Ex 1

Operating Characteristics and Estimated Running Cost (2009 $)

Plant / Unit	State	Nameplate Capacity (MW)	First Year of Operation	Plant Coal Heat Rate (mmbtu/MWh)	Capacity Factor (2008-2010)	Estimated Fuel Cost ($/MWh)	Estimated Fixed O&M Costs ($/kw-yr)	Estimated Variable O&M Costs ($/MWh)	Estimated Running Cost in 2010 ($/MWh)
Asbury 1	MO	213	1970	10.89	70.0%	$19.91	$21.00	$4.00	$27.34
Asbury 2	MO	19	1986	10.89	0.3%	$19.91	$30.00	$5.00	$1,097.57
Blue Valley 2	MO	25	1958	16.51	27.7%	$42.70	$30.00	$5.00	$60.04
Blue Valley 3	MO	65	1965	16.51	12.7%	$42.70	$30.00	$5.00	$74.59
Blue Valley ST1	MO	25	1958	16.51	32.3%	$42.70	$30.00	$5.00	$58.29
Chamois 1	MO	15	1953	11.92	47.8%	$20.39	$30.00	$5.00	$32.56
Chamois 2	MO	44	1960	11.92	94.1%	$20.39	$30.00	$5.00	$29.03
Columbia 5	MO	17	1957	13.94	7.9%	$60.19	$30.00	$5.00	$108.35
Columbia 7	MO	22	1965	13.94	11.4%	$60.19	$30.00	$5.00	$95.20
Hawthorn 5	MO	594	1969	10.05	72.5%	$10.89	$18.00	$3.75	$17.47
Iatan 1	MO	726	1980	10.09	69.4%	$10.94	$18.00	$3.75	$17.65
James River Power Station 1	MO	22	1957	11.66	57.8%	$26.38	$30.00	$5.00	$37.31
James River Power Station 2	MO	22	1957	11.66	56.0%	$26.38	$30.00	$5.00	$37.50
James River Power Station 3	MO	44	1960	11.66	64.8%	$26.38	$30.00	$5.00	$36.67
James River Power Station 4	MO	60	1964	11.66	70.9%	$26.38	$30.00	$5.00	$36.21
James River Power Station 5	MO	105	1970	11.66	67.1%	$26.38	$21.00	$4.00	$33.96
Labadie 1	MO	574	1970	10.27	85.1%	$13.24	$18.00	$3.75	$19.40
Labadie 2	MO	574	1971	10.27	85.5%	$13.24	$18.00	$3.75	$19.39
Labadie 3	MO	621	1972	10.27	83.6%	$13.24	$18.00	$3.75	$19.44
Labadie 4	MO	621	1973	10.27	83.7%	$13.24	$18.00	$3.75	$19.44
Lake Road 3	MO								
Lake Road 4	MO	90	1966	18.61	68.5%	$33.98	$30.00	$5.00	$43.97
Marshall 5	MO	17	1967	13.57	35.3%	$31.75	$30.00	$5.00	$46.45
Meramec 1	MO	138	1953	10.51	69.4%	$18.56	$21.00	$4.00	$26.01
Meramec 2	MO	138	1954	10.51	69.7%	$18.56	$21.00	$4.00	$26.00
Meramec 3	MO	289	1959	10.51	67.2%	$18.56	$21.00	$4.00	$26.13
Meramec 4	MO	359	1961	10.51	67.4%	$18.56	$18.00	$3.75	$25.36
Missouri City 1	MO	23	1954	17.79	10.0%	$54.16	$30.00	$5.00	$93.44

Ex 1

Operating Characteristics and Estimated Running Cost (2009 $)

