

## Executive Summary Table-2022

2021	Electric Participants	Electric Budget	Generator kW	Generator kWh	Participant Test Ratio	Utility Test Ratio	Ratepayer Impact Measure Test Ratio	TRC Ratio
<b>Business Segment</b>								
Lighting Efficiency	477	\$399,900	742	5,981,518	3.05	5.08	0.36	1.06
Business Saver's Switch	10	\$25,250	35	48	INF	1.07	0.85	1.07
Peak and Energy Control	1	\$10,000	174	345	INF	5.64	5.43	5.64
<b>Business Segment Total</b>	<b>488</b>	<b>\$435,150</b>	<b>951</b>	<b>5,981,911</b>	<b>3.05</b>	<b>4.86</b>	<b>0.37</b>	<b>1.08</b>
<b>Residential Segment</b>								
Home Lighting	6,154	\$101,933	587	4,334,997	37.33	12.48	0.27	5.97
Heat Pump Water Heaters	25	\$11,850	8	62,033	4.51	1.67	0.24	1.00
Residential Demand Response	1,400	\$243,500	781	87,288	2.71	2.00	1.47	2.04
Consumer Education	52,579	\$378,448	N/A	N/A				
<b>Residential Segment Total</b>	<b>52,579</b>	<b>378,448</b>	<b>1,376</b>	<b>4,484,318</b>	<b>17.88</b>	<b>1.29</b>	<b>1.29</b>	<b>0.00</b>
<b>Planning Segment</b>								
Regulatory Affairs	0	\$10,000	0	0				
<b>Planning Segment Total</b>	<b>0</b>	<b>10,000</b>	<b>0</b>	<b>0</b>				
<b>PORTFOLIO TOTAL</b>	<b>53,067</b>	<b>823,598</b>	<b>2,327</b>	<b>10,466,229</b>	<b>5.23</b>	<b>4.73</b>	<b>0.36</b>	<b>1.59</b>

2022 SD DSM Plan Cost-Effectiveness Analysis

LIGHTING EFFICIENCY						2022	ELECTRIC	GOAL
<b>2022 Net Present Cost Benefit Summary Analysis For All Participants</b>						<b>Input Summary and Totals</b>		
	<b>Participant Test (\$Total)</b>	<b>Utility Test (\$Total)</b>	<b>Rate Impact Test (\$Total)</b>	<b>Total Resource Test (\$Total)</b>	<b>Societal Test (\$Total)</b>	<b>Program "Inputs" per Customer kW</b>		
<b>Benefits</b>						Lifetime (Weighted on Generator kWh)	A	15.1 years
<b>Avoided Revenue Requirements</b>						Annual Hours	B	8760
Generation	N/A	\$467,523	\$467,523	\$467,523	\$467,523	Gross Customer kW	C	1 kW
T & D	N/A	\$83,111	\$83,111	\$83,111	\$83,111	Generator Peak Coincidence Factor	D	56.04%
Marginal Energy	N/A	\$1,479,300	\$1,479,300	\$1,479,300	\$1,479,300	Gross Load Factor at Customer	E	51.98%
Environmental Externality	N/A	N/A	N/A	N/A	\$1,511	Transmission Loss Factor (Energy)	F	4.752%
Subtotal	N/A	\$2,029,934	\$2,029,934	\$2,029,934	\$2,031,445	Transmission Loss Factor (Demand)	G	5.520%
<b>Participant Benefits</b>						Societal Net Benefit (Cost)	H	\$114
Bill Reduction - Electric	\$5,275,038	N/A	N/A	N/A	N/A	<b>Program Summary per Participant</b>		
Rebates from Xcel Energy	\$361,625	N/A	N/A	\$361,625	\$361,625	Gross kW Saved at Customer	I	2.62 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	\$5,636,663	N/A	N/A	\$361,625	\$361,625	Net Annual kWh Saved at Generator	$(B \times E \times I) / (1 - F)$	
<b>Total Benefits</b>	<b>\$5,636,663</b>	<b>\$2,029,934</b>	<b>\$2,029,934</b>	<b>\$2,391,559</b>	<b>\$2,393,070</b>	<b>Program Summary All Participants</b>		
<b>Costs</b>						Total Participants	J	477
<b>Utility Project Costs</b>						<b>Total Budget</b>	K	<b>\$399,900</b>
Customer Services	N/A	\$0	\$0	\$0	\$0	Gross kW Saved at Customer	$(J \times I)$	
Utility Administration	N/A	\$22,275	\$22,275	\$22,275	\$22,275	<b>Net coincident kW Saved at Generator</b>	$(I \times D) / (1 - G) \times J$	
Advertising & Promotion	N/A	\$16,000	\$16,000	\$16,000	\$16,000	Gross Annual kWh Saved at Customer	$(B \times E \times I) \times J$	
Measurement & Verification	N/A	\$0	\$0	\$0	\$0	<b>Net Annual kWh Saved at Generator</b>	$((B \times E \times I) / (1 - F)) \times J$	
Rebates	N/A	\$361,625	\$361,625	\$361,625	\$361,625	<b>Societal Net Benefits</b>	$(J \times I \times H)$	
Other	N/A	\$0	\$0	\$0	\$0	<b>Utility Program Cost per kWh Lifetime</b>		
Subtotal	N/A	\$399,900	\$399,900	\$399,900	\$399,900	<b>Utility Program Cost per kW at Gen</b>		
<b>Utility Revenue Reduction</b>								<b>\$0.0044</b>
Revenue Reduction - Electric	N/A	N/A	\$5,275,038	N/A	N/A			<b>\$539</b>
Subtotal	N/A	N/A	\$5,275,038	N/A	N/A			
<b>Participant Costs</b>								
Incremental Capital Costs	\$1,758,769	N/A	N/A	\$1,758,769	\$1,758,769			
Incremental O&M Costs	\$91,623	N/A	N/A	\$91,623	\$91,623			
Subtotal	\$1,850,393	N/A	N/A	\$1,850,393	\$1,850,393			
<b>Total Costs</b>	<b>\$1,850,393</b>	<b>\$399,900</b>	<b>\$5,674,938</b>	<b>\$2,250,293</b>	<b>\$2,250,293</b>			
<b>Net Benefit (Cost)</b>	<b>\$3,786,270</b>	<b>\$1,630,034</b>	<b>(\$3,645,004)</b>	<b>\$141,266</b>	<b>\$142,777</b>			
<b>Benefit/Cost Ratio</b>	<b>3.05</b>	<b>5.08</b>	<b>0.36</b>	<b>1.06</b>	<b>1.06</b>			

