Automated wood heating is a heating system that burns locally sourced, sustainable wood pellets instead of fossil fuels.

**AUTOMATED WOOD HEATING: Four Reasons to Switch**

1. **LOWER GREENHOUSE GAS EMISSIONS**
2. **SAVE ON ENERGY BILLS**
3. **BUY LOCAL**
4. **NO HASSLE**

Automated wood heating is a heating system that burns locally sourced, sustainable wood pellets instead of fossil fuels.

*Clean Energy Lives Here*  
MASSCEC.COM/GOCLEAN
# TABLE OF CONTENTS

Automated Wood Heating (AWH)

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology Overview</td>
<td>3</td>
</tr>
<tr>
<td>Is AWH a Good Fit For My Home?</td>
<td>5</td>
</tr>
<tr>
<td>Case Studies</td>
<td>6</td>
</tr>
<tr>
<td>Benefits of AWH</td>
<td>8</td>
</tr>
<tr>
<td>Costs, Incentives, &amp; Financing</td>
<td>9</td>
</tr>
<tr>
<td>Efficiency First</td>
<td>10</td>
</tr>
<tr>
<td>Making the Switch</td>
<td>11</td>
</tr>
<tr>
<td>How Can I Prepare for an AWH Installation?</td>
<td>12</td>
</tr>
<tr>
<td>Questions to Ask Your Installer</td>
<td>13</td>
</tr>
<tr>
<td>Getting the Most From Your New System</td>
<td>16</td>
</tr>
</tbody>
</table>
Automated Wood Heating is a heating system that burns locally sourced, sustainable wood pellets instead of fossil fuels. An automated wood heating system works just like a gas/oil boiler or furnace except that it burns wood instead of fossil fuels. Unlike traditional wood stoves or boilers, these heating systems are automated and don’t need to be manually loaded or cleaned. Automated wood heating systems can use the existing pipe or ducts in your home and require minimal homeowner interaction besides emptying a small ash bin a few times a year.

Automated wood heating systems feature a central wood boiler or furnace, usually in the basement or mechanical room of a house, a thermal storage tank (i.e., hot water tank) for homes with boilers, located next to the boiler; and a bulk pellet storage bin, usually in the basement or garage of a house, although pellet storage can also be located outdoors. In the winter, wood pellets are delivered directly to your home by a truck similar to an oil or propane fuel truck. The pellets are conveyed from the truck to your storage bin by a hose connection, typically located on the side of the house. The storage bin automatically feeds pellets into the boiler or furnace. As the pellets burn, the energy they produce is used to heat your home and domestic hot water. Thermal storage tanks store hot water, so that the boiler does not need to turn on every time the home needs heat or hot water, which increases the efficiency of the system.
EXISTING SYSTEMS THAT PAIR WELL WITH AUTOMATED WOOD HEATING SYSTEMS:

- Forced hot water baseboard or radiator
- Ductwork

HOME IMPROVEMENT SCENARIOS THAT WORK WITH AUTOMATED WOOD HEATING SYSTEMS:

- Existing home replacing heating or hot water systems
- Existing home doing major renovations
- New home construction
AUTOMATED WOOD HEATING (AWH)

Is Automated Wood Heating a Good Fit for My Home?

If you answer yes to ANY of the following questions, then automated wood heating may be a good fit for your home.

☐ Do you want to reduce your home’s greenhouse gas emissions?
  AWH systems burn sustainably grown wood instead of burning fossil fuels to heat your home reducing your home’s greenhouse gas emissions.

☐ Do you have a place to store the fuel?
  Automated wood heating systems need sufficient space for a bulk storage bin that can hold as much as five tons of wood pellets. A small (3 ton) pellet bin typically takes up 4.5 ft. by 6 ft., while a larger pellet bin (5 ton) takes up 10 ft. by 10 ft. Bulk storage bins are typically at least 6 ft. tall. If you do not have a basement or you do not have adequate space in your basement, you can also put these storage bins in crawl spaces, an outdoor storage shed or silo, or a garage. Vacuum lines up to 80 feet will then be run to the house to transport the pellets to the boiler.

