AUSLEY MCMULLEN
ATTORNEYS AND COUNSELORS AT LAW

123 SOUTH CALHOUN STREET
P.O. BOX 391 (ZIP 32302)
TALLAHASSEE, FLORIDA 32301
(850) 224-9115 FAX (850) 222-7560

November 30, 2017

VIA: ELECTRONIC FILING

Ms. Carlotta S. Stauffer
Commission Clerk
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, Florida 32399-0850

Re: Petition for approval of conservation street and outdoor lighting conversion program, by Tampa Electric Company; FPSC Docket No. 20170199-EI

Dear Ms. Stauffer:

Attached are Tampa Electric Company's responses to Staff's Second Data Requests Nos. 1-12. The Excel portions of responses to Data Request Nos. 11 and 12 are being hand delivered on a CD via separate cover letter.

Thank you for your assistance in connection with this matter.

Sincerely,

James D. Beasley

JDB/pp
Attachment

cc: Phillip Ellis (w/attachment)

TAMPA ELECTRIC COMPANY
DOCKET NO. 20170199-EI
STAFF'S SECOND DATA REQUEST
REQUEST NO. 1
BATES STAMPED PAGE: 1
FILED: NOVEMBER 30, 2017

1. Is it correct that TECO has not requested approval to recover/amortize street and outdoor lighting conversion costs through a Capital Recovery Schedule in its Petition filed in Docket No. 20170199-EI?

A. Yes, it is correct that Tampa Electric is not requesting approval of the remaining unamortized depreciation of the street and outdoor lighting conversion costs through a Capital Recovery Schedule in the company's petition filed in Docket No. 20170199-EI. The company proposed the method of recovery which will be based upon the actual number of qualifying LED luminaires that are replacing the existing Metal Halide ("MH") and High-Pressure Sodium ("HPS") luminaires. As the actual existing fixtures are replaced and retired, the remaining book value associated with the existing fixtures, which is $180.06 per fixture, will be recovered through the Energy Conservation Cost Recovery Clause ("ECCR"). Following this methodology, the recovery of the total remaining book value of the existing lighting will coincide with the actual conversion of the luminaires.

If approved, the tracking of these replacements will be performed monthly. At the end of each calendar year, the replacements totals will be reported in the company's annual DSM report as well as in the necessary ECCR Docket filings.

The company does recognize that some confusion was created in this docket when the capital cost recovery schedule was included in Docket No. 20170198. This was explained in the informal meeting with Commission Staff and other interested parties on November 17, 2017 at 1:30pm. The proposed capital recovery schedule was thought to be a less burdensome way for the company to recover the unamortized depreciation. However, using such an approach may not accurately reflect the actual number of qualifying luminaires that are replaced each month or in each year of the proposed five-year conversion program.

2. If your response to Question 1 above is negative, please identify the specific paragraph(s) of the Petition wherein a Capital Recovery Schedule was requested by the Company.

A. Not applicable.

3. Please identify any Commission orders by which asset cost recovery via a Capital Recovery Schedule was approved through the Energy Conservation Cost Recovery Clause (ECCR).

A. Tampa Electric is not aware of instances in which asset cost recovery has been accomplished via a Capital Recovery Schedule, though Tampa Electric is not proposing to recover the undepreciated costs associated with its existing lighting to be recovered in this manner as discussed in the response to Staff's Data Second Request No. 1. The following Commission orders identify asset cost recovery via the ECCR approved by the Commission:

Order No. 9974, Docket No. 810050-PU, issued April 24, 1981
Order No. 11002, Docket No. 19800701-EG, issued July 19, 1982
Order No. 11211, Docket 19820002-PU, issued September 29, 1982

The company has also included the Commission Staff's recommendation from Docket No. 19800701-EG heard at the Agenda conference on March 2, 1982. The recommendation outlines the same method for recovering the remaining unamortized depreciation that Tampa Electric is seeking in the proposed conversion program.

AGENDA 3/2/82
ITEM NO. 15

2/23/82 xc: GPW WJC

MEMORANDUM

February 18, 1982

TO : COMMISSION CLERK MM WS

FROM: ELECTRIC AND GAS (MEETER, STANLEY, WOERNER)

RE : DOCKET NUMBER 800701-EG - PETITION OF TAMPA ELECTRIC COMPANY (TECO) FOR APPROVAL OF CONSERVATION STREET AND OUTDOOR LIGHTING CONVERSION PROGRAM

PROPOSED AGENCY ACTION - AGENDA MARCH 2, 1982

ISSUES

1. Whether to approve TECO's proposed Conservation Street and Outdoor Lighting Conversion Program for inclusion into their Conservation Plan because the program is:

a. Cost-Effective

b. can be monitored.

2. Whether to approve the revised tariff sheets proposed by TECO.

RECOMMENDATIONS

We recommend that:

1. The proposed street light program, except for the 3,600 lumen fixture, should be approved because:

a. the program is cost-effective

b. the program can be monitored.

2. The tariff sheets filed by TECO should be approved. However, conservation cost recovery should not be allowed for the conversion of the mercury vapor 3,600 lumen fixture.

DISCUSSION

In FPSC Order Number 9669, the Commission approved the conservation programs submitted by TECO and suggested a high pressure sodium street light program should be proposed. TECO has completed their evaluation of the high pressure sodium light program and found that the program is cost-effective.

TECO proposes to replace 84,825 existing outdoor lights with high pressure sodium lights over an eight year period. Monitoring will consist of keeping track of the number of conversions. Statistical data on kw and kwH reductions is not necessary because these reductions are known. The present value of net benefits to the utility from this program was projected by TECO to be over $10 million and the benefit/cost ratio was projected to be 2.2.

Staff believes TECO has provided sufficient information in its submittal and in subsequent communication to justify the program's cost-effectiveness, as proposed. However, staff does not believe it is cost-effective to convert 3,600 lumen lights. This recommendation is inconsistent with the present commission policy toward FP&L and FPC which are currently allowed conservation cost recovery on their smallest lights. At the time that FPC and FP&L programs were approved staff felt that if a program was cost-effective on a total program basis the Commission should not delay conservation actions by disapproving portions of programs which might be very small. However, now that we've had more experience in this area and because the 3,600 lumen conversions represent such a large portion of TECO program we feel that non-cost-effective conversions would not benefit the ratepayers in this case.

In the tariffs filed with this request, TECO requests the addition of 50 and 150 watt high pressure sodium vapor lamps to its present selection of high pressure sodium lamp offerings. The company filed these revised tariffs in November with its petition for approval of its Conservation Street and Outdoor Lighting Conservation Program. After discussion with the staff, the company reduced the operating wattages used in calculations for the two lamps. The reduced wattages result in lower energy and demand charges for the two lamps. Attached is a copy of the latest version of the tariffs in "legislature" format. (See Attachment 2). The staff has reviewed the cost data for the lamps and feels that it is reasonable. A more thorough examination of the consistency of the charges between the various lighting tariffs will be made in the upcoming TECO rate case.

Attachment 1 is a copy of the cost-effectiveness analysis.

Attachment 2 is the proposed revised tariff sheets.