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

<b>BUSINESS SAVER'S SWITCH</b>						<b>2022</b>	<b>ELECTRIC</b>	<b>GOAL</b>	
<b>2022 Net Present Cost Benefit Summary Analysis For All Participants</b>						<b>Input Summary and Totals</b>			
	<b>Participant Test (\$Total)</b>	<b>Utility Test (\$Total)</b>	<b>Rate Impact Test (\$Total)</b>	<b>Total Resource Test (\$Total)</b>	<b>Societal Test (\$Total)</b>	<b>Program "Inputs" per Customer kW</b>			
<b>Benefits</b>						Lifetime (Weighted on Generator kWh)	A	15.0 years	
<b>Avoided Revenue Requirements</b>						Annual Hours	B	8760	
Generation	N/A	\$22,872	\$22,872	\$22,872	\$22,872	Gross Customer kW	C	1 kW	
T & D	N/A	\$4,066	\$4,066	\$4,066	\$4,066	Generator Peak Coincidence Factor	D	16.79%	
Marginal Energy	N/A	\$12	\$12	\$12	\$12	Gross Load Factor at Customer	E	0.00%	
Environmental Externality	N/A	N/A	N/A	N/A	\$2	Transmission Loss Factor (Energy)	F	4.752%	
Subtotal	N/A	\$26,950	\$26,950	\$26,950	\$26,952	Transmission Loss Factor (Demand)	G	5.520%	
<b>Participant Benefits</b>						Societal Net Benefit (Cost)	H	\$9	
Bill Reduction - Electric	\$6,374	N/A	N/A	N/A	N/A	<b>Program Summary per Participant</b>			
Rebates from Xcel Energy	\$0	N/A	N/A	\$0	\$0	Gross kW Saved at Customer	I	19.56 kW	
Incremental Capital Savings	\$0	N/A	N/A	\$0	\$0	Net coincident kW Saved at Generator	$(I \times D) / (1 - G)$		3.48 kW
Incremental O&M Savings	\$0	N/A	N/A	\$0	\$0	Gross Annual kWh Saved at Customer	$(B \times E \times I)$		5 kWh
Subtotal	\$6,374	N/A	N/A	\$0	\$0	Net Annual kWh Saved at Generator	$(B \times E \times I) / (1 - F)$		5 kWh
<b>Total Benefits</b>	<b>\$6,374</b>	<b>\$26,950</b>	<b>\$26,950</b>	<b>\$26,950</b>	<b>\$26,952</b>	<b>Program Summary All Participants</b>			
<b>Costs</b>						Total Participants	J	10	
<b>Utility Project Costs</b>						<b>Total Budget</b>	K	<b>\$25,250</b>	
Customer Services	N/A	\$15,750	\$15,750	\$15,750	\$15,750	Gross kW Saved at Customer	$(J \times I)$		195.60 kW
Utility Administration	N/A	\$7,000	\$7,000	\$7,000	\$7,000	<b>Net coincident kW Saved at Generator</b>	$(I \times D) / (1 - G) \times J$		<b>35 kW</b>
Advertising & Promotion	N/A	\$2,500	\$2,500	\$2,500	\$2,500	Gross Annual kWh Saved at Customer	$(B \times E \times I) \times J$		45 kWh
Measurement & Verification	N/A	\$0	\$0	\$0	\$0	<b>Net Annual kWh Saved at Generator</b>	$((B \times E \times I) / (1 - F)) \times J$		<b>48 kWh</b>
Rebates	N/A	\$0	\$0	\$0	\$0	<b>Societal Net Benefits</b>	$(J \times I \times H)$		<b>\$1,702</b>
Other	N/A	\$0	\$0	\$0	\$0	<b>Utility Program Cost per kWh Lifetime</b>			<b>\$35.3311</b>
Subtotal	N/A	\$25,250	\$25,250	\$25,250	\$25,250	<b>Utility Program Cost per kW at Gen</b>			<b>\$727</b>
<b>Utility Revenue Reduction</b>									
Revenue Reduction - Electric	N/A	N/A	\$6,374	N/A	N/A				
Subtotal	N/A	N/A	\$6,374	N/A	N/A				
<b>Participant Costs</b>									
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				
<b>Total Costs</b>	<b>\$0</b>	<b>\$25,250</b>	<b>\$31,624</b>	<b>\$25,250</b>	<b>\$25,250</b>				
<b>Net Benefit (Cost)</b>	<b>\$6,374</b>	<b>\$1,700</b>	<b>(\$4,674)</b>	<b>\$1,700</b>	<b>\$1,702</b>				
<b>Benefit/Cost Ratio</b>	<b>INF</b>	<b>1.07</b>	<b>0.85</b>	<b>1.07</b>	<b>1.07</b>				

