

Executive Summary Table - 2017								
2017	Electric Participants	Electric Budget	Generator kW	Generator kWh	Participant Test Ratio	Utility Test Ratio	Ratepayer Impact Measure Test Ratio	TRC Ratio
Business Segment								
Lighting Efficiency	2,140	\$ 389,520.00	552	4,192,955	2.18	5.46	0.62	1.27
Business Saver's Switch	12	\$ 30,950.00	34	85	INF	1.05	0.51	1.05
Peak and Energy Control	1	\$ 10,000.00	102	3,707	INF	4.17	1.67	4.17
Business Segment Total	2,153	\$ 430,470.00	689	4,196,747	2.21	5.12	0.63	1.285
Residential Segment								
Ground Source Heat Pump	12	\$ 25,050.00	20	98,404	1.17	2.76	0.50	0.64
Home Lighting	3,772	\$ 97,340.00	112	1,065,912	6.36	4.19	0.39	1.87
Residential Saver's Switch	770	\$ 181,650.00	565	1,486	INF	2.97	0.76	2.97
Consumer Education	68,000	\$ 27,165.00	0	0				-
Residential Segment Total	72,554	\$ 331,205.00	696	1,165,801	6.16	3.07	0.53	1.833
Planning Segment								
Regulatory Affairs	0	\$ 14,000.00	0	0				-
Planning Segment Total	0	\$ 14,000.00	0	0				-
PORTFOLIO TOTAL								
PORTFOLIO Tests with Regulatory Affairs	74,708	\$ 761,675.00	1,385	5,362,548	3.07	4.67	0.61	1.41
PORTFOLIO Tests with Regulatory Affairs	74,708	\$ 775,675.00	1,385	5,362,548	2.80	4.15	0.59	1.40

LIGHTING EFFICIENCY						2017 ELECTRIC		GOAL
2017 Net Present Cost Benefit Summary Analysis For All Participants						Input Summary and Totals		
	Participant Test (\$Total)	Utility Test (\$Total)	Rate Impact Test (\$Total)	Total Resource Test (\$Total)	Societal Test (\$Total)	Program "Inputs" per Customer kW		
Benefits						Lifetime (Weighted on Generator kWh)	A	16.7 years
Avoided Revenue Requirements						Annual Hours	B	8760
Generation	N/A	\$308,026	\$308,026	\$308,026	\$308,026	Gross Customer kW	C	1 kW
T & D	N/A	\$185,979	\$185,979	\$185,979	\$185,979	Generator Peak Coincidence Factor	D	65.10%
Marginal Energy	N/A	\$1,633,731	\$1,633,731	\$1,633,731	\$1,633,731	Gross Load Factor at Customer	E	58.06%
Environmental Externality	N/A	N/A	N/A	N/A	\$0	Transmission Loss Factor (Energy)	F	4.710%
Subtotal	N/A	\$2,127,736	\$2,127,736	\$2,127,736	\$2,127,736	Transmission Loss Factor (Demand)	G	7.380%
Participant Benefits						Societal Net Benefit (Cost)	H	\$677
Bill Reduction - Electric	\$3,034,745	N/A	N/A	N/A	N/A	Program Summary per Participant		
Rebates from Xcel Energy	\$346,015	N/A	N/A	\$346,015	\$346,015	Gross kW Saved at Customer	I	0.37 kW
Incremental Capital Savings	\$0	N/A	N/A	\$0	\$0	Net coincident kW Saved at Generator	$(I \times D) / (1 - G)$	
Incremental O&M Savings	\$0	N/A	N/A	\$0	\$0	Gross Annual kWh Saved at Customer	$(B \times E \times I)$	
Subtotal	\$3,380,760	N/A	N/A	\$346,015	\$346,015	Net Annual kWh Saved at Generator	$(B \times E \times I) / (1 - F)$	
Total Benefits	\$3,380,760	\$2,127,736	\$2,127,736	\$2,473,751	\$2,473,751	Program Summary All Participants		
Costs						Total Participants	J	2,140
Utility Project Costs						Total Budget	K	\$389,520
Customer Services	N/A	\$36,005	\$36,005	\$36,005	\$36,005	Gross kW Saved at Customer	$(J \times I)$	
Utility Administration	N/A	\$3,500	\$3,500	\$3,500	\$3,500	Net coincident kW Saved at Generator	$(I \times D) / (1 - G) \times J$	
Advertising & Promotion	N/A	\$4,000	\$4,000	\$4,000	\$4,000	Gross Annual kWh Saved at Customer	$(B \times E \times I) \times J$	
Measurement & Verification	N/A	\$0	\$0	\$0	\$0	Net Annual kWh Saved at Generator	$((B \times E \times I) / (1 - F)) \times J$	
Rebates	N/A	\$346,015	\$346,015	\$346,015	\$346,015	Societal Net Benefits	$(J \times I \times H)$	
Other	N/A	\$0	\$0	\$0	\$0	Utility Program Cost per kWh Lifetime		
Subtotal	N/A	\$389,520	\$389,520	\$389,520	\$389,520	Utility Program Cost per kW at Gen		
Utility Revenue Reduction								\$0.0056
Revenue Reduction - Electric	N/A	N/A	\$3,034,745	N/A	N/A			\$705
Subtotal	N/A	N/A	\$3,034,745	N/A	N/A			
Participant Costs								
Incremental Capital Costs	\$1,492,614	N/A	N/A	\$1,492,614	\$1,492,614			
Incremental O&M Costs	\$59,858	N/A	N/A	\$59,858	\$59,858			
Subtotal	\$1,552,471	N/A	N/A	\$1,552,471	\$1,552,471			
Total Costs	\$1,552,471	\$389,520	\$3,424,265	\$1,941,991	\$1,941,991			
Net Benefit (Cost)	\$1,828,289	\$1,738,216	(\$1,296,529)	\$531,760	\$531,760			
Benefit/Cost Ratio	2.18	5.46	0.62	1.27	1.27			

