

Winnisquam High School General Project Questions:

Questions the community considered before converting to wood biomass heating

Q: I understand the Honeywell energy efficiency project will not cost the taxpayers any additional money. Can you explain how this is possible?

A: The \$3,550,000 Honeywell project will be 100% self funded through school building aid at 50% of the project cost (\$1,775,000), utility rebates (\$31,770), a low interest loan that the school district was awarded as part of the stimulus program that will reduce financing interest costs by approximately 1.5 million and guaranteed annual energy savings of \$141,630 that are projected to reduce energy expenses by \$3,056,172 over the 15 year project term.

Q: Is the School Building Aid approved by the State?

A: Yes the School District has received approval for the School Building Aid from the State Department of Education.

Q: What other energy efficiency and building improvements are included in the project outside of the biomass plant?

A: In addition to the biomass heating plant for the Middle and High School the project includes ventilation upgrades, lighting upgrades, building infiltration reductions, temperature control upgrades, replacement of aging heating and ventilation equipment, and code compliance upgrades.

Q: Are there any additional benefits to the School District outside of energy efficiency?

A: Many of the changes planned for the buildings will improve the quality of the learning environment for the students. The changes geared to the students are improved lighting, increased ventilation and controls making the rooms more comfortable to allow students to focus on their work.

Q: When will the project start if approved and how long will construction last?

A: Construction activities will start in approximately 1-month after contract signature and will continue for approximately 12-months.

Q: How will the construction affect day to day school operations?

A: Most of the work within buildings will go unnoticed by students and teachers with the work being completed off hours. All project work will be coordinated with School District staff to ensure a limited impact on normal school operations.

Biomass Heating Plant Specific Questions

Q: Why isn't the Agricultural Buildings part of the central biomass heating plant?

A: The cost benefit analysis did not support putting the Agricultural Building onto the wood plant at this time due to the limited natural gas usage of the building and the potential energy savings Vs the cost of connecting the building to the central heating

plant. Provisions have been made however within the central heating plant design to include the Agricultural Building at a later date.

Q: Are there reliable local wood sources?

A: Yes, the Winnisquam School District has a significant amount of wood fuel and wood suppliers within 60 miles of the School District. The School District recently sent out a Request for Proposal to 15 suppliers to secure wood pricing for the 2010-2011 heating season. Within the seven New Hampshire Counties that are part of a 60 minute drive around Tilton (Belknap, Merrimack, Hillsboro, Grafton, Carroll, Rockingham, Strafford), there are over 3 million acres of forested land; this represents approximately 78% of the land base.

Q: How will the District secure a wood supplier? Can you lock into wood price over multi year agreements?

A: The school is going through a bidding process to procure a source for wood chips for the 2010-2011 heating season. Multi-year contracts are available.

Q: As the demand for biomass heating increases will the increase in wood prices reduce the savings benefit of the biomass plant?

A: It's unlikely to see a significant increase in the cost of wood chips due to the competition for those wood chips in the near future. Demand for wood for paper production is going down and these wood plants will only help to supplement that industry.

Q: Why use biomass fuels?

A: Low fuel cost is the main attraction of heating with woodchips. Unlike fuel oil, propane, and natural gas, biomass has a history of stable prices that are unaffected by global economics and political events.

Biomass is a locally available fuel source that increases the regions energy independence and security while stimulating the local economy by keeping energy dollars circulating in the region rather than exporting them. Using wood also helps to support the forest products industry, creating markets, and forestry and agriculture jobs in the surrounding region.

Modern community-scale biomass systems burn cleanly, with virtually no visible emissions or odors, and, compared with modern residential-scale wood and pellet stoves, with far less emissions of particulate matter (PM), an exhaust product of wood combustion known for its adverse effects on human respiratory health. For example, over the course of a winter season, the heating plant of a 200,000 square foot wood-heated school in a cold northern climate produces about the same amount of PM as five residential-scale wood stoves.

Burning wood for energy has a positive impact in moderating global climate change. Carbon dioxide (CO₂) buildup in the atmosphere is a significant cause of global climate change. Fossil fuel combustion takes carbon that was locked away underground (as crude oil and gas) and transfers it to the atmosphere as CO₂. When wood is burned, however, it recycles carbon that was already in the natural carbon cycle. Consequently, the net effect

of burning wood fuel is that no new CO₂ is added to the atmosphere.

