



A Guide to Energy Efficient Heating & Cooling

Heating & Cooling

WITH EFFICIENCY IN MIND



NYSERDA

Heating, cooling, and water heating account for more than half of the energy use in a typical New York home, making them significant energy expenses. Additionally, nearly two-thirds of all U.S. households use air conditioners, which cause energy costs to be even higher. And, in New York State, heating and cooling systems such as furnaces, boilers, and central/window ACs that burn fossil fuels are responsible for 32 percent of greenhouse gas emissions, which directly relate to carbon footprint. You can save on energy costs and improve your overall home comfort by choosing higher-efficiency heat pump systems in addition to making weatherization improvements.

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Keep efficiency in mind when replacing equipment in your home.

Benefits of Heat Pumps for Home Heating

- **Dual Heating and Cooling:** Heat pumps are designed to work efficiently in cold climates like New York — while also doubling as a cooling system in the summer.
- **Efficiency:** The cost of heating and cooling your home with a heat pump is typically less than oil, propane, or electric resistance.
- **Zoned Temperature Control:** With heat pumps, you can individually control the heating and cooling preferences of different rooms in your home.
- **Cleaner and Safer:** There is no combustion of fossil fuels, fuel storage, or carbon monoxide emissions associated with heat pumps. Heat pumps also have the lowest carbon emissions of any heating source.
- **Easier:** Heat pumps require minimal maintenance and eliminate the hassle of scheduling fuel deliveries and worrying about fluctuating fuel costs. Additionally, you won't have to struggle with installing room/window A/Cs every spring and then removing them every fall.

Benefits of Heat Pumps for Water Heating

- **Cleaner & Healthier:** Heat pump water heaters produce fewer greenhouse gas emissions, contributing to a cleaner environment.
- **Safer:** If you are heating your water with fossil fuels like natural gas, propane, or oil, a heat pump water heater can significantly reduce carbon monoxide emissions and indoor air pollutants in your home.
- **Efficient:** These water heaters can be two to three times more energy efficient than conventional electric resistance water heaters.
- **Affordable:** Upgrading to an electric heat pump water heater can cut your water heating costs in half, saving you \$200–\$400 per year or more on your energy bills, depending on how much hot water you use.



Six Signs It's Time to Replace Your Heating System

Home heating is the largest energy expense for most homeowners in New York. Consider upgrading your system or making air sealing and insulation upgrades if any of the following statements apply.

- **Your heating equipment is 15–20 years old.**

A furnace or boiler that has received annual maintenance can last 20 years or more. If you haven't had your system serviced regularly, it may not last as long. Even equipment that seems to be running fine can be wasteful and costly to operate. Consider replacing older equipment before any issues occur or it breaks down when you need it.

- **Your heating bills are rising.**

If your heating bills seem to be going up season after season, it may be time to replace your equipment with a new, energy-efficient heat pump. An increase in energy bills might mean that your system is running less efficiently. Newer, more efficient heat pumps are a smarter, more efficient option to keep your home comfortable all year long. These all-in-one heating and air conditioning systems are environmentally friendly, extremely efficient, and affordable to operate.

- **Your equipment needs frequent repairs.**

If your heating system is breaking down repeatedly, not providing heat at a comfortable level, or making unusual noises, it may be time to replace your system. When repairs become a constant expense or system performance is a nuisance, it's time for an upgrade.

- **You have rooms that are too hot or too cold.**

Properly functioning heating equipment should provide even temperatures throughout your home. If heating is inconsistent from room to room, this may be a sign that it's time to replace your system or that you need to seal and insulate air leaks in your home or ductwork.

- **Your home has humidity problems, excessive dust, or the air is too dry.**

If you feel uncomfortable in your home or are getting sick more often, you may need to replace or upgrade your system. When heating systems aren't working properly, you may notice problems managing humidity levels, excessive dust around the house, or other issues with indoor air quality that could impact the health of your family.

- **You are remodeling.**

If you are undergoing a renovation project, it's the perfect time to consider a new heating system—especially if you are creating new spaces to heat and cool. Take advantage of clean heating and cooling technologies, like heat pumps. Unlike conventional systems, heat pumps work by drawing heat from the environment and moving it indoors to heat or moving it outdoors to cool your home. They are the safest choice for your home with no burning of fossil fuels, no need for fuel storage tanks, and no potential for carbon monoxide emissions.

Time to replace your heating system?

Learn about [energy efficient heat pumps](#).

Six Signs It's Time to Replace Your Cooling System

Many New York households use air conditioners to cool their homes. Consider upgrading your system or making air sealing and insulation upgrades if any of the following statements apply.

□ **Your cooling equipment is 15–20 years old.**

A central air conditioner that has received annual maintenance can last up to 15 years. A room air conditioner (either a window unit or a portable air conditioner) can last 10–15 years and requires frequent maintenance. If you haven't had your system serviced regularly, it may not last as long and can cost more to operate—even if it seems to be doing a good job cooling your home. Consider replacing your system before any issues occur or it breaks down when you need it.

