"Optimize" CBA's Distribution Projects

CIRCUIT_ID	TOTAL RES CUSTOMERS	TOTAL NON-RES CUSTOMERS < 50,000 KWH AVG	TOTAL NON RES CUSTOMERS > 50,000 KWH AVG	TOTAL	PROJECT	
T3450B03	796	258	23	1,077	1	
T3450B04	580	100	8	688	1	missing T3450B02
	1,376	358	31	1,765		
02091206		1			2	one customer…GRVL hospital
02091207					2	
	-	1	-	-		
4091203	192	25	3	220	3	
4231203	695	186	28	909	3	two projects; same circuit
	887	211	31	1,129		
4231203	695	186	28	909	4	two projects; same circuit
4141203	431	171	24	626	4	
	1,126	357	52	1,535		
4351205	685	135	12	832	5	
4351206	1,089	163	10	1,262	5	
	1,774	298	22	2,094		
60081206	1,014	168	10	1,192	6	
60181201	243	83	20	346	6	
	1,257	251	30	1,538		
60181202	928	230	18	1,176	7	
60211202	1,279	295	15	1,589	7	
	2,207	525	33	2,765		
7311202	979	175	11	1,165	8	
7401202	507	121	3	631	8	
	1,486	296	14	1,796		

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 1 of 80

"Optimize" CBA's Distribution Projects

Project Number	Jurisdiction	State	Project	MED_Y_N	10yrOutageCount	10YrCI	10yrCMI
1	DEP	SC	Cheraw River	Y	10	5,191	6,197,624
1	DEP	SC	Cheraw River	N	49	22,502	1,883,685
2	DEC	SC	Brushy Creek	N	1	2	162
3	DEC	SC	Whitehall Hurricane Creek	Y	5	1,512	410,657
3	DEC	SC	Whitehall Hurricane Creek	N	9	4,105	134,932
4	DEC	SC	Whitehall Sandy Springs	Y	4	1,068	368,189
4	DEC	SC	Whitehall Sandy Springs	N	19	6,338	465,445
5	DEC	SC	Fants Grove	N	12	9,714	782,199
6	DEC	SC	Moore Camp Croft	Y	9	6,285	1,313,936
6	DEC	SC	Moore Camp Croft	N	28	11,152	1,331,054
7	DEC	SC	Moore Woodruff	Y	18	8,923	2,781,941
7	DEC	SC	Moore Woodruff	N	59	33,435	4,631,998
8	DEC	SC	Eddy Road Panorama	Y	17	1,774	1,343,157
8	DEC	SC	Eddy Road Panorama	N	28	8,530	1,057,981

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 2 of 80

"Optimize" CBA's Distribution Projects

Data Input	Description
Circuit ID's involved in the project	**Enter each circuit ID on a separate row**
02091206	Brushy Creek 1206
02091207	Brushy Creek 1207
Protective Device ID's impacted	Will research the 10 year outage history on these devices to estimate CI/CMI reduction by completing this project. Appears in most cases this will be the backbone devices upstream from the project site.
	Enter the Smallworld ID of each protective device impacted in Column A. One Smallworld ID per row.
38375632	1206 OCB
38361417	1207 OCB
	Input Data Here
Estimated Cost	$1,100,000
Timeframe to Complete (Years)	1
Estimated % decrease in event duration	90%

Special Considerations that have a financial impact: Mention additional considerations that would be cost beneficial. We will run the cost of the project vs traditional benefits like outage and veg savings.
Ex. Project will reduce vegetation trimming from 3 ROW's to 1
Ex. Changing to from wood to concrete poles (O&M)

Greenville Health System Level 1 Trauma center - electrical distribution delievery - feeds all the critical care facilities (Emeregency Room, Operating Rooms) - Societial impact - Long duration outage can require the hospital to evacuate
5-1980's vintage live front switchgears (two switchgears were inaccessable due to transformers blocking)
Drain wire (750 Al) feeding the courtyard area
Utility congestion in the courtyard - creates additional outage duration in event of a cable failure
Installing concrete encased duct bank (currently UG cable is direct bury)
Relocating switchgears and replacing the existing cable that is at end of life.

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 3 of 80

"Optimize" CBA's Distribution Projects

PROGRAM:	Long Duration/High Impact Sites	Long Duration/High Impact Sites	Long Duration/High Impact Sites	Long Duration/High Impact Sites	Long Duration/High Impact Sites	Long Duration/High Impact Sites	Long Duration/High Impact Sites	Long Duration/High Impact Sites
PROJECT:	Cheraw River Crossing - 1	Brushy Creek - 2	Whitehall Hurricance Creek - 3	Whitehall Sandy Creek - 4	Fants Grove - 5	Moore Camp Croft - 6	Moore Woodruff - 7	Eddy Rd Panorama - 8
REGULATORY JURISDICTION:	DEP	DEC	DEC	DEC	DEC	DEC	DEC	DEC
STATE:	SC	SC	SC	SC	SC	SC	SC	SC
ASSUMPTIONS								
Operational								
Outage and Restoration								
DEC Average Cost per Base Neighborhood Outage Event	$ 5,477	$ 5,477	$ 5,477	$ 5,477	$ 5,477	$ 5,477	$ 5,477	$ 5,477
DEC Average Cost per non-MED Outage Event	$ 16,431	$ 16,431	$ 16,431	$ 16,431	$ 16,431	$ 16,431	$ 16,431	$ 16,431
DEC Average Cost per MED Outage Event	$ 54,770	$ 54,770	$ 54,770	$ 54,770	$ 54,770	$ 54,770	$ 54,770	$ 54,770
DEP Average Cost per Base Neighborhood Outage Event	$ 4,742	$ 4,742	$ 4,742	$ 4,742	$ 4,742	$ 4,742	$ 4,742	$ 4,742
DEP Average Cost per Non-MED Outage Event	$ 14,226	$ 14,226	$ 14,226	$ 14,226	$ 14,226	$ 14,226	$ 14,226	$ 14,226
DEP Average Cost per MED Outage Event	$ 47,420	$ 47,420	$ 47,420	$ 47,420	$ 47,420	$ 47,420	$ 47,420	$ 47,420
Vegetation Management								
Vegetation Mgt. Multiplier for Complex Line Maintenance	10	10	10	10	10	10	10	10
Asset Management								
Customer								
DATA INPUTS								
Operational								
Project Deployment Cost	$ 7,200,000	$ 1,100,000	$ 150,000	$ 200,000	$ 25,000	$ 1,426,800	$ 1,200,000	$ 1,400,000
Deployment Installation Period	2	1	1	1	1	2	2	2
Start year of Installation	2019	2019	2019	2019	2019	2019	2019	2019
Outage and Restoration								
10 Year Customer Outage Events - Non-Major Event Days (MED)	49	1	9	19	12	28	59	28
10 Year Customer Interruptions (CI) - Non-MED	22,502	2	4,105	6,338	9,714	11,152	33,435	8,530
10 Year Customer Minutes Interrupted (CMI) - Non-MED	1,883,685	162	134,932	465,445	782,199	1,331,054	4,631,998	1,057,981
10 Year Customer Outage Events - MED	10	-	5	4	-	9	18	17
10 Year Customer Interruptions (CI) - MED	5,191	-	1,512	1,068	-	6,285	8,923	1,774
10 Year Customer Minutes Interrupted (CMI) - MED	6,197,624	-	410,657	368,189	-	1,313,936	2,781,941	1,343,157
Estimated Decrease in Event Frequency	67%	0%	0%	0%	0%	0%	0%	0%
Estimated Decrease in Event Duration	80%	90%	50%	50%	50%	50%	50%	50%
Vegetation Management								
Trim Cycle years (5, 7 or 9)								
Asset Management								
Line Miles of Deteriorated OH Conductor to Replace								
Customer								
Residential Customers	1,376	0	887	1,126	1,774	1,257	2,207	1,486
Small C&I Customers	358	0	211	357	298	251	525	296
Medium & Large C&I Customers	31	1	31	52	22	30	33	14
CALCULATIONS								
Operational								
Outage and Restoration								
10 Year Average Customer Outage Events - Non-Major Event Days (MED)	4.9	0.1	0.9	1.9	1.2	2.8	5.9	2.8
10 Year Average Customer Interruptions (CI) - Non-MED	2,250	0	411	634	971	1,115	3,344	853
10 Year Average Customer Minutes Interrupted (CMI) - Non-MED	188,369	16	13,493	46,544	78,220	133,105	463,200	105,798
10 Year Average Customer Outage Events - MED	1.0	0.0	0.5	0.4	0.0	0.9	1.8	1.7
10 Year Average Customer Interruptions (CI) - MED	519	0	151	107	0	629	892	177
10 Year Average Customer Minutes Interrupted (CMI) - MED	619,762	0	41,066	36,819	0	131,394	278,194	134,316
Annual Average Outage Duration (hours) Non-MED	1.4	1.4	0.5	1.2	1.3	2.0	2.3	2.1
Annual Average Outage Duration (hours) MED	19.9	0.0	4.5	5.7	0.0	3.5	5.2	12.6
Revised Outage Events based on Estimated Decrease in Event Frequency - Non-MED	1.6	0.1	0.9	1.9	1.2	2.8	5.9	2.8
Revised Outage Duration based on Estimated Decrease in Event Duration - Non-MED	0.3	0.1	0.3	0.6	0.7	1.0	1.2	1.0
Revised Outage Events based on Estimated Decrease in Event Frequency - MED	0.3	0.0	0.5	0.4	0.0	0.9	1.8	1.7
Revised Outage Duration based on Estimated Decrease in Event Duration - MED	4.0	0.0	2.3	2.9	0.0	1.7	2.6	6.3
Vegetation Management								
Asset Management								
Customer								

Non-MED values are 3X base values
MED values are 10X base values

Non-MED values are 3X base values
MED values are 10X base values

NOTES:

CELL INPUT:

Standard assumptions for all areas - review if standard applies
Individual data input per area
Calculated input - no input required

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 4 of 80

"Optimize" CBA's Distribution Projects

PROGRAM:	Long Duration/High Impact Sites	
PROJECT:	Brushy Creek - 2	
REGULATORY JURISDICTION:	DEC	
STATE:	SC	
ASSUMPTIONS		
Operational		
Outage and Restoration		
DEC Average Cost per Base Neighborhood Outage Event	$ 5,477	
DEC Average Cost per non-MED Outage Event	$ 16,431	Non-MED values are 3X base values
DEC Average Cost per MED Outage Event	$ 54,770	MED values are 10X base values
DEP Average Cost per Base Neighborhood Outage Event	$ 4,742	
DEP Average Cost per Non-MED Outage Event	$ 14,226	Non-MED values are 3X base values
DEP Average Cost per MED Outage Event	$ 47,420	MED values are 10X base values
Vegetation Management		
Vegetation Mgt. Multiplier for Complex Line Maintenance	10	
Asset Management		
Customer		
DATA INPUTS		
Operational		
Project Deployment Cost	$ 1,100,000	
Deployment Installation Period	1	
Start year of Installation	2019	
Outage and Restoration		
10 Year Customer Outage Events - Non-Major Event Days (MED)	1	
10 Year Customer Interruptions (CI) - Non-MED	2	
10 Year Customer Minutes Interrupted (CMI) - Non-MED	162	
10 Year Customer Outage Events - MED	-	
10 Year Customer Interruptions (CI) - MED	-	
10 Year Customer Minutes Interrupted (CMI) - MED	-	
Estimated Decrease in Event Frequency	0%	
Estimated Decrease in Event Duration	90%	
Vegetation Management		
Trim Cycle years (5, 7 or 9)		
Asset Management		
Line Miles of Deteriorated OH Conductor to Replace		
Customer		
Residential Customers	0	
Small C&I Customers	0	
Medium & Large C&I Customers	1	
CALCULATIONS		
Operational		
Outage and Restoration		
10 Year Average Customer Outage Events - Non-Major Event Days (MED)	0.1	
10 Year Average Customer Interruptions (CI) - Non-MED	0	
10 Year Average Customer Minutes Interrupted (CMI) - Non-MED	16	
10 Year Average Customer Outage Events - MED	0.0	
10 Year Average Customer Interruptions (CI) - MED	0	
10 Year Average Customer Minutes Interrupted (CMI) - MED	0	
Annual Average Outage Duration (hours) Non-MED	1.4	
Annual Average Outage Duration (hours) MED	0.0	
Revised Outage Events based on Estimated Decrease in Event Frequency - Non-MED	0.1	
Revised Outage Duration based on Estimated Decrease in Event Duration - Non-MED	0.1	
Revised Outage Events based on Estimated Decrease in Event Frequency - MED	0.0	
Revised Outage Duration based on Estimated Decrease in Event Duration - MED	0.0	
Vegetation Management		
Asset Management		
Customer		

NOTES:

CELL INPUT:

Standard assumptions for all areas - review if standard applies
Individual data input per area
Calculated input - no input required

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 5 of 80

"Optimize" CBA's Distribution Projects

PROGRAM:	Long Duration/High Impact Sites
PROJECT:	Brushy Creek - 2
REGULATORY JURISDICTION:	DEC
STATE:	SC

	NPV of BENEFIT STREAM	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
COSTS																																
Project Capital	$ 1,100,000	$ 1,100,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Project O&M	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Project Costs	$ 1,100,000	$ 1,100,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
N/A	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total On-Going O&M	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
OPERATIONAL BENEFITS																																
Outage and Restoration																																
Non-MED Restoration costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
MED Restoration costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Outage and Restoration Benefits	$ -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vegetation Management																																
Eliminate of VM cycle charges	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Avoid demand trimming costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Vegetation Management Benefits	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Asset Management																																
Elimination of deteriorated conductor replacement costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Elimination of pole replacement costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Asset Management Benefits	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
CUSTOMER BENEFITS																																
Customer																																
Outage Savings (non-MED) - Residential Customers	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Outage Savings (non-MED) - Small C&I Customers	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Outage Savings (non-MED) - Medium & Large C&I Customers	$ 13,241	$ -	$ 804	$ 824	$ 844	$ 865	$ 887	$ 909	$ 932	$ 955	$ 979	$ 1,004	$ 1,029	$ 1,054	$ 1,081	$ 1,108	$ 1,135	$ 1,164	$ 1,193	$ 1,223	$ 1,253	$ 1,285	$ 1,317	$ 1,350	$ 1,383	$ 1,418	$ 1,453	$ 1,490	$ 1,527	$ 1,565	$ 1,604	$ 1,644
Outage Savings (MED) - Residential Customers	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Outage Savings (MED) - Small C&I Customers	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Outage Savings (MED) - Medium & Large C&I Customers	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Customer Benefits	$ 13,241	$ -	$ 804	$ 824	$ 844	$ 865	$ 887	$ 909	$ 932	$ 955	$ 979	$ 1,004	$ 1,029	$ 1,054	$ 1,081	$ 1,108	$ 1,135	$ 1,164	$ 1,193	$ 1,223	$ 1,253	$ 1,285	$ 1,317	$ 1,350	$ 1,383	$ 1,418	$ 1,453	$ 1,490	$ 1,527	$ 1,565	$ 1,604	$ 1,644
COMBINED COSTS AND BENEFITS																																
Total PV of Operational Benefits	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total PV of Customer Benefits	$ 13,241	$ -	$ 804	$ 824	$ 844	$ 865	$ 887	$ 909	$ 932	$ 955	$ 979	$ 1,004	$ 1,029	$ 1,054	$ 1,081	$ 1,108	$ 1,135	$ 1,164	$ 1,193	$ 1,223	$ 1,253	$ 1,285	$ 1,317	$ 1,350	$ 1,383	$ 1,418	$ 1,453	$ 1,490	$ 1,527	$ 1,565	$ 1,604	$ 1,644
Total PV of Combined Benefits	$ 13,241	$ -	$ 804	$ 824	$ 844	$ 865	$ 887	$ 909	$ 932	$ 955	$ 979	$ 1,004	$ 1,029	$ 1,054	$ 1,081	$ 1,108	$ 1,135	$ 1,164	$ 1,193	$ 1,223	$ 1,253	$ 1,285	$ 1,317	$ 1,350	$ 1,383	$ 1,418	$ 1,453	$ 1,490	$ 1,527	$ 1,565	$ 1,604	$ 1,644
Project and On-Going Costs	$ 1,100,000	$ 1,100,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Escalation		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Deployment percentage		$ -	100%																													
Combined NPV of Project	$ (1,086,759)	$ (1,100,000)	$ 804	$ 824	$ 844	$ 865	$ 887	$ 909	$ 932	$ 955	$ 979	$ 1,004	$ 1,029	$ 1,054	$ 1,081	$ 1,108	$ 1,135	$ 1,164	$ 1,193	$ 1,223	$ 1,253	$ 1,285	$ 1,317	$ 1,350	$ 1,383	$ 1,418	$ 1,453	$ 1,490	$ 1,527	$ 1,565	$ 1,604	$ 1,644
Ratio of NPV Benefits to NPV Costs	0.0																															
Cumulative Net Benefits		$ (1,100,000)	$ (1,099,196)	$ 1,627	$ 1,668	$ 1,710	$ 1,752	$ 1,796	$ 1,841	$ 1,887	$ 1,934	$ 1,983	$ 2,032	$ 2,083	$ 2,135	$ 2,188	$ 2,243	$ 2,299	$ 2,357	$ 2,416	$ 2,476	$ 2,538	$ 2,601	$ 2,666	$ 2,733	$ 2,801	$ 2,871	$ 2,943	$ 3,017	$ 3,092	$ 3,170	$ 3,249

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 6 of 80

"Optimize" CBA's Distribution Projects

		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Deployment Costs																																
Project Capital	Escalation	$ 1.100.000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Project O&M	Factor																															
Outage and Restoration																																
Average Cost per Non-MED Outage Event	Escalation	$ 5,477	$ 5,614	$ 5,754	$ 5,898	$ 6,046	$ 6,197	$ 6,352	$ 6,510	$ 6,673	$ 6,840	$ 7,011	$ 7,186	$ 7,366	$ 7,550	$ 7,739	$ 7,932	$ 8,131	$ 8,334	$ 8,542	$ 8,756	$ 8,975	$ 9,199	$ 9,429	$ 9,665	$ 9,906	$ 10,154	$ 10,408	$ 10,668	$ 10,935	$ 11,208	$ 11,488
Average Cost per MED Outage Event	Escalation	$ 54.770	$ 56.139	$ 57.543	$ 58.981	$ 60.456	$ 61.967	$ 63.516	$ 65.104	$ 66.732	$ 68.400	$ 70.110	$ 71.863	$ 73.660	$ 75.501	$ 77.389	$ 79.323	$ 81.306	$ 83.339	$ 85.423	$ 87.558	$ 89.747	$ 91.991	$ 94.290	$ 96.648	$ 99.064	$ 101.541	$ 104.079	$ 106.681	$ 109.348	$ 112.082	$ 114.884
Vegetation Management																																
Asset Management																																
ICE Model																																
Current State																																
Residential Outaoe Value (non-MED)	Escalation	$ 6.51	$ 6.67	$ 6.84	$ 7.01	$ 7.19	$ 7.37	$ 7.55	$ 7.74	$ 7.93	$ 8.13	$ 8.33	$ 8.54	$ 8.75	$ 8.97	$ 9.20	$ 9.43	$ 9.66	$ 9.91	$ 10.15	$ 10.41	$ 10.67	$ 10.93	$ 11.21	$ 11.49	$ 11.77	$ 12.07	$ 12.37	$ 12.68	$ 13.00	$ 13.32	$ 13.65
Small C&I Outaoe Value (non-MED)	Escalation	$ 917.14	$ 940.07	$ 963.57	$ 987.66	$ 1.012.35	$ 1.037.66	$ 1.063.61	$ 1.090.20	$ 1.117.45	$ 1.145.39	$ 1.174.02	$ 1.203.37	$ 1.233.46	$ 1.264.29	$ 1.295.90	$ 1.328.30	$ 1.361.50	$ 1.395.54	$ 1.430.43	$ 1.466.19	$ 1.502.85	$ 1.540.42	$ 1.578.93	$ 1.618.40	$ 1.658.86	$ 1.700.33	$ 1.742.84	$ 1.786.41	$ 1.831.07	$ 1.876.85	$ 1.923.77
Large C&I Outaoe Value (non-MED)	Escalation	$ 23.576.92	$ 24.166.34	$ 24.770.50	$ 25.389.76	$ 26.024.50	$ 26.675.12	$ 27.341.99	$ 28.025.54	$ 28.726.18	$ 29.444.34	$ 30.180.44	$ 30.934.96	$ 31.708.33	$ 32.501.04	$ 33.313.56	$ 34.146.40	$ 35.000.06	$ 35.875.06	$ 36.771.94	$ 37.691.24	$ 38.633.52	$ 39.599.36	$ 40.589.34	$ 41.604.08	$ 42.644.18	$ 43.710.28	$ 44.803.04	$ 45.923.12	$ 47.071.19	$ 48.247.97	$ 49.454.17
Residential Outaoe Value (MED)	Escalation	$ 4.52	$ 4.64	$ 4.75	$ 4.87	$ 4.99	$ 5.12	$ 5.25	$ 5.38	$ 5.51	$ 5.65	$ 5.79	$ 5.93	$ 6.08	$ 6.23	$ 6.39	$ 6.55	$ 6.71	$ 6.88	$ 7.05	$ 7.23	$ 7.41	$ 7.60	$ 7.79	$ 7.98	$ 8.18	$ 8.39	$ 8.59	$ 8.81	$ 9.03	$ 9.26	$ 9.49
Small C&I Outaoe Value (MED)	Escalation	$ 477.79	$ 489.74	$ 501.98	$ 514.53	$ 527.39	$ 540.58	$ 554.09	$ 567.95	$ 582.15	$ 596.70	$ 611.62	$ 626.91	$ 642.58	$ 658.64	$ 675.11	$ 691.99	$ 709.29	$ 727.02	$ 745.20	$ 763.82	$ 782.92	$ 802.49	$ 822.56	$ 843.12	$ 864.20	$ 885.80	$ 907.95	$ 930.65	$ 953.91	$ 977.76	$ 1.002.20
Large C&I Outaoe Value (MED)	Escalation	$ 15.020.35	$ 15.395.86	$ 15.780.75	$ 16.175.27	$ 16.579.66	$ 16.994.15	$ 17.419.00	$ 17.854.48	$ 18.300.84	$ 18.758.36	$ 19.227.32	$ 19.708.00	$ 20.200.70	$ 20.705.72	$ 21.223.36	$ 21.753.94	$ 22.297.79	$ 22.855.24	$ 23.426.62	$ 24.012.28	$ 24.612.59	$ 25.227.91	$ 25.858.60	$ 26.505.07	$ 27.167.70	$ 27.846.89	$ 28.543.06	$ 29.256.64	$ 29.988.05	$ 30.737.75	$ 31.506.20
Future State																																
Residential Outaoe Value (non-MED)	Escalation	$ 4.71	$ 4.83	$ 4.95	$ 5.07	$ 5.20	$ 5.33	$ 5.46	$ 5.60	$ 5.74	$ 5.88	$ 6.03	$ 6.18	$ 6.34	$ 6.49	$ 6.66	$ 6.82	$ 6.99	$ 7.17	$ 7.35	$ 7.53	$ 7.72	$ 7.91	$ 8.11	$ 8.31	$ 8.52	$ 8.73	$ 8.95	$ 9.18	$ 9.40	$ 9.64	$ 9.88
Small C&I Outaoe Value (non-MED)	Escalation	$ 511.61	$ 524.40	$ 537.51	$ 550.95	$ 564.72	$ 578.84	$ 593.31	$ 608.14	$ 623.35	$ 638.93	$ 654.90	$ 671.28	$ 688.06	$ 705.26	$ 722.89	$ 740.96	$ 759.49	$ 778.48	$ 797.94	$ 817.89	$ 838.33	$ 859.29	$ 880.77	$ 902.79	$ 925.36	$ 948.50	$ 972.21	$ 996.51	$ 1.021.43	$ 1.046.96	$ 1.073.14
Large C&I Outaoe Value (non-MED)	Escalation	$ 15.737.07	$ 16.130.50	$ 16.533.76	$ 16.947.11	$ 17.370.79	$ 17.805.06	$ 18.250.18	$ 18.706.44	$ 19.174.10	$ 19.653.45	$ 20.144.79	$ 20.648.41	$ 21.164.62	$ 21.693.73	$ 22.236.07	$ 22.791.98	$ 23.361.78	$ 23.945.82	$ 24.544.47	$ 25.158.08	$ 25.787.03	$ 26.431.70	$ 27.092.50	$ 27.769.81	$ 28.464.05	$ 29.175.66	$ 29.905.05	$ 30.652.67	$ 31.418.99	$ 32.204.47	$ 33.009.58
Residential Outaoe Value (MED)	Escalation	$ 4.52	$ 4.64	$ 4.75	$ 4.87	$ 4.99	$ 5.12	$ 5.25	$ 5.38	$ 5.51	$ 5.65	$ 5.79	$ 5.93	$ 6.08	$ 6.23	$ 6.39	$ 6.55	$ 6.71	$ 6.88	$ 7.05	$ 7.23	$ 7.41	$ 7.60	$ 7.79	$ 7.98	$ 8.18	$ 8.39	$ 8.59	$ 8.81	$ 9.03	$ 9.26	$ 9.49
Small C&I Outaoe Value (MED)	Escalation	$ 477.79	$ 489.74	$ 501.98	$ 514.53	$ 527.39	$ 540.58	$ 554.09	$ 567.95	$ 582.15	$ 596.70	$ 611.62	$ 626.91	$ 642.58	$ 658.64	$ 675.11	$ 691.99	$ 709.29	$ 727.02	$ 745.20	$ 763.82	$ 782.92	$ 802.49	$ 822.56	$ 843.12	$ 864.20	$ 885.80	$ 907.95	$ 930.65	$ 953.91	$ 977.76	$ 1.002.20
Large C&I Outaoe Value (MED)	Escalation	$ 15.020.35	$ 15.395.86	$ 15.780.75	$ 16.175.27	$ 16.579.66	$ 16.994.15	$ 17.419.00	$ 17.854.48	$ 18.300.84	$ 18.758.36	$ 19.227.32	$ 19.708.00	$ 20.200.70	$ 20.705.72	$ 21.223.36	$ 21.753.94	$ 22.297.79	$ 22.855.24	$ 23.426.62	$ 24.012.28	$ 24.612.59	$ 25.227.91	$ 25.858.60	$ 26.505.07	$ 27.167.70	$ 27.846.89	$ 28.543.06	$ 29.256.64	$ 29.988.05	$ 30.737.75	$ 31.506.20

Assumption	Value	Source
Escalation Rate	2.90%	Duke Energy Standard Assumptions (provided by Treasury)
Discount Rate (WACC)	6.80%	For NC/SC combination, use NC amount
Discount Rate (WACC) DEC-SC	7.05%	Duke Energy Standard Assumptions (provided by Treasury)
Discount Rate (WACC) DEC-NC	6.80%	Duke Energy Standard Assumptions (provided by Treasury)
Discount Rate (WACC) DEP-SC	7.00%	Duke Energy Standard Assumptions (provided by Treasury)
Discount Rate (WACC) DEP-NC	6.80%	Duke Energy Standard Assumptions (provided by Treasury)

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 7 of 80

Table ES-1: Estimated Interuption Cost per Event, Average kW and Unserved kWh (US 2013$) by Duration and Customer Class

Interruption Cost	Interruption Duration						
	Momentary	30 Minutes	1 Hour	4 Hours	8 Hours	16 Hours	48 Hours (calculated)
	0.0	0.5	1.0	4.0	8.0	16.0	48.0
Cost per Event							
Medium and Large C&I (Over 50,000 Annual kWh)							
Cost per Event	$12,952.00	$15,241.00	$17,804.00	$39,458.00	$84,083.00	$165,482.00	$491,078.00
Cost per Average kW	$15.90	$18.70	$21.80	$48.40	$103.20	$203.00	
Cost per Unserved kWh	$190.70	$37.40	$21.80	$12.10	$12.90	$12.70	
Small C&I (Under 50,000 Annual kWh)							
Cost per Event	$412.00	$520.00	$647.00	$1,880.00	$4,690.00	$9,055.00	$26,515.00
Cost per Average kW	$187.90	$237.00	$295.00	$857.10	$2,138.10	$4,128.30	
Cost per Unserved kWh	$2,254.60	$474.10	$295.00	$214.30	$267.30	$258.00	
Residential							
Cost per Event	$3.90	$4.50	$5.10	$9.50	$17.20	$32.40	$93.20
Cost per Average kW	$2.60	$2.90	$3.30	$6.20	$11.30	$21.20	
Cost per Unserved kWh	$30.90	$5.90	$3.30	$1.60	$1.40	$1.30	

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 8 of 80

"Optimize" CBA's Distribution Projects

CIRCUIT_ID	TOTAL RES CUSTOMERS	TOTAL NON-RES CUSTOMERS < 50,000 KWH AVG	TOTAL NON RES CUSTOMERS > 50,000 KWH AVG	TOTAL	PROJECT	
T3450B03	796	258	23	1,077	1	
T3450B04	580	100	8	688	1	missing T3450B02
	1,376	358	31	1,765		
02091206		1			2	one customer…GRVL hospital
02091207					2	
	-	1	-	-		
4091203	192	25	3	220	3	
4231203	695	186	28	909	3	two projects; same circuit
	887	211	31	1,129		
4231203	695	186	28	909	4	two projects; same circuit
4141203	431	171	24	626	4	
	1,126	357	52	1,535		
4351205	685	135	12	832	5	
4351206	1,089	163	10	1,262	5	
	1,774	298	22	2,094		
60081206	1,014	168	10	1,192	6	
60181201	243	83	20	346	6	
	1,257	251	30	1,538		
60181202	928	230	18	1,176	7	
60211202	1,279	295	15	1,589	7	
	2,207	525	33	2,765		
7311202	979	175	11	1,165	8	
7401202	507	121	3	631	8	
	1,486	296	14	1,796		

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 9 of 80

"Optimize" CBA's Distribution Projects

Project Number	Jurisdiction	State	Project	MED_Y_N	10yrOutageCount	10YrCI	10yrCMI
1	DEP	SC	Cheraw River	Y	10	5,191	6,197,624
1	DEP	SC	Cheraw River	N	49	22,502	1,883,685
2	DEC	SC	Brushy Creek	N	1	2	162
3	DEC	SC	Whitehall Hurricane Creek	Y	5	1,512	410,657
3	DEC	SC	Whitehall Hurricane Creek	N	9	4,105	134,932
4	DEC	SC	Whitehall Sandy Springs	Y	4	1,068	368,189
4	DEC	SC	Whitehall Sandy Springs	N	19	6,338	465,445
5	DEC	SC	Fants Grove	N	12	9,714	782,199
6	DEC	SC	Moore Camp Croft	Y	9	6,285	1,313,936
6	DEC	SC	Moore Camp Croft	N	28	11,152	1,331,054
7	DEC	SC	Moore Woodruff	Y	18	8,923	2,781,941
7	DEC	SC	Moore Woodruff	N	59	33,435	4,631,998
8	DEC	SC	Eddy Road Panorama	Y	17	1,774	1,343,157
8	DEC	SC	Eddy Road Panorama	N	28	8,530	1,057,981

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 10 of 80

"Optimize" CBA's Distribution Projects

Data Input	Description
Circuit ID's involved in the project	**Enter each circuit ID on a separate row**
07311202	Eddy Road 1202
07401202	Panorama Ret 1202

Protective Device ID's impacted

Will research the 10 year outage history on these devices to estimate CI/CMI reduction by completing this project. Appears in most cases this will be the backbone devices upstream from the project site.