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

2017 SD DSM Plan Cost-Effectiveness Analysis

BUSINESS SAVER'S SWITCH						2017	ELECTRIC	GOAL
2017 Net Present Cost Benefit Summary Analysis For All Participants						Input Summary and Totals		
	Participant Test (\$Total)	Utility Test (\$Total)	Rate Impact Test (\$Total)	Total Resource Test (\$Total)	Societal Test (\$Total)	Program "Inputs" per Customer kW		
Benefits						Lifetime (Weighted on Generator kWh)	A	15.0 years
Avoided Revenue Requirements						Annual Hours	B	8760
Generation	N/A	\$20,228	\$20,228	\$20,228	\$20,228	Gross Customer kW	C	1 kW
T & D	N/A	\$12,213	\$12,213	\$12,213	\$12,213	Generator Peak Coincidence Factor	D	19.67%
Marginal Energy	N/A	\$51	\$51	\$51	\$51	Gross Load Factor at Customer	E	0.01%
Environmental Externality	N/A	N/A	N/A	N/A	\$0	Transmission Loss Factor (Energy)	F	4.710%
Subtotal	N/A	\$32,493	\$32,493	\$32,493	\$32,493	Transmission Loss Factor (Demand)	G	7.380%
						Societal Net Benefit (Cost)	H	\$10
Participant Benefits						Program Summary per Participant		
Bill Reduction - Electric	\$32,347	N/A	N/A	N/A	N/A	Gross kW Saved at Customer	I	13.45 kW
Rebates from Xcel Energy	\$0	N/A	N/A	\$0	\$0	Net coincident kW Saved at Generator	$(I \times D) / (1 - G)$	
Incremental Capital Savings	\$0	N/A	N/A	\$0	\$0	Gross Annual kWh Saved at Customer	$(B \times E \times I)$	
Incremental O&M Savings	\$0	N/A	N/A	\$0	\$0	Net Annual kWh Saved at Generator	$(B \times E \times I) / (1 - F)$	
Subtotal	\$32,347	N/A	N/A	\$0	\$0	Program Summary All Participants		
Total Benefits	\$32,347	\$32,493	\$32,493	\$32,493	\$32,493	Total Participants	J	12
Costs						Total Budget	K	\$30,950
Utility Project Costs						Gross kW Saved at Customer	$(J \times I)$	161 kW
Customer Services	N/A	\$17,700	\$17,700	\$17,700	\$17,700	Net coincident kW Saved at Generator	$(I \times D) / (1 - G) \times J$	
Utility Administration	N/A	\$11,750	\$11,750	\$11,750	\$11,750	Gross Annual kWh Saved at Customer	$(B \times E \times I) \times J$	
Advertising & Promotion	N/A	\$1,500	\$1,500	\$1,500	\$1,500	Net Annual kWh Saved at Generator	$((B \times E \times I) / (1 - F)) \times J$	
Measurement & Verification	N/A	\$0	\$0	\$0	\$0	Societal Net Benefits	$(J \times I \times H)$	
Rebates	N/A	\$0	\$0	\$0	\$0	Utility Program Cost per kWh Lifetime		
Other	N/A	\$0	\$0	\$0	\$0	Utility Program Cost per kW at Gen		
Subtotal	N/A	\$30,950	\$30,950	\$30,950	\$30,950			\$24.3854
								\$903
Utility Revenue Reduction								
Revenue Reduction - Electric	N/A	N/A	\$32,347	N/A	N/A			
Subtotal	N/A	N/A	\$32,347	N/A	N/A			
Participant Costs								
Incremental Capital Costs	\$0	N/A	N/A	\$0	\$0			
Incremental O&M Costs	\$0	N/A	N/A	\$0	\$0			
Subtotal	\$0	N/A	N/A	\$0	\$0			
Total Costs	\$0	\$30,950	\$63,297	\$30,950	\$30,950			
Net Benefit (Cost)	\$32,347	\$1,543	(\$30,805)	\$1,543	\$1,543			
Benefit/Cost Ratio	INF	1.05	0.51	1.05	1.05			

