Exhibit 7.0.c

Tenaska Transmission Service Memorandum

MEMORANDUM

TO: Worley Parsons

FROM: Scott M. Helyer

DATE: December 4, 2009

RE: Cost Estimate for Receiving Transmission Service from the Taylorville Energy Center to Ameren

Introduction

The Taylorville Energy Center ("TEC") is a 730MW (gross) Integrated Gasification Combined Cycle ("IGCC") power plant that is expected to be on-line and commercial in 2015. TEC will interconnect at the Commonwealth Edison ("ComEd") Kincaid 345 kV substation which is located in south-central Illinois, and become part of the PJM market. The Kincaid 345 kV substation has multiple 345 kV lines that ultimately connect it to other ComEd substations throughout Illinois and also to the Ameren transmission system. Ameren is a member of the Midwest ISO ("MISO").

Energy from TEC is expected to be sold into the various markets and is expected to include sales to both ComEd and Ameren over the life of the project. As Ameren is located in the MISO market, transmission service arrangements will be necessary beginning in 2014 to move the energy from TEC across the PJM system to the PJM/MISO interface where Ameren can take delivery. The PJM tariff and other agreements with MISO sets forth the rates, terms and conditions for providing transmission service from PJM and MISO and to alternative retail electric suppliers that sell energy to ComEd's and Ameren's distribution customers.. The two major costs for transmission service are the rate for service and congestion costs. The rate for transmission service is the higher of the tariff rate for transmission service (currently \$0/MWh for service between PJM and MISO), or the incremental cost of any transmission upgrades needed to provide the service. In addition, the transmission service customer must also pay, or be paid, for congestion associated with the transmission service.

This memorandum was prepared to provide an indication of the expected cost of receiving transmission service from PJM and includes:

- an evaluation, identification, and cost estimate of transmission system upgrades which may be necessary to accommodate a transmission service request on the PJM system to move energy from TEC to the PJM/MISO interface with ultimate delivery to Ameren; and
- 2) estimates of other transmission service costs including congestion and ancillary services.

Study Description and Assumptions

This study was performed with the 2008 series load flow cases that were prepared by the various transmission providers in the Eastern Interconnection. These cases provide a snapshot of certain system conditions and are designed to simulate summer peak conditions in various years between 2010 through 2019. These are the same, and only, load flow cases available to PJM and anyone else who studies the Eastern Interconnection. The analysis for this memorandum focused primarily on expected conditions in 2014 and 2019. While PJM will probably study the need for upgrades in other years between 2014 and 2019, the results of the 2014 and 2019 simulations should provide adequate information to identify potential transmission system upgrades and other costs to accommodate the transmission service request.

The load flow cases were modified to include a new 500 MW (net) generator representing the approximate net output of TEC at the Kincaid 345 kV substation where the point of interconnection will be located. The analysis performed to identify system upgrades simulated 2,065 individual line and transformer outages for each of the following scenarios in both 2014 and 2019:

- 1. TEC offline.
- 2. TEC online with 200MW transfer to Ameren and 0 MW to ComEd.
- 3. TEC online with 200MW transfer to Ameren and 300MW to ComEd.

The outage list included all lines and transformers greater than 200kV that are located within PJM and surrounding areas of MISO. These transmission areas whose facilities were included in the outage list are provided in Appendix A. All lines and transformers operating at a voltage greater than 115 kV in PJM and MISO were monitored during the study to determine whether the various line outages would cause any of the monitored lines to exceed their thermal limits.

A similar analysis was performed to estimate the congestion and losses that may occur between TEC and the PJM/MISO interface where Ameren can take delivery of the energy from TEC. This included a line outage and monitored line list needed to identify congestion that would influence the LMP prices in PJM.