	Enter the Smallworld ID of each protective device impacted in Column A. One Smallworld ID per row.
38836745	fuse 65t single ph eddy rd 1202
39008826	140 A Recl Eddy Rd 1202
39001174	200 A Recl Eddy Rd 1202
38362809	Eddy Rd OCB
38879093	fuse 80t single ph fuse panorama 1202 ret
39008522	200 A Recl Panorama 1202
38362785	Panorama 1202 OCB

	Input Data Here	
Estimated Cost	$1,400,000	
Timeframe to Complete (Years)	2	
Estimated % decrease in event duration	50%	(assumption that circuit tie will be able to significantly reduce the duration of 50% affected customers depending on fault location)

Special Considerations that have a financial impact: Mention additional considerations that would be cost beneficial. We will run the cost of the project vs traditional benefits like outage and veg savings.
Ex. Project will reduce vegetation trimming from 3 ROW's to 1
Ex. Changing to from wood to concrete poles (O&M)

Covert to three ph and create a circuit tie

Circuit ID	7311202	7401202
Circuit Name	EDDY ROAD - 1202	PANORAMA - 1202
Customers Served	1170	636

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 11 of 80

"Optimize" CBA's Distribution Projects

PROGRAM:	Long Duration/High Impact Sites	Long Duration/High Impact Sites	Long Duration/High Impact Sites	Long Duration/High Impact Sites	Long Duration/High Impact Sites	Long Duration/High Impact Sites	Long Duration/High Impact Sites	Long Duration/High Impact Sites
PROJECT:	Cheraw River Crossing - 1	Brushy Creek - 2	Whitehall Hurricance Creek - 3	Whitehall Sandy Springs - 4	Fants Grove - 5	Moore Camp Croft - 6	Moore Woodruff - 7	Eddy Rd Panorama - 8
REGULATORY JURISDICTION:	DEP	DEC	DEC	DEC	DEC	DEC	DEC	DEC
STATE:	SC	SC	SC	SC	SC	SC	SC	SC
ASSUMPTIONS								
Operational								
Outage and Restoration								
DEC Average Cost per Base Neighborhood Outage Event	$ 5,477	$ 5,477	$ 5,477	$ 5,477	$ 5,477	$ 5,477	$ 5,477	$ 5,477
DEC Average Cost per non-MED Outage Event	$ 16,431	$ 16,431	$ 16,431	$ 16,431	$ 16,431	$ 16,431	$ 16,431	$ 16,431
DEC Average Cost per MED Outage Event	$ 54,770	$ 54,770	$ 54,770	$ 54,770	$ 54,770	$ 54,770	$ 54,770	$ 54,770
DEP Average Cost per Base Neighborhood Outage Event	$ 4,742	$ 4,742	$ 4,742	$ 4,742	$ 4,742	$ 4,742	$ 4,742	$ 4,742
DEP Average Cost per Non-MED Outage Event	$ 14,226	$ 14,226	$ 14,226	$ 14,226	$ 14,226	$ 14,226	$ 14,226	$ 14,226
DEP Average Cost per MED Outage Event	$ 47,420	$ 47,420	$ 47,420	$ 47,420	$ 47,420	$ 47,420	$ 47,420	$ 47,420
Vegetation Management								
Vegetation Mgt. Multiplier for Complex Line Maintenance	10	10	10	10	10	10	10	10
Asset Management								
Customer								
DATA INPUTS								
Operational								
Project Deployment Cost	$ 7,200,000	$ 1,100,000	$ 150,000	$ 200,000	$ 25,000	$ 1,426,800	$ 1,200,000	$ 1,400,000
Deployment Installation Period	2	1	1	1	1	2	2	2
Start year of Installation	2019	2019	2019	2019	2019	2019	2019	2019
Outage and Restoration								
10 Year Customer Outage Events - Non-Major Event Days (MED)	49	1	9	19	12	28	59	28
10 Year Customer Interruptions (CI) - Non-MED	22,502	2	4,105	6,338	9,714	11,152	33,435	8,530
10 Year Customer Minutes Interrupted (CMI) - Non-MED	1,883,685	162	134,932	465,445	782,199	1,331,054	4,631,998	1,057,981
10 Year Customer Outage Events - MED	10	-	5	4	-	9	18	17
10 Year Customer Interruptions (CI) - MED	5,191	-	1,512	1,068	-	6,285	8,923	1,774
10 Year Customer Minutes Interrupted (CMI) - MED	6,197,624	-	410,657	368,189	-	1,313,936	2,781,941	1,343,157
Estimated Decrease in Event Frequency	67%	0%	0%	0%	0%	0%	0%	0%
Estimated Decrease in Event Duration	80%	90%	50%	50%	50%	50%	50%	50%
Vegetation Management								
Trim Cycle years (5, 7 or 9)								
Asset Management								
Line Miles of Deteriorated OH Conductor to Replace								
Customer								
Residential Customers	1,376	0	887	1,126	1,774	1,257	2,207	1,486
Small C&I Customers	358	0	211	357	298	251	525	296
Medium & Large C&I Customers	31	1	31	52	22	30	33	14
CALCULATIONS								
Operational								
Outage and Restoration								
10 Year Average Customer Outage Events - Non-Major Event Days (MED)	4.9	0.1	0.9	1.9	1.2	2.8	5.9	2.8
10 Year Average Customer Interruptions (CI) - Non-MED	2,250	0	411	634	971	1,115	3,344	853
10 Year Average Customer Minutes Interrupted (CMI) - Non-MED	188,369	16	13,493	46,544	78,220	133,105	463,200	105,798
10 Year Average Customer Outage Events - MED	1.0	0.0	0.5	0.4	0.0	0.9	1.8	1.7
10 Year Average Customer Interruptions (CI) - MED	519	0	151	107	0	629	892	177
10 Year Average Customer Minutes Interrupted (CMI) - MED	619,762	0	41,066	36,819	0	131,394	278,194	134,316
Annual Average Outage Duration (hours) Non-MED	1.4	1.4	0.5	1.2	1.3	2.0	2.3	2.1
Annual Average Outage Duration (hours) MED	19.9	0.0	4.5	5.7	0.0	3.5	5.2	12.6
Revised Outage Events based on Estimated Decrease in Event Frequency - Non-MED	1.6	0.1	0.9	1.9	1.2	2.8	5.9	2.8
Revised Outage Duration based on Estimated Decrease in Event Duration - Non-MED	0.3	0.1	0.3	0.6	0.7	1.0	1.2	1.0
Revised Outage Events based on Estimated Decrease in Event Frequency - MED	0.3	0.0	0.5	0.4	0.0	0.9	1.8	1.7
Revised Outage Duration based on Estimated Decrease in Event Duration - MED	4.0	0.0	2.3	2.9	0.0	1.7	2.6	6.3
Vegetation Management								
Asset Management								
Customer								

Non-MED values are 3X base values
MED values are 10X base values

Non-MED values are 3X base values
MED values are 10X base values

NOTES:

CELL INPUT:

Standard assumptions for all areas - review if standard applies
Individual data input per area
Calculated input - no input required

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 12 of 80

"Optimize" CBA's Distribution Projects

PROGRAM:	Long Duration/High Impact Sites	
PROJECT:	Eddy Rd Panorama - 8	
REGULATORY JURISDICTION:	DEC	
STATE:	SC	
ASSUMPTIONS		
Operational		
Outage and Restoration		
DEC Average Cost per Base Neighborhood Outage Event	$ 5,477	
DEC Average Cost per non-MED Outage Event	$ 16,431	Non-MED values are 3X base values
DEC Average Cost per MED Outage Event	$ 54,770	MED values are 10X base values
DEP Average Cost per Base Neighborhood Outage Event	$ 4,742	
DEP Average Cost per Non-MED Outage Event	$ 14,226	Non-MED values are 3X base values
DEP Average Cost per MED Outage Event	$ 47,420	MED values are 10X base values
Vegetation Management		
Vegetation Mgt. Multiplier for Complex Line Maintenance	10	
Asset Management		
Customer		
DATA INPUTS		
Operational		
Project Deployment Cost	$ 1,400,000	
Deployment Installation Period	2	
Start year of Installation	2019	
Outage and Restoration		
10 Year Customer Outage Events - Non-Major Event Days (MED)	28	
10 Year Customer Interruptions (CI) - Non-MED	8,530	
10 Year Customer Minutes Interrupted (CMI) - Non-MED	1,057,981	
10 Year Customer Outage Events - MED	17	
10 Year Customer Interruptions (CI) - MED	1,774	
10 Year Customer Minutes Interrupted (CMI) - MED	1,343,157	
Estimated Decrease in Event Frequency	0%	
Estimated Decrease in Event Duration	50%	
Vegetation Management		
Trim Cycle years (5, 7 or 9)		
Asset Management		
Line Miles of Deteriorated OH Conductor to Replace		
Customer		
Residential Customers	1,486	
Small C&I Customers	296	
Medium & Large C&I Customers	14	
CALCULATIONS		
Operational		
Outage and Restoration		
10 Year Average Customer Outage Events - Non-Major Event Days (MED)	2.8	
10 Year Average Customer Interruptions (CI) - Non-MED	853	
10 Year Average Customer Minutes Interrupted (CMI) - Non-MED	105,798	
10 Year Average Customer Outage Events - MED	1.7	
10 Year Average Customer Interruptions (CI) - MED	177	
10 Year Average Customer Minutes Interrupted (CMI) - MED	134,316	
Annual Average Outage Duration (hours) Non-MED	2.1	
Annual Average Outage Duration (hours) MED	12.6	
Revised Outage Events based on Estimated Decrease in Event Frequency - Non-MED	2.8	
Revised Outage Duration based on Estimated Decrease in Event Duration - Non-MED	1.0	
Revised Outage Events based on Estimated Decrease in Event Frequency - MED	1.7	
Revised Outage Duration based on Estimated Decrease in Event Duration - MED	6.3	
Vegetation Management		
Asset Management		
Customer		

NOTES:

CELL INPUT:

Standard assumptions for all areas - review if standard applies
Individual data input per area
Calculated input - no input required

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 13 of 80

"Optimize" CBA's Distribution Projects

PROGRAM:	Long Duration/High Impact Sites
PROJECT:	Eddy Rd Panorama - 8
REGULATORY JURISDICTION:	DEC
STATE:	SC

	NPV of BENEFIT STREAM	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
COSTS																																
Project Capital	$ 1,355,431	$ 700,000	$ 700,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Project O&M	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Project Costs	$ 1,355,431	$ 700,000	$ 700,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
N/A	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total On-Going O&M	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
OPERATIONAL BENEFITS																																
Outage and Restoration																																
Non-MED Restoration costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
MED Restoration costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Outage and Restoration Benefits	$ -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vegetation Management																																
Eliminate of VM cycle charges	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Avoid demand trimming costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Vegetation Management Benefits	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Asset Management																																
Elimination of deteriorated conductor replacement costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Elimination of pole replacement costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Asset Management Benefits	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
CUSTOMER BENEFITS																																
Customer																																
Outage Savings (non-MED) - Residential Customers	$ 116,523	$ -	$ -	$ 7,685	$ 7,877	$ 8,074	$ 8,276	$ 8,483	$ 8,695	$ 8,912	$ 9,135	$ 9,363	$ 9,598	$ 9,838	$ 10,083	$ 10,336	$ 10,594	$ 10,859	$ 11,130	$ 11,408	$ 11,694	$ 11,986	$ 12,286	$ 12,593	$ 12,908	$ 13,230	$ 13,561	$ 13,900	$ 14,248	$ 14,604	$ 14,969	$ 15,343
Outage Savings (non-MED) - Small C&I Customers	$ 6,504,216	$ -	$ -	$ 428,973	$ 439,697	$ 450,690	$ 461,957	$ 473,506	$ 485,344	$ 497,477	$ 509,914	$ 522,662	$ 535,729	$ 549,122	$ 562,850	$ 576,921	$ 591,344	$ 606,128	$ 621,281	$ 636,813	$ 652,733	$ 669,052	$ 685,778	$ 702,922	$ 720,495	$ 738,508	$ 756,970	$ 775,895	$ 795,292	$ 815,174	$ 835,554	$ 856,443
Outage Savings (non-MED) - Medium & Large C&I Customers	$ 5,402,644	$ -	$ -	$ 356,321	$ 365,229	$ 374,360	$ 383,719	$ 393,312	$ 403,144	$ 413,223	$ 423,554	$ 434,142	$ 444,996	$ 456,121	$ 467,524	$ 479,212	$ 491,192	$ 503,472	$ 516,059	$ 528,960	$ 542,184	$ 555,739	$ 569,633	$ 583,873	$ 598,470	$ 613,432	$ 628,768	$ 644,487	$ 660,599	$ 677,114	$ 694,042	$ 711,393
Outage Savings (MED) - Residential Customers	$ 561,433	$ -	$ -	$ 37,028	$ 37,954	$ 38,903	$ 39,875	$ 40,872	$ 41,894	$ 42,941	$ 44,015	$ 45,115	$ 46,243	$ 47,399	$ 48,584	$ 49,799	$ 51,044	$ 52,320	$ 53,628	$ 54,969	$ 56,343	$ 57,751	$ 59,195	$ 60,675	$ 62,192	$ 63,747	$ 65,340	$ 66,974	$ 68,648	$ 70,364	$ 72,124	$ 73,927
Outage Savings (MED) - Small C&I Customers	$ 34,467,753	$ -	$ -	$ 2,273,254	$ 2,330,085	$ 2,388,338	$ 2,448,046	$ 2,509,247	$ 2,571,978	$ 2,636,278	$ 2,702,185	$ 2,769,739	$ 2,838,983	$ 2,909,957	$ 2,982,706	$ 3,057,274	$ 3,133,706	$ 3,212,049	$ 3,292,350	$ 3,374,658	$ 3,459,025	$ 3,545,501	$ 3,634,138	$ 3,724,992	$ 3,818,116	$ 3,913,569	$ 4,011,408	$ 4,111,694	$ 4,214,486	$ 4,319,848	$ 4,427,844	$ 4,538,540
Outage Savings (MED) - Medium & Large C&I Customers	$ 28,955,743	$ -	$ -	$ 1,909,720	$ 1,957,463	$ 2,006,400	$ 2,056,560	$ 2,107,974	$ 2,160,673	$ 2,214,690	$ 2,270,057	$ 2,326,809	$ 2,384,979	$ 2,444,603	$ 2,505,718	$ 2,568,361	$ 2,632,570	$ 2,698,385	$ 2,765,844	$ 2,834,990	$ 2,905,865	$ 2,978,512	$ 3,052,974	$ 3,129,299	$ 3,207,531	$ 3,287,720	$ 3,369,913	$ 3,454,160	$ 3,540,514	$ 3,629,027	$ 3,719,753	$ 3,812,747
Total Customer Benefits	$ 69,387,572	$ -	$ -	$ 4,576,323	$ 4,690,731	$ 4,808,000	$ 4,928,200	$ 5,051,405	$ 5,177,690	$ 5,307,132	$ 5,439,810	$ 5,575,806	$ 5,715,201	$ 5,858,081	$ 6,004,533	$ 6,154,646	$ 6,308,512	$ 6,466,225	$ 6,627,881	$ 6,793,578	$ 6,963,417	$ 7,137,503	$ 7,315,940	$ 7,498,839	$ 7,686,310	$ 7,878,467	$ 8,075,429	$ 8,277,315	$ 8,484,248	$ 8,696,354	$ 8,913,763	$ 9,136,607
COMBINED COSTS AND BENEFITS																																
Total PV of Operational Benefits	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total PV of Customer Benefits	$ 69,387,572	$ -	$ -	$ 4,576,323	$ 4,690,731	$ 4,808,000	$ 4,928,200	$ 5,051,405	$ 5,177,690	$ 5,307,132	$ 5,439,810	$ 5,575,806	$ 5,715,201	$ 5,858,081	$ 6,004,533	$ 6,154,646	$ 6,308,512	$ 6,466,225	$ 6,627,881	$ 6,793,578	$ 6,963,417	$ 7,137,503	$ 7,315,940	$ 7,498,839	$ 7,686,310	$ 7,878,467	$ 8,075,429	$ 8,277,315	$ 8,484,248	$ 8,696,354	$ 8,913,763	$ 9,136,607
Total PV of Combined Benefits	$ 69,387,572	$ -	$ -	$ 4,576,323	$ 4,690,731	$ 4,808,000	$ 4,928,200	$ 5,051,405	$ 5,177,690	$ 5,307,132	$ 5,439,810	$ 5,575,806	$ 5,715,201	$ 5,858,081	$ 6,004,533	$ 6,154,646	$ 6,308,512	$ 6,466,225	$ 6,627,881	$ 6,793,578	$ 6,963,417	$ 7,137,503	$ 7,315,940	$ 7,498,839	$ 7,686,310	$ 7,878,467	$ 8,075,429	$ 8,277,315	$ 8,484,248	$ 8,696,354	$ 8,913,763	$ 9,136,607
Project and On-Going Costs	$ 1,355,431	$ 700,000	$ 700,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Escalation		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Deployment percentage		$ -	50%																													
Combined NPV of Project	$ 68,032,141	$ (700,000)	$ (700,000)	$ 4,576,323	$ 4,690,731	$ 4,808,000	$ 4,928,200	$ 5,051,405	$ 5,177,690	$ 5,307,132	$ 5,439,810	$ 5,575,806	$ 5,715,201	$ 5,858,081	$ 6,004,533	$ 6,154,646	$ 6,308,512	$ 6,466,225	$ 6,627,881	$ 6,793,578	$ 6,963,417	$ 7,137,503	$ 7,315,940	$ 7,498,839	$ 7,686,310	$ 7,878,467	$ 8,075,429	$ 8,277,315	$ 8,484,248	$ 8,696,354	$ 8,913,763	$ 9,136,607
Ratio of NPV Benefits to NPV Costs	51.2																															
Cumulative Net Benefits		$ (700,000)	$ (1,400,000)	$ 3,876,323	$ 9,267,055	$ 9,498,731	$ 9,736,200	$ 9,979,604	$ 10,229,095	$ 10,484,822	$ 10,746,943	$ 11,015,616	$ 11,291,006	$ 11,573,282	$ 11,862,614	$ 12,159,179	$ 12,463,159	$ 12,774,737	$ 13,094,106	$ 13,421,459	$ 13,756,995	$ 14,100,920	$ 14,453,443	$ 14,814,779	$ 15,185,148	$ 15,564,777	$ 15,953,897	$ 16,352,744	$ 16,761,563	$ 17,180,602	$ 17,610,117	$ 18,050,370

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 14 of 80

"Optimize" CBA's Distribution Projects

		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Deployment Costs																																
Project Capital	Escalation	$ 700.000	$ 700.000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Project O&M	Factor																															
Outage and Restoration																																
Average Cost per Non-MED Outage Event	Escalation	$ 5,477	$ 5,614	$ 5,754	$ 5,898	$ 6,046	$ 6,197	$ 6,352	$ 6,510	$ 6,673	$ 6,840	$ 7,011	$ 7,186	$ 7,366	$ 7,550	$ 7,739	$ 7,932	$ 8,131	$ 8,334	$ 8,542	$ 8,756	$ 8,975	$ 9,199	$ 9,429	$ 9,665	$ 9,906	$ 10,154	$ 10,408	$ 10,668	$ 10,935	$ 11,208	$ 11,488
Average Cost per MED Outage Event	Escalation	$ 54.770	$ 56.139	$ 57.543	$ 58.981	$ 60.456	$ 61.967	$ 63.516	$ 65.104	$ 66.732	$ 68.400	$ 70.110	$ 71.863	$ 73.660	$ 75.501	$ 77.389	$ 79.323	$ 81.306	$ 83.339	$ 85.423	$ 87.558	$ 89.747	$ 91.991	$ 94.290	$ 96.648	$ 99.064	$ 101.541	$ 104.079	$ 106.681	$ 109.348	$ 112.082	$ 114.884
Vegetation Management																																
Asset Management																																
ICE Model																																
Current State																																
Residential Outaoe Value (non-MED)	Escalation	$ 7.73	$ 7.92	$ 8.12	$ 8.32	$ 8.53	$ 8.75	$ 8.96	$ 9.19	$ 9.42	$ 9.65	$ 9.89	$ 10.14	$ 10.40	$ 10.66	$ 10.92	$ 11.19	$ 11.47	$ 11.76	$ 12.06	$ 12.36	$ 12.67	$ 12.98	$ 13.31	$ 13.64	$ 13.98	$ 14.33	$ 14.69	$ 15.06	$ 15.43	$ 15.82	$ 16.21
Small C&I Outaoe Value (non-MED)	Escalation	$ 1,258.97	$ 1,290.45	$ 1,322.71	$ 1,355.78	$ 1,389.67	$ 1,424.41	$ 1,460.02	$ 1,496.52	$ 1,533.94	$ 1,572.29	$ 1,611.59	$ 1,651.88	$ 1,693.18	$ 1,735.51	$ 1,778.90	$ 1,823.37	$ 1,868.95	$ 1,915.68	$ 1,963.57	$ 2,012.66	$ 2,062.98	$ 2,114.55	$ 2,167.41	$ 2,221.60	$ 2,277.14	$ 2,334.07	$ 2,392.42	$ 2,452.23	$ 2,513.54	$ 2,576.37	$ 2,640.78
Large C&I Outaoe Value (non-MED)	Escalation	$ 29,580.16	$ 30,319.66	$ 31,077.65	$ 31,854.59	$ 32,650.96	$ 33,467.23	$ 34,303.91	$ 35,161.51	$ 36,040.55	$ 36,941.56	$ 37,865.10	$ 38,811.73	$ 39,782.02	$ 40,776.57	$ 41,795.99	$ 42,840.89	$ 43,911.91	$ 45,009.71	$ 46,134.96	$ 47,288.33	$ 48,470.53	$ 49,682.30	$ 50,924.35	$ 52,197.46	$ 53,502.40	$ 54,839.96	$ 56,210.96	$ 57,616.23	$ 59,056.64	$ 60,533.05	$ 62,046.38
Residential Outaoe Value (MED)	Escalation	$ 30.12	$ 30.88	$ 31.65	$ 32.44	$ 33.25	$ 34.08	$ 34.93	$ 35.81	$ 36.70	$ 37.62	$ 38.56	$ 39.53	$ 40.51	$ 41.53	$ 42.56	$ 43.63	$ 44.72	$ 45.84	$ 46.98	$ 48.16	$ 49.36	$ 50.60	$ 51.86	$ 53.16	$ 54.49	$ 55.85	$ 57.24	$ 58.68	$ 60.14	$ 61.65	$ 63.19
Small C&I Outaoe Value (MED)	Escalation	$ 8,361.61	$ 8,570.65	$ 8,784.92	$ 9,004.54	$ 9,229.66	$ 9,460.40	$ 9,696.91	$ 9,939.33	$ 10,187.82	$ 10,442.51	$ 10,703.57	$ 10,971.16	$ 11,245.44	$ 11,526.58	$ 11,814.74	$ 12,110.11	$ 12,412.86	$ 12,723.19	$ 13,041.27	$ 13,367.30	$ 13,701.48	$ 14,044.02	$ 14,395.12	$ 14,754.99	$ 15,123.87	$ 15,501.97	$ 15,889.52	$ 16,286.75	$ 16,693.92	$ 17,111.27	$ 17,539.05
Large C&I Outaoe Value (MED)	Escalation	$ 152,012.45	$ 155,812.76	$ 159,708.08	$ 163,700.78	$ 167,793.30	$ 171,988.13	$ 176,287.83	$ 180,695.03	$ 185,212.40	$ 189,842.71	$ 194,588.78	$ 199,453.50	$ 204,439.84	$ 209,550.84	$ 214,789.61	$ 220,159.35	$ 225,663.33	$ 231,304.91	$ 237,087.54	$ 243,014.72	$ 249,090.09	$ 255,317.35	$ 261,700.28	$ 268,242.79	$ 274,948.86	$ 281,822.58	$ 288,868.14	$ 296,089.85	$ 303,492.09	$ 311,079.39	$ 318,856.38
Future State																																
Residential Outaoe Value (non-MED)	Escalation	$ 5.97	$ 6.12	$ 6.27	$ 6.43	$ 6.59	$ 6.76	$ 6.93	$ 7.10	$ 7.28	$ 7.46	$ 7.64	$ 7.84	$ 8.03	$ 8.23	$ 8.44	$ 8.65	$ 8.86	$ 9.09	$ 9.31	$ 9.55	$ 9.79	$ 10.03	$ 10.28	$ 10.54	$ 10.80	$ 11.07	$ 11.35	$ 11.63	$ 11.92	$ 12.22	$ 12.53
Small C&I Outaoe Value (non-MED)	Escalation	$ 766.33	$ 785.49	$ 805.13	$ 825.25	$ 845.89	$ 867.03	$ 888.71	$ 910.93	$ 933.70	$ 957.04	$ 980.97	$ 1,005.49	$ 1,030.63	$ 1,056.40	$ 1,082.81	$ 1,109.88	$ 1,137.62	$ 1,166.06	$ 1,195.21	$ 1,225.09	$ 1,255.72	$ 1,287.12	$ 1,319.29	$ 1,352.28	$ 1,386.08	$ 1,420.73	$ 1,456.25	$ 1,492.66	$ 1,529.98	$ 1,568.23	$ 1,607.43
Large C&I Outaoe Value (non-MED)	Escalation	$ 20,928.34	$ 21,451.54	$ 21,987.83	$ 22,537.53	$ 23,100.97	$ 23,678.49	$ 24,270.45	$ 24,877.22	$ 25,499.15	$ 26,136.62	$ 26,790.04	$ 27,459.79	$ 28,146.29	$ 28,849.94	$ 29,571.19	$ 30,310.47	$ 31,068.23	$ 31,844.94	$ 32,641.06	$ 33,457.09	$ 34,293.52	$ 35,150.85	$ 36,029.63	$ 36,930.37	$ 37,853.62	$ 38,799.97	$ 39,769.96	$ 40,764.21	$ 41,783.32	$ 42,827.90	$ 43,898.60
Residential Outaoe Value (MED)	Escalation	$ 16.17	$ 16.58	$ 16.99	$ 17.42	$ 17.85	$ 18.30	$ 18.76	$ 19.22	$ 19.70	$ 20.20	$ 20.70	$ 21.22	$ 21.75	$ 22.29	$ 22.85	$ 23.42	$ 24.01	$ 24.61	$ 25.22	$ 25.85	$ 26.50	$ 27.16	$ 27.84	$ 28.54	$ 29.25	$ 29.98	$ 30.73	$ 31.50	$ 32.29	$ 33.10	$ 33.92
Small C&I Outaoe Value (MED)	Escalation	$ 4,061.70	$ 4,163.24	$ 4,267.33	$ 4,374.01	$ 4,483.36	$ 4,595.44	$ 4,710.33	$ 4,828.09	$ 4,948.79	$ 5,072.51	$ 5,199.32	$ 5,329.31	$ 5,462.54	$ 5,599.10	$ 5,739.08	$ 5,882.56	$ 6,029.62	$ 6,180.36	$ 6,334.87	$ 6,493.24	$ 6,655.57	$ 6,821.96	$ 6,992.51	$ 7,167.32	$ 7,346.51	$ 7,530.17	$ 7,718.42	$ 7,911.38	$ 8,109.17	$ 8,311.90	$ 8,519.69
Large C&I Outaoe Value (MED)	Escalation	$ 75,638.53	$ 77,529.50	$ 79,467.73	$ 81,454.43	$ 83,490.79	$ 85,578.06	$ 87,717.51	$ 89,910.45	$ 92,158.21	$ 94,462.16	$ 96,823.72	$ 99,244.31	$ 101,725.42	$ 104,268.55	$ 106,875.27	$ 109,547.15	$ 112,285.83	$ 115,092.97	$ 117,970.30	$ 120,919.56	$ 123,942.54	$ 127,041.11	$ 130,217.14	$ 133,472.56	$ 136,809.38	$ 140,229.61	$ 143,735.35	$ 147,328.74	$ 151,011.96	$ 154,787.25	$ 158,656.94

Assumption	Value	Source
Escalation Rate	2.50%	Duke Energy Standard Assumptions (provided by Treasury)
Discount Rate (WACC)	6.80%	For NC/SC combination, use NC amount
Discount Rate (WACC) DEC-SC	7.05%	Duke Energy Standard Assumptions (provided by Treasury)
Discount Rate (WACC) DEC-NC	6.80%	Duke Energy Standard Assumptions (provided by Treasury)
Discount Rate (WACC) DEP-SC	7.00%	Duke Energy Standard Assumptions (provided by Treasury)
Discount Rate (WACC) DEP-NC	6.80%	Duke Energy Standard Assumptions (provided by Treasury)

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 15 of 80

Table ES-1: Estimated Interuption Cost per Event, Average kW and Unserved kWh (US 2013$) by Duration and Customer Class

Interruption Cost	Interruption Duration						
	Momentary	30 Minutes	1 Hour	4 Hours	8 Hours	16 Hours	48 Hours (calculated)
	0.0	0.5	1.0	4.0	8.0	16.0	48.0
Cost per Event							
Medium and Large C&I (Over 50,000 Annual kWh)							
Cost per Event	$12,952.00	$15,241.00	$17,804.00	$39,458.00	$84,083.00	$165,482.00	$491,078.00
Cost per Average kW	$15.90	$18.70	$21.80	$48.40	$103.20	$203.00	
Cost per Unserved kWh	$190.70	$37.40	$21.80	$12.10	$12.90	$12.70	
Small C&I (Under 50,000 Annual kWh)							
Cost per Event	$412.00	$520.00	$647.00	$1,880.00	$4,690.00	$9,055.00	$26,515.00
Cost per Average kW	$187.90	$237.00	$295.00	$857.10	$2,138.10	$4,128.30	
Cost per Unserved kWh	$2,254.60	$474.10	$295.00	$214.30	$267.30	$258.00	
Residential							
Cost per Event	$3.90	$4.50	$5.10	$9.50	$17.20	$32.40	$93.20
Cost per Average kW	$2.60	$2.90	$3.30	$6.20	$11.30	$21.20	
Cost per Unserved kWh	$30.90	$5.90	$3.30	$1.60	$1.40	$1.30	

