



Minnesota's Biomass Mandate: An Assessment

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June 2005

*A publication of the New Rules Project
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David Morris, Vice President
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May 2005

The biomass mandate has been transformed into a giant waste-to-energy subsidy that will cost at least \$1.1 billion over the next 20 years.

Summary

In 1994, as part of an effort to promote renewable electricity, the Minnesota legislature required the state's largest utility to generate or purchase 125 megawatts (MW) of biomass-fueled electricity by 2002.¹

As of May 1, 2005 only 20 percent (25 MW) of the original mandated goal has come online. Another 50 MW is expected to become operational by mid 2007. Contracts for the remaining biomass have yet to be approved.

The mandate was originally designed to spur new energy crops and new energy conversion technologies. The first two projects seriously considered satisfied both these worthy objectives. One, by a farmer cooperative, proposed to make alfalfa an energy as well as animal feed crop. The other, by a Minnesota business, proposed to use fast growing trees to fuel a patented whole tree energy conversion technology.

Within a year of the passage of the original mandate, its objectives were modified to allow the use of waste wood as a biomass fuel. By 2000, the biomass mandate had been transformed into a giant waste-to-energy subsidy that will cost Xcel Energy's electricity customers at least \$1.1 billion over the next 20 years.²

In 1994, Minnesota utilities and businesses were using 3.5 million tons of biomass in the form of waste wood and urban organic wastes to generate electricity. As of May 1, 2005, the biomass mandate has resulted in an additional 280,000 tons of waste wood being used for the generation of electricity. Another approved contract will result in the incineration of more than 500,000 tons of turkey manure.

The last two contracts, which will use waste wood for over 80 percent of their fuel, have yet to be approved by the PUC.

Although 11 years have passed since the

original biomass mandate was enacted, and almost three years since the mandate was to have been fulfilled, one could argue that the process and therefore the debate, is not yet over. Although it would be very difficult politically to make fundamental changes, it might be very wise economically to do so.

If the proposed contract with Virginia and Hibbing were not approved, over \$400 million could be saved or redirected to other biomass-related or renewable energy related ventures.

The contract for Fibrominn's turkey litter incinerator was approved four years ago. But it was not until December 2004 that the company finally gained sufficient financial commitments to proceed with full construction. Thus it might be possible to buy out that contract. This was common practice in the 1990s by electric utilities that entered into high priced contracts with renewable electricity providers only to see the wholesale price of electricity fall. Buying out Fibrominn's contract would be costly but given the subsidy involved of over \$500 million, it may be prudent.

What happened?

In retrospect we can identify several problems.

1. The initial legislative language eliminated from consideration a key technology. The original law called for projects that used farm-grown, closed loop biomass to provide 100 percent of the fuel for a power plant. This eliminated the ability of bidders to propose the most cost-effective biomass power producing technology (co-firing biomass with coal).³

2. Political and environmental leaders were unwilling either to fully embrace the biomass mandate's objectives and the large costs necessary to effect those objectives, or to redirect the money law to support less expensive renewable electricity projects.

As of May 1, 2005, only 25 MW of new biomass-generated electricity has come on-line, despite the mandate's December 31, 2002 deadline of 125 MW.

3. The continuing presence of the biomass mandate coupled with the delay in bringing new technologies or new "closed-loop" energy crops online opened the door to private firms to successfully lobby the legislature to rewrite the original legislation piecemeal to allow their own waste-based proposals to qualify for the mandate.

Background

In 1994, Minnesota power producers were generating electricity primarily by burning two kinds of biomass: waste wood and waste paper.

Timber and paper companies burned about 2.5 million tons of wood wastes a year to generate about 200 MW to power their own operations. Municipal and county garbage incinerators generated about 115 MW by burning some 1 million tons of organic solid waste.⁴

In 1994, after a long and contentious legislative debate about whether Minnesota would host a long-term radioactive waste storage facility, the legislature enacted a compromise bill. The owner of the Prairie Island nuclear facility, Northern States Power (now Xcel Energy)⁵ was allowed to install sufficient above-ground waste storage capacity to allow the facility to operate at least until 2002. At the same time Northern States Power was required to launch an aggressive renewable electricity initiative to generate about 550 MW by 2002.⁶

To satisfy the mandate, Xcel had to produce or purchase 425 MW of wind power and 125 MW of biomass power by 2002.

