

“November 25th Draft”
**Additional Electrical Generation
at the
Barron County Waste-to-Energy Facility**

Executive Summary

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Scope: The purpose of this document is to provide The Barron County Board of Supervisors and other interested parties with an executive summary description of the electrical generation project.

Background: Since beginning operation in 1986 the Barron County Waste-to-Energy Facility (“Facility”) has produced steam at levels above that originally anticipated creating a surplus over and above needs of the Facility’s long time steam customer, Saputo Cheese, USA (“Saputo”). Modifications made to the Facility’s pollution control equipment and boiler systems several years ago made it possible to capture additional steam energy.

Currently all of the high pressure steam energy from the Facility is directed through a back-pressure turbine generator that reduces it’s pressure and in doing so removes a portion of the steam’s potential energy and converts it into electricity. The BCWTEF and attached Barron County Recycling Material Recovery Facility currently utilize nearly all the electrical energy produced. The excess electricity is sold under contract to Xcel Energy. The low pressure steam exiting the turbine is then either sold to the steam customer, used in the Facility or condensed via an air-cooled condenser and reused in the boiler feedwater system. The excess steam has changed over the years depending on production capabilities and customer usage with approximately fifty percent (50%) of this low pressure steam currently being underutilized.

The Solid Waste Management Board (“SWMB”) has considered many options for this available steam for many years. While the best option for the available steam would be to sell it to an additional direct use customer, such an entity has proved elusive for over twenty years. A good road system and workforce exist, however, the lack of rail and wastewater treatment have hampered attracting steam using industries to the immediate area. For these reasons the SWMB has spent the last five (5) years exploring the option of using excess steam to produce additional electricity at the Facility.

Project Timing, Why now? The recent resolution of several important matters related to the Facility have made the timing of this project appropriate. The County recently completed a \$1,500,000 project to upgrade boiler and pollution control equipment at the Facility allowing for additional steam production and providing controls that will meet foreseeable environmental regulations. To assure fuel supplies for the Facility, Barron County has entered into a 30 year waste supply agreement with the City of Rice Lake and is in the final stages of implementing a waste flow control process for the rest of the County. Also, a new Steam Agreement extension has recently been negotiated with Saputo ensuring steam sales revenues to the Facility. In addition, the County is in the final stages of negotiations for economical long-term ash disposal for the Facility. Finally, the prices paid for renewable power have steadily increased in recent years and makes the project economically more attractive than in the past.

Purpose: When completed the project will produce incrementally, on average, over 500 kilowatts of electrical power with no adverse impact on the environment. Similar to wind power, the way this is accomplished is by transforming potential energy that already exists and that would otherwise goes unutilized. There is a net zero carbon footprint impact as no additional waste needs to be burned to create this power. The County will realize revenues that will be used to offset waste disposal tipping fees at the Facility. In addition, since the equipment is sized to process all the steam generated at the Facility, the project will offer a risk management shield against the unlikely possibility that the Facility’s only energy customer would some day stop purchasing steam.

Project Description, How It All Works: The project consists of adding a new condensing steam turbine generator, renovation of the existing back pressure turbine system and the addition of new steam super-heaters and boiler economizers. High pressure steam from the boiler will pass through a super-heater and the superheated steam will flow to the renovated existing back-pressure turbine. A portion of exhaust steam from this turbine will flow to Saputo with the excess 100 psig steam being directed through a second super-heater. This superheated steam then flows to a new condensing steam turbine with the exhaust steam from this turbine being directed to a surface condenser where it will be condensed and re-utilized in the feedwater system. The condensing turbine drives a new electrical generator that interfaces with the existing generating and synchronizing equipment. The entire project (including upgrades to the existing turbine generator) will result in the export of approximately six hundred (600) kilowatts of renewable power into the electric grid. For more information, process and electrical one line diagrams may be found at <http://www.co.barron.wi.us/waste2energy.htm>.

Project Cost: The turbine generator portion of the project is estimated to cost two million dollars (\$2,000,000). The SWMB has requested up to two million five hundred thousand dollars (\$2,500,000) in financing for the project and other related energy/money saving projects. The project has a simple payback period of five (5) to six (6) years and depending on finance options and final cost, an approximate tipping fee off-set of five dollars (\$5.00) to ten dollars (\$10.00) per ton. The worst case provides for a five percent (5%) rate of return over a twenty (20) year period. A detailed project cost estimate can be found at <http://www.co.barron.wi.us/waste2energy.htm>.

Duties: The following lists the duties and responsibilities of Barron County participants in the project:

The Solid Waste Management Board is responsible for planning, approval and oversight of the over-all project.

County Administration is responsible for financial planning and procurement of said financing and oversight of and adherence to general Barron County policies, practices and procedures as they apply to the project.

The Barron County Board of Supervisors is responsible for approval of budgeting and financing of the project.

Risk Management: Many issues must be considered when analyzing risks and benefits associated with the project. Primary areas of concern are waste supply, steam sales and usage rates, existing facility performance, new electrical equipment performance, long term ash disposal, future environmental regulations, electrical revenue rates and the status of renewable energy both on a state and national basis. Another area to be considered is the addition of another steam customer or additional needs in the future by the current customer. The project offers the added benefit of partially offsetting revenues from steam sales should they not be available. Due to the variable nature of steam usage from one or more direct use steam customers, there will always be benefit from the new project regardless of whether over-all usage goes up or down. This usage level will, however, have an impact (up or down) on financial performance of this project as well as over-all Facility finances.

Project Financing: The project has the possibility of being funded with Clean Renewable Energy Bonds (CREB's) at zero percent (0 %) interest. A fall-back position is to finance with a State Trust Fund loan. This is significant because depending on the term, interest could be as much as thirty percent (30 %) of the total project cost. The project has a time line of approximately 56 weeks from order of turbine until commissioning of equipment. For this reason some initial in-house financing may be prudent until such time substantial payments are required (approximately three to four months into an equipment contract). Further, in order to expedite procurement and equipment delivery, it may be necessary for some nominal expenditures to be made prior to a final commitment to the project.

Recommendation: The Barron County Solid Waste Management Board recommends that the Barron County Board of Supervisors authorize funding for this project so they can continue with final planning and take appropriate steps toward implementation.