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RECEIVED

October 31, 2001

NOV 01 2001

MIN PUBLIC UTILITIES COMMISSION

Dr. Burl Harr
Secretary
Public Utilities Commission
121 - 7th Place East
St. Paul, MN 55101

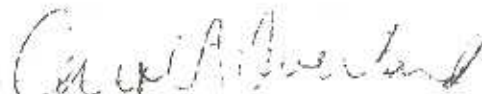
RE: Public Energy, Inc., submission for State Transmission Plan
The Buffalo Ridge Transmission Plan - Category 1 Project

Dear Dr. Harr:

Enclosed for filing please find 15 copies of Public Energy, Inc.'s submission for the State Transmission Plan.

This submission is the product of The Ad Hoc Committee for Dispersed Wind Electricity chaired by David Morris of the Institute for Local Self Reliance. "The Buffalo Ridge Transmission Plan: A Proposal to Maximize Regional Benefits of Wind Energy Exports for Southwestern Minnesota" is proposed as a Category 1 Project under the state's Transmission Plan statute.

Very truly yours,



Carol A. Overland
Co-President



Bill Neuman
Co-President

Public Energy, Inc., is a Minnesota corporation established to engage in general business practices, including to act as a generation or transmission organization to serve local load and/or serve utilities that own or operate electric transmission lines in Minnesota, regionally, and elsewhere; to promote local energy development through energy planning and policy development, utilization of established and emerging renewable technologies; and for promotion and development of broadly dispersed generation.

Summary of Transmission Projects Report

Statutory Compliance with Minn. Stat. §216B.2425, Subd. 2:

- 1) List specific present and reasonably foreseeable future

See The Buffalo Ridge Transmission Plan, p. 2-5, section II.

- 2) Identify alternative means of addressing each inadequacy listed:

This plan provides a flexible approach to address additions of generation incrementally as inadequacies are presented.

- 3) Identify general economic, environmental, and social issues associated with each alternative:

See The Buffalo Ridge Transmission Plan, p. 2-5, section II.

- 4) Provide a summary of public input the utilities and associations have gathered related to the list of inadequacies and the role of local government officials and other interested persons in assisting to develop the list and analyze alternatives.

The Buffalo Ridge Transmission Plan was prepared by an Ad Hoc Committee for Dispersed Wind Electricity, which included representatives and members of public interest groups committed to promotion of dispersed generation, reasonable interconnection, and buildable transmission, that is planned, sited, and which addresses needs and system inadequacies in a way that supports local economies and community access and development.

The concepts presented in the Transmission Plan have grown out of comments at a recent Environmental Quality Board meeting and in numerous discussions with other state agencies and associations and public interest groups.

This plan was reviewed by The Southwest Minnesota Energy Task Force, a group of Commissioners from Cottonwood, Jackson, Lincoln, Lyon, Murray, Nobles, Pipestone, Redwood, Renville, and Rock Counties, which addresses energy development in Southwest Minnesota. This plan was adopted, and as of this writing, discussions have begun with the Department of Commerce regarding the concepts presented in this plan.

The Buffalo Ridge Transmission Plan

A Proposal to Maximize Regional Benefits of Wind Energy Exports from Southwestern Minnesota

I. Statutory Changes Provide Opportunity to Submit Projects for Transmission Plan

Last spring the Minnesota legislature dramatically changed the rules regarding the process for proposing and approving transmission lines.(SF 722). Large generation plants and high voltage transmission lines over a certain length have traditionally required approval through a Certificate of Need(CON) process and the new law would still allow a stand-alone application for a Certificate of Need. However, the new law also requires utilities to submit all high voltage transmission upgrades over a certain length that are planned or proposed to be built within 10 years to the Public Utilities Commission(hereinafter "PUC") by November 1, 2001 and through this new process, a project may also receive approval in lieu of a Certificate of Need.

This new process has several objectives. One is to accelerate the certification process. Another is to allow policy makers the benefit of a ten year plan, the same planning horizon as is used by industry, and thus better understand how one transmission project relates to other transmission and generation proposals. A third is to establish priorities for transmission projects. Category I projects are those projects of immediate urgency for which the utility seeks certification by June 1, 2002. By June 2002, the PUC shall make a decision on the certification of all Category I projects. Category II projects have a time frame of 3-5 years and Category III projects have a time frame of 10 years.

In late summer 2001, the Attorney General's office, the Environmental Quality Board staff and the Department of Commerce Energy staff, in consultation with the Minnesota Transmission Owners and the Izaak Walton League issued a three page document, *Interim Guidelines--Minnesota Transmission Plan*. These Interim Guidelines were brought before the PUC in October, 2001, but the Commission did not act on the Guidelines. The Commission will further consider rulemaking. In addition, they have established an Advisory Committee to make a recommendation to the Commission by January 15, 2002..

Neither the legislation nor the interim guidelines prohibits parties other than utilities from submitting their own proposals regarding transmission line improvements. The southwest Minnesota region has a special interest in submission of a transmission proposal because it has abundant wind energy available and proposed for market. The region also has an interest in a transmission plan because the law requires the Commission to focus on the relationship of the proposed project to local Minnesota needs. The amended statute reads, "The commission may only certify a project...that the commission finds is: 1)necessary to maintain or enhance the reliability of electric service to Minnesota consumers".