Summary Results

In total, there are four elements that exceeded their thermal limits due to various outages in 2014 and 2019, consisting of two transformers in the Ameren system near TEC and two ComEd 345 kV lines located north of TEC (see Table 1). No voltage issues were encountered. A transmission line map showing the substations in relation to TEC is included in Appendix B and additional information on the line outage analysis is included in Appendix C.

Table 1

		<u>Rating</u>	
<u>Facility</u>	Contingency Loading (MVA%)	B(MVA)	Length(mi)
Lanesville 138/345kV transformer	122.5%	308	n/a
Pawnee 138/345kV transformer	108.4%	450	n/a
Pontiac 345kV - Wilton Center 345kV	109.1%	1201	51.7
Pontiac 345kV - Dresdon 345kV	100.9%	1341	43.0

An estimated cost of upgrading these facilities is provided below in Table 2. An estimated cost of \$200,000/mile was used for reconductoring the 345kV transmission lines.

Table 2

Facility	Suggested Upgrade	Estimated Cost (\$)
Lanesville 138/345kV transformer	Replace transformer	\$4,500,000
Pawnee 138/345kV transformer	Replace transformer	\$5,500,000
Pontiac 345kV – Dresdon 345kV	Reconductor	\$8,600,000
Pontiac 345kV – Wilton Center 345kV	Reconductor	\$10,340,000
	Total Cost:	\$28,940,000

The congestion analysis involved: 1) a review of historical congestion costs between the Kincaid substation and the PJM/MISO interface, and 2) an analysis of expected congestion that might occur with the addition of TEC in 2015, 2017, and 2019. The historical congestion costs indicated that some congestion occurred in 2005-2007, and increased beginning in late 2007 until early 2009. At that point, the congestion costs reduced to levels seen in 2005-2007. The congestion analysis in 2014-2019, due to the addition of TEC, also showed that some congestion could occur during some periods of each year. In other times, TEC could end up receiving revenues from the auction revenue rights that it would hold as a result of the transmission service reservation. The results of the congestion analysis are summarized in Table 1 and additional historical and the future congestion analysis details are included in Appendix E.

Table 3
Average Annual Congestion into MISO

Year	Off Peak	On Peak
2006	-\$0.29	\$1.45
2007	\$0.98	\$2.58
2008	\$2.66	\$4.72
2009	\$1.09	\$2.63
2015	\$0.46	\$0.11
2017	-\$0.10	\$0.78
2019	\$0.94	\$1.06

The costs associated with ancillary services will consist of a charge for scheduling and a charge for voltage control. The cost of scheduling the transmission service is currently \$0.1019/MWh for transmission customers taking service at the boundary of PJM. The cost of voltage control is currently between \$0.50/MWh and \$1.00/MWh, but this charge can vary as it is a formula rate.

Conclusion

This study identified four transmission system upgrades with a total estimated cost of \$28,940,000 in the ComEd and Ameren systems that would allow for transmission service in the amount of 200 MW from the TEC to Ameren, while an additional 300 MW may remain in ComEd. The actual upgrades and their cost will ultimately be determined by PJM. It is possible that the actual upgrades and their costs could increase ,or decrease, based on the actual transmission service and interconnection requests included in the PJM queues at the time the study is performed.

Once a final upgrade cost is determined, however, PJM will make a final determination regarding how the costs will be paid. FERC policy is that the cost for transmission service is the higher of the tariff rate included in PJM's Open Access Transmission Tariff or the incremental cost of the upgrades amortized over the length of the transmission service request. As PJM and MISO have an agreement that sets the tariff rate at \$0 for transmission service between the two RTOs, it is expected that the upgrade costs will be amortized over the 30-year term of the request.

The annual cost of congestion is expected to be in the range of \$1/MWh to \$4/MWh depending on the actual dispatch of the plant. Changes to the transmission system and the addition of new generation throughout the area could change the amount and direction of the congestion. However, one can assume that the cost of congestion over the 30-year term of the transmission service request will be \$2.50/MWh based on the information available today.