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 16 of 80

"Optimize" CBA's Distribution Projects

CIRCUIT_ID	TOTAL RES CUSTOMERS	TOTAL NON-RES CUSTOMERS < 50,000 KWH AVG	TOTAL NON RES CUSTOMERS > 50,000 KWH AVG	TOTAL	PROJECT	
T3450B03	796	258	23	1,077	1	
T3450B04	580	100	8	688	1	missing T3450B02
	1,376	358	31	1,765		
02091206		1			2	one customer…GRVL hospital
02091207					2	
	-	1	-	-		
4091203	192	25	3	220	3	
4231203	695	186	28	909	3	two projects; same circuit
	887	211	31	1,129		
4231203	695	186	28	909	4	two projects; same circuit
4141203	431	171	24	626	4	
	1,126	357	52	1,535		
4351205	685	135	12	832	5	
4351206	1,089	163	10	1,262	5	
	1,774	298	22	2,094		
60081206	1,014	168	10	1,192	6	
60181201	243	83	20	346	6	
	1,257	251	30	1,538		
60181202	928	230	18	1,176	7	
60211202	1,279	295	15	1,589	7	
	2,207	525	33	2,765		
7311202	979	175	11	1,165	8	
7401202	507	121	3	631	8	
	1,486	296	14	1,796		

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 17 of 80

"Optimize" CBA's Distribution Projects

Project Number	Jurisdiction	State	Project	MED_Y_N	10yrOutageCount	10YrCI	10yrCMI
1	DEP	SC	Cheraw River	Y	10	5,191	6,197,624
1	DEP	SC	Cheraw River	N	49	22,502	1,883,685
2	DEC	SC	Brushy Creek	N	1	2	162
3	DEC	SC	Whitehall Hurricane Creek	Y	5	1,512	410,657
3	DEC	SC	Whitehall Hurricane Creek	N	9	4,105	134,932
4	DEC	SC	Whitehall Sandy Springs	Y	4	1,068	368,189
4	DEC	SC	Whitehall Sandy Springs	N	19	6,338	465,445
5	DEC	SC	Fants Grove	N	12	9,714	782,199
6	DEC	SC	Moore Camp Croft	Y	9	6,285	1,313,936
6	DEC	SC	Moore Camp Croft	N	28	11,152	1,331,054
7	DEC	SC	Moore Woodruff	Y	18	8,923	2,781,941
7	DEC	SC	Moore Woodruff	N	59	33,435	4,631,998
8	DEC	SC	Eddy Road Panorama	Y	17	1,774	1,343,157
8	DEC	SC	Eddy Road Panorama	N	28	8,530	1,057,981

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 18 of 80

"Optimize" CBA's Distribution Projects

Data Input	Description
Circuit ID's involved in the project	**Enter each circuit ID on a separate row**
04351205	Fants Grove 1205
04351206	Fants Grove 1206
Protective Device ID's impacted	Will research the 10 year outage history on these devices to estimate CI/CMI reduction by completing this project. Appears in most cases this will be the backbone devices upstream from the project site.
	Enter the Smallworld ID of each protective device impacted in Column A. One Smallworld ID per row.
38616531	Single Ph 65K Fuse - Fants Grove 1205
38616555	Single Ph 65K Fuse - Fants Grove 1206
38360829	Fants Grove 1206 OCB
38616531	Fants Grove 1205 OCB
362264523	140 L Hydraulic upstream of 65 k fuse on 1206
	Input Data Here
Estimated Cost	$25,000
Timeframe to Complete (Years)	1
Estimated % decrease in event duration	50% (assumption that circuit tie will be able to significantly reduce the duration of 50% affected customers depending on fault location)

Special Considerations that have a financial impact: Mention additional considerations that would be cost beneficial. We will run the cost of the project vs traditional benefits like outage and veg savings.
Ex. Project will reduce vegetation trimming from 3 ROW's to 1
Ex. Changing to from wood to concrete poles (O&M)

Create a N.O. tie between the Fants Grove 1205 & 1206

Circuit ID		4351205		4351206
Circuit Name	FANTS GROVE 12KV - 1205		FANTS GROVE 12KV - 1206	
Customers Served		823		1273

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 19 of 80

"Optimize" CBA's Distribution Projects

PROGRAM:	Long Duration/High Impact Sites	Long Duration/High Impact Sites	Long Duration/High Impact Sites	Long Duration/High Impact Sites	Long Duration/High Impact Sites	Long Duration/High Impact Sites	Long Duration/High Impact Sites	Long Duration/High Impact Sites
PROJECT:	Cheraw River Crossing - 1	Brushy Creek - 2	Whitehall Hurricance Creek - 3	Whitehall Sandy Springs - 4	Fants Grove - 5	Moore Camp Croft - 6	Moore Woodruff - 7	Eddy Rd Panorama - 8
REGULATORY JURISDICTION:	DEP	DEC	DEC	DEC	DEC	DEC	DEC	DEC
STATE:	SC	SC	SC	SC	SC	SC	SC	SC
ASSUMPTIONS								
Operational								
Outage and Restoration								
DEC Average Cost per Base Neighborhood Outage Event	$ 5,477	$ 5,477	$ 5,477	$ 5,477	$ 5,477	$ 5,477	$ 5,477	$ 5,477
DEC Average Cost per non-MED Outage Event	$ 16,431	$ 16,431	$ 16,431	$ 16,431	$ 16,431	$ 16,431	$ 16,431	$ 16,431
DEC Average Cost per MED Outage Event	$ 54,770	$ 54,770	$ 54,770	$ 54,770	$ 54,770	$ 54,770	$ 54,770	$ 54,770
DEP Average Cost per Base Neighborhood Outage Event	$ 4,742	$ 4,742	$ 4,742	$ 4,742	$ 4,742	$ 4,742	$ 4,742	$ 4,742
DEP Average Cost per Non-MED Outage Event	$ 14,226	$ 14,226	$ 14,226	$ 14,226	$ 14,226	$ 14,226	$ 14,226	$ 14,226
DEP Average Cost per MED Outage Event	$ 47,420	$ 47,420	$ 47,420	$ 47,420	$ 47,420	$ 47,420	$ 47,420	$ 47,420
Vegetation Management								
Vegetation Mgt. Multiplier for Complex Line Maintenance	10	10	10	10	10	10	10	10
Asset Management								
Customer								
DATA INPUTS								
Operational								
Project Deployment Cost	$ 7,200,000	$ 1,100,000	$ 150,000	$ 200,000	$ 25,000	$ 1,426,800	$ 1,200,000	$ 1,400,000
Deployment Installation Period	2	1	1	1	1	2	2	2
Start year of Installation	2019	2019	2019	2019	2019	2019	2019	2019
Outage and Restoration								
10 Year Customer Outage Events - Non-Major Event Days (MED)	49	1	9	19	12	28	59	28
10 Year Customer Interruptions (CI) - Non-MED	22,502	2	4,105	6,338	9,714	11,152	33,435	8,530
10 Year Customer Minutes Interrupted (CMI) - Non-MED	1,883,685	162	134,932	465,445	782,199	1,331,054	4,631,998	1,057,981
10 Year Customer Outage Events - MED	10	-	5	4	-	9	18	17
10 Year Customer Interruptions (CI) - MED	5,191	-	1,512	1,068	-	6,285	8,923	1,774
10 Year Customer Minutes Interrupted (CMI) - MED	6,197,624	-	410,657	368,189	-	1,313,936	2,781,941	1,343,157
Estimated Decrease in Event Frequency	67%	0%	0%	0%	0%	0%	0%	0%
Estimated Decrease in Event Duration	80%	90%	50%	50%	50%	50%	50%	50%
Vegetation Management								
Trim Cycle years (5, 7 or 9)								
Asset Management								
Line Miles of Deteriorated OH Conductor to Replace								
Customer								
Residential Customers	1,376	0	887	1,126	1,774	1,257	2,207	1,486
Small C&I Customers	358	0	211	357	298	251	525	296
Medium & Large C&I Customers	31	1	31	52	22	30	33	14
CALCULATIONS								
Operational								
Outage and Restoration								
10 Year Average Customer Outage Events - Non-Major Event Days (MED)	4.9	0.1	0.9	1.9	1.2	2.8	5.9	2.8
10 Year Average Customer Interruptions (CI) - Non-MED	2,250	0	411	634	971	1,115	3,344	853
10 Year Average Customer Minutes Interrupted (CMI) - Non-MED	188,369	16	13,493	46,544	78,220	133,105	463,200	105,798
10 Year Average Customer Outage Events - MED	1.0	0.0	0.5	0.4	0.0	0.9	1.8	1.7
10 Year Average Customer Interruptions (CI) - MED	519	0	151	107	0	629	892	177
10 Year Average Customer Minutes Interrupted (CMI) - MED	619,762	0	41,066	36,819	0	131,394	278,194	134,316
Annual Average Outage Duration (hours) Non-MED	1.4	1.4	0.5	1.2	1.3	2.0	2.3	2.1
Annual Average Outage Duration (hours) MED	19.9	0.0	4.5	5.7	0.0	3.5	5.2	12.6
Revised Outage Events based on Estimated Decrease in Event Frequency - Non-MED	1.6	0.1	0.9	1.9	1.2	2.8	5.9	2.8
Revised Outage Duration based on Estimated Decrease in Event Duration - Non-MED	0.3	0.1	0.3	0.6	0.7	1.0	1.2	1.0
Revised Outage Events based on Estimated Decrease in Event Frequency - MED	0.3	0.0	0.5	0.4	0.0	0.9	1.8	1.7
Revised Outage Duration based on Estimated Decrease in Event Duration - MED	4.0	0.0	2.3	2.9	0.0	1.7	2.6	6.3
Vegetation Management								
Asset Management								
Customer								

Non-MED values are 3X base values
MED values are 10X base values

Non-MED values are 3X base values
MED values are 10X base values

NOTES:

CELL INPUT:

Standard assumptions for all areas - review if standard applies
Individual data input per area
Calculated input - no input required

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 20 of 80

"Optimize" CBA's Distribution Projects

PROGRAM:	Long Duration/High Impact Sites	
PROJECT:	Fants Grove - 5	
REGULATORY JURISDICTION:	DEC	
STATE:	SC	
ASSUMPTIONS		
Operational		
Outage and Restoration		
DEC Average Cost per Base Neighborhood Outage Event	$ 5,477	
DEC Average Cost per non-MED Outage Event	$ 16,431	Non-MED values are 3X base values
DEC Average Cost per MED Outage Event	$ 54,770	MED values are 10X base values
DEP Average Cost per Base Neighborhood Outage Event	$ 4,742	
DEP Average Cost per Non-MED Outage Event	$ 14,226	Non-MED values are 3X base values
DEP Average Cost per MED Outage Event	$ 47,420	MED values are 10X base values
Vegetation Management		
Vegetation Mgt. Multiplier for Complex Line Maintenance	10	
Asset Management		
Customer		
DATA INPUTS		
Operational		
Project Deployment Cost	$ 25,000	
Deployment Installation Period	1	
Start year of Installation	2019	
Outage and Restoration		
10 Year Customer Outage Events - Non-Major Event Days (MED)	12	
10 Year Customer Interruptions (CI) - Non-MED	9,714	
10 Year Customer Minutes Interrupted (CMI) - Non-MED	782,199	
10 Year Customer Outage Events - MED	-	
10 Year Customer Interruptions (CI) - MED	-	
10 Year Customer Minutes Interrupted (CMI) - MED	-	
Estimated Decrease in Event Frequency	0%	
Estimated Decrease in Event Duration	50%	
Vegetation Management		
Trim Cycle years (5, 7 or 9)		
Asset Management		
Line Miles of Deteriorated OH Conductor to Replace		
Customer		
Residential Customers	1,774	
Small C&I Customers	298	
Medium & Large C&I Customers	22	
CALCULATIONS		
Operational		
Outage and Restoration		
10 Year Average Customer Outage Events - Non-Major Event Days (MED)	1.2	
10 Year Average Customer Interruptions (CI) - Non-MED	971	
10 Year Average Customer Minutes Interrupted (CMI) - Non-MED	78,220	
10 Year Average Customer Outage Events - MED	0.0	
10 Year Average Customer Interruptions (CI) - MED	0	
10 Year Average Customer Minutes Interrupted (CMI) - MED	0	
Annual Average Outage Duration (hours) Non-MED	1.3	
Annual Average Outage Duration (hours) MED	0.0	
Revised Outage Events based on Estimated Decrease in Event Frequency - Non-MED	1.2	
Revised Outage Duration based on Estimated Decrease in Event Duration - Non-MED	0.7	
Revised Outage Events based on Estimated Decrease in Event Frequency - MED	0.0	
Revised Outage Duration based on Estimated Decrease in Event Duration - MED	0.0	
Vegetation Management		
Asset Management		
Customer		

NOTES:

CELL INPUT:

Standard assumptions for all areas - review if standard applies
Individual data input per area
Calculated input - no input required

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 21 of 80

"Optimize" CBA's Distribution Projects

PROGRAM:	Long Duration/High Impact Sites
PROJECT:	Fants Grove - 5
REGULATORY JURISDICTION:	DEC
STATE:	SC

	NPV of BENEFIT STREAM	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
COSTS																																
Project Capital	$ 25,000	$ 25,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Project O&M	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Project Costs	$ 25,000	$ 25,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
N/A	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total On-Going O&M	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
OPERATIONAL BENEFITS																																
Outage and Restoration																																
Non-MED Restoration costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
MED Restoration costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Outage and Restoration Benefits	$ -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vegetation Management																																
Eliminate of VM cycle charges	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Avoid demand trimming costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Vegetation Management Benefits	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Asset Management																																
Elimination of deteriorated conductor replacement costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Elimination of pole replacement costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Asset Management Benefits	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
CUSTOMER BENEFITS																																
Customer																																
Outage Savings (non-MED) - Residential Customers	$ 37,378	$ -	$ 2,268	$ 2,325	$ 2,383	$ 2,443	$ 2,504	$ 2,567	$ 2,631	$ 2,696	$ 2,764	$ 2,833	$ 2,904	$ 2,976	$ 3,051	$ 3,127	$ 3,205	$ 3,285	$ 3,367	$ 3,452	$ 3,538	$ 3,626	$ 3,717	$ 3,810	$ 3,905	$ 4,003	$ 4,103	$ 4,206	$ 4,311	$ 4,418	$ 4,529	$ 4,642
Outage Savings (non-MED) - Small C&I Customers	$ 1,569,939	$ -	$ 95,277	$ 97,659	$ 100,100	$ 102,603	$ 105,168	$ 107,797	$ 110,492	$ 113,254	$ 116,085	$ 118,988	$ 121,962	$ 125,011	$ 128,137	$ 131,340	$ 134,623	$ 137,989	$ 141,439	$ 144,975	$ 148,599	$ 152,314	$ 156,122	$ 160,025	$ 164,026	$ 168,126	$ 172,329	$ 176,638	$ 181,054	$ 185,580	$ 190,219	$ 194,975
Outage Savings (non-MED) - Medium & Large C&I Customers	$ 2,148,633	$ -	$ 130,397	$ 133,656	$ 136,998	$ 140,423	$ 143,933	$ 147,532	$ 151,220	$ 155,001	$ 158,876	$ 162,847	$ 166,919	$ 171,092	$ 175,369	$ 179,753	$ 184,247	$ 188,853	$ 193,574	$ 198,414	$ 203,374	$ 208,458	$ 213,670	$ 219,012	$ 224,487	$ 230,099	$ 235,852	$ 241,748	$ 247,792	$ 253,986	$ 260,336	$ 266,844
Outage Savings (MED) - Residential Customers	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Outage Savings (MED) - Small C&I Customers	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Outage Savings (MED) - Medium & Large C&I Customers	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Customer Benefits	$ 2,148,633	$ -	$ 130,397	$ 133,656	$ 136,998	$ 140,423	$ 143,933	$ 147,532	$ 151,220	$ 155,001	$ 158,876	$ 162,847	$ 166,919	$ 171,092	$ 175,369	$ 179,753	$ 184,247	$ 188,853	$ 193,574	$ 198,414	$ 203,374	$ 208,458	$ 213,670	$ 219,012	$ 224,487	$ 230,099	$ 235,852	$ 241,748	$ 247,792	$ 253,986	$ 260,336	$ 266,844
COMBINED COSTS AND BENEFITS																																
Total PV of Operational Benefits	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total PV of Customer Benefits	$ 2,148,633	$ -	$ 130,397	$ 133,656	$ 136,998	$ 140,423	$ 143,933	$ 147,532	$ 151,220	$ 155,001	$ 158,876	$ 162,847	$ 166,919	$ 171,092	$ 175,369	$ 179,753	$ 184,247	$ 188,853	$ 193,574	$ 198,414	$ 203,374	$ 208,458	$ 213,670	$ 219,012	$ 224,487	$ 230,099	$ 235,852	$ 241,748	$ 247,792	$ 253,986	$ 260,336	$ 266,844
Total PV of Combined Benefits	$ 2,148,633	$ -	$ 130,397	$ 133,656	$ 136,998	$ 140,423	$ 143,933	$ 147,532	$ 151,220	$ 155,001	$ 158,876	$ 162,847	$ 166,919	$ 171,092	$ 175,369	$ 179,753	$ 184,247	$ 188,853	$ 193,574	$ 198,414	$ 203,374	$ 208,458	$ 213,670	$ 219,012	$ 224,487	$ 230,099	$ 235,852	$ 241,748	$ 247,792	$ 253,986	$ 260,336	$ 266,844
Project and On-Going Costs	$ 25,000	$ 25,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Escalation		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Deployment percentage		$ -	100%																													
Combined NPV of Project	$ 2,123,633	$ (25,000)	$ 130,397	$ 133,656	$ 136,998	$ 140,423	$ 143,933	$ 147,532	$ 151,220	$ 155,001	$ 158,876	$ 162,847	$ 166,919	$ 171,092	$ 175,369	$ 179,753	$ 184,247	$ 188,853	$ 193,574	$ 198,414	$ 203,374	$ 208,458	$ 213,670	$ 219,012	$ 224,487	$ 230,099	$ 235,852	$ 241,748	$ 247,792	$ 253,986	$ 260,336	$ 266,844
Ratio of NPV Benefits to NPV Costs	85.9																															
Cumulative Net Benefits		$ (25,000)	$ 105,397	$ 264,053	$ 270,654	$ 277,421	$ 284,356	$ 291,465	$ 298,752	$ 306,221	$ 313,876	$ 321,723	$ 329,766	$ 338,010	$ 346,460	$ 355,122	$ 364,000	$ 373,100	$ 382,427	$ 391,988	$ 401,788	$ 411,833	$ 422,128	$ 432,682	$ 443,499	$ 454,586	$ 465,951	$ 477,600	$ 489,540	$ 501,778	$ 514,322	$ 527,181

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 22 of 80

"Optimize" CBA's Distribution Projects

		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Deployment Costs																																
Project Capital	Escalation	$ 25.000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Project O&M	Factor																															
Outage and Restoration																																
Average Cost per Non-MED Outage Event	Escalation	$ 5,477	$ 5,614	$ 5,754	$ 5,898	$ 6,046	$ 6,197	$ 6,352	$ 6,510	$ 6,673	$ 6,840	$ 7,011	$ 7,186	$ 7,366	$ 7,550	$ 7,739	$ 7,932	$ 8,131	$ 8,334	$ 8,542	$ 8,756	$ 8,975	$ 9,199	$ 9,429	$ 9,665	$ 9,906	$ 10,154	$ 10,408	$ 10,668	$ 10,935	$ 11,208	$ 11,488
Average Cost per MED Outage Event	Escalation	$ 54.770	$ 56.139	$ 57.543	$ 58.981	$ 60.456	$ 61.967	$ 63.516	$ 65.104	$ 66.732	$ 68.400	$ 70.110	$ 71.863	$ 73.660	$ 75.501	$ 77.389	$ 79.323	$ 81.306	$ 83.339	$ 85.423	$ 87.558	$ 89.747	$ 91.991	$ 94.290	$ 96.648	$ 99.064	$ 101.541	$ 104.079	$ 106.681	$ 109.348	$ 112.082	$ 114.884
Vegetation Management																																
Asset Management																																
ICE Model																																
Current State																																
Residential Outaoe Value (non-MED)	Escalation	$ 6.50	$ 6.66	$ 6.83	$ 7.00	$ 7.17	$ 7.35	$ 7.53	$ 7.72	$ 7.92	$ 8.11	$ 8.32	$ 8.52	$ 8.74	$ 8.96	$ 9.18	$ 9.41	$ 9.64	$ 9.88	$ 10.13	$ 10.39	$ 10.64	$ 10.91	$ 11.18	$ 11.46	$ 11.75	$ 12.04	$ 12.34	$ 12.65	$ 12.97	$ 13.29	$ 13.63
Small C&I Outaoe Value (non-MED)	Escalation	$ 913.35	$ 936.19	$ 959.59	$ 983.58	$ 1,008.17	$ 1,033.38	$ 1,059.21	$ 1,085.69	$ 1,112.83	$ 1,140.65	$ 1,169.17	$ 1,198.40	$ 1,228.36	$ 1,259.07	$ 1,290.54	$ 1,322.81	$ 1,355.88	$ 1,389.77	$ 1,424.52	$ 1,460.13	$ 1,496.64	$ 1,534.05	$ 1,572.40	$ 1,611.71	$ 1,652.01	$ 1,693.31	$ 1,735.64	$ 1,779.03	$ 1,823.50	$ 1,869.09	$ 1,915.82
Large C&I Outaoe Value (non-MED)	Escalation	$ 23,510.35	$ 24,098.10	$ 24,700.56	$ 25,318.07	$ 25,951.02	$ 26,599.80	$ 27,264.79	$ 27,946.41	$ 28,645.07	$ 29,361.20	$ 30,095.23	$ 30,847.61	$ 31,618.80	$ 32,409.27	$ 33,219.50	$ 34,049.99	$ 34,901.24	$ 35,773.77	$ 36,668.12	$ 37,584.82	$ 38,524.44	$ 39,487.55	$ 40,474.74	$ 41,486.61	$ 42,523.77	$ 43,586.87	$ 44,676.54	$ 45,793.45	$ 46,938.29	$ 48,111.75	$ 49,314.54
Residential Outaoe Value (MED)	Escalation	$ 4.52	$ 4.64	$ 4.75	$ 4.87	$ 4.99	$ 5.12	$ 5.25	$ 5.38	$ 5.51	$ 5.65	$ 5.79	$ 5.93	$ 6.08	$ 6.23	$ 6.39	$ 6.55	$ 6.71	$ 6.88	$ 7.05	$ 7.23	$ 7.41	$ 7.60	$ 7.79	$ 7.98	$ 8.18	$ 8.39	$ 8.59	$ 8.81	$ 9.03	$ 9.26	$ 9.49
Small C&I Outaoe Value (MED)	Escalation	$ 477.79	$ 489.74	$ 501.98	$ 514.53	$ 527.39	$ 540.58	$ 554.09	$ 567.95	$ 582.15	$ 596.70	$ 611.62	$ 626.91	$ 642.58	$ 658.64	$ 675.11	$ 691.99	$ 709.29	$ 727.02	$ 745.20	$ 763.82	$ 782.92	$ 802.49	$ 822.56	$ 843.12	$ 864.20	$ 885.80	$ 907.95	$ 930.65	$ 953.91	$ 977.76	$ 1,002.20
Large C&I Outaoe Value (MED)	Escalation	$ 15,020.35	$ 15,395.86	$ 15,780.75	$ 16,175.27	$ 16,579.66	$ 16,994.15	$ 17,419.00	$ 17,854.48	$ 18,300.84	$ 18,758.36	$ 19,227.32	$ 19,708.00	$ 20,200.70	$ 20,705.72	$ 21,223.36	$ 21,753.94	$ 22,297.79	$ 22,855.24	$ 23,426.62	$ 24,012.28	$ 24,612.59	$ 25,227.91	$ 25,858.60	$ 26,505.07	$ 27,167.70	$ 27,846.89	$ 28,543.06	$ 29,256.64	$ 29,988.05	$ 30,737.75	$ 31,506.20
Future State																																
Residential Outaoe Value (non-MED)	Escalation	$ 5.46	$ 5.59	$ 5.73	$ 5.88	$ 6.02	$ 6.17	$ 6.33	$ 6.49	$ 6.65	$ 6.81	$ 6.98	$ 7.16	$ 7.34	$ 7.52	$ 7.71	$ 7.90	$ 8.10	$ 8.30	$ 8.51	$ 8.72	$ 8.94	$ 9.16	$ 9.39	$ 9.63	$ 9.87	$ 10.12	$ 10.37	$ 10.63	$ 10.89	$ 11.17	$ 11.45
Small C&I Outaoe Value (non-MED)	Escalation	$ 653.42	$ 669.75	$ 686.50	$ 703.66	$ 721.25	$ 739.28	$ 757.76	$ 776.71	$ 796.13	$ 816.03	$ 836.43	$ 857.34	$ 878.77	$ 900.74	$ 923.26	$ 946.34	$ 970.00	$ 994.25	$ 1,019.11	$ 1,044.59	$ 1,070.70	$ 1,097.47	$ 1,124.91	$ 1,153.03	$ 1,181.85	$ 1,211.40	$ 1,241.68	$ 1,272.73	$ 1,304.55	$ 1,337.16	$ 1,370.59
Large C&I Outaoe Value (non-MED)	Escalation	$ 18,691.55	$ 19,158.84	$ 19,637.81	$ 20,128.76	$ 20,631.98	$ 21,147.78	$ 21,676.47	$ 22,218.38	$ 22,773.84	$ 23,343.19	$ 23,926.77	$ 24,524.94	$ 25,138.06	$ 25,766.51	$ 26,410.67	$ 27,070.94	$ 27,747.72	$ 28,441.41	$ 29,152.44	$ 29,881.25	$ 30,628.29	$ 31,393.99	$ 32,178.84	$ 32,983.31	$ 33,807.90	$ 34,653.09	$ 35,519.42	$ 36,407.41	$ 37,317.59	$ 38,250.53	$ 39,206.80
Residential Outaoe Value (MED)	Escalation	$ 4.52	$ 4.64	$ 4.75	$ 4.87	$ 4.99	$ 5.12	$ 5.25	$ 5.38	$ 5.51	$ 5.65	$ 5.79	$ 5.93	$ 6.08	$ 6.23	$ 6.39	$ 6.55	$ 6.71	$ 6.88	$ 7.05	$ 7.23	$ 7.41	$ 7.60	$ 7.79	$ 7.98	$ 8.18	$ 8.39	$ 8.59	$ 8.81	$ 9.03	$ 9.26	$ 9.49
Small C&I Outaoe Value (MED)	Escalation	$ 477.79	$ 489.74	$ 501.98	$ 514.53	$ 527.39	$ 540.58	$ 554.09	$ 567.95	$ 582.15	$ 596.70	$ 611.62	$ 626.91	$ 642.58	$ 658.64	$ 675.11	$ 691.99	$ 709.29	$ 727.02	$ 745.20	$ 763.82	$ 782.92	$ 802.49	$ 822.56	$ 843.12	$ 864.20	$ 885.80	$ 907.95	$ 930.65	$ 953.91	$ 977.76	$ 1,002.20
Large C&I Outaoe Value (MED)	Escalation	$ 15,020.35	$ 15,395.86	$ 15,780.75	$ 16,175.27	$ 16,579.66	$ 16,994.15	$ 17,419.00	$ 17,854.48	$ 18,300.84	$ 18,758.36	$ 19,227.32	$ 19,708.00	$ 20,200.70	$ 20,705.72	$ 21,223.36	$ 21,753.94	$ 22,297.79	$ 22,855.24	$ 23,426.62	$ 24,012.28	$ 24,612.59	$ 25,227.91	$ 25,858.60	$ 26,505.07	$ 27,167.70	$ 27,846.89	$ 28,543.06	$ 29,256.64	$ 29,988.05	$ 30,737.75	$ 31,506.20

Assumption	Value	Source
Escalation Rate	2.50%	Duke Energy Standard Assumptions (provided by Treasury)
Discount Rate (WACC)	6.80%	For NC/SC combination, use NC amount
Discount Rate (WACC) DEC-SC	7.05%	Duke Energy Standard Assumptions (provided by Treasury)
Discount Rate (WACC) DEC-NC	6.80%	Duke Energy Standard Assumptions (provided by Treasury)
Discount Rate (WACC) DEP-SC	7.00%	Duke Energy Standard Assumptions (provided by Treasury)
Discount Rate (WACC) DEP-NC	6.80%	Duke Energy Standard Assumptions (provided by Treasury)

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 23 of 80

Table ES-1: Estimated Interuption Cost per Event, Average kW and Unserved kWh (US 2013$) by Duration and Customer Class							
Interruption Cost	Interruption Duration						
	Momentary	30 Minutes	1 Hour	4 Hours	8 Hours	16 Hours	48 Hours (calculated)
	0.0	0.5	1.0	4.0	8.0	16.0	48.0
Cost per Event							
Medium and Large C&I (Over 50,000 Annual kWh)							
Cost per Event	$12,952.00	$15,241.00	$17,804.00	$39,458.00	$84,083.00	$165,482.00	$491,078.00
Cost per Average kW	$15.90	$18.70	$21.80	$48.40	$103.20	$203.00	
Cost per Unserved kWh	$190.70	$37.40	$21.80	$12.10	$12.90	$12.70	
Small C&I (Under 50,000 Annual kWh)							
Cost per Event	$412.00	$520.00	$647.00	$1,880.00	$4,690.00	$9,055.00	$26,515.00
Cost per Average kW	$187.90	$237.00	$295.00	$857.10	$2,138.10	$4,128.30	
Cost per Unserved kWh	$2,254.60	$474.10	$295.00	$214.30	$267.30	$258.00	
Residential							
Cost per Event	$3.90	$4.50	$5.10	$9.50	$17.20	$32.40	$93.20
Cost per Average kW	$2.60	$2.90	$3.30	$6.20	$11.30	$21.20	
Cost per Unserved kWh	$30.90	$5.90	$3.30	$1.60	$1.40	$1.30	

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 24 of 80

"Optimize" CBA's Distribution Projects

CIRCUIT_ID	TOTAL RES CUSTOMERS	TOTAL NON-RES CUSTOMERS < 50,000 KWH AVG	TOTAL NON RES CUSTOMERS > 50,000 KWH AVG	TOTAL	PROJECT	
T3450B03	796	258	23	1,077	1	
T3450B04	580	100	8	688	1	missing T3450B02
	1,376	358	31	1,765		
02091206		1			2	one customer…GRVL hospital
02091207					2	
	-	1	-	-		
4091203	192	25	3	220	3	
4231203	695	186	28	909	3	two projects; same circuit
	887	211	31	1,129		
4231203	695	186	28	909	4	two projects; same circuit
4141203	431	171	24	626	4	
	1,126	357	52	1,535		
4351205	685	135	12	832	5	
4351206	1,089	163	10	1,262	5	
	1,774	298	22	2,094		
60081206	1,014	168	10	1,192	6	
60181201	243	83	20	346	6	
	1,257	251	30	1,538		
60181202	928	230	18	1,176	7	
60211202	1,279	295	15	1,589	7	
	2,207	525	33	2,765		
7311202	979	175	11	1,165	8	
7401202	507	121	3	631	8	
	1,486	296	14	1,796		

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 25 of 80

"Optimize" CBA's Distribution Projects

Project Number	Jurisdiction	State	Project	MED_Y_N	10yrOutageCount	10YrCI	10yrCMI
1	DEP	SC	Cheraw River	Y	10	5,191	6,197,624
1	DEP	SC	Cheraw River	N	49	22,502	1,883,685
2	DEC	SC	Brushy Creek	N	1	2	162
3	DEC	SC	Whitehall Hurricane Creek	Y	5	1,512	410,657
3	DEC	SC	Whitehall Hurricane Creek	N	9	4,105	134,932
4	DEC	SC	Whitehall Sandy Springs	Y	4	1,068	368,189
4	DEC	SC	Whitehall Sandy Springs	N	19	6,338	465,445
5	DEC	SC	Fants Grove	N	12	9,714	782,199
6	DEC	SC	Moore Camp Croft	Y	9	6,285	1,313,936
6	DEC	SC	Moore Camp Croft	N	28	11,152	1,331,054
7	DEC	SC	Moore Woodruff	Y	18	8,923	2,781,941
7	DEC	SC	Moore Woodruff	N	59	33,435	4,631,998
8	DEC	SC	Eddy Road Panorama	Y	17	1,774	1,343,157
8	DEC	SC	Eddy Road Panorama	N	28	8,530	1,057,981

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 26 of 80

"Optimize" CBA's Distribution Projects

Data Input	Description
Circuit ID's involved in the project	**Enter each circuit ID on a separate row**
60181201	Moore 1201
60081206	Camp Croft 1206

Protective Device ID's impacted

Will research the 10 year outage history on these devices to estimate CI/CMI reduction by completing this project. Appears in most cases this will be the backbone devices upstream from the project site.

