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2022 Update:

Advanced Wood Heat Sector in Vermont

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Vermont Department of Public Service**

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The lead author of this report was Adam Sherman with research, analysis, and support from Sean Parker and Damon Lane. VEIC is a mission driven non-profit organization focused on developing and implementing market solutions to expand the use of energy efficiency and renewable energy.

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Terminology

This report uses specific terms to describe various forms of wood heating that need to be clarified:

| Term | Definition |
|-------------------------------|---|
| <i>Total wood heating</i> | Includes all wood fuels (cordwood, pellets, and chips) and all heating appliance (stoves, furnaces, and boilers) without regard to the efficiency or sophistication of the combustion equipment. Legacy wood heating equipment such as outdoor wood boilers and old non-EPA certified stoves are included in this definition. |
| <i>Advanced wood heating</i> | Includes all wood fuels (cordwood, pellets, and chips) and all high-efficiency heating appliance (stoves, furnaces, and boilers) installed indoors. Generally representative of all new appliances incentivized by the State of Vermont programs. |
| <i>Automated wood heating</i> | A subset of advanced wood heating that includes high-efficiency boilers and furnaces that are automatically fueled with either wood pellets or chips and can sustain automated operations for several days at a time. |

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Introduction

This report summarizes the findings of an assessment of the advanced wood heat industry and market in Vermont in 2022 as a follow up to [the original 2016 Wood Heat Baseline](#) report. A separate companion report, entitled “2022 Update: Wood Heat Use in Vermont” covers the 2022 update of total use of wood fuels and appliances to meet Vermont’s thermal energy needs. Both the 2022 update reports and the original 2016 baseline report can be found on the Public Service Department’s website.

Background

Wood heat has been a mainstay of providing thermal energy for buildings in Vermont for a very long time. While heating homes with woodstoves has been common for generations, using automated woodchip and wood pellet systems to heat entire buildings in Vermont only started a little over three decades ago. During that time, there has been slow and steady growth in the use of automated woodchip and pellet fueled boilers in the commercial, institutional, and residential markets. Based on VEIC’s assessment of this market across the US and Canada, Vermont remains home to the greatest density of installed automated wood heating systems in North America.

Assessment Purpose

Wood heating is aligned with and supports the goals of the Comprehensive Energy Plan, Vermont’s greenhouse gas reduction requirements, the Climate Action Plan, the Working Lands Initiative, and the State’s economic development targets. Tracking the development of wood heat allows the State of Vermont to measure progress toward these goals. The goal of this assessment update is to examine the size and condition of the wood heat market and industry in Vermont at the end of 2022, so that further market development progress can be measured against a specific point in time. This 2022 update will also help evaluate the impacts of the various support programs in the future. The aim of the Vermont Clean Energy Development Fund (CEDF) programs is to advance the use of wood heating, and measuring the impacts of the program over time is important to inform adjustments in response to changes in the market. Changes in the market are better understood using baseline information.

This is an update to the first advanced wood heat assessment of 2016. That report explored the state of the AWH sector at the time and this report shows what progress has been made since then.

Scope of Assessment

VEIC was tasked with conducting an updated assessment of the advanced wood heat sector as well as total wood heating in Vermont. This specific report covers the assessment of the advanced wood heat sector that has been targeted for programmatic support by the CEDF for the last nine years. The assessment covers:

- Businesses supplying cordwood, pellet, and chip fuel.
- Businesses providing import and distribution of equipment.
- Businesses installing and servicing wood heating equipment.

This assessment was focused on businesses whose primary revenue stems from wood heat related products and services. It does not directly cover the wide range of local hardware stores or large box store retailers that often sell bagged pellets. Nonetheless, these retailers are believed to account for a significant portion of total amount of bagged pellets sold annually in Vermont.

Methodology

There are numerous distinct sources of existing information that were used to provide the estimates developed for this study. To be efficient and make the most of various sources of existing data, VEIC compiled, reviewed, cross-referenced, and analyzed those different sources and wove them together to paint a comprehensive and coherent picture of the state of total wood heat in Vermont. State-level data for space heating and domestic hot water are sparse, inconsistent, and often inaccurate. State-level data on wood fuel consumption has the same drawbacks. Advanced wood heat businesses in the “region” (defined in this assessment as within 200 miles from the center of Vermont) were included in the assessment if they provided services and installations in Vermont.

The following sources of data provided the bulk of the data used in the analysis:

- CEDF’s Small-Scale Renewable Energy Incentive Program and Efficiency Vermont incentive program data (starting in 2012)
- The Vermont Residential Fuel Assessment (every 2 years between 1986-1998, 2008, 2015 and 2019) administered by the Department of Forests, Parks & Recreation, in partnership with the Department of Public Service
- Analysis previously performed in 2018 as part of the Vermont State Wood Energy Team (VSWET) grant to characterize the school and multifamily market
- The semi-annual Fuel for School Survey administered periodically by the Department of Forests, Parks & Recreation
- VEIC’s tracking of known commercial and institutional size facilities
- Energy Information Administration’s (EIA) State Energy Data System (SEDS) provide annual consumption estimates at the State level by sector and energy source
- Census American Community Survey (ACS) provided data on penetration level of wood heat appliances such as wood stoves. Census data also provided data on number of households in the State.
- The Vermont Clean Energy 2016 and 2023 Industry Reports, prepared for the CEDF by BW Research Partnership

Existing data listed above were supplemented by information gathered through interviews with key regional market players such as:

- Advanced wood heat system installers and importers/distributors
- Wood pellet fuel manufacturers and suppliers
- Wood pellet fuel distributors
- Specialty woodstove retailers

The most detailed sources of data available were used and, where needed, assumptions and estimates were made to fill in any gaps. Whenever possible, values calculated using the different data sources were

compared to verify the magnitude of the estimates and ensure estimates and results are reasonably consistent among data sources.

