

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

BUSINESS SEGMENT 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								
Avoided Revenue Requirements								
Generation	N/A	\$528,406	\$528,406	\$528,406	\$528,406			
T & D	N/A	\$319,033	\$319,033	\$319,033	\$319,033			
Marginal Energy	N/A	\$2,317,637	\$2,317,637	\$2,317,637	\$2,317,637			
Environmental Externality	N/A	N/A	N/A	N/A	\$0			
Subtotal	N/A	\$3,165,076	\$3,165,076	\$3,165,076	\$3,165,076			
Participant Benefits								
Bill Reduction - Electric	\$4,345,550	N/A	N/A	N/A	N/A			
Rebates from Xcel Energy	\$328,000	N/A	N/A	\$328,000	\$328,000			
Incremental Capital Savings	\$0	N/A	N/A	\$0	\$0			
Incremental O&M Savings	\$0	N/A	N/A	\$0	\$0			
Subtotal	\$4,673,550	N/A	N/A	\$328,000	\$328,000			
Total Benefits	\$4,673,550	\$3,165,076	\$3,165,076	\$3,493,076	\$3,493,076			
Costs								
Utility Project Costs								
Customer Services	N/A	\$56,900	\$56,900	\$56,900	\$56,900			
Utility Administration	N/A	\$17,050	\$17,050	\$17,050	\$17,050			
Advertising & Promotion	N/A	\$10,500	\$10,500	\$10,500	\$10,500			
Measurement & Verification	N/A	\$0	\$0	\$0	\$0			
Rebates	N/A	\$328,000	\$328,000	\$328,000	\$328,000			
Other	N/A	\$0	\$0	\$0	\$0			
Subtotal	N/A	\$412,450	\$412,450	\$412,450	\$412,450			
Utility Revenue Reduction								
Revenue Reduction - Electric	N/A	N/A	\$4,345,550	N/A	N/A			
Subtotal	N/A	N/A	\$4,345,550	N/A	N/A			
Participant Costs								
Incremental Capital Costs	\$1,406,500	N/A	N/A	\$1,406,500	\$1,406,500			
Incremental O&M Costs	\$12,814	N/A	N/A	\$12,814	\$12,814			
Subtotal	\$1,419,314	N/A	N/A	\$1,419,314	\$1,419,314			
Total Costs	\$1,419,314	\$412,450	\$4,758,000	\$1,831,764	\$1,831,764			
Net Benefit (Cost)	\$3,254,236	\$2,752,626	(\$1,592,924)	\$1,661,312	\$1,661,312			
Benefit/Cost Ratio	3.29	7.67	0.67	1.91	1.91			

Program "Inputs" per Customer kW		
Lifetime (Weighted on Generator kWh)	A	14.8 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	63.54%
Gross Load Factor at Customer	E	43.81%
Transmission Loss Factor (Energy)	F	4.710%
Transmission Loss Factor (Demand)	G	7.380%
Societal Net Benefit (Cost)	H	\$1,043

Program Summary per Participant		
Gross kW Saved at Customer	I	0.73 kW
Net coincident kW Saved at Generator	(I x D) / (1 - G)	0.50 kW
Gross Annual kWh Saved at Customer	(B x E x I)	2,789 kWh
Net Annual kWh Saved at Generator	(B x E x I) / (1 - F)	2,927 kWh

Program Summary All Participants		
Total Participants	J	2,193
Total Budget	K	\$412,450
Gross kW Saved at Customer	(J x I)	1,594 kW
Net coincident kW Saved at Generator	(I x D) / (1 - G) x J	1,093 kW
Gross Annual kWh Saved at Customer	(B x E x I) x J	6,116,173 kWh
Net Annual kWh Saved at Generator	((B x E x I) / (1 - F)) x J	6,418,484 kWh
Societal Net Benefits	(J x I x H)	\$1,661,312

Utility Program Cost per kWh Lifetime	\$0.0044
Utility Program Cost per kW at Gen	\$377