The costs associated with ancillary services will consist of a charge for scheduling and a charge for voltage control. The cost of scheduling the transmission service is currently \$0.1019/MWh for transmission customers taking service at the boundary of PJM. The cost of voltage control is currently between \$0.50/MWh and \$1.00/MWh, but this charge can vary as it is a formula rate.[Section to be modified]

Appendix A

List of transmission areas containing lines 200kV and above that are included in the contingency list used for this study.

PJM Transmission Areas:

AE – Atlantic Electric

AEP – American Electric Power

AP – Allegheny Power

BG&E – Baltimore Gas & Electric

CE – Commonwealth Edison

DAY- Dayton Power and Light

DLCO – Duquesne Light Company

VAP – Dominion Virginia Power

DP&L – Delmarva Power & Light

JCP&L – Jersey Central Power & Light

METED – Metropolitan Edison

PECO – PECO Energy Company

PEPCO – Potomac Electric Power Company

PPL – Pennsylvania Power & Light & UGI

PENELEC – Pennsylvania Electric Company

PSEG – Public Service Electric & Gas

UGI – UGI Corporation

PJM - PJM 500kV

MISO Transmission Areas:

AMIL – Ameren Illinois

AMMO – Ameren Missouri

FE – First Energy

IPL – Indianapolis Power and Light

EKPC – East Kentucky Power Cooperative

SIPC – Southern Illinois Power Cooperative

NIPS – Northern Illinois Power Cooperative

HE – Hoosier Energy

Appendix B

Transmission Map including relevant substations in Illinois. Wilton Ctr 345 Dresden Pontiac Midpoint Electric Transmission Lines Voltage Class kV Under 100 100-161 230-287 345 500 735 and Above - DC Line Proposed → Underground Counties Latham o_results_Electric_Substations <mark>L</mark>ánesville 11.15 22.30 ∮Blue Mound miles Kincaid gTaylorville Energy Center Pawnee

Appendix C

In the tables below, the column titled "TEC MW's" represents Taylorville Energy Center's MW contribution to the contingency overload. All of the contingency violations below appear as a result of TEC, with the exception of the Lanesville transformer. Its contingency loading is increased 6.5% as a result of TEC and should therefore be included.

New Contingency Violations

2019 - 200MW transfer to Ameren, 0 MW to ComEd

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Violation	Contingency	MVA%	TEC MW's	Limit(MVA)	CTG Loading(MVA)
Lanesville 138/345 kV Transformer	Kincaid 345kV - Latham Tap 345kV	112.9	21.4	308	347.6
	Brokaw 345kV - Lanesville 345kV	114.0	20.5	308	351.0
	Kincaid 345kV - Pawnee 345kV	103.3	17.6	308	318.2
Pontiac 345kV - Wilton Center 345kV	Dresdon 345kV - Pontiac 345kV	101.9	33.9	1201	1223.3

2019 - 200MW transfer to Ameren, 300 MW to ComEd

Violation	Contingency	MVA%	TEC MW's	Limit(MVA)	CTG Loading(MVA)
Lanesville 138/345 kV Transformer	Brokaw 345 kV - Pontiac 345 kV	104.6	14.3	308	322.0
	Kincaid 345kV - Latham Tap 345kV	123.7	21.4	308	381.1
	Brokaw 345kV - Lanesville 345kV	124.7	20.5	308	384.0
	Kincaid 345kV - Pawnee 345kV	111.7	17.6	308	344.2
Pawnee 138/345kV transformer	Kincaid 345kV - Lanesville 345kV	108.4	27.7	450	487.8
	Kincaid 345kV - Latham Tap 345kV	103.9	90.8	450	487.5
Pontiac 345 kV - Dresdon 345 kV	Pontiac 345kV - Wilton 345kV	100.9	34.4	1341	1353.6