	Enter the Smallworld ID of each protective device impacted in Column A. One Smallworld ID per row.
39002027	3 ph recloser on Camp Croft 1206
384158531	3 ph recloser upstream on Camp Croft 1206
39048359	3 ph solid bars
39006485	Upstream recloser 60181201 (Moore)
38371393	Moore 1201 OCB
38364393	Camp Croft 1206 OCB

	Input Data Here	
Estimated Cost	$1,426,800	
Timeframe to Complete (Years)	2	
Estimated % decrease in event duration	50%	(assumption that circuit tie will be able to significantly reduce the duration of 50% affected customers depending on fault location)

Special Considerations that have a financial impact: Mention additional considerations that would be cost beneficial. We will run the cost of the project vs traditional benefits like outage and veg savings.
Ex. Project will reduce vegetation trimming from 3 ROW's to 1
Ex. Changing to from wood to concrete poles (O&M)

Creating a circuit tie for switching options

Circuit ID	60081206	60181201
Circuit Name	CAMP CROFT - 120	MOORE - 1201
Customers Served	1199	357

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 27 of 80

"Optimize" CBA's Distribution Projects

PROGRAM:	Long Duration/High Impact Sites	Long Duration/High Impact Sites	Long Duration/High Impact Sites	Long Duration/High Impact Sites	Long Duration/High Impact Sites	Long Duration/High Impact Sites	Long Duration/High Impact Sites	Long Duration/High Impact Sites
PROJECT:	Cheraw River Crossing - 1	Brushy Creek - 2	Whitehall Hurricance Creek - 3	Whitehall Sandy Springs - 4	Fants Grove - 5	Moore Camp Croft - 6	Moore Woodruff - 7	Eddy Rd Panorama - 8
REGULATORY JURISDICTION:	DEP	DEC	DEC	DEC	DEC	DEC	DEC	DEC
STATE:	SC	SC	SC	SC	SC	SC	SC	SC
ASSUMPTIONS								
Operational								
Outage and Restoration								
DEC Average Cost per Base Neighborhood Outage Event	$ 5,477	$ 5,477	$ 5,477	$ 5,477	$ 5,477	$ 5,477	$ 5,477	$ 5,477
DEC Average Cost per non-MED Outage Event	$ 16,431	$ 16,431	$ 16,431	$ 16,431	$ 16,431	$ 16,431	$ 16,431	$ 16,431
DEC Average Cost per MED Outage Event	$ 54,770	$ 54,770	$ 54,770	$ 54,770	$ 54,770	$ 54,770	$ 54,770	$ 54,770
DEP Average Cost per Base Neighborhood Outage Event	$ 4,742	$ 4,742	$ 4,742	$ 4,742	$ 4,742	$ 4,742	$ 4,742	$ 4,742
DEP Average Cost per Non-MED Outage Event	$ 14,226	$ 14,226	$ 14,226	$ 14,226	$ 14,226	$ 14,226	$ 14,226	$ 14,226
DEP Average Cost per MED Outage Event	$ 47,420	$ 47,420	$ 47,420	$ 47,420	$ 47,420	$ 47,420	$ 47,420	$ 47,420
Vegetation Management								
Vegetation Mgt. Multiplier for Complex Line Maintenance	10	10	10	10	10	10	10	10
Asset Management								
Customer								
DATA INPUTS								
Operational								
Project Deployment Cost	$ 7,200,000	$ 1,100,000	$ 150,000	$ 200,000	$ 25,000	$ 1,426,800	$ 1,200,000	$ 1,400,000
Deployment Installation Period	2	1	1	1	1	2	2	2
Start year of Installation	2019	2019	2019	2019	2019	2019	2019	2019
Outage and Restoration								
10 Year Customer Outage Events - Non-Major Event Days (MED)	49	1	9	19	12	28	59	28
10 Year Customer Interruptions (CI) - Non-MED	22,502	2	4,105	6,338	9,714	11,152	33,435	8,530
10 Year Customer Minutes Interrupted (CMI) - Non-MED	1,883,685	162	134,932	465,445	782,199	1,331,054	4,631,998	1,057,981
10 Year Customer Outage Events - MED	10	-	5	4	-	9	18	17
10 Year Customer Interruptions (CI) - MED	5,191	-	1,512	1,068	-	6,285	8,923	1,774
10 Year Customer Minutes Interrupted (CMI) - MED	6,197,624	-	410,657	368,189	-	1,313,936	2,781,941	1,343,157
Estimated Decrease in Event Frequency	67%	0%	0%	0%	0%	0%	0%	0%
Estimated Decrease in Event Duration	80%	90%	50%	50%	50%	50%	50%	50%
Vegetation Management								
Trim Cycle years (5, 7 or 9)								
Asset Management								
Line Miles of Deteriorated OH Conductor to Replace								
Customer								
Residential Customers	1,376	0	887	1,126	1,774	1,257	2,207	1,486
Small C&I Customers	358	0	211	357	298	251	525	296
Medium & Large C&I Customers	31	1	31	52	22	30	33	14
CALCULATIONS								
Operational								
Outage and Restoration								
10 Year Average Customer Outage Events - Non-Major Event Days (MED)	4.9	0.1	0.9	1.9	1.2	2.8	5.9	2.8
10 Year Average Customer Interruptions (CI) - Non-MED	2,250	0	411	634	971	1,115	3,344	853
10 Year Average Customer Minutes Interrupted (CMI) - Non-MED	188,369	16	13,493	46,544	78,220	133,105	463,200	105,798
10 Year Average Customer Outage Events - MED	1.0	0.0	0.5	0.4	0.0	0.9	1.8	1.7
10 Year Average Customer Interruptions (CI) - MED	519	0	151	107	0	629	892	177
10 Year Average Customer Minutes Interrupted (CMI) - MED	619,762	0	41,066	36,819	0	131,394	278,194	134,316
Annual Average Outage Duration (hours) Non-MED	1.4	1.4	0.5	1.2	1.3	2.0	2.3	2.1
Annual Average Outage Duration (hours) MED	19.9	0.0	4.5	5.7	0.0	3.5	5.2	12.6
Revised Outage Events based on Estimated Decrease in Event Frequency - Non-MED	1.6	0.1	0.9	1.9	1.2	2.8	5.9	2.8
Revised Outage Duration based on Estimated Decrease in Event Duration - Non-MED	0.3	0.1	0.3	0.6	0.7	1.0	1.2	1.0
Revised Outage Events based on Estimated Decrease in Event Frequency - MED	0.3	0.0	0.5	0.4	0.0	0.9	1.8	1.7
Revised Outage Duration based on Estimated Decrease in Event Duration - MED	4.0	0.0	2.3	2.9	0.0	1.7	2.6	6.3
Vegetation Management								
Asset Management								
Customer								

Non-MED values are 3X base values
MED values are 10X base values

Non-MED values are 3X base values
MED values are 10X base values

NOTES:

CELL INPUT:

Standard assumptions for all areas - review if standard applies
Individual data input per area
Calculated input - no input required

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 28 of 80

"Optimize" CBA's Distribution Projects

PROGRAM:	Long Duration/High Impact Sites	
PROJECT:	Moore Camp Croft - 6	
REGULATORY JURISDICTION:	DEC	
STATE:	SC	
ASSUMPTIONS		
Operational		
Outage and Restoration		
DEC Average Cost per Base Neighborhood Outage Event	$ 5,477	
DEC Average Cost per non-MED Outage Event	$ 16,431	Non-MED values are 3X base values
DEC Average Cost per MED Outage Event	$ 54,770	MED values are 10X base values
DEP Average Cost per Base Neighborhood Outage Event	$ 4,742	
DEP Average Cost per Non-MED Outage Event	$ 14,226	Non-MED values are 3X base values
DEP Average Cost per MED Outage Event	$ 47,420	MED values are 10X base values
Vegetation Management		
Vegetation Mgt. Multiplier for Complex Line Maintenance	10	
Asset Management		
Customer		
DATA INPUTS		
Operational		
Project Deployment Cost	$ 1,426,800	
Deployment Installation Period	2	
Start year of Installation	2019	
Outage and Restoration		
10 Year Customer Outage Events - Non-Major Event Days (MED)	28	
10 Year Customer Interruptions (CI) - Non-MED	11,152	
10 Year Customer Minutes Interrupted (CMI) - Non-MED	1,331,054	
10 Year Customer Outage Events - MED	9	
10 Year Customer Interruptions (CI) - MED	6,285	
10 Year Customer Minutes Interrupted (CMI) - MED	1,313,936	
Estimated Decrease in Event Frequency	0%	
Estimated Decrease in Event Duration	50%	
Vegetation Management		
Trim Cycle years (5, 7 or 9)		
Asset Management		
Line Miles of Deteriorated OH Conductor to Replace		
Customer		
Residential Customers	1,257	
Small C&I Customers	251	
Medium & Large C&I Customers	30	
CALCULATIONS		
Operational		
Outage and Restoration		
10 Year Average Customer Outage Events - Non-Major Event Days (MED)	2.8	
10 Year Average Customer Interruptions (CI) - Non-MED	1,115	
10 Year Average Customer Minutes Interrupted (CMI) - Non-MED	133,105	
10 Year Average Customer Outage Events - MED	0.9	
10 Year Average Customer Interruptions (CI) - MED	629	
10 Year Average Customer Minutes Interrupted (CMI) - MED	131,394	
Annual Average Outage Duration (hours) Non-MED	2.0	
Annual Average Outage Duration (hours) MED	3.5	
Revised Outage Events based on Estimated Decrease in Event Frequency - Non-MED	2.8	
Revised Outage Duration based on Estimated Decrease in Event Duration - Non-MED	1.0	
Revised Outage Events based on Estimated Decrease in Event Frequency - MED	0.9	
Revised Outage Duration based on Estimated Decrease in Event Duration - MED	1.7	
Vegetation Management		
Asset Management		
Customer		

NOTES:

CELL INPUT:

Standard assumptions for all areas - review if standard applies
Individual data input per area
Calculated input - no input required

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 29 of 80

"Optimize" CBA's Distribution Projects

PROGRAM:	**Long Duration/High Impact Sites**
PROJECT:	**Moore Camp Croft - 6**
REGULATORY JURISDICTION:	**DEC**
STATE:	**SC**

	NPV of BENEFIT STREAM	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
COSTS																																
Project Capital	$ 1,381,378	$ 713,400	$ 713,400	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Project O&M	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Project Costs	$ 1,381,378	$ 713,400	$ 713,400	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
N/A	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total On-Going O&M	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
OPERATIONAL BENEFITS																																
Outage and Restoration																																
Non-MED Restoration costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
MED Restoration costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Outage and Restoration Benefits	$ -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vegetation Management																																
Eliminate of VM cycle charges	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Avoid demand trimming costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Vegetation Management Benefits	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Asset Management																																
Elimination of deteriorated conductor replacement costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Elimination of pole replacement costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Asset Management Benefits	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
CUSTOMER BENEFITS																																
Customer																																
Outage Savings (non-MED) - Residential Customers	$ 100,467	$ -	$ 6,097	$ 6,250	$ 6,406	$ 6,566	$ 6,730	$ 6,898	$ 7,071	$ 7,248	$ 7,429	$ 7,615	$ 7,805	$ 8,000	$ 8,200	$ 8,405	$ 8,615	$ 8,830	$ 9,051	$ 9,278	$ 9,509	$ 9,747	$ 9,991	$ 10,241	$ 10,497	$ 10,759	$ 11,028	$ 11,304	$ 11,586	$ 11,876	$ 12,173	$ 12,477
Outage Savings (non-MED) - Small C&I Customers	$ 5,615,672	$ -	$ 340,805	$ 349,325	$ 358,058	$ 367,009	$ 376,185	$ 385,589	$ 395,229	$ 405,110	$ 415,237	$ 425,618	$ 436,259	$ 447,165	$ 458,344	$ 469,803	$ 481,548	$ 493,587	$ 505,927	$ 518,575	$ 531,539	$ 544,828	$ 558,448	$ 572,409	$ 586,720	$ 601,388	$ 616,422	$ 631,833	$ 647,629	$ 663,819	$ 680,415	$ 697,425
Outage Savings (non-MED) - Medium & Large C&I Customers	$ 11,793,449	$ -	$ 715,723	$ 733,616	$ 751,956	$ 770,755	$ 790,024	$ 809,774	$ 830,019	$ 850,769	$ 872,038	$ 893,839	$ 916,185	$ 939,090	$ 962,567	$ 986,631	$ 1,011,297	$ 1,036,580	$ 1,062,494	$ 1,089,056	$ 1,116,283	$ 1,144,190	$ 1,172,795	$ 1,202,115	$ 1,232,167	$ 1,262,972	$ 1,294,546	$ 1,326,910	$ 1,360,082	$ 1,394,084	$ 1,428,936	$ 1,464,660
Outage Savings (MED) - Residential Customers	$ 56,619	$ -	$ 3,436	$ 3,522	$ 3,610	$ 3,700	$ 3,793	$ 3,888	$ 3,985	$ 4,084	$ 4,187	$ 4,291	$ 4,398	$ 4,508	$ 4,621	$ 4,737	$ 4,855	$ 4,976	$ 5,101	$ 5,228	$ 5,359	$ 5,493	$ 5,630	$ 5,771	$ 5,915	$ 6,063	$ 6,215	$ 6,370	$ 6,530	$ 6,693	$ 6,860	$ 7,032
Outage Savings (MED) - Small C&I Customers	$ 3,168,173	$ -	$ 192,271	$ 197,077	$ 202,004	$ 207,054	$ 212,231	$ 217,536	$ 222,975	$ 228,549	$ 234,263	$ 240,120	$ 246,123	$ 252,276	$ 258,583	$ 265,047	$ 271,673	$ 278,465	$ 285,427	$ 292,562	$ 299,876	$ 307,373	$ 315,058	$ 322,934	$ 331,008	$ 339,283	$ 347,765	$ 356,459	$ 365,370	$ 374,505	$ 383,867	$ 393,464
Outage Savings (MED) - Medium & Large C&I Customers	$ 6,650,152	$ -	$ 403,585	$ 413,675	$ 424,017	$ 434,617	$ 445,483	$ 456,620	$ 468,035	$ 479,736	$ 491,730	$ 504,023	$ 516,623	$ 529,539	$ 542,777	$ 556,347	$ 570,256	$ 584,512	$ 599,125	$ 614,103	$ 629,455	$ 645,192	$ 661,322	$ 677,855	$ 694,801	$ 712,171	$ 729,975	$ 748,225	$ 766,930	$ 786,104	$ 805,756	$ 825,900
Total Customer Benefits	$ 21,668,393	$ -	$ 1,315,014	$ 1,347,890	$ 1,381,587	$ 1,416,127	$ 1,451,530	$ 1,487,818	$ 1,525,014	$ 1,563,139	$ 1,602,217	$ 1,642,273	$ 1,683,330	$ 1,725,413	$ 1,768,548	$ 1,812,762	$ 1,858,081	$ 1,904,533	$ 1,952,146	$ 2,000,950	$ 2,050,974	$ 2,102,248	$ 2,154,804	$ 2,208,674	$ 2,263,891	$ 2,320,489	$ 2,378,501	$ 2,437,963	$ 2,498,912	$ 2,561,385	$ 2,625,420	$ 2,691,055
COMBINED COSTS AND BENEFITS																																
Total PV of Operational Benefits	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total PV of Customer Benefits	$ 21,668,393	$ -	$ 1,315,014	$ 1,347,890	$ 1,381,587	$ 1,416,127	$ 1,451,530	$ 1,487,818	$ 1,525,014	$ 1,563,139	$ 1,602,217	$ 1,642,273	$ 1,683,330	$ 1,725,413	$ 1,768,548	$ 1,812,762	$ 1,858,081	$ 1,904,533	$ 1,952,146	$ 2,000,950	$ 2,050,974	$ 2,102,248	$ 2,154,804	$ 2,208,674	$ 2,263,891	$ 2,320,489	$ 2,378,501	$ 2,437,963	$ 2,498,912	$ 2,561,385	$ 2,625,420	$ 2,691,055
Total PV of Combined Benefits	$ 21,668,393	$ -	$ 1,315,014	$ 1,347,890	$ 1,381,587	$ 1,416,127	$ 1,451,530	$ 1,487,818	$ 1,525,014	$ 1,563,139	$ 1,602,217	$ 1,642,273	$ 1,683,330	$ 1,725,413	$ 1,768,548	$ 1,812,762	$ 1,858,081	$ 1,904,533	$ 1,952,146	$ 2,000,950	$ 2,050,974	$ 2,102,248	$ 2,154,804	$ 2,208,674	$ 2,263,891	$ 2,320,489	$ 2,378,501	$ 2,437,963	$ 2,498,912	$ 2,561,385	$ 2,625,420	$ 2,691,055
Project and On-Going Costs	$ 1,381,378	$ 713,400	$ 713,400	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Escalation		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Deployment percentage		$ -	50%																													
Combined NPV of Project	$ 20,287,015	$ (713,400)	$ 601,614	$ 1,347,890	$ 1,381,587	$ 1,416,127	$ 1,451,530	$ 1,487,818	$ 1,525,014	$ 1,563,139	$ 1,602,217	$ 1,642,273	$ 1,683,330	$ 1,725,413	$ 1,768,548	$ 1,812,762	$ 1,858,081	$ 1,904,533	$ 1,952,146	$ 2,000,950	$ 2,050,974	$ 2,102,248	$ 2,154,804	$ 2,208,674	$ 2,263,891	$ 2,320,489	$ 2,378,501	$ 2,437,963	$ 2,498,912	$ 2,561,385	$ 2,625,420	$ 2,691,055
Ratio of NPV Benefits to NPV Costs	15.7																															
Cumulative Net Benefits		$ (713,400)	$ (111,786)	$ 1,949,504	$ 2,729,477	$ 2,797,714	$ 2,867,657	$ 2,939,348	$ 3,012,832	$ 3,088,153	$ 3,165,356	$ 3,244,490	$ 3,325,603	$ 3,408,743	$ 3,493,961	$ 3,581,310	$ 3,670,843	$ 3,762,614	$ 3,856,680	$ 3,953,096	$ 4,051,924	$ 4,153,222	$ 4,257,053	$ 4,363,479	$ 4,472,566	$ 4,584,380	$ 4,698,989	$ 4,816,464	$ 4,936,876	$ 5,060,298	$ 5,186,805	$ 5,316,475

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 30 of 80

"Optimize" CBA's Distribution Projects

		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Deployment Costs																																
Project Capital	Escalation	$ 713.400	$ 713.400	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Project O&M	Factor																															
Outage and Restoration																																
Average Cost per Non-MED Outage Event	Escalation	$ 5,477	$ 5,614	$ 5,754	$ 5,898	$ 6,046	$ 6,197	$ 6,352	$ 6,510	$ 6,673	$ 6,840	$ 7,011	$ 7,186	$ 7,366	$ 7,550	$ 7,739	$ 7,932	$ 8,131	$ 8,334	$ 8,542	$ 8,756	$ 8,975	$ 9,199	$ 9,429	$ 9,665	$ 9,906	$ 10,154	$ 10,408	$ 10,668	$ 10,935	$ 11,208	$ 11,488
Average Cost per MED Outage Event	Escalation	$ 54.770	$ 56.139	$ 57.543	$ 58.981	$ 60.456	$ 61.967	$ 63.516	$ 65.104	$ 66.732	$ 68.400	$ 70.110	$ 71.863	$ 73.660	$ 75.501	$ 77.389	$ 79.323	$ 81.306	$ 83.339	$ 85.423	$ 87.558	$ 89.747	$ 91.991	$ 94.290	$ 96.648	$ 99.064	$ 101.541	$ 104.079	$ 106.681	$ 109.348	$ 112.082	$ 114.884
Vegetation Management																																
Asset Management																																
ICE Model																																
Current State																																
Residential Outaoe Value (non-MED)	Escalation	$ 7.60	$ 7.79	$ 7.98	$ 8.18	$ 8.39	$ 8.60	$ 8.81	$ 9.03	$ 9.26	$ 9.49	$ 9.72	$ 9.97	$ 10.22	$ 10.47	$ 10.73	$ 11.00	$ 11.28	$ 11.56	$ 11.85	$ 12.15	$ 12.45	$ 12.76	$ 13.08	$ 13.41	$ 13.74	$ 14.08	$ 14.44	$ 14.80	$ 15.17	$ 15.55	$ 15.94
Small C&I Outaoe Value (non-MED)	Escalation	$ 1,221.84	$ 1,252.38	$ 1,283.69	$ 1,315.78	$ 1,348.68	$ 1,382.40	$ 1,416.96	$ 1,452.38	$ 1,488.69	$ 1,525.91	$ 1,564.05	$ 1,603.16	$ 1,643.23	$ 1,684.32	$ 1,726.42	$ 1,769.58	$ 1,813.82	$ 1,859.17	$ 1,905.65	$ 1,953.29	$ 2,002.12	$ 2,052.17	$ 2,103.48	$ 2,156.07	$ 2,209.97	$ 2,265.22	$ 2,321.85	$ 2,379.89	$ 2,439.39	$ 2,500.38	$ 2,562.88
Large C&I Outaoe Value (non-MED)	Escalation	$ 28,927.95	$ 29,651.15	$ 30,392.43	$ 31,152.24	$ 31,931.04	$ 32,729.32	$ 33,547.55	$ 34,386.24	$ 35,245.90	$ 36,127.04	$ 37,030.22	$ 37,955.97	$ 38,904.87	$ 39,877.50	$ 40,874.43	$ 41,896.29	$ 42,943.70	$ 44,017.29	$ 45,117.73	$ 46,245.67	$ 47,401.81	$ 48,586.86	$ 49,801.53	$ 51,046.57	$ 52,322.73	$ 53,630.80	$ 54,971.57	$ 56,345.86	$ 57,754.50	$ 59,198.37	$ 60,678.33
Residential Outaoe Value (MED)	Escalation	$ 10.14	$ 10.39	$ 10.65	$ 10.92	$ 11.19	$ 11.47	$ 11.76	$ 12.05	$ 12.35	$ 12.66	$ 12.98	$ 13.30	$ 13.64	$ 13.98	$ 14.33	$ 14.69	$ 15.05	$ 15.43	$ 15.81	$ 16.21	$ 16.62	$ 17.03	$ 17.46	$ 17.89	$ 18.34	$ 18.80	$ 19.27	$ 19.75	$ 20.24	$ 20.75	$ 21.27
Small C&I Outaoe Value (MED)	Escalation	$ 1,934.43	$ 1,982.79	$ 2,032.36	$ 2,083.17	$ 2,135.25	$ 2,188.63	$ 2,243.35	$ 2,299.43	$ 2,356.92	$ 2,415.84	$ 2,476.24	$ 2,538.14	$ 2,601.60	$ 2,666.64	$ 2,733.30	$ 2,801.63	$ 2,871.67	$ 2,943.47	$ 3,017.05	$ 3,092.48	$ 3,169.79	$ 3,249.04	$ 3,330.26	$ 3,413.52	$ 3,498.86	$ 3,586.33	$ 3,675.99	$ 3,767.89	$ 3,862.08	$ 3,958.64	$ 4,057.60
Large C&I Outaoe Value (MED)	Escalation	$ 41,442.57	$ 42,478.64	$ 43,540.60	$ 44,629.12	$ 45,744.85	$ 46,888.47	$ 48,060.68	$ 49,262.20	$ 50,493.75	$ 51,756.10	$ 53,050.00	$ 54,376.25	$ 55,735.65	$ 57,129.05	$ 58,557.27	$ 60,021.20	$ 61,521.73	$ 63,059.78	$ 64,636.27	$ 66,252.18	$ 67,908.48	$ 69,606.19	$ 71,346.35	$ 73,130.01	$ 74,958.26	$ 76,832.21	$ 78,753.02	$ 80,721.85	$ 82,739.89	$ 84,808.39	$ 86,928.60
Future State																																
Residential Outaoe Value (non-MED)	Escalation	$ 5.91	$ 6.05	$ 6.21	$ 6.36	$ 6.52	$ 6.68	$ 6.85	$ 7.02	$ 7.20	$ 7.38	$ 7.56	$ 7.75	$ 7.94	$ 8.14	$ 8.35	$ 8.56	$ 8.77	$ 8.99	$ 9.21	$ 9.44	$ 9.68	$ 9.92	$ 10.17	$ 10.42	$ 10.68	$ 10.95	$ 11.22	$ 11.51	$ 11.79	$ 12.09	$ 12.39
Small C&I Outaoe Value (non-MED)	Escalation	$ 748.74	$ 767.46	$ 786.64	$ 806.31	$ 826.47	$ 847.13	$ 868.31	$ 890.02	$ 912.27	$ 935.07	$ 958.45	$ 982.41	$ 1,006.97	$ 1,032.15	$ 1,057.95	$ 1,084.40	$ 1,111.51	$ 1,139.30	$ 1,167.78	$ 1,196.97	$ 1,226.90	$ 1,257.57	$ 1,289.01	$ 1,321.23	$ 1,354.27	$ 1,388.12	$ 1,422.82	$ 1,458.40	$ 1,494.86	$ 1,532.23	$ 1,570.53
Large C&I Outaoe Value (non-MED)	Escalation	$ 20,615.26	$ 21,130.64	$ 21,658.91	$ 22,200.38	$ 22,755.39	$ 23,324.27	$ 23,907.38	$ 24,505.07	$ 25,117.69	$ 25,745.63	$ 26,389.27	$ 27,049.01	$ 27,725.23	$ 28,418.36	$ 29,128.82	$ 29,857.04	$ 30,603.47	$ 31,368.56	$ 32,152.77	$ 32,956.59	$ 33,780.50	$ 34,625.02	$ 35,490.64	$ 36,377.91	$ 37,287.35	$ 38,219.54	$ 39,175.03	$ 40,154.40	$ 41,158.26	$ 42,187.22	$ 43,241.90
Residential Outaoe Value (MED)	Escalation	$ 7.18	$ 7.36	$ 7.54	$ 7.73	$ 7.92	$ 8.12	$ 8.32	$ 8.53	$ 8.74	$ 8.96	$ 9.19	$ 9.42	$ 9.65	$ 9.89	$ 10.14	$ 10.39	$ 10.65	$ 10.92	$ 11.19	$ 11.47	$ 11.76	$ 12.05	$ 12.36	$ 12.66	$ 12.98	$ 13.31	$ 13.64	$ 13.98	$ 14.33	$ 14.69	$ 15.05
Small C&I Outaoe Value (MED)	Escalation	$ 1,104.06	$ 1,131.66	$ 1,159.95	$ 1,188.95	$ 1,218.68	$ 1,249.14	$ 1,280.37	$ 1,312.38	$ 1,345.19	$ 1,378.82	$ 1,413.29	$ 1,448.62	$ 1,484.84	$ 1,521.96	$ 1,560.01	$ 1,599.01	$ 1,638.98	$ 1,679.96	$ 1,721.96	$ 1,765.01	$ 1,809.13	$ 1,854.36	$ 1,900.72	$ 1,948.24	$ 1,996.94	$ 2,046.86	$ 2,098.04	$ 2,150.49	$ 2,204.25	$ 2,259.36	$ 2,315.84
Large C&I Outaoe Value (MED)	Escalation	$ 26,859.54	$ 27,531.03	$ 28,219.31	$ 28,924.79	$ 29,647.91	$ 30,389.11	$ 31,148.84	$ 31,927.56	$ 32,725.75	$ 33,543.89	$ 34,382.49	$ 35,242.05	$ 36,123.10	$ 37,026.18	$ 37,951.83	$ 38,900.63	$ 39,873.14	$ 40,869.97	$ 41,891.72	$ 42,939.02	$ 44,012.49	$ 45,112.80	$ 46,240.62	$ 47,396.64	$ 48,581.55	$ 49,796.09	$ 51,041.00	$ 52,317.02	$ 53,624.95	$ 54,965.57	$ 56,339.71

Assumption	Value	Source
Escalation Rate	2.90%	Duke Energy Standard Assumptions (provided by Treasury)
Discount Rate (WACC)	6.80%	For NC/SC combination, use NC amount
Discount Rate (WACC) DEC-SC	7.05%	Duke Energy Standard Assumptions (provided by Treasury)
Discount Rate (WACC) DEC-NC	6.80%	Duke Energy Standard Assumptions (provided by Treasury)
Discount Rate (WACC) DEP-SC	7.00%	Duke Energy Standard Assumptions (provided by Treasury)
Discount Rate (WACC) DEP-NC	6.80%	Duke Energy Standard Assumptions (provided by Treasury)

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 31 of 80

Table ES-1: Estimated Interuption Cost per Event, Average kW and Unserved kWh (US 2013$) by Duration and Customer Class

