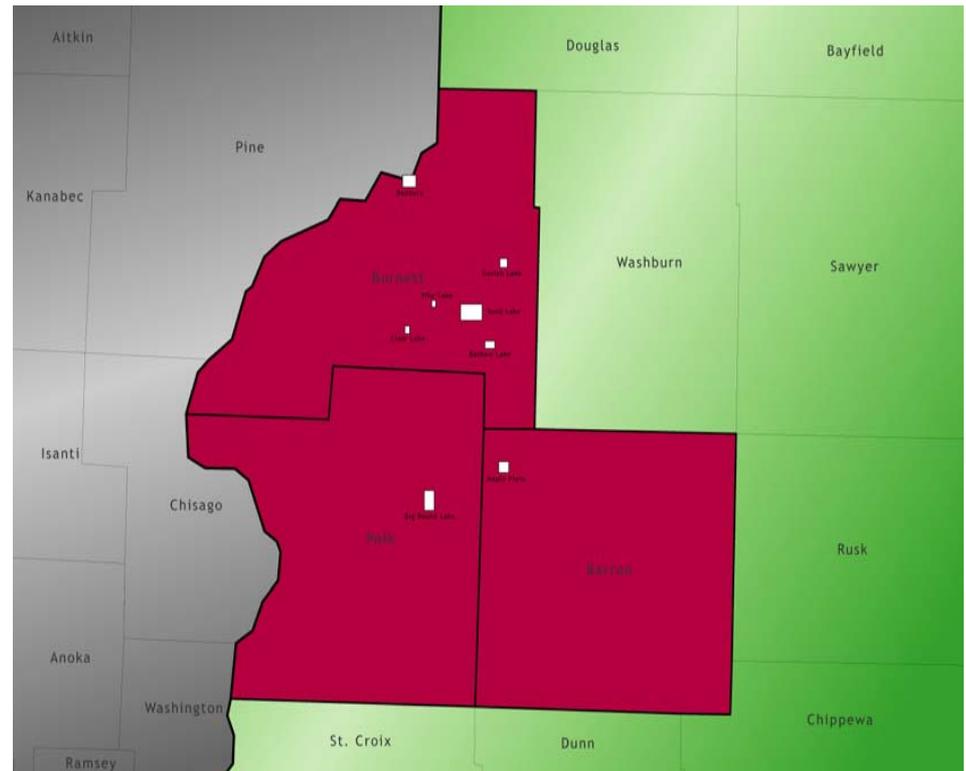


Bio Mass Electrical Generation on Tribal Lands

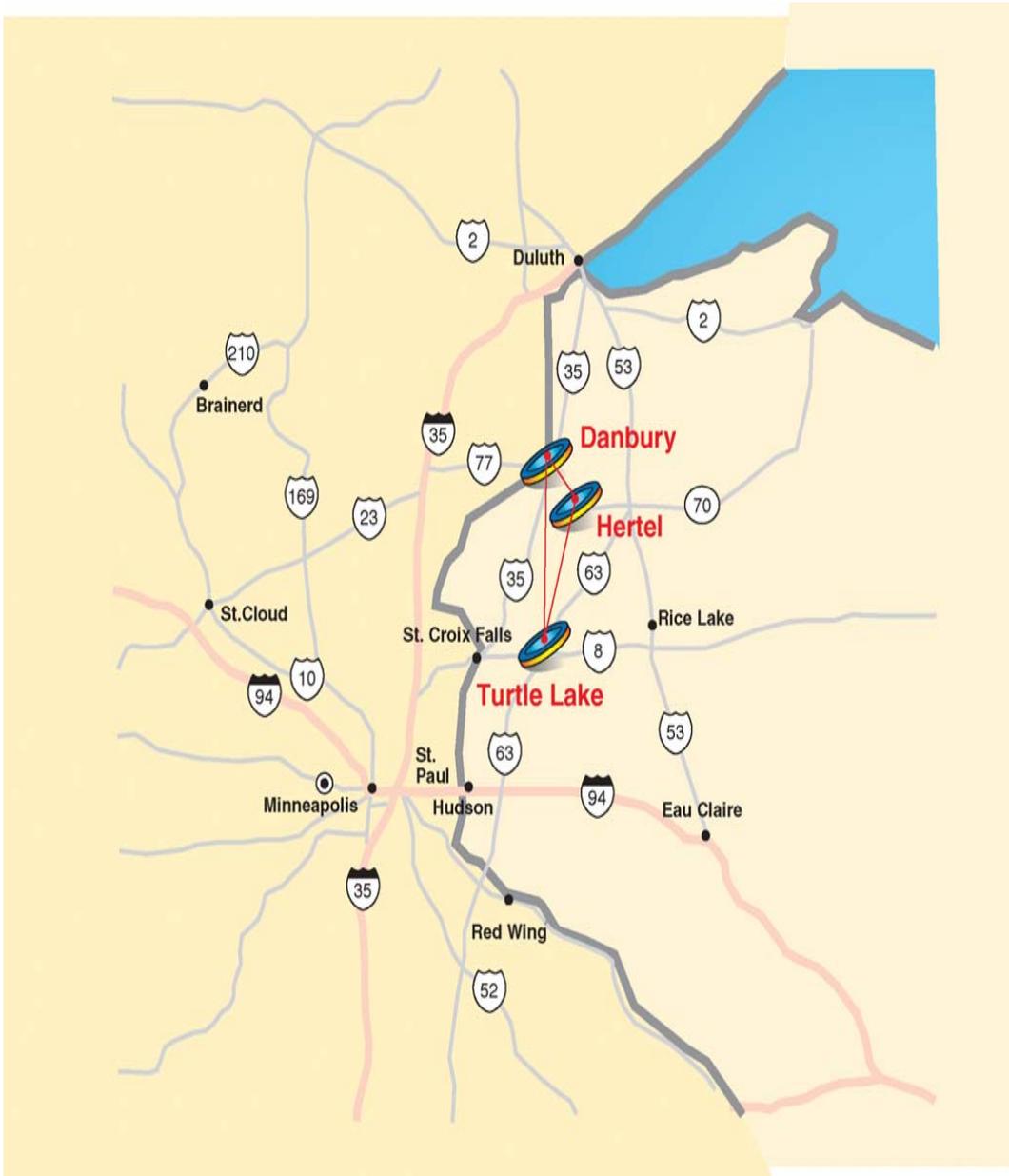


St. Croix Chippewa Indians of Wisconsin

The St. Croix Chippewa Indians of Wisconsin are located in northwestern Wisconsin. The reservation lands are scattered throughout three counties; Burnett, Polk, and Barron.



The Tribal communities are located within the State of Wisconsin's logging industry districts.



Currently, Gaming is the Tribe’s best asset to assist in improving the level of poverty prevalent on the reservation.

The Tribe recognizes, however, the need to diversify and add to its successes in order to reach their goal of achieving economic and social self-determination. The Tribe has in recent years become aggressive in its pursuit of economic opportunities.

The St. Croix Tribal Community development goals are closely aligned with the DOE’s “Renewable Energy Development on Tribal Lands” initiative. Using locally available bio fuel for power generation directly fits into the community, economic, social, and cultural goals of the St. Croix Tribe.

Project History

- **During 2003, The St. Croix Tribe applied for and was awarded a grant by DOE Tribal Energy Program to evaluate the feasibility of bio-mass electrical generation on tribal lands.**
- It concluded that:
 - Biomass fuel is locally available in sufficient quantities to support the project; however, the fuel collection and delivery infrastructure is undeveloped.
 - Small, biomass-fired power plant(s) could be feasible if the market would support a \$0.03 to \$0.04/kWh premium.