GWW/dm

Attachments

cc: General Counsel
Legal Department

FULL CONSERVATION PROGRAM

GENERATION ADDITIONS AND CAPACITY PURCHASES ASSUMPTIONS

STREET & OUTDOOR LIGHTING PROGRAM

YEAR	With Conservation (MW) Gen. Additions	With Conservation (MW) Capacity Purchases	Without Conservation (MW) Gen. Additions	Without Conservation (MW) Capacity Purchases	Available Capacity Savings	Reduced GWH	Fuel Savings	Maintenance Savings
82		150		150	0	5.9	312.2	0
83		250		300	50	11.8	1125.0	128.6
84		250		300	50	17.7	2050.1	138.1
85	400	200	400	300	100	23.6	3228.3	141.6
86		200		300	100	29.5	4653.9	144.6
87		100		300	200	35.3	6892.5	300.1
88		100		300	200	41.2	7793.8	300.8
89	400	100	800	300	600	47.1	(3016.2)	3016.2
90	400		400		400	47.1	(282.2)	3320.6
91					400	41.2	(2020.6)	3296.0
92					400	35.3	(4029.4)	3314.7
93	400				0	29.5	5625.9	0
94			400		400	23.6	(5136.9)	3606.1
95	400				0	17.7	4559.6	0
96			400		400	11.8	(4677.5)	3541.2
97	400				0	5.9	1572.9	0

7

RES
2/15/82

TAMPA ELECTRIC COMPANY
DOCKET NO. 20170199-EI
STAFF'S SECOND DATA REQUEST
FILED: NOVEMBER 30, 2017

NAME OF UTILITY: TAMPA ELECTRIC COMPANY

TAMPA ELECTRIC COMP
DOCKET NO. 800701-EG
APPENDIX C
PAGE 1 OF 1

TITLE OF PROGRAM: Conservation Street and Outdoor Lighting Conversion Program

BRIEF DESCRIPTION OF PROGRAM: Eight year conversion of existing mercury vapor lighting to more efficient high pressure sodium

PRIMARY PURPOSE OF PROGRAM: Energy Conservation

COST - BENEFIT ANALYSIS

	ESTIMATED COMPANY EXPENDITURES						REDUCTIONS				ESTIMATED COMPANY BENEFITS					
	1 ✓	2	3	4	5	6	7	8	9	10	11	12 ✓	13 ✓	14	15	16
YEAR	EQUIPMENT	MAINTENANCE	PERSONNEL	ADVERTISING	TOTAL	PRESENT VALUE OF TOTAL	PER CUSTOMER KW	PER CUSTOMER KWHR.	SYSTEM MW	SYSTEM GWH	CAPACITY SAVINGS	FUEL PURCHASE* SAVINGS	MAINTENANCE**	PERSONNEL	TOTAL	PRESENT VALUE OF TOTAL
	$ (000)	$ (000)	$ (000)	$ (000)	$ (000)	$ (000)	N/A	N/A			$(000) N/A	$ (000)	$ (000)	$ (000)	$ (000)	$ (000)
1981	-	-	-	-	-	-			-	-		-	-	-	-	-
1982	199.4	-	175.3	-	374.7	309.7			1.5	5.9		312.2	0	-	312.2	257.9
1983	412.8		362.9		775.7	582.8			2.9	11.8		1,125.0	128.6		1,253.6	941.8
1984	641.0		563.7		1,204.7	822.8			4.4	17.7		2,050.1	138.1		2,188.2	1,494.5
1985	885.4		778.4		1,663.8	1,033.1			5.9	23.6		3,228.3	141.6		3,369.9	2,092.4
1986	1,146.8		1,008.3		2,155.1	1,216.6			7.3	29.5		4,653.9	144.6		4,798.5	2,708.8
1987	1,426.5		1,254.3		2,680.8	1,375.8			8.6	35.3		6,892.3	300.1		7,192.6	3,691.2
1988	1,725.0		1,516.4		3,241.4	1,512.1			10.3	41.2		7,793.8	300.8		8,094.6	3,776.1
1989	2,045.1		1,797.9		3,843.0	1,629.8			11.7	47.1		(3,016.2)	3,016.2 ✓		0	0
1990									11.7	47.1		(282.8)	3,320.6		3,037.8	1,171.1
1991									10.3	41.2		(2,020.6)	3,296.0		1,275.4	447.0
1992									8.6	35.3		(4,029.4)	3,314.7		(714.7)	(227.7)
1993									7.3	29.5		5,625.9	0		5,625.9	1,623.8
1994									5.9	23.6		(5,136.9)	3,606.1		(1,530.8)	(403.1)
1995									4.4	17.7		4,559.6	0		4,559.6	1,091.6
1996									2.9	11.8		(4,677.5)	3,541.2		(1,136.3)	(224.8)
18									1.5	5.9		1,572.9	0		1,572.9	314.4
19.										-		-	-		-	
1999										-		-	-		-	
Cumulative Total	$8,482.0		$7,457.2		$15,939.2	$8,482.7				424.2		$18,650.8	$ 21,248.6		$ 39,899.4	$ 18,761.0

Net Benefits (Costs)

From Cumulative Totals
Col 16-Col. 6 $10,278,300

Benefit/Cost Ratio
From Cumulative Totals
Col. 16 ÷ Col. 6 2.2

Method and justification used to determine the cost effectiveness of this program: (attach additional sheets if necessary)

Revised 1/22/82

* Includes Purchase
** Includes Personnel

N/A = Not Applicable

TAMPA ELECTRIC COMPANY
DOCKET NO. 20170199-EI
STAFF'S SECOND DATA REQUEST
FILED: NOVEMBER 30, 2017

Backup Data for
Columns 12 and 13
Docket No. 800701-EG
Appendix C
Page 1 of 1

FUEL AND MAINTENANCE SAVINGS

The variation in fuel and maintenance expense savings as depicted in Columns 12 and 13 of Appendix C, Page 1 of 1, Docket No. 800701-EG can be explained as follows:

Years 82 through 88:

1. The maintenance savings in these years are directly related to savings in capacity purchases as listed on the Generation Additions and Capacity Purchases Table attached. The assumed cost of the purchased gas turbine capacity maintenance is $2.80 per Kw in 1981 dollars It has been escalated and also increased due to the increased MW savings through 1988.

2. The fuel savings is directly related to the avoided purchased capacity fuel cost and can also be seen on the attached.

Years 89 through 97:

1. The maintenance savings starting in year 1989 takes a definite jump in value. This is due to the delayed installation of 400MW of in-house coal fired capacity. The maintenance cost for this capacity was assumed at $29 per Kw in 1981 dollars. Notice that this is more than 10 times the purchased gas turbine maintenance, thus the big increase. Years 93, 95, and 97 show this maintenance savings at zero. This is because we have the same generation capacity in both the with and without conservation scenarios, therefore, the capacity savings is zero and likewise the maintenance savings zero.

2. Starting in year 1989 and thereafter except in those years when no capacity saving exists, the fuel cost savings becomes negative or an increased cost for the conservation option. This is from the generation available being less efficient than the generation with newer more efficient units as originally planned. The positive fuel savings in years 93, 95, and 97 comes about because the generation mix in these years is as originally planned in the no conservation scenario and simply shows a savings due to the reduced consumption.

3. Note: The fuel saving and the maintenance savings in year 1989 appear as the same number except the fuel purchase is negative. This occurance is totally a coincidence.

Attachment

RES
2/15/82

COST - BENEFIT BACK-UP DATA

ESTIMATED COMPANY EXPENDITURES

EQUIPMENT (Material)

HPS Lamp Size	Units	Unit Material Cost ('81)	Investment Total ('81 dollars)
50 W	39,756	$103.45	$4,112,758
100 W	20,664	106.21	2,194,723
150 W	21,138	108.46	2,292,628
400 W	3,267	179.83	587,505
	84,825		$9,187,614

1st Year	1982	Equip. Salvage Esc. Fxd. Chg. Rate $\frac{9,187.6 - 207.3}{8} \times 1.07 \times .166$	= $ 199.4	Fixed Charges
2nd Year	1983	$(1122.5 \times (1.07)^2 \times .166)$ + yr. 1	= 412.8	
	1984	$(1122.5 \times (1.07)^3 \times .166)$ + yr. 2	= 641.0	
	1985	$(1122.5 \times (1.07)^4 \times .166)$ + yr. 3	= 885.4	
	1986	$(1122.5 \times (1.07)^5 \times .166)$ + yr. 4	= 1146.8	
	1987	$(1122.5 \times (1.07)^6 \times .166)$ + yr. 5	= 1426.5	
	1988	$(1122.5 \times (1.07)^7 \times .166)$ + yr. 6	= 1725.0	
	1989	$(1122.5 \times (1.07)^8 \times .166)$ + yr. 7	= 2045.1	
		Equipment Total	$8482.0	

1/22/82

MAINTENANCE

Assumed equal for both systems.

