

# Feasibility Study for Bio Mass Electrical Generation on Tribal Lands

St. Croix Chippewa Indians of Wisconsin

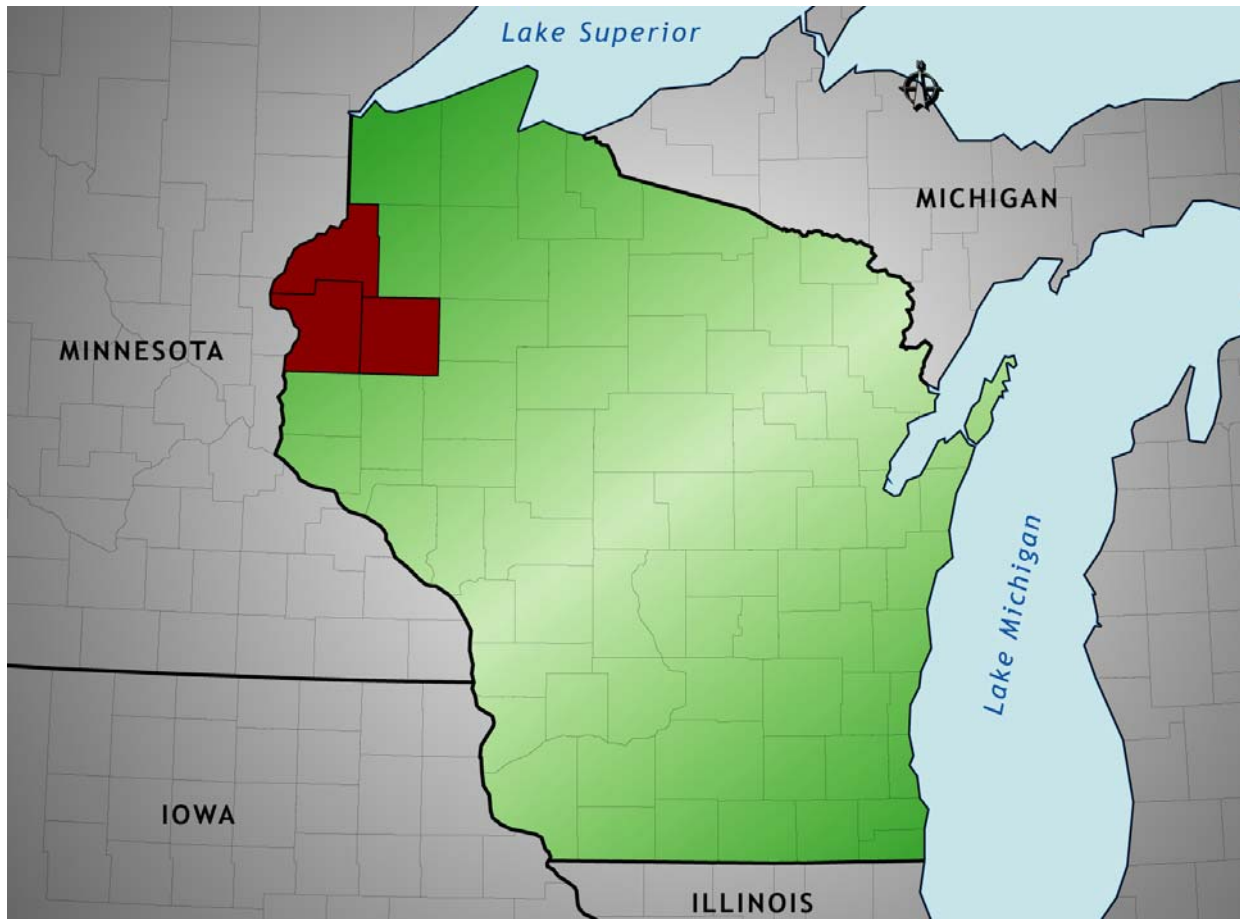


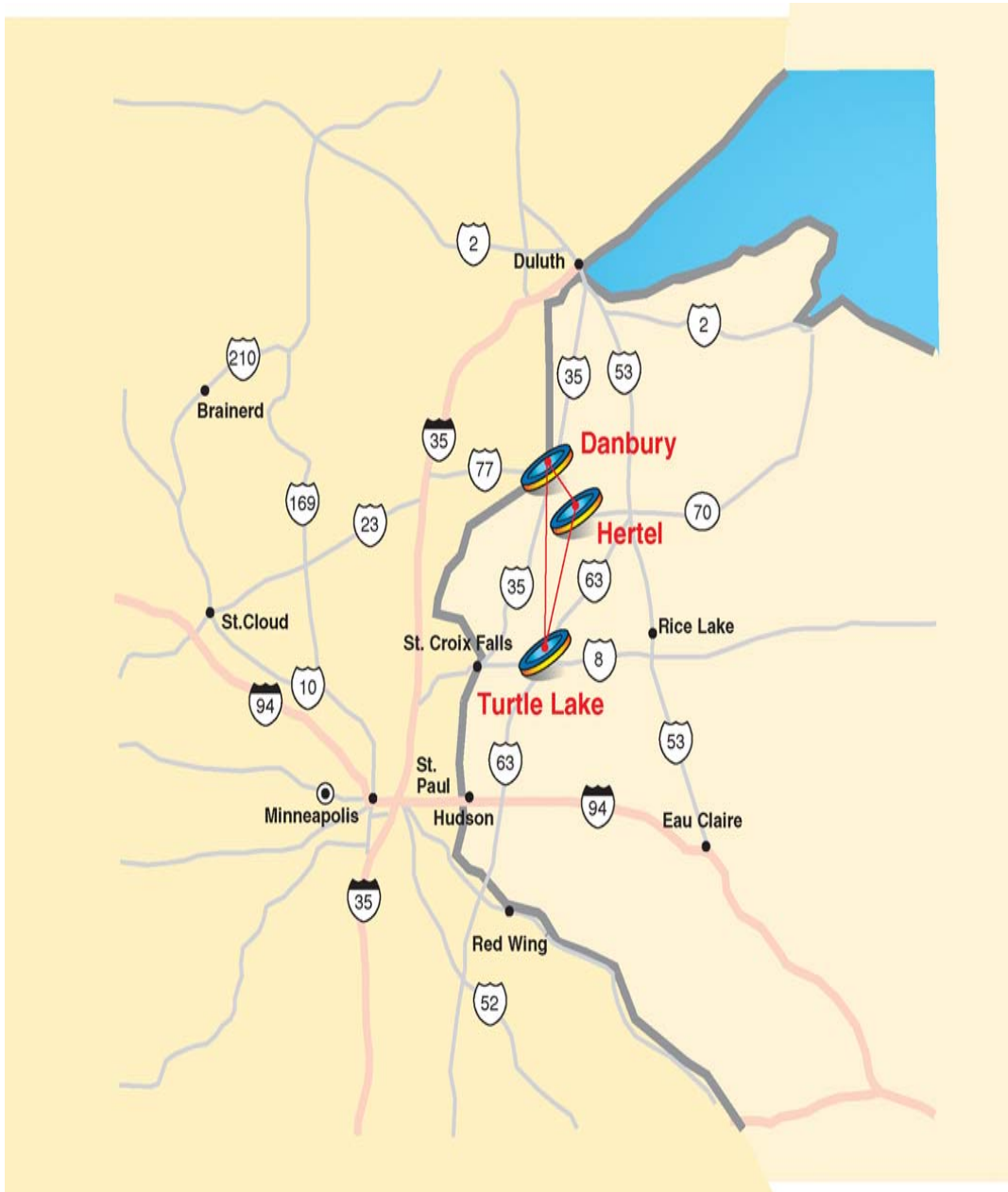
*The St. Croix Chippewa Indians, From Yesterday to Today and into the Future.*

The St. Croix Chippewa Tribe is governed by a five-member council, publicly elected every two-years. The Council consists of a Chair, Vice-chair, Secretary/Treasurer, and two Administrators.

Tribal Council is responsible for the general welfare of tribal members and the management of the day-to-day tribal businesses. The St. Croix Tribal Council oversees programs and projects out of its offices located in the St. Croix Tribal Center in Hertel, Wisconsin.

# State-Wide Setting of St. Croix Chippewa Reservation Associated Counties





The St. Croix Chippewa Indians of Wisconsin is the largest employer in Burnett County and one of Barron County's largest employers. With three casinos, a fishery and various other tribal enterprises, including the government center, the Tribal workforce totals near 2,000 employees.

