

With so many choices and information available on heating systems, renewable energy, and home energy efficiency upgrades, it can be hard to know where to start. The Skeena Watershed Conservation Coalition wants to make these decisions easier for everyone in the Upper Skeena region.

TODAY'S HEATING OPTIONS AND MAKING THE RIGHT CHOICE FOR YOUR HOME

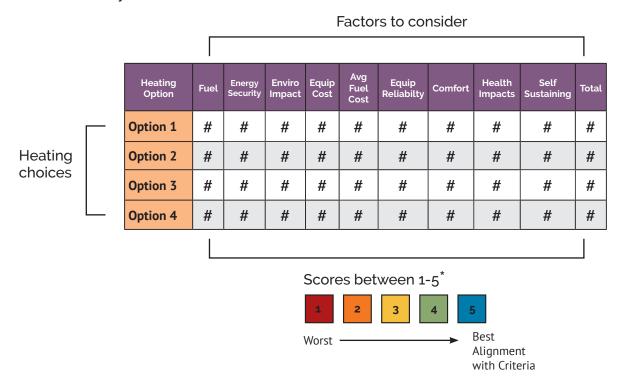
The SWCC team gathered the latest energy information to help residents choose the best home heating options.

To make things even simpler, we've created a **Decision-Making Matrix**—a straightforward tool that lets you compare different home heating options side by side, based on what matters most to you, like cost, efficiency, reliability, fuel availability, or environmental impact.

HOW DOES THE DECISION-MAKING MATRIX WORK?

The Decision-Making Matrix is set up as a table for quick reference.

Each row lists a different heating option, and each column shows a key factor to consider (such as price, reliability, or comfort). We've given each option a score (between 1-5) for each factor, so you can easily see how they stack up. By looking at the total scores, you can quickly spot which heating system might be the best fit for your needs.



^{*} The scoring was developed by a heating and HVAC technician with the Upper Skeena region's climate and geography factors as a focus.



Upper Skeena *Heating* **Decision-Making Matrix Scoring**

Scoring will be done though 1 to 5 for given factor:

- 1 Point Lowest Score. Does not meet any of your selected heating needs.
- 2 Points Low score. Does not meet most of your selected heating needs.
- 3 Points Moderate score. Meets some of your selected heating needs.
- 4 Points High score. Meets most of your selected heating needs.
- 5 Points Perfect score. Meets all of your selected heating needs.

USING THE HEATING DECISION-MAKING MATRIX:

- 1. Examine the summarized heating options on the left column of the scoring grid.
- 2. Examine the top row of factors and look at the corresponding score given.
- 3. Choose the heating option you want to learn more about.

 Detailed information about each heating technology begins on page 6.

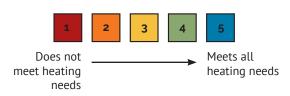
The higher the score of each criteria category, the more you reach your decision-making goals.



Upper Skeena Renewable Energy Decision-Making Matrix SCORING SUMMARY

Heating Option	Fuel	Energy Security	Enviro Impact	Equip Cost	Avg Fuel Cost	Equip Reliabilty	Comfort	Health Impacts	Self Sustaining	Total
Cold Climate Heat Pump	Elec	4	4	4	5	5	5	5	5	37
Electric Furnace	Elec	4	4	4	2	4	4	5	5	32
High Efficiency Wood Stove	Bio	4	2	3	3	5	4	3	1	25
Electric Baseboard *	Elec	4	4	5	2	4	3	4	5	31

*Baseboard heating isn't suitable for whole-house use but can be used as supplemental heat where no ducting exists.



This version of the Decision-Making Matrix is summarized to *only show the best options for the Upper Skeena region*. The full version of the matrix breaks down all existing options, including ones that score low for viability.