PERSONNEL (Labor)

HPS Lamp Size	Units	Unit Material Cost ('81)	Investment Total ('81 dollars)
50 W	39,756	92.61	$3,681,803
100 W	20,664	92.88	1,919,272
150 W	21,138	93.11	1,968,159
400 W	3,267	100.24	327,484
			$7,896,718

		Labor Escalation Fxd. Chg. Rate			
1st Year	1982	7,896.7 x 1.07 x .166) / 8	1.055	= $ 175.3	Fixed Charges
2nd Year	1983	(987.1 x (1.07)^2 x .166) + yr. 1	1.130	= 362.9	
	1984	(987.1 x (1.07)^3 x .166) + yr. 2	1.209	= 563.7	
	1985	(987.1 x (1.07)^4 x .166) + yr. 3	1.294	= 778.4	
	1986	(987.1 x (1.07)^5 x .166) + yr. 4	1.385	= 1008.3	
	1987	(987.1 x (1.07)^6 x .166) + yr. 5	1.481	= 1254.3	
	1988	(987.1 x (1.07)^7 x .166) + yr. 6	1.585	= 1516.4	
	1989	(987.1 x (1.07)^8 x .166) + yr. 7	1.686	= 1797.9	
		Personnel Total		$7457.2	

1/22/82

ADVERTISING

Assumed zero.

TOTAL

ANNUAL FIXED CHARGES

Year	(Material) Equipment	(Labor) Personnel	Total
1982	199.4	175.3	374.7
1983	412.8	362.9	775.7
1984	641.0	563.7	1204.7
1985	885.4	778.4	1663.8
1986	1146.8	1008.3	2155.1
1987	1426.5	1254.3	2680.8
1988	1725.0	1516.4	3241.4
1989	2045.1	1797.9	3843.0
	$ 8482.0	$ 7457.2	$ 15939.2

PRESENT VALUE (of Est. Co. Expenditures)

Year	Fixed Charge Total		Single Payment Present Worth Factor @ 10%*		Present Value
81	$ 0	x	.9041	=	$ 0
82	347.7	x	.8261	=	309.7
83	775.7	x	.7513	=	582.8
84	1204.7	x	.6830	=	822.8
85	1663.8	x	.6209	=	1033.1
86	2155.1	x	.5645	=	1216.6
87	2680.8	x	.5132	=	1375.8
88	3241.4	x	.4665	=	1512.1
89	$ 3843.0	x	.4241	=	1629.8
					$ 8482.7

* 10% Discount Rate supplied by Commission

1/22/82

SYSTEM MW REDUCTIONS *

See "Energy Savings/Year" attachment where total MW reduction is developed equal to 11.7 MW.

Year			
1982	$\frac{11.7}{8}$ MW	=	1.5
1983	2 $\frac{(11.7)}{8}$	=	2.9
1984	3 (1.46)	=	4.4
1985	4 (1.46)	=	5.8
1986	5 (1.46)	=	7.3
1987	6 (1.46)	=	8.6
1988	7 (1.46)	=	10.3
1989	8 (1.46)	=	11.7
1990			11.7 **
1991			10.3 **
1992			8.6 **
1993			7.3 **
1994			5.8 **
1995			4.4 **
1996			2.9 **
1997			1.5 **

* All MW reductions are assumed to be off-peak and therefore provide no benefits.

** The capacity and energy reductions incurred after 1989 are based on the following quotation from Order #9669, dated 11/26/80, "with respect to benefits, each utility is to consider benefits that occur up to 10 years after the date of implementation of the conservation measure." The step down approach was done under instruction from Commission staff.

1/22/82

SYSTEM GWH REDUCTIONS

See "Energy Savings/Year attachment where total implemented energy savings per year is equal to 47, 128, 240 Kwh.

Year			
1982	$\frac{47.1}{8}$ Years	GWH =	5.9
1983	2 (5.89)	=	11.8
1984	3 (5.89)	=	17.7
1985	4 (5.89)	=	23.6
1986	5 (5.89)	=	29.5
1987	6 (5.89)	=	35.3
1988	7 (5.89)	=	41.2
1989	8 (5.89)	=	47.1
1990			47.1 **
1991			41.2 **
1992			35.3 **
1993			29.5 **
1994			23.6 **
1995			17.7 **
1996			11.8 **
1997			5.9 **
	Total		424.2

* All MW reductions are assumed to be off-peak and therefore provide no benefits.

** The capacity and energy reductions incurred after 1989 are based on the following quotation form Order #9669, dated 11/26/80, "with respect to benefits, each utility is to consider benefits that occur up to 10 years after the date of implementation of the conservation measure". The step down approach was done under instruction from Commission staff.

1/22/82

CAPACITY SAVINGS

None was included, however, it is estimated that approximately 23% of our street and area lighting load contributes to the system peak load.

FUEL PURCHASE SAVINGS

This savings was determined using the cost per KWH savings average determined from the applicable programs of the overall conservation and load management program. Those applicable energy savings programs are: Cogeneration, Heat Pump, Energy Audits and Efficient Buildings. The resultant costs per KWH used are shown in the cost/kwh column below. The savings are determined by multiplying the cost/kwh by the kwh reductions shown under "System GWH Reductions".

Year	Cost/Kwh		Kwh		Savings
82	$ .053	x	5.9×10^6	=	$ 312.2
83	.095	x	11.8×10^6	=	1125.0
84	.116	x	17.7×10^6	=	2050.1
85	.137	x	23.6×10^6	=	3228.3
86	.158	x	29.5×10^6	=	4653.9
87	.195	x	35.3×10^6	=	6892.5
88	.189	x	41.2×10^6	=	7793.8
89	-.064*	x	47.1×10^6	=	(3016.2)
90	-.006*	x	47.1×10^6	=	(282.8)
91	-.049*	x	41.2×10^6	=	(2020.6)
92	-.114*	x	35.3×10^6	=	(4029.4)
93	.191	x	29.5×10^6	=	5625.9
94	-.218*	x	23.6×10^6	=	(5136.9)
95	.256	x	17.7×10^6	=	4559.6
96	-.397*	x	11.8×10^6	=	(4677.5)
97	.266	x	5.9×10^6	=	1572.9
				Total	$ 18650.8

* Note: The negative numbers are caused when generation expansion delays occur causing a less efficient scenario as compared to the original generation expansion with no conservation in place.

11/24/81

MAINTENANCE SAVINGS

Maintenance Savings were handled much the same way as the fuel purchase savings. The savings was determined using a maintenance cost per KWH average of applicable programs of the overall conservation and load management program. Those programs were the same as those in the fuel savings area. The resultant costs per KWH used are shown in the cost/kwh column below. The savings are determined by multiplying the cost/kwh by the kwh reductions shown under "System GWH Reductions".