Feasibility Assessment Elements

- Available bio-mass fuel
- Customers and distribution system
- Applicable technologies
- Project definition (size, fuel source, preferred technology, siting criteria, etc.)
- Site Selection
- Permit Planning
- Economic Modeling
- Environmental Impacts Assessment
- Socio-economic Impacts Assessment

**Subsequent project development efforts have
been funded by
BIA Division of Energy and Mineral Resources.**

- Resource Assessment
- Market Assessment
- Waste Heat Utilization Assessment.
- Equipment/Vendor Identification and Assessment.
- Project Economic Analysis
- E, P & C Contract Negotiations
- Fuel Supply Agreement Negotiations
- PPA Negotiations
- Environmental Permit Planning
- Project Financing

Fuel Supply Alternatives

- Wood waste from sawmills and wood products manufacturing operations
- Wood from logging operations
- Forest management and logging operations waste
- Tree farming



Logging Waste

- Logging waste is an abundant, under-utilized fuel source.
- Utilization of logging waste will enhance the logged environment, provide a value-added product to the logger and produce “green” electrical power.
- Logging wastes could be collected using existing logging practices and chipped at the landing or at the site.
- Slash left behind by a harvester could be collected and either chipped or fed into a bundler to produce compact “slash logs” .
- Logging wastes collection and delivery infrastructure is still undeveloped.
- Project economics are based on \$25/green ton.