Currently, Indian Gaming is the best resource and asset that the tribe's members and tribal government possesses to improve the grinding level of poverty prevalent on Indian reservations. The Tribe recognizes, however, the need to diversify and add to these successes in order to reach their goal of achieving economic and social self-determination. The St. Croix Tribe and its governing body have made enormous strides in improving the quality of life for the reservation residents and surrounding communities. The Tribe in recent years has become aggressive in its pursuit of economic opportunities in attempts to diversify its means for self-sufficiency.

# Recent Diversification Efforts

- **St. Croix Waters Fishery**, a 170,000 square foot state-of-the-art, recirculating aquaculture facility.
- **Chippewa Check Services**, a full service cash access business.
- **Fourwinds Market**, a grocery/retail business located in Siren, Wisconsin.
- **Southwinds Professional Building**, located in Siren, Wisconsin this building offers 12 Class A offices spaces for rent.
- **SCT Lumber**, located in Webster, Wisconsin.
- **SCT Travel Agency**, a full service travel agency serving a multitude of tribal and community clients.
- **Eagles Landing Campground**, providing 30 seasonal camp sites on over 900 feet of Yellow River frontage.

During 2003, The St. Croix Chippewa Tribe was awarded a grant by DOE Tribal Energy Program to evaluate feasibility of bio-mass electric generation on tribal lands.

The St. Croix tribe is very interested in development of bio-mass power projects on tribal lands. The Tribe is interested in “Green Business” development and sustainable economic development that promotes a better balance between environmental protection, jobs, and wealth distribution.

The St. Croix Tribal Community economic development goals are closely aligned with a “Renewable Energy Development on Tribal Lands” project. Using locally available bio fuel for power generation directly fits into the community, economic, social, and cultural goals of the St. Croix Tribe. Bio fuel power projects will leverage community assets and resources and provide a foundation for future sustainable development.



# Scope of Work

- The Feasibility Study included assessment of:
  - Sites
  - Impacts
  - Economics
  - Technologies
  - Fuel Supply
  - Power Markets

# Phase 1 - Preliminary Assessment

- available bio-mass fuel
- customers and distribution system
- applicable technologies
- project definition (size, fuel source, preferred technology, siting criteria, etc.)

# Phase 2 - Feasibility Assessment

- Site Selection
- Environmental Impacts Assessment
- Permit Planning
- Socio-economic Impacts Assessment
- Economic Modeling

Two potentially viable projects have been identified:

- 3 MW wood chip burning plant adjacent to St. Croix Fishery in Danbury, WI
- 10 MW wood chip burning plant adjacent to Tribal Headquarters in Hertel, WI

## Siting criteria included items such as:

- **Land** - Acreage required desired configuration, topography, zoning, and geology.
- **Utilities and Support Services** – Access to power line corridors, gas, water, sewer, wastewater.
- **Transportation** – Bio fuel supply highway requirements.
- **Labor** - Skill levels and number of employees required.
- **Environmental Issues** - Prior land use, construction and operating permits expected to be required, buffer zones, community receptivity, sensitivity to noise, sensitivity to truck traffic, visual impacts.
- **Business Climate** - Taxes, financing, construction costs, cultural considerations, proximity of support services, and infrastructure sharing opportunities.

# Danbury Site, St. Croix Waters Fishery

The Fishery uses 1.5 MW. Excess heat from the operation will be used to heat culture water to its optimum growth temperature. Potential savings will bolster revenues and create additional full-time employment for the plant which currently has 35 employees.



# St. Croix Waters Fishery, West Side





# St. Croix Waters Fishery, Southwest Corner





# Hertel Site, Water Tower

The Tribe has recently developed a partnership with Caterpillar, Inc. (Power Systems North America) to develop, construct, finance, and operate a 40-45 MW peaking power project in our utility park, for the sale of capacity and energy to Dairyland Power Cooperative, who now provides power to local cooperatives that service the St. Croix Reservation. This location has infrastructure and land to support a 10 MW project.