Plant / Unit	State	Nameplate Capacity (MW)	First Year of Operation	Plant Coal Heat Rate (mmbtu/MWh)	Capacity Factor (2008-2010)	Estimated Fuel Cost ($/MWh)	Estimated Fixed O&M Costs ($/kw-yr)	Estimated Variable O&M Costs ($/MWh)	Estimated Running Cost in 2010 ($/MWh)
Missouri City 2	MO	23	1954	17.79	6.4%	$54.16	$30.00	$5.00	$112.79
Montrose 1	MO	188	1958	11.01	61.9%	$19.22	$21.00	$4.00	$27.10
Montrose 2	MO	188	1960	11.01	65.5%	$19.22	$21.00	$4.00	$26.88
Montrose 3	MO	188	1964	11.01	68.2%	$19.22	$21.00	$4.00	$26.74
New Madrid 1	MO	600	1972	10.06	72.6%	$15.05	$18.00	$3.75	$21.63
New Madrid 2	MO	600	1977	10.06	68.6%	$15.05	$18.00	$3.75	$21.79
Rush Island 1	MO	621	1976	10.29	79.6%	$16.88	$18.00	$3.75	$23.22
Rush Island 2	MO	621	1977	10.29	68.2%	$16.88	$18.00	$3.75	$23.65
Sibley 1	MO	55	1960	10.62	70.0%	$22.21	$30.00	$5.00	$32.10
Sibley 2	MO	50	1962	10.62	75.6%	$22.21	$30.00	$5.00	$31.74
Sibley 3	MO	419	1969	10.62	57.0%	$22.21	$18.00	$3.75	$29.57
Sikeston Power Station 1	MO	261	1981	10.41	79.6%	$12.51	$21.00	$4.00	$19.53
Sioux 1	MO	550	1967	10.35	59.8%	$22.05	$18.00	$3.75	$29.23
Sioux 2	MO	550	1968	10.35	60.2%	$22.05	$18.00	$3.75	$29.21
Southwest Power Station ST1	MO	194	1976	10.46	65.5%	$23.23	$21.00	$4.00	$30.89
Thomas Hill 1	MO	180	1966	10.57	75.7%	$15.52	$21.00	$4.00	$22.69
Thomas Hill 2	MO	285	1969	10.57	76.6%	$15.52	$21.00	$4.00	$22.65
Thomas Hill 3	MO	670	1982	10.57	71.5%	$15.52	$18.00	$3.75	$22.14
Sources:		EIA Form 860 2010	EIA Form 860 2010	EIA 923 2010	EIA Form 860 2010, EIA Form 923 5A 2010 derivation	EIA Form 923 5A 2010 derivation	NERC EPA Analysis 2010 Assumptions	NERC EPA Analysis 2010 Assumptions	

Ex 2

Existing Pollution Control Technologies (EPA 2011 & EIA 860 2010)

Plant / Unit	State	Nameplate Capacity (MW)	Boiler SO_2 Control Processes[1]	Boiler NO_X Control Processes[1]	Boiler Mercury Control Processes[2]	Boiler PM Control Processes[1]	Boiler Cooling Type[3]
Asbury 1	MO	213		Overfire Air Selective Catalytic Reduction		Electrostatic Precipitator	Recirculating
Asbury 2	MO	19		Overfire Air Selective Catalytic Reduction		Electrostatic Precipitator	Recirculating
Blue Valley 2	MO	25		Low NOx Burner Technology w/ Closed-coupled OFA		Electrostatic Precipitator	Recirculating
Blue Valley 3	MO	65		Low NOx Burner Technology w/ Closed-coupled OFA		Electrostatic Precipitator	Recirculating
Blue Valley ST1	MO	25		Low NOx Burner Technology w/ Closed-coupled OFA		Electrostatic Precipitator	Recirculating
Chamois 1	MO	15				Electrostatic Precipitator	Once-Through Cooling
Chamois 2	MO	44				Electrostatic Precipitator	Once-Through Cooling
Columbia 5	MO	17				Baghouse	Recirculating
Columbia 7	MO	22				Baghouse	Recirculating
Hawthorn 5	MO	594	Dry Lime FGD	Low NOx Burner Technology w/ Overfire Air Selective Catalytic Reduction		Baghouse	Once-Through Cooling
Iatan 1	MO	726	Wet Lime FGD	Low NOx Burner Technology w/ Overfire Air Overfire Air Selective Catalytic Reduction		Baghouse	Once-Through Cooling
James River Power Station 1	MO	22		Water Injection			
James River Power Station 2	MO	22		Water Injection			
James River Power Station 3	MO	44		Low NOx Burner Technology w/ Overfire Air		Electrostatic Precipitator	
James River Power Station 4	MO	60		Low NOx Burner Technology w/ Overfire Air		Electrostatic Precipitator	
James River Power Station 5	MO	105		Low NOx Burner Technology w/ Overfire Air		Electrostatic Precipitator	
Labadie 1	MO	574		Low NOx Burner Technology w/ Closed-coupled/Separated OFA		Electrostatic Precipitator	Once-Through Cooling
Labadie 2	MO	574		Low NOx Burner Technology w/ Closed-coupled/Separated OFA		Electrostatic Precipitator	Once-Through Cooling
Labadie 3	MO	621		Low NOx Burner Technology w/ Closed-coupled/Separated OFA		Electrostatic Precipitator	Once-Through Cooling
Labadie 4	MO	621		Low NOx Burner Technology w/ Closed-coupled/Separated OFA		Electrostatic Precipitator	Once-Through Cooling
Lake Road 3	MO						
Lake Road 4	MO	90	-	-	-	-	Once-Through Cooling
Marshall 5	MO	17	-	-	-	-	Recirculating
Meramec 1	MO	138		Low NOx Burner Technology w/ Separated OFA		Electrostatic Precipitator	Once-Through Cooling
Meramec 2	MO	138		Low NOx Burner Technology w/ Separated OFA		Electrostatic Precipitator	Once-Through Cooling
Meramec 3	MO	289		Low NOx Burner Technology w/ Overfire Air		Electrostatic Precipitator	Once-Through Cooling
Meramec 4	MO	359		Low NOx Burner Technology w/ Overfire Air		Electrostatic Precipitator	Once-Through Cooling
Missouri City 1	MO	23	-	-	-	-	Once-Through Cooling