Advanced Wood Heat Sector in Vermont

This section of the report provides details regarding the state of the advanced wood heat industry in Vermont in 2022. This report covers the businesses involved in the production and delivery of wood fuels used for heating, as well as the production, import, sales, installation, and service of wood fueled heating equipment. New in 2022, we have expanded the categories covered to also include wood stove retailers as well as chimney sweeps.

Table 1 – Summary of wood heat related businesses in Vermont between 2016 and 2022

| | 2016 Baseline | 2022 Update | Percent Change |
|---|---------------|-------------|----------------|
| Pellet mills in Vermont | 2 | 1 | -50% |
| Pellet mills within surrounding region | 18 | 21 | 16% |
| Bulk pellet delivery businesses in Vermont | 3 | 2 | -33% |
| Specialty dry chip fuel suppliers serving Vermont | 1 | 1 | 0% |
| Traditional green wood chip suppliers serving heating market in VT ¹ | 7 | 6 | -15% |
| Businesses manufacturing automated wood systems in Vermont | 0 | 0 | 0% |
| Businesses selling and installing automated wood heating systems in Vermont | 41 | 19 | -53% |
| Wood stove retailers in Vermont | N/A | 28 | N/A |
| Chimney sweep businesses in Vermont | N/A | 33 | N/A |

Below are the VEIC estimates broken down by sector.

Wood Fuel Producers

Cordwood Producers

Based on the most recent data available from 2019 Residential Fuel Assessment, there were an estimated 400,000 cords of firewood used annually in Vermont for residential space heating during the 2018-2109 heating season.² Cordwood is generally harvested, processed, and consumed locally – there is little interstate movement due to pest quarantines and poor economics of transporting firewood.

A complete and accurate quantification of firewood production and sales is not feasible. Slightly over one third of firewood is self-cut by homeowners from their own properties or from the property of someone they know.³ In addition, there is a large amount of firewood sold by individuals who do not actually register

¹ There are numerous wood chip contractors that exclusively supply the power plant market, but do not actively serve smaller, seasonal heating market.

² https://fpr.vermont.gov/sites/fpr/files/Forest_and_Forestry/Wood_Biomass_Energy/Library/2019%20VT%20Residential%20Fuel%20Assessment%20Report%20FINAL.pdf

³ https://fpr.vermont.gov/sites/fpr/files/Forest_and_Forestry/Wood_Biomass_Energy/Library/2019%20VT%20Residential%20Fuel%20Assessment%20Report%20FINAL.pdf

or promote their firewood business – firewood production is a small side business. For this assessment, VEIC compiled a dataset of known firewood producers from on-line business directories and known firewood producers lists maintained by Department of Forests Parks and Recreation personnel.

When 2019 cordwood-use data are compared to the amount of cordwood used for residential heating reported in the 2016 Baseline Study, there was an 18% increase. When the next update of the RFA is released, it is anticipated that the use of cordwood fuel increased during and after the COVID-19 pandemic, due to more homeowners with cordwood appliances staying at home and working from home.

VEIC estimates that, in aggregate, firewood producers annually generate over \$50 million dollars in annual sales in Vermont.

Wood Pellet Producers

At the time of the 2016 Baseline Study, Vermont had two operational pellet mills (one in North Clarendon and the other in West Windsor) with a combined production capacity of slightly under 50,000 tons per year and there were several additional pellet mills under development.

In 2017, the pellet mill in West Windsor closed due to a combination of market factors. As of 2022, there was only one operational pellet mill in North Clarendon, Vermont. However, in 2023 a second pellet mill operation located in Richford came online and is now actively producing bagged pellets. Additionally, new pellet mills are being continually considered by private developers.

Due to confidentiality guidelines and there being only one pellet mill in Vermont in 2022, economic impacts from jobs and gross sales are not reported here but are included in the overall estimates.

While production in Vermont is currently limited, there is ample supply and capacity regionally that can serve the Vermont market. Based on 2022 data from Biomass Magazine^{4,5} for pellet mills located in Northeastern US and the province of Quebec, there are approximately 1.48 million tons of regional mill capacity.

Table 2 - Regional wood pellet mills, their location and capacity in 2022⁶

| Plant | Location | Capacity (US Ton per year) |
|-----------------------------------|----------|----------------------------|
| Blackstone Pellets | CT | 8,200 |
| Curran Renewable Energy LLC | NY | 108,900 |
| Dry Creek Wood Pellets | NY | 77,100 |
| Essex Pallet & Pellet | NY | 800 |
| Hearthside Wood Pellets | NY | 1,800 |
| Lignetics of Maine Inc. | ME | 69,900 |
| Lignetics of New England-Deposit | NY | 79,800 |
| Lignetics of New England-Jaffrey | NH | 81,600 |
| Lignetics of New England-Schuyler | NY | 54,400 |