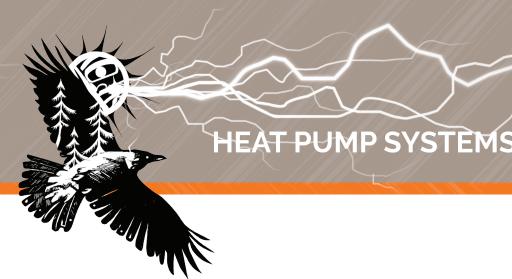


When choosing a heating system, there are a few questions to consider:

- How much will the system cost compared with other systems?
- Is the system compatible with my energy choice?
- Will this type of system suit my lifestyle?
- Will I be comfortable with it?
- Do I want central ventilation, air conditioning, or air circulation?
- Is there a contractor available to install and service the system?
- Is this an upgrade to my existing heating equipment or will it replace it entirely?

In many situations it can be beneficial to add redundancy to a heating system.

This can be accomplished by using more than one fuel type or by having auxiliary space heating systems designed to heat a specific zone of your home.



WHAT IS A HEAT PUMP SYSTEM?

Heat pumps have gained significant popularity due to their environmental and economic advantages. As the world addresses climate change, these systems offer a crucial tool for reducing carbon emissions by generating heat using electricity instead of burning fossil fuels. This makes them an environmentally friendly alternative to traditional heating systems.

Their improved energy efficiency means lower operating costs, with heat pumps typically generating about four times the energy they consume. Government incentives have made the initial investment more attractive and technological advancements in cold climate performance have also helped broaden their appeal. The benefits, cost savings, improved performance and their alignment with global decarbonization efforts have helped drive the widespread adoption of heat pumps across homes and businesses globally.

OVERVIEW

A heat pump is an electric heating and cooling system. The pump is an electrically driven device that extracts heat from a low temperature place (a source) and delivers it to a higher temperature place (a sink). In summer, the heat pump moves heat out of the house, and in the winter, it moves heat into the house–even if it's cold outside. Heat pumps use less energy to heat and cool the space in your home than traditional equipment does and are an excellent choice for both new homes and retrofits of existing heating and cooling systems.

WHY THE HYPE?

Furnaces and boilers provide space heating by adding heat to the air through the combustion of a fuel such as fossil fuels (gas/wood) or directly through an electric resistance coil. While efficiencies have continually improved, they remain below 100 percent, meaning not all the available energy is used to heat the air. Heat pumps operate on a different principle. The electricity input into the heat pump is used to transfer thermal energy between two locations. This allows the heat pump to operate more efficiently, with typical efficiencies well over 100 percent. Heat pumps today can reach 300 to 400 percent efficiency or even higher, meaning they're putting out three to four times as much energy in the form of heat as they're using in electricity.

SPECIALTY HEATING SYSTEM:

Air Sourced Heat Pumps

HOW DO HEAT PUMPS WORK

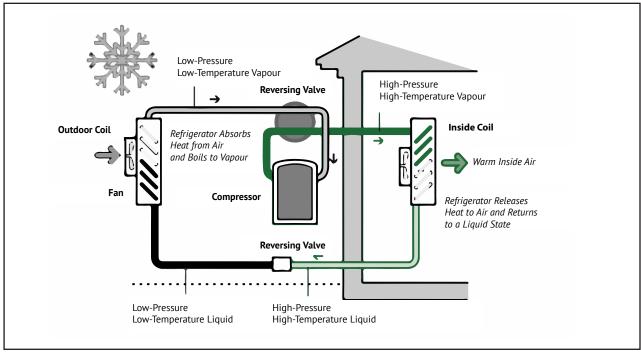
Heat pumps transfer heat rather than generate heat, making them energy-efficient while they provide comfortable temperatures for your home year-round. Heat pumps are able to transfer heat using a process of evaporation and condensation of a substance called refrigerant. This substance cycles between the indoor and outdoor units.

A heat pump's refrigeration system consists of a compressor and two coils (one indoors and one outside).

In heating mode, heat energy is extracted from the outdoor air and brought into the house via a compressor circulating refrigerant. A reversing valve changes the direction of refrigerant flow for cooling and for the winter defrost cycle. In warmer months, heat is extracted from the home and transferred outdoors.

If the outdoor temperature falls to near or below freezing when the heat pump is operating in the heating mode, moisture in the air passing over the outside coil will condense and freeze on it. The amount of frost buildup depends on the outdoor temperature and the amount of moisture in the air.