At first glance, the biomass mandate appears considerably smaller than the wind mandate. In reality, however, they're comparable because wind generates electricity at rated capacity only intermittently while a biomass-fueled plant does so virtually all the time.⁷

The original biomass mandate consisted of a single 70-word paragraph:

A public utility, as defined in Minnesota Statutes, section 216B.02, subdivision 4, that operates a nuclear powered electric generating plant within this state must, by December 31, 1998, construct and operate, purchase, or contract to construct and operate (1) 50 megawatts of electric energy installed capacity generated by farm grown closed-loop biomass; and (2) an additional 75 megawatts of installed capacity so generated by December 31, 2002.⁸

The mandate was designed to move the state beyond the burning of waste wood and urban organic wastes in relatively inefficient power plants. It was generally assumed that the biomass mandate would result in higher priced contracts than traditional energy resources. The legislature put no limit on the cost of biomass power. The contracts were viewed as a way to spur the establishment of new energy crops in Minnesota (e.g. grasses, fast growing trees) and the introduction of higher efficiency energy conversion technologies.

As of May 1, 2005, only 25 MW of new biomass-generated electricity has come on-line, despite the mandate's December 31, 2002 deadline of 125 MW.

The biomass provisions of the statutes have swollen to more than 2,200 words stretching over four pages. And the 2005 legislature likely will pass further modifications, lengthening the statute even more.

The original intent of the biomass mandate will never be realized with the current list of proposed projects. If planned facilities with contracts under the biomass mandate actually come online, about 90 percent of the biomass used will be waste wood or waste agricultural materials.⁹ No advanced technologies are involved in any of the facilities either currently operational or proposed.

The cost per kWh of the biomass mandate was originally expected to be similar to the cost of the wind energy mandate. However, the biomass contracts approved have prices nearly three times greater than wind energy.¹⁰ Indeed, based on current power purchase contracts, Xcel customers stand to pay over \$1.1 billion more over the life of the contracts for biomass-generated electricity than if an equivalent amount of wind-generated electricity had been purchased.

What happened?

1. The 1994 legislation was flawed.

Originally, projects meeting the requirements of the biomass mandate had to be 100 percent fueled by farm-grown closed loop biomass. In 1996 the legislature revised that percentage downward to 75 percent, that still eliminated from consideration the least expensive biomass-to-electricity option: co-firing biomass with coal.

This shortcoming was one of several reasons for the difficulties encountered by the Minnesota Valley Alfalfa Producers (MnVAP) biomass energy project. MnVAP is a cooperative of alfalfa farmers near Granite Falls. As MnVAP's initial studies found, the value of the

alfalfa lies in its leaf protein, not in its stems. Important work was done on finding efficient ways of separating and processing that protein and opening up new value added markets for it. But in the end the overwhelming focus was on building the new stem gasification power plant.

Except for the requirements in the law and DOE's intervention and funding for a greenfield plant, MnVAP might have sent its alfalfa stems to Xcel's Sherco facility to be co-fired with coal. A three percent biomass co-firing ratio would have generated about as much biomass electricity as MnVAP's proposed gasification facility at a cost as little as 20 percent the price of MnVAP's 1998 power purchase agreement (PPA).

Only in 2003 did the legislature finally allow co-firing to qualify for the biomass mandate, but only if the existing contracts did not succeed in satisfying the slimmed down goal (110 MW vs. the original 125 MW).

Since it wasn't allowed to co-fire alfalfa stems with coal in an existing power plant, MnVAP opted to build an expensive new power plant based on an uncommercialized technology, the gasification of alfalfa stems to fuel a gas turbine. MnVAP was also encouraged to build a new power plant by the U.S. Department of Energy. Eager to show progress in its biomass energy program, DOE offered MnVAP \$40 million to build a biomass gasification facility.