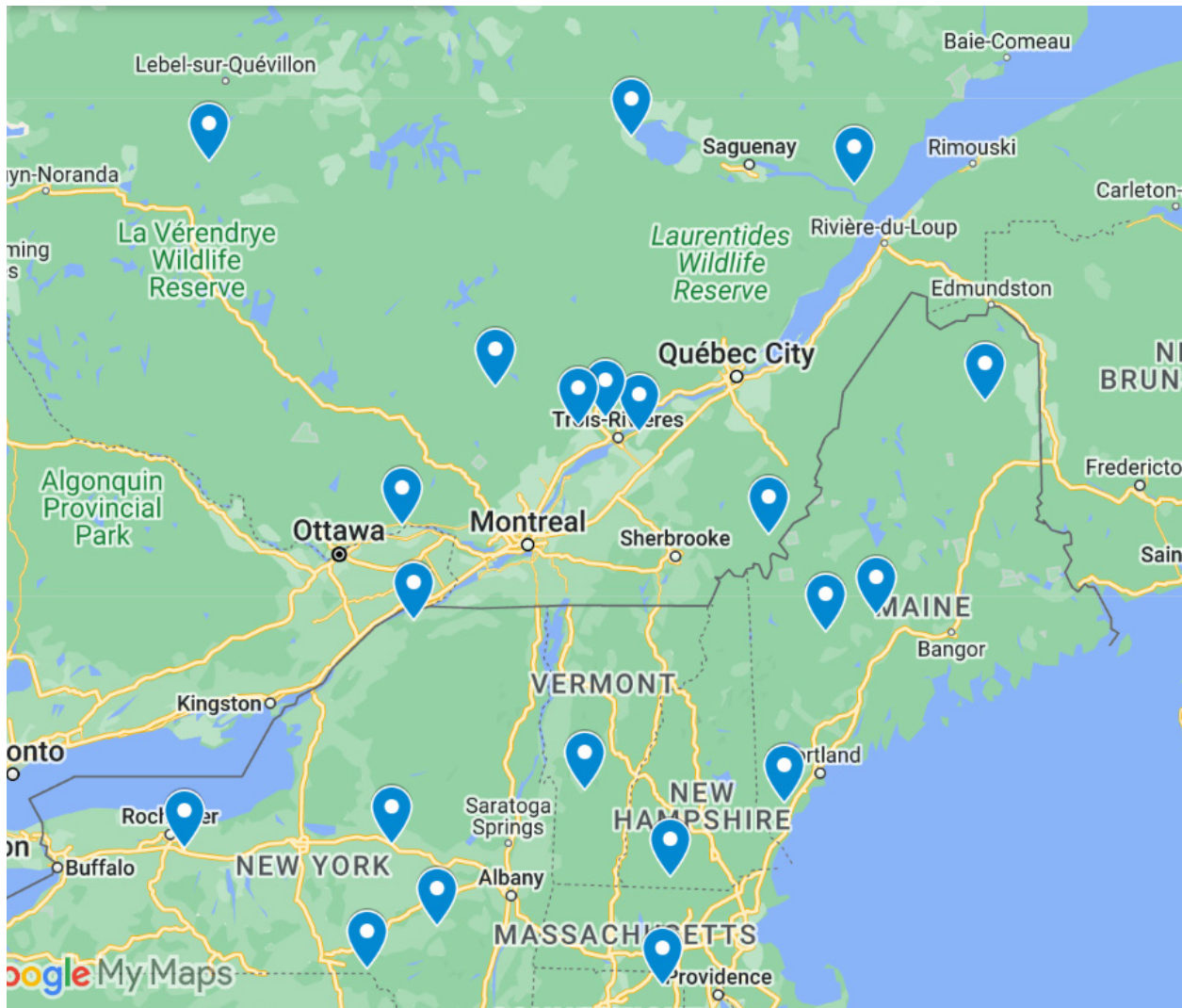
⁴ <https://biomassmagazine.com/plants/listplants/pellet/US/>

⁵ <https://biomassmagazine.com/plants/listplants/pellet/Canada/>

⁶ Table does not include Vermont Natural Forest Products’ pellet mill in Richford, VT because it became operational in 2023.

| | | |
|---|----|---------|
| Maine Woods Pellet Co. | ME | 99,800 |
| Northeast Pellets LLC | ME | 7,300 |
| T&D Wood Energy | ME | 33,600 |
| Vermont Wood Pellet Co. LLC | VT | 16,500 |
| Airex Energy Inc. | QC | 15,000 |
| Energex Pellet Fuel Inc. | QC | 120,000 |
| Granulco | QC | 30,000 |
| Granule 777 | QC | 210,000 |
| Granules de la Mauricie | QC | 55,000 |
| Granules LG Inc. | QC | 120,000 |
| La Granaudiere | QC | 200,000 |
| Lauzon Recycled Wood Energy-Papineauville | QC | 32,000 |
| Lauzon Recycled Wood Energy-Saint-Paulin | QC | 60,000 |

Figure 1 – Map of regional pellet mill locations in 2022⁷



A large majority of annual production across pellet mills in region sell over 90% of annual production in bags and only a handful of regional pellet mills selling the remainder in loose bulk form.

Based on data presented in the [2019 Residential Fuel Assessment](#) and estimates from increased pellet boiler installations in Vermont, in the time between the 2016 Baseline Study and 2022, there was steady and gradual increased demand for both bagged and bulk wood pellets.

⁷ Figure 2 map does not include Vermont Natural Forest Products' pellet mill in Richford, VT because it became operational in 2023.

Primary Woodchip Producers

Throughout Vermont there are numerous businesses that produce wood chips as part of their operations – sawmills, logging contractors, and tree service companies being the most common. There are, however, a smaller subset of woodchip fuel producers that actively serve the commercial and institutional heating market. While many suppliers are sawmills and logging contractors whose primary markets are not woodchip heating facilities, there are a growing number of businesses in Vermont who have made considerable investments in the infrastructure (chip screening equipment, live-bottom trailers, covered areas to store woodchips, etc.) necessary to serve the growing woodchip heating market.

It is difficult to separate woodchip suppliers' activities from other markets they serve (i.e., biomass power plants, pulpmills, etc.), but based on interviews with several of the premier woodchip suppliers to the heating market and the total annual woodchip heating fuel consumption of Vermont facilities, VEIC estimates the woodchip fuel suppliers who serve the heating market employ 19 full-time equivalent (FTE) staff and generate \$4.4 million in annual sales from woodchip heating fuel.

In the past 6 years, there have been few new woodchip systems installed and the resulting demand for wood chip fuel has remained steady.

Dry Chip Producers

There are several businesses regionally (none currently in Vermont) that purchase green wood chips and further process (screen and dry) the chips into a value-added fuel that is compatible with smaller high-efficiency European boilers. One primary producer has made significant investments in facilities to dry and store chips and in specialty pneumatic trucks to deliver chips into bins and silos.

These dry chip suppliers sell fuel to customers across the region with an estimated 2,000 tons being sold into Vermont. The Vermont portion of gross sales are estimated at \$1/2 million annually contributing to roughly one FTE for employment.