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

2017 SD DSM Plan Cost-Effectiveness Analysis

LIGHTING EFFICIENCY						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								
Avoided Revenue Requirements								
Generation	N/A	\$482,793	\$482,793	\$482,793	\$482,793			
T & D	N/A	\$291,495	\$291,495	\$291,495	\$291,495			
Marginal Energy	N/A	\$2,316,569	\$2,316,569	\$2,316,569	\$2,316,569			
Environmental Externality	N/A	N/A	N/A	N/A	N/A			
Subtotal	N/A	\$3,090,857	\$3,090,857	\$3,090,857	\$3,090,857			
Participant Benefits								
Bill Reduction - Electric	\$4,298,274	N/A	N/A	N/A	N/A			
Rebates from Xcel Energy	\$328,000	N/A	N/A	\$328,000	\$328,000			
Incremental Capital Savings	\$0	N/A	N/A	\$0	\$0			
Incremental O&M Savings	\$0	N/A	N/A	\$0	\$0			
Subtotal	\$4,626,274	N/A	N/A	\$328,000	\$328,000			
Total Benefits	\$4,626,274	\$3,090,857	\$3,090,857	\$3,418,857	\$3,418,857			
Costs								
Utility Project Costs								
Customer Services	N/A	\$36,000	\$36,000	\$36,000	\$36,000			
Utility Administration	N/A	\$3,500	\$3,500	\$3,500	\$3,500			
Advertising & Promotion	N/A	\$4,000	\$4,000	\$4,000	\$4,000			
Measurement & Verification	N/A	\$0	\$0	\$0	\$0			
Rebates	N/A	\$328,000	\$328,000	\$328,000	\$328,000			
Other	N/A	\$0	\$0	\$0	\$0			
Subtotal	N/A	\$371,500	\$371,500	\$371,500	\$371,500			
Utility Revenue Reduction								
Revenue Reduction - Electric	N/A	N/A	\$4,298,274	N/A	N/A			
Subtotal	N/A	N/A	\$4,298,274	N/A	N/A			
Participant Costs								
Incremental Capital Costs	\$1,406,500	N/A	N/A	\$1,406,500	\$1,406,500			
Incremental O&M Costs	\$12,814	N/A	N/A	\$12,814	\$12,814			
Subtotal	\$1,419,314	N/A	N/A	\$1,419,314	\$1,419,314			
Total Costs	\$1,419,314	\$371,500	\$4,669,774	\$1,790,814	\$1,790,814			
Net Benefit (Cost)	\$3,206,960	\$2,719,357	(\$1,578,917)	\$1,628,043	\$1,628,043			
Benefit/Cost Ratio	3.26	8.32	0.66	1.91	1.91			

Program "Inputs" per Customer kW		
Lifetime (Weighted on Generator kWh)	A	14.8 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	71.89%
Gross Load Factor at Customer	E	56.63%
Transmission Loss Factor (Energy)	F	4.710%
Transmission Loss Factor (Demand)	G	7.380%
Societal Net Benefit (Cost)	H	\$1,321

Program Summary per Participant		
Gross kW Saved at Customer	I	0.57 kW
Net coincident kW Saved at Generator	$(I \times D) / (1 - G)$	0.44 kW
Gross Annual kWh Saved at Customer	$(B \times E \times I)$	2,804 kWh
Net Annual kWh Saved at Generator	$(B \times E \times I) / (1 - F)$	2,943 kWh

Program Summary All Participants		
Total Participants	J	2,180
Total Budget	K	\$371,500
Gross kW Saved at Customer	$(J \times I)$	1,232 kW
Net coincident kW Saved at Generator	$(I \times D) / (1 - G) \times J$	956 kW
Gross Annual kWh Saved at Customer	$(B \times E \times I) \times J$	6,112,560 kWh
Net Annual kWh Saved at Generator	$((B \times E \times I) / (1 - F)) \times J$	6,414,692 kWh
Societal Net Benefits	$(J \times I \times H)$	\$1,628,043

Utility Program Cost per kWh Lifetime	\$0.0039
Utility Program Cost per kW at Gen	\$388

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.