The MnVAP project was also undermined by the three year delay in negotiating and approving a purchased power agreement. Part of this delay was due to the request by environmental organizations and the Department of Commerce to the PUC for an environmental impact statement on MnVAP's project.

MnVAP's Contract Negotiation

Timeline

- September 1995. NSP identifies MnVAP as one of three projects with which it will negotiate.
- March 1996. NSP proposes to reject all bids.
- June 1996. The PUC orders NSP to select and submit the name of a developer for the first 50MW of the biomass mandate.
- July 1996. NSP selects a 75 MW proposal from MnVAP for contract negotiations.
- February 1998. NSP asks the PUC to approve a 12 year power purchase agreement (PPA) with MnVAP.
- January 1999. A key financial partner with MnVAP withdraws from the project.
- March 1999. DOE freezes further funding.
- April 1999. The PUC approves the PPA with MnVAP.
- December 1999. NSP/Xcel terminates the contract with MnVAP.

Many participants in the MnVAP proceedings were concerned about the high price of its proposed contract with NSP, an estimated \$105 per MWH. Ironically, in retrospect, MnVAP's project may have been the lowest cost project of all the biomass mandate projects because the terms of the contract were for 12 years whereas all other biomass contracts were for 20 or 21 years. (Anticipated DOE funding also decreased the project's cost.)

2. The reluctance of Xcel Energy, the state's energy and political leaders and the environmental community to engage the biomass mandate and its original objectives left the situation in limbo for several years.

The focus of the environmental community was almost entirely on the wind power mandate. The biomass mandate had been an afterthought in the original legislation, and when it suffered birth pangs while the cost of wind energy dropped, the environmental and renewable energy community quickly gave its blessing to allowing waste wood to qualify.

District Energy

Biomass wastes were specifically prohibited by the original legislation. The original intent was focused on farm-grown sources of biomass. Only one legislative session after it was enacted, the biomass provision was altered to allow the Saint Paul District Energy company to qualify for 25 MW of the 125 MW mandate by using waste wood as its fuel.

Permission to use waste fuels was initially limited to the District Energy company.¹¹ Proponents justified the exemption for District Energy because its district heating system was itself an improved way of heating downtowns and biomass would displace coal burned in a downtown facility, and the proposed cogeneration plant would not only generate electricity but also capture the waste heat generated. By capturing the waste heat the overall process would be two or three times more efficient than a simple biomass-to-electricity process.

Fibrominn

In the 2000 legislative session, the waste fuels exemption was broadened to include poultry litter. The change in the biomass law benefited a single company, Fibrowatt, a subsidiary of a

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British corporation. The change was made even though poultry litter, at least in Minnesota, had a healthy, growing and unsubsidized market as a nitrogen-rich fertilizer. The legislature decided to heavily subsidize a shift from the use of poultry manure to displace natural gas-derived nitrogen fertilizer to its use to generate electricity.

Minnesota's executive branch agencies were split on the Fibrowatt exception. Minnesota's Department of Agriculture strongly supported the poultry litter biomass legislation. But the Department of Commerce argued before the legislature that if the mandate were to be opened to further use of waste materials it should allow all waste fuels, not just poultry litter. The Department of Commerce noted that by opening up the mandate for all waste fuels more competitive bids would be forthcoming, lowering the prices and potentially encouraging more efficient conversion technologies.

The Institute for Local Self-Reliance suggested that rather than expanding the definition of biomass to include waste wood and poultry manure, the remaining part of the biomass mandate not yet under contract should be shifted to the wind energy mandate. At the estimated cost of the 50 MW Fibrominn (Fibrowatt's local subsidiary) contract (9.5 cents per kWh) more than 450 MW of additional wind power could be purchased (at 2.9 cents per kWh).

The environmental community did not take a position one way or the other on the Fibrominn legislation.

Xcel argued that opening up the biomass mandate to competitive bidding would make it unlikely it could meet the legislature's 2002 deadline. Only the poultry litter incinerator could bring an additional 50 MW of biomass power online by the deadline.

