

**Vermont Sustainable Heating Initiative
Pilot Project Summary
August 18, 2011
Pellet Stoves for Low Income Vermonters**

Abstract: As of June 2011, VSHI has installed 17 pellet stoves as part of a pilot project. Money to purchase stoves and pay for their professional installation was raised through fundraisers and state grants. 14 stoves have been installed in northeastern Addison County and three in central Washington County. The goals of the pilot project were:

- To determine the usefulness of pellet stoves by LIHEAP clients in Vermont.
- To develop a methodology for selecting appropriate clients for stove placement.
- To assess the issues facing clients who choose to use pellet stoves.
- To assess the energy and cost issues for clients.

This report will address these project goals and make recommendations for future use of pellet stoves by LIHEAP clients in Vermont.

Usefulness of pellet stoves for the clients

LIHEAP clients who owned their own homes were contacted to determine their interest in receiving a pellet stove. 75 wrote to VSHI and expressed interest. Based on phone conversations, we selected clients for site visits. We visited 32 clients' homes and conducted site surveys to assess if the home was appropriate for stove placement. Of the thirty-two, only four were deemed inappropriate for pellet stove placement. Of the four deemed inappropriate for stove placement by our site visiting committee:

- One was due to our concern as to the client's ability to operate the stove, and the existing fire hazards in the house. No one living there was cognitively functional.

- One was due to a desperate need for weatherization. There were holes in the walls, ceiling and door. We referred the client to the weatherization program.
- One was due to lack of adequate structure to safely support a stove and its necessary vents. If a stove had been installed, the floor was so mobile that the vents could detach and fill the house with combustion byproducts, creating a health risk.
- One was due to need for both weatherization and a major upgrade to the wiring system before a stove could be installed.

Of the 32 clients visited who expressed interest in pellet heat, 28 clients (88%) were found to be suitable households for stove placement. Of these, we chose the 17 who received stoves based on greatest need.

One household may have sold their stove for cash. The others continue to use them. Three of the primary clients have died. However, the remaining household members continue to use the stove. (See the Recommendations section for how to address this in the future.)

Overall usefulness

The clients have expressed great satisfaction with their stoves. We installed three types of stoves. Just one Pel Pro stove from Aubuchon was installed. It experienced the most technical problems, and the clients were not satisfied with it. We do not recommend installing this brand of stove again.

We installed eight Englander stoves bought from Home Depot in Williston. These stoves are the least expensive at ~ \$1,200 each, and have required the most maintenance. Four visits by technicians have been required to replace auger motors or clear pellet jams. The visits cost \$85 each plus parts. VSHI has paid for these when the clients bring it to our attention.

We installed eight Harmon P38 stoves bought from The Vermont Flag and Stove Works. These stoves cost \$1,600 each. They are very well built and do not have an automatic ignition, thus requiring manual lighting similar to a wood stove. They are also built with a large ash bin, thus less frequent cleaning is required. The clients with these stoves have expressed the highest level of overall satisfaction.

Fuel use

Of the 17 clients we have worked with, the average pellet use is just over three tons per year. Collecting data on pellet use is some what of a challenge, as three of our clients

have died, and some others have been difficult to contact. One client had to temporarily move out of her home after a non-pellet stove related fire (part of the kitchen was burned but the stove was unaffected). This of course decreased her pellet use. Clients are always concerned about the future of their ability to receive assistance from LIHEAP funds. To this end, many are motivated to use or report use of a bit more fuel than is necessary. At the same time many are elderly or are in chemotherapy and thus are chilled all winter. These clients often kept the stove set on the highest heating level all the time. One advantage of a pellet stove is that clients who are chilled will move closer to the pellet heat source and thus be able to regulate their temperature. Any one who has ever lived with a wood stove has done this.

The typical client's home is not up to conventional housing standards. The trailer and site built homes are often in states of disrepair. VSHI did not install any stoves in houses that needed weatherization or had obvious holes and gaps. Three tons of pellets would heat a well built medium size home of 1,200 sq. ft. However a typical, poorly insulated trailer home of 400 sq. ft. (inherently possessing thinner walls) will also use three tons per year.

The average (mode) consumption was three tons per household per year. A few clients used 4 or 4.5 tons per year. These clients homes were larger and had more rooms.

We only installed stoves in homes of clients who had received more fuel assistance than the average client. Our typical client had received more than \$1,200. in aid. We asked for this information, and all of the clients were willing to show us receipts from the previous heating season.