□ **Your energy bills are rising.**

If your energy bills seem to be going up season after season, it may be time to replace your equipment with a new, energy-efficient model. An increase in energy bills can mean that your system is running less efficiently.

□ **Your equipment needs frequent repairs.**

If your cooling system is breaking down frequently and needs to be fixed throughout the summer or is excessively noisy, it may be time to replace your system. When repairs become a constant expense, it's time for an upgrade.

□ **Your home's temperature isn't comfortable.**

If you have a hard time keeping your home cool, this could be a sign of an aging air conditioner or even an incorrectly sized system. This could also signal that you may require sealing and insulation upgrades to better manage the indoor comfort of your home during the summer.

□ **Your home has humidity problems.**

Even on the hottest days, your home should not feel humid if the air conditioning system is working properly. If your system is having an increasingly difficult time removing excess moisture from the air, it may be time for an upgrade.

□ **You are remodeling.**

If you are undergoing a renovation project, it's the perfect time to consider a new cooling system—especially if you are creating new spaces to heat and cool. Take advantage of clean heating and cooling technologies, like heat pumps. A heat pump is an all-in-one heating and air conditioning system that is environmentally friendly, extremely efficient, and affordable to operate. Unlike conventional systems, heat pumps work by drawing heat from the environment and moving it indoors to heat or moving it outdoors to cool your home. They are the safest choice for your home with no burning of fossil fuels, no need for fuel storage tanks, and no potential for carbon monoxide emissions.

Time to replace your cooling system?

Learn about [energy efficient heat pumps](#).

Six Signs It's Time to Replace Your Water Heating System

Water heating is typically the second-largest energy expense in a home; it can cost the average household approximately \$400–\$600 each year. Consider upgrading or making air sealing and insulation upgrades if any of the following statements apply.

☐ **Your water heating equipment is 15–20 years old.**

A water heater that has received annual maintenance can last up to 20 years. If you haven't had your water heater serviced regularly, it may have a shorter life span. Consider replacing your system before any issues occur or it breaks down when you need it.

☐ **Your energy bills are rising.**

Hot water accounts for around 20 percent of a home's total energy use. If your bills seem to be going up, it may be time to replace your equipment with a new, energy-efficient heat pump water heater. An increase in energy bills can mean that your system is running less efficiently.

☐ **Your equipment needs frequent repairs.**

If your hot water system is breaking down repeatedly or leaking, it may be time to replace your system. When repairs become a constant expense, it's time for an upgrade.

☐ **You aren't getting as much hot water.**

If you have noticed that the amount of hot water you typically get has been declining, these are warnings that your system is in decline and may need to be replaced.

☐ **Your system is leaking or the water is discolored.**

If your water has a reddish tint, the inside of your hot water tank may be rusting out and is likely to start leaking soon. If you notice water puddling around the water heater, it's a sign that your system may be nearing the end of its life span.

☐ **You are remodeling.**

If you are undergoing a renovation project, it's the perfect time to consider a new hot water system. Take advantage of clean heating and cooling technologies, like heat pump water heaters. Unlike conventional systems, heat pump water heaters use electricity to pull heat from the surrounding air and transfer it to water enclosed in a tank. They are three times more energy efficient than conventional water heaters, resulting in lower energy bills and operating costs.

Time to replace your water heater?

Learn about [energy efficient heat pump water heaters](#).

Sealing & Insulating Your Home



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If any of your heating, cooling, or hot water systems are not working properly or need to be replaced, make sure to seal air leaks in your home and duct system in addition to upgrading the mechanical systems. Poor insulation and air leakage can prevent equipment from functioning properly or as efficiently as possible. Sealing and insulating ducts can improve the efficiency of your heating and cooling system by as much as 20 percent.

Air Sealing

Air sealing is one of the most cost-effective ways to boost the energy efficiency of your home and save you money. When done properly, air sealing also reduces the risk of mold and mildew, reduces ice damming on your roof, increases the comfort of your home by reducing drafts, and prevents dust and pollutants from entering your home.

The most common air leakage points are in the attic and basement, as well as around windows, doors, and heating ducts. If air is escaping in any of these places, your heating and cooling systems may not be able to keep your home as comfortable as it could be.

Insulation

When combined with air sealing, insulation contributes to additional savings on heating and cooling costs. Any surface in your home that separates the interior from the exterior should be insulated to prevent hot and cold air from escaping. In colder climates like New York, insulation is even more important to keeping your home comfortable year-round and ensuring your heating and cooling systems work efficiently.

While there are do-it-yourself opportunities to improve the air sealing and insulation of your home, the best return on investment is to hire a professional contractor.

Learn more about
[replacing equipment with efficiency in mind.](#)