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

<b>PEAK AND ENERGY CONTROL</b>						<b>2022</b>	<b>ELECTRIC</b>	<b>GOAL</b>
<b>2022 Net Present Cost Benefit Summary Analysis For All Participants</b>						<b>Input Summary and Totals</b>		
	<b>Participant Test (\$Total)</b>	<b>Utility Test (\$Total)</b>	<b>Rate Impact Test (\$Total)</b>	<b>Total Resource Test (\$Total)</b>	<b>Societal Test (\$Total)</b>	<b>Program "Inputs" per Customer kW</b>		
<b>Benefits</b>						Lifetime (Weighted on Generator kWh)	A	5.0 years
<b>Avoided Revenue Requirements</b>						Annual Hours	B	8760
Generation	N/A	\$47,994	\$47,994	\$47,994	\$47,994	Gross Customer kW	C	1 kW
T & D	N/A	\$8,408	\$8,408	\$8,408	\$8,408	Generator Peak Coincidence Factor	D	100.00%
Marginal Energy	N/A	\$38	\$38	\$38	\$38	Gross Load Factor at Customer	E	0.02%
Environmental Externality	N/A	N/A	N/A	N/A	\$0	Transmission Loss Factor (Energy)	F	4.752%
Subtotal	N/A	\$56,441	\$56,441	\$56,441	\$56,441	Transmission Loss Factor (Demand)	G	5.520%
<b>Participant Benefits</b>						Societal Net Benefit (Cost)	H	\$283
Bill Reduction - Electric	\$394	N/A	N/A	N/A	N/A	<b>Program Summary per Participant</b>		
Rebates from Xcel Energy	\$0	N/A	N/A	\$0	\$0	Gross kW Saved at Customer	I	164.29 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	\$394	N/A	N/A	\$0	\$0	Net Annual kWh Saved at Generator	$(B \times E \times I) / (1 - F)$	
<b>Total Benefits</b>	<b>\$394</b>	<b>\$56,441</b>	<b>\$56,441</b>	<b>\$56,441</b>	<b>\$56,441</b>	<b>Program Summary All Participants</b>		
<b>Costs</b>						Total Participants	J	1
<b>Utility Project Costs</b>						<b>Total Budget</b>	K	<b>\$10,000</b>
Customer Services	N/A	\$0	\$0	\$0	\$0	Gross kW Saved at Customer	$(J \times I)$	
Utility Administration	N/A	\$10,000	\$10,000	\$10,000	\$10,000	<b>Net coincident kW Saved at Generator</b>	$(I \times D) / (1 - G) \times J$	
Advertising & Promotion	N/A	\$0	\$0	\$0	\$0	Gross Annual kWh Saved at Customer	$(B \times E \times I) \times J$	
Measurement & Verification	N/A	\$0	\$0	\$0	\$0	<b>Net Annual kWh Saved at Generator</b>	$((B \times E \times I) / (1 - F)) \times J$	
Rebates	N/A	\$0	\$0	\$0	\$0	<b>Societal Net Benefits</b>	$(J \times I \times H)$	
Other	N/A	\$0	\$0	\$0	\$0	<b>Utility Program Cost per kWh Lifetime</b>		
Subtotal	N/A	\$10,000	\$10,000	\$10,000	\$10,000	<b>Utility Program Cost per kW at Gen</b>		
<b>Utility Revenue Reduction</b>								<b>\$5.7976</b>
Revenue Reduction - Electric	N/A	N/A	\$394	N/A	N/A			<b>\$58</b>
Subtotal	N/A	N/A	\$394	N/A	N/A			
<b>Participant Costs</b>								
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			
<b>Total Costs</b>	<b>\$0</b>	<b>\$10,000</b>	<b>\$10,394</b>	<b>\$10,000</b>	<b>\$10,000</b>			
<b>Net Benefit (Cost)</b>	<b>\$394</b>	<b>\$46,441</b>	<b>\$46,047</b>	<b>\$46,441</b>	<b>\$46,441</b>			
<b>Benefit/Cost Ratio</b>	<b>INF</b>	<b>5.64</b>	<b>5.43</b>	<b>5.64</b>	<b>5.64</b>			