In evaluating transmission proposals, the Public Utilities Commission is directed that it "may certify a Category I project only if the Commission finds all of the following". That includes a finding that the project

is "in the public interest "taking into account" economic, environmental and social interests affected by the Project".¹

II. There Is A Specific Need for Wind Transmission in the Region

There is an identified need for transmission capacity in the Buffalo Ridge region to transmit wind energy to market. Xcel identified and studied several options. This plan is an outgrowth of one option found to be a viable alternative. The studies and reports supporting Xcel's determinations are attached. This plan best addresses the issues of scale, size, timing, and type that are factors in a Certificate of Need statutory determination through the incremental nature of transmission additions and upgrades, provides local benefits, is intended to serve a Minnesota market, is a "buildable project," and as such embodies the best means of reaching the goals of the plan to move wind off Buffalo Ridge, the statutory planning scheme, and the state's new Transmission Plan.

The Buffalo Ridge Transmission Plan fills a need not addressed by any other transmission plan. As submitted here, it embodies the public interest as defined by elected bodies in southwest Minnesota who as representatives are best able to assess the need of their constituents. Because of the emphasis on wind generation and energy issues in the area, they are also uniquely equipped to make energy assessments. Local governments have been instrumental in the encouragement of proposals, development of wind generation, and recognition and promotion of wind as a community resource. Although there have been some transmission improvements and the area does have sufficient transmission capacity to handle current generation levels, the area transmission system does not have sufficient capacity to handle the mandated 425 MW of additional wind capacity, much less capture a large percentage of wind potential.

As of October 23rd, XCEL's proposal for new transmission capacity in the southwest area has as its preferred Category I option a 345 kV line from Split Rock to Lakefield Junction along with other upgrades.² However, Xcel's proposal does not meet the area's particularized need for incremental additions of wind transmission nor does it address the incongruity of the proposal with the timeline of wind development.

A. This plan facilitates incremental growth and eliminates and mitigates common objections to transmission projects.

This plan recognizes the need to quickly facilitate expansion of transmission and subtransmission capacity to enable a rapid yet incremental expansion in wind electric exports, yet it also recognizes that different transmission configurations can have a very different economic and social impact on the region. Wind projects are typically developed in separate projects of smaller capacity than a typical baseload generating plant. Wind projects are also typically developed in separate physical locations. This plan serves the area by collecting electricity generated in these dispersed locations. It leaves a smaller footprint than typical high voltage transmission lines and will have lower land acquisition costs. Because this plan promotes tie-in of wind generation on adjacent properties, there is economic incentive to landowners to support the plan

¹ The Commission may certify a Category I Project only if the Commission finds all of the following: a)The Project is necessary to maintain or enhance the reliability of electric service to Minnesota consumers; and b) The Project is needed, applying the criteria in Minnesota statutes section 2165B.243.subd.3; and c) the Project is in the public interest, taking into account electric energy system needs and economic, environmental and social interests affected by the Project.

² Southwest Minnesota/Southeast South Dakota Electric Transmission Study. Phase 1. Transmission Outlet Analysis for Southwest Minnesota(Buffalo Ridge Area) Generation Additions. (0-400 MW beyond initial 425 MW). August 17, 2001. Draft.

and because it is lower voltage than a typical transmission line, there is less danger from electrical effects and environmental impact and hence mitigate opposition to the line. As a low voltage alternative, this line would do the same job as a higher voltage line, but it will cost significantly less.

B. This plan addresses the immediacy of the need for increased transmission capacity.

The Buffalo Ridge Transmission Plan falls within the time frame for a Category I project. The interim guidelines indicate that a Category I project is of immediate urgency and thus needs an immediate go-ahead. The areas' needs can best be met with lower voltage lines that can be constructed quickly as needed. Much of option 3 is reconductoring and rebuild, as opposed to new construction. A 345 kV line such as that proposed by Xcel may take 1-3 years longer to build than a lower voltage line, and realistically, such a line would not be operational before 2006, long after a need for incremental improvements is necessary. This plan could result in an operational system addition within two years or less.

C. This plan addresses rural economic considerations and provides benefits the local landowners through promotion and facilitation of wind generation.

The Buffalo Ridge Transmission Plan will encourage the development of wind resources by local landowners. This is both an economic benefit to the community and a compliance and promotion of state policy toward small wind generators and developers. To connect to a high voltage line such as the 345 kV line would cost tens of millions of dollars, far beyond the reach of anyone but for the very largest wind farms. On the other hand, a lower voltage network, as proposed in this plan, would allow for access to the transmission system by local landowners with modest amounts of wind electric generating capacity at a cost of approximately \$20,000.00. The difference between interconnection costs of twenty thousand dollars compared with millions of dollars is a distinct advantage in promotion. Significantly lower interconnection costs are also in keeping with the spirit of state policy which encourages dispersed wind generation as evidenced by the state producer incentive that is provided only to wind electric facilities of 2 MW and less. It is evidenced also in that, for the first time, the state legislature in 2001 required that utilities proposing transmission upgrades should look at "distributed generation" as an alternative.