This frost buildup decreases the efficiency of the coil by reducing its ability to transfer heat to the refrigerant. At some point, the frost must be removed. To do this, the heat pump automatically switches into defrost mode.



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DO HEAT PUMPS WORK IN THE COLD?

The claim that heat pumps don't work well in really cold weather is often repeated by fossil-fuel companies, which have a competing product to sell. There's a kernel of truth here: heat pumps are less efficient in extreme cold. As the temperature difference between inside and outside increases, a heat pump will have to work harder to gather heat from that outside air and disperse it into the room, causing efficiency to drop.

Natural Resources Canada has developed guidelines to help with the sizing and selection of heat pumps based on climate, heating or cooling load, and intended use. While the report is intended for mechanical designers and contractors, it is a good source of information.

Interestingly, the highest penetration of heat pumps can be found in the coldest climates—despite frequent claims in parts of the media that heat pumps do not work in cold climates. In Europe, the four countries with the largest share of heat pumps are Norway (60 percent of households), Sweden (43 percent of households), Finland (41 percent of households) and Estonia (34 percent of households). These four nations also face the coldest winters in Europe. This heat pump leadership has been, in part, attributed to the high historical prevalence of fossil fuel-based heating in these countries.

SUPPLEMENTARY HEAT SOURCES

Since air source heat pumps have a minimum outdoor operating temperature (between -15°C to -25°C) and reduced heating capacity at very cold temperatures, considering a supplemental heating source for air source heat pump operations is important. Supplementary heating may also be required when the heat pump is defrosting. Different options are available:

All Electric

In this configuration, heat pump operations are supplemented with electric resistance elements located in the ductwork or with electric baseboards. These resistance elements are less efficient than the heat pump, but their ability to provide heating is independent of outdoor temperature.

Hybrid System

In a hybrid system, the air source heat pump uses a supplemental system such as a furnace or boiler. This option can be used in new installations and is also a good option where a heat pump is added to an existing system, for example, when a heat pump is installed as a replacement for a central air conditioner.

COMMON TYPES OF HEAT PUMPS

When choosing a heat pump, understanding the different configurations available is essential. These systems can be tailored to suit various home layouts, preferences, and heating and cooling needs. Here's an overview to help you make an informed decision:

Split vs packaged:

Split systems

Have components both inside and outside the building, with the air handler and evaporator indoors and the condenser and compressor outdoors. This system is ideal for homes where space is available for both indoor and outdoor units.

Packaged systems

Contain all components in one unit. Similar to traditional window mounted air conditioners. These systems are often located outside and heated or cooled air is delivered via ductwork passing through a wall or roof. They take up less space inside and can be easier to install.

Ductless vs ducted:

Ductless systems

Often called a mini-split system. In a ductless system, refrigerant lines run from one or more indoor ductless units to one or more outdoor units. Each indoor ductless unit controls the temperature of a zone, so a larger property may require more than one indoor unit. Since each indoor unit is responsible for a specific zone, heating and cooling can be adjusted based on occupant comfort to save on energy consumption. The modern design of the indoor ductless unit can be installed on a wall, ceiling, or floor of an existing space, requires minimal construction, and is ideal for additions, studio apartments, or smaller homes. They avoid ductwork efficiency losses but lack air filtration or the ability to add ventilation.

Ducted systems

In a ducted heat pump system with standard technology, there is one outdoor compressor/coil unit, and one centrally located air handler. The heat pump and air handler work together to heat or cool the air, which is then pushed throughout the home's ductwork. The entire system is typically controlled by a thermostat in one location. These systems are ideal for homes with an existing forced air system as the traditional furnace can be used as an air handler and provide a backup or auxiliary heat source.

WHAT'S NEW WITH HEAT PUMP TECHNOLOGY?