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

2022 SD DSM Plan Cost-Effectiveness Analysis

<b>BUSINESS SEGMENT TOTAL</b>					
2022 Net Present Cost Benefit Summary Analysis For All Participants					
	Participant	Utility	Rate	Total	Societal
	Test	Test	Impact	Resource	Test
	(\$Total)	(\$Total)	(\$Total)	(\$Total)	(\$Total)
<b>Benefits</b>					
<b>Avoided Revenue Requirements</b>					
Generation	N/A	\$538,389	\$538,389	\$538,389	\$538,389
T & D	N/A	\$95,586	\$95,586	\$95,586	\$95,586
Marginal Energy	N/A	\$1,479,350	\$1,479,350	\$1,479,350	\$1,479,350
Environmental Externality	N/A	N/A	N/A	N/A	\$1,513
Subtotal	N/A	\$2,113,325	\$2,113,325	\$2,113,325	\$2,114,838
<b>Participant Benefits</b>					
Bill Reduction - Electric	\$5,281,806	N/A	N/A	N/A	N/A
Rebates from Xcel Energy	\$361,625	N/A	N/A	\$361,625	\$361,625
Incremental Capital Savings	\$0	N/A	N/A	\$0	\$0
Incremental O&M Savings	\$0	N/A	N/A	\$0	\$0
Subtotal	\$5,643,432	N/A	N/A	\$361,625	\$361,625
<b>Total Benefits</b>	<b>\$5,643,432</b>	<b>\$2,113,325</b>	<b>\$2,113,325</b>	<b>\$2,474,950</b>	<b>\$2,476,463</b>
<b>Costs</b>					
<b>Utility Project Costs</b>					
Customer Services	N/A	\$15,750	\$15,750	\$15,750	\$15,750
Utility Administration	N/A	\$39,275	\$39,275	\$39,275	\$39,275
Advertising & Promotion	N/A	\$18,500	\$18,500	\$18,500	\$18,500
Measurement & Verification	N/A	\$0	\$0	\$0	\$0
Rebates	N/A	\$361,625	\$361,625	\$361,625	\$361,625
Other	N/A	\$0	\$0	\$0	\$0
Subtotal	N/A	\$435,150	\$435,150	\$435,150	\$435,150
<b>Utility Revenue Reduction</b>					
Revenue Reduction - Electric	N/A	N/A	\$5,281,806	N/A	N/A
Subtotal	N/A	N/A	\$5,281,806	N/A	N/A
<b>Participant Costs</b>					
Incremental Capital Costs	\$1,758,769	N/A	N/A	\$1,758,769	\$1,758,769
Incremental O&M Costs	\$91,623	N/A	N/A	\$91,623	\$91,623
Subtotal	\$1,850,393	N/A	N/A	\$1,850,393	\$1,850,393
<b>Total Costs</b>	<b>\$1,850,393</b>	<b>\$435,150</b>	<b>\$5,716,957</b>	<b>\$2,285,543</b>	<b>\$2,285,543</b>
<b>Net Benefit (Cost)</b>	<b>\$3,793,039</b>	<b>\$1,678,175</b>	<b>(\$3,603,631)</b>	<b>\$189,407</b>	<b>\$190,920</b>
<b>Benefit/Cost Ratio</b>	<b>3.05</b>	<b>4.86</b>	<b>0.37</b>	<b>1.08</b>	<b>1.08</b>

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

<b>2022 ELECTRIC GOAL</b>		
Input Summary and Totals		
Program "Inputs" per Customer kW		
Lifetime (Weighted on Generator kWh)	A	15.1 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	55.76%
Gross Load Factor at Customer	E	40.37%
Transmission Loss Factor (Energy)	F	4.752%
Transmission Loss Factor (Demand)	G	5.520%
Societal Net Benefit (Cost)	H	\$119
<b>Program Summary per Participant</b>		
Gross kW Saved at Customer	I	3.30 kW
Net coincident kW Saved at Generator	$(I \times D) / (1 - G)$	1.95 kW
Gross Annual kWh Saved at Customer	$(B \times E \times I)$	11,675 kWh
Net Annual kWh Saved at Generator	$(B \times E \times I) / (1 - F)$	12,258 kWh
<b>Program Summary All Participants</b>		
Total Participants	J	488
<b>Total Budget</b>	<b>K</b>	<b>\$435,150</b>
Gross kW Saved at Customer	$(J \times I)$	1,611.11 kW
<b>Net coincident kW Saved at Generator</b>	$(I \times D) / (1 - G) \times J$	<b>951 kW</b>
Gross Annual kWh Saved at Customer	$(B \times E \times I) \times J$	5,697,620 kWh
<b>Net Annual kWh Saved at Generator</b>	$((B \times E \times I) / (1 - F)) \times J$	<b>5,981,911 kWh</b>
<b>Societal Net Benefits</b>	$(J \times I \times H)$	<b>\$190,920</b>
<b>Utility Program Cost per kWh Lifetime</b>		<b>\$0.0048</b>
<b>Utility Program Cost per kW at Gen</b>		<b>\$458</b>