D. This plan addresses specific wind needs and distributed generation needs.

The Buffalo Ridge Transmission Plan will encourage development of wind generation because it can accommodate development incrementally. Typically, as an intermittent source of power, wind electricity's access to transmission capacity is less likely and more costly than coal fired electricity's access. As XCEL notes in its Study(p. 21), while there are about 600 MW of wind proposed in the several state area around southwest Minnesota, there are some 2200-3000 MW of coal where "development or feasibility studies have been publicly announced...In addition....other generation siting studies are known to be under way by various independent power producers." When taking capacity factors into account, the proposed or planned coal plants could generate 13 times more electricity per year than the proposed or planned wind plants. The coal generation is proposed, the wind generation mandated by the legislature is not specifically proposed and XCEL has been granted an extension until 2012 to develop this wind generation. Nothing is specifically planned. XCEL's proposal contains no guarantee that wind would or could be given a preferred status for transmission access which is an important consideration given the timing of planned construction of coal generation versus wind generation and it is therefore unreasonable to claim that the Xcel proposal is for wind. The Buffalo Ridge Transmission Plan provides for the incremental need of the

area for wind transmission yet does so in a way that assures wind does get on the line and that the purpose of the line is for wind.

E. This plan provides a favorable cost benefit analysis for the area.

XCEL does not serve retail customers in southwest Minnesota, but the target market for this wind capacity is the Minneapolis/St. Paul metropolitan area. The 345 kV line proposed by XCEL is a superhighway that cuts through the area but which is not intended to serve local load or provide local benefit it would benefit the area only to the extent that wind generation could access the transmission at great cost and at a questionable capacity for which there is no guarantee – hence there is no quantifiable benefit to the area. The Buffalo Ridge Wind Transmission Project takes a different approach, one that maximizes the benefits to those who bear the costs of the project and those who receive the benefits from the Project, those adjacent to the line and local units of government. Xcel's analysis found that the cost of this option was higher at the outset but as the incremental benefit of increased output capacity increased, the cost difference declined. Option 3 was not the least cost option, but it is competitive and after 200 MW of capacity is installed, it becomes the second least cost option.

F. This plan provides "buildability" benefits in its simplicity of design and accessibility to the community.

The primary benefits of the project are due to the simplicity of design. This project relies on the construction of additional lower voltage lines (161/115 kV) with a capacity in character with the low voltage and include a 34.5 kV line underbuilt on the same poles. This would achieve several objectives:

First, it would provide sufficient expanded transmission capacity to allow for an additional 400-600 MW of wind electricity to be exported from southwestern Minnesota and it would do so in an expedited manner. Thus it can realistically be evaluated as a Category I project.

Second, in comparison with any other option, this plan would maximize the number of farmers and other landowners with an interest in the transmission line, and a greater percentage of landowners of the land area of southwest Minnesota would have low cost access to the transmission system. Because a greater number of landowners are involved, there will also be a much higher rate of buy-in to the line and less opposition, which increases costs.

Third, the transmission line, because it is a low voltage line, will leave a smaller footprint, requiring a smaller corridor and creating less environmental impact.

Fourth, the transmission capacity will largely be filled by wind generated electricity. This is because the line is not overbuilt at the outset, and usurped by coal generation, but is instead built as needed, making lower voltage lines be unattractive to large coal fired central power plants. That means that transmission capacity can be more nearly equated with wind transmission capacity. It also means that most of the costs of the transmission lines will be spread out over all the ratepayers and not imposed on the wind producers, again enabling dispersed wind generation. According to Minnesota Statutes, Section 216B.1645, the ratepayers can be asked to pay for investments made by a utility to satisfy the wind

mandate, including investments in transmission capacity. However, this only applies to the portion of transmission costs needed to "transmit power from renewable sources of energy".³

Fifth, as a result of achieving the first four objectives, the lower voltage, more extensive network proposed here would maximize the economic benefit to the region from its wind resources. In addition, for all of the reasons above, the cost of the transmission line as proposed would be far less than a higher voltage alternative.

III. Buffalo Ridge Wind Transmission Proposal

This plan builds on XCEL's Option 3 proposal which establishes three new 115 or 161 kV outlet lines from Buffalo Ridge (See p. 6ff). It includes a 34.5 kV "underbuild", that is a 34.5 kV line attached to the 115 or 161 kV poles beneath the present lines and in compliance with clearance requirements of NESC. The design of the proposal results in significantly lower reactive power requirements than found in the other plans. The line losses attributed to this proposal is less than two of the options presented, the lowest losses of any option during peak load conditions, and represents reasonable levels of line loss for the transfer capacity provided.

This plan is a web of low voltage lines designed to have a lesser environmental impact and lower cost than a single high voltage transmission line. The capacity of the lines are also lower and in keeping with the character of the low voltage lines. The cost is reasonable in comparison with the other options and it provides concrete benefits to the area it traverses.

- 115 kV line from Buffalo Ridge to Yankee-18.2 miles
- 115 kV double circuit line from Yankee to White-12.4 miles
- 115 kV line from Chanarambie to Fenton-19.2 miles
- 115 kV line from Lyon County to Franklin-40 miles
- 161 kV line from Fenton to Heron Lake-30 miles
- 34.5 kV underbuild on all of these lines-109.8 miles.