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

2017 SD DSM Plan Cost-Effectiveness Analysis

PEAK AND ENERGY CONTROL						2017	ELECTRIC	GOAL	
2017 Net Present Cost Benefit Summary Analysis For All Participants						Input Summary and Totals			
	Participant Test (\$Total)	Utility Test (\$Total)	Rate Impact Test (\$Total)	Total Resource Test (\$Total)	Societal Test (\$Total)	Program "Inputs" per Customer kW			
Benefits						Lifetime (Weighted on Generator kWh)	A	5.0 years	
Avoided Revenue Requirements						Annual Hours	B	8760	
Generation	N/A	\$25,385	\$25,385	\$25,385	\$25,385	Gross Customer kW	C	1 kW	
T & D	N/A	\$15,325	\$15,325	\$15,325	\$15,325	Generator Peak Coincidence Factor	D	47.46%	
Marginal Energy	N/A	\$1,017	\$1,017	\$1,017	\$1,017	Gross Load Factor at Customer	E	0.20%	
Environmental Externality	N/A	N/A	N/A	N/A	\$0	Transmission Loss Factor (Energy)	F	4.710%	
Subtotal	N/A	\$41,727	\$41,727	\$41,727	\$41,727	Transmission Loss Factor (Demand)	G	7.380%	
Participant Benefits						Societal Net Benefit (Cost)	H	\$159	
Bill Reduction - Electric	\$14,929	N/A	N/A	N/A	N/A	Program Summary per Participant			
Rebates from Xcel Energy	\$0	N/A	N/A	\$0	\$0	Gross kW Saved at Customer	I	200.00 kW	
Incremental Capital Savings	\$0	N/A	N/A	\$0	\$0	Net coincident kW Saved at Generator	$(I \times D) / (1 - G)$		102.48 kW
Incremental O&M Savings	\$0	N/A	N/A	\$0	\$0	Gross Annual kWh Saved at Customer	$(B \times E \times I)$		3,532 kWh
Subtotal	\$14,929	N/A	N/A	\$0	\$0	Net Annual kWh Saved at Generator	$(B \times E \times I) / (1 - F)$		3,707 kWh
Total Benefits	\$14,929	\$41,727	\$41,727	\$41,727	\$41,727	Program Summary All Participants			
Costs						Total Participants	J	1	
Utility Project Costs						Total Budget	K	\$10,000	
Customer Services	N/A	\$3,200	\$3,200	\$3,200	\$3,200	Gross kW Saved at Customer	$(J \times I)$		200 kW
Utility Administration	N/A	\$1,800	\$1,800	\$1,800	\$1,800	Net coincident kW Saved at Generator	$(I \times D) / (1 - G) \times J$		102 kW
Advertising & Promotion	N/A	\$5,000	\$5,000	\$5,000	\$5,000	Gross Annual kWh Saved at Customer	$(B \times E \times I) \times J$		3,532 kWh
Measurement & Verification	N/A	\$0	\$0	\$0	\$0	Net Annual kWh Saved at Generator	$((B \times E \times I) / (1 - F)) \times J$		3,707 kWh
Rebates	N/A	\$0	\$0	\$0	\$0	Societal Net Benefits	$(J \times I \times H)$		\$31,727
Other	N/A	\$0	\$0	\$0	\$0	Utility Program Cost per kWh Lifetime			\$0.5396
Subtotal	N/A	\$10,000	\$10,000	\$10,000	\$10,000	Utility Program Cost per kW at Gen			\$98
Utility Revenue Reduction									
Revenue Reduction - Electric	N/A	N/A	\$14,929	N/A	N/A				
Subtotal	N/A	N/A	\$14,929	N/A	N/A				
Participant Costs									
Incremental Capital Costs	\$0	N/A	N/A	\$0	\$0				
Incremental O&M Costs	\$0	N/A	N/A	\$0	\$0				
Subtotal	\$0	N/A	N/A	\$0	\$0				
Total Costs	\$0	\$10,000	\$24,929	\$10,000	\$10,000				
Net Benefit (Cost)	\$14,929	\$31,727	\$16,798	\$31,727	\$31,727				
Benefit/Cost Ratio	INF	4.17	1.67	4.17	4.17				

