

Full Economic Benefit Results for Grain Belt Express

Demand Cost*	(\$M)	2019			
		Business as Usual	Slow Growth	Robust Economy	Green Economy
Without Grain Belt	Missouri	3,221	2,239	5,324	9,067
With Grain Belt	Missouri	3,199	2,228	5,255	9,035
Savings	Missouri	22	11	69	32

Locational Marginal Price (\$/MWh)*			2019			
			Business as Usual	Slow Growth	Robust Economy	Green Economy
Without Grain Belt	LMP OnPeak Avg	Missouri	38.77	26.66	63.65	98.56
Without Grain Belt	LMP OffPeak Avg	Missouri	28.41	20.85	37.62	77.00
Without Grain Belt	LMP Average	Missouri	33.35	23.62	50.03	87.28
With Grain Belt	LMP OnPeak Avg	Missouri	38.45	26.53	62.87	98.11
With Grain Belt	LMP OffPeak Avg	Missouri	28.27	20.76	37.06	76.84
With Grain Belt	LMP Average	Missouri	33.13	23.51	49.36	86.98
LMP Change	LMP OnPeak Delta	Missouri	-0.32	-0.13	-0.78	-0.45
LMP Change	LMP OffPeak Delta	Missouri	-0.14	-0.09	-0.56	-0.16
LMP Change	LMP Average Delta	Missouri	-0.22	-0.11	-0.67	-0.30

Variable Production Cost (Eastern US)	(\$M)		2019	
	Business as Usual	Slow Growth	Robust Economy	Green Economy
Without Grain Belt	75,906	52,959	100,798	150,015
With Grain Belt	75,331	52,572	99,931	148,780
Savings	574	387	867	1,236

*Result has been updated after adding 29 KCPL load buses to the Missouri Load Hub definition

Emissions and Water Use Reduction Results for Grain Belt Express

Emissions (Eastern US) 2019

		Business as Usual	Slow Growth	Robust Economy	Green Economy
Without Grain Belt	NOx (tons)	902,580	596,858	1,084,855	615,122
Without Grain Belt	SOx (tons)	2,196,005	971,702	2,618,321	1,426,626
Without Grain Belt	CO2 (tons)	1,541,471,608	1,171,768,238	1,768,831,993	1,140,810,137
Without Grain Belt	Hg (lbs)	28,091	13,352	32,614	18,238
Without Grain Belt	Water (MGal)	424,612	502,802	457,766	478,173
With Grain Belt	NOx (tons)	895,469	588,908	1,080,168	609,014
With Grain Belt	SOx (tons)	2,176,216	955,125	2,608,824	1,405,774
With Grain Belt	CO2 (tons)	1,531,458,478	1,160,202,768	1,761,300,314	1,130,027,471
With Grain Belt	Hg (lbs)	27,955	13,235	32,545	18,095
With Grain Belt	Water (MGal)	420,331	500,018	452,873	474,222
Reduction	NOx (tons)	7,111	7,950	4,687	6,109
Reduction	SOx (tons)	19,788	16,578	9,497	20,852
Reduction	CO2 (tons)	10,013,130	11,565,469	7,531,679	10,782,667
Reduction	Hg (lbs)	135	117	69	143
Reduction	Water (MGal)	4,281	2,783	4,893	3,952

Adjusted Production Cost Results for State of Missouri with Grain Belt Express

Business as Usual

		Without Grain Belt	With Grain Belt	Difference
Energy (GWh)	Generation	87,889	87,653	(235)
	Purchases	9,074	9,268	195
	Sales	(891)	(850)	41
	Net	96,071	96,071	(0)
Cost (M\$)	Generation	2,082.9	2,074.7	(8.1)
	Purchases	349.0	353.5	4.3
	Sales	(23.2)	(22.1)	0.9
	Net	2,408.7	2,406.1	(2.6)

Slow Growth

		Without Grain Belt	With Grain Belt	Difference
Energy GWh	Generation	77,545	76,618	(927)
	Purchases	17,733	18,651	918
	Sales	(31)	(22)	9
	Net	95,247	95,247	0
Cost (M\$)	Generation	1,565.0	1,541.3	(23.7)
	Purchases	405.2	423.5	18.3
	Sales	(0.9)	(0.6)	0.2
	Net	1,969.3	1,964.1	(5.2)

Robust Economy

		Without Grain Belt	With Grain Belt	Difference
Energy GWh	Generation	92,468	92,114	(354)
	Purchases	11,655	11,979	324
	Sales	(569)	(539)	30
	Net	103,554	103,554	-
Cost (M\$)	Generation	2,518.7	2,497.0	(21.7)
	Purchases	700.8	709.5	8.6
	Sales	(17.1)	(16.0)	1.0
	Net	3,202.5	3,190.5	(12.1)

Green Economy

		Without Grain Belt	With Grain Belt	Difference
Energy GWh	Generation	68,207	68,052	(155)
	Purchases	35,348	35,503	155
	Sales	-	-	-
	Net	103,554	103,554	-
Cost (M\$)	Generation	4,458.3	4,445.1	(13.2)
	Purchases	3,159.8	3,162.2	2.4
	Sales	-	-	-
	Net	7,618.0	7,607.3	(10.7)