2017 SD DSM Plan Cost-Effectiveness Analysis

PORTFOLIO 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	13.6 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	37.70%	
Generation	N/A	\$913,296	\$913,296	\$913,296	\$913,296	Gross Load Factor at Customer	E	18.76%	
T & D	N/A	\$551,421	\$551,421	\$551,421	\$551,421	Transmission Loss Factor (Energy)	F	4.767%	
Marginal Energy	N/A	\$2,579,238	\$2,579,238	\$2,579,238	\$2,579,238	Transmission Loss Factor (Demand)	G	8.130%	
Environmental Externality	N/A	N/A	N/A	N/A	\$0	Societal Net Benefit (Cost)	H	\$487	
Subtotal	N/A	\$4,043,955	\$4,043,955	\$4,043,955	\$4,043,955	Program Summary per Participant			
Participant Benefits						Gross kW Saved at Customer	I	0.06 kW	
Bill Reduction - Electric	\$5,618,346	N/A	N/A	N/A	N/A	Net coincident kW Saved at Generator	$(I \times D) / (1 - G)$		0.02 kW
Rebates from Xcel Energy	\$391,145	N/A	N/A	\$391,145	\$391,145	Gross Annual kWh Saved at Customer	$(B \times E \times I)$		98 kWh
Incremental Capital Savings	\$0	N/A	N/A	\$0	\$0	Net Annual kWh Saved at Generator	$(B \times E \times I) / (1 - F)$		103 kWh
Incremental O&M Savings	\$0	N/A	N/A	\$0	\$0	Program Summary All Participants			
Subtotal	\$6,009,491	N/A	N/A	\$391,145	\$391,145	Total Participants	J	72,849	
Total Benefits						Total Budget	K	\$732,980	
Total Benefits	\$6,009,491	\$4,043,955	\$4,043,955	\$4,435,100	\$4,435,100	Gross kW Saved at Customer	$(J \times I)$	4,333 kW	
Costs						Net coincident kW Saved at Generator	$(I \times D) / (1 - G) \times J$		1,778 kW
Utility Project Costs						Gross Annual kWh Saved at Customer	$(B \times E \times I) \times J$		7,120,883 kWh
Customer Services	N/A	\$170,450	\$170,450	\$170,450	\$170,450	Net Annual kWh Saved at Generator	$((B \times E \times I) / (1 - F)) \times J$		7,477,316 kWh
Utility Administration	N/A	\$121,720	\$121,720	\$121,720	\$121,720	Societal Net Benefits	$(J \times I \times H)$		\$2,109,683
Advertising & Promotion	N/A	\$49,665	\$49,665	\$49,665	\$49,665	Utility Program Cost per kWh Lifetime			
Measurement & Verification	N/A	\$0	\$0	\$0	\$0	Utility Program Cost per kW at Gen			
Rebates	N/A	\$391,145	\$391,145	\$391,145	\$391,145	\$0.0072			
Other	N/A	\$0	\$0	\$0	\$0	\$412			
Subtotal	N/A	\$732,980	\$732,980	\$732,980	\$732,980				
Utility Revenue Reduction									
Revenue Reduction - Electric	N/A	N/A	\$5,618,346	N/A	N/A				
Subtotal	N/A	N/A	\$5,618,346	N/A	N/A				
Participant Costs									
Incremental Capital Costs	\$1,579,623	N/A	N/A	\$1,579,623	\$1,579,623				
Incremental O&M Costs	\$12,814	N/A	N/A	\$12,814	\$12,814				
Subtotal	\$1,592,437	N/A	N/A	\$1,592,437	\$1,592,437				
Total Costs									
Total Costs	\$1,592,437	\$732,980	\$6,351,326	\$2,325,417	\$2,325,417				
Net Benefit (Cost)									
Net Benefit (Cost)	\$4,417,054	\$3,310,975	(\$2,307,371)	\$2,109,683	\$2,109,683				
Benefit/Cost Ratio									
Benefit/Cost Ratio	3.77	5.52	0.64	1.91	1.91				