# Hertel Utility Park Property



# Environmental Impacts

Many of the environmental issues have already been considered during development of the fishery in Danbury and the water tower in Hertel, however specific environmental issues to be assessed include:

- Air Quality
- Water Resources
- Solid waste
- Traffic
- Land Resources
- Living Resources
- Resource use Patterns
- Public Health and Safety

# Environmental Permits

The proposed biomass facility will be located on Tribal Land. Therefore, the facility will be under the direct jurisdiction of the Environmental Protection Agency (EPA) – Bureau of Indian Affairs.

The facility will obtain environmental permits from the EPA rather than the Wisconsin Department of Natural Resources (WDNR).

The facility may require the following permits or approvals for construction and operation of the proposed facility:

- EPA Determination Request for Non-major Air Source Construction
- Part 71 Operating Permit
- NPDES Storm Water Construction Permit
- NPDES Industrial Wastewater Discharge Permit
- Storm Water Permit
- Combustion Emissions
- Solid Waste
- Water/Wastewater

# Socio-economic Impacts

The Socio-economic Impacts that were assessed include:

- Population, Economy, and Employment
- Revenue Generation
- Infrastructure

The Biomass Project will contribute to the continued diversification of Tribal revenues and help increase, enhance, and improve the quality of life of Tribal and community members.

The Biomass Project will provide new meaningful permanent employment, and retain and expand existing regional employment (logging).

The added spending in Burnett, Barron, and Polk Counties by those employed at the facility and in the logging industry would support jobs in grocery stores, food and beverage establishments, service stations, auto repair shops, clothing stores, barber and beauty shops, laundries and furniture stores.

The benefits to the Tribal communities, both on the reservation and in the surrounding communities, would be substantial. The revenue generated would be used for badly needed improvements in Tribal health care, housing, education, social services, community development, human resources, and other Tribal services and necessary infrastructure.

# Economic Assessment Assumptions

- Online Factor-90%
- 3 MW, Danbury location
- Plant operation labor force is estimated at 1 1/2 operators
- Tribal equity at 25% of total (\$4.75mm) with 12% rate of return
- Finance remainder at 5% for 10 years
- No depreciation tax credits
- Minimum Capacity Charge



# Fuel Price Sensitivity

• Price of Fuel	Power Price
• \$10/ton	\$0.054 KWH
• \$15/ton	\$0.068 KWH
• \$20/ton	\$0.083 KWH

# Conclusions

- There are two key issues that have the greatest impact on project viability:
  - markets (government mandates and “green” premium)
  - fuel supply (cost and supply risks)
- Each issue is “evolving” in our project area:
  - Wisconsin Governor’s Task Force for Renewable Energy is making recommendations for government and utility renewable portfolio mandates
  - New technology for collecting logging waste may have the potential to dramatically reduce fuel cost.

# Markets

- Alternatives:
  - Captive use
  - Regional IOUs and Co-ops
  - State government

# Wisconsin Governor's Task Force for Renewable Energy Recommendations

- State Government Portfolio:
  - 10% by 2006
  - 20% by 2010
- State facilities delivered renewable power by local utilities
- Statewide utilities renewable portfolio
  - currently at 4%
  - additional 2% by 2010
  - additional 4% by 2015

# Fuel Supply

- Alternatives:
  - Mill wastes
  - Loggers/Tree Chippers
  - Logging wastes
  - Tree farming

# Mill Wastes

The project investigated the mill waste market dynamics within the possible procurement areas for wood energy projects at Danbury and Hertel. Generators of mill waste were contacted to determine volumes of waste currently generated, the nature of that waste and existing markets within which the waste is traded.

The sources of mill waste investigated included:

- primary forest products firms that process logs or pulpwood into products such as lumber, veneer, pulp or waferboard and,
- secondary forest products firms that use lumber and other intermediate wood products to produce final consumer products.

While our investigation determined that the amount of this resource is finite, the more pertinent question became how much can the project pay and will this be enough to attract sufficient volumes.

Generation of the waste is a normal part of the production process. The industries send the material to purchasers who pay the highest price after transportation costs are deducted.

The evaluation determined mill waste were not a viable, sustainable fuel option.



# Loggers / Tree Chippers

Numerous loggers/tree chippers operate in the project region.

Chips are sold for manufacturing, building materials, pulp & paper, and boiler fuel.

The best price from local logging contractors is estimated to be \$20/ton.

# Logging Waste

Slash left behind by a harvester can be collected and fed into a bundler which produces compact “slash logs” .

