Sound Energy serves more than 1 million electric customers and nearly 750,000 natural gas customers in 11 counties. A subsidiary of Puget Energy, PSE meets the energy needs of its growing customer base through incremental, cost-effective energy conservation, procurement of sustainable energy resources, and far-sighted investment in the energy-delivery infrastructure. PSE employees are dedicated to providing great customer service and delivering energy that is safe, reliable, reasonably priced, and environmentally responsible.

In this guide

This guide contains the following general information to help you make informed decisions about your home heating system.

- 4** Top energy saving tips
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RE-ENERGIZE WITH LOW-COST, NO-COST ENERGY-SAVING TIPS

Top energy-saving tips

Make sure that your home has appropriate levels of attic, floor and wall insulation, proper venting and vapor barriers in place, and duct work is properly insulated and sealed. Properly insulating your home is a critical factor in determining your home's energy efficiency.

Be energy-conscious in how you use your current heating system, and get an annual inspection and or tune-up. A heating system tune-up is the main way to ensure that you are getting the most out of each energy dollar while utilizing your existing system. Other options include considering an upgrade to a more efficient system. Heating represents the largest energy usage for most homes. The tips below can help reduce your overall energy consumption and save you money.

- Utilize a programmable ENERGY STAR[®] set-back thermostat.
- Large setbacks aren't recommended or necessary to maximize savings on a heat pump. By using a minimal setback you will not need to use the less efficient strip heat to bring your home up to the desired temperature.
- Electric and gas furnaces can have a 10 degree night and away setback. Heat pumps want a minimal 3-5 degree setback.
- If you have baseboard heaters, turn the thermostat off in unoccupied rooms and close the door.
- Clean or replace your furnace filters regularly throughout the heating season. Proper air flow is important to the performance of your heating system. Replace filters as needed.
- Keep furniture, rugs and curtains away from duct registers and return air grills to promote good airflow, if heating with a heat pump or an electric or natural gas furnace.
- Keep areas in front of electric baseboard and wall heaters clear of furnishings, curtains, or other objects that block airflow and create a potential fire safety hazard.
- Never use an oven or range burners to heat a kitchen. This should not be considered as a solution to high heating costs. Utilize the controls of your primary heating system or, if necessary, the safe and efficient use of portable heaters.

SELECTING THE RIGHT HOME HEATING SYSTEM IS RE-ENERGIZING

Selecting an energy-efficient heating system

Different energy type, different operating costs

The first consideration is usually cost. Different energy types have different costs associated with them, so it's important to compare available options to evaluate which will be the most economical for you.

Using a natural gas furnace or heat pump for home heating has been historically less expensive than using electric resistance heat, propane, oil or wood. When comparing energy costs, keep in mind that market prices often fluctuate. To maximize your savings, purchase the most efficient system you can afford and look for the ENERGY STAR.

Energy IQ

ENERGY STAR is a voluntary labeling program of the U.S. Environmental Protection Agency and the U.S. Department of Energy that identifies energy-efficient products. Qualified products exceed minimum standards for energy consumption, or where no standards exist, have certain energy-saving features. Such products may display the ENERGY STAR.

Proper equipment sizing

When it's time to replace your heating system, choosing the correct size is critical to getting the best operating efficiency, comfort, and lowest maintenance and operating costs over the life of the new system.

Heat Pumps

For heat pumps, these are commonly undersized. This reduces energy-savings benefits by using more of the electric-resistance elements.

Heat pumps want to be sized to achieve a desired 30 degree balance point. This means that your heat pump should provide all of your space heating needs until the temperature outside drops below 30 degrees. Below 30 degrees is when your less efficient electric-resistance elements come on in your furnace. Every time these electric resistance elements come on you're losing your efficiency.