To deal with some of the issues raised by critics, the legislature included two new provisions in the biomass mandate statute. One required that the Fibrominn contract be lower in price than the existing lowest cost contract, that of District Energy.

Initially, Fibrominn submitted a price remarkably similar to that of District Energy. Fibrominn's original offer was \$94.21 per megawatt-hour (MWh), compared to District Energy's \$95.25 (see Appendix A for costs of all the negotiated biomass contracts.) Further negotiations with Fibrominn lowered the ultimate contract price to \$85.97 per MWh.

Another provision of the 2000 legislation required that Fibrominn's "capacity must be

scheduled to be operational by December 31, 2002." To avoid the 3.5 year delay that undermined the MnVAP project and to ensure that Fibrominn did meet the December 31, 2002 deadline, the legislation directed the PUC to "finally approve, modify or disapprove no later than July 1, 2001 all contracts submitted by a public utility as of September 1, 2000 to meet the mandate set forth in this subdivision."

The PUC did this, but in mid 2002, Fibrominn requested an extension beyond the December 2002 deadline. Additional extensions were also requested and granted. In December 2004 the company announced it had finally attracted sufficient financial guarantees to build the plant. The facility is currently scheduled to become operational in mid 2007.

EPS/Beck

Besides the MnVAP project, the other biomass power project that was to use new energy crops was that of Energy Performance Systems (EPS), a Minnesota company headed up by an engineer who had run Northern States Power's (NSP is now Xcel Energy) biomass program in the 1980s. EPS intended to contract with farmers to raise fast growing hybrid poplars on a five-year harvest cycle on about 25,000 acres near St. Peter, and burn the whole tree in a specially designed power system.

In 1996, contract negotiations began with EPS and its partner, R.W. Beck. An initial 25 MW contract was negotiated. In August 1999, the PUC deferred the approval of the EPS/Beck contract. The Department of Commerce had recommended that the PUC require the project to double its size, to 50 MW, in order to lower the contract price. NSP responded that "EPS/Beck has stated that it cannot assume the additional risks (of a 50 MW plant)...and still obtain equity participation or financing."

In January 2000 the PUC approved a 20-year PPA between NSP and EPS/Beck for 25 MW and requested NSP to report back within 5 months on the possibility of increasing the contract to 50 or 75 MW. In September 2000 the PUC approved a revised PPA for a 50 MW project by EPS/Beck.

The EPS/Beck project ran into problems and in February 2003, Xcel Energy proposed to transfer EPS/Beck's PPA to NGP Power Corporation (NGPP), a company that proposed to fuel a new biomass power plant near Waseca with fast growing willow trees. The transfer was done via a contingency sales agreement.

In 2003, the legislature made several significant changes in the biomass mandate. It increased the amount of power Fibrominn could generate, from 50 MW to 55 MW and the power the District energy facility could generate, from 25 to 33 MW. It reduced the biomass mandate from 125 MW to 110 MW. And it required the PUC to approve a request pending as of May 15, 2003 to assign “a contract for power from a facility that uses short-rotation, woody crops as its primary fuel previously approved to satisfy a portion of the biomass mandate if the developer of the project agrees to reduce the size of its project from 50 megawatts to 35 megawatts while maintaining a price for energy at or below the current contract price.”

In January 2004, Xcel Energy filed an amended plan to transfer EPS/Beck's original PPA to the municipal utilities of Virginia and Hibbing, MN. These cities had agreed to take over NGPP's project and use a combination of fast growing trees and waste wood to provide 35 MW of electricity to Xcel and steam to the cities' district heating systems.

The PPA with Virginia and Hibbing has yet to be approved. It appears that the contract price is around \$104.75. If pending legislation in the 2005 legislature is enacted, fast growing trees (new biomass) will have to comprise only 25 percent of the boiler's fuel over the life of the contract. To satisfy that requirement, about 5,000 acres of hybrid poplar will be needed.