Year	Cost/Kwh	Kwh		Savings
82	0	5.9×10^6	=	0
83	.0109	11.8×10^6	=	128.6
84	.0078	17.7×10^6	=	138.1
85	.0060	23.6×10^6	=	141.6
86	.0049	29.5×10^6	=	144.6
87	.0085	35.3×10^6	=	300.1
88	.0073	41.2×10^6	=	300.8
89	.0640	47.1×10^6	=	3016.2
90	.0705	47.1×10^6	=	3320.6
91	.0800	41.2×10^6	=	3296.0
92	.0939	35.3×10^6	=	3314.7
93	0	29.5×10^6	=	0
94	.1528	23.6×10^6	=	3606.1
95	0	17.7×10^6	=	0
96	.3001	11.8×10^6	=	3541.2
97	0	5.9×10^6	=	0
		Total		$21,248

11/24/81

PERSONNEL

**Note that maintenance savings includes all entries for the personnel column.

TOTAL

This column contains the sum of the Estimated Company Benefits, namely fuel purchase and maintenance savings.

PRESENT VALUE (of Est. Co. Benefits)

Year	Total Benefits		Single Payment Present Worth Factor @ 10%*		Present Value
81	0	x	.9041	=	$ 0
82	312.2	x	.8261	=	257.9
83	1253.6	x	.7513	=	941.8
84	2188.2	x	.6830	=	1494.5
85	3369.9	x	.6209	=	2092.4
86	4798.5	x	.5645	=	2708.8
87	7192.6	x	.4241	=	3691.2
			etc.		
97	1572.9	x	.1999	=	1572.9
				Total	$18761.0

* 10% Discount Rate supplied by Commission.

11/24/81

NET BENEFITS

Present Value of Estimated Company Benefits	$18,761,000
Present Value of Estimated Company Expenditures	8,482,700
Net Benefits	$10,278,300

BENEFIT/COST RATIO

Present Value of Estimated Company Benefits ÷ Present Value of Estimated Company Expenditures = Benefit/Cost Ratio

$$\frac{\$18,761,000}{8,482,700} = 2.2$$

11/24/81

STREET AND OUTDOOR LIGHTING PROGRAM
CONVERSION COSTS AND SAVINGS TIMETABLE

EXISTING INSTALLATIONS ONLY

Year	Quantity	Material Cost (000)	Labor Cost (000)	GWH Savings
82	10,600	$ 1,201.1	$ 1,056.2	5.9
83	10,600	1,285.2	1,130.1	11.8
84	10,600	1,375.1	1,209.2	17.7
85	10,600	1,471.4	1,293.9	23.6
86	10,600	1,574.4	1,384.5	29.5
87	10,600	1,684.6	1,481.4	35.3
88	10,600	1,802.5	1,585.0	41.2
89	10,600	1,928.7	1,696.0	47.1
		$12,323.0	$10,836.3	

1/22/82

BACK-UP DATA
STREET AND OUTDOOR LIGHTING PROGRAM
CONVERSION COSTS AND SAVINGS TIMETABLE

Quantity

$\frac{84835}{8}$ Total Units / Conversion Years = 10,600 lights per year

Material Cost

	Units	Material Cost ('81)	
50 W	39,756	$103.45 /unit	
100 W	20,664	106.21	$9,187,614
150 W	21,138	108.46	
400 W	3,267	$179.83	

Year	Material	Salvage	Escalation		Total
82	$\frac{9187.6 - 207.3}{8 \text{ Years}}$	x	1.07	=	$ 1201.1
83	1122.5	x	$(1.07)^2$	=	1285.2
84	1122.5	x	$(1.07)^3$	=	1375.1
85	1122.5	x	$(1.07)^4$	=	1471.4
86	1122.5	x	$(1.07)^5$	=	1574.4
87	1122.5	x	$(1.07)^6$	=	1684.6
88	1122.5	x	$(1.07)^7$	=	1802.5
89	1122.5	x	$(1.07)^8$	=	1928.7
				Total	$12323.0

1/22/82

Labor Costs

	Units	Labor Cost ('81)	
50 W	39,756	$ 92.61 /unit	
100 W	20,664	92.88	$7,896,718
150 W	21,138	93.11	
400 W	3,267	100.24	

Year	Labor		Escalation		Total(000)
82	7896.7 / 8 Years	x	1.07	=	$ 1056.2
83	987.1	x	$(1.07)^2$	=	1130.1
84	987.1	x	$(1.07)^3$	=	1209.2
85	987.1	x	$(1.07)^4$	=	1293.9
86	987.1	x	$(1.07)^5$	=	1384.5
87	987.1	x	$(1.07)^6$	=	1481.4
88	987.1	x	$(1.07)^7$	=	1585.0
89	987.1	x	$(1.07)^8$	=	1696.0
				Total	$10836.3

GWH Savings

Annual savings when all are converted is 47,128,240 Kwh. (From R. McCullough). See other back-up data for year by year reduction.

1/22/82

BACK UP DATA
HIGH PRESSURE SODIUM CONVERSION

MATERIAL & LABOR COSTS

Material	50W 4,000L	100W 9,500L	150W 16,000L	400W 50,000L
Luminaire	66.33	67.39	69.39	129.66
Lamp	11.00	12.70	12.95	22.25
Bracket	15.15	15.15	15.15	16.66
Photo Control	3.10	3.10	3.10	3.10
P & B Cable	.87	.87	.87	1.16
Misc. Connectors, etc.	7.00	7.00	7.00	7.00
Total Material	103.45	106.21	108.46	179.83
Labor & Vehicles				
Install Luminaire	52.95	52.95	52.95	52.95
Engineering	29.31	29.31	29.31	29.31
Material Handling	10.35	10.62	10.85	17.98
Total Labor & Vehicle	92.61	92.88	93.11	100.24
Total Installed Cost	196.06	199.09	201.57	280.07

8/28/81 RCM

BACK UP DATA
HIGH PRESSURE SODIUM CONVERSION
LABOR (Personnel) INFORMATION
(Based on 10 Light Job)

	50W 4,000L	100W 9,500L	150W 16,000L	400W 50,000L
Install Luminaire Load - 1/2 hr. Travel Time - 15 min. Make-Up Time - 15 min. Install Light - 15 min. Make connections & Test - 5 min.	$52.95	$52.95	$52.95	$ 52.95
Engineering Travel Time - 1/2 hr. Field Work - 1/2 hr. W/O Time - 1/2 hr.	29.31	29.31	29.31	29.31
Material Handling 10% of Mat'l Cost	10.35	10.62	10.85	17.98
Totals	$92.61	$92.88	$93.11	$100.24

RCM 1/22/82

BACK UP DATA

HIGH PRESSURE SODIUM CONVERSION

ENERGY SAVINGS/YEAR

Number Conversion Units	Existing Size Lumens	KW/Unit	H.P.S. Size Lumens	KW/Unit	KW/Unit Reduction	MW Total Reduction
39,756	3,600	.124	4,000	.063	.061	2.4
19,271	7,000	.218	9,500	.156	.062	1.2
1,393	11,000	.309	9,500	.156	.153	.2
21,138	20,000	.491	16,000	.216	.275	5.8
1,417	55,000	1.177	50,000	.526	.651	.9
1,850	100,000	1.182	50,000	.526	.656	1.2
					Grand Total Reduction	11.7

Energy Savings/Year (total implemented)

11,782.06 KW x 4,000 hours/year = 47,128,240 Kwh.