20 miles of reconductor of Heron Lk to Lakefield Jct 161 kV
50 miles of reconductor of Lakefield Jct to Fox Lake
Fox Lake to Rutland and Spencer to Tribli
New Fenton substation
New Yankee substation

³ Minnesota Statutes, Section 216B.1645. [POWER PURCHASE CONTRACT OR INVESTMENT.] Upon the petition of a public utility, the public utilities commission shall approve or disapprove power purchase contracts, investments, or expenditures entered into or made by the utility to satisfy the wind and biomass mandates contained in sections 216B.2423 and, 216B.2424, and 216B.169, including reasonable investments and expenditures made to transmit the electricity generated from sources developed under those sections that is ultimately used to provide service to the utility's retail customers... Upon petition by a public utility, the commission shall approve or approve as modified a rate schedule providing for the automatic adjustment of charges to recover the expenses or costs approved by the commission, which, in the case of transmission expenditures, are limited to the portion of actual transmission costs that are directly allocable to the need to transmit power from the renewable sources of energy. The commission may not approve recovery of the costs for that portion of the power generated from sources governed by this section that the utility sells into the wholesale market. (Underlinings added)

Substation work at Heron Lk
Substation work at Lakefield Jct
115 kV line termination at Franklin
115 kV line termination at Lyon
Substation work at Buffalo Ridge
Substation work at White
Add 160.15 kV trx at Fenton

Upgrades:

Reconductor 3 miles of 69 kV line from Jeff to Wooster
Reconductor 0.5 miles of 69 kV line from Oglvie tap to Common junction
Capacitor bank at Tribolji 161 kV bus

Infrastructure to mitigate flow on Fort Calhoun south interface for PTFD for
generation addition with new lines already in: 80 series compensation on 345 kV line
from Martin County to Wilmarth

The cost of constructing Option 3, according to XCEL, is \$83 million, taking into account line losses, compared to \$86 million for the 345 kV line. The addition of a 34.5 kV underbuild would be about \$4 million for a total of about \$87 million.⁴

⁴ Based on a 3 phase underbuild cost of \$36,600 a mile, as estimated by Minnesota Power in its Arrowhead transmission project proposal. Costs, Appendix B, Volume II.

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JAN 04 2002

MN PUBLIC UTILITIES COMMISSION

December 31, 2001

Dr. Burl Harr
Secretary
Public Utilities Commission
121 - 7th Place East
St. Paul, MN 55101

RE: Rough Cost Estimates
Public Energy, Inc., submission for State Transmission Plan
The Buffalo Ridge Transmission Plan - Category 1 Project

Dear Dr. Harr:

Enclosed for filing please find 15 copies of the Cost Estimate Addendum to Public Energy, Inc.'s Buffalo Ridge Transmission Plan submission for certification under the State Transmission Plan. By copy of this letter, the Service List has been served.

Public Energy, Inc., is taking steps to secure funding for engineering work. At this time, I am presenting the estimates that I have prepared based on extrapolation of information contained in legal documents from other transmission line cases I have worked on. This Cost Estimate is intended as a more detailed explanation of the Plan and we are using it as a basis for securing estimates for the engineering work we need, but I believe it would also be useful to the Commission to flesh out the Plan as submitted.

The most important pieces missing from this estimate are substation modifications, specifically the 34.5/115 or 34.5 161 kV transformers and associated equipment necessary to support the 34.5 underbuild and integrate it into the grid. This will be produced after we secure our engineering funding.

Because the project is not one line, but is instead three lines broken into five segments, the cost estimates are presented individually for the five segments. Each segment has a detailed itemization, and then as a check, two estimates based on Xcel figures from the Chisago project and from the Sioux Falls to Lakefield Jct. "Study." The results are comparable.

Public Energy, Inc., is a Minnesota corporation established to engage in general business practices, including to act as a generation or transmission organization to serve local load and/or serve utilities that own or operate electric transmission lines in Minnesota, regionally, and elsewhere; to promote local energy development through energy planning and policy development, utilization of established and emerging renewable technologies; and for promotion and development of broadly dispersed generation.

The first page of the Cost Estimate first shows "Segment Totals," a summary of the individual cost estimates to compare the Public Energy estimate against two professional estimates on the record in various public proceedings. Next is "Something Else to Look At" which sets out the Option 1 and Option 3 costs claimed by Xcel in the narrative part of the SW MN/SE SD study against the costs of Appendix C for the base plan and total. Next is an expansion of Table 1 (SW MN/SE SD study, p. 7) comparing the data in Table 1 with that found in Appendix C. The numbers provided by Xcel are not consistent.

Moving next to the Segment Cost Estimates, for each Segment, costs are itemized showing the estimated quantity, unit, individual cost, and total costs. This data was extrapolated from the cost estimates from the Arrowhead-Weston transmission line application (selected pages attached), which provides the most specific cost data of the transmission projects I have worked on. The resulting approximation was then increased for the CPI increase (taken from Xcel Costs, Chisago Economics.xls, Per Unit Costs, 9/14/01, attached) over the two years since the A-W Application. Because this itemized estimate is based on Arrowhead-Weston assumptions, it is a high estimate, as construction of a transmission line in the wooded terrain of northern Wisconsin is much more difficult than construction in the open plains of Buffalo Ridge.