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

BUSINESS SEGMENT TOTAL						2017	ELECTRIC	GOAL
2017 Net Present Cost Benefit Summary Analysis For All Participants						Input Summary and Totals		
	Participant	Utility	Rate	Total	Societal	Program "Inputs" per Customer kW		
	Test	Test	Impact	Resource	Test	Lifetime (Weighted on Generator kWh)	A	16.7 years
	(\$Total)	(\$Total)	(\$Total)	(\$Total)	(\$Total)	Annual Hours	B	8760
Benefits						Gross Customer kW	C	1 kW
Avoided Revenue Requirements						Generator Peak Coincidence Factor	D	55.64%
Generation	N/A	\$353,639	\$353,639	\$353,639	\$353,639	Gross Load Factor at Customer	E	39.80%
T & D	N/A	\$213,517	\$213,517	\$213,517	\$213,517	Transmission Loss Factor (Energy)	F	4.710%
Marginal Energy	N/A	\$1,634,799	\$1,634,799	\$1,634,799	\$1,634,799	Transmission Loss Factor (Demand)	G	7.380%
Environmental Externality	N/A	N/A	N/A	N/A	\$0	Societal Net Benefit (Cost)	H	\$493
Subtotal	N/A	\$2,201,956	\$2,201,956	\$2,201,956	\$2,201,956	Program Summary per Participant		
Participant Benefits						Gross kW Saved at Customer	I	0.53 kW
Bill Reduction - Electric	\$3,082,021	N/A	N/A	N/A	N/A	Net coincident kW Saved at Generator	$(I \times D) / (1 - G)$	
Rebates from Xcel Energy	\$346,015	N/A	N/A	\$346,015	\$346,015	Gross Annual kWh Saved at Customer	$(B \times E \times I)$	
Incremental Capital Savings	\$0	N/A	N/A	\$0	\$0	Net Annual kWh Saved at Generator	$(B \times E \times I) / (1 - F)$	
Incremental O&M Savings	\$0	N/A	N/A	\$0	\$0	Program Summary All Participants		
Subtotal	\$3,428,036	N/A	N/A	\$346,015	\$346,015	Total Participants	J	2,153
Total Benefits						Total Budget	K	\$430,470
	\$3,428,036	\$2,201,956	\$2,201,956	\$2,547,971	\$2,547,971	Gross kW Saved at Customer	$(J \times I)$	1,147 kW
Costs						Net coincident kW Saved at Generator	$(I \times D) / (1 - G) \times J$	
Utility Project Costs						Gross Annual kWh Saved at Customer	$(B \times E \times I) \times J$	
Customer Services	N/A	\$56,905	\$56,905	\$56,905	\$56,905	Net Annual kWh Saved at Generator	$((B \times E \times I) / (1 - F)) \times J$	
Utility Administration	N/A	\$17,050	\$17,050	\$17,050	\$17,050	Societal Net Benefits	$(J \times I \times H)$	
Advertising & Promotion	N/A	\$10,500	\$10,500	\$10,500	\$10,500	Utility Program Cost per kWh Lifetime		
Measurement & Verification	N/A	\$0	\$0	\$0	\$0	Utility Program Cost per kW at Gen		
Rebates	N/A	\$346,015	\$346,015	\$346,015	\$346,015	\$0.0062		
Other	N/A	\$0	\$0	\$0	\$0	\$625		
Subtotal	N/A	\$430,470	\$430,470	\$430,470	\$430,470			
Utility Revenue Reduction								
Revenue Reduction - Electric	N/A	N/A	\$3,082,021	N/A	N/A			
Subtotal	N/A	N/A	\$3,082,021	N/A	N/A			
Participant Costs								
Incremental Capital Costs	\$1,492,614	N/A	N/A	\$1,492,614	\$1,492,614			
Incremental O&M Costs	\$59,858	N/A	N/A	\$59,858	\$59,858			
Subtotal	\$1,552,471	N/A	N/A	\$1,552,471	\$1,552,471			
Total Costs								
	\$1,552,471	\$430,470	\$3,512,491	\$1,982,941	\$1,982,941			
Net Benefit (Cost)								
	\$1,875,565	\$1,771,486	(\$1,310,536)	\$565,029	\$565,029			
Benefit/Cost Ratio								
	2.21	5.12	0.63	1.28	1.28			