Q: Where does woody biomass come from?

A: The most common source of woody biomass fuel comes from sawmills that chip wood as a by-product. Heating system operators generally prefer mill chips because of their size uniformity as oversized pieces can potentially jam machinery. Other woodchips come directly from harvesting operations in the woods. Mobile chippers turn diseased and other cull logs into chips, while most of the tops and branches stay in the forest to return nutrients to the soil. While woodchips produced by this method are less uniform in size, they usually are significantly lower in cost. A third source of wood-based biomass comes from the waste stream of the forest products industry such as furniture manufacturers; however, manufacturing wood wastes are often used by the plants that produce them, and are less likely to be available for purchase by energy users. In addition, institutional users tend to avoid dry wood because it comes with more dust and a higher level of fire risk. The municipal waste stream can also provide wood for biomass fuel use in the form of waste construction and demolition material, but this type is generally not acceptable due to air-quality issues.

Q: Does burning wood involve a lot of labor?

A: The biomass heating system operator will spend 15 minutes or less each weekday to remove the residual ash.

Q: Is a woodchip system noisy?

A: As with other heating options, the building occupants usually never hear the woodchip system unless they go into the boiler room. A biomass system is generally the same as conventional fossil fuel heating system.

Q: Isn't wood a dirty fuel that will make a mess at our building?

A: The woodchips are stored in a closed bin and burned in the boiler room, in a sealed combustion chamber. They never get out onto the grounds or into the rest of the building.

Q: Why should we experiment with an unfamiliar technology?

A: Burning woodchips and other forms of biomass for heat has been common in the wood products industry for decades. In the last 25 years, woodchip systems have been successfully installed in hundreds of buildings, including hospitals, government facilities, greenhouses, commercial buildings, schools, hotels, and motels. The technology is well proven and there are a number of manufacturers with successful track records. There are five New Hampshire School Districts that currently use wood heating systems including Merrimack Valley High School. Vermont has over 40 schools and Maine has five.

Q: Will big trucks be coming and going every day?

A: Depending on the season wood chip deliveries might be as infrequent as one truckload every two months, or as frequent as two loads per week.

Q: Is there a danger that a large store of woodchips will catch fire?

A: Green woodchips are close to 50 percent water by weight, and it is next to impossible to set them on fire outside the controlled conditions of the combustion chamber.

Q: What do you expect the price of woodchips to do, especially with the development of cellulosic ethanol?

A: The price of woodchips is dependent upon the regional supply. Where woodchips are available as a plentiful by-product such as in the US eastern states, the price will continue to stay relatively low and stable. In places where by-product material is well-spoken for and the seasonal heating market is transitioning from a by-product to a commodity, the prices can be higher and may escalate some. Nevertheless, woodchips generally will continue to be much less expensive than oil. Based on the energy content (Btu output) of each, even if woodchips were to reach \$100 per ton, approximately twice the current price, it would be the same as paying \$1.61 per gallon of oil.

Q: Why should we use the forest for energy?

A: Humans have a long history of utilizing forests for sustenance including food, fuel, shelter, clothing, fences and barriers, weapons, and numerous other uses. As we continue to use wood products, it makes sense to also use the low-grade material and wood wastes that are generated to displace fossil fuels for heating. In fact, providing markets for these low-grade and waste materials is a key component of both sustainable harvesting and forest conservation, helping forested parcels maintain long-term value as a sustained resource. Sustainably produced biomass from forests is a local renewable energy source that keeps energy dollars circulating in the local economy by creating markets for low-grade wood, adding economic vitality and jobs to the forest-products industry, and improving the health of our forests.

Q: What are the impacts of using the forest for fuel?

A: Procuring biomass fuel is integrated into harvesting operations that are already occurring; therefore there is no additional impact to the forest. Removing low-quality trees for biomass can actually *help* forests by opening up space necessary for higher-quality trees to grow faster. Further, without markets for low-quality wood, only high-quality trees are harvested, thereby degrading the forest quality over time. While any forest management plan should consider the resiliency of the particular forest being harvested, some level of management and harvest most often is restorative as opposed to damaging, with short-term impacts minimized and long-term negligible. Some positive impacts include sustaining the local forest products industry, maintaining the value of forested land, and sourcing forest-based products locally rather than putting that burden on more distant forests. Community-scale biomass projects that are properly sited and implemented do not put undue strain on forest resources.