Interruption Cost	Interruption Duration						
	Momentary	30 Minutes	1 Hour	4 Hours	8 Hours	16 Hours	48 Hours (calculated)
	0.0	0.5	1.0	4.0	8.0	16.0	48.0
Cost per Event							
Medium and Large C&I (Over 50,000 Annual kWh)							
Cost per Event	$12,952.00	$15,241.00	$17,804.00	$39,458.00	$84,083.00	$165,482.00	$491,078.00
Cost per Average kW	$15.90	$18.70	$21.80	$48.40	$103.20	$203.00	
Cost per Unserved kWh	$190.70	$37.40	$21.80	$12.10	$12.90	$12.70	
Small C&I (Under 50,000 Annual kWh)							
Cost per Event	$412.00	$520.00	$647.00	$1,880.00	$4,690.00	$9,055.00	$26,515.00
Cost per Average kW	$187.90	$237.00	$295.00	$857.10	$2,138.10	$4,128.30	
Cost per Unserved kWh	$2,254.60	$474.10	$295.00	$214.30	$267.30	$258.00	
Residential							
Cost per Event	$3.90	$4.50	$5.10	$9.50	$17.20	$32.40	$93.20
Cost per Average kW	$2.60	$2.90	$3.30	$6.20	$11.30	$21.20	
Cost per Unserved kWh	$30.90	$5.90	$3.30	$1.60	$1.40	$1.30	

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 32 of 80

"Optimize" CBA's Distribution Projects

CIRCUIT_ID	TOTAL RES CUSTOMERS	TOTAL NON-RES CUSTOMERS < 50,000 KWH AVG	TOTAL NON RES CUSTOMERS > 50,000 KWH AVG	TOTAL	PROJECT	
T3450B03	796	258	23	1,077	1	
T3450B04	580	100	8	688	1	missing T3450B02
	1,376	358	31	1,765		
02091206		1			2	one customer…GRVL hospital
02091207					2	
	-	1	-	-		
4091203	192	25	3	220	3	
4231203	695	186	28	909	3	two projects; same circuit
	887	211	31	1,129		
4231203	695	186	28	909	4	two projects; same circuit
4141203	431	171	24	626	4	
	1,126	357	52	1,535		
4351205	685	135	12	832	5	
4351206	1,089	163	10	1,262	5	
	1,774	298	22	2,094		
60081206	1,014	168	10	1,192	6	
60181201	243	83	20	346	6	
	1,257	251	30	1,538		
60181202	928	230	18	1,176	7	
60211202	1,279	295	15	1,589	7	
	2,207	525	33	2,765		
7311202	979	175	11	1,165	8	
7401202	507	121	3	631	8	
	1,486	296	14	1,796		

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 33 of 80

"Optimize" CBA's Distribution Projects

Project Number	Jurisdiction	State	Project	MED_Y_N	10yrOutageCount	10YrCI	10yrCMI
1	DEP	SC	Cheraw River	Y	10	5,191	6,197,624
1	DEP	SC	Cheraw River	N	49	22,502	1,883,685
2	DEC	SC	Brushy Creek	N	1	2	162
3	DEC	SC	Whitehall Hurricane Creek	Y	5	1,512	410,657
3	DEC	SC	Whitehall Hurricane Creek	N	9	4,105	134,932
4	DEC	SC	Whitehall Sandy Springs	Y	4	1,068	368,189
4	DEC	SC	Whitehall Sandy Springs	N	19	6,338	465,445
5	DEC	SC	Fants Grove	N	12	9,714	782,199
6	DEC	SC	Moore Camp Croft	Y	9	6,285	1,313,936
6	DEC	SC	Moore Camp Croft	N	28	11,152	1,331,054
7	DEC	SC	Moore Woodruff	Y	18	8,923	2,781,941
7	DEC	SC	Moore Woodruff	N	59	33,435	4,631,998
8	DEC	SC	Eddy Road Panorama	Y	17	1,774	1,343,157
8	DEC	SC	Eddy Road Panorama	N	28	8,530	1,057,981

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 34 of 80

"Optimize" CBA's Distribution Projects

Data Input	Description
Circuit ID's involved in the project	**Enter each circuit ID on a separate row**
60181202	Moore 1202
60211202	Woodruff 1202
Protective Device ID's impacted	Will research the 10 year outage history on these devices to estimate CI/CMI reduction by completing this project. Appears in most cases this will be the backbone devices upstream from the project site.
	Enter the Smallworld ID of each protective device impacted in Column A. One Smallworld ID per row.
39002162	3 ph 140l recl on Woodruff 1202
39008297	Upstream 200 A recl on Woodruff 1202
38364705	Woodruff OCB
39009056	3ph 100 4h recl on Moore 1202
39002141	3 ph 140 l recl on Moore 1202
39002137	G&W Viper Moore 1202
38364609	Moore 1202 OCB
	Input Data Here

Estimated Cost	$1,200,000	
Timeframe to Complete (Years)	2	
Estimated % decrease in event duration	50%	(assumption that circuit tie will be able to significantly reduce the duration of 50% affected customers depending on fault location)

Special Considerations that have a financial impact: Mention additional considerations that would be cost beneficial. We will run the cost of the project vs traditional benefits like outage and veg savings.
Ex. Project will reduce vegetation trimming from 3 ROW's to 1
Ex. Changing to from wood to concrete poles (O&M)

Circuit ID	60181202	60211202
Circuit Name	MOORE - 1202	WOODRUFF - 1202
Customers Served	1184	1600

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 35 of 80

"Optimize" CBA's Distribution Projects

PROGRAM:	Long Duration/High Impact Sites	Long Duration/High Impact Sites	Long Duration/High Impact Sites	Long Duration/High Impact Sites	Long Duration/High Impact Sites	Long Duration/High Impact Sites	Long Duration/High Impact Sites	Long Duration/High Impact Sites
PROJECT:	Cheraw River Crossing - 1	Brushy Creek - 2	Whitehall Hurricance Creek - 3	Whitehall Sandy Springs - 4	Fants Grove - 5	Moore Camp Croft - 6	Moore Woodruff - 7	Eddy Rd Panorama - 8
REGULATORY JURISDICTION:	DEP	DEC	DEC	DEC	DEC	DEC	DEC	DEC
STATE:	SC	SC	SC	SC	SC	SC	SC	SC
ASSUMPTIONS								
Operational								
Outage and Restoration								
DEC Average Cost per Base Neighborhood Outage Event	$ 5,477	$ 5,477	$ 5,477	$ 5,477	$ 5,477	$ 5,477	$ 5,477	$ 5,477
DEC Average Cost per non-MED Outage Event	$ 16,431	$ 16,431	$ 16,431	$ 16,431	$ 16,431	$ 16,431	$ 16,431	$ 16,431
DEC Average Cost per MED Outage Event	$ 54,770	$ 54,770	$ 54,770	$ 54,770	$ 54,770	$ 54,770	$ 54,770	$ 54,770
DEP Average Cost per Base Neighborhood Outage Event	$ 4,742	$ 4,742	$ 4,742	$ 4,742	$ 4,742	$ 4,742	$ 4,742	$ 4,742
DEP Average Cost per Non-MED Outage Event	$ 14,226	$ 14,226	$ 14,226	$ 14,226	$ 14,226	$ 14,226	$ 14,226	$ 14,226
DEP Average Cost per MED Outage Event	$ 47,420	$ 47,420	$ 47,420	$ 47,420	$ 47,420	$ 47,420	$ 47,420	$ 47,420
Vegetation Management								
Vegetation Mgt. Multiplier for Complex Line Maintenance	10	10	10	10	10	10	10	10
Asset Management								
Customer								
DATA INPUTS								
Operational								
Project Deployment Cost	$ 7,200,000	$ 1,100,000	$ 150,000	$ 200,000	$ 25,000	$ 1,426,800	$ 1,200,000	$ 1,400,000
Deployment Installation Period	2	1	1	1	1	2	2	2
Start year of Installation	2019	2019	2019	2019	2019	2019	2019	2019
Outage and Restoration								
10 Year Customer Outage Events - Non-Major Event Days (MED)	49	1	9	19	12	28	59	28
10 Year Customer Interruptions (CI) - Non-MED	22,502	2	4,105	6,338	9,714	11,152	33,435	8,530
10 Year Customer Minutes Interrupted (CMI) - Non-MED	1,883,685	162	134,932	465,445	782,199	1,331,054	4,631,998	1,057,981
10 Year Customer Outage Events - MED	10	-	5	4	-	9	18	17
10 Year Customer Interruptions (CI) - MED	5,191	-	1,512	1,068	-	6,285	8,923	1,774
10 Year Customer Minutes Interrupted (CMI) - MED	6,197,624	-	410,657	368,189	-	1,313,936	2,781,941	1,343,157
Estimated Decrease in Event Frequency	67%	0%	0%	0%	0%	0%	0%	0%
Estimated Decrease in Event Duration	80%	90%	50%	50%	50%	50%	50%	50%
Vegetation Management								
Trim Cycle years (5, 7 or 9)								
Asset Management								
Line Miles of Deteriorated OH Conductor to Replace								
Customer								
Residential Customers	1,376	0	887	1,126	1,774	1,257	2,207	1,486
Small C&I Customers	358	0	211	357	298	251	525	296
Medium & Large C&I Customers	31	1	31	52	22	30	33	14
CALCULATIONS								
Operational								
Outage and Restoration								
10 Year Average Customer Outage Events - Non-Major Event Days (MED)	4.9	0.1	0.9	1.9	1.2	2.8	5.9	2.8
10 Year Average Customer Interruptions (CI) - Non-MED	2,250	0	411	634	971	1,115	3,344	853
10 Year Average Customer Minutes Interrupted (CMI) - Non-MED	188,369	16	13,493	46,544	78,220	133,105	463,200	105,798
10 Year Average Customer Outage Events - MED	1.0	0.0	0.5	0.4	0.0	0.9	1.8	1.7
10 Year Average Customer Interruptions (CI) - MED	519	0	151	107	0	629	892	177
10 Year Average Customer Minutes Interrupted (CMI) - MED	619,762	0	41,066	36,819	0	131,394	278,194	134,316
Annual Average Outage Duration (hours) Non-MED	1.4	1.4	0.5	1.2	1.3	2.0	2.3	2.1
Annual Average Outage Duration (hours) MED	19.9	0.0	4.5	5.7	0.0	3.5	5.2	12.6
Revised Outage Events based on Estimated Decrease in Event Frequency - Non-MED	1.6	0.1	0.9	1.9	1.2	2.8	5.9	2.8
Revised Outage Duration based on Estimated Decrease in Event Duration - Non-MED	0.3	0.1	0.3	0.6	0.7	1.0	1.2	1.0
Revised Outage Events based on Estimated Decrease in Event Frequency - MED	0.3	0.0	0.5	0.4	0.0	0.9	1.8	1.7
Revised Outage Duration based on Estimated Decrease in Event Duration - MED	4.0	0.0	2.3	2.9	0.0	1.7	2.6	6.3
Vegetation Management								
Asset Management								
Customer								

Non-MED values are 3X base values
MED values are 10X base values

Non-MED values are 3X base values
MED values are 10X base values

NOTES:

CELL INPUT:

Standard assumptions for all areas - review if standard applies
Individual data input per area
Calculated input - no input required

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 36 of 80

"Optimize" CBA's Distribution Projects

PROGRAM:	Long Duration/High Impact Sites	
PROJECT:	Moore Woodruff - 7	
REGULATORY JURISDICTION:	DEC	
STATE:	SC	
ASSUMPTIONS		
Operational		
Outage and Restoration		
DEC Average Cost per Base Neighborhood Outage Event	$ 5,477	
DEC Average Cost per non-MED Outage Event	$ 16,431	Non-MED values are 3X base values
DEC Average Cost per MED Outage Event	$ 54,770	MED values are 10X base values
DEP Average Cost per Base Neighborhood Outage Event	$ 4,742	
DEP Average Cost per Non-MED Outage Event	$ 14,226	Non-MED values are 3X base values
DEP Average Cost per MED Outage Event	$ 47,420	MED values are 10X base values
Vegetation Management		
Vegetation Mgt. Multiplier for Complex Line Maintenance	10	
Asset Management		
Customer		
DATA INPUTS		
Operational		
Project Deployment Cost	$ 1,200,000	
Deployment Installation Period	2	
Start year of Installation	2019	
Outage and Restoration		
10 Year Customer Outage Events - Non-Major Event Days (MED)	59	
10 Year Customer Interruptions (CI) - Non-MED	33,435	
10 Year Customer Minutes Interrupted (CMI) - Non-MED	4,631,998	
10 Year Customer Outage Events - MED	18	
10 Year Customer Interruptions (CI) - MED	8,923	
10 Year Customer Minutes Interrupted (CMI) - MED	2,781,941	
Estimated Decrease in Event Frequency	0%	
Estimated Decrease in Event Duration	50%	
Vegetation Management		
Trim Cycle years (5, 7 or 9)		
Asset Management		
Line Miles of Deteriorated OH Conductor to Replace		
Customer		
Residential Customers	2,207	
Small C&I Customers	525	
Medium & Large C&I Customers	33	
CALCULATIONS		
Operational		
Outage and Restoration		
10 Year Average Customer Outage Events - Non-Major Event Days (MED)	5.9	
10 Year Average Customer Interruptions (CI) - Non-MED	3,344	
10 Year Average Customer Minutes Interrupted (CMI) - Non-MED	463,200	
10 Year Average Customer Outage Events - MED	1.8	
10 Year Average Customer Interruptions (CI) - MED	892	
10 Year Average Customer Minutes Interrupted (CMI) - MED	278,194	
Annual Average Outage Duration (hours) Non-MED	2.3	
Annual Average Outage Duration (hours) MED	5.2	
Revised Outage Events based on Estimated Decrease in Event Frequency - Non-MED	5.9	
Revised Outage Duration based on Estimated Decrease in Event Duration - Non-MED	1.2	
Revised Outage Events based on Estimated Decrease in Event Frequency - MED	1.8	
Revised Outage Duration based on Estimated Decrease in Event Duration - MED	2.6	
Vegetation Management		
Asset Management		
Customer		

NOTES:

CELL INPUT:

Standard assumptions for all areas - review if standard applies
Individual data input per area
Calculated input - no input required

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 37 of 80

"Optimize" CBA's Distribution Projects

PROGRAM:	Long Duration/High Impact Sites
PROJECT:	Moore Woodruff - 7
REGULATORY JURISDICTION:	DEC
STATE:	SC

	NPV of BENEFIT STREAM	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
COSTS																																
Project Capital	$ 1,161,798	$ 600,000	$ 600,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Project O&M	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Project Costs	$ 1,161,798	$ 600,000	$ 600,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
N/A	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total On-Going O&M	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
OPERATIONAL BENEFITS																																
Outage and Restoration																																
Non-MED Restoration costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
MED Restoration costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Outage and Restoration Benefits	$ -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vegetation Management																																
Eliminate of VM cycle charges	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Avoid demand trimming costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Vegetation Management Benefits	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Asset Management																																
Elimination of deteriorated conductor replacement costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Elimination of pole replacement costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Asset Management Benefits	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
CUSTOMER BENEFITS																																
Customer																																
Outage Savings (non-MED) - Residential Customers	$ 407,312	$ -	$ -	$ 26,863	$ 27,535	$ 28,223	$ 28,929	$ 29,652	$ 30,394	$ 31,153	$ 31,932	$ 32,731	$ 33,549	$ 34,388	$ 35,247	$ 36,128	$ 37,032	$ 37,957	$ 38,906	$ 39,879	$ 40,876	$ 41,898	$ 42,945	$ 44,019	$ 45,119	$ 46,247	$ 47,404	$ 48,589	$ 49,803	$ 51,048	$ 52,325	$ 53,633
Outage Savings (non-MED) - Small C&I Customers	$ 27,151,563	$ -	$ -	$ 1,790,729	$ 1,835,497	$ 1,881,385	$ 1,928,419	$ 1,976,630	$ 2,026,045	$ 2,076,697	$ 2,128,614	$ 2,181,829	$ 2,236,375	$ 2,292,284	$ 2,349,592	$ 2,408,331	$ 2,468,540	$ 2,530,253	$ 2,593,509	$ 2,658,347	$ 2,724,806	$ 2,792,926	$ 2,862,749	$ 2,934,318	$ 3,007,676	$ 3,082,868	$ 3,159,939	$ 3,238,938	$ 3,319,911	$ 3,402,909	$ 3,487,982	$ 3,575,181
Outage Savings (non-MED) - Medium & Large C&I Customers	$ 29,972,607	$ -	$ -	$ 1,976,785	$ 2,026,205	$ 2,076,860	$ 2,128,782	$ 2,182,001	$ 2,236,551	$ 2,292,465	$ 2,349,777	$ 2,408,521	$ 2,468,734	$ 2,530,452	$ 2,593,714	$ 2,658,557	$ 2,725,021	$ 2,793,146	$ 2,862,975	$ 2,934,549	$ 3,007,913	$ 3,083,111	$ 3,160,188	$ 3,239,193	$ 3,320,173	$ 3,403,177	$ 3,488,257	$ 3,575,463	$ 3,664,850	$ 3,756,471	$ 3,850,383	$ 3,946,642
Outage Savings (MED) - Residential Customers	$ 319,888	$ -	$ -	$ 21,098	$ 21,625	$ 22,166	$ 22,720	$ 23,288	$ 23,870	$ 24,467	$ 25,078	$ 25,705	$ 26,348	$ 27,007	$ 27,682	$ 28,374	$ 29,083	$ 29,810	$ 30,556	$ 31,320	$ 32,103	$ 32,905	$ 33,728	$ 34,571	$ 35,435	$ 36,321	$ 37,229	$ 38,160	$ 39,114	$ 40,092	$ 41,094	$ 42,121
Outage Savings (MED) - Small C&I Customers	$ 24,729,069	$ -	$ -	$ 1,630,958	$ 1,671,732	$ 1,713,525	$ 1,756,363	$ 1,800,272	$ 1,845,279	$ 1,891,411	$ 1,938,697	$ 1,987,164	$ 2,036,843	$ 2,087,764	$ 2,139,958	$ 2,193,457	$ 2,248,294	$ 2,304,501	$ 2,362,114	$ 2,421,166	$ 2,481,696	$ 2,543,738	$ 2,607,331	$ 2,672,515	$ 2,739,327	$ 2,807,811	$ 2,878,006	$ 2,949,956	$ 3,023,705	$ 3,099,298	$ 3,176,780	$ 3,256,200
Outage Savings (MED) - Medium & Large C&I Customers	$ 25,748,075	$ -	$ -	$ 1,698,165	$ 1,740,619	$ 1,784,134	$ 1,828,738	$ 1,874,456	$ 1,921,317	$ 1,969,350	$ 2,018,584	$ 2,069,049	$ 2,120,775	$ 2,173,794	$ 2,228,139	$ 2,283,843	$ 2,340,939	$ 2,399,462	$ 2,459,449	$ 2,520,935	$ 2,583,958	$ 2,648,557	$ 2,714,771	$ 2,782,640	$ 2,852,206	$ 2,923,512	$ 2,996,599	$ 3,071,514	$ 3,148,302	$ 3,227,010	$ 3,307,685	$ 3,390,377
Total Customer Benefits	$ 80,769,639	$ -	$ -	$ 5,327,006	$ 5,460,181	$ 5,596,685	$ 5,736,602	$ 5,880,018	$ 6,027,018	$ 6,177,693	$ 6,332,136	$ 6,490,439	$ 6,652,700	$ 6,819,018	$ 6,989,493	$ 7,164,230	$ 7,343,336	$ 7,526,920	$ 7,715,093	$ 7,907,970	$ 8,105,669	$ 8,308,311	$ 8,516,019	$ 8,728,919	$ 8,947,142	$ 9,170,821	$ 9,400,091	$ 9,635,093	$ 9,875,971	$ 10,122,870	$ 10,375,942	$ 10,635,340
COMBINED COSTS AND BENEFITS																																
Total PV of Operational Benefits	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total PV of Customer Benefits	$ 80,769,639	$ -	$ -	$ 5,327,006	$ 5,460,181	$ 5,596,685	$ 5,736,602	$ 5,880,018	$ 6,027,018	$ 6,177,693	$ 6,332,136	$ 6,490,439	$ 6,652,700	$ 6,819,018	$ 6,989,493	$ 7,164,230	$ 7,343,336	$ 7,526,920	$ 7,715,093	$ 7,907,970	$ 8,105,669	$ 8,308,311	$ 8,516,019	$ 8,728,919	$ 8,947,142	$ 9,170,821	$ 9,400,091	$ 9,635,093	$ 9,875,971	$ 10,122,870	$ 10,375,942	$ 10,635,340
Total PV of Combined Benefits	$ 80,769,639	$ -	$ -	$ 5,327,006	$ 5,460,181	$ 5,596,685	$ 5,736,602	$ 5,880,018	$ 6,027,018	$ 6,177,693	$ 6,332,136	$ 6,490,439	$ 6,652,700	$ 6,819,018	$ 6,989,493	$ 7,164,230	$ 7,343,336	$ 7,526,920	$ 7,715,093	$ 7,907,970	$ 8,105,669	$ 8,308,311	$ 8,516,019	$ 8,728,919	$ 8,947,142	$ 9,170,821	$ 9,400,091	$ 9,635,093	$ 9,875,971	$ 10,122,870	$ 10,375,942	$ 10,635,340
Project and On-Going Costs	$ 1,161,798	$ 600,000	$ 600,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Escalation		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Deployment percentage		$ -	50%																													
Combined NPV of Project	$ 79,607,841	$ (600,000)	$ (600,000)	$ 5,327,006	$ 5,460,181	$ 5,596,685	$ 5,736,602	$ 5,880,018	$ 6,027,018	$ 6,177,693	$ 6,332,136	$ 6,490,439	$ 6,652,700	$ 6,819,018	$ 6,989,493	$ 7,164,230	$ 7,343,336	$ 7,526,920	$ 7,715,093	$ 7,907,970	$ 8,105,669	$ 8,308,311	$ 8,516,019	$ 8,728,919	$ 8,947,142	$ 9,170,821	$ 9,400,091	$ 9,635,093	$ 9,875,971	$ 10,122,870	$ 10,375,942	$ 10,635,340
Ratio of NPV Benefits to NPV Costs	69.5																															
Cumulative Net Benefits		$ (600,000)	$ (1,200,000)	$ 4,727,006	$ 10,787,186	$ 11,056,866	$ 11,333,288	$ 11,616,620	$ 11,907,035	$ 12,204,711	$ 12,509,829	$ 12,822,575	$ 13,143,139	$ 13,471,718	$ 13,808,511	$ 14,153,723	$ 14,507,567	$ 14,870,256	$ 15,242,012	$ 15,623,062	$ 16,013,639	$ 16,413,980	$ 16,824,329	$ 17,244,938	$ 17,676,061	$ 18,117,963	$ 18,570,912	$ 19,035,184	$ 19,511,064	$ 19,998,841	$ 20,498,812	$ 21,011,282

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 38 of 80

"Optimize" CBA's Distribution Projects

		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Deployment Costs																																
Project Capital	Escalation	$ 600.000	$ 600.000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Project O&M	Factor																															
Outage and Restoration																																
Average Cost per Non-MED Outage Event	Escalation	$ 5,477	$ 5,614	$ 5,754	$ 5,898	$ 6,046	$ 6,197	$ 6,352	$ 6,510	$ 6,673	$ 6,840	$ 7,011	$ 7,186	$ 7,366	$ 7,550	$ 7,739	$ 7,932	$ 8,131	$ 8,334	$ 8,542	$ 8,756	$ 8,975	$ 9,199	$ 9,429	$ 9,665	$ 9,906	$ 10,154	$ 10,408	$ 10,668	$ 10,935	$ 11,208	$ 11,488
Average Cost per MED Outage Event	Escalation	$ 54.770	$ 56.139	$ 57.543	$ 58.981	$ 60.456	$ 61.967	$ 63.516	$ 65.104	$ 66.732	$ 68.400	$ 70.110	$ 71.863	$ 73.660	$ 75.501	$ 77.389	$ 79.323	$ 81.306	$ 83.339	$ 85.423	$ 87.558	$ 89.747	$ 91.991	$ 94.290	$ 96.648	$ 99.064	$ 101.541	$ 104.079	$ 106.681	$ 109.348	$ 112.082	$ 114.884
Vegetation Management																																
Asset Management																																
ICE Model																																
Current State																																
Residential Outaoe Value (non-MED)	Escalation	$ 8.14	$ 8.34	$ 8.55	$ 8.77	$ 8.99	$ 9.21	$ 9.44	$ 9.68	$ 9.92	$ 10.17	$ 10.42	$ 10.68	$ 10.95	$ 11.22	$ 11.50	$ 11.79	$ 12.09	$ 12.39	$ 12.70	$ 13.01	$ 13.34	$ 13.67	$ 14.02	$ 14.37	$ 14.72	$ 15.09	$ 15.47	$ 15.86	$ 16.25	$ 16.66	$ 17.08
Small C&I Outaoe Value (non-MED)	Escalation	$ 1,374.21	$ 1,408.57	$ 1,443.78	$ 1,479.88	$ 1,516.88	$ 1,554.80	$ 1,593.67	$ 1,633.51	$ 1,674.35	$ 1,716.21	$ 1,759.11	$ 1,803.09	$ 1,848.17	$ 1,894.37	$ 1,941.73	$ 1,990.27	$ 2,040.03	$ 2,091.03	$ 2,143.31	$ 2,196.89	$ 2,251.81	$ 2,308.11	$ 2,365.81	$ 2,424.95	$ 2,485.58	$ 2,547.72	$ 2,611.41	$ 2,676.70	$ 2,743.61	$ 2,812.20	$ 2,882.51
Large C&I Outaoe Value (non-MED)	Escalation	$ 31,604.02	$ 32,394.12	$ 33,203.98	$ 34,034.07	$ 34,884.93	$ 35,757.05	$ 36,650.98	$ 37,567.25	$ 38,506.43	$ 39,469.09	$ 40,455.82	$ 41,467.22	$ 42,503.90	$ 43,566.49	$ 44,655.66	$ 45,772.05	$ 46,916.35	$ 48,089.26	$ 49,291.49	$ 50,523.78	$ 51,786.87	$ 53,081.54	$ 54,408.58	$ 55,768.79	$ 57,163.01	$ 58,592.09	$ 60,056.89	$ 61,558.31	$ 63,097.27	$ 64,674.70	$ 66,291.57
Residential Outaoe Value (MED)	Escalation	$ 13.69	$ 14.03	$ 14.38	$ 14.74	$ 15.11	$ 15.49	$ 15.87	$ 16.27	$ 16.68	$ 17.09	$ 17.52	$ 17.96	$ 18.41	$ 18.87	$ 19.34	$ 19.82	$ 20.32	$ 20.83	$ 21.35	$ 21.88	$ 22.43	$ 22.99	$ 23.56	$ 24.15	$ 24.76	$ 25.38	$ 26.01	$ 26.66	$ 27.33	$ 28.01	$ 28.71
Small C&I Outaoe Value (MED)	Escalation	$ 3,154.75	$ 3,233.62	$ 3,314.46	$ 3,397.32	$ 3,482.25	$ 3,569.31	$ 3,658.54	$ 3,750.01	$ 3,843.76	$ 3,939.85	$ 4,038.35	$ 4,139.30	$ 4,242.79	$ 4,348.86	$ 4,457.58	$ 4,569.02	$ 4,683.24	$ 4,800.32	$ 4,920.33	$ 5,043.34	$ 5,169.42	$ 5,298.66	$ 5,431.13	$ 5,566.90	$ 5,706.08	$ 5,848.73	$ 5,994.95	$ 6,144.82	$ 6,298.44	$ 6,455.90	$ 6,617.30
Large C&I Outaoe Value (MED)	Escalation	$ 61,235.41	$ 62,766.30	$ 64,335.46	$ 65,943.84	$ 67,592.44	$ 69,282.25	$ 71,014.31	$ 72,789.66	$ 74,609.40	$ 76,474.64	$ 78,386.51	$ 80,346.17	$ 82,354.82	$ 84,413.69	$ 86,524.04	$ 88,687.14	$ 90,904.31	$ 93,176.92	$ 95,506.35	$ 97,894.00	$ 100,341.35	$ 102,849.89	$ 105,421.14	$ 108,056.66	$ 110,758.08	$ 113,527.03	$ 116,365.21	$ 119,274.34	$ 122,256.20	$ 125,312.60	$ 128,445.42
Future State																																
Residential Outaoe Value (non-MED)	Escalation	$ 6.18	$ 6.33	$ 6.49	$ 6.65	$ 6.82	$ 6.99	$ 7.16	$ 7.34	$ 7.53	$ 7.71	$ 7.91	$ 8.11	$ 8.31	$ 8.52	$ 8.73	$ 8.95	$ 9.17	$ 9.40	$ 9.63	$ 9.88	$ 10.12	$ 10.38	$ 10.63	$ 10.90	$ 11.17	$ 11.45	$ 11.74	$ 12.03	$ 12.33	$ 12.64	$ 12.96
Small C&I Outaoe Value (non-MED)	Escalation	$ 823.95	$ 844.55	$ 865.66	$ 887.31	$ 909.49	$ 932.23	$ 955.53	$ 979.42	$ 1,003.90	$ 1,029.00	$ 1,054.73	$ 1,081.10	$ 1,108.12	$ 1,135.83	$ 1,164.22	$ 1,193.33	$ 1,223.16	$ 1,253.74	$ 1,285.08	$ 1,317.21	$ 1,350.14	$ 1,383.89	$ 1,418.49	$ 1,453.95	$ 1,490.30	$ 1,527.56	$ 1,565.75	$ 1,604.89	$ 1,645.01	$ 1,686.14	$ 1,728.29
Large C&I Outaoe Value (non-MED)	Escalation	$ 21,940.27	$ 22,488.77	$ 23,050.99	$ 23,627.27	$ 24,217.95	$ 24,823.40	$ 25,443.98	$ 26,080.08	$ 26,732.09	$ 27,400.39	$ 28,085.40	$ 28,787.53	$ 29,507.22	$ 30,244.90	$ 31,001.02	$ 31,776.05	$ 32,570.45	$ 33,384.71	$ 34,219.33	$ 35,074.81	$ 35,951.68	$ 36,850.48	$ 37,771.74	$ 38,716.03	$ 39,683.93	$ 40,676.03	$ 41,692.93	$ 42,735.25	$ 43,803.64	$ 44,898.73	$ 46,021.20
Residential Outaoe Value (MED)	Escalation	$ 8.63	$ 8.85	$ 9.07	$ 9.30	$ 9.53	$ 9.77	$ 10.01	$ 10.26	$ 10.52	$ 10.78	$ 11.05	$ 11.33	$ 11.61	$ 11.90	$ 12.20	$ 12.50	$ 12.82	$ 13.14	$ 13.46	$ 13.80	$ 14.15	$ 14.50	$ 14.86	$ 15.23	$ 15.61	$ 16.00	$ 16.40	$ 16.81	$ 17.23	$ 17.67	$ 18.11
Small C&I Outaoe Value (MED)	Escalation	$ 1,512.03	$ 1,549.83	$ 1,588.58	$ 1,628.29	$ 1,669.00	$ 1,710.72	$ 1,753.49	$ 1,797.33	$ 1,842.26	$ 1,888.32	$ 1,935.53	$ 1,983.91	$ 2,033.51	$ 2,084.35	$ 2,136.46	$ 2,189.87	$ 2,244.62	$ 2,300.73	$ 2,358.25	$ 2,417.21	$ 2,477.64	$ 2,539.58	$ 2,603.07	$ 2,668.14	$ 2,734.85	$ 2,803.22	$ 2,873.30	$ 2,945.13	$ 3,018.76	$ 3,094.23	$ 3,171.59
Large C&I Outaoe Value (MED)	Escalation	$ 34,024.34	$ 34,874.95	$ 35,746.83	$ 36,640.50	$ 37,556.51	$ 38,495.42	$ 39,457.81	$ 40,444.25	$ 41,455.36	$ 42,491.74	$ 43,554.04	$ 44,642.89	$ 45,758.96	$ 46,902.93	$ 48,075.51	$ 49,277.40	$ 50,509.33	$ 51,772.06	$ 53,066.36	$ 54,393.02	$ 55,752.85	$ 57,146.67	$ 58,575.34	$ 60,039.72	$ 61,540.71	$ 63,079.23	$ 64,656.21	$ 66,272.62	$ 67,929.43	$ 69,627.67	$ 71,368.36