Cold Climate Air Source Heat Pump (Cc-Ashp) Technology

At lower outdoor air temperatures, the efficiency and capacity of heat pumps decrease because the colder air has less heat energy available to extract. Historically, this meant heat pump installers needed to provide supplemental heating or leave existing heating systems in place to serve as backups during extremely cold weather. However, recent advances in technology have led to the development of units that, when properly sized and commissioned, can continue efficient operation at low temperatures such that the supplemental or backup heating systems are rarely needed to efficiently meet the heating load of the building.

Since the air outside will always contain some heat, a heat pump can supply heat to a house even on cold winter days. In fact, air at -18°C contains about 85 percent of the heat it contained at 21°C.

CC-ASHP are designed to maintain a higher COP efficiency under the increased demand of colder climates. Cold climate heat pumps are built to work efficiently in conditions down to -25°C, with some systems maintaining an efficiency of over 200 percent at -18°C. Cold climate heat pumps have been in development and testing in Canadian winters since the early 2010s. Many leading brands have a cold climate option, and it is one of the most discussed subjects regarding heat pump technology research.

Improvements in several of their main components have helped boost the efficiency and performance of heat pumps, especially in the cold. New compressors used in heat pumps today can get refrigerants to higher pressures using less power. There are also variable-speed compressors that allow heat pumps to ramp their power up and down. The heat exchangers that transfer heat between the air and the refrigerant are getting bigger and better, so they can move heat around more effectively. Finally, the one major improvement is in the refrigerants. Freon, also called R-22, used to dominate the market, but has been phased out due to its ozone depleting effects.

Finding The Right Refrigerant

Today, a mixture of chemicals referred to as R-410A is one of the most widely used refrigerants in heat pumps. In addition to being slightly less harmful for the ozone layer, R-410A has a lower boiling point than R-22. This means it can absorb more heat at lower temperatures, boosting efficiency in the cold.

Because R-410A operates at such high pressures, there is an increased risk of an environmentally harmful refrigerant leak during maintenance and repair work. R-410A is currently being phased out. New systems will use more sustainable A2L refrigerants, which are a class of refrigerants that have higher efficiency and lower Global Warming Potential (GWP). The two foremost R410a replacements are R-32 and R-454B.

Existing air conditioners cannot simply switch from R410-A to the new refrigerants. A2L refrigerants may only be used for new AC and heat pump units specifically built for them. This means that consumers can continue to use their existing HVAC units and not have to replace them, or replace the R410-A refrigerant that they use with A2L. However, the EPA has proposed banning the use of R410-A in new air conditioners and heat pumps by January 1, 2025.

SPECIALTY HEAT PUMP HEATING SYSTEM:

Ducted Air Sourced Heat Pump

OVERVIEW

An air sourced heat pump (ASHP) connects to a central duct system. The ASHP sits outside your home like a central AC unit would, utilizing a coil in the air stream and an air handler to communicate heat in or out of the home through ductwork connected to every room.

ENERGY EFFICIENCY

SCORE: 5

Heat pumps are a low-carbon heating technology with the potential to deliver large-scale reductions in carbon emissions from building heat. They use electricity to move heat from ambient outside air to a building's interior. This process is highly efficient, with heat pumps delivering three to five units of heat for each unit of electricity needed to run them. When the electricity used to drive the electric compressor is produced from low-carbon sources such as hydroelectric, nearly all the useful heat provided becomes low or even zero carbon.

INSTALLATION COSTS & REQUIREMENTS

SCORE: 4

Our modelling finds that heat pumps are the lowest-cost heating and cooling option for most households, lower than gas-fired heating with air conditioning. Despite heat pumps having higher upfront costs, their efficiency and the fact that they double as a cooling and heating technology supports their cost competitiveness.

Heat pumps have been repeatedly identified as a key, cost-effective solution for tackling the carbon emissions associated with keeping buildings warm at international, regional, and national level. The costs of low carbon electricity have also declined significantly over the last decade, bolstering the case for electric heat pumps.

Depending on the size of your new heat pump, some modifications may be needed to your ductwork to avoid added noise and fan energy use. The cost of installing an air-source heat pump depends on the type of system, your design objectives, and any existing heating equipment and ductwork in your home. In some cases, additional modifications to the ductwork or electrical services may be required to support your new heat pump installation.