Each of these bundles contain about 1 MWh of energy when combusted. A felling area one hectare in size yields about 150 bundles.







After being bundled, the slash logs are transported from forest to the end users via standard logging trucks.

The bundling system makes the storing of bundles clean and easy. Because the compact bundles do not start decomposing immediately, it is possible to store them for the peak periods in energy production.

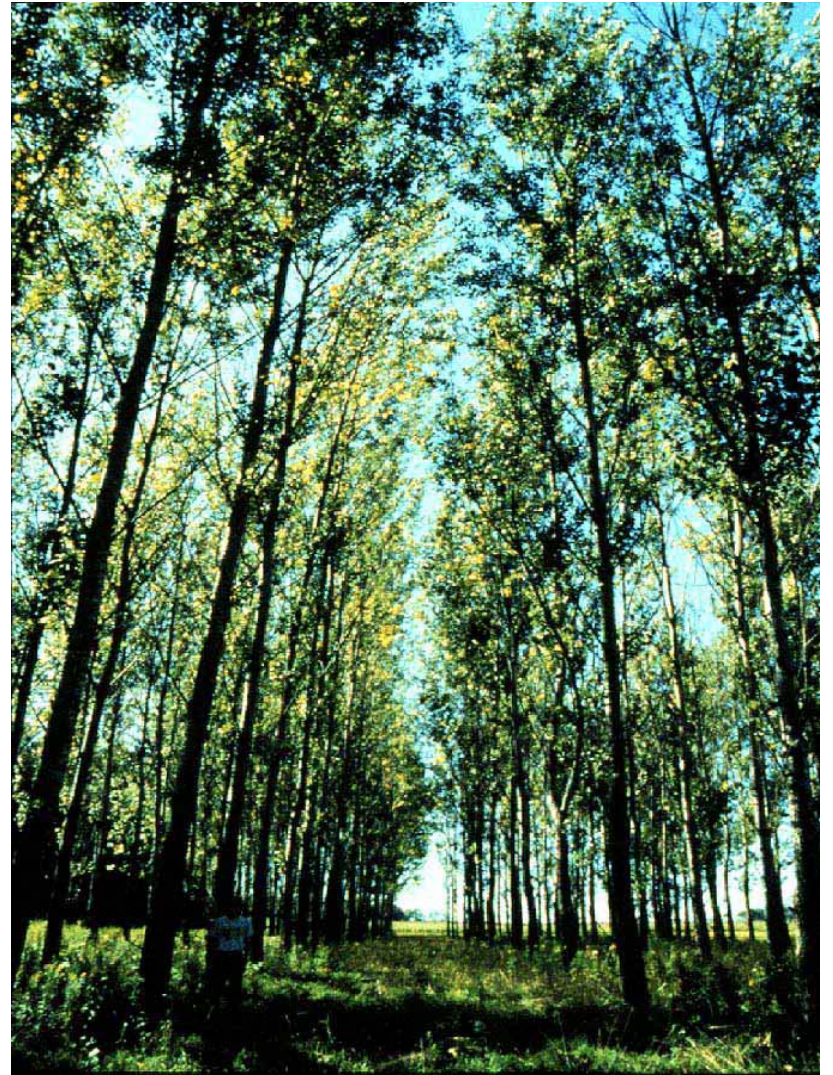
The slash logs are then ground into fuel chips at the end users site.

Although the technology is new in the U.S., using logging waste has the potential to reduce fuel cost to \$10-\$15/ton

# Tree Farming (Hybrid Poplar)

- Developed by crossing native aspen and introduced poplar (primarily asian & european)
- Large scale plantations have been developed near Alexandria and Oklee Minnesota
- Commercial harvests are being used for pulpwood
- Establishment of markets for the wood must occur simultaneously with the planting
- Grows best on high quality cropland
- Is harvested with conventional harvesting equipment
- Establishment and land costs are often the highest expenses
- Rotation age to produce pulpwood and small sawlogs is 10 – 15 years
- Fuel cost from tree farming is estimated to be \$ 25/ton in our region





# Project Development Action Plan

- Develop fuel supply strategy to reduce cost and supplier uncertainty
- Develop firm power sales agreements
- Project financing, permitting, EPC contracting