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

2017 SD DSM Plan Cost-Effectiveness Analysis

GROUND SOURCE HEAT PUMP						2017	ELECTRIC	GOAL
2017 Net Present Cost Benefit Summary Analysis For All Participants						Input Summary and Totals		
	Participant	Utility	Rate	Total				
	Test	Test	Impact	Resource	Societal			
	(\$Total)	(\$Total)	(\$Total)	(\$Total)	Test			
	(\$Total)	(\$Total)	(\$Total)	(\$Total)	(\$Total)			
Benefits						Program "Inputs" per Customer kW		
Avoided Revenue Requirements						Lifetime (Weighted on Generator kWh)	A	20.0 years
Generation	N/A	\$13,487	\$13,487	\$13,487	\$13,487	Annual Hours	B	8760
T & D	N/A	\$8,143	\$8,143	\$8,143	\$8,143	Gross Customer kW	C	1 kW
Marginal Energy	N/A	\$47,446	\$47,446	\$47,446	\$47,446	Generator Peak Coincidence Factor	D	32.76%
Environmental Externality	N/A	N/A	N/A	N/A	\$0	Gross Load Factor at Customer	E	19.51%
Subtotal	N/A	\$69,077	\$69,077	\$69,077	\$69,077	Transmission Loss Factor (Energy)	F	5.260%
						Transmission Loss Factor (Demand)	G	8.580%
Participant Benefits						Societal Net Benefit (Cost)	H	(\$919)
Bill Reduction - Electric	\$113,793	N/A	N/A	N/A	N/A	Program Summary per Participant		
Rebates from Xcel Energy	\$18,480	N/A	N/A	\$18,480	\$18,480	Gross kW Saved at Customer	I	4.55 kW
Incremental Capital Savings	\$0	N/A	N/A	\$0	\$0	Net coincident kW Saved at Generator	$(I \times D) / (1 - G)$	
Incremental O&M Savings	\$0	N/A	N/A	\$0	\$0	Gross Annual kWh Saved at Customer	$(B \times E \times I)$	
Subtotal	\$132,273	N/A	N/A	\$18,480	\$18,480	Net Annual kWh Saved at Generator	$(B \times E \times I) / (1 - F)$	
						Program Summary All Participants		
Total Benefits						Total Participants	J	12
	\$132,273	\$69,077	\$69,077	\$87,557	\$87,557	Total Budget	K	\$25,050
Costs						Gross kW Saved at Customer	$(J \times I)$	55 kW
Utility Project Costs						Net coincident kW Saved at Generator	$(I \times D) / (1 - G) \times J$	
Customer Services	N/A	\$0	\$0	\$0	\$0	Gross Annual kWh Saved at Customer	$(B \times E \times I) \times J$	
Utility Administration	N/A	\$5,770	\$5,770	\$5,770	\$5,770	Net Annual kWh Saved at Generator	$((B \times E \times I) / (1 - F)) \times J$	
Advertising & Promotion	N/A	\$800	\$800	\$800	\$800	Societal Net Benefits	$(J \times I \times H)$	
Measurement & Verification	N/A	\$0	\$0	\$0	\$0			
Rebates	N/A	\$18,480	\$18,480	\$18,480	\$18,480	Utility Program Cost per kWh Lifetime	\$0.0127	
Other	N/A	\$0	\$0	\$0	\$0	Utility Program Cost per kW at Gen	\$1,281	
Subtotal	N/A	\$25,050	\$25,050	\$25,050	\$25,050			
Utility Revenue Reduction								
Revenue Reduction - Electric	N/A	N/A	\$113,793	N/A	N/A			
Subtotal	N/A	N/A	\$113,793	N/A	N/A			
Participant Costs								
Incremental Capital Costs	\$112,664	N/A	N/A	\$112,664	\$112,664			
Incremental O&M Costs	\$0	N/A	N/A	\$0	\$0			
Subtotal	\$112,664	N/A	N/A	\$112,664	\$112,664			
Total Costs								
	\$112,664	\$25,050	\$138,843	\$137,714	\$137,714			
Net Benefit (Cost)	\$19,609	\$44,027	(\$69,766)	(\$50,157)	(\$50,157)			
Benefit/Cost Ratio	1.17	2.76	0.50	0.64	0.64			

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

2017 SD DSM Plan Cost-Effectiveness Analysis

RESIDENTIAL HOME LIGHTING						2017	ELECTRIC	GOAL	
2017 Net Present Cost Benefit Summary Analysis For All Participants						Input Summary and Totals			
	Participant	Utility	Rate	Total		Program "Inputs" per Customer kW			
	Test	Test	Impact	Resource	Societal	Lifetime (Weighted on Generator kWh)	A	5.9 years	
	(\$Total)	(\$Total)	Test	Test	Test	Annual Hours	B	8760	
			(\$Total)	(\$Total)	(\$Total)	Gross Customer kW	C	1 kW	
Benefits						Generator Peak Coincidence Factor	D	11.59%	
Avoided Revenue Requirements						Gross Load Factor at Customer	E	13.10%	
Generation	N/A	\$54,194	\$54,194	\$54,194	\$54,194	Transmission Loss Factor (Energy)	F	5.096%	
T & D	N/A	\$32,721	\$32,721	\$32,721	\$32,721	Transmission Loss Factor (Demand)	G	8.514%	
Marginal Energy	N/A	\$320,603	\$320,603	\$320,603	\$320,603	Societal Net Benefit (Cost)	H	\$252	
Environmental Externality	N/A	N/A	N/A	N/A	\$0	Program Summary per Participant			
Subtotal	N/A	\$407,518	\$407,518	\$407,518	\$407,518	Gross kW Saved at Customer	I	0.23 kW	
Participant Benefits						Net coincident kW Saved at Generator	$(I \times D) / (1 - G)$		0.03 kW
Bill Reduction - Electric	\$940,261	N/A	N/A	N/A	N/A	Gross Annual kWh Saved at Customer	$(B \times E \times I)$		268 kWh
Rebates from Xcel Energy	\$70,340	N/A	N/A	\$70,340	\$70,340	Net Annual kWh Saved at Generator	$(B \times E \times I) / (1 - F)$		283 kWh
Incremental Capital Savings	\$0	N/A	N/A	\$0	\$0	Program Summary All Participants			
Incremental O&M Savings	\$0	N/A	N/A	\$0	\$0	Total Participants	J	3,772	
Subtotal	\$1,010,601	N/A	N/A	\$70,340	\$70,340	Total Budget	K	\$97,340	
Total Benefits						Gross kW Saved at Customer	$(J \times I)$	881 kW	
	\$1,010,601	\$407,518	\$407,518	\$477,858	\$477,858	Net coincident kW Saved at Generator	$(I \times D) / (1 - G) \times J$		112 kW
Costs						Gross Annual kWh Saved at Customer	$(B \times E \times I) \times J$	1,011,596 kWh	
Utility Project Costs						Net Annual kWh Saved at Generator	$((B \times E \times I) / (1 - F)) \times J$		1,065,912 kWh
Customer Services	N/A	\$22,000	\$22,000	\$22,000	\$22,000	Societal Net Benefits	$(J \times I \times H)$	\$221,717	
Utility Administration	N/A	\$0	\$0	\$0	\$0	Utility Program Cost per kWh Lifetime			\$0.0154
Advertising & Promotion	N/A	\$5,000	\$5,000	\$5,000	\$5,000	Utility Program Cost per kW at Gen			\$871
Measurement & Verification	N/A	\$0	\$0	\$0	\$0				
Rebates	N/A	\$70,340	\$70,340	\$70,340	\$70,340				
Other	N/A	\$0	\$0	\$0	\$0				
Subtotal	N/A	\$97,340	\$97,340	\$97,340	\$97,340				
Utility Revenue Reduction									
Revenue Reduction - Electric	N/A	N/A	\$940,261	N/A	N/A				
Subtotal	N/A	N/A	\$940,261	N/A	N/A				
Participant Costs									
Incremental Capital Costs	\$158,801	N/A	N/A	\$158,801	\$158,801				
Incremental O&M Costs	\$0	N/A	N/A	\$0	\$0				
Subtotal	\$158,801	N/A	N/A	\$158,801	\$158,801				
Total Costs									
	\$158,801	\$97,340	\$1,037,601	\$256,141	\$256,141				
Net Benefit (Cost)									
	\$851,800	\$310,178	(\$630,083)	\$221,717	\$221,717				
Benefit/Cost Ratio									
	6.36	4.19	0.39	1.87	1.87				