EQUIPMENT RELIABILITY AND MAINTENANCE

SCORE: 4

Heat pumps are considered a safer HVAC system because they don't rely on combustion. Oil and gas furnaces pose a greater risk due to lack of maintenance, and heat pumps reduce your overall carbon emissions compared to other heating options. Additionally, they require less maintenance than combustion heating systems, meaning there's less room for error when working on them and fewer ongoing air conditioner repair costs.

The single most important thing you can do to ensure the longevity of your furnace is to have it serviced when needed and change air filters on a regular schedule.

Like all heating equipment, routine maintenance will keep your system at peak efficiency, save on energy, and keep repairs to a minimum. Annual (yearly) servicing is recommended. You should have all home heating equipment regardless of fuel type, serviced annually, by a certified professional (source).

COMFORT

SCORE: 5

With electric powered equipment there is basically zero requirement for the homeowner, other than costs. No harvesting fuel and feeding a fire, just sit back and enjoy the warmth.

FORCED AIR HEATING SYSTEM:

Electric Furnaces

OVERVIEW

An electric furnace is a forced air heating system that heats air by passing cooler air over an electric resistance element that converts electrical energy into thermal energy. The heated element (much like the one in a toaster) warms the air as it is passing over, and this heated air is then distributed by the blower fan throughout your home duct system.

Blowers (large fans) in electric furnaces move air over a stack of two to seven electric resistance coils, called elements, each of which are typically rated at five kilowatts. The furnace's heating elements activate in stages to avoid overloading the home's electrical system. A built-in thermostat, called a limit, prevents overheating. This limit may shut the furnace off if the blower fails or if a dirty filter is blocking the airflow.

Electric furnaces can serve multiple functions, which is why they are often referred to as Electric Air Handlers or Air Handling Units (AHU). Electric forced air furnaces, as with most other types of forced air furnaces, can be used as an AHU paired with a central heat pump system to provide a hybrid heating solution.

ENERGY EFFICIENCY

SCORE: 4

Converting electricity into heat energy is a very efficient process, most times reaching close to 100 percent conversion efficiency and 95 to 99 percent overall unit efficiency (how much of the heat is transferred to the passing air).

If the thermal conversion rate of energy on a resistance element is 100 percent, why is the actual efficiency of an electric furnace a few percent lower?

Electric furnaces require additional energy to distribute the heated air throughout your home (which is common for any heating system that uses ducts for distribution). Heated air is delivered throughout the home through supply ducts and returned to the furnace through return ducts. If these ducts run through unheated areas, they lose some of their heat through air leakage, radiation, and convection from the duct's surface.

COST REQUIREMENTS

SCORE: 4

The average cost of a new electric furnace in Canada is between \$1,500 and \$6,000+ for the equipment alone. Every home and installation is different. Like any home improvement project, various factors can impact the final price of installation. The labor and materials costs of replacing an existing furnace are roughly \$1,500 to \$2,000. The complete cost to upgrade an existing furnace is on average between \$3,000 and \$8,000. In more remote areas this cost could drastically increase.

The upfront purchase costs for an electric furnace are very similar to the costs of upgrading to a modern high efficiency condensing gas furnace. However, if you are planning to replace an existing gas furnace with an electric furnace, you will also need to consider that your home's electrical system may require upgrades to cope with the increased electrical power draw required for an electric furnace.

If your home already has an electrical system that can handle the increased capacity needed for heat pumps or electric heating, an electric furnace would be a cost effective and environmentally friendly option.

RELIABILITY AND MAINTENANCE

SCORE: 5

The single most important thing you can do to ensure the longevity of your furnace is to have it serviced when needed and change air filters on a regular schedule.

Like all heating equipment, routine maintenance will keep your system at peak efficiency, save on energy and keep repairs to a minimum. Annual (yearly) servicing is recommended. You should have all home heating equipment, regardless of fuel type, serviced annually by a certified professional (source).

In general, most electric furnaces last longer as they have fewer components. An electric furnace has a life expectancy of 15 to 30 years, but as they age the heating elements lose efficiency and can fail, requiring a replacement element.