8/27/81 RCM

BACK UP DATA
STREET AND OUTDOOR LIGHTING CONVERSION PROGRAM
EIGHT YEAR CHANGEOUT SCHEDULE

NUMBER OF UNITS CONVERTED

This was determined assuming that an equal number of lights of similar size would be converted each year.

$$\frac{84{,}825 \text{ lights}}{8 \text{ years}} = 10{,}600 \text{ lights per year}$$

The 84,825 is made up of:

No.	No. Per Year	Wattage	Lumens	Type
39,756	4,970	100	3,600	MV (Mercury Vapor)
19,271	2,408	175	7,000	MV
1,393	174	250	11,000	MV
21,138	2,642	400	20,000	MV
1,417	176	1,000	55,000	MV
1,850	230	1,000	100,000	MH (Metal Halide)
84,825	10,600			

11/24/81

COST RECOVERY REQUIREMENTS

ESTIMATED REMOVAL COSTS

The estimated removal cost was taken from Distribution Engineering's estimating data as $15.92 per fixture.

Units/Year		Cost/Unit	=	Total Cost/Year ('81)
10,600	x	$15.92	=	$168,752

For 82:

Escalation

$168,752 x 1.07 = $180.6 Thousand

For 83:

$168,752 x $(1.07)^2$ = 193.2 Thousand

etc.

UNAMORTIZED PLANT

The Unamortized plant was determined by Plant Accounting Department (Jim Wannamaker). Their worksheet is attached.

TOTAL

The total column shows the total Cost Recovery Requirements for 1982 through 1989 (completion year for the conversion program).

11/24/81

CALCULATION OF THE UNRECOVERED COST OF EXISTING MERCURY VAPOR STREET LIGHT FIXTURES ASSUMING EQUAL GROUP RETIREMENTS OVER THE PERIOD 1982 - 1989

DESCRIPTION	1982 $	1983 $	1984 $	1985 $	1986 $	1987 $	1988 $	1989 $
Depreciable Base*	717,551	717,551	717,551	717,551	717,551	717,551	717,551	717,551
Accumulated Depreciation*	(35,975)*	(35,975)	(35,975)	(35,975)	(35,975)	(35,975)	(35,975)	(35,975)
Unrecovered Investment*	681,576	681,576	681,576	681,576	681,576	681,576	681,576	681,57
Projected Depreciation**	(75,486)	(113,229)	(150,972)	(188,715)	(226,458)	(264,201)	(301,944)	(339,687)
Unrecovered Investment	606,090	568,347	530,604	492,861	455,118	417,375	379,632	341,889

27

*Incremental balances as at 12/31/80.

*Assuming a 19 year average service life (5.26% / yr.) based upon an engineer's estimate. The yearly incremental depreciation accrual would be $37,743. 1982 includes a two year increment of depreciation ($75,486).

* Note: Assist verification caused use of a sizeable amount of the already accumulated depreciation reserve when the book retirement took place to bring the records in line with factual data.

Approved By: J. B. Hammontree

Prepared By: R. A. Walker

Date: Nov. 20, 1981

TAMPA ELECTRIC COMPANY
DOCKET NO. 20170199-EI
STAFF'S SECOND DATA REQUEST
FILED: NOVEMBER 30, 2017

MEMORANDUM

November 20, 1981

TO: Dick Stephens

FROM: Jim Wannamaker

RE: Feasibility Study to convert existing Mercury Vapor lights to High Pressure Sodium.

In answer to your question as to the company's unrecovered investment in mercury vapor lights of 12/31/80, the attached exhibit is submitted. As per your estimates, retirement of these fixtures will take place equally over the next 8 years and the life of the fixture is approximately 19 years.

When this program is approved by the FPSC, I understand that I must set up procedures to accomplish the following:

1. Determine the unrecovered cost of street and area light retirements replaced by high pressure sodium. Transfer this cost to the appropriate account to initiate collection of these dollars through the energy conservation clause.

2. Set up the necessary system to identify the related cost of removal and salvage. Transfer these dollars to the energy conservation clause collection account.

Please advise me when the necessary regulating approval has been concluded.

JW/eg

cc: J. Rowe, Jr.
D. Mestas
L. Brier

COMPARISON OF TAMPA ELECTRIC COMPANY'S
MERCURY VAPOR AND HIGH PRESSURE SODIUM VAPOR
STREETLIGHT AND GENERAL OUTDOOR LIGHTING RATES

STREETLIGHT LIGHTING SERVICE

Mercury Vapor Wood Pole - Overhead[a]		High Pressure Sodium Vapor Wood Pole - Overhead	Existing Pole[b]	Wood Pole[c]
3,600 Lumen	$4.97	4,000 Lumen	$5.00	$6.45
7,000 Lumen	7.10	5,800 Lumen	5.62	7.07
11,000 Lumen	8.77	9,500 Lumen	6.96	8.41
20,000 Lumen	11.69	16,000 Lumen	8.16	9.89
		27,500 Lumen	10.95	12.69
55,000 Lumen	22.06	50,000 Lumen	15.36	17.09

Ornamental Metal or Concrete Pole - Overhead	1 Light Per Pole	2 Lights Per Pole	Concrete Pole - Overhead	1 Light Per Pole	2 Lights Per Pole
3,600 Lumen	$6.71	$11.03	4,000 Lumen	$8.02	$12.17
7,000 Lumen	8.24	13.97	5,800 Lumen	8.64	13.41
11,000 Lumen	10.67		9,500 Lumen	9.98	16.09
20,000 Lumen	13.42	24.36	16,000 Lumen	11.94	19.51
			27,500 Lumen	14.73	25.09
55,000 Lumen	23.30	44.11	50,000 Lumen	19.13	34.09

Ornamental Metal or Concrete Pole - Underground	1 Light Per Pole	2 Lights Per Pole	Concrete Pole - Underground	1 Light Per Pole	2 Lights Per Pole
3,600 Lumen	$9.26	$14.29	4,000 Lumen	$10.91	$15.06
7,000 Lumen	11.60	16.95	5,800 Lumen	11.52	16.29
11,000 Lumen	13.06	21.02	9,500 Lumen	12.87	18.98
20,000 Lumen	15.65	25.72	16,000 Lumen	21.96	29.53
			27,500 Lumen	24.75	35.11
55,000 Lumen	27.38	48.18	50,000 Lumen	29.34	44.30

OUTDOOR LIGHTING SERVICE

Mercury Vapor Wood Pole - Overhead[a]		High Pressure Sodium Vapor Wood Pole - Overhead	Existing Pole[b]	Wood Pole[c]
3,600 Lumen	$5.33	4,000 Lumen	$5.49	$7.17
7,000 Lumen	8.37	5,800 Lumen	6.12	7.80
		9,500 Lumen	7.46	9.14
20,000 Lumen	13.21	16,000 Lumen	8.67	10.67
		27,500 Lumen	11.52	13.52
55,000 Lumen	27.12	50,000 Lumen	16.04	18.05

Ornamental Metal or Concrete Pole - Overhead	1 Light Per Pole	2 Lights Per Pole	Concrete Pole - Overhead	1 Light Per Pole	2 Lights Per Pole
3,600 Lumen	$7.60	$12.45	4,000 Lumen	$8.98	$13.50
7,000 Lumen	10.21	17.28	5,800 Lumen	9.61	14.75
			9,500 Lumen	10.95	17.44
20,000 Lumen	15.00	28.00	16,000 Lumen	13.03	21.03
			27,500 Lumen	15.88	26.73
55,000 Lumen	28.58	53.80	50,000 Lumen	20.41	36.00

Ornamental Metal or Concrete Pole - Underground	1 Light Per Pole	2 Lights Per Pole	Concrete Pole - Underground	1 Light Per Pole	2 Lights Per Pole
3,600 Lumen	$11.44	$16.29	4,000 Lumen	$12.32	$16.84
7,000 Lumen	13.13	20.20	5,800 Lumen	12.94	18.08
			9,500 Lumen	14.29	20.78
20,000 Lumen	19.38	32.38	16,000 Lumen	24.62	32.62
			27,500 Lumen	27.47	38.32
55,000 Lumen	32.90	58.12	50,000 Lumen	32.21	47.80

a. This is the charge for all fixtures on wood poles regardless of whether an additional pole was required.

b. A customer pays the existing pole charge if his fixture is on a distribution system wood pole.

c. If the fixture required the installation of an additional wood pole, the wood pole charge is applicable.