Bulk Pellet Delivery Businesses

In 2022, there were three active Vermont based companies offering bulk pellet fuel delivery services – Bourne’s Energy, Vermont Renewable Fuels, and Bourdeau Brothers. Several additional businesses based outside Vermont also serve the Vermont market – Lyme Green Heat, Sandri, and MeSys.



The three Vermont-based businesses operate a total of five specialty pneumatic delivery trucks and several grain trucks ranging in payload capacity from 10 – 30 tons. These three businesses deliver an estimated 9,000 tons annually.

In addition to the three Vermont-based businesses actively delivering bulk pellets in Vermont, in 2022 there were a few additional businesses providing bulk wood pellet fuel delivery service to the Vermont market from their locations in Massachusetts, New Hampshire, Maine. However, there was recently some industry consolidation – Lyme Green Heat in New Hampshire acquired the bulk pellet business previously operated by Sandri Energy based in Greenfield, Massachusetts.

Overall, Vermont-based bulk pellet delivery businesses delivered an estimated \$2.2 million in annual bulk pellet sales in Vermont. An additional \$1 million in sales were delivered by non-Vermont businesses selling bulk pellets into Vermont.

Vermont-based bulk wood pellet fuel delivery businesses employed an estimated 6.2 FTE employees for all their operations.

Heating Appliance Manufacturing/Assembly

Automated Wood Heating Systems

Vermont has been home to several companies that have manufactured advanced wood heating systems in Vermont. From the mid-eighties until 2010, Chip-tec woodchip systems were manufactured in Vermont. For a brief period between 2011 and 2013 a small company called WeBiomass was assembling pellet boilers from Ireland at their location in Rutland. Pellergy is a locally owned small business that began manufacturing high-efficiency wood pellet combustors for retrofitting oil, propane, and cordwood boilers in their location in Barre in 2008. However, in 2015 when new EPA regulations and testing requirements for residential boilers were enacted, Pellergy stopped manufacturing its combustor units and began importing and distributing wood pellet boilers manufactured in Upper Austria under their brand. Currently, there are no automated wood heating systems manufactured or assembled in Vermont.

Advanced Wood Heating Systems



For decades, wood stoves have been manufactured in Vermont. Vermont Castings had several facilities in Vermont – including a foundry in Randolph and an assembly plant in Bethel. Today, the foundry in Randolph produces components for woodstoves that are manufactured in Pennsylvania.

Hearthstone located in Morrisville is the only woodstove company that is still manufacturing products in Vermont. They produce both wood and gas fired stoves.

Heating Appliance Sales, Installation, and Service

There are numerous businesses that sell, install, and service wood heating systems in Vermont.

This industry segment is broken down into two primary categories below – businesses that specialize in centralized, automated heating appliances like boilers and furnaces and businesses that specialize in room heaters such as wood and pellet stoves.

Automated Wood Heat Segment

These businesses range in size from small HVAC and plumbing contractors installing a few residential pellet boilers a year, to larger companies with several employees wholly focused on both residential and commercial pellet and woodchip systems. It is important to note that the HVAC contractors that may install only a few wood boilers per year may be small firms or large firms that do a high volume of installations with fossil fuels and heat pumps, but a low volume of automated wood heat installations.

There are also several Vermont-based and regional automated wood heat businesses that are importers and distributors of boilers. Some of these businesses exclusively distribute boilers while others also provide installation services. There is one Vermont based importer/distributor of boilers and three additional businesses based in surrounding states that serve the Vermont market.

In 2022, there were 12 known installers of automated systems based in Vermont that serve the Vermont market and 2-4 additional installers based in surrounding states that serve the Vermont market.

Based on revenue estimates developed from installer phone interviews, VEIC estimates that these businesses generate gross revenue of up to \$7 million from sales, installations, and maintenance in Vermont.⁸ Of that total, \$4 million is estimated to be generated by Vermont-based businesses (Figure 3). This value was calculated using revenue figures reported in interviews, assuming that the businesses that were not interviewed generated a similar revenue and using the average from the last few years for

⁸ Value includes direct costs of the equipment purchased at wholesale. This value represents gross sales, not the markup portion of the installer's revenue.

businesses that only install systems intermittently. All businesses reported that their sales fluctuate greatly from year to year, with some businesses not installing any systems in a given year.

The distribution, sale, installation, and service of automated wood heat systems in Vermont provides over 37 full time equivalent (FTE) jobs in Vermont and the region. Estimates developed from responses to telephone interviews indicate that 20 of these FTE jobs are in Vermont, with most of the remaining jobs located in New Hampshire and Massachusetts.

Advanced Wood and Pellet Stove Segment

Advanced wood heating using stoves accounts for a large majority of the wood heating market and industry in Vermont. For this assessment, 28 woodstove retail businesses in Vermont were identified. These are retailers who specialize in the sale and service of wood heating equipment – namely cordwood and pellet stoves and fireplace inserts. While nearly all these retailers do sell other related products such as barbeque and outdoor fire pits, all reported most of the sales coming from equipment used for home heating. For this assessment, other retailers who also sell stoves and bagged pellets such as box stores and hardware stores were not included.

Many retailers sell a wide range of appliance – some sell gas fired units and some even sell heat pumps. Most retailers also sell pellet fuel.

This market segment employs and estimated 160 FTE and generates \$10 million in annual sales of stoves and fuel.

Additionally, part of the wood and pellet stove segment are businesses that provide service for the install and maintenance of the appliances as well as the associated chimney and flues. VEIC identified 33 chimney sweep service businesses in Vermont and estimates these businesses employ 145 FTE and generate \$10 million in annual revenue.

Types and Quantities of Heating Appliance Installations

Table 3 - Estimated number of homes with wood heating appliances in Vermont

| Appliance type | 2022 Estimate of Number of Installed Units |
|-------------------------------|--|
| Cordwood stoves and inserts | 90,408 |
| Pellet stoves | 21,001 |
| Pellet boilers | 719 |
| Cordwood boilers and furnaces | Unknown |

Using data from a variety of sources, VEIC estimates that there are over 112,000 single-households in Vermont with some form of wood heating appliance (Table 3).