The next cost estimate, located directly below each itemized estimate, is taken from Xcel's Chisago project cost estimates, which gives a base estimate for single circuit and double circuit 115 kV and single circuit 161 kV transmission lines. To this estimate, I have added the costs of the 34.5 underbuild as estimate in the initial itemized estimate.

The third cost estimate is taken directly from Xcel's SW MN/SE SD "Study." There are mileage discrepancies between the mileage proposed by Xcel in the list accompanying the maps provided by Xcel and those found Appendix C. These discrepancies are noted.

After the cost estimates, on pages 7-8, is a listing of inconsistencies in Xcel's SW MN/SE SD study that must be addressed. The Option 3 upon which the Buffalo Ridge Transmission Plan is based is described in Xcel documents in "Concept 3" list accompanying the maps, and this is listed at the top of page 7. The project is also defined by Xcel in Appendix C, and that is listed at the bottom of page 7. Both are cross referenced to highlight the items found in one project that are not found in the other. Page 8 lists the upgrades and costs not accounted for in both of the project lists, sorted in two sections, those from "Concept 3" list and those of Appendix C not accounted for in Concept 3 list. It appears that \$32,575,000 in upgrades has not been considered by Xcel in its cost accounting for the options.

If you have any questions about this information, do not hesitate to call or write.

Very truly yours,



Carol A. Overland
Co-President

SEGMENT TOTALS

Segment Number	Public Energy Estimate	Xcel Estimate, Undrblid	Xcel, App. C, Undrblid
Segment 1	4,597,872	5,264,600	add 1+2 for comparison
Segment 2	4,415,052	5,940,800	9,400,000
Segment 3	5,101,480	6,165,600	add 3+5 for comparison
Segment 4	10,763,781	11,564,600	14,284,600
Segment 5	9,249,899	9,633,600	13,634,400
TOTALS:	29,988,984	38,569,200	37,319,000

Segment Totals:	29,988,984	38,569,200	37,319,000
Necessary Upgrades:	32,575,000	32,575,000	32,575,000
More App. C Costs:	?	?	?

SOMETHING ELSE TO LOOK AT

Source	Option 1	Option 3
Narrative		
Appendix C – Base Plan	64,300	49,490
Appendix C – Total	161,150	159,868

Table 1 (p. 7) + App. C Costs

Can any Option provide benefits if entire App. C list of upgrades is not built?
 Where do "Base Plan" figures in Table 1 come from – different than App. C Costs.
 Why is Evaluated Cost different than Total Cost in App. C Costs?
 Total for Options in last column is the Total provided in App. C.

#	Description	Base Plan	App. C Base	Omaha Fix	App. C Omaha	Other Fixes	App. C Fixes	Evaluated Cost	Total App.C
1	Split Rock-Lakefield 345	78	64.30	8	5.85	0	96.5	86	161.2
3	115 & 161 kV	65	49.49	4	5.85	1	110.4	83	159.9

Segment 1 – 115 kV line from Buffalo Ridge to Yankee – 18.2 miles
 115 Single Circuit Single steel Pole – direct burial
 18.2 miles (96,096 ft.), 650' ruling span*

Description of Item	Qty	Unit	Estimate	TOTALS
115kV SC steel pole tangent	115	ea.	8,300	954,000
115kV SC steel pole 1-7°	17	ea.	9,900	168,300
115kV SC steel pole 7-50°	7	ea.	12,400	86,800
115kV SC steel pole 50-90°	9	ea.	18,500	116,500
Counterpoise wire – ground**	1500	ft.	3	4,500
795 KCM ACSR 26/7 -3 wires	18.2	mi.	43,200	786,240
3/2" EHS shieldwire – one (?)	18.2	mi.	4,700	85,540
43' ROW parallel road	18.2	mi.	25,400	462,280
Clear ROW	94.86	acre	3,200	303,552
Engineering	18.2	mi	19,300	351,260
Underbuild 3-phase***	18.2	mi.	36,000	655,200
Underbuild intermediate poles†	480	ea.	800	384,000
			Subtotal:	4,358,172
CPI since A-W (2000-2001) ‡	5.5%			+ 239,700
			TOTAL:	4,597,872

- * Assumes 78% Steel pole tangent, 11% 1-7°, 5% 7-50°, 6% 50-90° (A-W Application, Vol.II, B1-41)
- ** 64
- *** Average of underbuild costs (A-W Application, Vol. II)
- † Assumes q 200', per A-W, may be overestimate
- ‡ 2.75% annual cost escalation (Xcel Costs, Chisago Economics.xls, Per Unit Costs, 9/14/2001)

Xcel Cost Estimate (Chisago Economics.xls, Per Unit Costs, 9/14/01):

Single Circuit, Wood Pole, Rural 115kV 795A	\$232,000 mi. 2001 dollars
	<u> x 18.2</u>
	4,222,400
	<u>1,042,200 Underbuild</u>
Xcel Total:	5,264,600