2019 - 200MW transfer to Ameren, 0 MW to ComEd - Queued Wind Generation online

Violation	Contingency	MVA%	TEC MW's	Limit(MVA)	CTG Loading(MVA)
Lanesville 138/345 kV Transformer	Kincaid 345kV - Pawnee 345kV	102.6	59.2	308	316.0
	Kincaid 345kV - Latham Tap 345kV	111.0	97.1	308	341.8
	Brokaw 345kV - Lanesville 345kV	111.9	87.9	308	344.6
Pontiac 345 kV - Wilton Center 345kV	Dresdon 345kV - Pontiac 345kV	109.2	33.9	1201	1310.9

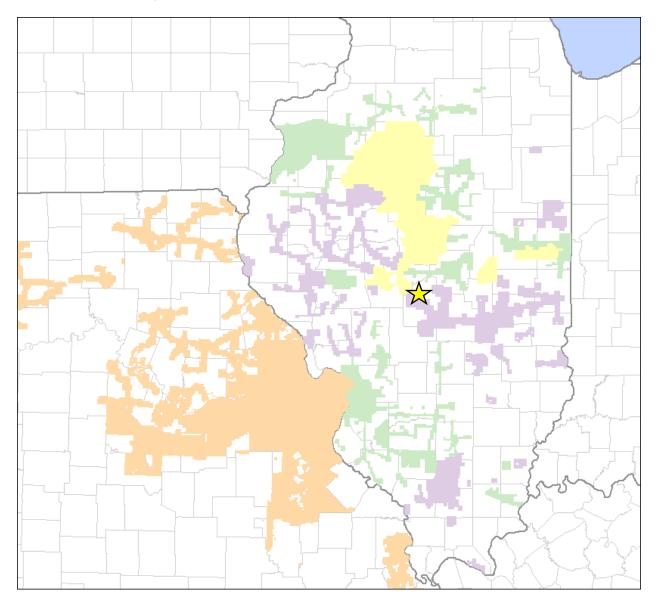
2019 - 200MW transfer to Ameren, 300 MW to ComEd - Queued Wind Generation online

2013 - 2000 W transfer to America, 300 MW to Comica - Queuca Wind Generation online					
Violation	Contingency	MVA%	TEC MW's	Limit(MVA)	CTG Loading(MVA)
Pawnee 138/345kV transformer	Kincaid 345kV - Latham Tap 345kV	102.7	92.4	450	462.3
	Kincaid 345kV - Lanesville 345kV	107.3	90.8	450	482.7
Lanesville 138/345 kV Transformer	Kincaid 345kV - Latham Tap 345kV	121.8	97.1	308	375.2
	Brokaw 345kV - Lanesville 345kV	122.6	87.9	308	377.6
	Brokaw 345 kV - Pontiac 345 kV	103.3	26.3	308	318.3
	Kincaid 345kV - Pawnee 345kV	111.0	59.2	308	341.9

There were no significant contingency violations found in the 2014 case as a result of making a 200 MW transfer from Taylorville Energy Center to Ameren.

Appendix D

Ameren service territory



The shaded areas represent the electric service territory of Ameren Corp. The star is the location of Taylorville Energy Center.

Appendix E

2006 Historical LMP data, Off-Peak

Year: 2006	PJM-MISO	Taylorville	Congestion
Month	Interface	Bus LMP	into MISO
January	\$34.26	\$34.18	\$0.08
February	\$30.08	\$38.19	-\$8.11
March	\$36.23	\$35.07	\$1.16
April	\$32.98	\$33.30	-\$0.32
May	\$29.96	\$29.07	\$0.89
June	\$24.92	\$24.42	\$0.50
July	\$37.41	\$36.42	\$0.99
August	\$36.63	\$36.70	-\$0.07
September	\$25.47	\$25.28	\$0.19
October	\$29.67	\$29.01	\$0.66
November	\$33.12	\$32.60	\$0.52
December	\$29.04	\$29.06	-\$0.02