2022 SD DSM Plan Cost-Effectiveness Analysis

HOME LIGHTING						2022	ELECTRIC	GOAL
<b>2022 Net Present Cost Benefit Summary Analysis For All Participants</b>						<b>Input Summary and Totals</b>		
	<b>Participant Test (\$Total)</b>	<b>Utility Test (\$Total)</b>	<b>Rate Impact Test (\$Total)</b>	<b>Total Resource Test (\$Total)</b>	<b>Societal Test (\$Total)</b>	<b>Program "Inputs" per Customer kW</b>		
<b>Benefits</b>						Lifetime (Weighted on Generator kWh)	A	12.6 years
<b>Avoided Revenue Requirements</b>						Annual Hours	B	8760
Generation	N/A	\$310,720	\$310,720	\$310,720	\$310,720	Gross Customer kW	C	1 kW
T & D	N/A	\$55,215	\$55,215	\$55,215	\$55,215	Generator Peak Coincidence Factor	D	16.68%
Marginal Energy	N/A	\$905,782	\$905,782	\$905,782	\$905,782	Gross Load Factor at Customer	E	14.28%
Environmental Externality	N/A	N/A	N/A	N/A	\$5,083	Transmission Loss Factor (Energy)	F	5.553%
Subtotal	N/A	\$1,271,717	\$1,271,717	\$1,271,717	\$1,276,800	Transmission Loss Factor (Demand)	G	7.005%
						Societal Net Benefit (Cost)	H	\$346
<b>Participant Benefits</b>						<b>Program Summary per Participant</b>		
Bill Reduction - Electric	\$4,583,063	N/A	N/A	N/A	N/A	Gross kW Saved at Customer	I	0.53 kW
Rebates from Xcel Energy	\$82,200	N/A	N/A	\$82,200	\$82,200	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	\$4,665,263	N/A	N/A	\$82,200	\$82,200	<b>Program Summary All Participants</b>		
<b>Total Benefits</b>	<b>\$4,665,263</b>	<b>\$1,271,717</b>	<b>\$1,271,717</b>	<b>\$1,353,917</b>	<b>\$1,359,000</b>	Total Participants	J	6,154
<b>Costs</b>						<b>Total Budget</b>	K	<b>\$101,933</b>
<b>Utility Project Costs</b>						Gross kW Saved at Customer	$(J \times I)$	
Customer Services	N/A	\$13,500	\$13,500	\$13,500	\$13,500	<b>Net coincident kW Saved at Generator</b>	$(I \times D) / (1 - G) \times J$	
Utility Administration	N/A	\$4,949	\$4,949	\$4,949	\$4,949	Gross Annual kWh Saved at Customer	$(B \times E \times I) \times J$	
Advertising & Promotion	N/A	\$1,284	\$1,284	\$1,284	\$1,284	<b>Net Annual kWh Saved at Generator</b>	$((B \times E \times I) / (1 - F)) \times J$	
Measurement & Verification	N/A	\$0	\$0	\$0	\$0	<b>Societal Net Benefits</b>	$(J \times I \times H)$	
Rebates	N/A	\$82,200	\$82,200	\$82,200	\$82,200	<b>Utility Program Cost per kWh Lifetime</b>		
Other	N/A	\$0	\$0	\$0	\$0	<b>Utility Program Cost per kW at Gen</b>		
Subtotal	N/A	\$101,933	\$101,933	\$101,933	\$101,933	\$0.0019		
						\$174		
<b>Utility Revenue Reduction</b>								
Revenue Reduction - Electric	N/A	N/A	\$4,583,063	N/A	N/A			
Subtotal	N/A	N/A	\$4,583,063	N/A	N/A			
<b>Participant Costs</b>								
Incremental Capital Costs	\$124,960	N/A	N/A	\$124,960	\$124,960			
Incremental O&M Costs	\$0	N/A	N/A	\$0	\$0			
Subtotal	\$124,960	N/A	N/A	\$124,960	\$124,960			
<b>Total Costs</b>	<b>\$124,960</b>	<b>\$101,933</b>	<b>\$4,684,996</b>	<b>\$226,893</b>	<b>\$226,893</b>			
<b>Net Benefit (Cost)</b>	<b>\$4,540,303</b>	<b>\$1,169,784</b>	<b>(\$3,413,279)</b>	<b>\$1,127,024</b>	<b>\$1,132,107</b>			
<b>Benefit/Cost Ratio</b>	<b>37.33</b>	<b>12.48</b>	<b>0.27</b>	<b>5.97</b>	<b>5.99</b>			

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

<b>HEAT PUMP WATER HEATERS</b>						<b>2022</b>	<b>ELECTRIC</b>	<b>GOAL</b>	
<b>2022 Net Present Cost Benefit Summary Analysis For All Participants</b>						<b>Input Summary and Totals</b>			
	<b>Participant Test (\$Total)</b>	<b>Utility Test (\$Total)</b>	<b>Rate Impact Test (\$Total)</b>	<b>Total Resource Test (\$Total)</b>	<b>Societal Test (\$Total)</b>	<b>Program "Inputs" per Customer kW</b>			
<b>Benefits</b>						Lifetime (Weighted on Generator kWh)	A	13.0 years	
<b>Avoided Revenue Requirements</b>						Annual Hours	B	8760	
Generation	N/A	\$4,768	\$4,768	\$4,768	\$4,768	Gross Customer kW	C	1 kW	
T & D	N/A	\$845	\$845	\$845	\$845	Generator Peak Coincidence Factor	D	100.00%	
Marginal Energy	N/A	\$14,186	\$14,186	\$14,186	\$14,186	Gross Load Factor at Customer	E	89.75%	
Environmental Externality	N/A	N/A	N/A	N/A	\$1	Transmission Loss Factor (Energy)	F	5.830%	
Subtotal	N/A	\$19,800	\$19,800	\$19,800	\$19,801	Transmission Loss Factor (Demand)	G	7.100%	
<b>Participant Benefits</b>						Societal Net Benefit (Cost)	H	\$2	
Bill Reduction - Electric	\$70,941	N/A	N/A	N/A	N/A	<b>Program Summary per Participant</b>			
Rebates from Xcel Energy	\$10,000	N/A	N/A	\$10,000	\$10,000	Gross kW Saved at Customer	I	0.30 kW	
Incremental Capital Savings	\$0	N/A	N/A	\$0	\$0	Net coincident kW Saved at Generator	$(I \times D) / (1 - G)$		0.32 kW
Incremental O&M Savings	\$0	N/A	N/A	\$0	\$0	Gross Annual kWh Saved at Customer	$(B \times E \times I)$		2,337 kWh
Subtotal	\$80,941	N/A	N/A	\$10,000	\$10,000	Net Annual kWh Saved at Generator	$(B \times E \times I) / (1 - F)$		2,481 kWh
<b>Total Benefits</b>	<b>\$80,941</b>	<b>\$19,800</b>	<b>\$19,800</b>	<b>\$29,800</b>	<b>\$29,801</b>	<b>Program Summary All Participants</b>			
<b>Costs</b>						Total Participants	J	25	
<b>Utility Project Costs</b>						<b>Total Budget</b>	K	<b>\$11,850</b>	
Customer Services	N/A	\$0	\$0	\$0	\$0	Gross kW Saved at Customer	$(J \times I)$		7.43 kW
Utility Administration	N/A	\$1,850	\$1,850	\$1,850	\$1,850	<b>Net coincident kW Saved at Generator</b>	$(I \times D) / (1 - G) \times J$		<b>8 kW</b>
Advertising & Promotion	N/A	\$0	\$0	\$0	\$0	Gross Annual kWh Saved at Customer	$(B \times E \times I) \times J$		58,416 kWh
Measurement & Verification	N/A	\$0	\$0	\$0	\$0	<b>Net Annual kWh Saved at Generator</b>	$((B \times E \times I) / (1 - F)) \times J$		<b>62,033 kWh</b>
Rebates	N/A	\$10,000	\$10,000	\$10,000	\$10,000	<b>Societal Net Benefits</b>	$(J \times I \times H)$		<b>\$11</b>
Other	N/A	\$0	\$0	\$0	\$0	<b>Utility Program Cost per kWh Lifetime</b>			<b>\$0.0147</b>
Subtotal	N/A	\$11,850	\$11,850	\$11,850	\$11,850	<b>Utility Program Cost per kW at Gen</b>			<b>\$1,482</b>
<b>Utility Revenue Reduction</b>									
Revenue Reduction - Electric	N/A	N/A	\$70,941	N/A	N/A				
Subtotal	N/A	N/A	\$70,941	N/A	N/A				
<b>Participant Costs</b>									
Incremental Capital Costs	\$16,464	N/A	N/A	\$16,464	\$16,464				
Incremental O&M Costs	\$1,476	N/A	N/A	\$1,476	\$1,476				
Subtotal	\$17,940	N/A	N/A	\$17,940	\$17,940				
<b>Total Costs</b>	<b>\$17,940</b>	<b>\$11,850</b>	<b>\$82,791</b>	<b>\$29,790</b>	<b>\$29,790</b>				
<b>Net Benefit (Cost)</b>	<b>\$63,001</b>	<b>\$7,950</b>	<b>(\$62,991)</b>	<b>\$10</b>	<b>\$11</b>				
<b>Benefit/Cost Ratio</b>	<b>4.51</b>	<b>1.67</b>	<b>0.24</b>	<b>1.00</b>	<b>1.00</b>				