Xcel Cost Estimate (App. C) Plus Underbuild

(see Segment 2 – Appendix C combines these together. Listed as 26 miles, not 30.6 total)

Segment 2 – 115 kV Double Circuit Yankee to White – 12.4 miles

115 Double Circuit Single steel Pole – direct burial

12.4 miles (65,472 ft.), 650' ruling span*

Description of Item	Qty	Unit	Estimate	TOTALS
115kV SC steel pole tangent	78	ea.	13,800	1,076,400
115kV SC steel pole 1-10° (requires foundation)	11	ea.	26,500	291,500
115kV SC steel pole 10-50° (requires foundation)	5	ea.	47,200	236,000
115kV SC steel pole 50-90° (requires foundation)	6	ea.	75,700	454,200
Counterpoise wire – ground**	1,023	ft.	3	3,069
795 KCM ACSR 26/7 -6 wires	12.4	mi.	78,500	973,400
3/2" EHS shieldwire – one (?)	12.4	mi.	4,700	58,280
43' ROW parallel road	12.4	mi.	25,400	314,960
Clear ROW	64.63	acre	3,200	206,816
Engineering	12.4	mi.	19,300	239,320
Engineering - Foundations	22	ea.	1,100	24,200
Underbuild 3-phase***	12.4	mi.	36,000	446,400
Underbuild intermediate poles†	327	ea.	800	261,600
			Subtotal:	4,186,145
CPI since A-W (2000-2001) ‡	5.5%			+ 228,907
			TOTAL:	4,415,052

* Assumes 78% Steel pole tangent, 11% 1-7°, 5% 7-50°, 6% 50-90° (A-W Application, Vol.II, B1-41)

** 64

*** Average of underbuild costs (A-W Application, Vol. II)

† Assumes q 200', per A-W, may be overestimate

‡ 2.75% annual cost escalation (Xcel Costs, Chisago Economics.xls, Per Unit Costs, 9/14/2001)

Xcel Cost Estimate (Chisago Economics.xls, Per Unit Costs, 9/14/2001) :

Double Circuit, Wood Pole, Rural 115kV 795A	\$422,000 mi. 2001 dollars
	x 12.4
	5,232,800
	708,000 Underbuild
Xcel Total:	5,940,800

Xcel Cost Estimate (App. C) Plus Underbuild 1 + 2 App. C, 26 mi., not 30.6

Build BRI – White 115 kV	26 mi.	250,000/mi	6,500,000 + 1,750,500 = 8,250,200
	30.6 mi.	"	7,650,000 + 1,750,500 = 9,400,000

Segment 3 – 161kV from Chanarambie to Fenton – 19.2 miles

161 Single Circuit Single steel pole – direct burial
19.2 miles (101,376 ft.), 650' ruling span*

Description of Item	Qty	Unit	Estimate	TOTALS
161kV SC steel pole tangent	122	ea.	8,700	1,076,400
161kV SC steel pole 1-7°	17	ea.	10,400	291,500
161kV SC steel pole 7-50°	8	ea.	13,000	104,000
161kV SC steel pole 50-90° (requires foundation)	9	ea.	40,200	454,200
Counterpoise wire – ground**	2,209	ft.	3	3,069
795 KCM ACSR 26/7 -6 wires	19.2	mi.	78,500	973,400
3/2" EHS shieldwire – one (?)	19.2	mi.	4,700	58,280
43' ROW parallel road	19.2	mi.	25,400	314,960
Clear ROW	100.07	acre	3,200	206,816
Engineering	19.2	mi.	19,300	239,320
Engineering – Foundations	9	ea.	1,100	9,900
Underbuild 3-phase***	19.2	mi.	36,000	691,200
Underbuild intermediate poles†	507	ea.	800	405,600
			Subtotal:	4,828,645
CPI since A-W (2000-2001) ‡	5.5%			+ 272,835
			TOTAL:	5,101,480

* Assumes 78% Steel pole tangent, 11% 1-7°, 5% 7-50°, 6% 50-90° (A-W Application, Vol.II, B1-41)

** 64

*** Average of underbuild costs (A-W Application, Vol. II)

† Assumes q 200', per A-W, may be overestimate

‡ 2.75% annual cost escalation (Xcel Costs, Chisago Economics.xls, Per Unit Costs, 9/14/2001)

Xcel Cost Estimate (Chisago Economics.xls, Per Unit Costs, 9/14/2001) :

Single Circuit, Wood Pole, Rural 161kV 795A	\$264,000 mi.	2001 dollars
	x 19.2	
	5,068,800	
	1,096,800	Underbuild
Xcel Total:	6,165,600	

Xcel Cost Estimate (App. C) Plus Underbuild

(see Segment 5 – Appendix C combines these together. Listed as 52 miles, not 49.2 total)

Segment 4 – 115 kV line from Lyon County to Franklin – 40 miles
 115 Single Circuit Single steel Pole – direct burial
 40 miles (211,200 ft.), 650' ruling span*