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

2017 SD DSM Plan Cost-Effectiveness Analysis

RESIDENTIAL SAVER'S SWITCH						2017	ELECTRIC	GOAL	
2017 Net Present Cost Benefit Summary Analysis For All Participants						Input Summary and Totals			
	Participant Test (\$Total)	Utility Test (\$Total)	Rate Impact Test (\$Total)	Total Resource Test (\$Total)	Societal Test (\$Total)	Program "Inputs" per Customer kW			
Benefits						Lifetime (Weighted on Generator kWh)	A	15.0 years	
Avoided Revenue Requirements						Annual Hours	B	8760	
Generation	N/A	\$335,688	\$335,688	\$335,688	\$335,688	Gross Customer kW	C	1 kW	
T & D	N/A	\$202,682	\$202,682	\$202,682	\$202,682	Generator Peak Coincidence Factor	D	27.31%	
Marginal Energy	N/A	\$695	\$695	\$695	\$695	Gross Load Factor at Customer	E	0.01%	
Environmental Externality	N/A	N/A	N/A	N/A	\$0	Transmission Loss Factor (Energy)	F	5.260%	
Subtotal	N/A	\$539,065	\$539,065	\$539,065	\$539,065	Transmission Loss Factor (Demand)	G	8.580%	
Participant Benefits						Societal Net Benefit (Cost)	H	\$189	
Bill Reduction - Electric	\$528,539	N/A	N/A	N/A	N/A	Program Summary per Participant			
Rebates from Xcel Energy	\$0	N/A	N/A	\$0	\$0	Gross kW Saved at Customer	I	2.46 kW	
Incremental Capital Savings	\$0	N/A	N/A	\$0	\$0	Net coincident kW Saved at Generator	$(I \times D) / (1 - G)$		0.73 kW
Incremental O&M Savings	\$0	N/A	N/A	\$0	\$0	Gross Annual kWh Saved at Customer	$(B \times E \times I)$		2 kWh
Subtotal	\$528,539	N/A	N/A	\$0	\$0	Net Annual kWh Saved at Generator	$(B \times E \times I) / (1 - F)$		2 kWh
Total Benefits	\$528,539	\$539,065	\$539,065	\$539,065	\$539,065	Program Summary All Participants			
Costs						Total Participants	J	770	
Utility Project Costs						Total Budget	K	\$181,650	
Customer Services	N/A	\$91,550	\$91,550	\$91,550	\$91,550	Gross kW Saved at Customer	$(J \times I)$		1,892 kW
Utility Administration	N/A	\$82,100	\$82,100	\$82,100	\$82,100	Net coincident kW Saved at Generator	$(I \times D) / (1 - G) \times J$		565 kW
Advertising & Promotion	N/A	\$8,000	\$8,000	\$8,000	\$8,000	Gross Annual kWh Saved at Customer	$(B \times E \times I) \times J$		1,408 kWh
Measurement & Verification	N/A	\$0	\$0	\$0	\$0	Net Annual kWh Saved at Generator	$((B \times E \times I) / (1 - F)) \times J$		1,486 kWh
Rebates	N/A	\$0	\$0	\$0	\$0	Societal Net Benefits	$(J \times I \times H)$		\$357,415
Other	N/A	\$0	\$0	\$0	\$0	Utility Program Cost per kWh Lifetime			\$8.1503
Subtotal	N/A	\$181,650	\$181,650	\$181,650	\$181,650	Utility Program Cost per kW at Gen			\$321
Utility Revenue Reduction									
Revenue Reduction - Electric	N/A	N/A	\$528,539	N/A	N/A				
Subtotal	N/A	N/A	\$528,539	N/A	N/A				
Participant Costs									
Incremental Capital Costs	\$0	N/A	N/A	\$0	\$0				
Incremental O&M Costs	\$0	N/A	N/A	\$0	\$0				
Subtotal	\$0	N/A	N/A	\$0	\$0				
Total Costs	\$0	\$181,650	\$710,189	\$181,650	\$181,650				
Net Benefit (Cost)	\$528,539	\$357,415	(\$171,124)	\$357,415	\$357,415				
Benefit/Cost Ratio	INF	2.97	0.76	2.97	2.97				