Assumption	Value	Source
Escalation Rate	2.90%	Duke Energy Standard Assumptions (provided by Treasury)
Discount Rate (WACC)	6.80%	For NC/SC combination, use NC amount
Discount Rate (WACC) DEC-SC	7.05%	Duke Energy Standard Assumptions (provided by Treasury)
Discount Rate (WACC) DEC-NC	6.80%	Duke Energy Standard Assumptions (provided by Treasury)
Discount Rate (WACC) DEP-SC	7.00%	Duke Energy Standard Assumptions (provided by Treasury)
Discount Rate (WACC) DEP-NC	6.80%	Duke Energy Standard Assumptions (provided by Treasury)

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 39 of 80

Table ES-1: Estimated Interuption Cost per Event, Average kW and Unserved kWh (US 2013$) by Duration and Customer Class

Interruption Cost	Interruption Duration						
	Momentary	30 Minutes	1 Hour	4 Hours	8 Hours	16 Hours	48 Hours (calculated)
	0.0	0.5	1.0	4.0	8.0	16.0	48.0
Cost per Event							
Medium and Large C&I (Over 50,000 Annual kWh)							
Cost per Event	$12,952.00	$15,241.00	$17,804.00	$39,458.00	$84,083.00	$165,482.00	$491,078.00
Cost per Average kW	$15.90	$18.70	$21.80	$48.40	$103.20	$203.00	
Cost per Unserved kWh	$190.70	$37.40	$21.80	$12.10	$12.90	$12.70	
Small C&I (Under 50,000 Annual kWh)							
Cost per Event	$412.00	$520.00	$647.00	$1,880.00	$4,690.00	$9,055.00	$26,515.00
Cost per Average kW	$187.90	$237.00	$295.00	$857.10	$2,138.10	$4,128.30	
Cost per Unserved kWh	$2,254.60	$474.10	$295.00	$214.30	$267.30	$258.00	
Residential							
Cost per Event	$3.90	$4.50	$5.10	$9.50	$17.20	$32.40	$93.20
Cost per Average kW	$2.60	$2.90	$3.30	$6.20	$11.30	$21.20	
Cost per Unserved kWh	$30.90	$5.90	$3.30	$1.60	$1.40	$1.30	

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 40 of 80

"Optimize" CBA's Distribution Projects

CIRCUIT_ID	TOTAL RES CUSTOMERS	TOTAL NON-RES CUSTOMERS < 50,000 KWH AVG	TOTAL NON RES CUSTOMERS > 50,000 KWH AVG	TOTAL	PROJECT	
T3450B03	796	258	23	1,077	1	
T3450B04	580	100	8	688	1	missing T3450B02
	1,376	358	31	1,765		
02091206		1			2	one customer…GRVL hospital
02091207					2	
	-	1	-	-		
4091203	192	25	3	220	3	
4231203	695	186	28	909	3	two projects; same circuit
	887	211	31	1,129		
4231203	695	186	28	909	4	two projects; same circuit
4141203	431	171	24	626	4	
	1,126	357	52	1,535		
4351205	685	135	12	832	5	
4351206	1,089	163	10	1,262	5	
	1,774	298	22	2,094		
60081206	1,014	168	10	1,192	6	
60181201	243	83	20	346	6	
	1,257	251	30	1,538		
60181202	928	230	18	1,176	7	
60211202	1,279	295	15	1,589	7	
	2,207	525	33	2,765		
7311202	979	175	11	1,165	8	
7401202	507	121	3	631	8	
	1,486	296	14	1,796		

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 41 of 80

"Optimize" CBA's Distribution Projects

Project Number	Jurisdiction	State	Project	MED_Y_N	10yrOutageCount	10YrCI	10yrCMI
1	DEP	SC	Cheraw River	Y	10	5,191	6,197,624
1	DEP	SC	Cheraw River	N	49	22,502	1,883,685
2	DEC	SC	Brushy Creek	N	1	2	162
3	DEC	SC	Whitehall Hurricane Creek	Y	5	1,512	410,657
3	DEC	SC	Whitehall Hurricane Creek	N	9	4,105	134,932
4	DEC	SC	Whitehall Sandy Springs	Y	4	1,068	368,189
4	DEC	SC	Whitehall Sandy Springs	N	19	6,338	465,445
5	DEC	SC	Fants Grove	N	12	9,714	782,199
6	DEC	SC	Moore Camp Croft	Y	9	6,285	1,313,936
6	DEC	SC	Moore Camp Croft	N	28	11,152	1,331,054
7	DEC	SC	Moore Woodruff	Y	18	8,923	2,781,941
7	DEC	SC	Moore Woodruff	N	59	33,435	4,631,998
8	DEC	SC	Eddy Road Panorama	Y	17	1,774	1,343,157
8	DEC	SC	Eddy Road Panorama	N	28	8,530	1,057,981

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 42 of 80

"Optimize" CBA's Distribution Projects

Data Input	Description
Circuit ID's involved in the project	**Enter each circuit ID on a separate row**
02091206	Brushy Creek 1206
02091207	Brushy Creek 1207
Protective Device ID's impacted	Will research the 10 year outage history on these devices to estimate CI/CMI reduction by completing this project. Appears in most cases this will be the backbone devices upstream from the project site.
	Enter the Smallworld ID of each protective device impacted in Column A. One Smallworld ID per row.
38375632	1206 OCB
38361417	1207 OCB
	Input Data Here
Estimated Cost	$1,100,000
Timeframe to Complete (Years)	1
Estimated % decrease in event duration	90%

Special Considerations that have a financial impact: Mention additional considerations that would be cost beneficial. We will run the cost of the project vs traditional benefits like outage and veg savings.
Ex. Project will reduce vegetation trimming from 3 ROW's to 1
Ex. Changing to from wood to concrete poles (O&M)

Greenville Health System Level 1 Trauma center - electrical distribution delievery - feeds all the critical care facilities (Emeregency Room, Operating Rooms) - Societial impact - Long duration outage can require the hospital to evacuate
5-1980's vintage live front switchgears (two switchgears were inaccessable due to transformers blocking)
Drain wire (750 Al) feeding the courtyard area
Utility congestion in the courtyard - creates additional outage duration in event of a cable failure
Installing concrete encased duct bank (currently UG cable is direct bury)
Relocating switchgears and replacing the existing cable that is at end of life.

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 43 of 80

"Optimize" CBA's Distribution Projects

PROGRAM:	Long Duration/High Impact Sites	Long Duration/High Impact Sites	Long Duration/High Impact Sites	Long Duration/High Impact Sites	Long Duration/High Impact Sites	Long Duration/High Impact Sites	Long Duration/High Impact Sites	Long Duration/High Impact Sites
PROJECT:	Cheraw River Crossing - 1	Brushy Creek - 2	Whitehall Hurricance Creek - 3	Whitehall Sandy Creek - 4	Fants Grove - 5	Moore Camp Croft - 6	Moore Woodruff - 7	Eddy Rd Panorama - 8
REGULATORY JURISDICTION:	DEP	DEC	DEC	DEC	DEC	DEC	DEC	DEC
STATE:	SC	SC	SC	SC	SC	SC	SC	SC
ASSUMPTIONS								
Operational								
Outage and Restoration								
DEC Average Cost per Base Neighborhood Outage Event	$ 5,477	$ 5,477	$ 5,477	$ 5,477	$ 5,477	$ 5,477	$ 5,477	$ 5,477
DEC Average Cost per non-MED Outage Event	$ 16,431	$ 16,431	$ 16,431	$ 16,431	$ 16,431	$ 16,431	$ 16,431	$ 16,431
DEC Average Cost per MED Outage Event	$ 54,770	$ 54,770	$ 54,770	$ 54,770	$ 54,770	$ 54,770	$ 54,770	$ 54,770
DEP Average Cost per Base Neighborhood Outage Event	$ 4,742	$ 4,742	$ 4,742	$ 4,742	$ 4,742	$ 4,742	$ 4,742	$ 4,742
DEP Average Cost per Non-MED Outage Event	$ 14,226	$ 14,226	$ 14,226	$ 14,226	$ 14,226	$ 14,226	$ 14,226	$ 14,226
DEP Average Cost per MED Outage Event	$ 47,420	$ 47,420	$ 47,420	$ 47,420	$ 47,420	$ 47,420	$ 47,420	$ 47,420
Vegetation Management								
Vegetation Mgt. Multiplier for Complex Line Maintenance	10	10	10	10	10	10	10	10
Asset Management								
Customer								
DATA INPUTS								
Operational								
Project Deployment Cost	$ 7,200,000	$ 1,100,000	$ 150,000	$ 200,000	$ 25,000	$ 1,426,800	$ 1,200,000	$ 1,400,000
Deployment Installation Period	2	1	1	1	1	2	2	2
Start year of Installation	2019	2019	2019	2019	2019	2019	2019	2019
Outage and Restoration								
10 Year Customer Outage Events - Non-Major Event Days (MED)	49	1	9	19	12	28	59	28
10 Year Customer Interruptions (CI) - Non-MED	22.502	2	4.105	6.338	9.714	11.152	33.435	8.530
10 Year Customer Minutes Interrupted (CMI) - Non-MED	1.883.685	162	134.932	465.445	782.199	1.331.054	4.631.998	1.057.981
10 Year Customer Outage Events - MED	10	-	5	4	-	9	18	17
10 Year Customer Interruptions (CI) - MED	5.191	-	1.512	1.068	-	6.285	8.923	1.774
10 Year Customer Minutes Interrupted (CMI) - MED	6.197.624	-	410.657	368.189	-	1.313.936	2.781.941	1.343.157
Estimated Decrease in Event Frequency	67%	0%	0%	0%	0%	0%	0%	0%
Estimated Decrease in Event Duration	80%	90%	50%	50%	50%	50%	50%	50%
Vegetation Management								
Trim Cycle years (5, 7 or 9)								
Asset Management								
Line Miles of Deteriorated OH Conductor to Replace								
Customer								
Residential Customers	1,376	0	887	1,126	1,774	1,257	2,207	1,486
Small C&I Customers	358	0	211	357	298	251	525	296
Medium & Large C&I Customers	31	1	31	52	22	30	33	14
CALCULATIONS								
Operational								
Outage and Restoration								
10 Year Average Customer Outage Events - Non-Major Event Days (MED)	4.9	0.1	0.9	1.9	1.2	2.8	5.9	2.8
10 Year Average Customer Interruptions (CI) - Non-MED	2,250	0	411	634	971	1,115	3,344	853
10 Year Average Customer Minutes Interrupted (CMI) - Non-MED	188,369	16	13,493	46,544	78,220	133,105	463,200	105,798
10 Year Average Customer Outage Events - MED	1.0	0.0	0.5	0.4	0.0	0.9	1.8	1.7
10 Year Average Customer Interruptions (CI) - MED	519	0	151	107	0	629	892	177
10 Year Average Customer Minutes Interrupted (CMI) - MED	619,762	0	41,066	36,819	0	131,394	278,194	134,316
Annual Average Outage Duration (hours) Non-MED	1.4	1.4	0.5	1.2	1.3	2.0	2.3	2.1
Annual Average Outage Duration (hours) MED	19.9	0.0	4.5	5.7	0.0	3.5	5.2	12.6
Revised Outage Events based on Estimated Decrease in Event Frequency - Non-MED	1.6	0.1	0.9	1.9	1.2	2.8	5.9	2.8
Revised Outage Duration based on Estimated Decrease in Event Duration - Non-MED	0.3	0.1	0.3	0.6	0.7	1.0	1.2	1.0
Revised Outage Events based on Estimated Decrease in Event Frequency - MED	0.3	0.0	0.5	0.4	0.0	0.9	1.8	1.7
Revised Outage Duration based on Estimated Decrease in Event Duration - MED	4.0	0.0	2.3	2.9	0.0	1.7	2.6	6.3
Vegetation Management								
Asset Management								
Customer								

Non-MED values are 3X base values
MED values are 10X base values

Non-MED values are 3X base values
MED values are 10X base values

NOTES:

CELL INPUT:

Standard assumptions for all areas - review if standard applies
Individual data input per area
Calculated input - no input required

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 44 of 80

"Optimize" CBA's Distribution Projects

PROGRAM:	Long Duration/High Impact Sites	
PROJECT:	Brushy Creek - 2	
REGULATORY JURISDICTION:	DEC	
STATE:	SC	
ASSUMPTIONS		
Operational		
Outage and Restoration		
DEC Average Cost per Base Neighborhood Outage Event	$ 5,477	
DEC Average Cost per non-MED Outage Event	$ 16,431	Non-MED values are 3X base values
DEC Average Cost per MED Outage Event	$ 54,770	MED values are 10X base values
DEP Average Cost per Base Neighborhood Outage Event	$ 4,742	
DEP Average Cost per Non-MED Outage Event	$ 14,226	Non-MED values are 3X base values
DEP Average Cost per MED Outage Event	$ 47,420	MED values are 10X base values
Vegetation Management		
Vegetation Mgt. Multiplier for Complex Line Maintenance	10	
Asset Management		
Customer		
DATA INPUTS		
Operational		
Project Deployment Cost	$ 1,100,000	
Deployment Installation Period	1	
Start year of Installation	2019	
Outage and Restoration		
10 Year Customer Outage Events - Non-Major Event Days (MED)	1	
10 Year Customer Interruptions (CI) - Non-MED	2	
10 Year Customer Minutes Interrupted (CMI) - Non-MED	162	
10 Year Customer Outage Events - MED	-	
10 Year Customer Interruptions (CI) - MED	-	
10 Year Customer Minutes Interrupted (CMI) - MED	-	
Estimated Decrease in Event Frequency	0%	
Estimated Decrease in Event Duration	90%	
Vegetation Management		
Trim Cycle years (5, 7 or 9)		
Asset Management		
Line Miles of Deteriorated OH Conductor to Replace		
Customer		
Residential Customers	0	
Small C&I Customers	0	
Medium & Large C&I Customers	1	
CALCULATIONS		
Operational		
Outage and Restoration		
10 Year Average Customer Outage Events - Non-Major Event Days (MED)	0.1	
10 Year Average Customer Interruptions (CI) - Non-MED	0	
10 Year Average Customer Minutes Interrupted (CMI) - Non-MED	16	
10 Year Average Customer Outage Events - MED	0.0	
10 Year Average Customer Interruptions (CI) - MED	0	
10 Year Average Customer Minutes Interrupted (CMI) - MED	0	
Annual Average Outage Duration (hours) Non-MED	1.4	
Annual Average Outage Duration (hours) MED	0.0	
Revised Outage Events based on Estimated Decrease in Event Frequency - Non-MED	0.1	
Revised Outage Duration based on Estimated Decrease in Event Duration - Non-MED	0.1	
Revised Outage Events based on Estimated Decrease in Event Frequency - MED	0.0	
Revised Outage Duration based on Estimated Decrease in Event Duration - MED	0.0	
Vegetation Management		
Asset Management		
Customer		

NOTES:

CELL INPUT:

Standard assumptions for all areas - review if standard applies
Individual data input per area
Calculated input - no input required

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 45 of 80

"Optimize" CBA's Distribution Projects

PROGRAM:	Long Duration/High Impact Sites
PROJECT:	Brushy Creek - 2
REGULATORY JURISDICTION:	DEC
STATE:	SC

	NPV of BENEFIT STREAM	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
COSTS																																
Project Capital	$ 1,100,000	$ 1,100,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Project O&M	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Project Costs	$ 1,100,000	$ 1,100,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
N/A	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total On-Going O&M	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
OPERATIONAL BENEFITS																																
Outage and Restoration																																
Non-MED Restoration costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
MED Restoration costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Outage and Restoration Benefits	$ -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vegetation Management																																
Eliminate of VM cycle charges	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Avoid demand trimming costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Vegetation Management Benefits	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Asset Management																																
Elimination of deteriorated conductor replacement costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Elimination of pole replacement costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Asset Management Benefits	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
CUSTOMER BENEFITS																																
Customer																																
Outage Savings (non-MED) - Residential Customers	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Outage Savings (non-MED) - Small C&I Customers	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Outage Savings (non-MED) - Medium & Large C&I Customers	$ 13,241	$ -	$ 804	$ 824	$ 844	$ 865	$ 887	$ 909	$ 932	$ 955	$ 979	$ 1,004	$ 1,029	$ 1,054	$ 1,081	$ 1,108	$ 1,135	$ 1,164	$ 1,193	$ 1,223	$ 1,253	$ 1,285	$ 1,317	$ 1,350	$ 1,383	$ 1,418	$ 1,453	$ 1,490	$ 1,527	$ 1,565	$ 1,604	$ 1,644
Outage Savings (MED) - Residential Customers	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Outage Savings (MED) - Small C&I Customers	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Outage Savings (MED) - Medium & Large C&I Customers	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Customer Benefits	$ 13,241	$ -	$ 804	$ 824	$ 844	$ 865	$ 887	$ 909	$ 932	$ 955	$ 979	$ 1,004	$ 1,029	$ 1,054	$ 1,081	$ 1,108	$ 1,135	$ 1,164	$ 1,193	$ 1,223	$ 1,253	$ 1,285	$ 1,317	$ 1,350	$ 1,383	$ 1,418	$ 1,453	$ 1,490	$ 1,527	$ 1,565	$ 1,604	$ 1,644
COMBINED COSTS AND BENEFITS																																
Total PV of Operational Benefits	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total PV of Customer Benefits	$ 13,241	$ -	$ 804	$ 824	$ 844	$ 865	$ 887	$ 909	$ 932	$ 955	$ 979	$ 1,004	$ 1,029	$ 1,054	$ 1,081	$ 1,108	$ 1,135	$ 1,164	$ 1,193	$ 1,223	$ 1,253	$ 1,285	$ 1,317	$ 1,350	$ 1,383	$ 1,418	$ 1,453	$ 1,490	$ 1,527	$ 1,565	$ 1,604	$ 1,644
Total PV of Combined Benefits	$ 13,241	$ -	$ 804	$ 824	$ 844	$ 865	$ 887	$ 909	$ 932	$ 955	$ 979	$ 1,004	$ 1,029	$ 1,054	$ 1,081	$ 1,108	$ 1,135	$ 1,164	$ 1,193	$ 1,223	$ 1,253	$ 1,285	$ 1,317	$ 1,350	$ 1,383	$ 1,418	$ 1,453	$ 1,490	$ 1,527	$ 1,565	$ 1,604	$ 1,644
Project and On-Going Costs	$ 1,100,000	$ 1,100,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Escalation		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Deployment percentage		$ -	100%																													
Combined NPV of Project	$ (1,086,759)	$ (1,100,000)	$ 804	$ 824	$ 844	$ 865	$ 887	$ 909	$ 932	$ 955	$ 979	$ 1,004	$ 1,029	$ 1,054	$ 1,081	$ 1,108	$ 1,135	$ 1,164	$ 1,193	$ 1,223	$ 1,253	$ 1,285	$ 1,317	$ 1,350	$ 1,383	$ 1,418	$ 1,453	$ 1,490	$ 1,527	$ 1,565	$ 1,604	$ 1,644
Ratio of NPV Benefits to NPV Costs	0.0																															
Cumulative Net Benefits		$ (1,100,000)	$ (1,099,196)	$ 1,627	$ 1,668	$ 1,710	$ 1,752	$ 1,796	$ 1,841	$ 1,887	$ 1,934	$ 1,983	$ 2,032	$ 2,083	$ 2,135	$ 2,188	$ 2,243	$ 2,299	$ 2,357	$ 2,416	$ 2,476	$ 2,538	$ 2,601	$ 2,666	$ 2,733	$ 2,801	$ 2,871	$ 2,943	$ 3,017	$ 3,092	$ 3,170	$ 3,249

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 46 of 80

"Optimize" CBA's Distribution Projects

		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Deployment Costs																																
Project Capital	Escalation	$ 1,100,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Project O&M	Factor																															
Outage and Restoration																																
Average Cost per Non-MED Outage Event	Escalation	$ 5,477	$ 5,614	$ 5,754	$ 5,898	$ 6,046	$ 6,197	$ 6,352	$ 6,510	$ 6,673	$ 6,840	$ 7,011	$ 7,186	$ 7,366	$ 7,550	$ 7,739	$ 7,932	$ 8,131	$ 8,334	$ 8,542	$ 8,756	$ 8,975	$ 9,199	$ 9,429	$ 9,665	$ 9,906	$ 10,154	$ 10,408	$ 10,668	$ 10,935	$ 11,208	$ 11,488
Average Cost per MED Outage Event	Escalation	$ 54,770	$ 56,139	$ 57,543	$ 58,981	$ 60,456	$ 61,967	$ 63,516	$ 65,104	$ 66,732	$ 68,400	$ 70,110	$ 71,863	$ 73,660	$ 75,501	$ 77,389	$ 79,323	$ 81,306	$ 83,339	$ 85,423	$ 87,558	$ 89,747	$ 91,991	$ 94,290	$ 96,648	$ 99,064	$ 101,541	$ 104,079	$ 106,681	$ 109,348	$ 112,082	$ 114,884
Vegetation Management																																
Asset Management																																
ICE Model																																
Current State																																
Residential Outaoe Value (non-MED)	Escalation	$ 6.51	$ 6.67	$ 6.84	$ 7.01	$ 7.19	$ 7.37	$ 7.55	$ 7.74	$ 7.93	$ 8.13	$ 8.33	$ 8.54	$ 8.75	$ 8.97	$ 9.20	$ 9.43	$ 9.66	$ 9.91	$ 10.15	$ 10.41	$ 10.67	$ 10.93	$ 11.21	$ 11.49	$ 11.77	$ 12.07	$ 12.37	$ 12.68	$ 13.00	$ 13.32	$ 13.65
Small C&I Outaoe Value (non-MED)	Escalation	$ 917.14	$ 940.07	$ 963.57	$ 987.66	$ 1,012.35	$ 1,037.66	$ 1,063.61	$ 1,090.20	$ 1,117.45	$ 1,145.39	$ 1,174.02	$ 1,203.37	$ 1,233.46	$ 1,264.29	$ 1,295.90	$ 1,328.30	$ 1,361.50	$ 1,395.54	$ 1,430.43	$ 1,466.19	$ 1,502.85	$ 1,540.42	$ 1,578.93	$ 1,618.40	$ 1,658.86	$ 1,700.33	$ 1,742.84	$ 1,786.41	$ 1,831.07	$ 1,876.85	$ 1,923.77
Large C&I Outaoe Value (non-MED)	Escalation	$ 23,576.92	$ 24,166.34	$ 24,770.50	$ 25,389.76	$ 26,024.50	$ 26,675.12	$ 27,341.99	$ 28,025.54	$ 28,726.18	$ 29,444.34	$ 30,180.44	$ 30,934.96	$ 31,708.33	$ 32,501.04	$ 33,313.56	$ 34,146.40	$ 35,000.06	$ 35,875.06	$ 36,771.94	$ 37,691.24	$ 38,633.52	$ 39,599.36	$ 40,589.34	$ 41,604.08	$ 42,644.18	$ 43,710.28	$ 44,803.04	$ 45,923.12	$ 47,071.19	$ 48,247.97	$ 49,454.17
Residential Outaoe Value (MED)	Escalation	$ 4.52	$ 4.64	$ 4.75	$ 4.87	$ 4.99	$ 5.12	$ 5.25	$ 5.38	$ 5.51	$ 5.65	$ 5.79	$ 5.93	$ 6.08	$ 6.23	$ 6.39	$ 6.55	$ 6.71	$ 6.88	$ 7.05	$ 7.23	$ 7.41	$ 7.60	$ 7.79	$ 7.98	$ 8.18	$ 8.39	$ 8.59	$ 8.81	$ 9.03	$ 9.26	$ 9.49
Small C&I Outaoe Value (MED)	Escalation	$ 477.79	$ 489.74	$ 501.98	$ 514.53	$ 527.39	$ 540.58	$ 554.09	$ 567.95	$ 582.15	$ 596.70	$ 611.62	$ 626.91	$ 642.58	$ 658.64	$ 675.11	$ 691.99	$ 709.29	$ 727.02	$ 745.20	$ 763.82	$ 782.92	$ 802.49	$ 822.56	$ 843.12	$ 864.20	$ 885.80	$ 907.95	$ 930.65	$ 953.91	$ 977.76	$ 1,002.20
Large C&I Outaoe Value (MED)	Escalation	$ 15,020.35	$ 15,395.86	$ 15,780.75	$ 16,175.27	$ 16,579.66	$ 16,994.15	$ 17,419.00	$ 17,854.48	$ 18,300.84	$ 18,758.36	$ 19,227.32	$ 19,708.00	$ 20,200.70	$ 20,705.72	$ 21,223.36	$ 21,753.94	$ 22,297.79	$ 22,855.24	$ 23,426.62	$ 24,012.28	$ 24,612.59	$ 25,227.91	$ 25,858.60	$ 26,505.07	$ 27,167.70	$ 27,846.89	$ 28,543.06	$ 29,256.64	$ 29,988.05	$ 30,737.75	$ 31,506.20
Future State																																
Residential Outaoe Value (non-MED)	Escalation	$ 4.71	$ 4.83	$ 4.95	$ 5.07	$ 5.20	$ 5.33	$ 5.46	$ 5.60	$ 5.74	$ 5.88	$ 6.03	$ 6.18	$ 6.34	$ 6.49	$ 6.66	$ 6.82	$ 6.99	$ 7.17	$ 7.35	$ 7.53	$ 7.72	$ 7.91	$ 8.11	$ 8.31	$ 8.52	$ 8.73	$ 8.95	$ 9.18	$ 9.40	$ 9.64	$ 9.88
Small C&I Outaoe Value (non-MED)	Escalation	$ 511.61	$ 524.40	$ 537.51	$ 550.95	$ 564.72	$ 578.84	$ 593.31	$ 608.14	$ 623.35	$ 638.93	$ 654.90	$ 671.28	$ 688.06	$ 705.26	$ 722.89	$ 740.96	$ 759.49	$ 778.48	$ 797.94	$ 817.89	$ 838.33	$ 859.29	$ 880.77	$ 902.79	$ 925.36	$ 948.50	$ 972.21	$ 996.51	$ 1,021.43	$ 1,046.96	$ 1,073.14
Large C&I Outaoe Value (non-MED)	Escalation	$ 15,737.07	$ 16,130.50	$ 16,533.76	$ 16,947.11	$ 17,370.79	$ 17,805.06	$ 18,250.18	$ 18,706.44	$ 19,174.10	$ 19,653.45	$ 20,144.79	$ 20,648.41	$ 21,164.62	$ 21,693.73	$ 22,236.07	$ 22,791.98	$ 23,361.78	$ 23,945.82	$ 24,544.47	$ 25,158.08	$ 25,787.03	$ 26,431.70	$ 27,092.50	$ 27,769.81	$ 28,464.06	$ 29,175.66	$ 29,905.05	$ 30,652.67	$ 31,418.99	$ 32,204.47	$ 33,009.58
Residential Outaoe Value (MED)	Escalation	$ 4.52	$ 4.64	$ 4.75	$ 4.87	$ 4.99	$ 5.12	$ 5.25	$ 5.38	$ 5.51	$ 5.65	$ 5.79	$ 5.93	$ 6.08	$ 6.23	$ 6.39	$ 6.55	$ 6.71	$ 6.88	$ 7.05	$ 7.23	$ 7.41	$ 7.60	$ 7.79	$ 7.98	$ 8.18	$ 8.39	$ 8.59	$ 8.81	$ 9.03	$ 9.26	$ 9.49
Small C&I Outaoe Value (MED)	Escalation	$ 477.79	$ 489.74	$ 501.98	$ 514.53	$ 527.39	$ 540.58	$ 554.09	$ 567.95	$ 582.15	$ 596.70	$ 611.62	$ 626.91	$ 642.58	$ 658.64	$ 675.11	$ 691.99	$ 709.29	$ 727.02	$ 745.20	$ 763.82	$ 782.92	$ 802.49	$ 822.56	$ 843.12	$ 864.20	$ 885.80	$ 907.95	$ 930.65	$ 953.91	$ 977.76	$ 1,002.20
Large C&I Outaoe Value (MED)	Escalation	$ 15,020.35	$ 15,395.86	$ 15,780.75	$ 16,175.27	$ 16,579.66	$ 16,994.15	$ 17,419.00	$ 17,854.48	$ 18,300.84	$ 18,758.36	$ 19,227.32	$ 19,708.00	$ 20,200.70	$ 20,705.72	$ 21,223.36	$ 21,753.94	$ 22,297.79	$ 22,855.24	$ 23,426.62	$ 24,012.28	$ 24,612.59	$ 25,227.91	$ 25,858.60	$ 26,505.07	$ 27,167.70	$ 27,846.89	$ 28,543.06	$ 29,256.64	$ 29,988.05	$ 30,737.75	$ 31,506.20

Assumption	Value	Source
Escalation Rate	2.90%	Duke Energy Standard Assumptions (provided by Treasury)
Discount Rate (WACC)	6.80%	For NC/SC combination, use NC amount
Discount Rate (WACC) DEC-SC	7.05%	Duke Energy Standard Assumptions (provided by Treasury)
Discount Rate (WACC) DEC-NC	6.80%	Duke Energy Standard Assumptions (provided by Treasury)
Discount Rate (WACC) DEP-SC	7.00%	Duke Energy Standard Assumptions (provided by Treasury)
Discount Rate (WACC) DEP-NC	6.80%	Duke Energy Standard Assumptions (provided by Treasury)

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 47 of 80

Table ES-1: Estimated Interuption Cost per Event, Average kW and Unserved kWh (US 2013$) by Duration and Customer Class