2007 Historical LMP data, Off-Peak

Year: 2007	PJM-MISO	Taylorville	Congestion
Month	Interface	Bus LMP	into MISO
January	\$30.25	\$29.88	\$0.37
February	\$51.28	\$50.53	\$0.75
March	\$34.33	\$33.75	\$0.58
April	\$38.91	\$38.98	-\$0.07
May	\$30.54	\$30.81	-\$0.27
June	\$25.38	\$24.29	\$1.09
July	\$30.18	\$28.63	\$1.55
August	\$43.34	\$42.16	\$1.18
September	\$28.08	\$26.39	\$1.69
October	\$38.04	\$35.70	\$2.34
November	\$33.75	\$33.82	-\$0.07
December	\$37.48	\$34.83	\$2.65

2006 Historical LMP data, On-Peak

Year: 2006	PJM-MISO	Taylorville	Congestion
Month	Interface	Bus LMP	into MISO
January	\$49.00	\$48.83	\$0.17
February	\$46.97	\$46.72	\$0.25
March	\$48.83	\$45.39	\$3.44
April	\$50.58	\$50.59	-\$0.01
May	\$48.48	\$48.22	\$0.26
June	\$43.31	\$43.03	\$0.28
July	\$61.47	\$55.98	\$5.49
August	\$67.01	\$61.11	\$5.90
September	\$36.54	\$35.85	\$0.69
October	\$44.73	\$44.01	\$0.72
November	\$48.78	\$48.79	-\$0.01
December	\$37.27	\$37.11	\$0.16

2007 Historical LMP data, On-Peak

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Year: 2007	PJM-MISO	Taylorville	Congestion
Month	Interface	Bus LMP	into MISO
January	\$40.76	\$40.26	\$0.50
February	\$61.81	\$60.60	\$1.21
March	\$48.71	\$48.31	\$0.40
April	\$56.38	\$56.32	\$0.06
May	\$54.09	\$54.65	-\$0.56
June	\$48.53	\$44.23	\$4.30
July	\$52.69	\$47.29	\$5.40
August	\$65.65	\$61.48	\$4.17
September	\$48.39	\$43.27	\$5.12
October	\$59.09	\$55.19	\$3.90
November	\$49.48	\$47.50	\$1.98
December	\$49.94	\$45.52	\$4.42

2008 Historical LMP data, Off-Peak

Year: 2008	PJM-MISO	Taylorville	Congestion
Month	Interface	Bus LMP	into MISO
January	\$37.18	\$37.37	-\$0.19
February	\$45.83	\$44.20	\$1.63
March	\$51.36	\$48.02	\$3.34
April	\$42.54	\$36.72	\$5.82
May	\$29.09	\$27.64	\$1.45
June	\$37.31	\$32.37	\$4.94
July	\$43.73	\$42.43	\$1.30
August	\$36.59	\$34.65	\$1.94
September	\$27.45	\$27.06	\$0.39
October	\$28.68	\$23.12	\$5.56
November	\$32.07	\$29.90	\$2.17
December	\$34.73	\$31.21	\$3.52

2009 Historical LMP data, Off-Peak

Year: 2009	PJM-MISO	Taylorville	Congestion
Month	Interface	Bus LMP	into MISO
January	\$35.76	\$33.25	\$2.51
February	\$30.95	\$28.06	\$2.89
March	\$24.44	\$22.30	\$2.14
April	\$22.31	\$23.71	-\$1.40
May	\$21.63	\$20.16	\$1.47
June	\$19.75	\$18.59	\$1.16
July	\$21.18	\$20.48	\$0.70
August	\$21.85	\$22.26	-\$0.41
September	\$21.14	\$20.03	\$1.11
October	\$23.26	\$22.80	\$0.46
November	\$23.77	\$22.37	\$1.40
December	n/a	n/a	n/a