Ex 2

Existing Pollution Control Technologies (EPA 2011 & EIA 860 2010)

Plant / Unit	State	Nameplate Capacity (MW)	Boiler SO_2 Control Processes[1]	Boiler NO_X Control Processes[1]	Boiler Mercury Control Processes[2]	Boiler PM Control Processes[1]	Boiler Cooling Type[3]
Missouri City 2	MO	23	-	-	-	-	Once-Through Cooling
Montrose 1	MO	188				Electrostatic Precipitator	Cooling Pond
Montrose 2	MO	188				Electrostatic Precipitator	Cooling Pond
Montrose 3	MO	188				Electrostatic Precipitator	Cooling Pond
New Madrid 1	MO	600		Selective Catalytic Reduction Overfire Air		Electrostatic Precipitator	Once-Through Cooling
New Madrid 2	MO	600		Selective Catalytic Reduction Overfire Air		Electrostatic Precipitator	Once-Through Cooling
Rush Island 1	MO	621		Low NOx Burner Technology w/ Closed-coupled/Separated OFA		Electrostatic Precipitator	Once-Through Cooling
Rush Island 2	MO	621		Low NOx Burner Technology w/ Closed-coupled/Separated OFA		Electrostatic Precipitator	Once-Through Cooling
Sibley 1	MO	55		Overfire Air Selective Non-catalytic Reduction		Electrostatic Precipitator	Once-Through Cooling
Sibley 2	MO	50		Overfire Air Selective Non-catalytic Reduction		Electrostatic Precipitator	Once-Through Cooling
Sibley 3	MO	419		Overfire Air Selective Catalytic Reduction		Electrostatic Precipitator	Once-Through Cooling
Sikeston Power Station 1	MO	261		Selective Non-catalytic Reduction Low NOx Burner Technology (Dry Bottom only)		Electrostatic Precipitator	Recirculating
Sioux 1	MO	550	Wet Limestone	Overfire Air Other	FGD	Electrostatic Precipitator	Once-Through Cooling
Sioux 2	MO	550	Wet Limestone	Overfire Air Other	FGD	Electrostatic Precipitator	Once-Through Cooling
Southwest Power Station ST1	MO	194		Other Selective Catalytic Reduction	OT	Electrostatic Precipitator	Recirculating
Thomas Hill 1	MO	180		Overfire Air Selective Catalytic Reduction		Electrostatic Precipitator	Once-Through Cooling
Thomas Hill 2	MO	285		Overfire Air Selective Catalytic Reduction		Electrostatic Precipitator	Once-Through Cooling
Thomas Hill 3	MO	670		Overfire Air Low NOx Burner Technology (Dry Bottom only) Selective Catalytic Reduction		Electrostatic Precipitator	Once-Through Cooling

[1] Source: EPA Clean Air Markets Dataset (CAMD) 2011 Unit Characteristics Report

[2] Source: EIA 860 2010. ACJ = Activated Carbon Injection; BH = Baghouse; DS = Dry Scrubber; EP = Electrostatic Precipitator; FGD = Flue Gas Desulfuization; LI = Lime Injection; WS = Wet Scrubber

[3] Source: EIA 860 2010.