Resource Assessment Report – June 2006

1. Document 10 year logging history
2. Determine state, county and private cuts
3. Verify amount of slash available and how much should be left
4. Conversion factors and fuel quality issues
5. Slash management contract requirements – State and County policies
6. Slash ownership issues
7. Hertel and Danbury as potential locations
8. Access limitations on slash harvesting
9. Other general issues uncovered in the course of the project
10. Loggers meetings and database
11. Bidding processes
12. Transportation costs
13. Optimal collection method and wood chip supply chain

Danbury Site, St. Croix Waters Fishery



The Resource Assessment Report demonstrated that the resources available are enough to supply up to a 10 MW plant at the Danbury location.

St. Croix Waters Fishery

In October of 2001, the St. Croix Waters Fishery opened in Danbury, Wisconsin. The 170,000 square-foot, \$23 million facility is a state-of-the-art, re-circulating aquaculture system. The facility has grown yellow perch and hybrid striped bass and is capable of producing approximately 2 million pounds annually for commercial sale.

The Fishery site provides land and infrastructure, reducing capital investment requirements. Sharing of management and maintenance labor cost is a benefit to both the power plant and the fishery. Excess heat from the biomass operation may be used to reduce the natural gas usage.



St. Croix Waters Fishery



St. Croix Waters Fishery

Market Assessment

- On March 17, 2006 Wisconsin Governor Jim Doyle signed Senate Bill 459 into law mandating an increase in purchases of renewable energy within the State.



- The market premium Wisconsin utilities will pay for renewable energy is “evolving” as utilities take steps to meet mandates.

Wisconsin's Renewable Energy Mandates

- State Government Portfolio:
(State facilities delivered renewable power by local utilities)
 - 10% by 2007
 - 20% by 2011
- Statewide utilities renewable portfolio
 - currently at 4%
 - additional 2% by 2010
 - additional 4% by 2015

Potential Customers

- Regional IOUs and Co-ops
- State Government
- Captive use

Equipment/Vendor Identification and Assessment

- Three technologies were evaluated for combined heat and power
 - Stoker (pile burner),
 - Close-coupled Gasifier (Chiptec),
 - STRPG.
- While the STRPG has the best economic results, the technology does not support commercial sales at this time.
- Either the stoker or the gasifier would be appropriate for St. Croix.
- The Tribe is working with vendors to obtain the best mix of capital and operating costs, plus performance guarantees.







Project Definition

- 6 MW wood chip burning plant adjacent to St. Croix Fishery in Danbury, WI
- Readily available fuel supply (slash from logging operations within 30 to 50 miles)
- Proven, reliable technology

Current Project Activities

- Finalizing technology and engineering, procurement and construction vendor selection.
- Preparing for the Environmental Permit process based upon technology selection.
- Preparing and negotiating Memorandums of Understanding (MOUs) for fuel supply, technology transfer, purchase power agreements, project financing, etc.
- Structuring project partnership and completing associated legal work (formation of project sponsor entity, i.e.; JV, tribal entity, etc.)
- Facilitating Wisconsin public policy changes necessary for project viability.

Regional Economic Benefits

- Relative to imported wind power, a 6 MW biomass-fired power plant has a economic benefit to the local economy of at least \$15 million.
 - Payroll
 - Purchases from local loggers
- Wisconsin RPS could and should be amended to favor in-state biomass projects.

Renewable Energy Policy Efforts

- Governor's Office - Policy Director
- Department of Administration
- Public Service Commission
- Office of Energy Independence
- Forest Products Laboratory

Key Issues

- Current public policy does not provide mechanism to reward project for regional benefits (jobs, fuel purchase, voltage support)
- Depreciation and production tax credits crucial for project viability
- PPA and fuel supply contracts must maintain “spark spread”

Our Vision

- **Our expectation is that implementation of renewable energy portfolio standards in Wisconsin will result in a firm market premium for biomass-fired power. This, in turn, will provide the basis for negotiating with area loggers and mills (and eventually tree farmers) to secure a reliable supply of biomass fuel at a price that justifies Tribal investment in the project.**
- **If key policy issues are addressed, we believe that a small power project based on locally available biomass can be demonstrated to be economically viable in Danbury and replicated in numerous communities throughout northern Wisconsin, Minnesota and Michigan.**