2008 Historical LMP data, On-Peak

Year: 2008	PJM-MISO	Taylorville	Congestion
Month	Interface	Bus LMP	into MISO
January	\$53.02	\$51.40	\$1.62
February	\$59.33	\$56.66	\$2.67
March	\$65.00	\$58.26	\$6.74
April	\$63.26	\$54.85	\$8.41
May	\$56.31	\$54.16	\$2.15
June	\$79.55	\$71.11	\$8.44
July	\$76.66	\$71.75	\$4.91
August	\$62.75	\$58.54	\$4.21
September	\$53.87	\$51.62	\$2.25
October	\$45.13	\$39.02	\$6.11
November	\$45.29	\$42.49	\$2.80
December	\$45.83	\$39.45	\$6.38

2009 Historical LMP data. On-Peak

Year: 2009 PJM-MISO Taylorville Congestion			
Year: 2009		=	_
Month	Interface	Bus LMP	into MISO
January	\$44.64	\$41.39	\$3.25
February	\$37.56	\$32.95	\$4.61
March	\$32.47	\$29.27	\$3.20
April	\$29.73	\$27.89	\$1.84
May	\$32.82	\$31.13	\$1.69
June	\$32.38	\$30.40	\$1.98
July	\$29.13	\$26.43	\$2.70
August	\$29.55	\$26.90	\$2.65
September	\$28.24	\$24.31	\$3.93
October	\$32.36	\$31.13	\$1.23
November	\$31.00	\$29.13	\$1.87
December	n/a	n/a	n/a

2015 Forcasted LMP data, Off-Peak

Year: 2015	PJM-MISO	Taylorville	Congestion
Month	Interface	Bus LMP	into MISO
January	\$0.70	-\$0.28	\$0.98
February	-\$2.15	\$0.01	-\$2.16
March	\$4.33	\$0.53	\$3.81
April	\$1.74	\$0.72	\$1.02
May	-\$0.87	-\$0.33	-\$0.54
June	-\$0.78	-\$0.93	\$0.15
July	\$2.75	\$0.36	\$2.40
August	\$2.20	\$0.31	\$1.89
September	-\$0.14	-\$0.32	\$0.18
October	\$0.80	-\$0.03	\$0.83
November	\$0.07	\$0.60	-\$0.52
December	-\$0.55	\$2.00	-\$2.55

2017 Forcasted LMP data, Off-Peak

Year: 2017	PJM-MISO	Taylorville	Congestion
Month	Interface	Bus LMP	into MISO
January	\$68.07	\$66.04	\$2.03
February	\$68.27	\$71.97	-\$3.70
March	\$61.21	\$58.61	\$2.60
April	\$54.87	\$54.44	\$0.43
May	\$54.16	\$54.37	-\$0.21
June	\$54.58	\$55.00	-\$0.42
July	\$55.52	\$56.53	-\$1.01
August	\$55.69	\$56.06	-\$0.37
September	\$55.24	\$55.63	-\$0.39
October	\$52.70	\$52.92	-\$0.22
November	\$61.08	\$61.29	-\$0.21
December	\$66.27	\$66.03	\$0.24

2015 Forcasted LMP data, On-Peak

Year: 2015	PJM-MISO	Taylorville	Congestion
Month	Interface	Bus LMP	into MISO
January	\$62.53	\$62.33	\$0.20
February	\$59.50	\$60.57	-\$1.07
March	\$56.93	\$54.50	\$2.43
April	\$52.09	\$50.85	\$1.24
May	\$51.89	\$52.55	-\$0.66
June	\$53.64	\$54.45	-\$0.81
July	\$64.02	\$62.47	\$1.55
August	\$66.77	\$65.52	\$1.25
September	\$61.09	\$61.33	-\$0.24
October	\$51.95	\$51.56	\$0.39
November	\$50.04	\$53.70	-\$3.66
December	\$62.10	\$61.38	\$0.72