Other issues facing clients who chose to use pellet stoves

The state fuel assistance program in the heating season of 2010-2011 changed its policy to allow clients to be able to use fuel assistance to purchase more than one type of fuel. For some of our clients this was necessary, as a pellet stove worked in part of the home while another fuel was necessary for some space heating, warming the basement or heating water. Before this policy change, fuel assistance only paid for one type of fuel, which was a concern for many of our clients. A popular dual fuel combination of clients is L.P. gas and wood pellets. L.P. gas is more than twice as expensive as wood pellets, in terms of cost per BTU of usable heat.

Cost analysis

Last heating season, the price of fuel oil was more than \$4 per gallon. One ton of pellets contains the heating equivalent of 120 gallons of fuel oil. Pellets are currently

selling for under \$200 a ton. Thus, \$200 of pellets replace \$480 worth of oil, kerosene or L.P. gas.

Clients are living in a state of desperation. We only installed stoves in homes owned by clients. However, these households have no money for basic repairs or maintenance.

Several of the clients had heating systems that were partially broken or were obviously unsafe to use. Several had improperly vented cord wood or oil systems. Several clients had jury-rigged unsafe gas or electric heaters so that they could stay in their homes and not freeze. Most reported near death experiences caused by such jury-rigged systems. Several also reported that when pressed, they would resort to using electric heat because they knew that their electricity could not be shut off in the winter.

In general the pellet stove replaced L.P. gas, kerosene or fuel oil with pellet heat. Existing heating systems in the clients homes were left intact. The pellet stove with its own exhaust vent and air intake is added and becomes the primary heat source. Pellet fuel is much more affordable than other fuel options, so the clients will tend to use pellets first and other fuels only as necessary.

Costs of installation

\$1,600.	Harmon P38 stove bought in bulk order
\$ 200.	Vent kit for both air intake and exhaust
\$ 100.	Hearth and materials for installation
\$ 300.	Labor for professional installation
\$2,200.	Total

This assumes approximately 20 hours of volunteer assistance.

If a client uses three tons of pellets at \$200/ton, more than \$600 will be saved in relation to the costs of other fuels. If the pellets are provided for free by the local pellet industry, the savings are over \$1,200.** Thus, the payback period is two to three years.

** VSHI is proposing a the creation of a 70,000 ton per year pellet factory in Chittenden County with 5% of the production going to support the state fuel assistance program. See VSHI-BERC 2011 study.

Method for selecting clients for stove placement

Clients were selected on a regional basis. Focusing on clients in a specific region was helpful in scheduling site visits, conducting preliminary work getting ready for stove installation and finally in optimizing stove installation. In one day, one installer working with VSHI volunteers installed three systems, located within a few miles of each other.

We started in Northeastern Addison County. Our next focus area will be in Washington County.

The site visit committee was made up of VSHI volunteers who were both knowledgeable of the technical requirements of stove placement and also the issues facing LIHEAP clients. A site visit team should always have at least three members. At least four site visits are necessary for each installation. We visited one client more than 20 times in one heating season because the “dual fuel” option did not exist. Please note this section on stove placement is a brief overview; the actual placement details as per manufacturer’s requirements are more complex.

First visit...

Determine if both the house and the client’s house mates are appropriate for stove use and placement.

House mate issues to be assessed: Who will be responsible for running the stove? Are they cognitively capable? Are there small children in the home? If so, is a raised hearth or safety screen needed? Can someone in the home move a 40 lb. bags of pellets? If not, can they scoop five or ten pounds at a time?

House issues to be assessed: Where will the stove be best located? Is there grounded electric access? Is there appropriate venting access for both exhaust and air intake? Are there ice dam and roof issues? Is the floor structurally capable of supporting a stove without movement? Does the space have the needed set backs to meet the manufacturers’ requirements for safe installation? Where will the pellets be stored? Where will the ash be disposed?

Second visit...

If the household is deemed to be a suitable site for a pellet stove then a second visit is scheduled. On the second visit the hearth is installed for the stove. This often requires leveling the hearth area and/or building a raised hearth. The hearth we use is a 3 x 5 ft. piece of masonry hardy backer covered with ceramic tile. The hearth is screwed to the sub flooring. The locations for venting are roughly located.

Third visit...

On the third visit the stove is installed by a professional contractor. This labor has run between \$100 and \$300 per stove depending on the difficulty of venting. The tiles are grouted if the client wishes. The stove is left unfired so that the caulk and grout can harden.