COMFORT

SCORE: 5

With electric powered equipment there is basically zero requirement for the homeowner, other than costs. No harvesting fuel and feeding a fire, just sit back and enjoy the warmth.

FORCED AIR HEATING SYSTEM:

Biomass Furnaces (Wood/Pellet)

OVERVIEW

Biomass or bioenergy includes multiple fuel sources such as: cord wood, pellet, wood chip, and coal. When dealing with biomass furnaces you will regularly be talking about a cord wood furnace or a wood pellet furnace. These furnaces, unlike a biomass boiler system, are usually located inside a house. They operate very similarly to a gas or electric furnace, by burning a fuel to create heat that is introduced into an air stream and communicated to the house via ductwork by a large fan. Like gas furnaces, biomass furnaces use a heat exchanger system. This ensures that the combustion process is isolated, and any harmful byproducts are safely vented outside through a chimney.

Both pellet and cord wood burning furnaces come with the requirement of some physical labor on the hands of the homeowner. Wood must be harvested and processed then brought into the house and fed into the furnace manually. Pellets must also be packed into the house and loaded into a large storage device called a hopper, that then automatically feeds the burner. Both fuels also leave the homeowner with a fair amount of clean up with extra wood dust from the fuels, ash that must be cleaned out from the furnace regularly, and in most cases, a chimney that must be swept.

Cord wood burning furnaces offer a readily available fuel source in remote areas and can be gathered with little to no cost (other than a large amount of work). Most wood burning furnaces can operate in a limited capacity without electricity. They are great in a power outage or when electricity isn't reliable.

Pellet furnaces take some of the work out of the homeowners' hands by automatically feeding fuel from a hopper into the fire and in most cases automating the ignition process. This allows for longer periods of time between adding fuel and less work. This unfortunately comes with the side effect of a greater reliance on electricity in comparison to cord wood.

With most biomass furnaces acting as a dual fuel or hybrid system you will never again be dependent on a single source of energy to guarantee the comfort and safety of your family. Depending on the furnace, you can add an electric element, an oil unit, or use it as a wood add-on to an existing furnace.

Most biomass furnaces are controlled by a wall thermostat that gives you the exact comfort level you want for your home. This is usually done by modulating air intake to throttle the burner and cycling the fan blower to deliver the required heat. Some systems even incorporate automatic ignition systems, so whether or not you are present, your home will be comfortable without interruption.

ENERGY EFFICIENCY

SCORE: 2

As of 2017 only boilers that are certified to meet emissions standards set by the US EPA or the CSA are legal to sell in BC (Source).

Most modern equipment, and any that include CSA approval, must be able to meet the strict EPA/CSA emissions standards. This doesn't govern a specific efficiency percentage but rather controls equipment emissions.

Wood and pellet furnaces now commonly feature a secondary combustion system, like a catalytic converter, to increase their efficiency by taking heat from the smoke made by the initial burning of fuel. These furnaces easily reach up to a 30 percent reduction in fuel wood used. EPA certified or CSA B415.1-10 tested wood furnaces are 80 to 90 percent efficient, compared with 40 to 60 percent for conventional units.

COST REQUIREMENTS

SCORE: 2

Biomass furnaces have a high initial equipment cost. Wood furnaces range from \$5,000 to \$10,000+ and require an expensive chimney system that often costs upwards of \$2,000. Pellet furnaces with the added complicated mechanical systems range from \$6,000 to \$12,000+.

Biomass furnaces are larger and heavier than furnaces of other fuel types and often require more space. Clearances to combustible surfaces and framing are important to note as some equipment requires a specific distance from it to anything combustible for safety.

Fuel storage for biomass fuels often requires a large amount of area in a dry space separate from the area in the house where the equipment is located. This often means that the fuel needs to be stored in an outbuilding designed or built for this purpose.

