

FILED

APR 15 2010

Illustrative Retail Rat Impact Model for Missouri Utility to meet Prop-C

Missouri Public
Service Commission

Inflation Assumption 2.50%

		2010	2011	2012	2013	2014	2015	2016	2017	2018
Renewable Energy Requirements										
Retail Sales (GWh)	Load Growth Rate 1.0%	35,000	35,350	35,704	36,061	36,421	36,785	37,153	37,525	37,900
RPS Requirement		0%	2%	2%	2%	5%	5%	5%	5%	10%
Total RPS Needs (GWh)			707	714	721	1,821	1,839	1,858	1,876	3,790
Solar RPS, 2% of Total (GWh)			14	14	14	36	37	37	38	76
Non-Renewable Retail Sales		35,000	34,643	34,989	35,339	34,600	34,946	35,296	35,649	34,110

Admin & Rebate Costs										
Administrative Costs Estimates (Millions)			\$1.00	\$1.03	\$1.05	\$1.08	\$1.10	\$1.13	\$1.16	\$1.19
	Avg Rebate \$3,000									
# of Solar Rebate Customer			25	30	35	40	45	50	55	60
Solar Rebate Cost Estimates (Millions)			\$0.08	\$0.09	\$0.11	\$0.13	\$0.15	\$0.17	\$0.20	\$0.22

RENEWABLE BUILD PROCUREMENT (WIND/SOLAR)

WIND		2010 Capital cost								
Wind Capital Costs (\$/kW)	\$2,000	\$2,000	\$2,050	\$2,101	\$2,154	\$2,208	\$2,263	\$2,319	\$2,377	\$2,437
Wind Fixed O&M (\$/KW-Yr)	\$28	\$28	\$29	\$29	\$30	\$31	\$32	\$32	\$33	\$34
Annual Energy Capacity Factor for Wind		33%	33%	33%	33%	33%	33%	33%	33%	33%
Prop-C Driven Capacity Needed (MW)			240	242	244	617	624	630	636	1,285
Capacity Project 1			244							
Capacity Project 2						392				
Capacity Project 3										675
Capacity Project 4										
Total Capacity Level of Resources (8% for Wind)			20	20	20	51	51	51	51	105
Total Capital Cost of Project (Millions)			\$501			\$864				\$1,644
Levelized Capital Cost of Wind Project 1 (Millions)	Levelized Fixed Charge Rate 15%		\$75.2	\$75.2	\$75.2	\$75.2	\$75.2	\$75.2	\$75.2	\$75.2
Fixed Wind O&M Cost Project 1 (Millions)			\$7.0	\$7.2	\$7.4	\$7.6	\$7.7	\$7.9	\$8.1	\$8.3
Levelized Capital Cost of Wind Project 2 (Millions)						\$129.7	\$129.7	\$129.7	\$129.7	\$129.7
Fixed Wind O&M Cost Project 2 (Millions)						\$12.1	\$12.4	\$12.7	\$13.0	\$13.4
Levelized Capital Cost of Wind Project 3 (Millions)										\$246.6
Fixed Wind O&M Cost Project 3 (Millions)										\$23.0
Levelized Capital Cost of Wind Project 4 (Millions)										
Fixed Wind O&M Cost Project 4 (Millions)										
Annual Cost for Wind (Millions)			\$82.2	\$82.4	\$82.6	\$224.5	\$225.0	\$225.5	\$226.0	\$496.1
SOLAR										
Solar Capital Costs (\$/kW)		\$6,000	\$6,150	\$6,304	\$6,461	\$6,623	\$6,788	\$6,958	\$7,132	\$7,310
Annual Energy Capacity Factor for Solar		20%	20%	20%	20%	20%	20%	20%	20%	20%
Prop-C Driven Solar Capacity Needed (MW)			8.1	8.2	8.2	20.8	21.0	21.2	21.4	43.3
Capacity Project 1			8.2							
Capacity Project 2						13.2				
Capacity Project 3										22.7