Itasca Power

As of the completion of this report, the legislature had made one further significant change regarding the use of biomass-generated electricity. In 2001, legislature required Xcel Energy to negotiate a long-term contract for a 10-20 MW facility. It clearly identified which facility this would be by adding, “by a small business-sponsored independent power producer facility to be located within the northern quarter of the state, which means the area located north of Constitutional route No. 8...” The facility could use wood, sawdust, bark, chipped wood, or brush and “must be operational by December 31, 2002”.¹²

Itasca Power (IP), the owner of the proposed facility described in the bill, petitioned the PUC several times in 2001 and 2002 to direct Xcel Energy to negotiate a PPA. There was some question as to whether the legislation was part of the biomass mandate. Xcel Energy argued that it was and that since the mandate had been satisfied, it was under no obligation to negotiate a contract with Itasca Power.

In 2003, the legislature again required Xcel Energy to “enter into a power purchase agreement by January 1, 2004, for ten to 20 megawatts of biomass energy and capacity”. It added the requirement that the PPA be at an “all-inclusive price not to exceed \$55 per megawatt hour” and that the project be operational and producing energy by June 2005. This requirement would make the price of Itasca Power at least 40 percent lower than the next lowest biomass contract. This provision was not part of the original biomass mandate but a new Renewable Energy Objectives mandate. The REO was voluntary for all Minnesota utilities but mandatory for Xcel Energy.

Despite the explicit price and time guidelines in the legislation, IP and Xcel Energy were still unable to negotiate a mutually satisfactory PPA. In August 2004 the PUC directed IP and Xcel Energy to go through a mediation process to work out a contract. In November 2004 the PUC ordered Xcel Energy to file a proposed power purchase agreement with Itasca Power by November 30, 2004.

As of May 2005, a contract has yet to be approved between Itasca Power and Xcel Energy.

Concluding Observations

Minnesota's biomass mandate was a gutsy effort to jump-start the establishment of energy crops and new energy conversion technologies in the state. The concept was worthy. The execution was inadequate.

There were many reasons the program ran into difficulties. The very high price needed to allow for the introduction of new energy crops and new energy conversion technologies attracted that attention of entrepreneurs peddling existing technologies that relied on waste materials. Within a year of the passage of the original mandate, the legislature agreed to allow waste materials as a fuel. Repeatedly during the next 10 years the legislature intervened on behalf of a specific company to modify the original rules in piecemeal fashion.

Although the original concept was worthy, it too may have been more the result of an individual entrepreneur's involvement in the design of the 1994 law than a widely embraced, well-thought-out strategy. Thus, when problems arose, attention focused much more on meeting the quantitative numbers of the mandate rather than using it to spur new crops and new technologies.

The initial requirement for 100 percent biomass fuels (later lowered to 75 percent)

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eliminated from consideration the lowest cost and most flexible process (co-firing with coal). This obstacle, as well as DOE's offer of a significant sum of money for gasification, may have ultimately derailed the MnVAP project. It is interesting to note, in this regard, the University of Minnesota is home to the Agricultural Research Service's largest group of alfalfa breeders.

EPS/Beck's project also may have suffered from the understandable desire by the PUC and other parties to lower its contract price by doubling its size. The project may also have suffered from the inherent timing mismatch of fast growing trees, even those harvested on a 5 year cycle, and the start-up of electricity generation, as well as the reluctance of farmers to plant a long term tree crop that has little or no alternative uses on high-valued farmland in southern Minnesota.

As the table in Appendix A reveals, the biomass mandate has been a very costly initia-

tive to Minnesotans, more specifically those who purchase electricity from Xcel Energy. The price of the biomass contracts are about three times the price of recent wind energy contracts. (This is not strictly comparable because of the higher value of biomass energy that is dispatchable and available virtually all the time. Also, at least in the case of waste wood-fueled projects, no federal incentive is available while the incentive for wind energy as of 2005 is 1.8 cents per kWh. Poultry litter used for biomass energy is eligible for an incentive comparable to that of wind energy).

It is still not too late to redirect the enormous subsidies involved in the biomass mandate. The highest cost contract has yet to be approved. And it may be possible to buy out the contract for the turkey litter incinerator. This would be costly, but not nearly as costly as continuing the high priced contract for the next 21 years.