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

<b>RESIDENTIAL DEMAND RESPONSE</b>						<b>2022</b>	<b>ELECTRIC</b>	<b>GOAL</b>
<b>2022 Net Present Cost Benefit Summary Analysis For All Participants</b>						<b>Input Summary and Totals</b>		
	<b>Participant</b>	<b>Utility</b>	<b>Rate</b>	<b>Total</b>	<b>Societal</b>	<b>Program "Inputs" per Customer kW</b>		
	<b>Test</b>	<b>Test</b>	<b>Impact</b>	<b>Resource</b>	<b>Test</b>			
	<b>(\$Total)</b>	<b>(\$Total)</b>	<b>(\$Total)</b>	<b>(\$Total)</b>	<b>(\$Total)</b>			
<b>Benefits</b>						<b>Program Summary per Participant</b>		
<b>Avoided Revenue Requirements</b>						<b>Program Summary All Participants</b>		
Generation	N/A	\$399,577	\$399,577	\$399,577	\$399,577	Gross kW Saved at Customer	I	1.40 kW
T & D	N/A	\$70,787	\$70,787	\$70,787	\$70,787	Net coincident kW Saved at Generator	( I x D ) / ( 1 - G )	0.56 kW
Marginal Energy	N/A	\$17,612	\$17,612	\$17,612	\$17,612	Gross Annual kWh Saved at Customer	( B x E x I )	59 kWh
Environmental Externality	N/A	N/A	N/A	N/A	\$71	Net Annual kWh Saved at Generator	( B x E x I ) / ( 1 - F )	62 kWh
Subtotal	N/A	\$487,976	\$487,976	\$487,976	\$488,047	<b>Utility Program Cost per kWh Lifetime</b>		
<b>Participant Benefits</b>						<b>Utility Program Cost per kW at Gen</b>		
Bill Reduction - Electric	\$88,039	N/A	N/A	N/A	N/A	<b>\$0.2786</b>		
Rebates from Xcel Energy	\$65,000	N/A	N/A	\$65,000	\$65,000	<b>\$312</b>		
Incremental Capital Savings	\$0	N/A	N/A	\$0	\$0			
Incremental O&M Savings	\$242,418	N/A	N/A	\$242,418	\$242,418			
Subtotal	\$395,457	N/A	N/A	\$307,418	\$307,418			
<b>Total Benefits</b>	<b>\$395,457</b>	<b>\$487,976</b>	<b>\$487,976</b>	<b>\$795,393</b>	<b>\$795,465</b>			
<b>Costs</b>								
<b>Utility Project Costs</b>								
Customer Services	N/A	\$126,000	\$126,000	\$126,000	\$126,000			
Utility Administration	N/A	\$42,500	\$42,500	\$42,500	\$42,500			
Advertising & Promotion	N/A	\$10,000	\$10,000	\$10,000	\$10,000			
Measurement & Verification	N/A	\$0	\$0	\$0	\$0			
Rebates	N/A	\$65,000	\$65,000	\$65,000	\$65,000			
Other	N/A	\$0	\$0	\$0	\$0			
Subtotal	N/A	\$243,500	\$243,500	\$243,500	\$243,500			
<b>Utility Revenue Reduction</b>								
Revenue Reduction - Electric	N/A	N/A	\$88,039	N/A	N/A			
Subtotal	N/A	N/A	\$88,039	N/A	N/A			
<b>Participant Costs</b>								
Incremental Capital Costs	\$146,000	N/A	N/A	\$146,000	\$146,000			
Incremental O&M Costs	\$0	N/A	N/A	\$0	\$0			
Subtotal	\$146,000	N/A	N/A	\$146,000	\$146,000			
<b>Total Costs</b>	<b>\$146,000</b>	<b>\$243,500</b>	<b>\$331,539</b>	<b>\$389,500</b>	<b>\$389,500</b>			
<b>Net Benefit (Cost)</b>	<b>\$249,457</b>	<b>\$244,476</b>	<b>\$156,436</b>	<b>\$405,893</b>	<b>\$405,965</b>			
<b>Benefit/Cost Ratio</b>	<b>2.71</b>	<b>2.00</b>	<b>1.47</b>	<b>2.04</b>	<b>2.04</b>			