2017 Forcasted LMP data, On-Peak

Year: 2017	PJM-MISO	Taylorville	Congestion
Month	Interface	Bus LMP	into MISO
January	\$74.08	\$70.71	\$3.37
February	\$77.84	\$78.43	-\$0.59
March	\$64.01	\$63.20	\$0.81
April	\$63.31	\$63.07	\$0.24
May	\$70.40	\$70.73	-\$0.33
June	\$79.17	\$79.72	-\$0.55
July	\$93.49	\$92.36	\$1.13
August	\$87.26	\$85.99	\$1.27
September	\$80.52	\$81.69	-\$1.17
October	\$62.22	\$63.07	-\$0.85
November	\$66.63	\$63.49	\$3.14
December	\$77.81	\$74.97	\$2.84

2019 Forcasted LMP data, Off-Peak

Year: 2019	PJM-MISO	Taylorville	Congestion
Month	Interface	Bus LMP	into MISO
January	\$71.56	\$66.79	\$4.77
February	\$79.00	\$77.55	\$1.45
March	\$69.37	\$68.72	\$0.65
April	\$59.20	\$58.30	\$0.90
May	\$58.95	\$58.87	\$0.08
June	\$62.88	\$63.77	-\$0.89
July	\$66.99	\$66.93	\$0.06
August	\$69.70	\$69.87	-\$0.17
September	\$69.08	\$68.90	\$0.18
October	\$63.33	\$62.76	\$0.57
November	\$64.08	\$63.27	\$0.81
December	\$76.77	\$73.88	\$2.89

2019 Forcasted LMP data, On-Peak

Year: 2019	PJM-MISO	Taylorville	Congestion
Month	Interface	Bus LMP	into MISO
January	\$82.64	\$82.47	\$0.17
February	\$96.71	\$92.81	\$3.90
March	\$82.93	\$85.58	-\$2.65
April	\$72.66	\$69.99	\$2.67
May	\$79.88	\$79.20	\$0.68
June	\$83.76	\$83.61	\$0.15
July	\$88.65	\$87.56	\$1.09
August	\$95.14	\$91.87	\$3.27
September	\$88.06	\$87.76	\$0.30
October	\$71.00	\$71.39	-\$0.39
November	\$75.65	\$72.16	\$3.49
December	\$85.29	\$85.29	\$0.00

Average Annual Congestion into MISO

Average Affilial Congestion into Miso			
Year	Off Peak	On Peak	
2006	-\$0.29	\$1.45	
2007	\$0.98	\$2.58	
2008	\$2.66	\$4.72	
2009	\$1.09	\$2.63	
2015	\$0.46	\$0.11	
2017	-\$0.10	\$0.78	
2019	\$0.94	\$1.06	

About the Author

Scott M. Helyer Vice President, Transmission

As Vice President of Transmission for Tenaska, Scott M. Helyer supports Tenaska's power plant development and power marketing businesses by developing innovative solutions to transmission interconnection and access issues, both domestically and internationally.

With more than 25 years of experience in transmission and distribution system planning, transmission operations and regulatory issues, Mr. Helyer has expertise in analyzing the electric transmission business from economic, reliability and regulatory perspectives. Before joining Tenaska in 1996, he held engineering management positions with Austin Energy, the municipal electric utility in Austin, Texas.

Mr. Helyer was chairman of the North American Electric Reliability Corporation (NERC) Planning Committee from 2005 to 2009; he currently represents independent power producers on the NERC Members Representatives Committee; and represents independent power producers and power marketers on various NERC subcommittees, working groups and task forces. He is also a member of the Electric Reliability Council of Texas (ERCOT) Reliability and Operations Subcommittee, The Western Electricity Coordinating Council (WECC) Planning Coordination Committee, the PJM Markets and Reliability Committee, and other electric industry committees, subcommittees, working groups and task forces in North America.

He has a Bachelor of Science degree in electrical engineering from the University of Texas at Austin and is registered as a professional engineer in Texas.