Ex 3 **Estimated Environmental Upgrade Capital Expenditures (Million 2009$)**

Plant / Unit	State	FGD Total Project Cost (Million $)	SCR Total Project Cost (Million $)	Baghouse Capital Cost (Million $)	ACI Capital Cost (Million $)	Wet Cooling Tower Capital Cost (Million $)	Total Capital Expenditures (Million $)
Asbury 1	MO	$144		$36	$3		**$183**
Asbury 2	MO	$25		$5	$2		**$33**
Blue Valley 2	MO	$36	$13	$9	$3		**$62**
Blue Valley 3	MO	$72	$27	$20	$3		**$123**
Blue Valley ST1	MO	$36	$13	$9	$3		**$62**
Chamois 1	MO	$22	$7	$5	$2	$1	**$38**
Chamois 2	MO	$48	$16	$10	$3	$8	**$85**
Columbia 5	MO	$25	$9		$3		**$37**
Columbia 7	MO	$31	$11		$3		**$45**
Hawthorn 5	MO				$4	$45	**$49**
Iatan 1	MO	$333	$139	$89	$4	$70	**$635**
James River Power S	MO	$29	$10	$6	$2		**$47**
James River Power S	MO	$29	$10	$6	$2		**$47**
James River Power S	MO	$48		$10	$3		**$61**
James River Power S	MO	$60		$13	$3		**$76**
James River Power S	MO	$89	$32	$21	$3		**$145**
Labadie 1	MO	$282	$115	$84	$4	$95	**$580**
Labadie 2	MO	$282	$115	$84	$4	$96	**$580**
Labadie 3	MO	$298	$123	$90	$4	$101	**$616**
Labadie 4	MO	$298	$123	$90	$4	$101	**$616**
Lake Road 3	MO	#N/A	#N/A	#N/A	#N/A	#N/A	**#N/A**
Lake Road 4	MO	$97	$40	$27	$3	$12	**$179**
Marshall 5	MO	$25	$9		$3		**$36**
Meramec 1	MO	$103	$36	$24	$3	$19	**$184**
Meramec 2	MO	$103	$36	$24	$3	$19	**$184**
Meramec 3	MO	$175	$66	$44	$3	$38	**$326**
Meramec 4	MO	$204	$79	$52	$4	$47	**$386**
Missouri City 1	MO	$36	$13		$3	$0	**$52**

Ex 3 **Estimated Environmental Upgrade Capital Expenditures (Million 2009$)**

Plant / Unit	State	FGD Total Project Cost (Million $)	SCR Total Project Cost (Million $)	Baghouse Capital Cost (Million $)	ACI Capital Cost (Million $)	Wet Cooling Tower Capital Cost (Million $)	Total Capital Expenditures (Million $)
Missouri City 2	MO	$36	$13		$3		**$52**
Montrose 1	MO	$132	$49	$36	$3	$1	**$221**
Montrose 2	MO	$132	$49	$36	$3	$1	**$221**
Montrose 3	MO	$132	$49	$36	$3	$1	**$221**
New Madrid 1	MO	$291		$77	$4	$57	**$428**
New Madrid 2	MO	$291		$77	$4	$49	**$421**
Rush Island 1	MO	$299	$123	$90	$4	$97	**$612**
Rush Island 2	MO	$299	$123	$90	$4	$83	**$599**
Sibley 1	MO	$53	$18	$11	$3	$8	**$93**
Sibley 2	MO	$50	$17	$11	$3	$7	**$87**
Sibley 3	MO	$229	$91	$60	$4	$47	**$430**
Sikeston Power Static	MO		$62	$41	$3		**$106**
Sioux 1	MO		$114	$83	$4	$64	**$265**
Sioux 2	MO		$114	$83	$4	$65	**$265**
Southwest Power Sta	MO		$49	$36	$3		**$88**
Thomas Hill 1	MO	$125	$45	$30	$3	$10	**$214**
Thomas Hill 2	MO	$174	$66	$44	$3	$16	**$303**
Thomas Hill 3	MO	$320	$135	$87	$4	$84	**$629**

Sources: EPA IPM v4.1 Appendix 5-1a (Sargent & Lundy); EPA IPM v4.1 Appendix 5-2a (Sargent & Lundy); EPA IPM v4.1 Appendix 5-5 (Sargent & Lundy); EPA IPM v4.1 Appendix 5-3 (Sargent & Lundy); EPA Technical Development Document for 316(b)

Ex 4

Estimated Impact of Environmental Upgrades on Forward-Going Cost (2009 $/MWh)