Q: Is it better to leave the forests alone to store carbon or only use wood for products that continue to store carbon, like a table?

A: A forest management plan can be employed to optimize forest growth at a rate that maximizes carbon sequestration while also sustainably harvesting for both products and energy needs. Forest products like furniture or flooring are great uses of our local forest resource, but they don't provide energy. Local forests, when properly managed, should also provide a local source of energy for communities.

Q: Does using biomass from the forests destroy habitats?

A: Procuring biomass is integrated into forest harvesting that is already occurring, resulting in no additional impact on habitats. It is important to note that woodland harvesting is often prescribed specifically for wildlife management, as many species of game and non-game wildlife require open areas created by harvesting and the early successional vegetation that takes over after a harvest.

Q: Are woodchips as clean as gas or oil?

A: The answer depends on the pollutant to which you are comparing woodchips. Wood has lower sulfur dioxide emissions and net greenhouse gas emissions than both oil and propane; however, particulate matter, carbon monoxide, and total organic compound emissions are higher from wood than oil. Oxides of nitrogen (NOx) emissions from wood are comparable to oil. Volatile organic compounds (VOCs), some of which are produced by combustion, are higher when using wood than when using natural gas or oil, but each fuel emits different VOCs at varying levels and each type has varying reactivity. It is important to note that using the best available control technology and combustion practices, careful siting, appropriate stack (chimney) height, and careful consideration of dispersion patterns will bring emissions well within permissible limits and lessen the impacts of any pollutants emitted when burning biomass. In addition, biomass is considered a carbon neutral fuel when harvested using sustainable forestry practices, and its use when replacing fossil fuels helps mitigate the effects of climate change.

Q: Will the wood smoke be an air-quality problem?

A: Automated, commercial-sized woodchip and pellet systems burn much cleaner than even the most modern home wood or pellet stove. They produce no creosote and practically no visual smoke or odor. Because the biomass fuel is green, or close to 50 percent water, however, in cold weather the chimney may show a plume of condensed water vapor. Interviews with dozens of system operators support the conclusion that odor generated by the fuel or the smoke is almost never a problem, and in most cases, both chip and pellet systems easily meet state air quality standards.

Q: Will the system produce airborne wood ash that will fall over the neighborhood?

A: No. A well-designed woodchip system burns at a high rate of efficiency, resulting in a small percentage of residual ash (about one percent of the original fuel volume). In addition, these systems require specific stack (chimney) heights that effectively disperse any emissions into the prevailing winds. With the reduction of oil heat in the Middle and High School and the increased stack height of the biomass heating plant air quality will actually improve in the area around the schools.

Q: Are the wood ashes toxic? Where and how are they disposed?

A: Wood ash from institutional and commercial heating plants is not toxic, in fact, it is an excellent soil additive for agricultural use. It can also be spread on athletic fields and gardens or disposed of at a landfill.

Q: Is burning wood really carbon neutral?

A: Although carbon is released in the form of carbon dioxide when wood is burned, if the wood is harvested and burned **at the rate it grows in the forest**, no new carbon is added

to the atmosphere. It is only if this condition of harvesting sustainably is met that the claim of carbon neutrality can be made. Conversely, if harvesting occurs at a rate faster than regrowth can take place, the statement cannot be made that burning wood is carbon neutral. Many reputable sources, including the US Environmental Protection Agency, the US Department of Energy, and the National Renewable Energy Laboratory, take the position that burning wood is carbon neutral as long as sustainable forest practices are employed.

Q: What is peak oil and why should we be concerned?

A: Peak oil was first termed by M. King Hubbert in 1956 in his accurate prediction that US oil production would decline between 1965 and 1970. Today, it generally refers to the point or timeframe at which the maximum *global* petroleum production rate is reached and a terminal decline begins. The aftermath of peak oil will result in decreases in the availability and increases in pricing, particularly for rural communities located at the end of the fossil-fuel pipeline. Experts agree that without significant investments in alternative energy projects, communities may have trouble meeting their energy demands.