Fourth visit...

This visit is to teach the client how to use their stove. This usually takes about an hour. It is a celebration for the client's household.

Follow-up visits...

Recommended to ensure that everything is working properly and that clients are warm and safe. I visited one client twice a week all winter to deliver donated pellets (this is the client who was visited approximately 20 times that heating season). Creating a heating support community for the clients is beneficial if they desire it.

Recommendations based on Pilot Program

*Pellet stoves should be made available to clients who own their own home and wish to heat with a pellet stove. Pellet stoves should not be forced on households.

*The pellet stoves should be leased to the clients at a minimal cost per year.

A lease fee of \$85 will serve several purposes. It will pay for a trained technician to visit the household once a year for annual maintenance. It will also allow for the stoves to be tracked and to be moved to a new clients home in the case of the original client's death or change in circumstances.

If such a lease program is started an organization such as VSHI or Efficiency Vermont should be the owner of the stoves. The stoves can be removed and installed in a new client's home for a cost of between \$200. and \$400. depending on the difficulty of moving the stove and the ability to reuse the venting system. The low cost built in hearths can not be reused.

*Pellet stoves should be offered as part of a lease to own program.

This program as a lease to own stove placement will help provide heat to households who receive minimal LIHEAP assistance. The clients should be able to pay off the stove over a five year period using the savings by using less expensive fuels.

*Some clients should be able to purchase more than one type of fuel.

Clients who heat with cord wood or pellets should continue to be able to use fuel assistance to purchase more than one type of fuel. This will allow them to for example purchase both pellets for heat and some L.P. gas for hot water and some space heating.

*The fuel assistance program in Vermont should work with the town energy committees to assess clients in terms of pellet stove placement and weatherization needs. The town energy committees will need to be trained to be able to determine if the clients are appropriate candidates for heating with a pellet stove. VSHI working with the fuel assistance program will be able to conduct this training.

*Vermont needs to transition our poorest neighbors off of the most expensive fuels to clean, safe pellet fuel. Our poorest neighbors will commit acts of environmental desperation when they need to. I do not blame them, but recognize that when people are faced with a Vermont winter and no money the choices are grim. The VSHI volunteers have seen the following on our site visits:

- Broken wood stoves creating puddles of creosote next to a house.
- Clients burning trash and trash wood in wood stoves to stay warm.
- (Pellet stoves will only burn pellets and thus avoid trash burning)
- Smoke from inefficient wood stoves creating health problems in trailer parks.
- Clients using poorly vented or broken oil furnaces that flood their house with exhaust gases.
- Clients cutting down any thing they can to burn.
- Clients harvesting wood on land with out permission.
- Clients going with out food or medication so as to purchase fuel.

Every client who has access to a pellet stove will not be forced to commit such acts of environmental desperation.

*Vermont's government should work with the developing in-state pellet manufacturing industry to provide pellets at minimal or no cost to the state's fuel assistance program.

(See VSHI-BERC report to be published fall 2011.)

*Vermont fuel assistance program should have a goal of placing 1000 pellet stoves in LIHEAP clients homes by 2014.

Conclusion

Pellet stoves are an effective and cost saving way to provide heat to LIHEAP clients. The benefits of keeping LIHEAP clients in their own homes far out weigh the costs. Several of our elderly and/or disabled clients were considering abandoning their homes prior to receiving a pellet stove. If they had been forced to abandon their homes, they would've had to rely more heavily on other state programs.

Pellet heating technology well established. In Northern Vermont, approximately 10,000 pellet stoves and furnaces are already installed in homes and businesses. This number increases every year. The infrastructure of pellet technology will improve in efficiency and cost savings. As this infrastructure develops, it is imperative to include our neediest neighbors in the community of sustainable heating.

"Just because I am poor, does not mean that I don't want to be green." LIHEAP Client

"It is in every Vermonter's best interest to help transition all Vermonters to a safe, affordable and sustainable heating future." Tom Tailer, VSHI Director

Key Points

1. Pellet stoves can be used to meet the needs of thousands of Vermont LIHEAP clients.
2. Partnering with Town Energy Committees can facilitate the placement of the stoves and create support communities for the LIHEAP clients.
3. Pellet stoves can provide a safer, cleaner, and more affordable heating alternative.
4. Stoves should be “leased” to the clients at a minimal cost. This will pay for yearly maintenance by a trained professional.
5. A lease-to-own option should be provided to all Vermonters below a certain income level.