Hearing Exhibit No. 1
Date 4/16/10 Reporter MM
File No. EX-2010-0169

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Capacity Project 4										
Regulatory Capacity of Solar Resources (20% for Solar)	1.6	1.6	1.6	4.3	4.3	4.3	4.3	8.8		
Total Solar Capital Cost of Project (Millions)	\$51			\$87				\$166		
Levelized Capital Cost of Solar Project 1 (Millions)	\$8	\$8	\$8	\$8	\$8	\$8	\$8	\$8		
Levelized Capital Cost of Solar Project 2 (Millions)				\$13	\$13	\$13	\$13	\$13		
Levelized Capital Cost of Solar Project 3 (Millions)									\$25	
Levelized Capital Cost of Solar Project 4 (Millions)									\$25	
Total Levelized Annual Cost for Solar (Millions)	\$8	\$8	\$8	\$21	\$21	\$21	\$21	\$21	\$46	
Market Value of Energy & Capacity from Prop-C Resources										
ATC Market Value for Energy (\$/MWh)	\$40	\$41	\$42	\$43	\$44	\$45	\$46	\$48	\$49	
Carbon Assumption (\$/Short Ton)					\$20	\$21	\$21	\$22	\$22	
ATC Market-Carbon Adjusted (60% Carbon flows to ATC)	\$40	\$41	\$42	\$43	\$56	\$58	\$59	\$60	\$62	
Market Value for Capacity (\$/KW-Yr)	\$25	\$35	\$45	\$55	\$65	\$75	\$75	\$77	\$79	
Prop-C Capacity Project 1 (Wind & Solar)	21	21	21	21	21	21	21	21	21	
Prop-C Capacity Project 1 (Wind & Solar)				34	34	34	34	34	34	
Prop-C Capacity Project 1 (Wind & Solar)									59	
Prop-C Capacity Project 1 (Wind & Solar)										
Prop-C Energy Level 1 (Wind & Solar)	721	721	721	721	721	721	721	721	721	
Prop-C Energy Level 1 (Wind & Solar)				1,155	1,155	1,155	1,155	1,155	1,155	
Prop-C Energy Level 1 (Wind & Solar)									1,990	
Prop-C Energy Level 1 (Wind & Solar)										
Total Prop-C Energy Produced (Wind & Solar)	721	\$721	\$721	1,876	1,876	1,876	1,876	1,876	3,866	
Total Prop-C Energy & Capacity Market Value (Millions)										
Prop-C Level 1 (Wind & Solar)	\$30.1	\$31.1	\$32.0	\$41.7	\$42.9	\$44.1	\$45.2	\$46.4		
Prop-C Level 1 (Wind & Solar)				\$52.9	\$54.5	\$56.1	\$57.5	\$59.0		
Prop-C Level 1 (Wind & Solar)									\$128.0	
Prop-C Level 1 (Wind & Solar)										
RETAIL IMPACT TEST										
Revenue Requirement Under Non-Renewable Case										
Net Base Revenue Requirement (Projected)	Percent increase 2.0%	\$2,000	\$2,040	\$2,081	\$2,122	\$2,165	\$2,208	\$2,252	\$2,297	\$2,343
Revenue Requirement Under Renewable Case										
Total Prop-C Revenue Requirement Project 1		\$60.77	\$60.04	\$59.29	\$49.88	\$48.89	\$47.88	\$47.03	\$46.15	
Total Prop-C Revenue Requirement Project 2					\$102.00	\$100.69	\$99.35	\$98.26	\$97.15	
Total Prop-C Revenue Requirement Project 3										\$166.55
Total Prop-C Revenue Requirement Project 4										
Rate increase needed to meet Prop-C		2.98%			4.71%					7.11%
% ALLOWABLE RENEWABLE IMPACT		1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
CAN RPS BE MET UNDER 1% RATE CAP		No			No					No

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2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
38,279	38,662	39,048	39,439	39,833	40,232	40,634	41,040	41,451	41,865	42,284	42,707
10%	10%	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%
3,828	3,866	5,857	5,916	5,975	6,035	6,095	6,156	6,218	6,280	6,343	6,406
77	77	117	118	119	121	122	123	124	126	127	128
34,451	34,796	33,191	33,523	33,858	34,197	34,539	34,884	35,233	35,585	35,941	36,301
\$1.22	\$1.25	\$1.28	\$1.31	\$1.34	\$1.38	\$1.41	\$1.45	\$1.48	\$1.52	\$1.56	\$1.60
65	70	75	80	85	90	95	100	105	110	115	120
\$0.24	\$0.27	\$0.30	\$0.32	\$0.35	\$0.38	\$0.41	\$0.45	\$0.48	\$0.51	\$0.55	\$0.59
\$2,498	\$2,560	\$2,624	\$2,690	\$2,757	\$2,826	\$2,897	\$2,969	\$3,043	\$3,119	\$3,197	\$3,277
\$35	\$36	\$37	\$38	\$39	\$40	\$41	\$42	\$43	\$44	\$45	\$46
33%	33%	33%	33%	33%	33%	33%	33%	33%	33%	33%	33%
1,298	1,311	1,986	2,006	2,026	2,046	2,066	2,087	2,108	2,129	2,150	2,172
		861									
105	105	174	174	174	174	174	174	174	174	174	174
		\$2,259									
\$75.2	\$75.2	\$75.2	\$50.1	\$50.1	\$50.1	\$50.1	\$50.1	\$50.1	\$50.1	\$50.1	\$50.1
\$8.5	\$8.8	\$9.0	\$9.2	\$9.4	\$9.7	\$9.9	\$10.2	\$10.4	\$10.7	\$10.9	\$11.2
\$129.7	\$129.7	\$129.7	\$129.7	\$129.7	\$129.7	\$129.7	\$129.7	\$129.7	\$129.7	\$129.7	\$129.7
\$13.7	\$14.0	\$14.4	\$14.7	\$15.1	\$15.5	\$15.9	\$16.3	\$16.7	\$17.1	\$17.5	\$18.0
\$246.6	\$246.6	\$246.6	\$246.6	\$246.6	\$246.6	\$246.6	\$246.6	\$246.6	\$246.6	\$246.6	\$246.6
\$23.6	\$24.2	\$24.8	\$25.4	\$26.0	\$26.7	\$27.4	\$28.0	\$28.7	\$29.5	\$30.2	\$31.0
		\$338.9	\$338.9	\$338.9	\$338.9	\$338.9	\$338.9	\$338.9	\$338.9	\$338.9	\$338.9
		\$31.6	\$32.4	\$33.2	\$34.1	\$34.9	\$35.8	\$36.7	\$37.6	\$38.5	\$39.5
\$497.3	\$498.4	\$870.1	\$847.1	\$849.1	\$851.2	\$853.4	\$855.6	\$857.8	\$860.1	\$862.5	\$864.9
\$7,493	\$7,681	\$7,873	\$8,069	\$8,271	\$8,478	\$8,690	\$8,907	\$9,130	\$9,358	\$9,592	\$9,832
20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
43.7	44.1	66.9	67.5	68.2	68.9	69.6	70.3	71.0	71.7	72.4	73.1