Table 4 – Automated wood heating system market summary table

| | 2016 Baseline | 2022 Update | Percent Change |
|---|---------------|-------------|----------------|
| Number of green wood chip fueled systems | 67 | 67 | 0% |
| Number of dry wood chip fueled systems | 1 | 6 | 600% |
| Number of commercial bulk pellet systems | 100 | 148 | 48% |
| Number of residential bulk pellet systems | 377 | 719 | 90% |

Table 3: Cumulative automated wood heat installations in Vermont, 1986-2022

| Number of Installed Systems | Pellet | Woodchips |
|--|------------|-----------|
| Residential | 719 | - |
| Commercial and Institutional | 148 | 67 |
| Total Number of Installed Systems | 867 | 67 |

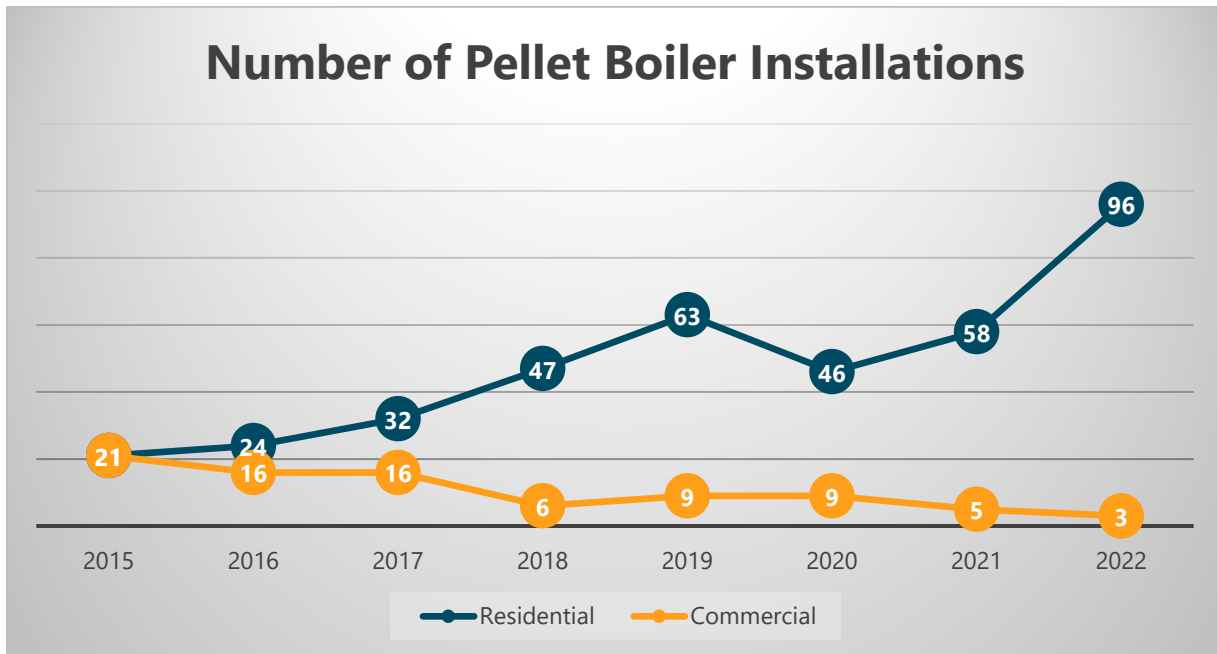
Using data from installer interviews, VEIC estimates that between 2016 and 2022, 342 new residential pellet boiler systems were installed in Vermont, as well as an additional 53 commercial and institutional automated wood heat systems.

Installation Trends

Examining historical trends can help us better understand the market forces that impact an industry and anticipate how the market may change in the future. While historical trends are not predictive of the future, they can be useful to identify where programs and funding support could help bolster certain market segments.

On the residential side, the Efficiency Vermont and the CEDF Small-scale Renewable Energy Incentive program provide a representative depiction of the overall growth of the advanced wood heat market in recent years. The trend in residential pellet boiler system installation has increased. Rising heating fuel costs, the inclusion of a federal tax incentive for qualifying wood heating systems, the COVID-19 pandemic, and steady state incentives were the likely drivers behind this increased rate of pellet boiler installations.

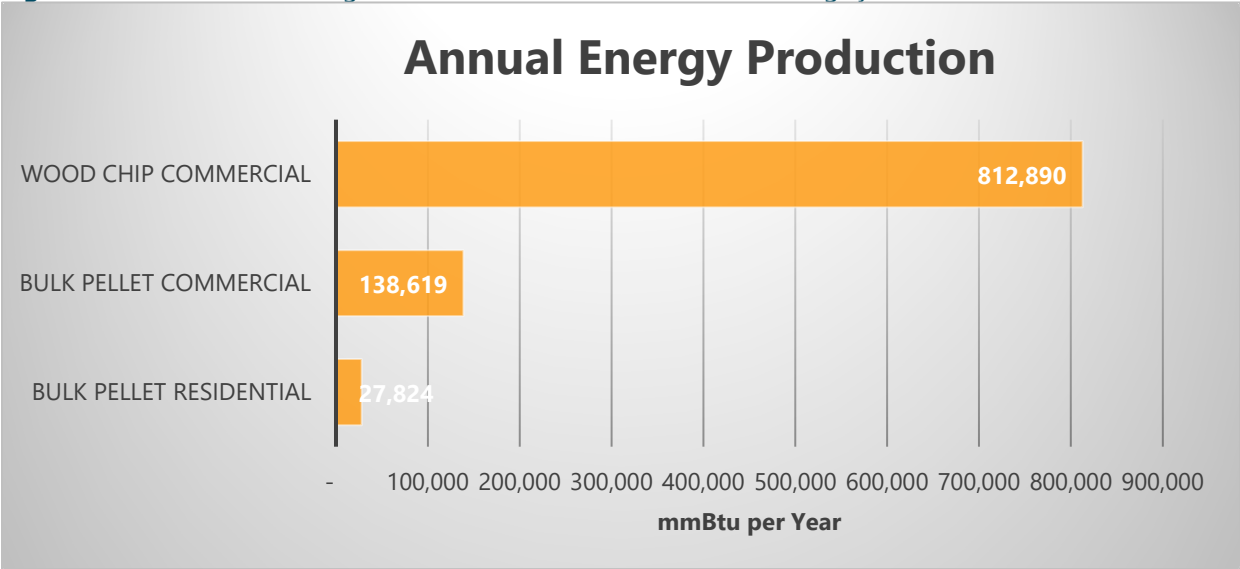
Figure 2 - Residential and commercial pellet boiler installations through the incentive programs 2015-2022