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	Societal	Program "Inputs" per Customer kW		
	Test	Test	Impact	Resource	Test	Lifetime (Weighted on Generator kWh)	A	20.0 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	32.76%
Generation	N/A	\$13,487	\$13,487	\$13,487	\$13,487	Gross Load Factor at Customer	E	19.51%
T & D	N/A	\$8,143	\$8,143	\$8,143	\$8,143	Transmission Loss Factor (Energy)	F	5.260%
Marginal Energy	N/A	\$47,446	\$47,446	\$47,446	\$47,446	Transmission Loss Factor (Demand)	G	8.580%
Environmental Externality	N/A	N/A	N/A	N/A	\$0	Societal Net Benefit (Cost)	H	(\$919)
Subtotal	N/A	\$69,077	\$69,077	\$69,077	\$69,077	Program Summary per Participant		
Participant Benefits						Gross kW Saved at Customer	I	4.55 kW
Bill Reduction - Electric	\$113,793	N/A	N/A	N/A	N/A	Net coincident kW Saved at Generator	$(I \times D) / (1 - G)$	
Rebates from Xcel Energy	\$18,480	N/A	N/A	\$18,480	\$18,480	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	\$132,273	N/A	N/A	\$18,480	\$18,480	Total Participants	J	12
Total Benefits						Total Budget	K	\$25,050
Total Benefits	\$132,273	\$69,077	\$69,077	\$87,557	\$87,557	Gross kW Saved at Customer	$(J \times I)$	55 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	\$0	\$0	\$0	\$0	Net Annual kWh Saved at Generator	$((B \times E \times I) / (1 - F)) \times J$	
Utility Administration	N/A	\$5,770	\$5,770	\$5,770	\$5,770	Societal Net Benefits	$(J \times I \times H)$	
Advertising & Promotion	N/A	\$800	\$800	\$800	\$800	Utility Program Cost per kWh Lifetime		
Measurement & Verification	N/A	\$0	\$0	\$0	\$0	Utility Program Cost per kW at Gen		
Rebates	N/A	\$18,480	\$18,480	\$18,480	\$18,480	\$0.0127		
Other	N/A	\$0	\$0	\$0	\$0	\$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								
Total Costs	\$112,664	\$25,050	\$138,843	\$137,714	\$137,714			
Net Benefit (Cost)								
Net Benefit (Cost)	\$19,609	\$44,027	(\$69,766)	(\$50,157)	(\$50,157)			
Benefit/Cost Ratio								
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	Societal	Program "Inputs" per Customer kW			
	Test	Test	Impact	Resource	Test	Lifetime (Weighted on Generator kWh)	A	5.5 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	11.71%	
Generation	N/A	\$35,715	\$35,715	\$35,715	\$35,715	Gross Load Factor at Customer	E	13.21%	
T & D	N/A	\$21,562	\$21,562	\$21,562	\$21,562	Transmission Loss Factor (Energy)	F	5.092%	
Marginal Energy	N/A	\$213,460	\$213,460	\$213,460	\$213,460	Transmission Loss Factor (Demand)	G	8.512%	
Environmental Externality	N/A	N/A	N/A	N/A	N/A	Societal Net Benefit (Cost)	H	\$247	
Subtotal	N/A	\$270,737	\$270,737	\$270,737	\$270,737	Program Summary per Participant			
Participant Benefits						Gross kW Saved at Customer	I	0.41 kW	
Bill Reduction - Electric	\$630,464	N/A	N/A	N/A	N/A	Net coincident kW Saved at Generator	$(I \times D) / (1 - G)$		0.05 kW
Rebates from Xcel Energy	\$44,665	N/A	N/A	\$44,665	\$44,665	Gross Annual kWh Saved at Customer	$(B \times E \times I)$		474 kWh
Incremental Capital Savings	\$0	N/A	N/A	\$0	\$0	Net Annual kWh Saved at Generator	$(B \times E \times I) / (1 - F)$		499 kWh
Incremental O&M Savings	\$0	N/A	N/A	\$0	\$0	Program Summary All Participants			
Subtotal	\$675,129	N/A	N/A	\$44,665	\$44,665	Total Participants	J	1,874	
Total Benefits						Total Budget	K	\$71,665	
	\$675,129	\$270,737	\$270,737	\$315,402	\$315,402	Gross kW Saved at Customer	$(J \times I)$	767 kW	
Costs						Net coincident kW Saved at Generator	$(I \times D) / (1 - G) \times J$		98 kW
Utility Project Costs						Gross Annual kWh Saved at Customer	$(B \times E \times I) \times J$		887,609 kWh
Customer Services	N/A	\$22,000	\$22,000	\$22,000	\$22,000	Net Annual kWh Saved at Generator	$((B \times E \times I) / (1 - F)) \times J$		935,230 kWh
Utility Administration	N/A	\$0	\$0	\$0	\$0	Societal Net Benefits	$(J \times I \times H)$		\$189,232
Advertising & Promotion	N/A	\$5,000	\$5,000	\$5,000	\$5,000	Utility Program Cost per kWh Lifetime			
Measurement & Verification	N/A	\$0	\$0	\$0	\$0	Utility Program Cost per kW at Gen			
Rebates	N/A	\$44,665	\$44,665	\$44,665	\$44,665	\$0.0139			
Other	N/A	\$0	\$0	\$0	\$0	\$730			
Subtotal	N/A	\$71,665	\$71,665	\$71,665	\$71,665				
Utility Revenue Reduction									
Revenue Reduction - Electric	N/A	N/A	\$630,464	N/A	N/A				
Subtotal	N/A	N/A	\$630,464	N/A	N/A				
Participant Costs									
Incremental Capital Costs	\$54,505	N/A	N/A	\$54,505	\$54,505				
Incremental O&M Costs	\$0	N/A	N/A	\$0	\$0				
Subtotal	\$54,505	N/A	N/A	\$54,505	\$54,505				
Total Costs									
	\$54,505	\$71,665	\$702,129	\$126,170	\$126,170				
Net Benefit (Cost)									
	\$620,624	\$199,072	(\$431,392)	\$189,232	\$189,232				
Benefit/Cost Ratio									
	12.39	3.78	0.39	2.50	2.50				