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



2022 SD DSM Plan Cost-Effectiveness Analysis

<b>RESIDENTIAL SEGMENT TOTAL</b>						<b>2022</b>	<b>ELECTRIC</b>	<b>GOAL</b>
<b>2022 Net Present Cost Benefit Summary Analysis For All Participants</b>						<b>Input Summary and Totals</b>		
	<b>Participant</b>	<b>Utility</b>	<b>Rate</b>	<b>Total</b>	<b>Societal</b>	<b>Program "Inputs" per Customer kW</b>		
	<b>Test</b>	<b>Test</b>	<b>Impact</b>	<b>Resource</b>	<b>Test</b>			
	<b>(\$Total)</b>	<b>(\$Total)</b>	<b>(\$Total)</b>	<b>(\$Total)</b>	<b>(\$Total)</b>			
<b>Benefits</b>						<b>Program Summary per Participant</b>		
<b>Avoided Revenue Requirements</b>						<b>Program Summary All Participants</b>		
Generation	N/A	\$715,066	\$715,066	\$715,066	\$715,066	Gross kW Saved at Customer	I	0.10 kW
T & D	N/A	\$126,848	\$126,848	\$126,848	\$126,848	Net coincident kW Saved at Generator	( I x D ) / ( 1 - G )	0.03 kW
Marginal Energy	N/A	\$937,580	\$937,580	\$937,580	\$937,580	Gross Annual kWh Saved at Customer	( B x E x I )	81 kWh
Environmental Externality	N/A	N/A	N/A	N/A	\$5,155	Net Annual kWh Saved at Generator	( B x E x I ) / ( 1 - F )	85 kWh
Subtotal	N/A	\$1,779,493	\$1,779,493	\$1,779,493	\$1,784,648	Total Participants	J	52,579
<b>Participant Benefits</b>						<b>Total Budget</b>		
Bill Reduction - Electric	\$4,742,044	N/A	N/A	N/A	N/A	Gross kW Saved at Customer	( J x I )	5,241.12 kW
Rebates from Xcel Energy	\$157,200	N/A	N/A	\$157,200	\$157,200	Net coincident kW Saved at Generator	( I x D ) / ( 1 - G ) x J	1,376 kW
Incremental Capital Savings	\$0	N/A	N/A	\$0	\$0	Gross Annual kWh Saved at Customer	( B x E x I ) x J	4,234,904 kWh
Incremental O&M Savings	\$240,942	N/A	N/A	\$240,942	\$240,942	Net Annual kWh Saved at Generator	( ( B x E x I ) / ( 1 - F ) ) x J	4,484,318 kWh
Subtotal	\$5,140,185	N/A	N/A	\$398,142	\$398,142	Societal Net Benefits	( J x I x H )	\$1,516,918
<b>Total Benefits</b>						<b>Utility Program Cost per kWh Lifetime</b>		
	\$5,140,185	\$1,779,493	\$1,779,493	\$2,177,635	\$2,182,790	<b>Utility Program Cost per kW at Gen</b>		
<b>Costs</b>						<b>Societal Net Benefit (Cost)</b>		
<b>Utility Project Costs</b>						<b>Benefit/Cost Ratio</b>		
Customer Services	N/A	\$160,665	\$160,665	\$160,665	\$160,665	17.88	4.70	0.35
Utility Administration	N/A	\$49,299	\$49,299	\$49,299	\$49,299			
Advertising & Promotion	N/A	\$11,284	\$11,284	\$11,284	\$11,284			
Measurement & Verification	N/A	\$0	\$0	\$0	\$0			
Rebates	N/A	\$157,200	\$157,200	\$157,200	\$157,200			
Other	N/A	\$0	\$0	\$0	\$0			
Subtotal	N/A	\$378,448	\$378,448	\$378,448	\$378,448			
<b>Utility Revenue Reduction</b>						<b>Net Benefit (Cost)</b>		
Revenue Reduction - Electric	N/A	N/A	\$4,742,044	N/A	N/A	\$4,852,761	\$1,401,045	(\$3,340,999)
Subtotal	N/A	N/A	\$4,742,044	N/A	N/A	\$1,511,763	\$1,516,918	
<b>Participant Costs</b>						<b>Net Benefit (Cost)</b>		
Incremental Capital Costs	\$287,424	N/A	N/A	\$287,424	\$287,424			
Incremental O&M Costs	\$0	N/A	N/A	\$0	\$0			
Subtotal	\$287,424	N/A	N/A	\$287,424	\$287,424			
<b>Total Costs</b>						<b>Benefit/Cost Ratio</b>		
	\$287,424	\$378,448	\$5,120,492	\$665,872	\$665,872			
<b>Net Benefit (Cost)</b>						<b>Benefit/Cost Ratio</b>		
	\$4,852,761	\$1,401,045	(\$3,340,999)	\$1,511,763	\$1,516,918			
<b>Benefit/Cost Ratio</b>						<b>Benefit/Cost Ratio</b>		
	17.88	4.70	0.35	3.27	3.28			