In the commercial and institutional sector, the number of pellet systems installed annually has steadily decreased since 2015. This may be due to several factors – dwindling incentives for this market, as well as the introduction of dry chip systems and fuel that often provide better project economics given the lower fuel cost as compared to bulk pellets.

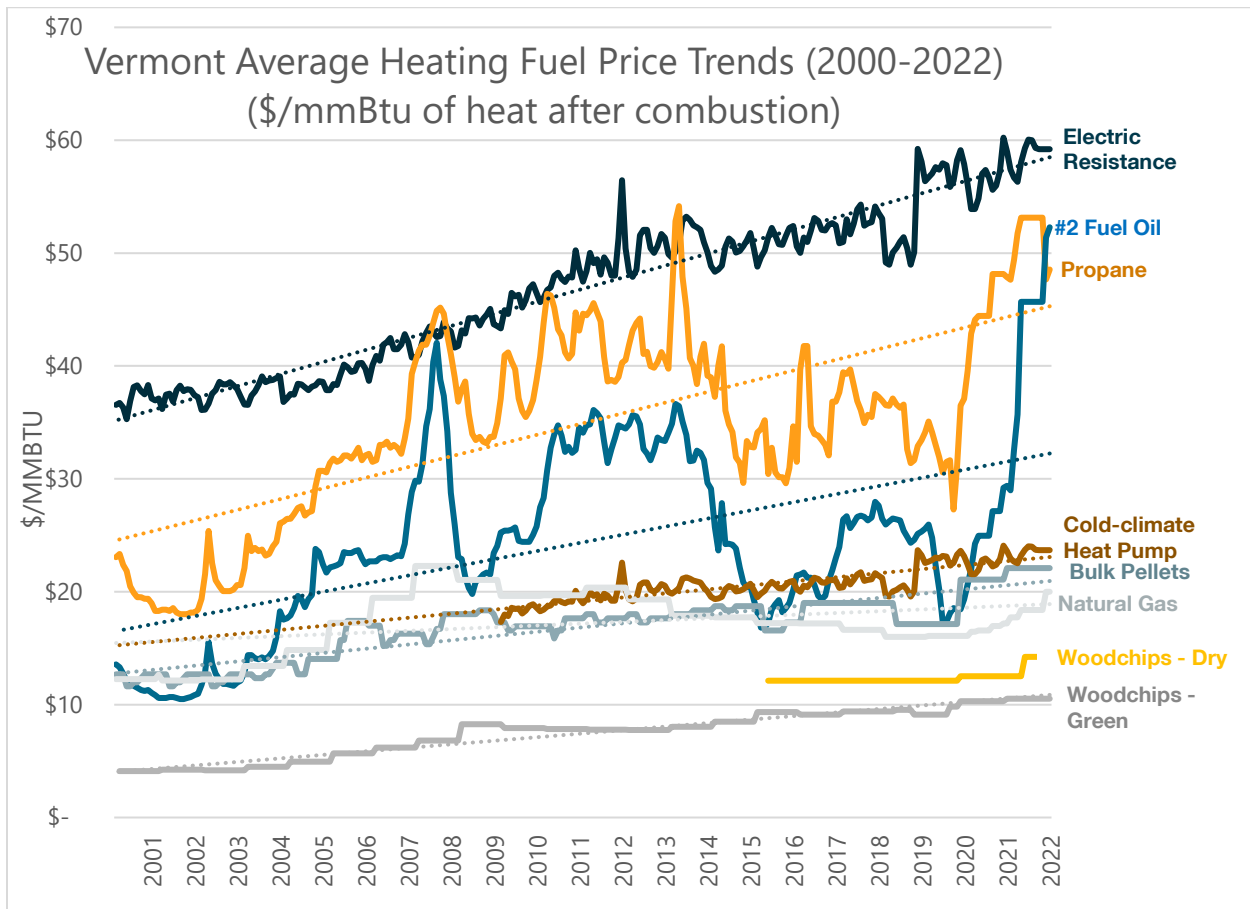
In the time from 2016 to 2022, there were few new commercial/institutional wood chip heating systems installed in Vermont. There has been limited growth of new green wood chip systems and more recently only a handful (approximately 5) new dry wood chip systems installed to date. The relatively few new dry-chip fueled systems may be due, in part, to recent changes in State air quality regulations that make permitting for these dry-chip systems more complicated.

Figure 3 - 2022 Annual heat generation from automated wood heating systems in Vermont



While the number of systems installed is an important factor, it is also important to consider the total amount of energy being generated by each category of system. Figure 4 above illustrates that fewer, but very large wood chip systems generate far more energy (and displace more fossil fuel) than many smaller systems.

Figure 4 – Price graph showing comparative heating fuel values over time.



The graph above illustrates several key patterns that put Vermont’s wood heat industry and market growth into context. First, there remains excellent fuel savings when heating oil and propane are replaced with various wood fuels. Second, the prices of wood fuels in Vermont have been comparatively stable to the volatility of heating oil and propane prices. Third, the average rate of price escalation over time has been less for wood fuels.

