Grain Belt Express Exhibit 2.1

Cost Comparisons of 4000 MW Transmission Links

Series compensation used to load each circuit 2 x SIL

*May not meet N-1 Requirements

Alternative			345 kV AC Six Single Circuits	345 kV AC Three Double Circuits	500 kV AC Three Single Circuits	500 kV AC One Single Circuit + Double Circuit	765 kV AC One Single Circuit	± 600 kV One HVDC Multi-terminal Bipole
Capital Cost								
Line voltage (kV)			345	345	500	500	765	600
Rated Power (MW)			4000	4000	4000	4000	4000	4000
No of lines required			6	3	3	2	1	1
No. of circuits			6	6	3	3	1	2
No. of ac line segments per circuit			3	3	3	3	3	
No. of series capacitors per line segment			2	2	2	2	2	
Total No. Series Capacitors			36	36	18	18	6	
Total No. AC or DC Sub/Sw/Stations			4	4	4	4	4	2.33
No. Shunt Reactors per ac line segment			2	2	2	2	4	
Total No. Shunt Reactors			36	36	18	18	12	
No of transformer banks per S/S			2	2	2	2	2	
Total No. Transformers			8	8	8	8	8	
Tot no. of SVC's			1	1	2	2	2	
No. of shunt caps per S/S			2	2	1	1	1	
Total no. Shunt Capacitors			8	8	4	4	4	
HVDC stations & AC substations incl reactive comp			$720,000,000	$720,000,000	$631,000,000	$631,000,000	$642,000,000	$699,000,000
Transmission Line (cost/mile)			$1,687,400	$2,700,100	$2,781,000	$7,231,500	$3,300,000	$1,700,000
Transmission Line R/W & permitting (cost/mile)			$300,000	$300,000	$300,000	$300,000	$300,000	$300,000
Transmission path distance (miles)			780	780	780	780	780	780
Total sum line distance (miles)			4,680	2,340	2,340	1,560	780	780
Transmission Line Cost			$9,301,032,000	$7,020,234,000	$7,209,540,000	$5,874,570,000.00	$2,808,000,000	$1,560,000,000
Total Transmission Cost			**$10,021,032,000**	**$7,740,234,000**	**$7,840,540,000**	**$6,505,570,000**	**$3,450,000,000**	**$2,259,000,000**
Annual Payment, 40 years @ rate of		8%	$840,365,362	$649,097,273	$657,508,951	$545,558,151	$289,317,557	$189,440,105
Cost per kW-Yr			$210.09	$162.27	$164.38	$136.39	$72.33	$47.36
Cost per MWh @ Utilization Factor of		60%	$39.97	$30.87	$31.27	$25.95	$13.76	$9.01
Losses								
No of conductors/pole/phase			2	2	2	2	6	3
Conductor (ohms/mile) ac or dc @ oper temp			0.0736	0.0736	0.0550	0.0550	0.1411	0.0509
Line/Pole Current (Amps)			1187	1187	1638	1638	3212	3333
Conductor current density (A/mm^2)			0.737	0.737	0.699	0.699	1.329	1.017
Losses @ full load			759	759	550	550	600	354
Losses at full load in %			18.99%	18.99%	13.75%	13.75%	14.99%	8.86%
Annual Cost of losses @ UF & $/kW of:	60%	$4,178	**$1,903,806,018**	**$1,903,806,018**	**$1,378,980,853**	**$1,378,980,853**	**$1,503,065,712**	**$888,052,952**

Parameters:

Interest rate %	8%
Capitalized cost of losses $/kW	$4,178
Utilization factor	60%
Transmission distance	780

Note:

AC current assumes power factor of:	94.00%
Full load converter losses per station	0.75%
AC substation losses per station	0.20%

Substation unit costs M$	**345 kV**	**500 kV**	**765 kV**
Series capacitor bank	8.0	10.0	15.0
Shunt reactor cost	5.0	7.5	12.0
Transformer (1500MVA bank)	15.0	16.5	20.0
AC term equip per s/s - cb's, disc, inst trans	12.0	16.0	24.0
Shunt capacitor banks	3.0	5.0	8.0
New S/S development cost	10.0	10.0	10.0
Static Var Compensator	20.0	30.0	40.0

Converter station cost M$	**600 kV**
3500 MW Converter Station	300

AC Line Costs M$/mi	**345 kV**	**500 kV**	**765 kV**
ac line construct cost (single ckt)	$1.69	$2.78	$3.30
ac line construct cost (double ckt)	$2.70	$4.45	-
ac line R/W and permitting cost	$0.30	$0.30	$0.30
Conductor type	ACSR	ACSR	ACSR
Conductor area (kcmil)	1,590	2,312	795
Cond ac res @ 25 C (ohms/mi)	0.0611	0.0457	0.1172
No. of conductors per phase	2	2	6
Conductor operating temp deg C	75	75	75
Cond ac res at oper temp (ohms/mi)	0.0736	0.0550	0.1411

How to calculate the annual cost of losses:

Annual loss costs are calculated by multiplying the maximum losses at rated power transfer (which is different for each transmission alternative) by a capitalized cost of $4,178/kW and then multiplying this product by an expected utilization factor of 60%. The 60% utilization factor is based on the assumption that the wind energy that flows on the AC or DC line(s) will result in an energy transfer that represents loading that line 60% of the time in a given year. The capitalized loss cost of $4,178/kW is based on the net present value of a single kW of power loss over a 40-year period at an 8% discount rate starting with an assumption that the value of a MWh of wind-generated energy (including a federal production tax credit), levelized over 40 years, is $40.

Assumed cost inputs are primarily from publicly available sources and typically used for budgetary purposes. Inputs for this comparison are not drawn from costs that have been presented in other testimony in this docket; however these costs are indicative for comparative purposes.

DC Line Costs M$/mi	**600 kV**
bipolar dc line construct cost	$1.70
dc line R/W and permitting costs	$0.30
Conductor type	ACSR
Conductor area (kcmil)	2156
Cond dc res @ 25 C (ohms/mi)	0.0423
No. of conductors per pole	3
Conductor operating temp deg C	75
Cond dc res at oper temp (ohms/mi)	0.0509