Plant / Unit	State	Estimated Running Cost in 2010 ($/MWh)	Incremental Cost of FGD Upgrade ($/MWh)*	Incremental Cost of SCR Upgrade ($/MWh)*	Incremental Cost of Baghouse Upgrade ($/MWh)*	Incremental Cost of ACI Upgrade ($/MWh)*	Incremental Cost of Cooling Tower Upgrade ($/MWh)*	CO_2 Price**	Forward-Going Cost ($/MWh)
Asbury 1	MO	**$27.3**	$21.4	$0.9	$4.5	$0.8	$0.0	$20.0	**$81.7**
Asbury 2	MO	**$1,097.6**	$11,088.1	$515.3	$1,522.4	$702.2	$0.0	$20.0	**$16,723.6**
Blue Valley 2	MO	**$60.0**	$99.8	$29.0	$17.2	$5.4	$0.0	$20.0	**$259.3**
Blue Valley 3	MO	**$74.6**	$142.2	$45.3	$31.1	$5.2	$0.0	$20.0	**$376.7**
Blue Valley ST1	MO	**$58.3**	$86.0	$25.0	$14.7	$4.7	$0.0	$20.0	**$232.6**
Chamois 1	MO	**$32.6**	$71.0	$18.7	$9.0	$4.8	$2.8	$20.0	**$191.5**
Chamois 2	MO	**$29.0**	$23.0	$6.7	$3.6	$1.3	$2.8	$20.0	**$102.5**
Columbia 5	MO	**$108.4**	$397.8	$106.9	$2.5	$30.5	$0.0	$20.0	**$944.8**
Columbia 7	MO	**$95.2**	$239.1	$65.6	$1.7	$18.6	$0.0	$20.0	**$632.4**
Hawthorn 5	MO	**$17.5**	$2.9	$0.8	$0.2	$2.6	$1.9	$20.0	**$49.4**
Iatan 1	MO	**$17.7**	$14.8	$5.8	$3.4	$0.5	$2.7	$20.0	**$67.2**
James River Power Station 1	MO	**$37.3**	$46.8	$12.6	$6.0	$2.8	$0.0	$20.0	**$132.2**
James River Power Station 2	MO	**$37.5**	$48.2	$13.0	$6.2	$2.8	$0.0	$20.0	**$134.7**
James River Power Station 3	MO	**$36.7**	$30.6	$1.8	$4.7	$1.6	$0.0	$20.0	**$100.8**
James River Power Station 4	MO	**$36.2**	$24.8	$1.4	$4.1	$1.2	$0.0	$20.0	**$92.7**
James River Power Station 5	MO	**$34.0**	$21.3	$6.7	$3.9	$1.0	$0.0	$20.0	**$91.9**
Labadie 1	MO	**$19.4**	$13.4	$5.1	$3.3	$0.5	$3.8	$20.0	**$66.1**
Labadie 2	MO	**$19.4**	$13.3	$5.0	$3.3	$0.5	$3.8	$20.0	**$66.0**
Labadie 3	MO	**$19.4**	$13.3	$5.1	$3.3	$0.5	$3.8	$20.0	**$66.1**
Labadie 4	MO	**$19.4**	$13.3	$5.1	$3.3	$0.5	$3.8	$20.0	**$66.1**
Lake Road 3	MO	**#N/A**	#N/A	#N/A	#N/A	#N/A	#N/A	$20.0	**#N/A**
Lake Road 4	MO	**$44.0**	$36.9	$13.4	$8.3	$1.6	$3.8	$20.0	**$146.5**
Marshall 5	MO	**$46.4**	$90.4	$24.3	$0.6	$10.2	$0.0	$20.0	**$297.5**
Meramec 1	MO	**$26.0**	$24.4	$7.9	$4.8	$1.0	$3.8	$20.0	**$89.9**
Meramec 2	MO	**$26.0**	$24.3	$7.8	$4.8	$1.0	$3.8	$20.0	**$89.7**
Meramec 3	MO	**$26.1**	$20.0	$7.0	$4.3	$0.7	$3.8	$20.0	**$84.0**
Meramec 4	MO	**$25.4**	$18.8	$6.7	$4.1	$0.7	$3.8	$20.0	**$81.4**

Ex 4

Estimated Impact of Environmental Upgrades on Forward-Going Cost (2009 $/MWh)