Appendix A

Biomass Mandate Contract Costs

Project	Avg. Price \$/MWH	Length of Contract (Yrs)
MnVAP	(est.) \$105.00	12
EPS/Beck 25 MW	\$129.83	20
EPS/Beck 50 MW	\$105.37	20
District Energy 25 MW	\$95.25	20
Fibrominn (Original Offer)	\$94.21	21
Fibrominn Final Approved	\$85.97	21
NGPP/Va-Hibbing 35 MW	(est.) \$104.75	20
Wind	(est.) \$30.00	20

Appendix B

Minnesota Biomass Mandate Time Line

- 1994** **May 10, 1994.** Governor signs legislation requiring Northern States Power (NSP) to acquire 50 MW of biomass generated electricity by December 31, 1998 and an additional 75 MW by December 31, 2002. All biomass must come from “farm grown closed-loop biomass”.
- 1995** **January 1995.** NSP issues a Request for Proposals (RFP) for 50 MW of biomass-generated electricity.
- May 25, 1995.** Governor signs legislation that allows 25 MW of the biomass mandate to be “provided by a St. Paul district heating and cooling system cogeneration facility utilizing waste wood as a primary fuel source.”
- September 29, 1995.** NSP presents its short list of biomass power developers to the Public Utilities Commission (PUC) generated by its original RFP. The short list includes: Norstar Power (a partnership between NSP’s subsidiary, NRG Energy and Lindroc Energy), Minnesota Valley Alfalfa Producers (MnVAP), a 250 member farmers cooperative in Granite Falls, MN, and Kenetech. Kenetech subsequently withdraws its proposal prior to the final evaluation. Norstar and EPS then develop a joint project for a 25 MW biomass plant using rapidly growing poplars.
- 1996** **March 7, 1996.** In a petition to the PUC, NSP proposes to reject all bids received from its RFP.
- April 11, 1996.** Governor signs legislation that clarifies the meaning of “closed loop, farm-grown biomass.” Such biomass must be “fired in a new or substantially retrofitted electric generating facility that is...designed to use biomass to meet at least 75 percent of its fuel requirements.”
- June 20, 1996.** PUC orders NSP to select and submit the name of a developer of the first 50 MW of biomass.
- July 12, 1996.** NSP files letter with PUC that it had selected a 75 MW proposal from MnVAP using alfalfa stems as its primary fuel for contract negotiations.
- 1998** **February 17, 1998.** NSP files petition with PUC for approval of a 12-year power purchase agreement (PPA) with MnVAP.
- April 16, 1998.** Izaak Walton League of America (IWLA) asks PUC not to approve MnVAP contract without an environmental review and further testing of its gasification technology.
- December 31, 1998.** Deadline passes for the first 50 MW of the biomass mandate to become operational.
- 1999** **Early 1999.** Enron, which had signed on as a co-developer with MnVAP in 1998, withdraws from the project.
- Spring 1999.** DOE freezes further disbursements from its \$44 million grant to MnVAP for gasification of alfalfa stems.
- April 22, 1999.** PUC approves PPA between Xcel and MnVAP
- August 5, 1999.** PUC defers decision on approving two 25 MW PPAs with EPS/Beck and District Energy. The Department of Commerce asks the PUC to require that EPS/Beck’s project double to a 50 MW plant in order to lower the contract price. NSP notes “that EPS/Beck has stated that it cannot assume the additional risks (of a 50 MW plant) recommended by the Department (of Commerce) and still obtain equity participation or financing.” The PUC encourages EPS/Beck to increase the size of its project to 50 MW and for District Energy to lower its requested purchase price. It also orders NSP to meet with MnVAP to determine the status of that project.