Despite the three advantages listed above, there are a few trends that negatively impact the potential growth of the wood heating sector in Vermont. Figure 5 shows that wood fuels have a difficult time competing on price with natural gas and cold-climate air-source heat pumps. Additionally, heating oil and propane prices dipped significantly between 2015 and 2020. Numerous businesses interviewed for this assessment indicated that low oil and propane prices during this time hampered the potential market growth of wood heating in Vermont despite state policies and incentives.

Economic Impacts of Advanced Wood Heat

Overall, the wood heat industry contributes over \$90 million in annual gross sales revenue for installers and wood fuel producers and distributors in Vermont – with over 1/2 of that revenue from cordwood sales alone. Automated wood heat represents roughly \$14 million annually.

Figure 5 – Estimated gross annual sales in Vermont.

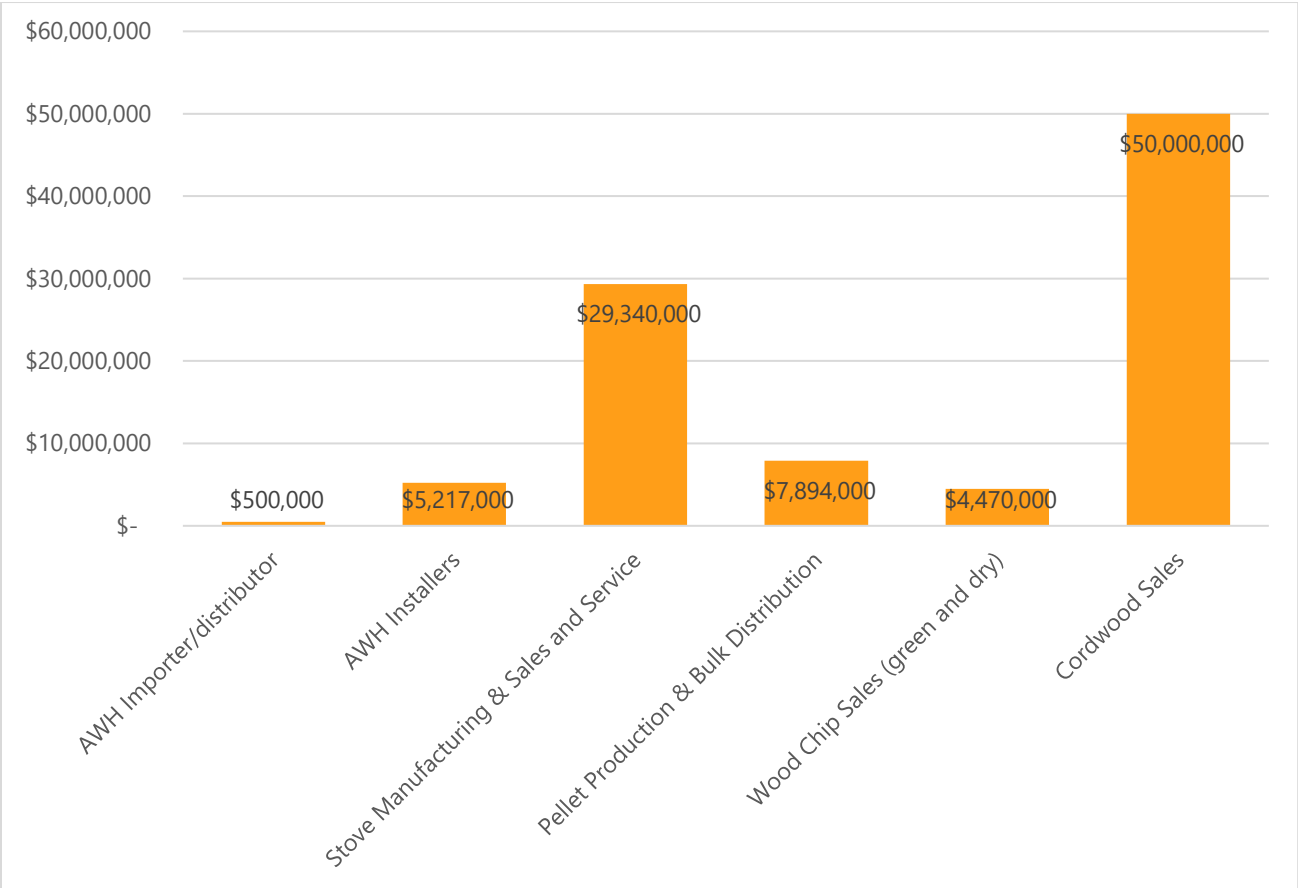


Figure 6: Estimated gross sales revenue generated by wood heat in Vermont in 2022.