NOTE: This comparison was prepared by the Commission Staff.

TAMPA ELECTRIC COMPANY

FIRST REVISED SHEET NO. 6.260
CANCELS ORIGINAL SHEET NO. 6.260

HIGH PRESSURE SODIUM STREET LIGHTING SERVICE

SCHEDULE: SL-2

RATE CODE: 660-699, 760-799.

AVAILABLE: Entire service area.

APPLICABLE: For public street and highway lighting for incorporated cities and other governmental authorities. Also for subdivision developers and responsible civic groups who (1) install a minimum of six lights, (2) make a deposit equivalent to a six months' bill and (3) agree to a five-year contract.

CHARACTER OF SERVICE: Service provided during the hours of darkness.

RATE PER MONTH:

	Facilities' Charge	Demand Charge	Energy Charge	Facilities' Maintenance Charge
Existing Pole-Overhead Wire				
50 Watt - 4000 Lumen	$ 3.15	$ .32	$ .88	$.65
70 Watt - 5800 Lumen	3.21	.46	1.27	.68
100 Watt - 9500 Lumen	3.23	.79	2.19	.75
150 Watt - 16000 Lumen	3.27	1.09	3.02	.78
250 Watt - 27500 Lumen	3.65	1.72	4.78	.80
400 Watt - 50000 Lumen	4.44	2.65	7.38	.89
Set Wood Pole-Overhead Wire				
50 Watt - 4000 Lumen	$ 4.60	$ .32	$ .88	$.65
70 Watt - 5800 Lumen	4.66	.46	1.27	.68
100 Watt - 9500 Lumen	4.68	.79	2.19	.75
150 Watt - 16000 Lumen	5.00	1.09	3.02	.78
250 Watt - 27500 Lumen	5.39	1.72	4.78	.80
400 Watt - 50000 Lumen	6.17	2.65	7.38	.89
Set Concrete Pole-Overhead Wire				
50 Watt - 4000 Lumen	$ 6.17	$ .32	$ .88	$.65
70 Watt - 5800 Lumen	6.23	.46	1.27	.68
100 Watt - 9500 Lumen	6.25	.79	2.19	.75
150 Watt - 16000 Lumen	7.05	1.09	3.02	.78
250 Watt - 27500 Lumen	7.43	1.72	4.78	.80
400 Watt - 50000 Lumen	8.21	2.65	7.38	.89

Continued to Sheet No. 6.261

ISSUED BY: H. L. Culbreath, President

DATE EFFECTIVE:

TAMPA ELECTRIC COMPANY

FIRST REVISED SHEET NO. 6.261
CANCELS ORIGINAL SHEET NO. 6.261

Continued from Sheet No. 6.260

		Facilities' Charge	Demand Charge	Energy Charge	Facilities' Maintenance Charge
Existing Pole-Underground Wire					
50 Watt -	4000 Lumen	$ 4.90	$ .32	$ .88	$.67
70 Watt -	5800 Lumen	4.96	.46	1.27	.69
100 Watt -	9500 Lumen	4.98	.79	2.19	.77
150 Watt -	16000 Lumen	13.29	1.09	3.02	.79
250 Watt -	27500 Lumen	13.68	1.72	4.78	.81
400 Watt -	50000 Lumen	14.64	2.65	7.38	.90
Set Concrete Pole-Underground Wire					
50 Watt -	4000 Lumen	$ 9.04	$ .32	$ .88	$.67
70 Watt -	5800 Lumen	9.10	.46	1.27	.69
100 Watt -	9500 Lumen	9.12	.79	2.19	.77
150 Watt -	16000 Lumen	17.06	1.09	3.02	.79
250 Watt -	27500 Lumen	17.44	1.72	4.78	.81
400 Watt -	50000 Lumen	18.41	2.65	7.38	.90
Set Aluminum Pole-Underground Wire					
50 Watt -	4000 Lumen	$10.92	$ .32	$ .88	$.67
70 Watt -	5800 Lumen	10.98	.46	1.27	.69
100 Watt -	9500 Lumen	11.00	.79	2.19	.77
150 Watt -	16000 Lumen	24.08	1.09	3.02	.79
250 Watt -	27500 Lumen	24.46	1.72	4.78	.81
400 Watt -	50000 Lumen	33.82	2.65	7.38	.90
Each Additional Light on a Wood or Concrete Pole					
50 Watt -	4000 Lumen	$ 2.33	$ .32	$ .88	$.62
70 Watt -	5800 Lumen	2.40	.46	1.27	.64
100 Watt -	9500 Lumen	2.41	.79	2.19	.72
150 Watt -	16000 Lumen	2.72	1.09	3.02	.74
250 Watt -	27500 Lumen	3.10	1.72	4.78	.76
400 Watt -	50000 Lumen	4.08	2.65	7.38	.85
Each Additional Light on an Aluminum Pole					
50 Watt -	4000 Lumen	$ 2.54	$ .32	$ .88	$.62
70 Watt -	5800 Lumen	2.60	.46	1.27	.64
100 Watt -	9500 Lumen	2.62	.79	2.19	.72
150 Watt -	16000 Lumen	3.64	1.09	3.02	.74
250 Watt -	27500 Lumen	4.02	1.72	4.78	.76
400 Watt -	50000 Lumen	5.36	2.65	7.38	.85

Continued on Sheet No. 6.262

TAMPA ELECTRIC COMPANY

FIRST REVISED SHEET NO. 6.262
CANCELS ORIGINAL SHEET NO. 6.262

Continued from Sheet No. 6.261

	Facilities' Charge	Demand Charge	Energy Charge	Facilities' Maintenance Charge
Decorative Post Top-Ornamental Pole and Underground Wire				
70 Watt - 5800 Lumen	$8.98	$.46	$1.27	$.73

MINIMUM CHARGE: The monthly charge.

FUEL ADJUSTMENT: See "Billing Adjustments" beginning on Sheet No. 6.020. Kilowatt-hours for the Fuel Adjustment shall be determined by the following table.

Lumens	Lamp Size	Kwh Per Month
4,000	50 Watts	19
5,800	70 Watts	28
9,500	100 Watts	48
16,000	150 Watts	66
27,500	250 Watts	105
50,000	400 Watts	162

CONSERVATION ADJUSTMENT: See "Billing Adjustments" beginning on Sheet No. 6.020. Kilowatt-hours for the Conservation Adjustment shall be determined by the above table.

FRANCHISE FEE ADJUSTMENT: See "Billing Adjustments" beginning on Sheet No. 6.020.

PAYMENT OF BILLS: See Sheet No. 6.021.

ISSUED BY: H. L. Culbreath, President

DATE EFFECTIVE:

TAMPA ELECTRIC COMPANY

FIRST REVISED SHEET NO. 6.270
CANCELS ORIGINAL SHEET NO. 6.270

HIGH PRESSURE SODIUM
GENERAL OUTDOOR LIGHTING SERVICE

SCHEDULE: OL-1

RATE CODE: 430-449, 460-479, 530-549, 560-579.

AVAILABLE: Entire service area.

APPLICABLE: For outdoor area lighting.

CHARACTER OF SERVICE: Service provided during the hours of darkness.

LIMITATION: Installations shall be made only when, in the judgment of the Company, location of the proposed light is, and will continue to be, easily and economically accessible to Company equipment and personnel for both construction and maintenance.