RELIABILITY AND MAINTENANCE

SCORE: 3

The longevity and efficiency of a biomass furnace is heavily dependent on the quality of the fuel used. Poor-quality fuel can cause incomplete combustion, producing excess ash and smoke. This can increase maintenance needs, reduce efficiency, and lead to catastrophic failures due to ash buildup in components, combustion failures, smoke or ash pollution in the home, and even chimney blockages or fires. Using good fuel and proper maintenance is essential.

In addition to regularly changing air filters, many manufacturers require homeowners to perform maintenance tasks such as cleaning ash pans and combustion chambers. While these tasks can be done by homeowners, annual servicing, including cleaning vents/chimneys and heat exchangers, should be completed by a certified professional.

Biomass furnaces are made from durable heavy metals to endure the combustion process, making them more resilient than some other furnace types. With proper care and fuel quality, they typically last 15 to 30 years. However, neglecting maintenance or using poor fuel can significantly reduce their reliability/lifespan.

COMFORT

SCORE: 3

As mentioned, biomass furnaces require additional efforts that take you out of the comfort of your home and involve heavy labor. Delivering fuel from its outdoor storage to the equipment indoors can be required in poor weather conditions and at inopportune times. Failure to add fuel can result in outages and cold or freezing indoor temperatures.

Biomass heat is considered a dryer heat, and the burning of wood or pellets can lead to lower home humidity.

Traditionally, wood burning fireplaces offer a higher comfort and ambiance. Many biomass furnaces can offer the same feeling..

SECONDARY HEATING SYSTEM:

Electric Baseboards

OVERVIEW

Electric baseboard heaters are based on one of the first whole house heating systems: hydronic heat or radiators. Electric models are a more modern, more reliable source of secondary heat.

Think of electric baseboard heat like a toaster. They work by sending an electric current through the unit heating the metal fins which then radiate that heat into the air. Currents in the room circulate the heat keeping the room toasty—pun intended.

Electric baseboard heat is the most sought after form of secondary heat in the Northeast, where it can be bitterly cold. Electricity performs better in extreme temperatures where other sources might struggle.

One downside to electric baseboards is that they aren't very subtle in the space, nor are they attractive to look at. These concerns were eliminated by launching nice looking covers (very similar to the hydronic baseboard heater covers). These are available in kits for full update to your baseboard heat that are easy and quick to install.





No matter what kind of heating system you have in your house, you can save money and increase your comfort by properly maintaining and upgrading your home. By taking some simple steps you can maximize your retrofit gains and can improve your home's heating, cooling and ventilation performance, and overall durability. Even more important, you will create a healthier, more comfortable living environment.



DO IT YOURSELF / SIMPLE FIXES

Hiring a professional to perform major home improvements and renovations is recommended, but if you're skilled enough or willing to learn, some tasks can be managed without help. Some simple lifestyle changes can also have a major impact on the energy costs of home heating. As the temperature starts to take a dip, there are some simple things you can do to cut back on heating bills.

Make your curtains work for you

Windows are one of the biggest sources of heat loss in a house. Window coverings can reduce energy loss through your windows, lower heating and cooling bills, and improve your home's comfort. Remember to open your curtains or blinds in the morning to let in natural heat and sunlight. Be sure to close them in the evening to keep heat from escaping back out through the windows.

Heat is expensive, but you already own a sweater & socks

You don't need to buy, build, or install anything to lower your heating bills. Simple changes in your daily habits can have a significant impact without requiring any financial investment. Adjusting your indoor attire can allow you to keep your thermostat at a lower setting while staying comfortable. A cozy sweater and wool socks can make you feel warmer.

Use your ceiling fan more effectively

Change the rotational direction of your ceiling fan so it spins clockwise. This will pull up more cold air, forcing it to mix with hot air near the ceiling. The resulting warm air will get pushed down and make the room feel warmer.

Refrain from heating unused spaces to conserve heat

If you have unused rooms in your home, don't waste heating energy and money by heating them. Consider reducing heat sent to guest rooms, laundry rooms, or storage areas. Partially close vents in those rooms, close doors, and conduct the flow of warm air to rooms that you use more regularly.