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

<b>PORTFOLIO TOTAL</b>			<b>2022</b>	<b>ELECTRIC</b>	<b>GOAL</b>	
<b>2022 Net Present Cost Benefit Summary Analysis For All Participants</b>						
	<b>Participant Test (\$Total)</b>	<b>Utility Test (\$Total)</b>	<b>Rate Impact Test (\$Total)</b>	<b>Total Resource Test (\$Total)</b>	<b>Societal Test (\$Total)</b>	
<b>Benefits</b>						
<b>Avoided Revenue Requirements</b>						
Generation	N/A	\$1,253,455	\$1,253,455	\$1,253,455	\$1,253,455	
T & D	N/A	\$222,434	\$222,434	\$222,434	\$222,434	
Marginal Energy	N/A	\$2,416,929	\$2,416,929	\$2,416,929	\$2,416,929	
Environmental Externality	N/A	N/A	N/A	N/A	\$6,668	
Subtotal	N/A	\$3,892,818	\$3,892,818	\$3,892,818	\$3,899,486	
<b>Participant Benefits</b>						
Bill Reduction - Electric	\$10,023,850	N/A	N/A	N/A	N/A	
Rebates from Xcel Energy	\$518,825	N/A	N/A	\$518,825	\$518,825	
Incremental Capital Savings	\$0	N/A	N/A	\$0	\$0	
Incremental O&M Savings	\$149,318	N/A	N/A	\$149,318	\$149,318	
Subtotal	\$10,691,994	N/A	N/A	\$668,144	\$668,144	
<b>Total Benefits</b>	<b>\$10,691,994</b>	<b>\$3,892,818</b>	<b>\$3,892,818</b>	<b>\$4,560,962</b>	<b>\$4,567,630</b>	
<b>Costs</b>						
<b>Utility Project Costs</b>						
Customer Services	N/A	\$176,415	\$176,415	\$176,415	\$176,415	
Utility Administration	N/A	\$98,574	\$98,574	\$98,574	\$98,574	
Advertising & Promotion	N/A	\$29,784	\$29,784	\$29,784	\$29,784	
Measurement & Verification	N/A	\$0	\$0	\$0	\$0	
Rebates	N/A	\$518,825	\$518,825	\$518,825	\$518,825	
Other	N/A	\$0	\$0	\$0	\$0	
Subtotal	N/A	\$823,598	\$823,598	\$823,598	\$823,598	
<b>Utility Revenue Reduction</b>						
Revenue Reduction - Electric	N/A	N/A	\$10,023,850	N/A	N/A	
Subtotal	N/A	N/A	\$10,023,850	N/A	N/A	
<b>Participant Costs</b>						
Incremental Capital Costs	\$2,046,194	N/A	N/A	\$2,046,194	\$2,046,194	
Incremental O&M Costs	\$0	N/A	N/A	\$0	\$0	
Subtotal	\$2,046,194	N/A	N/A	\$2,046,194	\$2,046,194	
<b>Total Costs</b>	<b>\$2,046,194</b>	<b>\$823,598</b>	<b>\$10,847,448</b>	<b>\$2,869,792</b>	<b>\$2,869,792</b>	
<b>Net Benefit (Cost)</b>	<b>\$8,645,800</b>	<b>\$3,069,220</b>	<b>(\$6,954,630)</b>	<b>\$1,691,170</b>	<b>\$1,697,838</b>	
<b>Benefit/Cost Ratio</b>	<b>5.23</b>	<b>4.73</b>	<b>0.36</b>	<b>1.59</b>	<b>1.59</b>	

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

<b>Input Summary and Totals</b>		
<b>Program "Inputs" per Customer kW</b>		
Lifetime (Weighted on Generator kWh)	A	14.0 years
Annual Hours	B	8760
Gross Customer kW	C	1 kW
Generator Peak Coincidence Factor	D	31.68%
Gross Load Factor at Customer	E	16.55%
Transmission Loss Factor (Energy)	F	5.099%
Transmission Loss Factor (Demand)	G	6.688%
Societal Net Benefit (Cost)	H	\$248
<b>Program Summary per Participant</b>		
Gross kW Saved at Customer	I	0.13 kW
Net coincident kW Saved at Generator	$(I \times D) / (1 - G)$	0.04 kW
Gross Annual kWh Saved at Customer	$(B \times E \times I)$	187 kWh
Net Annual kWh Saved at Generator	$(B \times E \times I) / (1 - F)$	197 kWh
<b>Program Summary All Participants</b>		
Total Participants	J	53,067
<b>Total Budget</b>	<b>K</b>	<b>\$823,598</b>
Gross kW Saved at Customer	$(J \times I)$	6,852.23 kW
<b>Net coincident kW Saved at Generator</b>	<b><math>(I \times D) / (1 - G) \times J</math></b>	<b>2,327 kW</b>
Gross Annual kWh Saved at Customer	$(B \times E \times I) \times J$	9,932,524 kWh
<b>Net Annual kWh Saved at Generator</b>	<b><math>((B \times E \times I) / (1 - F)) \times J</math></b>	<b>10,466,229 kWh</b>
<b>Societal Net Benefits</b>	$(J \times I \times H)$	<b>\$1,697,838</b>
<b>Utility Program Cost per kWh Lifetime</b>		<b>\$0.0056</b>
<b>Utility Program Cost per kW at Gen</b>		<b>\$354</b>