

Menominee Tribal Enterprises

MTE Biomass CHP District Energy System

Presented by:
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The Menominee Nation

- The Menominee Nation once occupied 9.5 million acres of land
- The present Menominee Reservation was established in 1854 with 234,000 acres.
- The Menominee hunted, fished and harvested wild rice on their reservation.



The mark of
responsible forestry

The Menominee Nation

- The Menominee retained their island of timber & community by perseverance of their own tenacity, federal protection and fortuitous circumstance.



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The Menominee Nation

- 95% of the reservation produces the finest old stands of hardwood, pine and hemlock located in the Great Lakes region.



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The Menominee Nation

- Forty-six of Wisconsin's timber varieties grow and are harvested on the reservation.



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The Menominee Nation

- 24 miles of the Wolf River flows through the Menominee Reservation.
- It is one of the last pristine rivers in the state.



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The Menominee Nation

- Located along the river at Keshena Falls is the Menominee Logging Camp Museum
- Visitors view over 20,000 artifacts housed in 7 log buildings



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- MTE is the business arm of the Menominee Indian Tribe of Wisconsin



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Menominee Tribal Enterprises



- MTE is owned and operated by the Menominee Indian Tribe of Wisconsin through a 12 member Board of Directors elected from the members at large.



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Menominee Tribal Enterprises

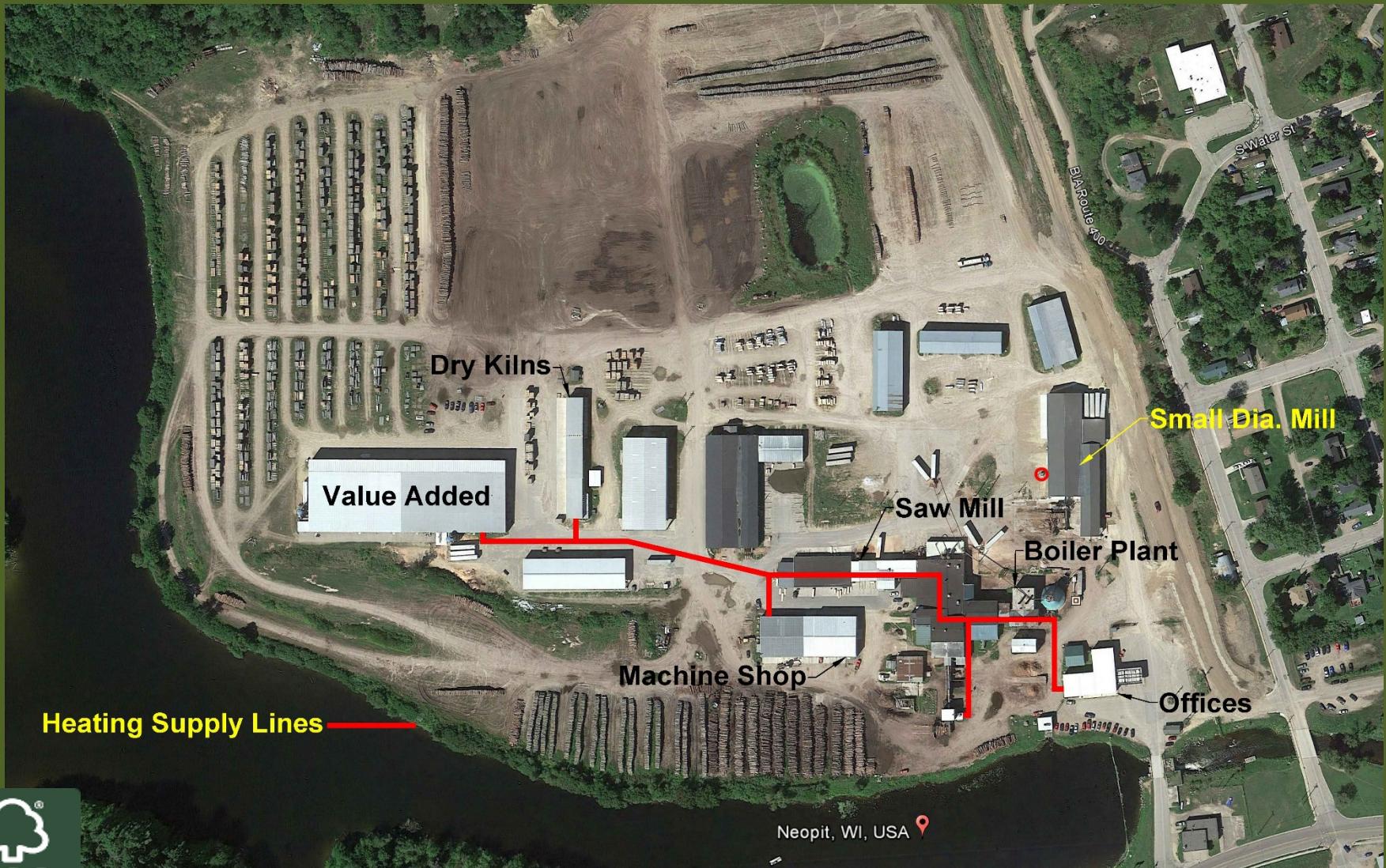


- Committed producer and manufacturer of quality sustainable forest products since 1908.
- Employs ~300 individuals throughout its operation. The mill alone employs ~160 in peak season.
- MTE embodies the culture, values and spirituality of the Menominee