Adjusted Production Cost Results for Ameren Missouri with Grain Belt Express**Business as Usual**

		Without Grain Belt	With Grain Belt	Difference
Energy (GWh)	Generation	45,953	45,844	(109)
	Purchases	4,108	4,160	51
	Sales	(2,954)	(2,897)	58
	Net	47,107	47,107	(0)
Cost (M\$)	Generation	995.2	991.7	(3.5)
	Purchases	163.8	164.3	0.5
	Sales	(82.0)	(79.9)	2.0
	Net	1,077.0	1,076.0	(1.0)

Slow Growth

		Without Grain Belt	With Grain Belt	Difference
Energy GWh	Generation	38,689	37,931	(758)
	Purchases	8,468	9,168	700
	Sales	(297)	(239)	58
	Net	46,860	46,860	0
Cost (M\$)	Generation	837.8	817.5	(20.2)
	Purchases	206.6	221.5	14.9
	Sales	(7.9)	(6.4)	1.5
	Net	1,036.5	1,032.6	(3.9)

Robust Economy

		Without Grain Belt	With Grain Belt	Difference
Energy GWh	Generation	46,697	46,658	(39)
	Purchases	6,039	6,066	26
	Sales	(1,790)	(1,778)	12
	Net	50,946	50,946	-
Cost (M\$)	Generation	1,093.9	1,088.7	(5.2)
	Purchases	368.3	365.1	(3.2)
	Sales	(57.3)	(56.3)	1.0
	Net	1,404.8	1,397.5	(7.4)

Green Economy

		Without Grain Belt	With Grain Belt	Difference
Energy GWh	Generation	24,658	24,555	(104)
	Purchases	26,288	26,392	104
	Sales	-	-	-
	Net	50,946	50,946	-
Cost (M\$)	Generation	1,295.7	1,285.7	(10.0)
	Purchases	2,485.7	2,481.4	(4.3)
	Sales	-	-	-
	Net	3,781.5	3,767.1	(14.4)

Full Economic Benefit Results for MISO Wind Alternative Scenario

Demand Cost	(\$M)	2019
		Business as Usual
Without MISO Wind	Missouri	3,221
With MISO Wind	Missouri	3,217
Savings	Missouri	4

Locational Marginal Price (\$/MWh)			2019
			Business as Usual
Without MISO Wind	LMP OnPeak Avg	Missouri	38.77
Without MISO Wind	LMP OffPeak Avg	Missouri	28.41
Without MISO Wind	LMP Average	Missouri	33.35
With MISO Wind	LMP OnPeak Avg	Missouri	38.71
With MISO Wind	LMP OffPeak Avg	Missouri	28.39
With MISO Wind	LMP Average	Missouri	33.31
LMP Change	LMP OnPeak Delta	Missouri	-0.06
LMP Change	LMP OffPeak Delta	Missouri	-0.02
LMP Change	LMP Average Delta	Missouri	-0.04

Variable Production Cost (Eastern US)	(\$M)	2019
		Business as Usual
Without MISO Wind	75,906	
With MISO Wind	75,839	
Savings	67	

Emissions and Water Use Reduction Results for MISO Wind Alternative Scenario

Emissions (Eastern US) 2019

		Business as Usual
Without MISO Wind	NOx (tons)	902,580
Without MISO Wind	SOx (tons)	2,196,005
Without MISO Wind	CO2 (tons)	1,541,471,608
Without MISO Wind	Hg (lbs)	28,091
Without MISO Wind	Water (MGal)	424,612
With MISO Wind	NOx (tons)	901,901
With MISO Wind	SOx (tons)	2,194,129
With MISO Wind	CO2 (tons)	1,539,897,167
With MISO Wind	Hg (lbs)	28,052
With MISO Wind	Water (MGal)	424,128
Reduction	NOx (tons)	679
Reduction	SOx (tons)	1,867
Reduction	CO2 (tons)	1,574,441
Reduction	Hg (lbs)	39
Reduction	Water (MGal)	484

Adjusted Production Cost Results for State of Missouri with MISO Wind Alternative

Business as Usual

MISO Wind Alternative

		Without MISO Wind	With MISO Wind	Difference
Energy GWh	Generation	87,871	87,913	42
	Purchases	9,089	9,065	(24)
	Sales	(888)	(906)	(12)
	Net	96,071	96,071	-
Cost (M\$)	Generation	2,082.9	2,083.9	1.0
	Purchases	349.7	348.5	(1.2)
	Sales	(23.4)	(23.6)	(0.2)
	Net	2,409.24	2,408.75	(0.48)

Adjusted Production Cost Results for Ameren Missouri with MISO Wind Alternative

Business as Usual

MISO Wind Alternative

		Without MISO Wind	With MISO Wind	Difference
Energy GWh	Generation	45,953	45,946	(7)
	Purchases	4,108	4,113	4
	Sales	(2,954)	(2,952)	3
	Net	47,107	47,107	-
Cost (M\$)	Generation	995.2	994.9	(0.3)
	Purchases	163.8	163.6	(0.1)
	Sales	(82.0)	(81.9)	0.1
	Net	1,077.0	1,076.7	(0.3)