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

2017 SD DSM Plan Cost-Effectiveness Analysis

RESIDENTIAL SEGMENT TOTAL						2017	ELECTRIC	GOAL
2017 Net Present Cost Benefit Summary Analysis For All Participants						Input Summary and Totals		
	Participant	Utility	Rate	Total	Societal	Program "Inputs" per Customer kW		
	Test	Test	Impact	Resource	Test	Lifetime (Weighted on Generator kWh)	A	7.1 years
	(\$Total)	(\$Total)	(\$Total)	(\$Total)	(\$Total)	Annual Hours	B	8760
Benefits						Gross Customer kW	C	1 kW
Avoided Revenue Requirements						Generator Peak Coincidence Factor	D	22.52%
Generation	N/A	\$403,370	\$403,370	\$403,370	\$403,370	Gross Load Factor at Customer	E	4.47%
T & D	N/A	\$243,546	\$243,546	\$243,546	\$243,546	Transmission Loss Factor (Energy)	F	5.110%
Marginal Energy	N/A	\$368,744	\$368,744	\$368,744	\$368,744	Transmission Loss Factor (Demand)	G	8.559%
Environmental Externality	N/A	N/A	N/A	N/A	\$0	Societal Net Benefit (Cost)	H	\$177
Subtotal	N/A	\$1,015,660	\$1,015,660	\$1,015,660	\$1,015,660	Program Summary per Participant		
Participant Benefits						Gross kW Saved at Customer	I	0.04 kW
Bill Reduction - Electric	\$1,582,592	N/A	N/A	N/A	N/A	Net coincident kW Saved at Generator	$(I \times D) / (1 - G)$	
Rebates from Xcel Energy	\$88,820	N/A	N/A	\$88,820	\$88,820	Gross Annual kWh Saved at Customer	$(B \times E \times I)$	
Incremental Capital Savings	\$0	N/A	N/A	\$0	\$0	Net Annual kWh Saved at Generator	$(B \times E \times I) / (1 - F)$	
Incremental O&M Savings	\$0	N/A	N/A	\$0	\$0	Program Summary All Participants		
Subtotal	\$1,671,412	N/A	N/A	\$88,820	\$88,820	Total Participants	J	72,554
Total Benefits						Total Budget	K	\$331,205
Total Benefits	\$1,671,412	\$1,015,660	\$1,015,660	\$1,104,480	\$1,104,480	Gross kW Saved at Customer	$(J \times I)$	2,828 kW
Costs						Net coincident kW Saved at Generator	$(I \times D) / (1 - G) \times J$	
Utility Project Costs						Gross Annual kWh Saved at Customer	$(B \times E \times I) \times J$	1,106,231 kWh
Customer Services	N/A	\$113,550	\$113,550	\$113,550	\$113,550	Net Annual kWh Saved at Generator	$((B \times E \times I) / (1 - F)) \times J$	
Utility Administration	N/A	\$89,670	\$89,670	\$89,670	\$89,670	Societal Net Benefits	$(J \times I \times H)$	
Advertising & Promotion	N/A	\$39,165	\$39,165	\$39,165	\$39,165	Utility Program Cost per kWh Lifetime		
Measurement & Verification	N/A	\$0	\$0	\$0	\$0	Utility Program Cost per kW at Gen		
Rebates	N/A	\$88,820	\$88,820	\$88,820	\$88,820	\$0.0399		
Other	N/A	\$0	\$0	\$0	\$0	\$476		
Subtotal	N/A	\$331,205	\$331,205	\$331,205	\$331,205			
Utility Revenue Reduction								
Revenue Reduction - Electric	N/A	N/A	\$1,582,592	N/A	N/A			
Subtotal	N/A	N/A	\$1,582,592	N/A	N/A			
Participant Costs								
Incremental Capital Costs	\$271,464	N/A	N/A	\$271,464	\$271,464			
Incremental O&M Costs	\$0	N/A	N/A	\$0	\$0			
Subtotal	\$271,464	N/A	N/A	\$271,464	\$271,464			
Total Costs								
Total Costs	\$271,464	\$331,205	\$1,913,797	\$602,669	\$602,669			
Net Benefit (Cost)								
Net Benefit (Cost)	\$1,399,948	\$684,455	(\$898,138)	\$501,811	\$501,811			
Benefit/Cost Ratio								
Benefit/Cost Ratio	6.16	3.07	0.53	1.83	1.83			

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.