☐ Do you have an oil or propane hot water boiler or furnace?
  With today’s energy prices, heating your home with an AWH system instead of oil or propane will lower your heating operating expenses. Plus, AWH systems can easily be incorporated into your current heating distribution and completely replace your current method of heating.
  Wood pellets are a low carbon alternative to more carbon intensive fossil fuels such as oil or propane.

☐ Are you interested in supporting the regional economy?
  Wood pellets and chips for automated wood heating systems come from byproducts of sustainably managed Northeastern forests, keeping more of your dollars in the regional economy.

☐ Do you also need a heating solution for your domestic hot water?
  Automated wood heating systems can also heat your hot water. You may be surprised by how much energy is consumed producing hot water and the savings can add up over a year.
Ted Wright recently added an automated wood heating system and solar hot water to his home in Montgomery, MA, with the help of MassCEC rebates and has been extremely happy with the result.

Ted uses his new fully automated pellet boiler to provide space heating for his home and as back-up hot water heater for his solar hot water system in the winter. During the installation, he disposed of his old oil-fired system and his old wood furnace that was highly-polluting and non-EPA certified.

He also wanted a more automated system, because he didn’t want to worry about cutting, splitting, and manually feeding the wood fired boiler in the future. Ted has found the pellet system is very easy to maintain and generates far fewer ashes than his old wood system. He also likes how it can function without any backup heat, and therefore replaced both his old wood and oil boilers.

Ted decided to add a solar hot water heater to minimize the consumption of pellets during the warmer season. He has found that the pellet boiler and solar hot water system work well together to heat his hot water and home comfortably.
Winchester resident Wyatt Biel installed an automated wood heating system with the help of a rebate from MassCEC and has been extremely pleased with the results.

Prior to switching to a pellet boiler, his home was heated by oil. Wyatt shared that he wishes he had made the transition to automated wood heating sooner.

“The pellet boiler has operated flawlessly since installation,” Wyatt stated. “Receiving delivery of pellets is effortless.”

He has found that the boiler has exceeded his expectations for meeting his heating needs, and he appreciates how the system moderates fuel input and energy output so adaptively. He feels that heating with wood pellet boilers is still underutilized in the U.S.
AUTOMATED WOOD HEATING (AWH)

Benefits of AWH

FLEXIBILITY & FUNCTION
• Homeowners can use existing heating distribution systems, such as ducts or radiators
• Systems can provide both space heating and domestic hot water
• Systems are fully automated; homeowners only need to set their thermostats and the boiler or furnace will regulate itself
• No chopping wood or feeding logs; homeowners only need to empty a small ash bin a few times a year

GREENHOUSE GAS EMISSIONS
• Lower greenhouse gas impact than fossil fuels by using pellets derived from sustainably harvested or scrap/waste wood

SUPPORT LOCAL ECONOMY
• Heating expenditures stay in the local economy and support the local forestry industry, thereby helping to keep forest land economically viable
INCENTIVES

There are incentives available to homeowners in Massachusetts wishing to upgrade their heating system to an automated wood heating system. Incentives depend on the kind of system installed and the cost of the system. Depending on your electric provider, you may be eligible for different incentive programs.

- **Federal Investment Tax Credit**: For systems installed through 2022, 26% of the installed cost of the system may be claimed as a tax credit on your personal income tax return. The amount decreases to 22% in 2023 and is eliminated in 2024. See the IRS website and/or consult your tax advisor to confirm eligibility.

- **Massachusetts Alternative Energy Certificates (AECs)**: AECs (worth approximately $3-12 each) are provided to homeowners who install qualified automated wood heating systems every quarter, depending on the number of tons of pellets used. Homeowners apply for AEC credits after installation. A typical 2,000 square foot home will use 4-6 tons of pellets per year, which translates to quarterly payments that could be worth $60-250 annually. See the Department of Energy Resources (DOER) website for more information on AECs.