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		29.0									
8.8	8.8	14.6	14.6	14.6	14.6	14.6	14.6	14.6	14.6	14.6	14.6
		\$228									
\$8	\$8	\$8	\$8	\$8	\$8	\$8	\$8	\$8	\$8	\$8	\$8
\$13	\$13	\$13	\$13	\$13	\$13	\$13	\$13	\$13	\$13	\$13	\$13
\$25	\$25	\$25	\$25	\$25	\$25	\$25	\$25	\$25	\$25	\$25	\$25
		\$34	\$34	\$34	\$34	\$34	\$34	\$34	\$34	\$34	\$34
\$46	\$46	\$80	\$80	\$80	\$80	\$80	\$80	\$80	\$80	\$80	\$80
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\$50	\$51	\$52	\$54	\$55	\$57	\$58	\$59	\$61	\$62	\$64	\$66
\$23	\$23	\$24	\$24	\$25	\$26	\$26	\$27	\$28	\$28	\$29	\$30
\$64	\$65	\$67	\$68	\$70	\$72	\$74	\$76	\$77	\$79	\$81	\$83
\$81	\$83	\$85	\$87	\$89	\$91	\$94	\$96	\$98	\$101	\$103	\$106
21	21	21	21	21	21	21	21	21	21	21	21
34	34	34	34	34	34	34	34	34	34	34	34
59	59	59	59	59	59	59	59	59	59	59	59
		75	75	75	75	75	75	75	75	75	75
721	721	721	721	721	721	721	721	721	721	721	721
1,155	1,155	1,155	1,155	1,155	1,155	1,155	1,155	1,155	1,155	1,155	1,155
1,990	1,990	1,990	1,990	1,990	1,990	1,990	1,990	1,990	1,990	1,990	1,990
		2,540	2,540	2,540	2,540	2,540	2,540	2,540	2,540	2,540	2,540
3,866	3,866	6,406	6,406	6,406	6,406	6,406	6,406	6,406	6,406	6,406	6,406
\$47.5	\$48.7	\$49.9	\$51.2	\$52.5	\$53.8	\$55.1	\$56.5	\$57.9	\$59.4	\$60.8	\$62.4
\$60.4	\$62.0	\$63.5	\$65.1	\$66.7	\$68.4	\$70.1	\$71.8	\$73.6	\$75.5	\$77.4	\$79.3
\$131.1	\$134.4	\$137.8	\$141.2	\$144.8	\$148.4	\$152.1	\$155.9	\$159.8	\$163.8	\$167.9	\$172.1
		\$175.9	\$180.3	\$184.8	\$189.4	\$194.1	\$199.0	\$203.9	\$209.0	\$214.3	\$219.6
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\$2,390	\$2,438	\$2,487	\$2,536	\$2,587	\$2,639	\$2,692	\$2,746	\$2,800	\$2,856	\$2,914	\$2,972
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\$45.26	\$44.34	\$43.40	\$17.37	\$16.38	\$15.37	\$14.33	\$13.27	\$12.18	\$11.07	\$9.93	\$8.76
\$96.01	\$94.84	\$93.65	\$92.42	\$91.16	\$89.87	\$88.55	\$87.19	\$85.80	\$84.38	\$82.92	\$81.42
\$163.93	\$161.24	\$158.49	\$155.66	\$152.77	\$149.80	\$146.75	\$143.64	\$140.44	\$137.16	\$133.81	\$130.36
		\$230.50	\$226.95	\$223.32	\$219.59	\$215.78	\$211.86	\$207.85	\$203.75	\$199.53	\$195.22
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		9.27%									
1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
		No									