Keep in mind when choosing a heating contractor, a good estimator will measure walls, ceilings, floor space, and windows to determine the room volumes, and will assess the R-value of the home's insulation, windows and building materials. A good estimate will also include an inspection of the duct work for proper sizing, insulation and the condition of visible seals on joints. The placement of supply and return registers should be appropriate for the system type and size.

Gas Furnaces

For gas furnaces, a common mistake is oversizing. This creates large temperature swings in the house as well as reduces the life expectancy of the equipment.

Before the era of tightly constructed homes, it was not uncommon to install gas furnaces that had two to four times the necessary capacity. Since many people have added new windows, caulking, weather-stripping, and insulation to their homes, going by the nameplate of the old equipment is likely to result in an improperly sized system. Making improvements such as these to reduce heat loss in the winter and heat gain in the summer should allow you to install smaller gas systems while still being comfortable and saving energy.

Tips

Homeowners should insist that contractors use a correct sizing calculation before signing a contract. Manual J, "Residential Load Calculation," published by the Air Conditioning Contractors of America (ACCA), is the recommended method for use in the United States.

Environmental and resource considerations

Puget Sound Energy recommends using natural gas directly for home space and water heating. Using natural gas directly, at the heating appliance, opposed to using it to generate electricity means using about half as much natural gas. This also has less of an environmental impact by reducing the amount of fossil fuels burned for generating electricity.

When natural gas service is not available, Puget Sound Energy recommends high-efficiency, air-source heat pumps opposed to the use of electric baseboards or wall heaters.

Homes heated with wood fireplaces and stoves should consider natural gas, a clean-burning fuel. Compared to wood fireplaces, natural gas fireplaces, vented to the outdoors, produce much less carbon monoxide and particulate emissions.

Tips

Consider ENERGY STAR qualified systems. PSE may have rebates available for ENERGY STAR qualified natural gas furnaces and electric high-efficiency, air-source heat pumps. Contact a PSE Energy Advisor at 1-800-562-1482 or visit [PSE.com/Rebates](https://www.pse.com/Rebates) for more information.

About forced air systems

- Natural gas forced-air furnaces are the most common type of heating systems in the Northwest. In areas where natural gas is available over 90 percent of homes use it for heating. That's approximately 45 percent of the homes in our region. This type of furnace burns natural gas to heat air. The heated air is then distributed in the home by the use of a blower through a duct system. The minimum AFUE of new furnaces is 80 percent. By contrast, ENERGY STAR qualified natural gas furnaces have an efficiency of at least 90 percent to over 97 percent.
- Electric forced-air furnaces have an AFUE equivalent of 95 to 100 percent. However, despite their high efficiency, the higher cost of electricity compared to natural gas makes all-electric furnaces an uneconomical choice. If you are interested in electric heating, consider installing a high-efficiency heat pump system. One important factor to consider when purchasing a new natural gas furnace is the efficiency of the unit.
- Heat pumps in general work by circulating refrigerant to move heat from the outside air or ground and then transferring it into the house. For cooling, the process is reversed.
- Heat pumps require the use of an indoor, forced-air back-up heat source such as an electric or natural gas furnace to circulate heated or cooled air through ductwork. Heat pumps can provide all home heating needs up to the point when the outside air temperature drops below a set temperature. At that point, the supplemental electric resistance elements make up the difference between what the heat pump provides and what the home needs to maintain comfort levels. Heat pumps can operate with efficiencies two to three times that of an electric furnace.

- A ductless heat pump is a highly efficient zonal heating and cooling system that does not require the use of air ducts. Ductless heat pump systems consist of an outdoor compressor unit and one or more indoor air-handling units, called “heads”, linked by a supply / return refrigerant line. Indoor heads are typically mounted high on a wall covering 2.5” hole where the refrigerant and electrical conduit line passes through to the outside unit, which is mounted at the base of the house. A condensate drain also passes through this hole. The supply/return refrigerant lines are wrapped together in insulation. Each indoor head corresponds with a heating and cooling zone that can be controlled independently.