*Please note that the price of AEC credits is subject to market demand and that the price listed here may be different than the current market price.*

FINANCING

- **Mass Save® HEAT Loan**: If you are located in Mass Save® territory, then eligible automated wood heating systems can be financed through the Mass Save® HEAT Loan, which offers loans of up to $25,000 at 0% interest over terms of up to 7 years. If unsure whether you are eligible for Mass Save® incentives, check on the Mass Save® website.

- If you are not eligible for Mass Save® incentives, check with your local municipal electricity provider to see if they have any financing options available for clean energy systems.

ESTIMATED COST

The cost to install an automated wood heating system in your home will depend on the specifications of the building, the extent to which you are replacing your existing system, and your installer. Costs also depend on the size of the system, size of storage bins, and modifications to the distribution system required for installation. Automated wood heating systems costs typically start around $26,000 before incentives.

If your existing heating system is more than 10 years old, consider replacing it before it fails. The true cost to install an automated wood heating system is the difference in cost between replacing your existing boiler or furnace with an in-kind replacement versus the cost of installing an automated wood heating system.
Taking steps to air-seal and insulate your home will ensure that it is ready for your new automated wood heat system and will help reduce overall energy consumption. A tighter, more insulated home will not only save you money on operating costs and reduce your carbon emissions throughout the year, it may also allow you to buy smaller, less expensive equipment in the first place.

There are a few ways to increase your home’s efficiency and reduce its heating and cooling load.

- **Air sealing**: Ensuring there are as few gaps as possible for indoor air to escape and outdoor air to get in reduces the heating and cooling load in a home. Air leakage can represent up to 40% of space-conditioning costs in a leaky building. Weatherization professionals will focus on sealing leaks hidden in the attic, garage, or between floors. Air sealing often involves re-sealing windows, replacing broken or jammed vents, and replacing the rubber seals around door frames. Experienced professionals will know the common culprits of air leakage to target, but a professional assessment of hidden leaks using a blower door to pressure-test the house is the best way to find leaks in your house.

- **Insulation**: Adding insulation slows heat transfer through the building envelope (i.e., walls, roof, floors); heat transfer is the leading cause of heat loss in the winter. Working with a professional contractor to improve roof, wall, and floor insulation can considerably lower heat transfer, improving your home’s efficiency. Many insulation contractors are trained to air-seal before insulating, when it’s much easier to do.

- **Duct Upgrades**: If your home utilizes a centralized heating or cooling unit with ducts outside of the conditioned space of the home (i.e., in an attic, basement, garage, or crawlspace), sealing and insulating the ducts can significantly improve the overall efficiency of your system by ensuring that more of the heated or cooled air gets delivered to where it is needed.

- **Programmable Thermostat**: Using a programmable thermostat allows you to automatically raise and lower your home’s temperature to accommodate your schedule. A programmable thermostat allows you to automatically turn down your heating system for the times when you’re away and turn it up for you to come back to a warm home.

Mass Save® or your gas or electricity provider may provide a no-cost assessment to identify efficiency opportunities for your home and incentives to help pay for the upfront cost of insulating and air-sealing.
1. Confirm that automated wood heating is the best fit for your home and your home clean energy priorities.

2. Understand the costs and plan how you will finance the project. Check out the Cost, Incentives, & Financing section to understand the typical costs to install an automated wood heating system.

3. Contact installers. MassCEC recommends contacting at least three installers to learn more about installing an automated wood heating system in your home. Visit our Find An Installer Near You page for installers. Referrals from family, friends, or neighbors is another great way to find an installer.

4. Prepare your home. If necessary, take preliminary measures to get your home ready for a new heating system, such as completing any weatherization work recommended in your home energy assessment like sealing air leaks or installing insulation. If you are planning to improve the weatherization of your home, make sure your installer is aware so that they take the reduced heating needs of your home into account when designing your automated wood heating system.

5. Install automated wood heating system. Talk to your installer about how long installation will take. Automated wood heating systems installations typically take between 3 days and 2 weeks, depending on home size and system complexity.
Plan for where you would store the pellet or wood chips.