Description of Item	Qty	Unit	Estimate	TOTALS
115kV SC steel pole tangent	254	ea.	8,300	2,108,200
115kV SC steel pole 1-7°	36	ea.	9,900	356,400
115kV SC steel pole 7-50°	16	ea.	12,400	198,400
115kV SC steel pole 50-90°	20	ea.	18,500	370,000
Counterpoise wire – ground**	3,300	ft.	3	9,900
795 KCM ACSR 26/7 -3 wires	40	mi.	43,200	1,728,000
3/2" EHS shieldwire – one (?)	40	mi.	4,700	188,000
43' ROW parallel road	40	mi.	25,400	1,016,000
Clear ROW	208	acre	3,200	665,600
Engineering	40	mi.	19,300	772,000
Underbuild 3-phase***	40	mi.	36,000	1,440,000
Underbuild intermediate poles†	1,056	ea.	800	844,600
			Subtotal:	9,697,100
CPI since A-W (2000-2001) ‡	5.5%			+ 533,340
			TOTAL:	10,763,781

- * Assumes 78% Steel pole tangent, 11% 1-7°, 5% 7-50°, 6% 50-90° (A-W Application, Vol.II, B1-41)
- ** 64
- *** Average of underbuild costs (A-W Application, Vol. II)
- † Assumes q 200', per A-W, may be overestimate
- ‡ 2.75% annual cost escalation (Xcel Costs, Chisago Economics.xls, Per Unit Costs, 9/14/2001)

Xcel Cost Estimate (Chisago Economics.xls, Per Unit Costs, 9/14/2001) :

Single Circuit, Wood Pole, Rural 115kV 795A	\$232,000 mi. 2001 dollars
	x 40
	9,280,000
	2,284,600 Underbuild
Xcel Total:	11,564,600

Xcel Cost Estimate (App. C) Plus Underbuild App. C lists at 44 mi, not 40

Build Lyon Co.-Franklin 115 kV	44 mi.	300,000 mi.	13,200,000 + 2,284,600 = 15,484,600
	40 mi	"	12,000,000 + 2,284,600 = 14,284,600

Segment 5 – 161kV from Fenton to Heron Lake – 30 miles

161 Single Circuit Single steel pole – direct burial

30 miles (158,400 ft.), 650' ruling span*

Description of Item	Qty	Unit	Estimate	TOTALS
161kV SC steel pole tangent	190	ea.	8,700	1,653,000
161kV SC steel pole 1-7°	27	ea.	10,400	280,800
161kV SC steel pole 7-50°	12	ea.	13,000	156,000
161kV SC steel pole 50-90° (requires foundation)	15	ea.	40,200	603,000
Counterpoise wire – ground**	2,475	ft.	3	7,425
795 KCM ACSR 26/7 -6 wires	30	mi.	78,500	2,355,000
3/2" EHS shieldwire – one (?)	30	mi.	4,700	141,000
43' ROW parallel road	30	mi.	25,400	762,000
Clear ROW	156.36	acre	3,200	500,352
Engineering	30	mi.	19,300	579,000
Engineering – Foundations	15	ea.	1,100	16,500
Underbuild 3-phase***	30	mi.	36,000	1,080,000
Underbuild intermediate poles†	792	ea.	800	633,600
			Subtotal:	8,767,677
CPI since A-W (2000-2001) ‡	5.5%			+ 482,222
			TOTAL:	9,249,899

* Assumes 78% Steel pole tangent, 11% 1-7°, 5% 7-50°, 6% 50-90° (A-W Application, Vol.II, B1-41)

** 64

*** Average of underbuild costs (A-W Application, Vol. II)

† Assumes q 200', per A-W, may be overestimate

‡ 2.75% annual cost escalation (Xcel Costs, Chisago Economics.xls, Per Unit Costs, 9/14/2001)

Xcel Cost Estimate (Chisago Economics.xls, Per Unit Costs, 9/14/2001) :

Single Circuit, Wood Pole, Rural 161kV 795A	\$264,000 mi. 2001 dollars
	x 30
	7,920,000
	1,713,600 Underbuild
Xcel Total:	9,633,600

Xcel Cost Estimate (App. C) Plus Underbuild 3+5 App. C, 52 mi., not 49.2

CHB – Heron Lk 161 kV	52 mi.	220,000 mi.	11,440,000 + 2,810,400 = 14,250,400
	49.2	*	10,824,000 + 2,810,400 = 13,634,400

Project as defined in handout with maps

Segments 1- 5 plus Associated Upgrades (* denotes appears to be on App. C list below):

20 miles of reconductor of Heron Lake to Lakefield Jct. 161kV *

50 miles of reconductor of Lakefield Jct. to Fox Lake *

Fox Lke to Rutland and Spencer to Tribolji ** not listed in base plan, but on cost sheet

New Fenton substation

New Yankee substation

Substation work at Heron Lake *

Substation work at Lakefield Jct.

115 kV line termination at Franklin *

115 kV line termination at Lyon *

Substation work at Buffalo Ridge *

Substation work at White *

Add 161/115 kV trx at Fenton * (CHB?)