Keep cold air outside and warm air inside

Check for areas in your home where drafts are allowing cold air in and warm air to escape. Check windows and doorways for drafts. You may be able to stop leaking heat with weather stripping, door sweeps, or clear plastic window films to reduce the loss of warm air and better insulate your home.

BE SMART ABOUT SETTING YOUR THERMOSTAT

Cranking the thermostat doesn't warm up the room any faster. If you've ever returned home to a room that feels like the Arctic, it's pretty tempting to crank the thermostat up four or five degrees past where you normally set it. But the space will still take the same length of time to warm up and you'll just use more energy because your heating system continues heating the room after you've passed your regular comfortable temperature. This often results in opening a window to lower the room temperature letting all that expensive heat go to waste and a massive loss of efficiency.

Lowering the temperature of your home two to three degrees Celsius is optimal for saving energy and keeping your home comfortable. A good guide is to program 17°C when you are sleeping or not at home, and 20°C when you are awake and at home. Keep it simple and install a smart thermostat so you can set it and forget it.

Did you know that heating costs can increase by about 5 percent for every degree above 20°C (68°F)? Most people often set their thermostat higher than it needs to be.

Installing a smart or programmable thermostat is one of the most effective ways to reduce heating costs. These devices offer precise temperature control and can learn your habits to optimize heating schedules automatically. However, even standard programmable thermostats can make a big difference when used correctly. Remember, the best programmable thermostat is the one you'll use and use properly, not the one with the most features.

The following temperature guidelines are recommended, but every house has different requirements.

Sleep 16 - 18°C (61 - 64°F) During sleep or rest set the temperature lower

Active 18°C (64°F) Doing housework or cooking

Inactive 21°C (70°F)

Watching TV or reading

A higher minimum indoor temperature than 18°C may be necessary for vulnerable groups including older people, children, and those with chronic illnesses, particularly cardiorespiratory disease.

PROFESSIONAL RENOVATIONS AND RETROFITS

In some cases, Do It Yourself (DIY) projects may not be enough. While professional options require a larger upfront investment, they can lead to significant long-term savings on your heating and cooling bills.

Renovating a house so it will keep the heat in during the heating season and keep the temperature cooler during the summer often involves hiring a professional. This means adding insulation, caulking and weatherstripping, improving or replacing windows and doors, and improving the mechanical systems including adequate ventilation. Talk to a professional contractor about the best options for your home. They may do a heat loss calculation and point out the most efficient project to start with.

Natural Resources Canada goes into great detail regarding building science principles and how they can help you control the flow of heat, air and moisture / humidity, and why you must consider these factors together in this document.

Add more insulation

Your house may lose heat quickly if it is not well insulated. This is often the case with older properties that were built before modern-day insulation techniques and do not have the space to add cavity wall insulation.

Too little insulation, especially in your attic or basement, can really affect the warmth of your home, letting hot air escape outside or making it feel colder near the walls. Adding insulation to key places, or even upgrading the insulation in your whole home, can make a big difference.

Eliminate drafts and plug holes

Check for extra space around your windows and doors that could be letting in cold air. If you're not sure, try placing your hand a few centimeters away from the edges and see if you can feel a draft. If so, apply weather-stripping or sealant to fill any cracks. A new, improved heating system will not reduce heating costs if much of its heat escapes because your house envelope needs more insulation or has air leaks. Take a close look at where you can reduce the heating losses by draft proofing and insulating before you change the heating system.

Replace your windows

Does it feel like your windows are wide open, even when they're closed? Is there any mold on your window frame? This problem probably needs more than just sealant; it's likely time to replace your windows. Replacing all of your windows with new certified models could save you up to 45 percent on your energy bill.

By implementing quick fixes like sealing drafts and optimizing your existing system, along with long-term strategies such as improving insulation and considering renewable energy sources, you can significantly lower your heating bills while maintaining a comfortable home environment. We recommend starting with the most accessible and affordable options and gradually working towards more comprehensive solutions as your budget allows.



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QUICK GUIDE: UPPER SKEENA HOME HEATING SOLUTIONS —A Practical Decision-Making Guide



Skeena Watershed Conservation Coalition