Think about where you would put a pellet storage bin. While the width and depth of a bin vary on the volume of pellets it can hold, height is also important. Most storage bins will be a minimum of six feet high. Storage bins are typically put in the basement of a home, but can also be in a storage shed, crawl space, or garage. A small storage bin is 4.5 ft. by 6 ft., while a larger storage bin will be 10 ft. by 10 ft.

Pellet storage bins can also be custom built to fit a particular space, which can be a good option if the available space is irregularly shaped.

Collect your fuel bills from the last two to three years (if they’re available).

Your current fuel usage and cost is a great way to determine the savings you’ll get by switching to an AWH system.

Current fuel usage can also help installers size an AWH system for the needs of your home.

Weatherize your home!

It’s important to weatherize your home before installing an AWH system. AWH systems operate best in well-insulated and air-sealed homes with efficient windows. Get a home energy assessment and implement the recommended weatherization measures. Make sure to tell your installer about any weatherization measures that you have done or are planning, so that they can size your system appropriately.
During your conversation with installers, consider asking the following questions:

**CONFIGURATION**

Did you perform a heat load calculation to determine the size of the system?

Many installers size systems using general rules and their experience. If you are installing an automated wood heating system, it is important that the system is well designed, and a heat load calculation for your specific home is an important tool in selecting the right equipment.

**Where do you recommend placing the boiler, thermal storage tank, and bulk pellet storage?**

Make sure you understand and are comfortable with the location of the boiler, thermal storage tank, and bulk pellet storage. The bulk pellet storage should be located in an area that gets natural air circulation like a basement.

**COST**

What is the installation price and what incentives may be available? Who will apply for these incentives?

Make sure that you understand upfront who will apply for any incentives that you are pursuing and when you need to apply (before or after installation).
**QUESTIONS TO ASK YOUR INSTALLER (CONT.)**

**What is the expected price of wood pellets?**
Your installer should be able to provide you with the current price of wood pellets from a supplier that serves your area. You can also reach out to other suppliers. The Department of Energy Resources surveys the market to estimate the average price of wood pellets each heating season.

**Aside from annual fuel costs, what annual costs can I expect (such as regular maintenance or parts)?**
MassCEC suggests that you have your automated wood heating system inspected every one to two years. Ask if you contractor performs routine maintenance or if they have another company that they recommend.

**TIMING**
**How far in advance can we plan the installation and how long does the installation take?**
Be sure to communicate if you have particular time constraints and get a sense when your installer will be available to do the installation. Summer is the busiest time of the year for automated wood heating installers and many installers have some delays during the summer season.

**What should I do to prepare for the installation?**
Make sure you understand from your installer if there is anything you need to do to prepare to have them working in your home.
QUALITY ASSURANCE
Do you provide a warranty for the systems you install? What are the different warranty options?
Make sure you have a sense of what is covered by any warranty offered by your contractor. Some warranties cover labor, some cover the equipment, and some cover both.

Have you participated in manufacturer training for the systems you would install, and can you provide references from previous customers?
As with any home improvement project, it is important to ensure that your installer has the right training and a good track record with past customers.

Will you hire subcontractors to complete portions of the project? If so, what will they do? What are the names of these companies and how long have you worked with them?
Some automated wood heating installers may sub-contract part of the installation work.

Will you provide training for me on how to properly operate and maintain the system (i.e., how to set the thermostat to how often to empty the ash bin)?
Automated wood heating systems are relatively simple to operate, but there are a few differences compared to other heating systems, and your installer should be a good educational resource.
OPERATION

• Most automated wood heating systems will alert you when pellets are running low in your bulk pellet storage bin. Once you receive a notification, schedule a bulk pellet delivery. During this delivery, the pellets will be run through a tube into your bulk pellet storage. Homeowners will need pellets to be delivered every 3-4 months, depending on heating needs and the size of your home.

PROFESSIONAL MAINTENANCE

• Schedule an annual maintenance check with your automated wood heating system installer to make sure that everything is running smoothly.

HOMEOWNER MAINTENANCE

• Empty the ash bin in your boiler every two to three months. During the winter months, you may need to empty your ash bin more frequently depending on the heating needs and size of your home.
Clean Energy Lives Here.
MASSCEC.COM/GOCLEAN