1999**December 9, 1999.** NSP notifies PUC that it has terminated MnVAP's PPA.**December 1999.** MnVAP abandons alfalfa electrification project.**2000****January 11, 2000.** PUC approves a 20-year Power Purchase Agreement (PPA) between NSP and St. Paul Cogeneration for 25 MW, and another between NSP and EPS/Beck for 25 MW. The EPS/Beck project will use a new "whole-tree" combustion technology and fast growing poplars planted on about 25,000 acres near St. Peter, MN and harvested on a five-year cycle. The PUC requests NSP to report back within 5 months on the possibility of increasing the EPS/Beck contract to 50 MW or 75 MW.**April 21, 2000.** Governor signs legislation that allows "no more than 50 megawatts" of the biopower mandate to "be provided by a facility that uses poultry litter as its primary fuel source". The legislation requires NSP to negotiate a PPA with the poultry litter incineration business by September 1, 2000 and the PUC to "approve, modify or disapprove no later than July 1, 2001." The legislation also provides that if the biomass mandate remains unsatisfied by contracts filed with the PUC by September 1, 2000 then a new competitive bidding process should be conducted. In the new process a facility "co-firing biomass with non-biomass" will qualify even if the biomass should be a small portion of the overall fuel. Qualifying biomass for a new competitive bidding process includes "farm-grown closed-loop biomass, agricultural wastes, including animal, poultry and plant wastes, and waste wood, including chipped wood, bark, brush, residue wood and sawdust."**August 21, 2000.** Northern States Power becomes Xcel Energy after a merger between Northern States Power and Denver-based New Century Energies.**September 11, 2000.** PUC approves PPA for the expansion of the EPS/Beck project from 25 MW to 50 MW.**2001****May 8, 2001.** PUC approves a 21 year PPA between Xcel and Fibrominn for 50 MW.**June 20, 2001.** Governor signs legislation that requires Xcel to "accept and consider on an equal basis with other biomass proposals...a proposal for a new facility to satisfy more than ten but not more than 20 megawatts of the electrical generation requirements by a small business-sponsored independent power producer facility to be located with the northern quarter of the state, which means the area located north of Constitutional Route No. 8...and that utilizes biomass residue wood, sawdust, bark, chipped wood or brush to generate electricity." The facility "must" be "operational by December 31, 2002."**2002****February 8, 2002.** The developer of the proposed 10-20 megawatt facility, Itasca Power, requests the PUC to direct Xcel to enter into negotiations.**June 27, 2002.** The PUC decides that no action is warranted on Itasca Power's request.**August 8, 2002.** Fibrominn requests a 10 month extension of the data at which it must either complete the financing of the plant or begin continuous construction, from July 2002 to April 30, 2003. Xcel Energy agrees.**December 31, 2002.** Deadline passes for second 75 MW of biomass power to be operational under the original mandate.**2003****February 12, 2003.** Fibrominn requests an additional 6 month extension from April 30 to October 31, 2003 PUC agrees.**February 27, 2003.** Xcel files proposal with PUC to transfer the PPA contracted with EPS/Beck to NGP Power Corporation. NGPP would fuel a new biomass power plant near Waseca with fast growing willow trees.**May 6, 2003.** Saint Paul Cogeneration Facility, a joint venture between Trigen-Cinergy and Market Street Energy (the latter owned by Saint Paul District Energy) begins generating electricity under its 25 MW contract with Xcel.

2003 **May 25, 2003.** Governor signs legislation that pushes back the date when the 10-20 megawatt facility must become operational. New language requires it to “be under construction by December 31, 2005”.

May 29, 2003. Governor signs legislation containing several major provisions.

- 1) Raises ceiling on the St. Paul district heating and cooling system biomass contract from 25 MW to 33 MW, and the poultry litter firm’s biomass contract from 50 MW to 55 MW.
- 2) Reduces the biomass mandate from 125 MW to 110 MW.
- 3) Requires the PUC to “approve a request” pending before it to allow the EPS/Beck contract to be transferred if the new “developer of the project agrees to reduce the size of its project from 50 megawatts to 35 megawatts, while maintaining a price for energy at or below the current contract price.”
- 4) Changes the Renewable Energy Objectives section that requires all Minnesota utilities to make a good faith effort to increase the amount of renewable electricity they use (the Renewable Energy objective is mandatory for Xcel). The new language expands the definition of an “eligible energy technology” to include “biomass, which includes an energy recovery facility used to capture the heat value of mixed municipal solid waste or refuse-derived fuel from mixed municipal solid waste as a primary fuel”.
- 5) Requires that biomass electricity be “not less than 0.5 percent” of the energy generated under the renewable energy objectives by 2005 and one percent by 2010.
- 6) Requires Xcel “to enter into a power purchase agreement by January 1, 2004 for ten to 20 megawatts of biomass energy and capacity at an all-inclusive price not to exceed \$55 per megawatt-hour...The project must be operational and producing energy by June 30, 2005.”