Other Upgrades:

Reconductor 3 miles of 69 kV line from Jeff to Wooster

Reconductor 0.5 miles of 69 kV line from Oglvie tap to Common Junction

Capacitor bank at Tribolji 161 kV bus

Infrastructure to mitigate flow on Fort Calhoun South Interface for PTFD for generation addition with new lines in (5.6% to 5.0%): 80 series compensation on 345 kV line from Martin County to Wilmarth (different from Omaha fix below?)

Project as defined in Appendix C, Option 3 "115 & 161 kV"

Segments 1-5 plus (* denotes project appears to be on list above):

Build Troy 69 kV SS

Franklin 115 kV ring bus *

Lyon Co. 115 kV line term *

BRI ring bus

White line term *

CHB 115/161 tx & line term * (Fenton?)

Heron Lk line term *

Omaha fix (different from "Infrastructure to mitigate" above?)

Other upgrades in base plan of Appendix C:

Willmar 115/69 tx replacement

Wilmarth Martin Co. upgrade to 100C

Minn Valley 230/115 tx from 100 to 187 MVA

Lakefield Fox Lake rebuild *

Alexandria Douglas Co. reconductor

Franklin Birch rebuild as double circuit 115/69

Henry Birch rebuild as double circuit

Summit Dome reconductor

Elbow Lake Grant Co reconductor

Willmar Kerkhoven reconductor

Dome Loon Tp reconductor

Paynesville Wakefield reconductor

Madelia J Hanska T reconductor

Brandon Elbow Lake reconductor

Heron Lake Lakefield rebuild *

Add CHB-LAY-CYC 115 kV

Fox Lake Rutland rebuild *

Upgrades not accounted for in both lists of scope of project

These missing items are important because if they are necessary for the project to provide claimed benefits, they must be counted in the cost of the project. This applies not only to Xcel's Option 3 but to ALL projects.

From Concept 3 map list not shown on App. 3 Option 3 list:

Spencer to Tribolji	4,840,000
Add 115 kV shunt caps	1,600,000
New Fenton substation (comparative substation costs: Chisago 9,400,000;	9,000,000
New Yankee substation Lawrence Creek 10,300,000; Hwy 70 7,651,000)	9,000,000
Substation work at Lakefield Jct.	

Other Upgrades:

Reconductor 3 miles of 69 kV line from Jeff to Wooster	900,000
Reconductor 0.5 miles of 69 kV line from Oglvie tap to Common Junction	150,000
Capacitor bank at Tribolji 161 kV bus (based on Barron 4x30 MVAR capacitors)	<u>2,200,000</u>
SUBTOTAL:	27,690,000

Upgrades in base plan of Appendix C not accounted for in Concept 3 map list:

<u>Description</u>	<u>Cost Estimate</u>
Willmar 115/69 tx replacement	1,200,000
Wilmarth Martin Co. upgrade to 100C	1,000,000
Minn Valley 230/115 tx from 100 to 187 MVA	1,500,000
Alexandria Douglas Co. reconductor	1,045,000
Franklin Birch rebuild as double circuit 115/69	930,000
Henry Birch rebuild as double circuit	1,770,000
Summit Dome reconductor	266,000
Elbow Lake Grant Co reconductor	342,000
Willmar Kerkhoven reconductor	1,397,000
Dome Loon Tp reconductor	2,100,000
Paynesville Wakefield reconductor	1,425,000
Madelia J Hanska T reconductor	333,000
Brandon Elbow Lake reconductor	<u>1,577,000</u>
SUBTOTAL:	4,885,000
TOTAL NECESSARY "PLAN" UPGRADES UNACCOUNTED FOR:	32,575,000

Basic construction costs included above (estimates)

ROW – Easements

43'	ROW parallel road	\$25,400/mile
91'	ROW parallel road	37,000/mile
120'	ROW new	44,000/mile
150'	ROW new	51,400/mile
	ROW Clearing	\$ 3,200/acre

Structures & Foundations (650 ft. Ruling Span)

161 kV steel (direct burial)	\$ 8,700/each
161 kV steel (1-7)	10,400/each
161 kV steel (7-50)	13,200/each
161 kV steel (50-90) (foundation)	40,200/each

Structures & Foundations (450 ft. Ruling Span)

115/115 kV (direct burial)	13,800/each
115/115 kV (1-10 foundation)	26,500/each
115/115 kV (10-50 foundation)	47,200/each
115/115 kV (50-90 foundation)	75,700/each
115 kV (direct burial)	2,900/each
115 kV (1-7)	3,500/each
115 kV (7-50)	4,900/each
115 kV (50-90) (foundation)	14,400/each

Conductor

795 KCM ACSR 26/7 (3 wires)	\$43,200/mile
795 KCM ACSR 26/7 (6 wires)	78,500/mile

Communication

48 Fiber OPGW shieldwire (96 Fiber = 2 shieldwires)	\$26,200/mile
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Underbuild

3 phase underbuild	\$36,000/mile
Intermediate poles – wood	800/each

Estimated Engineering Costs

115/161 kV line & underbuild	
Rough & cost estimates	
Final engineering	\$ 3,000/mi

Removal & Salvage

Wood pole line removal	\$11,000/mi
Material salvaged (conductor @\$.25/lb)	(\$ 3,000/mi)