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						
	Test	Test	Impact	Resource	Societal					
	(\$Total)	(\$Total)	(\$Total)	(\$Total)	Test					
Benefits						Program "Inputs" per Customer kW				
Avoided Revenue Requirements						Lifetime (Weighted on Generator kWh)	A	6.9 years		
Generation	N/A	\$384,890	\$384,890	\$384,890	\$384,890	Annual Hours	B	8760		
T & D	N/A	\$232,388	\$232,388	\$232,388	\$232,388	Gross Customer kW	C	1 kW		
Marginal Energy	N/A	\$261,602	\$261,602	\$261,602	\$261,602	Generator Peak Coincidence Factor	D	22.86%		
Environmental Externality	N/A	N/A	N/A	N/A	\$0	Gross Load Factor at Customer	E	4.19%		
Subtotal	N/A	\$878,879	\$878,879	\$878,879	\$878,879	Transmission Loss Factor (Energy)	F	5.112%		
						Transmission Loss Factor (Demand)	G	8.561%		
Participant Benefits						Societal Net Benefit (Cost)	H	\$169		
Bill Reduction - Electric	\$1,272,796	N/A	N/A	N/A	N/A	Program Summary per Participant				
Rebates from Xcel Energy	\$63,145	N/A	N/A	\$63,145	\$63,145	Gross kW Saved at Customer	I	0.04 kW		
Incremental Capital Savings	\$0	N/A	N/A	\$0	\$0	Net coincident kW Saved at Generator	$(I \times D) / (1 - G)$		0.01 kW	
Incremental O&M Savings	\$0	N/A	N/A	\$0	\$0	Gross Annual kWh Saved at Customer	$(B \times E \times I)$		14 kWh	
Subtotal	\$1,335,941	N/A	N/A	\$63,145	\$63,145	Net Annual kWh Saved at Generator	$(B \times E \times I) / (1 - F)$		15 kWh	
Total Benefits						Program Summary All Participants				
Costs						Total Participants	J	70,656		
Utility Project Costs						Total Budget	K	\$305,530		
Customer Services	N/A	\$113,550	\$113,550	\$113,550	\$113,550	Gross kW Saved at Customer	$(J \times I)$		2,740 kW	
Utility Administration	N/A	\$89,670	\$89,670	\$89,670	\$89,670	Net coincident kW Saved at Generator	$(I \times D) / (1 - G) \times J$		685 kW	
Advertising & Promotion	N/A	\$39,165	\$39,165	\$39,165	\$39,165	Gross Annual kWh Saved at Customer	$(B \times E \times I) \times J$		1,004,710 kWh	
Measurement & Verification	N/A	\$0	\$0	\$0	\$0	Net Annual kWh Saved at Generator	$((B \times E \times I) / (1 - F)) \times J$		1,058,832 kWh	
Rebates	N/A	\$63,145	\$63,145	\$63,145	\$63,145	Societal Net Benefits	$(J \times I \times H)$		\$463,371	
Other	N/A	\$0	\$0	\$0	\$0	Utility Program Cost per kWh Lifetime			\$0.0420	
Subtotal	N/A	\$305,530	\$305,530	\$305,530	\$305,530	Utility Program Cost per kW at Gen			\$446	
Utility Revenue Reduction										
Revenue Reduction - Electric	N/A	N/A	\$1,272,796	N/A	N/A					
Subtotal	N/A	N/A	\$1,272,796	N/A	N/A					
Participant Costs										
Incremental Capital Costs	\$173,123	N/A	N/A	\$173,123	\$173,123					
Incremental O&M Costs	\$0	N/A	N/A	\$0	\$0					
Subtotal	\$173,123	N/A	N/A	\$173,123	\$173,123					
Total Costs										
Net Benefit (Cost)										
Benefit/Cost Ratio										
Net Benefit (Cost)						\$1,162,818	\$573,349	(\$699,446)	\$463,371	\$463,371
Benefit/Cost Ratio						7.72	2.88	0.56	1.97	1.97

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