# Frequently Asked Questions

## Q. What is the Missouri Fuels for Schools Project?

**A.** The Missouri Fuels for Schools project was created when the USDA Forest Service's State and Private Forestry Program awarded $6 million in grants through the Missouri Department of Conservation (MDC) to seven Missouri public school districts. The grants are being funded through the American Recovery and Reinvestment Act (ARRA).

The seven wood-chip heating systems being financed will serve as models for a saving money using local wood resources for heating, creating local jobs and promoting healthy sustainable forests.

Project staff is available to make presentations about wood-chip heating systems and funding sources. Staff will also assist schools in analyzing their facilities and options for wood-chip heating systems.

## 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 region's 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 ($CO_2$) 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 $CO_2$. When wood is burned, however, it recycles carbon that was already in the natural carbon cycle.

## Q. Where does woody biomass come from?

**A:** Woody biomass fuel can come from various sources: sawmills that chip wood as a by-product, directly from harvesting operations in the woods, or from clean community wood wastes such as chipped urban tree trimmings, stumps, and discarded Christmas trees. While woodchips can also come from clean construction and demolition material, this fuel is not acceptable in New Hampshire and other areas due to possible chemical contamination of the material and the associated air-quality issues

from burning it. In addition to these traditional sources, chips are increasingly being produced from chipped low-grade logs or "pulpwood" in dedicated chip yards and chip mills.

### Q. What kinds of facilities use biomass?

**A:** Facilities suitable for biomass systems include colleges, universities, hospitals, public buildings, hotels and motels, commercial buildings, greenhouses, large-scale agricultural operations, manufacturing plants, power plants, schools, and community district energy systems (the latter being the use of a central heating plant to provide heat to multiple buildings using buried pipes to distribute the energy). BERC's expertise is in 'community-scale' biomass systems in the 1-to-10 million Btu per hour (output) range.

### Q. What does a woodchip system look like? Will it make our building look like a saw mill or factory?

**A:** With careful attention to design, the woodchip system will blend in with the building. Biomass heating facilities are similar in their functional parts to those that run on conventional fuels. All require fuel storage capability, a means of moving the fuel from the storage bin to the boiler, a boiler to burn the fuel and extract the useable heat from combustion, and a connection to a chimney to disperse the combustion gases. With woody biomass systems, the boilers are larger and the fuel handling equipment takes up extra space, therefore may require a larger area. Biomass systems also call for a taller stack (chimney) than an oil or gas system.

### Q. Does burning wood involve a lot of labor?

**A:** In an automated woodchip or pellet system, the operator never handles the fuel. The wood fuel is loaded into the bin automatically and handled by completely automated equipment in the building. In a semi-automated system, the operator will spend 15-30 additional minutes each day to feed the day bin and 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.

### 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.

### Q. Will big trucks be coming and going every day?

**A:** Depending on the season and the size of the building, chip deliveries might be as infrequent as one truckload every two months, or as frequent as two-to-three loads per week. Interviews with system owners indicate that truck traffic for institutional biomass systems is not a significant issue. Generally, the number of deliveries depends largely on the size of the facility and its heating requirements.

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

**A:** It is possible for large woodchip piles to spontaneously combust and it has been known to happen on rare occasions. This spontaneous combustion is due to increased temperature within the chip pile as a result of fermentation and decomposition and only happens in very large piles that have been sitting for prolonged periods of time (more than three months). Wood that must be stored for periods longer than three months should be stored in roundwood form and not as piled woodchips. This stored roundwood can then be chipped on demand as needed.

### Q. How stable is the supply of woodchips? Will they always be available?

**A:** The answer depends on the region as well as the sizes and types of biomass heating projects that need to be supplied with wood. In many western US states, biomass is readily available in large sustainable volumes as a forest by-product. Various low-quality, small-diameter species must be culled in very large volumes from Western forests to reduce the 'fuel' that feeds wildfires. By burning this hazardous material— fuel biomass systems can help prevent and reduce the intensity of fires, while at the same time, promoting the health of commercial timber stands.

In the Northeast, biomass as a by-product is well-spoken for and transitioning from a waste-stream product to a commodity. A gauge to the vitality of this market commodity is the strength of the forest products industry, which provides the infrastructure (loggers, mills, trucks, etc.) required to supply the seasonal heating market. The biomass energy needs of the seasonal heating market can be better met if integrated into the existing market by piggybacking onto a regional anchor such as a pulpmill or cluster of wood-fired facilities.

### Q. What do you expect the price of woodchips to do, especially with the development or 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 western 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 sustainability harvesting for both products and energy needs. Forest products like furniture or flooring are great uses of our local forest resource, by 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:** Biomass fuel harvesting is nearly always conducted as part of an integrated timber harvest where multiple products (veneer, sawlogs, pulp, and firewood) are removed at the same time. As long as good forest management practices are followed, the biomass fuel harvesting results in no additional impact on wildlife habitat. It is important to note that some harvesting is often prescribed by foresters specifically for enhancing or expanding the habitat of various game and non-game wildlife. Many types of wildlife require open areas created by harvesting and the early successional vegetation that takes over after a harvest. Depending on the forest management objectives, biomass harvesting can in fact contribute to the diversity of wildlife habitat in a forest.

### Q. Are woodchips are 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. BERC has not heard of this reported as a problem in the neighborhoods of institutional and commercial woodchip burners.

### 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. How can we pay for this project?

**A:** The financial driver of biomass projects is the savings generated in fuel costs, which go a long way to offset system construction costs. The protocol for seeking third-party funding depends on facility ownership. Schools and municipal buildings may require a vote in the district in order to float a bond for the project, nonprofits look to their donor base, and businesses look to a variety of possibilities. There are also opportunities for such creative financing of projects as partnerships, energy service companies (ESCOs), or cooperatives.

### 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 increased 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.

### Q. What are carbon credits, and will my project be eligible for them?

**A:** Carbon credits are the 'currency' in an approach to controlling global greenhouse gas pollution by providing economic incentives on an industrial scale to reduce the emission of pollutants. Carbon credits can be exchanged between businesses or bought and sold in international markets. There are also many companies that sell carbon credits to commercial and individual customers who are interested in lowering their carbon footprint on a voluntary basis. These carbon offsetters purchase the credits from an investment fund or a carbon development company that has aggregated the credits from individual projects. As long as the United States continues to be in voluntary mode, it is difficult meet eligibility requirements, particularly for smaller projects. Applying for credits is cost- and time-prohibitive for smaller projects (a lot of paperwork for very little credit). A creative way to make the process viable may be to aggregate smaller projects into a single application as mentioned above.