PORTFOLIO TOTAL						2017	ELECTRIC	GOAL	
2017 Net Present Cost Benefit Summary Analysis For All Participants						Input Summary and Totals			
	Participant	Utility	Rate	Total					
	Test	Test	Impact	Resource	Societal				
	(\$Total)	(\$Total)	(\$Total)	(\$Total)	Test				
	(\$Total)	(\$Total)	(\$Total)	(\$Total)	(\$Total)				
Benefits						Program "Inputs" per Customer kW			
Avoided Revenue Requirements						Lifetime (Weighted on Generator kWh)	A	14.6 years	
Generation	N/A	\$757,009	\$757,009	\$757,009	\$757,009	Annual Hours	B	8760	
T & D	N/A	\$457,063	\$457,063	\$457,063	\$457,063	Gross Customer kW	C	1 kW	
Marginal Energy	N/A	\$2,003,543	\$2,003,543	\$2,003,543	\$2,003,543	Generator Peak Coincidence Factor	D	31.99%	
Environmental Externality	N/A	N/A	N/A	N/A	\$0	Gross Load Factor at Customer	E	14.66%	
Subtotal	N/A	\$3,217,615	\$3,217,615	\$3,217,615	\$3,217,615	Transmission Loss Factor (Energy)	F	4.797%	
						Transmission Loss Factor (Demand)	G	8.222%	
Participant Benefits						Societal Net Benefit (Cost)	H	\$265	
Bill Reduction - Electric	\$4,664,614	N/A	N/A	N/A	N/A	Program Summary per Participant			
Rebates from Xcel Energy	\$434,835	N/A	N/A	\$434,835	\$434,835	Gross kW Saved at Customer	I	0.05 kW	
Incremental Capital Savings	\$0	N/A	N/A	\$0	\$0	Net coincident kW Saved at Generator	$(I \times D) / (1 - G)$		0.02 kW
Incremental O&M Savings	\$0	N/A	N/A	\$0	\$0	Gross Annual kWh Saved at Customer	$(B \times E \times I)$		68 kWh
Subtotal	\$5,099,449	N/A	N/A	\$434,835	\$434,835	Net Annual kWh Saved at Generator	$(B \times E \times I) / (1 - F)$		72 kWh
Total Benefits						Program Summary All Participants			
Total Benefits	\$5,099,449	\$3,217,615	\$3,217,615	\$3,652,450	\$3,652,450	Total Participants	J	74,708	
Costs						Total Budget	K	\$775,675	
Utility Project Costs						Gross kW Saved at Customer	$(J \times I)$		3,974 kW
Customer Services	N/A	\$170,455	\$170,455	\$170,455	\$170,455	Net coincident kW Saved at Generator	$(I \times D) / (1 - G) \times J$		1,385 kW
Utility Administration	N/A	\$120,720	\$120,720	\$120,720	\$120,720	Gross Annual kWh Saved at Customer	$(B \times E \times I) \times J$		5,105,311 kWh
Advertising & Promotion	N/A	\$49,665	\$49,665	\$49,665	\$49,665	Net Annual kWh Saved at Generator	$((B \times E \times I) / (1 - F)) \times J$		5,362,548 kWh
Measurement & Verification	N/A	\$0	\$0	\$0	\$0	Societal Net Benefits	$(J \times I \times H)$		\$1,052,840
Rebates	N/A	\$434,835	\$434,835	\$434,835	\$434,835	Utility Program Cost per kWh Lifetime			\$0.0099
Other	N/A	\$0	\$0	\$0	\$0	Utility Program Cost per kW at Gen			\$560
Subtotal	N/A	\$775,675	\$775,675	\$775,675	\$775,675				
Utility Revenue Reduction									
Revenue Reduction - Electric	N/A	N/A	\$4,664,614	N/A	N/A				
Subtotal	N/A	N/A	\$4,664,614	N/A	N/A				
Participant Costs									
Incremental Capital Costs	\$1,764,078	N/A	N/A	\$1,764,078	\$1,764,078				
Incremental O&M Costs	\$59,858	N/A	N/A	\$59,858	\$59,858				
Subtotal	\$1,823,936	N/A	N/A	\$1,823,936	\$1,823,936				
Total Costs									
Total Costs	\$1,823,936	\$775,675	\$5,440,289	\$2,599,611	\$2,599,611				
Net Benefit (Cost)									
Net Benefit (Cost)	\$3,275,513	\$2,441,940	(\$2,222,673)	\$1,052,840	\$1,052,840				
Benefit/Cost Ratio									
Benefit/Cost Ratio	2.80	4.15	0.59	1.40	1.40				

Note: Dollar values represent present value of impacts accumulated over the lifetime of the measures.