September 5, 2003. PUC approves extension of “effective date” of Fibrominn PPA to October 31, 2003 and allows Xcel to continue to extend the date.

2004 **January 16, 2004.** Xcel files an amended plan to transfer EPS/Beck’s PPA to NGP, given the new language in the 2003 legislation. NGP Power has been negotiating with the city utilities of Virginia and Hibbing. The result is that cities become owners of NGPP’s project and propose to use fast growing trees and waste wood to fuel existing, refurbished, city boilers.

August 13, 2004. PUC asks the Office of Administrative Hearings to mediate the disagreement regarding a PPA between Itasca Power and Xcel.

October 1, 2004. PUC receives a report from Administrative Law Judge Beverly Jones Heydinger’s on the mediation results. The parties were unable to reach agreement.

November 4, 2004. PUC orders Xcel to file a proposed purchased power agreement with Itasca Power with the Commission by November 30, 2004 and orders Itasca to accept or reject the proposed agreement within 90 days of receiving it. “If Itasca does not notify the Commission of its acceptance or rejection of the proposed agreement within 90 days of receiving it, the Commission will presume that Itasca has rejected it and will close this docket.”

2005 **May 1, 2005.** Neither the Itasca PPA nor the Hibbing-Virginia PPA has been approved by the PUC. Legislation pending to permit the Hibbing-Virginia contract to be satisfied with 25 percent farm-grown biomass.

Notes

1. Minn. Stat. §216B.2424, Sec. 3.
2. This is the additional cost over 20 years for biomass electricity over wind electricity.
3. In 1996 the legislature lowered the 100 percent requirement to 75 percent, still far above the 2-10 percent biomass that would normally be mixed with coal.
4. The organic solid waste includes some textiles and some plastic.
5. On August 21, 2000 Northern States Power formerly became Xcel Energy as a result of a merger between Northern States Power and Denver-based New Century Energies.
6. The legislation required Xcel to acquire an additional 400 MW of wind power if the Public Utilities Commission determined that this was viable under least cost resource planning guidelines. In January 1999 the PUC ruled that the development of 400 MW of wind energy was in the public interest under least-cost planning and resource-planning analysis and must be constructed or contracted by 2012.
7. In 1994 the assumption was that a wind turbine would be generating electricity at its rated capacity about 30 percent of the time while a biomass-fueled power plant would be generating output at its rated capacity about 90 percent of the time. Thus the electricity produced by 400 MW of wind was about the same as that generated by 125 MW of biomass.
8. Minn. Stat. §216B.2424, Sec. 3.
9. The District Energy St. Paul 25 MW system will be 80 percent fueled by waste wood. The 55 MW Fibrominn system will be 100 percent fueled by waste. The proposed Itasca Power project will be 100 percent fueled by waste wood. The proposed Virginia-Hibbing project will be 25 percent fueled by fast growing trees and the rest by waste wood. Neither the Itasca nor the Virginia-Hibbing utilities projects have been approved by the PUC as of late April 2005.
10. These figures are not directly comparable because biomass generated electricity is base load power and is dispatchable and available on demand. Wind generated electricity is not dispatchable although wide area arrays of wind turbines overlap with peak power demands.
11. Each individual exception to the original biomass mandate in terms of the use of wastes contained the following provision, the facility "need not use biomass that complies with the definition in subdivision 1."
12. In 2003 the legislature changed the wording. Rather than having to become operational by December 31, 2002, the facility had to be "under construction by December 31, 2005".