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Current District Heating System Site



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Current Energy Profile

- 3,600,000 kWh/year
- 1.44 MW peak demand
- 20,000 tons of sawmill byproducts consumed by boiler/year
- Typical demand 2,000 - 4,000 lb./hour
- Peak demand 12,000 lb./hour



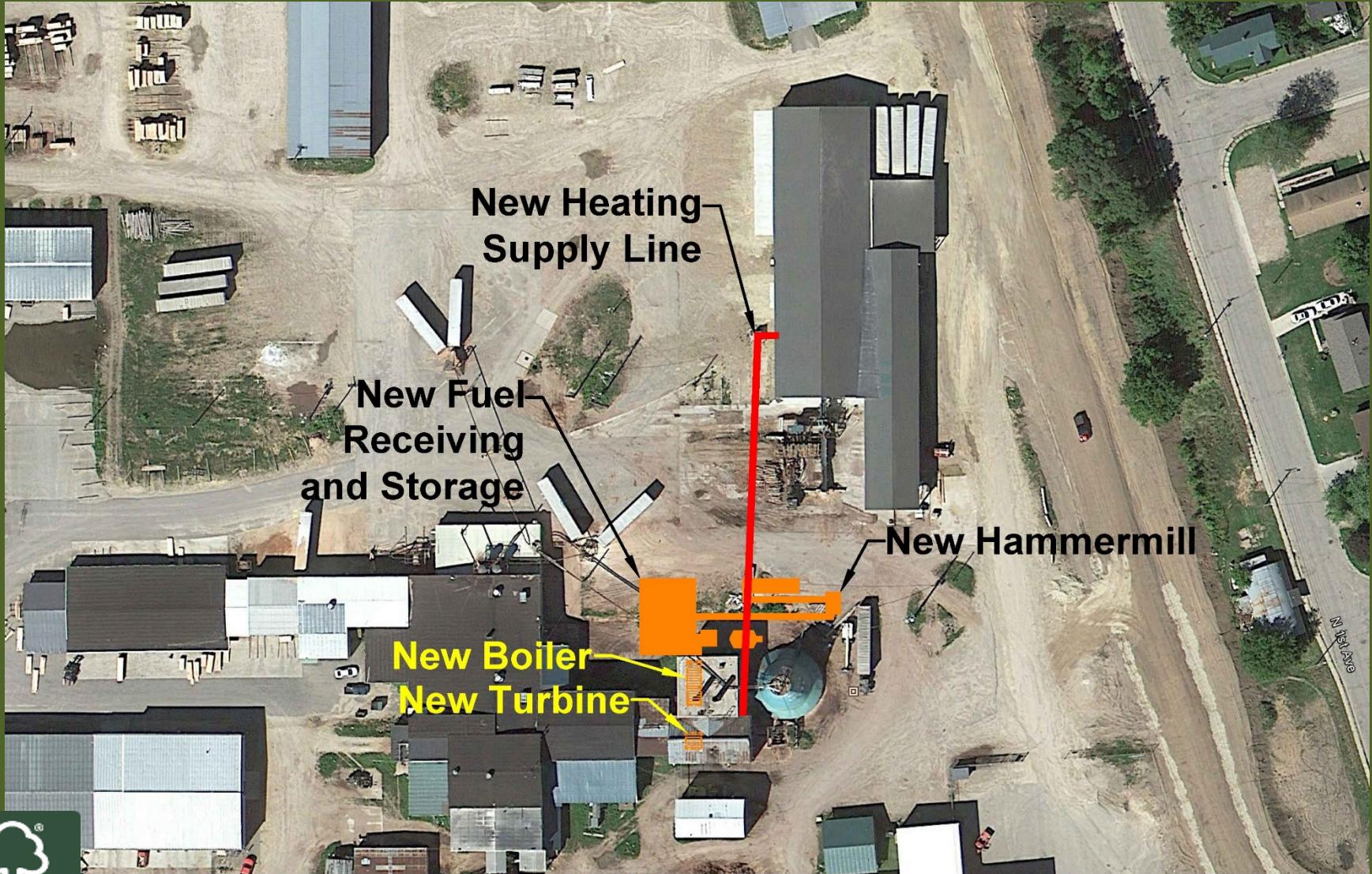
Existing Boilers

- (2) 27,000 PPH 150 psig
- Installed in 70s updated in 80s
- Designed to operate steam shotgun sawmill carriage
- Too big for current load profile
- <25% efficiency