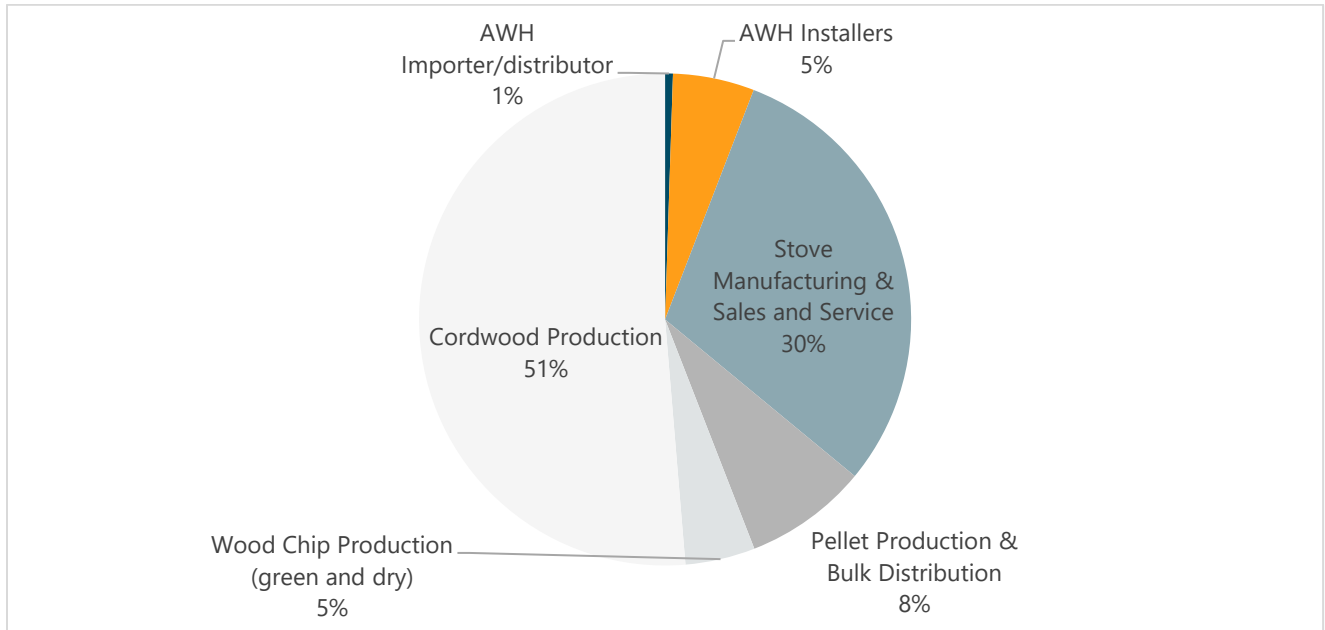
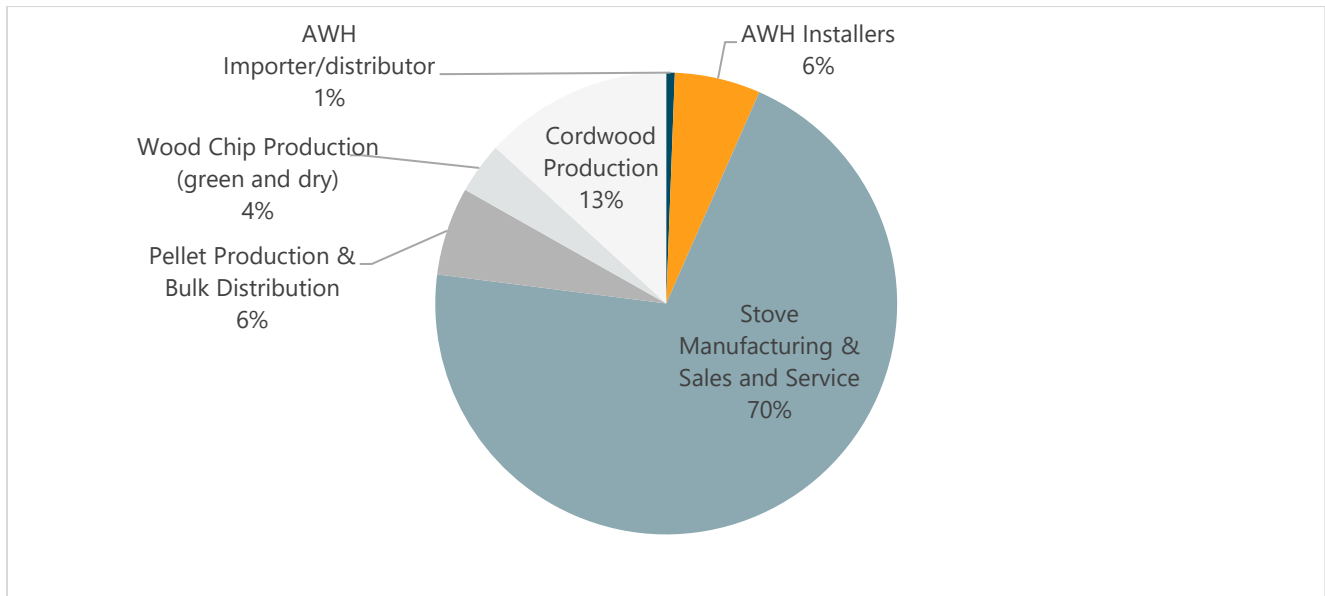


Figure 7 shows the same data as the bar chart in Figure 6 on the previous page.

Figure 7: FTE jobs associated with advanced wood heat in 2022.



In total, wood heating is estimated to contribute over 500 jobs in Vermont with stove manufacturing and cordwood production making up the two largest segments.

Conclusions

Wood heating remains a vital component to meeting Vermont's energy, economic development, and forest management goals and has seen moderate growth in the last 8 years (from 2014 to 2022). Automated and advanced wood heating market segments are growing, but legacy cordwood use in Vermont contributes the greatest amount of economic impact.

The five-year period of consistently low oil and propane prices from 2015 to 2020, hit as the industry was poised for growth and curbed the likely growth of the market and industry. As a result, the industry is experiencing some contraction – closure of the pellet mill in West Windsor and fewer pellet boiler installers in 2022 than in 2016. In line with national trends, the wood heat industry in the region has also seen some consolidation – one excellent example is Sandri Energy in Massachusetts selling their bulk pellet distribution business and assets to Lyme Green Heat based in New Hampshire.

Rebates (coupled with federal tax incentives) appear to be helping the residential market for pellet boilers. However, the commercial pellet boiler market seems to be struggling and the annual number of projects has been going down. The dry wood chip fuel and boiler market are gradually getting established and gaining momentum but have been hampered by the absence of multiple suppliers and complexity in dry chip boiler certification to meet State air quality regulations. Despite excellent fuel savings potential, there have been no recent installations of larger green woodchip systems at schools, colleges, or hospitals in Vermont in the last 8 years (from 2014 to 2022).

Many advanced wood heating business owners interviewed for this project, expressed concern about the future of wood heating in Vermont – the primary reasons given were continued uncertainty of oil and propane prices, public perceptions, and as well as concern that state and federal policy will shift to exclusive support for electrification.