



NEBRASKA WOODY BIOMASS ENERGY

Nebraska facilities have been heating with modern wood boiler systems since the early 1990s. Today, as fossil fuel prices fluctuate and waste wood availability increases, interest in woody biomass energy is increasing across the country.

WHAT IS IT?

“Woody biomass energy” is a term that refers to producing and using heat (thermal energy) from the combustion of a wood fuel such as woodchips, cordwood or pellets. These systems produce heat by burning a wood fuel to produce hot air, steam or hot water. The air, steam or hot water is then directed to nearby facilities and used in conjunction with heat exchangers to provide heat to a facility or provide heat for an industrial process.

Woody biomass systems can also be used to produce electricity. When producing electricity, these systems either provide steam which spins an electrical turbine or, through a process called “gasification”, the system processes the wood fuel to produce syngas which is used to power an electrical engine, much like a natural gas generator.

APPLICATIONS IN NEBRASKA

Wood energy in Nebraska is used for a number of purposes including facility heating and cooling, manufacturing and even swimming pool heating. Facilities using this technology range from large campuses to small private businesses.

Large Boiler Systems

There are eight registered boilers operating at five facilities in Nebraska with wood as the primary fuel.

Arbor Day Foundation’s Lied Lodge and Conference Center (Nebraska City)

- Fuel - Woodchips produced from sawmill waste
- Heat use - Facility heating/cooling, swimming pool heating, and laundry services

Chadron State College (Chadron)

- Fuel - Woodchips produced from timber harvest and forest management waste in Nebraska’s Pine Ridge region
- Heat use - Facility heating/cooling of over one million square feet of building space

Nebraska College of Technical Agriculture (Curtis)

- Fuel - Woodchips produced from redcedar management waste in southwest Nebraska
- Heat use - Facility heating of approximately 200,000 square feet of building space

Additionally, two private wood products manufacturing companies utilize wood boilers.



Wood boiler installed at Nebraska College of Technical Agriculture in Curtis, NE



Woody biomass energy is most economical when using a wood waste as a fuel. Heating with forest management residue or waste wood provides a low-cost fuel option as opposed to burning or landfilling the wood material.

Small Wood Heating Systems

It is unknown exactly how many small wood heating systems there are in Nebraska. However, these systems are commonly used for facility heating and providing heat for a specific purpose, such as drying lumber, alfalfa for feed or other agricultural products.

While large wood boiler systems typically utilize woodchips for fuel, smaller systems tend to utilize cordwood, waste wood or pellets as a fuel, although newer technology is allowing for more use of woodchips in smaller systems.

Facilities with the greatest potential for small wood heating system use include...

- Livestock operations (heating of livestock buildings such as poultry houses or horse barns)
- Wood products manufacturing facilities (facility heating, kiln drying or process heat)
- Horticulture greenhouses (early/late season heating or overwintering of plants)
- Agricultural operations (grain or feed drying)
- Manufacturing facilities (facility heating or process heat fueled with manufacturing wood waste)



Small woodchip heating system used to provide heat for lumber kilns and product showroom at Big Red Sawmill and Firewood in Palmyra, NE

WOOD WASTE SOLUTION: WOODY BIOMASS ENERGY

Active management of Nebraska's trees and forests is increasing across the state. Elevated wildfire threats due to increasing forest densities have led to more landowners thinning their forests. Redcedar encroachment into grasslands and forests has also led to increased removal and management. In communities, tree pests impacts have led to increased tree removals and disposal. All of these activities produce woody material suitable as a woody biomass fuel.



Forest management waste ready to be chipped and delivered to Chadron State College in Nebraska's Pine Ridge.

IS WOODY BIOMASS ENERGY RIGHT FOR YOU?

There are several factors to consider when determining if a business could benefit from a woody biomass energy system.

- Do you currently utilize fossil fuels for your heating needs, specifically propane or heating oil?
- Do you have access to waste wood or low-cost wood fuel?
- Do you have consistent heating needs throughout the majority of the year?
- Do you have a desire to utilize a renewable heating option?

If any of the above apply to you or your facility, it may be time to consider wood energy!



Depending on the size of facility and amount of heat needed, utilizing woody biomass energy for facility heating can reduce a facility's heating and utility costs by 40-60%, compared to using fossil fuels.