Interruption Cost	Interruption Duration						
	Momentary	30 Minutes	1 Hour	4 Hours	8 Hours	16 Hours	48 Hours (calculated)
	0.0	0.5	1.0	4.0	8.0	16.0	48.0
Cost per Event							
Medium and Large C&I (Over 50,000 Annual kWh)							
Cost per Event	$12,952.00	$15,241.00	$17,804.00	$39,458.00	$84,083.00	$165,482.00	$491,078.00
Cost per Average kW	$15.90	$18.70	$21.80	$48.40	$103.20	$203.00	
Cost per Unserved kWh	$190.70	$37.40	$21.80	$12.10	$12.90	$12.70	
Small C&I (Under 50,000 Annual kWh)							
Cost per Event	$412.00	$520.00	$647.00	$1,880.00	$4,690.00	$9,055.00	$26,515.00
Cost per Average kW	$187.90	$237.00	$295.00	$857.10	$2,138.10	$4,128.30	
Cost per Unserved kWh	$2,254.60	$474.10	$295.00	$214.30	$267.30	$258.00	
Residential							
Cost per Event	$3.90	$4.50	$5.10	$9.50	$17.20	$32.40	$93.20
Cost per Average kW	$2.60	$2.90	$3.30	$6.20	$11.30	$21.20	
Cost per Unserved kWh	$30.90	$5.90	$3.30	$1.60	$1.40	$1.30	

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 48 of 80

"Optimize" CBA's Distribution Projects

CIRCUIT_ID	TOTAL RES CUSTOMERS	TOTAL NON-RES CUSTOMERS < 50,000 KWH AVG	TOTAL NON RES CUSTOMERS > 50,000 KWH AVG	TOTAL	PROJECT	
T3450B03	796	258	23	1,077	1	
T3450B04	580	100	8	688	1	missing T3450B02
	1,376	358	31	1,765		
02091206		1			2	one customer…GRVL hospital
02091207					2	
	-	1	-	-		
4091203	192	25	3	220	3	
4231203	695	186	28	909	3	two projects; same circuit
	887	211	31	1,129		
4231203	695	186	28	909	4	two projects; same circuit
4141203	431	171	24	626	4	
	1,126	357	52	1,535		
4351205	685	135	12	832	5	
4351206	1,089	163	10	1,262	5	
	1,774	298	22	2,094		
60081206	1,014	168	10	1,192	6	
60181201	243	83	20	346	6	
	1,257	251	30	1,538		
60181202	928	230	18	1,176	7	
60211202	1,279	295	15	1,589	7	
	2,207	525	33	2,765		
7311202	979	175	11	1,165	8	
7401202	507	121	3	631	8	
	1,486	296	14	1,796		

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 49 of 80

"Optimize" CBA's Distribution Projects

Project Number	Jurisdiction	State	Project	MED_Y_N	10yrOutageCount	10YrCI	10yrCMI
1	DEP	SC	Cheraw River	Y	10	5,191	6,197,624
1	DEP	SC	Cheraw River	N	49	22,502	1,883,685
2	DEC	SC	Brushy Creek	N	1	2	162
3	DEC	SC	Whitehall Hurricane Creek	Y	5	1,512	410,657
3	DEC	SC	Whitehall Hurricane Creek	N	9	4,105	134,932
4	DEC	SC	Whitehall Sandy Springs	Y	4	1,068	368,189
4	DEC	SC	Whitehall Sandy Springs	N	19	6,338	465,445
5	DEC	SC	Fants Grove	N	12	9,714	782,199
6	DEC	SC	Moore Camp Croft	Y	9	6,285	1,313,936
6	DEC	SC	Moore Camp Croft	N	28	11,152	1,331,054
7	DEC	SC	Moore Woodruff	Y	18	8,923	2,781,941
7	DEC	SC	Moore Woodruff	N	59	33,435	4,631,998
8	DEC	SC	Eddy Road Panorama	Y	17	1,774	1,343,157
8	DEC	SC	Eddy Road Panorama	N	28	8,530	1,057,981

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 50 of 80

"Optimize" CBA's Distribution Projects

Data Input	Description
Circuit ID's involved in the project	**Enter each circuit ID on a separate row**
04141203	Sandy Springs 1203
04231203	Whitehall 1203
Protective Device ID's impacted	Will research the 10 year outage history on these devices to estimate CI/CMI reduction by completing this project. Appears in most cases this will be the backbone devices upstream from the project site.
	Enter the Smallworld ID of each protective device impacted in Column A. One Smallworld ID per row.
39000626	Whitehall 1203 Recloser 3-100L
38600279	Sandy Springs 65T Fuse - Single Phase
39011358	G&W Viper on Sandy Springs Upstream from fuse
38374514	Sandy Springs 1203 OCB
88306110	G&W Viper on Whitehall 1203 upstream of solid blades
38359953	Whitehall 1203 OCB
	Input Data Here

Estimated Cost	$200,000	
Timeframe to Complete (Years)	1	
Estimated % decrease in event duration	50%	(assumption that circuit tie will be able to significantly reduce the duration of 50% affected customers depending on fault location)

Special Considerations that have a financial impact: Mention additional considerations that would be cost beneficial. We will run the cost of the project vs traditional benefits like outage and veg savings.
Ex. Project will reduce vegetation trimming from 3 ROW's to 1
Ex. Changing to from wood to concrete poles (O&M)

Install a new electronic recloser at the open point between the two circuits
Reconductor from #2 ACSR to 556 AAC to build a full capacity tie.

Circuit ID	4141203	4231203
Circuit Name	SANDY SPRNGS - 1203	WHITEHALL - 1203
Customers Served	647	927

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 51 of 80

"Optimize" CBA's Distribution Projects

PROGRAM:	Long Duration/High Impact Sites	Long Duration/High Impact Sites	Long Duration/High Impact Sites	Long Duration/High Impact Sites	Long Duration/High Impact Sites	Long Duration/High Impact Sites	Long Duration/High Impact Sites	Long Duration/High Impact Sites
PROJECT:	Cheraw River Crossing - 1	Brushy Creek - 2	Whitehall Hurricance Creek - 3	Whitehall Sandy Springs - 4	Fants Grove - 5	Moore Camp Croft - 6	Moore Woodruff - 7	Eddy Rd Panorama - 8
REGULATORY JURISDICTION:	DEP	DEC	DEC	DEC	DEC	DEC	DEC	DEC
STATE:	SC	SC	SC	SC	SC	SC	SC	SC
ASSUMPTIONS								
Operational								
Outage and Restoration								
DEC Average Cost per Base Neighborhood Outage Event	$ 5,477	$ 5,477	$ 5,477	$ 5,477	$ 5,477	$ 5,477	$ 5,477	$ 5,477
DEC Average Cost per non-MED Outage Event	$ 16,431	$ 16,431	$ 16,431	$ 16,431	$ 16,431	$ 16,431	$ 16,431	$ 16,431
DEC Average Cost per MED Outage Event	$ 54,770	$ 54,770	$ 54,770	$ 54,770	$ 54,770	$ 54,770	$ 54,770	$ 54,770
DEP Average Cost per Base Neighborhood Outage Event	$ 4,742	$ 4,742	$ 4,742	$ 4,742	$ 4,742	$ 4,742	$ 4,742	$ 4,742
DEP Average Cost per Non-MED Outage Event	$ 14,226	$ 14,226	$ 14,226	$ 14,226	$ 14,226	$ 14,226	$ 14,226	$ 14,226
DEP Average Cost per MED Outage Event	$ 47,420	$ 47,420	$ 47,420	$ 47,420	$ 47,420	$ 47,420	$ 47,420	$ 47,420
Vegetation Management								
Vegetation Mgt. Multiplier for Complex Line Maintenance	10	10	10	10	10	10	10	10
Asset Management								
Customer								
DATA INPUTS								
Operational								
Project Deployment Cost	$ 7,200,000	$ 1,100,000	$ 150,000	$ 200,000	$ 25,000	$ 1,426,800	$ 1,200,000	$ 1,400,000
Deployment Installation Period	2	1	1	1	1	2	2	2
Start year of Installation	2019	2019	2019	2019	2019	2019	2019	2019
Outage and Restoration								
10 Year Customer Outage Events - Non-Major Event Days (MED)	49	1	9	19	12	28	59	28
10 Year Customer Interruptions (CI) - Non-MED	22.502	2	4.105	6.338	9.714	11.152	33.435	8.530
10 Year Customer Minutes Interrupted (CMI) - Non-MED	1.883.685	162	134.932	465.445	782.199	1.331.054	4.631.998	1.057.981
10 Year Customer Outage Events - MED	10	-	5	4	-	9	18	17
10 Year Customer Interruptions (CI) - MED	5.191	-	1.512	1.068	-	6.285	8.923	1.774
10 Year Customer Minutes Interrupted (CMI) - MED	6.197.624	-	410.657	368.189	-	1.313.936	2.781.941	1.343.157
Estimated Decrease in Event Frequency	67%	0%	0%	0%	0%	0%	0%	0%
Estimated Decrease in Event Duration	80%	90%	50%	50%	50%	50%	50%	50%
Vegetation Management								
Trim Cycle years (5, 7 or 9)								
Asset Management								
Line Miles of Deteriorated OH Conductor to Replace								
Customer								
Residential Customers	1,376	0	887	1,126	1,774	1,257	2,207	1,486
Small C&I Customers	358	0	211	357	298	251	525	296
Medium & Large C&I Customers	31	1	31	52	22	30	33	14
CALCULATIONS								
Operational								
Outage and Restoration								
10 Year Average Customer Outage Events - Non-Major Event Days (MED)	4.9	0.1	0.9	1.9	1.2	2.8	5.9	2.8
10 Year Average Customer Interruptions (CI) - Non-MED	2,250	0	411	634	971	1,115	3,344	853
10 Year Average Customer Minutes Interrupted (CMI) - Non-MED	188,369	16	13,493	46,544	78,220	133,105	463,200	105,798
10 Year Average Customer Outage Events - MED	1.0	0.0	0.5	0.4	0.0	0.9	1.8	1.7
10 Year Average Customer Interruptions (CI) - MED	519	0	151	107	0	629	892	177
10 Year Average Customer Minutes Interrupted (CMI) - MED	619,762	0	41,066	36,819	0	131,394	278,194	134,316
Annual Average Outage Duration (hours) Non-MED	1.4	1.4	0.5	1.2	1.3	2.0	2.3	2.1
Annual Average Outage Duration (hours) MED	19.9	0.0	4.5	5.7	0.0	3.5	5.2	12.6
Revised Outage Events based on Estimated Decrease in Event Frequency - Non-MED	1.6	0.1	0.9	1.9	1.2	2.8	5.9	2.8
Revised Outage Duration based on Estimated Decrease in Event Duration - Non-MED	0.3	0.1	0.3	0.6	0.7	1.0	1.2	1.0
Revised Outage Events based on Estimated Decrease in Event Frequency - MED	0.3	0.0	0.5	0.4	0.0	0.9	1.8	1.7
Revised Outage Duration based on Estimated Decrease in Event Duration - MED	4.0	0.0	2.3	2.9	0.0	1.7	2.6	6.3
Vegetation Management								
Asset Management								
Customer								

Non-MED values are 3X base values
MED values are 10X base values

Non-MED values are 3X base values
MED values are 10X base values

NOTES:

CELL INPUT:

Standard assumptions for all areas - review if standard applies
Individual data input per area
Calculated input - no input required

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 52 of 80

"Optimize" CBA's Distribution Projects

PROGRAM:	Long Duration/High Impact Sites	
PROJECT:	Whitehall Sandy Springs - 4	
REGULATORY JURISDICTION:	DEC	
STATE:	SC	
ASSUMPTIONS		
Operational		
Outage and Restoration		
DEC Average Cost per Base Neighborhood Outage Event	$ 5,477	
DEC Average Cost per non-MED Outage Event	$ 16,431	Non-MED values are 3X base values
DEC Average Cost per MED Outage Event	$ 54,770	MED values are 10X base values
DEP Average Cost per Base Neighborhood Outage Event	$ 4,742	
DEP Average Cost per Non-MED Outage Event	$ 14,226	Non-MED values are 3X base values
DEP Average Cost per MED Outage Event	$ 47,420	MED values are 10X base values
Vegetation Management		
Vegetation Mgt. Multiplier for Complex Line Maintenance	10	
Asset Management		
Customer		
DATA INPUTS		
Operational		
Project Deployment Cost	$ 200,000	
Deployment Installation Period	1	
Start year of Installation	2019	
Outage and Restoration		
10 Year Customer Outage Events - Non-Major Event Days (MED)	19	
10 Year Customer Interruptions (CI) - Non-MED	6,338	
10 Year Customer Minutes Interrupted (CMI) - Non-MED	465,445	
10 Year Customer Outage Events - MED	4	
10 Year Customer Interruptions (CI) - MED	1,068	
10 Year Customer Minutes Interrupted (CMI) - MED	368,189	
Estimated Decrease in Event Frequency	0%	
Estimated Decrease in Event Duration	50%	
Vegetation Management		
Trim Cycle years (5, 7 or 9)		
Asset Management		
Line Miles of Deteriorated OH Conductor to Replace		
Customer		
Residential Customers	1,126	
Small C&I Customers	357	
Medium & Large C&I Customers	52	
CALCULATIONS		
Operational		
Outage and Restoration		
10 Year Average Customer Outage Events - Non-Major Event Days (MED)	1.9	
10 Year Average Customer Interruptions (CI) - Non-MED	634	
10 Year Average Customer Minutes Interrupted (CMI) - Non-MED	46,544	
10 Year Average Customer Outage Events - MED	0.4	
10 Year Average Customer Interruptions (CI) - MED	107	
10 Year Average Customer Minutes Interrupted (CMI) - MED	36,819	
Annual Average Outage Duration (hours) Non-MED	1.2	
Annual Average Outage Duration (hours) MED	5.7	
Revised Outage Events based on Estimated Decrease in Event Frequency - Non-MED	1.9	
Revised Outage Duration based on Estimated Decrease in Event Duration - Non-MED	0.6	
Revised Outage Events based on Estimated Decrease in Event Frequency - MED	0.4	
Revised Outage Duration based on Estimated Decrease in Event Duration - MED	2.9	
Vegetation Management		
Asset Management		
Customer		

NOTES:

CELL INPUT:

Standard assumptions for all areas - review if standard applies
Individual data input per area
Calculated input - no input required

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 53 of 80

"Optimize" CBA's Distribution Projects

PROGRAM:	**Long Duration/High Impact Sites**
PROJECT:	**Whitehall Sandy Springs - 4**
REGULATORY JURISDICTION:	**DEC**
STATE:	**SC**

	NPV of BENEFIT STREAM	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
COSTS																																
Project Capital	$ 200,000	$ 200,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Project O&M	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Project Costs	$ 200,000	$ 200,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
N/A	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total On-Going O&M	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
OPERATIONAL BENEFITS																																
Outage and Restoration																																
Non-MED Restoration costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
MED Restoration costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Outage and Restoration Benefits	$ -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vegetation Management																																
Eliminate of VM cycle charges	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Avoid demand trimming costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Vegetation Management Benefits	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Asset Management																																
Elimination of deteriorated conductor replacement costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Elimination of pole replacement costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Asset Management Benefits	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
CUSTOMER BENEFITS																																
Customer																																
Outage Savings (non-MED) - Residential Customers	$ 33,276	$ -	$ 2,019	$ 2,070	$ 2,122	$ 2,175	$ 2,229	$ 2,285	$ 2,342	$ 2,400	$ 2,460	$ 2,522	$ 2,585	$ 2,650	$ 2,716	$ 2,784	$ 2,853	$ 2,925	$ 2,998	$ 3,073	$ 3,150	$ 3,228	$ 3,309	$ 3,392	$ 3,477	$ 3,564	$ 3,653	$ 3,744	$ 3,838	$ 3,933	$ 4,032	$ 4,133
Outage Savings (non-MED) - Small C&I Customers	$ 2,532,293	$ -	$ 153,680	$ 157,522	$ 161,460	$ 165,497	$ 169,634	$ 173,875	$ 178,222	$ 182,677	$ 187,244	$ 191,925	$ 196,724	$ 201,642	$ 206,683	$ 211,850	$ 217,146	$ 222,575	$ 228,139	$ 233,843	$ 239,689	$ 245,681	$ 251,823	$ 258,118	$ 264,571	$ 271,186	$ 277,965	$ 284,914	$ 292,037	$ 299,338	$ 306,822	$ 314,492
Outage Savings (non-MED) - Medium & Large C&I Customers	$ 6,977,274	$ -	$ 423,438	$ 434,024	$ 444,874	$ 455,996	$ 467,396	$ 479,081	$ 491,058	$ 503,334	$ 515,918	$ 528,816	$ 542,036	$ 555,587	$ 569,477	$ 583,714	$ 598,307	$ 613,264	$ 628,596	$ 644,311	$ 660,418	$ 676,929	$ 693,852	$ 711,198	$ 728,978	$ 747,203	$ 765,883	$ 785,030	$ 804,656	$ 824,772	$ 845,391	$ 866,526
Outage Savings (MED) - Residential Customers	$ 44,230	$ -	$ 2,684	$ 2,751	$ 2,820	$ 2,891	$ 2,963	$ 3,037	$ 3,113	$ 3,191	$ 3,271	$ 3,352	$ 3,436	$ 3,522	$ 3,610	$ 3,700	$ 3,793	$ 3,888	$ 3,985	$ 4,084	$ 4,187	$ 4,291	$ 4,398	$ 4,508	$ 4,621	$ 4,737	$ 4,855	$ 4,976	$ 5,101	$ 5,228	$ 5,359	$ 5,493
Outage Savings (MED) - Small C&I Customers	$ 4,725,933	$ -	$ 286,808	$ 293,978	$ 301,328	$ 308,861	$ 316,582	$ 324,497	$ 332,609	$ 340,925	$ 349,448	$ 358,184	$ 367,139	$ 376,317	$ 385,725	$ 395,368	$ 405,252	$ 415,384	$ 425,768	$ 436,412	$ 447,323	$ 458,506	$ 469,968	$ 481,718	$ 493,761	$ 506,105	$ 518,757	$ 531,726	$ 545,019	$ 558,645	$ 572,611	$ 586,926
Outage Savings (MED) - Medium & Large C&I Customers	$ 11,249,175	$ -	$ 682,692	$ 699,759	$ 717,253	$ 735,184	$ 753,564	$ 772,403	$ 791,713	$ 811,506	$ 831,793	$ 852,588	$ 873,903	$ 895,750	$ 918,144	$ 941,098	$ 964,625	$ 988,741	$ 1,013,459	$ 1,038,796	$ 1,064,766	$ 1,091,385	$ 1,118,670	$ 1,146,636	$ 1,175,302	$ 1,204,685	$ 1,234,802	$ 1,265,672	$ 1,297,314	$ 1,329,747	$ 1,362,990	$ 1,397,065
Total Customer Benefits	$ 22,996,612	$ -	$ 1,395,622	$ 1,430,512	$ 1,466,275	$ 1,502,932	$ 1,540,505	$ 1,579,018	$ 1,618,493	$ 1,658,956	$ 1,700,429	$ 1,742,940	$ 1,786,514	$ 1,831,177	$ 1,876,956	$ 1,923,880	$ 1,971,977	$ 2,021,276	$ 2,071,808	$ 2,123,603	$ 2,176,693	$ 2,231,111	$ 2,286,889	$ 2,344,061	$ 2,402,662	$ 2,462,729	$ 2,524,297	$ 2,587,405	$ 2,652,090	$ 2,718,392	$ 2,786,352	$ 2,856,010
COMBINED COSTS AND BENEFITS																																
Total PV of Operational Benefits	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total PV of Customer Benefits	$ 22,996,612	$ -	$ 1,395,622	$ 1,430,512	$ 1,466,275	$ 1,502,932	$ 1,540,505	$ 1,579,018	$ 1,618,493	$ 1,658,956	$ 1,700,429	$ 1,742,940	$ 1,786,514	$ 1,831,177	$ 1,876,956	$ 1,923,880	$ 1,971,977	$ 2,021,276	$ 2,071,808	$ 2,123,603	$ 2,176,693	$ 2,231,111	$ 2,286,889	$ 2,344,061	$ 2,402,662	$ 2,462,729	$ 2,524,297	$ 2,587,405	$ 2,652,090	$ 2,718,392	$ 2,786,352	$ 2,856,010
Total PV of Combined Benefits	$ 22,996,612	$ -	$ 1,395,622	$ 1,430,512	$ 1,466,275	$ 1,502,932	$ 1,540,505	$ 1,579,018	$ 1,618,493	$ 1,658,956	$ 1,700,429	$ 1,742,940	$ 1,786,514	$ 1,831,177	$ 1,876,956	$ 1,923,880	$ 1,971,977	$ 2,021,276	$ 2,071,808	$ 2,123,603	$ 2,176,693	$ 2,231,111	$ 2,286,889	$ 2,344,061	$ 2,402,662	$ 2,462,729	$ 2,524,297	$ 2,587,405	$ 2,652,090	$ 2,718,392	$ 2,786,352	$ 2,856,010
Project and On-Going Costs	$ 200,000	$ 200,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Escalation		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Deployment percentage		$ -	100%																													
Combined NPV of Project	$ 22,796,612	$ (200,000)	$ 1,395,622	$ 1,430,512	$ 1,466,275	$ 1,502,932	$ 1,540,505	$ 1,579,018	$ 1,618,493	$ 1,658,956	$ 1,700,429	$ 1,742,940	$ 1,786,514	$ 1,831,177	$ 1,876,956	$ 1,923,880	$ 1,971,977	$ 2,021,276	$ 2,071,808	$ 2,123,603	$ 2,176,693	$ 2,231,111	$ 2,286,889	$ 2,344,061	$ 2,402,662	$ 2,462,729	$ 2,524,297	$ 2,587,405	$ 2,652,090	$ 2,718,392	$ 2,786,352	$ 2,856,010
Ratio of NPV Benefits to NPV Costs	**115.0**																															
Cumulative Net Benefits		$ (200,000)	$ 1,195,622	$ 2,826,134	$ 2,896,787	$ 2,969,207	$ 3,043,437	$ 3,119,523	$ 3,197,511	$ 3,277,449	$ 3,359,385	$ 3,443,370	$ 3,529,454	$ 3,617,690	$ 3,708,133	$ 3,800,836	$ 3,895,857	$ 3,993,253	$ 4,093,084	$ 4,195,412	$ 4,300,297	$ 4,407,804	$ 4,517,999	$ 4,630,949	$ 4,746,723	$ 4,865,391	$ 4,987,026	$ 5,111,702	$ 5,239,494	$ 5,370,482	$ 5,504,744	$ 5,642,362

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 54 of 80

"Optimize" CBA's Distribution Projects

		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Deployment Costs																																
Project Capital	Escalation	$ 200.000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Project O&M	Factor																															
Outage and Restoration																																
Average Cost per Non-MED Outage Event	Escalation	$ 5,477	$ 5,614	$ 5,754	$ 5,898	$ 6,046	$ 6,197	$ 6,352	$ 6,510	$ 6,673	$ 6,840	$ 7,011	$ 7,186	$ 7,366	$ 7,550	$ 7,739	$ 7,932	$ 8,131	$ 8,334	$ 8,542	$ 8,756	$ 8,975	$ 9,199	$ 9,429	$ 9,665	$ 9,906	$ 10,154	$ 10,408	$ 10,668	$ 10,935	$ 11,208	$ 11,488
Average Cost per MED Outage Event	Escalation	$ 54.770	$ 56.139	$ 57.543	$ 58.981	$ 60.456	$ 61.967	$ 63.516	$ 65.104	$ 66.732	$ 68.400	$ 70.110	$ 71.863	$ 73.660	$ 75.501	$ 77.389	$ 79.323	$ 81.306	$ 83.339	$ 85.423	$ 87.558	$ 89.747	$ 91.991	$ 94.290	$ 96.648	$ 99.064	$ 101.541	$ 104.079	$ 106.681	$ 109.348	$ 112.082	$ 114.884
Vegetation Management																																
Asset Management																																
ICE Model																																
Current State																																
Residential Outaoe Value (non-MED)	Escalation	$ 6.30	$ 6.45	$ 6.61	$ 6.78	$ 6.95	$ 7.12	$ 7.30	$ 7.48	$ 7.67	$ 7.86	$ 8.06	$ 8.26	$ 8.47	$ 8.68	$ 8.90	$ 9.12	$ 9.35	$ 9.58	$ 9.82	$ 10.06	$ 10.32	$ 10.57	$ 10.84	$ 11.11	$ 11.39	$ 11.67	$ 11.96	$ 12.26	$ 12.57	$ 12.88	$ 13.20
Small C&I Outaoe Value (non-MED)	Escalation	$ 857.07	$ 878.49	$ 900.45	$ 922.97	$ 946.04	$ 969.69	$ 993.93	$ 1,018.78	$ 1,044.25	$ 1,070.36	$ 1,097.12	$ 1,124.54	$ 1,152.66	$ 1,181.47	$ 1,211.01	$ 1,241.29	$ 1,272.32	$ 1,304.13	$ 1,336.73	$ 1,370.15	$ 1,404.40	$ 1,439.51	$ 1,475.50	$ 1,512.39	$ 1,550.20	$ 1,588.95	$ 1,628.67	$ 1,669.39	$ 1,711.13	$ 1,753.90	$ 1,797.75
Large C&I Outaoe Value (non-MED)	Escalation	$ 22,521.82	$ 23,084.86	$ 23,661.98	$ 24,253.53	$ 24,859.87	$ 25,481.37	$ 26,118.40	$ 26,771.36	$ 27,440.65	$ 28,126.66	$ 28,829.83	$ 29,550.58	$ 30,289.34	$ 31,046.57	$ 31,822.74	$ 32,618.31	$ 33,433.76	$ 34,269.61	$ 35,126.35	$ 36,004.51	$ 36,904.62	$ 37,827.24	$ 38,772.92	$ 39,742.24	$ 40,736.80	$ 41,754.19	$ 42,798.04	$ 43,868.00	$ 44,964.70	$ 46,088.81	$ 47,241.03
Residential Outaoe Value (MED)	Escalation	$ 14.91	$ 15.29	$ 15.67	$ 16.06	$ 16.46	$ 16.87	$ 17.30	$ 17.73	$ 18.17	$ 18.63	$ 19.09	$ 19.57	$ 20.06	$ 20.56	$ 21.07	$ 21.60	$ 22.14	$ 22.69	$ 23.26	$ 23.84	$ 24.44	$ 25.05	$ 25.68	$ 26.32	$ 26.98	$ 27.65	$ 28.34	$ 29.05	$ 29.78	$ 30.52	$ 31.28
Small C&I Outaoe Value (MED)	Escalation	$ 3,602.48	$ 3,692.54	$ 3,784.85	$ 3,879.47	$ 3,976.46	$ 4,075.87	$ 4,177.77	$ 4,282.21	$ 4,389.27	$ 4,499.00	$ 4,611.47	$ 4,726.76	$ 4,844.93	$ 4,966.05	$ 5,090.20	$ 5,217.46	$ 5,347.90	$ 5,481.59	$ 5,618.63	$ 5,759.10	$ 5,903.08	$ 6,050.65	$ 6,201.92	$ 6,356.97	$ 6,515.89	$ 6,678.79	$ 6,845.76	$ 7,016.90	$ 7,192.32	$ 7,372.13	$ 7,556.44
Large C&I Outaoe Value (MED)	Escalation	$ 68,345.66	$ 70,054.30	$ 71,805.65	$ 73,600.80	$ 75,440.82	$ 77,326.84	$ 79,260.01	$ 81,241.51	$ 83,272.54	$ 85,354.36	$ 87,488.22	$ 89,675.42	$ 91,917.31	$ 94,215.24	$ 96,570.62	$ 98,984.89	$ 101,459.51	$ 103,996.00	$ 106,595.90	$ 109,260.79	$ 111,992.31	$ 114,792.12	$ 117,661.93	$ 120,603.47	$ 123,618.56	$ 126,709.02	$ 129,876.75	$ 133,123.67	$ 136,451.76	$ 139,863.05	$ 143,359.63
Future State																																
Residential Outaoe Value (non-MED)	Escalation	$ 5.37	$ 5.51	$ 5.65	$ 5.79	$ 5.93	$ 6.08	$ 6.23	$ 6.39	$ 6.55	$ 6.71	$ 6.88	$ 7.05	$ 7.23	$ 7.41	$ 7.59	$ 7.78	$ 7.98	$ 8.18	$ 8.38	$ 8.59	$ 8.81	$ 9.03	$ 9.25	$ 9.48	$ 9.72	$ 9.96	$ 10.21	$ 10.47	$ 10.73	$ 11.00	$ 11.27
Small C&I Outaoe Value (non-MED)	Escalation	$ 636.02	$ 651.93	$ 668.22	$ 684.93	$ 702.05	$ 719.60	$ 737.59	$ 756.03	$ 774.93	$ 794.31	$ 814.17	$ 834.52	$ 855.38	$ 876.77	$ 898.69	$ 921.15	$ 944.18	$ 967.79	$ 991.98	$ 1,016.78	$ 1,042.20	$ 1,068.26	$ 1,094.96	$ 1,122.34	$ 1,150.39	$ 1,179.15	$ 1,208.63	$ 1,238.85	$ 1,269.82	$ 1,301.57	$ 1,334.10
Large C&I Outaoe Value (non-MED)	Escalation	$ 18,340.54	$ 18,799.06	$ 19,269.03	$ 19,750.76	$ 20,244.53	$ 20,750.64	$ 21,269.41	$ 21,801.14	$ 22,346.17	$ 22,904.82	$ 23,477.44	$ 24,064.38	$ 24,665.99	$ 25,282.64	$ 25,914.70	$ 26,562.57	$ 27,226.64	$ 27,907.30	$ 28,604.98	$ 29,320.11	$ 30,053.11	$ 30,804.44	$ 31,574.55	$ 32,363.92	$ 33,173.01	$ 34,002.34	$ 34,852.40	$ 35,723.71	$ 36,616.80	$ 37,532.22	$ 38,470.53
Residential Outaoe Value (MED)	Escalation	$ 9.10	$ 9.33	$ 9.56	$ 9.80	$ 10.04	$ 10.30	$ 10.55	$ 10.82	$ 11.09	$ 11.36	$ 11.65	$ 11.94	$ 12.24	$ 12.54	$ 12.86	$ 13.18	$ 13.51	$ 13.85	$ 14.19	$ 14.55	$ 14.91	$ 15.28	$ 15.67	$ 16.06	$ 16.46	$ 16.87	$ 17.29	$ 17.72	$ 18.17	$ 18.62	$ 19.09
Small C&I Outaoe Value (MED)	Escalation	$ 1,643.00	$ 1,684.08	$ 1,726.18	$ 1,769.33	$ 1,813.57	$ 1,858.91	$ 1,905.38	$ 1,953.01	$ 2,001.84	$ 2,051.88	$ 2,103.18	$ 2,155.76	$ 2,209.66	$ 2,264.90	$ 2,321.52	$ 2,379.56	$ 2,439.05	$ 2,500.02	$ 2,562.52	$ 2,626.59	$ 2,692.25	$ 2,759.56	$ 2,828.55	$ 2,899.26	$ 2,971.74	$ 3,046.03	$ 3,122.19	$ 3,200.24	$ 3,280.25	$ 3,362.25	$ 3,446.31
Large C&I Outaoe Value (MED)	Escalation	$ 36,324.48	$ 37,232.59	$ 38,163.40	$ 39,117.49	$ 40,095.43	$ 41,097.81	$ 42,125.26	$ 43,178.39	$ 44,257.85	$ 45,364.30	$ 46,498.40	$ 47,660.86	$ 48,852.38	$ 50,073.69	$ 51,325.54	$ 52,608.67	$ 53,923.89	$ 55,271.99	$ 56,653.79	$ 58,070.13	$ 59,521.89	$ 61,009.93	$ 62,535.18	$ 64,098.56	$ 65,701.03	$ 67,343.55	$ 69,027.14	$ 70,752.82	$ 72,521.64	$ 74,334.68	$ 76,193.05