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Changes to System



System Updates

- Replace 1 aging boiler with new, 8,600 lb./hr high pressure steam boiler
- Automate remaining large boiler



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Back-Pressure Steam Turbine

- Reduces pressure from 275psi to 30psi
- Generates 1,000,000 kWh/yr electricity
- < \$0.01/kWh energy costs



New Fuel Processing & Storage

Hammer Mill



Fuel Storage



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District Heating System Benefits

- Generates 1,000 MWh electricity
= 28% annual use
- <\$0.01/kWh
- Improve boiler efficiency from <25% to >60%
- Reduce wood consumption by 11,400 tons
- Annual net savings >\$400,000
- PM reduced by 90%

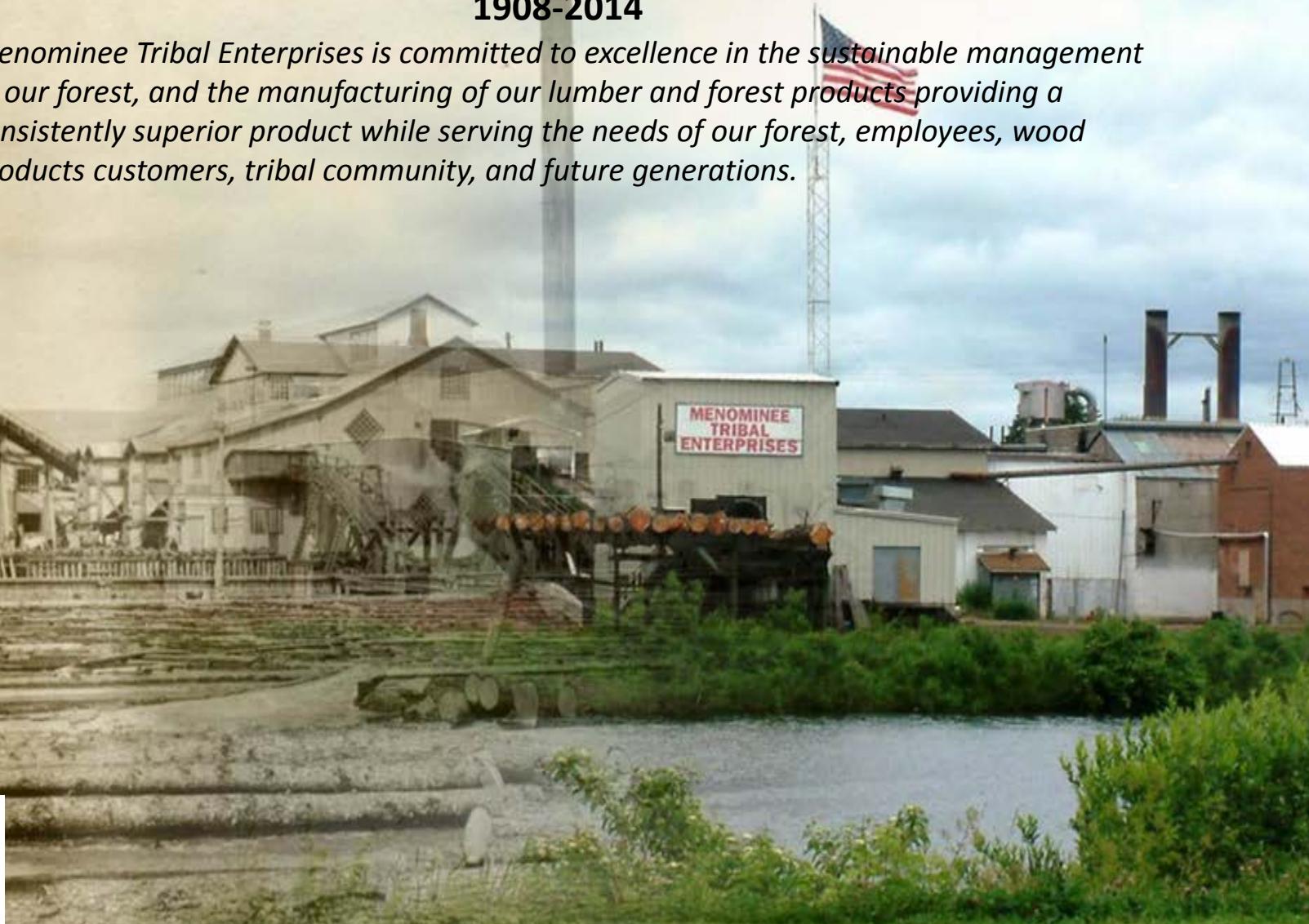


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1908-2014

Menominee Tribal Enterprises is committed to excellence in the sustainable management of our forest, and the manufacturing of our lumber and forest products providing a consistently superior product while serving the needs of our forest, employees, wood products customers, tribal community, and future generations.



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