Plant / Unit	State	Estimated Running Cost in 2010 ($/MWh)	Incremental Cost of FGD Upgrade ($/MWh)*	Incremental Cost of SCR Upgrade ($/MWh)*	Incremental Cost of Baghouse Upgrade ($/MWh)*	Incremental Cost of ACI Upgrade ($/MWh)*	Incremental Cost of Cooling Tower Upgrade ($/MWh)*	CO_2 Price**	Forward-Going Cost ($/MWh)
Missouri City 1	MO	**$93.4**	$290.4	$85.2	$2.3	$22.0	$2.6	$20.0	**$702.0**
Missouri City 2	MO	**$112.8**	$452.3	$132.7	$3.5	$31.1	$0.0	$20.0	**$1,043.0**
Montrose 1	MO	**$27.1**	$25.1	$8.5	$5.9	$0.9	$0.2	$20.0	**$91.0**
Montrose 2	MO	**$26.9**	$23.8	$8.0	$5.5	$0.9	$0.2	$20.0	**$88.5**
Montrose 3	MO	**$26.7**	$22.9	$7.7	$5.3	$0.9	$0.2	$20.0	**$86.8**
New Madrid 1	MO	**$21.6**	$11.6	$0.8	$2.5	$0.5	$1.8	$20.0	**$60.0**
New Madrid 2	MO	**$21.8**	$12.2	$0.8	$2.6	$0.5	$1.7	$20.0	**$60.8**
Rush Island 1	MO	**$23.2**	$13.9	$5.3	$3.5	$0.5	$3.8	$20.0	**$71.5**
Rush Island 2	MO	**$23.6**	$15.9	$6.1	$4.1	$0.5	$3.8	$20.0	**$75.5**
Sibley 1	MO	**$32.1**	$33.4	$9.9	$5.7	$1.7	$3.8	$20.0	**$110.1**
Sibley 2	MO	**$31.7**	$32.2	$9.5	$5.4	$1.7	$3.8	$20.0	**$107.6**
Sibley 3	MO	**$29.6**	$21.0	$7.7	$4.8	$0.7	$3.8	$20.0	**$91.4**
Sikeston Power Station 1	MO	**$19.5**	$3.4	$4.4	$2.6	$0.6	$0.0	$20.0	**$55.0**
Sioux 1	MO	**$29.2**	$3.4	$7.0	$4.7	$0.6	$3.7	$20.0	**$71.0**
Sioux 2	MO	**$29.2**	$3.4	$6.9	$4.7	$0.6	$3.7	$20.0	**$70.9**
Southwest Power Station ST1	MO	**$30.9**	$4.3	$5.5	$3.6	$0.7	$0.0	$20.0	**$72.1**
Thomas Hill 1	MO	**$22.7**	$16.1	$5.2	$3.1	$0.7	$1.1	$20.0	**$70.1**
Thomas Hill 2	MO	**$22.6**	$13.8	$4.8	$2.8	$0.6	$1.1	$20.0	**$66.9**
Thomas Hill 3	MO	**$22.1**	$11.7	$4.5	$2.6	$0.5	$2.5	$20.0	**$65.1**

Sources: EPA IPM v4.1 Appendix 5-1a (Sargent & Lundy); EPA IPM v4.1 Appendix 5-2a (Sargent & Lundy); EPA IPM v4.1 Appendix 5-5 (Sargent & Lundy); EPA IPM v4.1 Appendix 5-3 (Sargent & Lundy); EPA Technical Development Document for 316(b)

*Includes amortized capital expendatures, as well as fixed and variable O&M costs. Fixed costs distributed over net generation in 2008/2009. Assumes FGD, SCR, ACI, baghouse, and cooling towers operate at 100% utilization during operating hours. Assumes 10% capital recovery factor for all projects.

**Assumes 1 tCO_2/MWh emissions rate for coal and levelized cost of CO_2 at $20

Ex 5

Economic Merit of Existing Coal Fleet Relative to Alternative Supply and Demand Side Options (2009 $/MWh)

Plant / Unit	State	Capacity Factor, Average 2008-2010	Forward-Going Cost for Existing Coal Units* ($/MWh)	Estimated All-in Cost of a New Natural Gas CC** ($/MWh)	Estimated Cost of Existing Gas CC** ($/MWh)	Estimated Cost of Converting Station to Natural Gas** ($/MWh)	Estimated Cost of Wind @ 40% Capacity Factor ($/MWh)***	Cost of Energy Efficiency ($/MWh)****
Asbury 1	MO	70.0%	**$81.7**	$69.2	$51.5	$63.2	$84.7	$50.0
Asbury 2	MO	0.3%	**$16,723.6**	$5,190.2	$557.6	NA	$84.7	$50.0
Blue Valley 2	MO	27.7%	**$259.3**	$81.3	$55.0	NA	$54.6	$50.0
Blue Valley 3	MO	12.7%	**$376.7**	$123.2	$61.9	$97.0	$54.6	$50.0
Blue Valley ST1	MO	32.3%	**$232.6**	$76.2	$54.2	NA	$54.6	$50.0
Chamois 1	MO	47.8%	**$191.5**	$68.3	$52.6	NA	$58.7	$50.0
Chamois 2	MO	94.1%	**$102.5**	$57.2	$50.9	NA	$58.7	$50.0
Columbia 5	MO	7.9%	**$944.8**	$170.1	$69.6	NA	$54.6	$50.0
Columbia 7	MO	11.4%	**$632.4**	$132.2	$63.4	NA	$54.6	$50.0
Hawthorn 5	MO	72.5%	**$49.4**	$68.4	$51.4	$52.2	$84.7	$50.0
Iatan 1	MO	69.4%	**$67.2**	$69.4	$51.5	$51.4	$84.7	$50.0
James River Power Station 1	MO	57.8%	**$132.2**	$62.8	$52.0	NA	$54.6	$50.0
James River Power Station 2	MO	56.0%	**$134.7**	$63.4	$52.1	NA	$54.6	$50.0
James River Power Station 3	MO	64.8%	**$100.8**	$61.0	$51.7	$65.4	$54.6	$50.0
James River Power Station 4	MO	70.9%	**$92.7**	$59.7	$51.5	$61.5	$54.6	$50.0
James River Power Station 5	MO	67.1%	**$91.9**	$60.4	$51.6	$61.3	$54.6	$50.0
Labadie 1	MO	85.1%	**$66.1**	$65.0	$51.1	$53.0	$84.7	$50.0
Labadie 2	MO	85.5%	**$66.0**	$64.9	$51.1	$52.9	$84.7	$50.0
Labadie 3	MO	83.6%	**$66.1**	$65.4	$51.1	$52.8	$84.7	$50.0
Labadie 4	MO	83.7%	**$66.1**	$65.4	$51.1	$52.8	$84.7	$50.0
Lake Road 3	MO	#N/A	**#N/A**	#N/A	#N/A	#N/A	#N/A	$50.0
Lake Road 4	MO	68.5%	**$146.5**	$69.7	$51.6	$59.2	$84.7	$50.0
Marshall 5	MO	35.3%	**$297.5**	$73.7	$53.8	NA	$54.6	$50.0
Meramec 1	MO	69.4%	**$89.9**	$69.4	$51.5	$58.2	$84.7	$50.0
Meramec 2	MO	69.7%	**$89.7**	$69.3	$51.5	$57.8	$84.7	$50.0
Meramec 3	MO	67.2%	**$84.0**	$70.2	$51.6	$56.8	$84.7	$50.0
Meramec 4	MO	67.4%	**$81.4**	$70.1	$51.6	$58.2	$84.7	$50.0