When having a new heat pump system installed, make sure your contractor provides you with the AHRI certificate of Certified Performance to ensure appropriate expectation of the systems performance. The certificate will also identify that you are purchasing a matched heating system, which is important to the efficiency and comfort performance, as well as life of the equipment. AHRI Certified Performance Certificates can be found at ahridirectory.org

Tips

A key to getting the best efficiencies out of a heating system is appropriate equipment sizing and duct performance. Make sure that your contractor is performing a heat load calculation and inspecting the duct system in the home. If installed improperly a heat pump system will not be able to meet manufacturers efficiency claims or AHRI Certified Performance ratings and life expectancy.

Caution



If adding a heat pump or central air conditioning to your home and Puget Sound Energy is your electric provider, talk with your contractor or call 1-888-321-7779 to check if the transformer and service to the homes is sized properly to avoid adverse impact to power quality due to the “voltage flicker”.

Voltage flicker must remain within permissible limits as required by the Washington Administrative Code (WAC 480-100-373) and home owners could potentially incur additional costs to upgrade Puget Sound Energy’s distribution system to accommodate their new equipment.

Other space heating systems

- **Electric resistance** heating such as baseboards and electric wall units are some of the most common type of radiant heating system, used in 22 percent of households in the Northwest. Baseboard heaters and electric wall units are very inexpensive to install but are costly to operate and have difficulty maintaining a constant temperature. Customers with this type of heating should consider installing a high-efficiency ductless heat pump.
- **Hydronic systems** use hot water circulated through pipes to heat the living space. Water is heated using a boiler, storage or a tankless hot water heater. In-floor systems use tubes in the sub-floor that circulate hot water. The water heats the floor, and warmth then radiates into the living space. Radiator systems send hot water through pipes to radiator units in each room. Hydronic systems heat space uniformly and can be quite efficient because the home remains warm and comfortable without using as much energy. ENERGY STAR qualified boilers have efficiency ratings of over 85 percent.
- **Natural gas fireplaces** often include fans to move warmed air throughout a room. For safety, and indoor moisture control, all fossil-fuel home heaters should use outside air for combustion and be vented to the outside. Direct-vent fireplaces should be considered. Fireplace operating efficiencies vary greatly, so when choosing a fireplace to heat your home, make sure that the equipment you purchase is “heat rated”. Many units are designed specifically for aesthetics and are not intended to be used as a primary source for heating. Consider purchasing a fireplace that uses electronic instead of a standing pilot light.
- **Wood fireplaces, stoves and Pellet stoves** are common in older homes and homes constructed recently after the energy crisis in the 1970s. New wood stoves typically have an efficiency rating of 6 to 7 percent. Using dry wood is important. Care must be exercised in installation, operation and cleaning of a wood stove and its chimney. Pellet stoves can be a higher efficiency, more convenient option to a wood stove. Wood fireplaces typically are a very inefficient and uncomfortable type of heating because fireplaces draw lots of heated air out of the home through the chimney, even when they are not in use.

Caution



If an **unvented** fossil-fuel space heater is needed in an emergency, use only fuel-burning equipment that is designed to operate indoors. Consider installing a carbon monoxide detector near sleeping areas in your home.

WARMING UP WITH THE RIGHT FIREPLACE IS RE-ENERGIZING

Selecting the right fireplace

- The fireplace should have a Btu rating that matches the space you are heating
- Heat-rated fireplace inserts have an outdoor air intake vent.
- The heat-rated fireplace may have an AFUE, steady-state, or fireplace efficiency (FE) rating: The higher the number the more fuel efficient.

For information on the environmental impacts of wood burning equipment visit the Puget Sound Clean Air Agency online at pscleanair.org.



Energy IQ

The steady-state rating refers to the unit's efficiency while maintaining a constant temperature. The AFUE rating takes into account the unit's efficiency at startup and as desired temperature is reached. When comparing fireplaces be sure to compare ratings using the same scale.