Assumption	Value	Source
Escalation Rate	2.50%	Duke Energy Standard Assumptions (provided by Treasury)
Discount Rate (WACC)	6.80%	For NC/SC combination, use NC amount
Discount Rate (WACC) DEC-SC	7.05%	Duke Energy Standard Assumptions (provided by Treasury)
Discount Rate (WACC) DEC-NC	6.80%	Duke Energy Standard Assumptions (provided by Treasury)
Discount Rate (WACC) DEP-SC	7.00%	Duke Energy Standard Assumptions (provided by Treasury)
Discount Rate (WACC) DEP-NC	6.80%	Duke Energy Standard Assumptions (provided by Treasury)

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 55 of 80

Table ES-1: Estimated Interuption Cost per Event, Average kW and Unserved kWh (US 2013$) by Duration and Customer Class

Interruption Cost	Interruption Duration						
	Momentary	30 Minutes	1 Hour	4 Hours	8 Hours	16 Hours	48 Hours (calculated)
	0.0	0.5	1.0	4.0	8.0	16.0	48.0
Cost per Event							
Medium and Large C&I (Over 50,000 Annual kWh)							
Cost per Event	$12,952.00	$15,241.00	$17,804.00	$39,458.00	$84,083.00	$165,482.00	$491,078.00
Cost per Average kW	$15.90	$18.70	$21.80	$48.40	$103.20	$203.00	
Cost per Unserved kWh	$190.70	$37.40	$21.80	$12.10	$12.90	$12.70	
Small C&I (Under 50,000 Annual kWh)							
Cost per Event	$412.00	$520.00	$647.00	$1,880.00	$4,690.00	$9,055.00	$26,515.00
Cost per Average kW	$187.90	$237.00	$295.00	$857.10	$2,138.10	$4,128.30	
Cost per Unserved kWh	$2,254.60	$474.10	$295.00	$214.30	$267.30	$258.00	
Residential							
Cost per Event	$3.90	$4.50	$5.10	$9.50	$17.20	$32.40	$93.20
Cost per Average kW	$2.60	$2.90	$3.30	$6.20	$11.30	$21.20	
Cost per Unserved kWh	$30.90	$5.90	$3.30	$1.60	$1.40	$1.30	

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 56 of 80

"Optimize" CBA's Distribution Projects

CIRCUIT_ID	TOTAL RES CUSTOMERS	TOTAL NON-RES CUSTOMERS < 50,000 KWH AVG	TOTAL NON RES CUSTOMERS > 50,000 KWH AVG
T3450B03	796	258	23
T3450B04	580	100	8
	1,376	358	31
02091206		1	
02091207			
	-	1	-
4091203	192	25	3
4231203	695	186	28
	887	211	31
4231203	695	186	28
4141203	431	171	24
	1,126	357	52
4351205	685	135	12
4351206	1,089	163	10
	1,774	298	22
60081206	1,014	168	10
60181201	243	83	20
	1,257	251	30
60181202	928	230	18
60211202	1,279	295	15
	2,207	525	33
7311202	979	175	11
7401202	507	121	3
	1,486	296	14

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 57 of 80

TOTAL	PROJECT	
1,077	1	
688	1	missing T3450B02
1,765		
	2	one customer…GRVL hospital
	2	
-		
220	3	
909	3	two projects; same circuit
1,129		
909	4	two projects; same circuit
626	4	
1,535		
832	5	
1,262	5	
2,094		
1,192	6	
346	6	
1,538		
1,176	7	
1,589	7	
2,765		
1,165	8	
631	8	
1,796		

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 58 of 80

"Optimize" CBA's Distribution Projects

Project Number	Jurisdiction	State	Project	MED_Y_N	10yrOutageCount	10YrCI	10yrCMI
1	DEP	SC	Cheraw River	Y	10	5,191	6,197,624
1	DEP	SC	Cheraw River	N	49	22,502	1,883,685
2	DEC	SC	Brushy Creek	N	1	2	162
3	DEC	SC	Whitehall Hurricane Creek	Y	5	1,512	410,657
3	DEC	SC	Whitehall Hurricane Creek	N	9	4,105	134,932
4	DEC	SC	Whitehall Sandy Springs	Y	4	1,068	368,189
4	DEC	SC	Whitehall Sandy Springs	N	19	6,338	465,445
5	DEC	SC	Fants Grove	N	12	9,714	782,199
6	DEC	SC	Moore Camp Croft	Y	9	6,285	1,313,936
6	DEC	SC	Moore Camp Croft	N	28	11,152	1,331,054
7	DEC	SC	Moore Woodruff	Y	18	8,923	2,781,941
7	DEC	SC	Moore Woodruff	N	59	33,435	4,631,998
8	DEC	SC	Eddy Road Panorama	Y	17	1,774	1,343,157
8	DEC	SC	Eddy Road Panorama	N	28	8,530	1,057,981

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 59 of 80

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 60 of 80

Data Input | **Description - Cher**

Circuit ID's involved in the project | **Enter each circuit ID**

T3450B02 (Stevens 23kV)	
T3450B03 (City 23kV)	(special note here: This City 23kV c
T3450B04 (State Road 23kV)	

Protective Device ID's impacted	Corresponding	Will research the 10 y
Breaker T3450B02	3017553	**Enter the DIS number of each protective device impacted in Column A. One DIS # per row. Enter corresponding Source ID for that protective device oin Column B of the same row**
Breaker T3450B03	3017555	
Breaker T3450B04	3017554	
G&W Recloser @ AB40BV	111784083	
G&W Recloser @ AP35BV	111783496	
G&W Recloser @ 17FF93	104178426	
G&W Recloser @ 1CDG50	113199685	
Versatech Reclosers @ A23BV	3019940	

	Input Data Here	
Estimated Cost	$ 7,200,000	(see more detailed br
Timeframe to Complete (Years)	18 months	(plan to start 2019, fir
Estimated % decrease in event frequency	67%	(assuming 2/3 reduct
Estimated % decrease in event duration	80%	(assume 80% reducti

Special Considerations that have a financial impact: Mention additional co

Wetlands for approximately 1.5 miles which require special equpiment during restoration, mainten
Reducing 3 rights of way to 1 right of way
Reducing 3 standard distribution wood pole lines to 1 triple circuit steel pole transmission style line
Currently all 3 rights of way have to be trimmed on both sides, new project will only require 1 right
Estimates to cut this ROW during normal cycles are at least 10 times as expesnive (conservative)
Estimates to restore power during normal operations are at least 10 times as expensive (conserva
Estimates to maintain (i.e. replace poles, etc.) this equipment are at least 10 times as expensive (
Restoration of these lines when faults occur in these 1.5 mile corridors are extedned due to inacce
Specialized permitting is required for this project due to State and Federal enviromental requireme
Specialized ROW acquisition and easements are required for this project due to State and Federa
These circuits affect a large portion of the City of Cheraw, emergency services, businesses, schoo
Project will be constructed on steel transmission structures with transmission type insulators which
Removing approximatley 1 mile of deteriorated conductor as part of the project
Project will allow future ability to include these circuits in Self-Healing and SOG schemes
Project will allow Duke to release 2 rights of ways (approxiamtely 3 line miles) back to the origianl

Cheraw Pee Dee River Crossing – 18 month duration, $7.2M cost
Project Manager - Chris Spangler
Breakdown of estimated project costs are shown below

Cheraw Pee Dee River Crossing

Construction	**$3.3M**
Feeder Exits	$150K
Triple Circuit Construction	$1.9M
Small Wire Make Ready Work	$400K
Tap to Cheraw Pump and Ties	$200K
Removals	$600K
Vegetation	**$1.5M**
Ground to sky clear on State Rd. Feeder	
Clearing around Industrial and City Feeders	
BMP's and Matting	**$2.1M**
Permitting/Consulting/Survey/Engineering	**$350K**
Total	**$7.2M**

Project timeframes attached for Cheraw River crossing project (combined document, there are 3 c

GIP LDO Projects Schedule.pdf

Row Labels	T3450B03	T3450B04
COMMERCIAL	250	94
INDUSTRIAL	1	6
RESIDENTIAL	672	502
Grand Total	**923**	**602**

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 61 of 80

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 62 of 80

irucuit is one breaker at the substation but accounts for two of the rights of ways described below and

year outage history on these devices to estimate CI/CMI reduction by completing this project. Appear

ion in frequency because going from 3 normal wood distribution pole lines/ROW to 1 transmission ste
ion in duration due to hardened redesign, ability to assess new line, new location of facilities to assist

nsiderations that would be cost beneficial. We will run the cost of the project vs traditional benefits lik

to trim than normal ROW trimming due to special equipment, procedures, environmental impact mini

conservative) due to special equipment, specialized procedures, environmental impact minimization, e
essibility, need for specialized equipment to patrol and repair and specialized procedures to complete

will improve reliability, storm harden the assets, reduce future maintenance costs and increase acce

other projects shown as well which are not related to Cheraw)

T3450B02	Grand Total
	344
1	8
	1174
	1526

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 63 of 80

l two of the Cheraw River Crossings - each leg of this circuit is protected by a G&W recloser which are

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 64 of 80

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 65 of 80

listed below)

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 66 of 80

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 67 of 80

PROGRAM:

PROJECT:
REGULATORY JURISDICTION:
STATE:

ASSUMPTIONS

Operational

Outage and Restoration
DEC Average Cost per Base Neighborhood Outage Event
DEC Average Cost per non-MED Outage Event
DEC Average Cost per MED Outage Event
DEP Average Cost per Base Neighborhood Outage Event
DEP Average Cost per Non-MED Outage Event
DEP Average Cost per MED Outage Event

Vegetation Management
Vegetation Mgt. Multiplier for Complex Line Maintenance

Asset Management

Customer

DATA INPUTS

Operational
Project Deployment Cost
Deployment Installation Period
Start year of Installation

Outage and Restoration
10 Year Customer Outage Events - Non-Major Event Days (MED)
10 Year Customer Interruptions (CI) - Non-MED
10 Year Customer Minutes Interrupted (CMI) - Non-MED
10 Year Customer Outage Events - MED
10 Year Customer Interruptions (CI) - MED
10 Year Customer Minutes Interrupted (CMI) - MED

Estimated Decrease in Event Frequency
Estimated Decrease in Event Duration

Vegetation Management
Trim Cycle years (5, 7 or 9)

Asset Management
Line Miles of Deteriorated OH Conductor to Replace

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 68 of 80

Customer

Residential Customers
Small C&I Customers
Medium & Large C&I Customers

CALCULATIONS

Operational

Outage and Restoration

10 Year Average Customer Outage Events - Non-Major Event Days (MED)
10 Year Average Customer Interruptions (CI) - Non-MED
10 Year Average Customer Minutes Interrupted (CMI) - Non-MED
10 Year Average Customer Outage Events - MED
10 Year Average Customer Interruptions (CI) - MED
10 Year Average Customer Minutes Interrupted (CMI) - MED

Annual Average Outage Duration (hours) Non-MED
Annual Average Outage Duration (hours) MED

Revised Outage Events based on Estimated Decrease in Event Frequency - Non-MED
Revised Outage Duration based on Estimated Decrease in Event Duration - Non-MED
Revised Outage Events based on Estimated Decrease in Event Frequency - MED
Revised Outage Duration based on Estimated Decrease in Event Duration - MED

Vegetation Management

Asset Management

Customer

NOTES:

CELL INPUT:

Standard assumptions for all areas - review if standard applies
Individual data input per area
Calculated input - no input required

Long Duration/High Impact Sites	Long Duration/High Impact Sites	Long Duration/High Impact Sites	Long Duration/High Impact Sites
Cheraw River Crossing - 1	Brushy Creek - 2	Whitehall Hurricance Creek - 3	Whitehall Sandy Creek - 4
DEP	DEC	DEC	DEC
SC	SC	SC	SC
$ 5,477	$ 5,477	$ 5,477	$ 5,477
$ 16,431	$ 16,431	$ 16,431	$ 16,431
$ 54,770	$ 54,770	$ 54,770	$ 54,770
$ 4,742	$ 4,742	$ 4,742	$ 4,742
$ 14,226	$ 14,226	$ 14,226	$ 14,226
$ 47,420	$ 47,420	$ 47,420	$ 47,420
10	10	10	10
$ 7,200,000	$ 1,100,000	$ 150,000	$ 200,000
2	1	1	1
2019	2019	2019	2019
49	1	9	19
22,502	2	4,105	6,338
1,883,685	162	134,932	465,445
10	-	5	4
5,191	-	1,512	1,068
6,197,624	-	410,657	368,189
67%	0%	0%	0%
80%	90%	50%	50%

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 69 of 80

1,376	0	887	1,126
358	0	211	357
31	1	31	52
4.9	0.1	0.9	1.9
2,250	0	411	634
188,369	16	13,493	46,544
1.0	0.0	0.5	0.4
519	0	151	107
619,762	0	41,066	36,819
1.4	1.4	0.5	1.2
19.9	0.0	4.5	5.7
1.6	0.1	0.9	1.9
0.3	0.1	0.3	0.6
0.3	0.0	0.5	0.4
4.0	0.0	2.3	2.9

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 70 of 80

Long Duration/High Impact Sites	Long Duration/High Impact Sites	Long Duration/High Impact Sites	Long Duration/High Impact Sites
Fants Grove - 5	Moore Camp Croft - 6	Moore Woodruff - 7	Eddy Rd Panorama - 8
DEC	DEC	DEC	DEC
SC	SC	SC	SC
$ 5,477	$ 5,477	$ 5,477	$ 5,477
$ 16,431	$ 16,431	$ 16,431	$ 16,431
$ 54,770	$ 54,770	$ 54,770	$ 54,770
$ 4,742	$ 4,742	$ 4,742	$ 4,742
$ 14,226	$ 14,226	$ 14,226	$ 14,226
$ 47,420	$ 47,420	$ 47,420	$ 47,420
10	10	10	10
$ 25,000	$ 1,426,800	$ 1,200,000	$ 1,400,000
1	2	2	2
2019	2019	2019	2019
12	28	59	28
9,714	11,152	33,435	8,530
782,199	1,331,054	4,631,998	1,057,981
-	9	18	17
-	6,285	8,923	1,774
-	1,313,936	2,781,941	1,343,157
0%	0%	0%	0%
50%	50%	50%	50%

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 71 of 80

1,774	1,257	2,207	1,486
298	251	525	296
22	30	33	14
1.2	2.8	5.9	2.8
971	1,115	3,344	853
78,220	133,105	463,200	105,798
0.0	0.9	1.8	1.7
0	629	892	177
0	131,394	278,194	134,316
1.3	2.0	2.3	2.1
0.0	3.5	5.2	12.6
1.2	2.8	5.9	2.8
0.7	1.0	1.2	1.0
0.0	0.9	1.8	1.7
0.0	1.7	2.6	6.3

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 72 of 80

Non-MED values are 3X base values
MED values are 10X base values

Non-MED values are 3X base values
MED values are 10X base values

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 73 of 80

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 74 of 80

PROGRAM:

PROJECT:
REGULATORY JURISDICTION:
STATE:

ASSUMPTIONS

Operational

Outage and Restoration
DEC Average Cost per Base Neighborhood Outage Event
DEC Average Cost per non-MED Outage Event
DEC Average Cost per MED Outage Event
DEP Average Cost per Base Neighborhood Outage Event
DEP Average Cost per Non-MED Outage Event
DEP Average Cost per MED Outage Event

Vegetation Management
Vegetation Mgt. Multiplier for Complex Line Maintenance

Asset Management

Customer

DATA INPUTS

Operational
Project Deployment Cost
Deployment Installation Period
Start year of Installation

Outage and Restoration
10 Year Customer Outage Events - Non-Major Event Days (MED)
10 Year Customer Interruptions (CI) - Non-MED
10 Year Customer Minutes Interrupted (CMI) - Non-MED
10 Year Customer Outage Events - MED
10 Year Customer Interruptions (CI) - MED
10 Year Customer Minutes Interrupted (CMI) - MED

Estimated Decrease in Event Frequency
Estimated Decrease in Event Duration

Vegetation Management
Trim Cycle years (5, 7 or 9)

Asset Management
Line Miles of Deteriorated OH Conductor to Replace

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 75 of 80

Customer

Residential Customers
Small C&I Customers
Medium & Large C&I Customers

CALCULATIONS

Operational

Outage and Restoration

10 Year Average Customer Outage Events - Non-Major Event Days (MED)
10 Year Average Customer Interruptions (CI) - Non-MED
10 Year Average Customer Minutes Interrupted (CMI) - Non-MED
10 Year Average Customer Outage Events - MED
10 Year Average Customer Interruptions (CI) - MED
10 Year Average Customer Minutes Interrupted (CMI) - MED

Annual Average Outage Duration (hours) Non-MED
Annual Average Outage Duration (hours) MED

Revised Outage Events based on Estimated Decrease in Event Frequency - Non-MED
Revised Outage Duration based on Estimated Decrease in Event Duration - Non-MED
Revised Outage Events based on Estimated Decrease in Event Frequency - MED
Revised Outage Duration based on Estimated Decrease in Event Duration - MED

Vegetation Management

Asset Management

Customer

NOTES:

CELL INPUT:

Standard assumptions for all areas - review if standard applies
Individual data input per area
Calculated input - no input required

Long Duration/High Impact Sites	
Cheraw River Crossing - 1	
DEP	
SC	
$ 5,477	
$ 16,431	Non-MED values are 3X base values
$ 54,770	MED values are 10X base values
$ 4,742	
$ 14,226	Non-MED values are 3X base values
$ 47,420	MED values are 10X base values
10	
$ 7,200,000	
2	
2019	
49	
22,502	
1,883,685	
10	
5,191	
6,197,624	
67%	
80%	
1.0	

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 76 of 80

1,376
358
31
4.9
2,250
188,369
1.0
519
619,762
1.4
19.9
1.6
0.3
0.3
4.0

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 77 of 80

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 78 of 80

PROGRAM:	**Long Duration/High Impact Sites**
PROJECT:	**Cheraw River Crossing - 1**
REGULATORY JURISDICTION:	**DEP**
STATE:	**SC**

	NPV of BENEFIT STREAM	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
		0	1	2	3	4	5	6	7	8	9	10	11	12
COSTS														
Project Capital	$ 6,970,787	$ 3,600,000	$ 3,600,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Project O&M	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Project Costs	$ 6,970,787	$ 3,600,000	$ 3,600,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
N/A	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total On-Going O&M	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
OPERATIONAL BENEFITS														
Outage and Restoration														
Non-MED Restoration costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
MED Restoration costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Outage and Restoration Benefits	**$ -**	-	-	-	-	-	-	-	-	-	-	-	-	-
Vegetation Management														
Eliminate of VM cycle charges	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Avoid demand trimming costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Vegetation Management Benefits	**$ -**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Asset Management														
Elimination of deteriorated conductor replacement costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Elimination of pole replacement costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Asset Management Benefits	**$ -**	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
CUSTOMER BENEFITS														
Customer														
Outage Savings (non-MED) - Residential Customers	$ 533,371	$ -	$ -	$ 35,177	$ 36,057	$ 36,958	$ 37,882	$ 38,829	$ 39,800	$ 40,795	$ 41,815	$ 42,860	$ 43,932	$ 45,030
Outage Savings (non-MED) - Small C&I Customers	$ 21,180,268	$ -	$ -	$ 1,396,904	$ 1,431,826	$ 1,467,622	$ 1,504,313	$ 1,541,920	$ 1,580,468	$ 1,619,980	$ 1,660,480	$ 1,701,992	$ 1,744,541	$ 1,788,155
Outage Savings (non-MED) - Medium & Large C&I Customer	$ 44,788,756	$ -	$ -	$ 2,953,956	$ 3,027,805	$ 3,103,500	$ 3,181,087	$ 3,260,615	$ 3,342,130	$ 3,425,683	$ 3,511,325	$ 3,599,108	$ 3,689,086	$ 3,781,313
Outage Savings (MED) - Residential Customers	$ 932,459	$ -	$ -	$ 61,499	$ 63,036	$ 64,612	$ 66,227	$ 67,883	$ 69,580	$ 71,319	$ 73,102	$ 74,930	$ 76,803	$ 78,723
Outage Savings (MED) - Small C&I Customers	$ 69,869,766	$ -	$ -	$ 4,608,126	$ 4,723,329	$ 4,841,412	$ 4,962,447	$ 5,086,508	$ 5,213,671	$ 5,344,013	$ 5,477,613	$ 5,614,554	$ 5,754,917	$ 5,898,790
Outage Savings (MED) - Medium & Large C&I Customers	$ 110,057,409	$ -	$ -	$ 7,258,624	$ 7,440,090	$ 7,626,092	$ 7,816,744	$ 8,012,163	$ 8,212,467	$ 8,417,778	$ 8,628,223	$ 8,843,929	$ 9,065,027	$ 9,291,652
Total Customer Benefits	**$ 225,648,390**	$ -	$ -	$ 14,882,204	$ 15,254,259	$ 15,635,616	$ 16,026,506	$ 16,427,169	$ 16,837,848	$ 17,258,794	$ 17,690,264	$ 18,132,521	$ 18,585,834	$ 19,050,479
COMBINED COSTS AND BENEFITS														
Total PV of Operational Benefits	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total PV of Customer Benefits	$ 225,648,390	$ -	$ -	$ 14,882,204	$ 15,254,259	$ 15,635,616	$ 16,026,506	$ 16,427,169	$ 16,837,848	$ 17,258,794	$ 17,690,264	$ 18,132,521	$ 18,585,834	$ 19,050,479
Total PV of Combined Benefits	$ 225,648,390	$ -	$ -	$ 14,882,204	$ 15,254,259	$ 15,635,616	$ 16,026,506	$ 16,427,169	$ 16,837,848	$ 17,258,794	$ 17,690,264	$ 18,132,521	$ 18,585,834	$ 19,050,479
Project and On-Going Costs	$ 6,970,787	$ 3,600,000	$ 3,600,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Escalation		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Deployment percentage		$ -	50%											
Combined NPV of Project	**$ 218,677,603**	$ (3,600,000)	$ (3,600,000)	$ 14,882,204	$ 15,254,259	$ 15,635,616	$ 16,026,506	$ 16,427,169	$ 16,837,848	$ 17,258,794	$ 17,690,264	$ 18,132,521	$ 18,585,834	$ 19,050,479
Ratio of NPV Benefits to NPV Costs	**32.4**													
Cumulative Net Benefits		$ (3,600,000)	$ (7,200,000)	$ 11,282,204	$ 30,136,463	$ 30,889,875	$ 31,662,122	$ 32,453,675	$ 33,265,017	$ 34,096,642	$ 34,949,058	$ 35,822,784	$ 36,718,354	$ 37,636,313

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 79 of 80

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TORY JURISDICTION:

	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046
	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
Project Capital	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Project O&M	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Project Costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
N/A	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total On-Going O&M	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
IONAL BENEFITS															
Outage and Restoration															
Non-MED Restoration costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
MED Restoration costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Outage and Restoration Benefits	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vegetation Management															
Eliminate of VM cycle charges	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Avoid demand trimming costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Vegetation Management Benefits	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Asset Management															
Elimination of deteriorated conductor replacement costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Elimination of pole replacement costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Asset Management Benefits	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
IER BENEFITS															
Customer															
Outage Savings (non-MED) - Residential Customers	$ 46,156	$ 47,310	$ 48,493	$ 49,705	$ 50,947	$ 52,221	$ 53,527	$ 54,865	$ 56,236	$ 57,642	$ 59,083	$ 60,561	$ 62,075	$ 63,626	$ 65,217
Outage Savings (non-MED) - Small C&I Customers	$ 1,832,859	$ 1,878,680	$ 1,925,647	$ 1,973,788	$ 2,023,133	$ 2,073,711	$ 2,125,554	$ 2,178,693	$ 2,233,160	$ 2,288,989	$ 2,346,214	$ 2,404,869	$ 2,464,991	$ 2,526,616	$ 2,589,781
Outage Savings (non-MED) - Medium & Large C&I Customers	$ 3,875,846	$ 3,972,742	$ 4,072,061	$ 4,173,862	$ 4,278,209	$ 4,385,164	$ 4,494,793	$ 4,607,163	$ 4,722,342	$ 4,840,401	$ 4,961,411	$ 5,085,446	$ 5,212,582	$ 5,342,897	$ 5,476,469
Outage Savings (MED) - Residential Customers	$ 80,691	$ 82,709	$ 84,776	$ 86,896	$ 89,068	$ 91,295	$ 93,577	$ 95,917	$ 98,315	$ 100,772	$ 103,292	$ 105,874	$ 108,521	$ 111,234	$ 114,015
Outage Savings (MED) - Small C&I Customers	$ 6,046,260	$ 6,197,417	$ 6,352,352	$ 6,511,161	$ 6,673,940	$ 6,840,788	$ 7,011,808	$ 7,187,103	$ 7,366,781	$ 7,550,950	$ 7,739,724	$ 7,933,217	$ 8,131,548	$ 8,334,836	$ 8,543,207
Outage Savings (MED) - Medium & Large C&I Customers	$ 9,523,944	$ 9,762,042	$ 10,006,093	$ 10,256,246	$ 10,512,652	$ 10,775,468	$ 11,044,855	$ 11,320,976	$ 11,604,001	$ 11,894,101	$ 12,191,453	$ 12,496,239	$ 12,808,645	$ 13,128,862	$ 13,457,083
Total Customer Benefits	$ 19,526,741	$ 20,014,910	$ 20,515,283	$ 21,028,165	$ 21,553,869	$ 22,092,716	$ 22,645,033	$ 23,211,159	$ 23,791,438	$ 24,386,224	$ 24,995,880	$ 25,620,777	$ 26,261,296	$ 26,917,829	$ 27,590,774
ED COSTS AND BENEFITS															
Total PV of Operational Benefits	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total PV of Customer Benefits	$ 19,526,741	$ 20,014,910	$ 20,515,283	$ 21,028,165	$ 21,553,869	$ 22,092,716	$ 22,645,033	$ 23,211,159	$ 23,791,438	$ 24,386,224	$ 24,995,880	$ 25,620,777	$ 26,261,296	$ 26,917,829	$ 27,590,774
Total PV of Combined Benefits	$ 19,526,741	$ 20,014,910	$ 20,515,283	$ 21,028,165	$ 21,553,869	$ 22,092,716	$ 22,645,033	$ 23,211,159	$ 23,791,438	$ 24,386,224	$ 24,995,880	$ 25,620,777	$ 26,261,296	$ 26,917,829	$ 27,590,774
Project and On-Going Costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Escalation	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Deployment percentage															
Combined NPV of Project	$ 19,526,741	$ 20,014,910	$ 20,515,283	$ 21,028,165	$ 21,553,869	$ 22,092,716	$ 22,645,033	$ 23,211,159	$ 23,791,438	$ 24,386,224	$ 24,995,880	$ 25,620,777	$ 26,261,296	$ 26,917,829	$ 27,590,774
Ratio of NPV Benefits to NPV Costs															
Cumulative Net Benefits	$ 38,577,221	$ 39,541,651	$ 40,530,193	$ 41,543,447	$ 42,582,034	$ 43,646,584	$ 44,737,749	$ 45,856,193	$ 47,002,598	$ 48,177,662	$ 49,382,104	$ 50,616,657	$ 51,882,073	$ 53,179,125	$ 54,508,603

ELECTRONICALLY FILED - 2019 March 12 4:12 PM - SCPSC - Docket # 2018-319-E - Page 80 of 80

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ATORY JURISDICTION:

	2047	2048	2049
	28	29	30
Project Capital	$ -	$ -	$ -
Project O&M	$ -	$ -	$ -
Total Project Costs	$ -	$ -	$ -
N/A	$ -	$ -	$ -
Total On-Going O&M	$ -	$ -	$ -
IONAL BENEFITS			
Outage and Restoration			
Non-MED Restoration costs	$ -	$ -	$ -
MED Restoration costs	$ -	$ -	$ -
Total Outage and Restoration Benefits	-	-	-
Vegetation Management			
Eliminate of VM cycle charges	$ -	$ -	$ -
Avoid demand trimming costs	$ -	$ -	$ -
Total Vegetation Management Benefits	$ -	$ -	$ -
Asset Management			
Elimination of deteriorated conductor replacement costs	$ -	$ -	$ -
Elimination of pole replacement costs	$ -	$ -	$ -
Total Asset Management Benefits	$ -	$ -	$ -
MER BENEFITS			
Customer			
Outage Savings (non-MED) - Residential Customers	$ 66,848	$ 68,519	$ 70,232
Outage Savings (non-MED) - Small C&I Customers	$ 2,654,526	$ 2,720,889	$ 2,788,911
Outage Savings (non-MED) - Medium & Large C&I Customers	$ 5,613,381	$ 5,753,715	$ 5,897,558
Outage Savings (MED) - Residential Customers	$ 116,865	$ 119,787	$ 122,781
Outage Savings (MED) - Small C&I Customers	$ 8,756,787	$ 8,975,707	$ 9,200,100
Outage Savings (MED) - Medium & Large C&I Customers	$ 13,793,510	$ 14,138,348	$ 14,491,807
Total Customer Benefits	$ 28,280,544	$ 28,987,557	$ 29,712,246
ED COSTS AND BENEFITS			
Total PV of Operational Benefits	$ -	$ -	$ -
Total PV of Customer Benefits	$ 28,280,544	$ 28,987,557	$ 29,712,246
Total PV of Combined Benefits	$ 28,280,544	$ 28,987,557	$ 29,712,246
Project and On-Going Costs	$ -	$ -	$ -
Escalation	$ -	$ -	$ -
Deployment percentage			
Combined NPV of Project	$ 28,280,544	$ 28,987,557	$ 29,712,246
Ratio of NPV Benefits to NPV Costs			
Cumulative Net Benefits	$ 55,871,318	$ 57,268,101	$ 58,699,804