Ex 5

Economic Merit of Existing Coal Fleet Relative to Alternative Supply and Demand Side Options (2009 $/MWh)

Plant / Unit	State	Capacity Factor, Average 2008-2010	Forward-Going Cost for Existing Coal Units* ($/MWh)	Estimated All-in Cost of a New Natural Gas CC** ($/MWh)	Estimated Cost of Existing Gas CC** ($/MWh)	Estimated Cost of Converting Station to Natural Gas** ($/MWh)	Estimated Cost of Wind @ 40% Capacity Factor ($/MWh)***	Cost of Energy Efficiency ($/MWh)****
Missouri City 1	MO	10.0%	**$702.0**	$144.5	$65.4	NA	$54.6	$50.0
Missouri City 2	MO	6.4%	**$1,043.0**	$200.3	$74.6	NA	$54.6	$50.0
Montrose 1	MO	61.9%	**$91.0**	$72.3	$51.8	$59.0	$84.7	$50.0
Montrose 2	MO	65.5%	**$88.5**	$70.8	$51.7	$58.2	$84.7	$50.0
Montrose 3	MO	68.2%	**$86.8**	$69.8	$51.6	$57.9	$84.7	$50.0
New Madrid 1	MO	72.6%	**$60.0**	$60.6	$51.4	$51.7	$58.7	$50.0
New Madrid 2	MO	68.6%	**$60.8**	$61.4	$51.6	$52.0	$58.7	$50.0
Rush Island 1	MO	79.6%	**$71.5**	$66.4	$51.2	$55.7	$84.7	$50.0
Rush Island 2	MO	68.2%	**$75.5**	$69.8	$51.6	$57.1	$84.7	$50.0
Sibley 1	MO	70.0%	**$110.1**	$69.2	$51.5	$62.8	$84.7	$50.0
Sibley 2	MO	75.6%	**$107.6**	$67.5	$51.3	$62.1	$84.7	$50.0
Sibley 3	MO	57.0%	**$91.4**	$74.6	$52.0	$56.4	$84.7	$50.0
Sikeston Power Station 1	MO	79.6%	**$55.0**	$58.1	$51.2	$51.7	$54.6	$50.0
Sioux 1	MO	59.8%	**$71.0**	$73.2	$51.9	$54.9	$84.7	$50.0
Sioux 2	MO	60.2%	**$70.9**	$73.0	$51.9	$54.9	$84.7	$50.0
Southwest Power Station ST1	MO	65.5%	**$72.1**	$60.8	$51.7	$62.2	$54.6	$50.0
Thomas Hill 1	MO	75.7%	**$70.1**	$60.0	$51.3	$53.1	$58.7	$50.0
Thomas Hill 2	MO	76.6%	**$66.9**	$59.8	$51.3	$52.2	$58.7	$50.0
Thomas Hill 3	MO	71.5%	**$65.1**	$60.8	$51.5	$49.9	$58.7	$50.0