RATE PER MONTH:

	Facilities' Charge	Demand Charge	Energy Charge	Facilities' Maintenance Charge
Existing Pole-Overhead Wire				
50 Watt - 4000 Lumen	$ 3.64	$ .32	$ .88	$.65
70 Watt - 5800 Lumen	3.71	.46	1.27	.68
100 Watt - 9500 Lumen	3.73	.79	2.19	.75
150 Watt - 16000 Lumen	3.78	1.09	3.02	.78
250 Watt - 27500 Lumen	4.22	1.72	4.78	.80
400 Watt - 50000 Lumen	5.12	2.65	7.38	.89
Set Wood Pole-Overhead Wire				
50 Watt - 4000 Lumen	$ 5.32	$ .32	$ .88	$.65
70 Watt - 5800 Lumen	5.39	.46	1.27	.68
100 Watt - 9500 Lumen	5.41	.79	2.19	.75
150 Watt - 16000 Lumen	5.78	1.09	3.02	.78
250 Watt - 27500 Lumen	6.22	1.72	4.78	.80
400 Watt - 50000 Lumen	7.13	2.65	7.38	.89
Set Concrete Pole-Overhead Wire				
50 Watt - 4000 Lumen	$ 7.13	$ .32	$ .88	$.65
70 Watt - 5800 Lumen	7.20	.46	1.27	.68
100 Watt - 9500 Lumen	7.22	.79	2.19	.75
150 Watt - 16000 Lumen	8.14	1.09	3.02	.78
250 Watt - 27500 Lumen	8.58	1.72	4.78	.80
400 Watt - 50000 Lumen	9.49	2.65	7.38	.89

Continued to Sheet No. 6.271

ISSUED BY: H. L. Culbreath, President

DATE EFFECTIVE:

TAMPA ELECTRIC COMPANY

FIRST REVISED SHEET NO. 6.271
CANCELS ORIGINAL SHEET NO. 6.271

Continued from Sheet No. 6.270

	Facilities' Charge	Demand Charge	Energy Charge	Facilities' Maintenance Charge
Existing Pole-Underground Wire				
50 Watt - 4000 Lumen	$ 5.66	$ .32	$ .88	$.67
70 Watt - 5800 Lumen	5.74	.46	1.27	.69
100 Watt - 9500 Lumen	5.75	.79	2.19	.77
150 Watt - 16000 Lumen	15.36	1.09	3.02	.79
250 Watt - 27500 Lumen	15.80	1.72	4.78	.81
400 Watt - 50000 Lumen	16.92	2.65	7.38	.90
Set Concrete Pole-Underground Wire				
50 Watt - 4000 Lumen	$10.45	$ .32	$ .88	$.67
70 Watt - 5800 Lumen	10.52	.46	1.27	.69
100 Watt - 9500 Lumen	10.54	.79	2.19	.77
150 Watt - 16000 Lumen	19.72	1.09	3.02	.79
250 Watt - 27500 Lumen	20.16	1.72	4.78	.81
400 Watt - 50000 Lumen	21.28	2.65	7.38	.90
Each Additional Light on a Wood or Concrete Pole				
50 Watt - 4000 Lumen	$ 2.70	$ .32	$ .88	$.62
70 Watt - 5800 Lumen	2.77	.46	1.27	.64
100 Watt - 9500 Lumen	2.79	.79	2.19	.72
150 Watt - 16000 Lumen	3.15	1.09	3.02	.74
250 Watt - 27500 Lumen	3.59	1.72	4.78	.76
400 Watt - 50000 Lumen	4.71	2.65	7.38	.85
Decorative Post Top-Ornamental Pole and Underground Wire				
70 Watt - 5800 Lumen	$10.37	$ .46	$1.27	$.73

ADDITIONAL CHARGE: Where pavement must be removed and replaced in order to install the underground cable, the customer will bear the cost of this additional work.

MINIMUM CHARGE: The monthly charge.

Continued on Sheet No. 6.272

ISSUED BY: H. L. Culbreath, President

DATE EFFECTIVE:

TAMPA ELECTRIC COMPANY

FIRST REVISED SHEET NO. 6.272
CANCELS ORIGINAL SHEET NO. 6.272

Continued from Sheet No. 6.271

FUEL ADJUSTMENT: See "Billing Adjustments" beginning on Sheet No. 6.020. Kilowatt-hours for the Fuel Adjustment shall be determined by the following table:

Lumens	Lamp Size	Kwh Per Month
4,000	50 Watts	19
5,800	70 Watts	28
9,500	100 Watts	48
16,000	150 Watts	66
27,500	250 Watts	105
50,000	400 Watts	162

CONSERVATION ADJUSTMENT: See "Billing Adjustments" beginning on Sheet No. 6.020. Kilowatt-hours for the Conservation Adjustment shall be determined by the above table.

FRANCHISE FEE ADJUSTMENT: See "Billing Adjustments" beginning on Sheet No. 6.020.

TERMS OF SERVICE: Overhead installations under this schedule are available only to customers who sign a contract for a minimum period of 1 year. Underground installations are available only to customers who sign a contract for a minimum period of 5 years. Decorative post top units available in groups of six or more lights only.

PAYMENT OF BILLS: See Sheet No. 6.021

ISSUED BY: H. L. Culbreath, President

DATE EFFECTIVE:

4. Explain how Rule 25-17.008, Florida Administrative Code, or any other Commission Rule, warrants the recovery of cost via Capital Recovery Schedule through the ECCR. Please identify the relevant Rule and explain.

A. As explained in the response to Staff's Second Data Request No. 1, the company is not seeking to utilize a capital recovery schedule as a means of amortizing and recovering the unamortized depreciation in this docket, but rather is seeking to recover this investment through the ECCR as qualifying luminaires are removed from service.

As provided in Staff's First Data Request No. 5 that was filed on October 19, 2017, Tampa Electric believes that Rule 25-17.008 of the Florida Administrative Code does not identify any specific cost-effectiveness analysis nor itemized costs or benefits that may be included in such an analysis. However, the rule does point to the publication "Florida Public Service Commission Cost Effectiveness Manual for Demand Side Management Programs and Self-Service Wheeling Proposals".

With respect to the analysis described in that Manual, Tampa Electric believes that unamortized depreciation capture can be included in the cost-effectiveness analysis as has been done in the past and approved by the Commission.

The company believes that FEECA fully supports recovering the unamortized depreciation costs in performing this street and outdoor lighting conversion project.

5. Please refer to paragraph 12 of the Petition and the Company's response to Staff's First Data Request, No. 13(b). Reconcile these statements and specify how much is being spent specifically to advertise the proposed Demand Side Management (DSM) Program.

A. Tampa Electric is projecting to conduct advertising and communications during each year of the five-year conversion program for the proposed Street and Outdoor Lighting Conversion Program. The company estimates that total conservation advertising costs will incrementally increase, if this proposed conversion program is approved, by $50,000 in each of the five years. The vast majority of this incremental increase will be specifically devoted to advertising and communicating the proposed Street and Outdoor Lighting Conversion Program. As with all of Tampa Electric's other DSM programs that utilize advertising, an exact percentage of the messaging that relates specifically to the program cannot be determined because Tampa Electric's DSM program promotions contain messaging that promotes awareness of all of Tampa Electric's DSM programs.

6. Please refer to Staff's First Data Request, No. 8. Explain why offering customers a rebate would be "highly inappropriate" for a Demand-Side Management (DSM) Program.