About zonal heating systems

When heating for living spaces are independently controlled, unused rooms can be kept cooler, saving energy. Many radiant heat systems (resistance/hydronic) use individual thermostats in separate rooms. Proper selection and use of a natural gas fireplace to heat a main living space as supplemental heat may result in noticeable energy savings.

RE-ENERGIZE YOUR UNDERSTANDING OF HEATING CONTROLS

Understanding heating controls

You can save around 10 percent a year on your heating and cooling bills by simply turning your thermostat back at night and while you are away from the home. You can do this automatically without sacrificing comfort by installing an automatic setback or programmable thermostat. The percentage of savings from setback is greater for homes in the northwest climate than for those in more severe climates.

- **Line-Voltage**

Electric resistance systems, such as electric baseboard heating, require thermostats capable of directly controlling 120-volt or 240-volt circuits. These are most commonly recognized as old dial thermostats. Though they are available, only a few companies manufacture line-voltage programmable thermostats.

- **Programmable thermostats**

Using a programmable thermostat, you can automatically adjust the use of your heating or air-conditioning according to a pre-set schedule. As a result, your system can operate less when you are asleep or when the house is not occupied.

- **Locating your thermostat**

The location of your thermostat can affect its performance and efficiency. Place thermostats away from direct sunlight, drafts, doorways, skylights and windows. Also make sure your thermostat is conveniently located for programming.



HAVING THE RIGHT CONTRACTOR ON CALL IS RE-ENERGIZING

Selecting the right contractor

Whether you are upgrading or installing new equipment, your heating system is a vital part of the structure of your home. So it's important for the work to be done by skilled professionals.

When choosing contractors, make sure they are licensed, insured and bonded. They should have a strong understanding of energy codes and recommend energy-efficient equipment where applicable. They should secure all necessary permits, which ensures that the equipment is installed in accordance with energy and mechanical codes.

A woman with dark hair in a ponytail is sitting at a desk, looking at a laptop. She is wearing a light-colored sweater and has several rings on her fingers. In the background, another person is visible, and there is a white mug on the desk in the foreground.

Energy IQ

PSE created the Contractor Referral Service to help you find contractors who can help you select and install all of your energy-related home improvements. These pre-screened, independent contractors can help you make the right heating choice for your lifestyle and budget to maximize your energy efficiency and lower your overall utility costs. For more information, call a PSE Energy Advisor at 1-800-562-1482 or visit [PSE.com/ReENERGIZE](https://www.pse.com/ReENERGIZE).

KNOWING THE TERMINOLOGY IS RE-ENERGIZING

Glossary

Annual Fuel Utilization Efficiency (AFUE) refers to the amount of heat that is captured for use in the home. For example, in an 80 percent efficient natural gas furnace, only 80 percent of the heat created is actually used to heat the living space, while the other 20 percent is lost through the combustion process.

Heating Season Performance Factor (HSPF) is a calculation of heating efficiency comparing watts of power consumed versus Btu of heat produced. It is used to gauge the efficiency of the heating mode of heat pumps; the higher the rating, the greater the efficiency and cost-savings. Today's models typically come with ratings from 7.7 to over 9.5. PSE recommends considering units that have a rating of over nine.

Seasonal Energy Efficiency Rating (SEER) is an air conditioning calculation of cooling efficiency comparing watts of power consumed as compared to Btu of cooling produced.

Resources

energystar.gov

This official government Web site has information on ENERGY STAR qualified products, new homes, and improvements.

ini.wa.gov

This link will help you review a contractor through Dept of Labor and Industries

eren.doe.gov/buildings/info/homes/coolinghome.html

US Department of Energy's Energy Efficiency and Renewable Energy Web site has detailed information about heating and cooling systems.

ahridirectory.org

The Air-Conditioning and Refrigeration Institute site has information on heat pump ratings.

goingductless.com

Find benefits and frequently asked questions about ductless heat pumps.



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