Sources: EIA Form 860 2010, EIA Form 923 5A 2010 derivation; AEO 2011, AEO 2012; AEO 2011, AEO 2012; EPA IPM v4.1 Supplement (Sargent & Lundy); NREL 2012. "Levelized Cost of Energy from U.S. Wind Power Projects"

*Includes $20/t$CO_2$ cost

**Includes $20/t$CO_2$ cost; assumes that gas unit runs at same capacity factor as coal unit

***Assumed capacity factor of 40% & 10% CRF

****Assumed cost of energy efficiency

Ex Sources

Exhibit	Column Title	Source
Ex1	Nameplate Capacity (MW)	EIA Form 860 2010
Ex1	First Year of Operation	EIA Form 860 2010
Ex1	Plant Coal Heat Rate (mmbtu/MWh)	EIA 923 2010
Ex1	Capacity Factor (2008-2010)	EIA Form 860 2010, EIA Form 923 5A 2010 derivation
Ex1	Estimated Fuel Cost ($/MWh)	EIA Form 923 5A 2010 derivation
Ex1	Estimated Fixed O&M Costs ($/kw-yr)	NERC EPA Analysis 2010 Assumptions
Ex1	Estimated Variable O&M Costs ($/MWh)	NERC EPA Analysis 2010 Assumptions
Ex1	Estimated Running Cost in 2010 ($/MWh)	Sum based on Exhibit 1
Ex2	Nameplate Capacity (MW)	EIA Form 860 2010
Ex2	Boiler SO2 Control Processes1	EPA Clean Air Markets Dataset (CAMD) 2011 Unit Characteristics Report
Ex2	Boiler NOX Control Processes1	EPA Clean Air Markets Dataset (CAMD) 2011 Unit Characteristics Report
Ex2	Boiler Mercury Control Processes2	EIA Form 860 2010
Ex2	Boiler PM Control Processes1	EPA Clean Air Markets Dataset (CAMD) 2011 Unit Characteristics Report
Ex2	Boiler Cooling Type3	EIA Form 860 2010
Ex3	FGD Total Project Cost (Million $)	EPA IPM v4.1 Appendix 5-1a (Sargent & Lundy)
Ex3	SCR Total Project Cost (Million $)	EPA IPM v4.1 Appendix 5-2a (Sargent & Lundy)
Ex3	Baghouse Capital Cost (Million $)	EPA IPM v4.1 Appendix 5-5 (Sargent & Lundy)
Ex3	ACI Capital Cost (Million $)	EPA IPM v4.1 Appendix 5-3 (Sargent & Lundy)
Ex3	Wet Cooling Tower Capital Cost (Million $)	2011 EPA Technical Development Document for 316(b)
Ex3	Total Capital Expenditures (Million $)	Sum based on Exhibit 3
Ex4	Estimated Running Cost in 2010 ($/MWh)	Sum based on Exhibit 1
Ex4	Incremental Cost of FGD Upgrade ($/MWh)	EPA IPM v4.1 Appendix 5-1a (Sargent & Lundy)
Ex4	Incremental Cost of SCR Upgrade ($/MWh)	EPA IPM v4.1 Appendix 5-2a (Sargent & Lundy)
Ex4	Incremental Cost of Baghouse Upgrade ($/MWh)	EPA IPM v4.1 Appendix 5-5 (Sargent & Lundy)
Ex4	Incremental Cost of ACI Upgrade ($/MWh)	EPA IPM v4.1 Appendix 5-3 (Sargent & Lundy)
Ex4	Incremental Cost of Cooling Tower Upgrade ($/MWh)	2011 EPA Technical Development Document for 316(b)
Ex4	CO2 Price	User input
Ex4	Forward-Going Cost ($/MWh)	Sum based on Exhibit 4
Ex5	Capacity Factor, Average 2008-2010	EIA Form 860 2010, EIA Form 923 5A 2010 derivation
Ex5	Forward-Going Cost for Existing Coal Units ($/MWh)	Sum based on Exhibit 4
Ex5	Estimated All-in Cost of a New Natural Gas CC ($/MWh)	AEO 2011 (Capital and O&M Costs), AEO 2012 (Fuel Costs)
Ex5	Estimated Cost of Existing Gas CC ($/MWh)	AEO 2011 (Capital and O&M Costs), AEO 2012 (Fuel Costs)
Ex5	Estimated Cost of Converting Station to Natural Gas ($/MWh)	EPA IPM v4.1 Supplement (Sargent & Lundy)
Ex5	Estimated Cost of Wind @ 40% Capacity Factor ($/MWh)	NREL 2012. "Recent developments in the Levelized Cost of Energy from U.S. Wind Power Projects"
Ex5	Cost of Energy Efficiency ($/MWh)	User input