A. Tampa Electric does not view offering customers rebates to incent customers to participate in any of the company's Commission approved DSM programs as highly inappropriate as a general proposition. In its response, Tampa Electric was merely attempting to make the point that for this proposed Street and Outdoor Lighting Conversion Program the incentive portion is utilized to recover the unamortized depreciation value that is associated with the non-LED luminaire's plant value eligible for replacement, and that adding any additional amount just because the Rate Impact Measure ("RIM") test would support paying it would be highly inappropriate.

To clarify further, when Tampa Electric designs a DSM program, the incentive amount is set at a level to incent customers to want to participate. The Street and Outdoor Lighting Conversion Program will bring significant winter demand and annual energy savings to customers along with many other qualitative benefits with essentially the same lighting service bill. Some of these qualitative benefits include:

- Aesthetic benefits from a more even color temperature of lamps
- Greater ability to see different colors under the lights with a much higher color rendering index ("CRI")
- Longer life of the luminaire
- Ability of the luminaire to self-report that it has a problem increasing customer satisfaction and lighting service hours
- Less overall light pollution because LED luminaires are directional
- Promotes cities as being more "Green"

7. If a customer does not want to participate in the proposed DSM Program, will they be able to retain their existing lighting service at existing rates? Please explain.

A. Yes, lighting service customers that do not wish to receive the LED luminaire and participate in the proposed Street and Outdoor Lighting Conversion Program can keep their existing MH or HPS luminaire or they can choose to discontinue their lighting service, both without penalty. If the customer chooses to keep their existing MH or HPS luminaire they can continue to receive lighting service with that luminaire until the actual MH or HPS portion of the luminaire fails.

In the event of a lighting service customer with a MH or HPS luminaire that fails, the customer will be informed that their lighting service can be upgraded to a new LED luminaire during the restoration. In this case, if the customer chooses to not participate in the LED conversion, the customer will be provided the option to discontinue their lighting service without penalty. If the luminaire failure is due to parts that Tampa Electric still has a supply of that supports MH or HPS luminaires (e.g., cabling, photocells), the luminaire will be repaired. If the parts are no longer in supply, the lighting service customer would need to either discontinue their lighting service or have the luminaire upgraded to the LED.

Tampa Electric will proactively communicate to the company's lighting service customers to describe the project, the benefits, where to get more information regarding the conversion project or how to contact a Tampa Electric representative for assistance. Customers that do not wish to participate will have their accounts notated.

During the project, customers that are scheduled to have their existing MH or HPS luminaire replaced with an LED luminaire will receive direct mail correspondence at least 30-days prior to the work that will describe the project, the benefits, and where to get more information or talk to a representative.

8. Can customers on the existing tariff convert to the new tariff without participating in this program? If not, please explain how this program is voluntary.

A. Yes, lighting service customers that want to convert to the new LED rates without participating in this program can do so by renewing their 10-year primary contract term. Additionally, if the lighting service customer is still in the primary term of their current agreement and choose to not participate, they will be assessed any applicable liquidated damages.

9. Do the replacement LEDs have the same lumen output as the original installations?

a. If not, would this require additional lighting installations for the customer to receive the same lumens? Please explain.

b. If (a) would require additional installations, are the costs for these additional installations included in the Company's cost-effectiveness analysis? Please explain.

A. No, the replacement LED luminaires have a different lumen ("L") output than the existing MH or HPS luminaire.

a. There are many factors that influence a person's ability to see objects while driving. These factors include the contrast of the object, both photometric and color (i.e., the difference between the object and its background); the person or driver's adaptation level (impacted by the brightness of the road and surroundings, how much glare from approaching vehicles and luminaires, etc.), and how long the person has to view the object or hazard on the street or roadway. Tampa Electric fully understands all of these factors when the company initially designs or modifies the roadway or street lighting systems. The company utilizes team members that are active members of the Illuminating Engineering Society ("IES") as well as being very experienced Lighting Designers to analyze, design and finally approve of Tampa Electric's streetlight and outdoor lighting systems for lighting service.

Tampa Electric analyzed the existing lighting system characteristics and selected the replacement LED luminaires for the existing MH and HPS luminaires that would either improve or maintain the existing capability of the lighting system. Because of the many beneficial lighting characteristics that LED luminaires have, allows Tampa Electric to actually reduce the number of Ls required from each luminaire. LED luminaires are considered a directional light source as compared to the existing MH and HPS luminaires. This directional characteristic allows for the LED luminaire to provide light to a desired area rather than broad washing of the entire area with light as with a MH or HPS luminaire. LED luminaires also have a much higher CRI which is the ability to reveal or differentiate colors underneath the light

source as compared to the existing MH and HPS luminaires. Both of these drastic improvements in directional ability of the light source and CRI allow the company to achieve the proper average foot-candle ("FC") levels on the ground, street or roadway from the proposed LED luminaires. Additionally, all of the proposed LED luminaires are photometrically matched to the existing MH and HPS by throw pattern and average FC within the throw pattern.

b. Tampa Electric's replacement LED luminaires were selected to maintain the proper average FC level, as compared to those provided by the existing MH and HPS luminaires, at the working surface (ground, street or roadway).

10. Please explain the variance between existing tariff capacity values listed in LS-1 and wattage value used in Exhibit C of the Company's Petition.

A. The variance between the existing capacity values listed in LS-1 and wattage values used in the Exhibit C of the company's petitions is due to the inclusion of the wattage required by the ballast to drive the lamp in the company's petition.

11. Provide a calculation of the cost-effectiveness tests incorporating the change in tariffs to customers for each tariff conversion separately. Please provide this in electronic spreadsheet (Excel) format.

A. The calculation of the cost-effectiveness tests (RIM test, Total Resource Cost ("TRC") test and the Participant Cost Test ("PCT")) incorporating the change in tariffs to customers for each tariff conversion separately is included on the accompanying CD with the summary results for each tariff conversion further below. For the performance of the cost-effectiveness tests, Tampa Electric assumed that each fixture population was evenly dispersed across the company's service area and included the incremental costs associated with the new LED fixture as compared to the existing MH and HPS fixtures as requested by Commission Staff at the informal meeting that was conducted on November 17, 2017.

For cost-effectiveness, Tampa Electric views the proper and consistent way to establish the true cost-effectiveness of the proposed Street and Outdoor Light Conversion Program is to look at the entire program which includes all luminaires together. This method of including all luminaires together is consistent with DSM programs that Tampa Electric currently offers and has offered in the past which couples' different components together to achieve an overall more beneficial result. Two existing DSM programs that utilize coupling are the company's Commission approved Neighborhood Weatherization and Energy Education, Awareness and Agency Outreach Programs. Both of these programs utilize many different components which are not managed in isolation (i.e., cost-effectiveness is not performed on an individual component level but rather on the entire program offerings). Prior examples of Commission approved DSM programs which coupled components together were the company's Residential Building Envelope Program, Residential New Construction Program and the Commercial Building Envelope Program. All of these programs also were determined to be cost-effective with a variety of components and analyzed as a whole rather than as separate components.

Proposed Street and Outdoor Lighting Conversion Program
Cost-effectivness results for Total Program and by Individual Components

Luminaire Count	Luminaire Type	Existing Wattage	Replacement LED Wattage	RIM	TRC	PCT
209,821	Total Proposed Conversion Project			1.04	0.69	15,974
6,332	Cobra (closed)	62.50	27.00	0.45	0.21	-683
20	Post Top (closed)	62.50	26.00	0.44	0.19	-2
11,755	Cobra/Nema (closed)	87.50	27.00	0.66	0.36	-544
4,088	Coach Post Top (closed)	87.50	26.00	0.67	0.20	-1,106
82,910	Cobra	125.00	47.00	0.78	0.46	-760
5,060	Nema	125.00	27.00	0.89	0.62	278
8,903	Classic Post Top	125.00	39.00	0.83	0.48	-37
3,387	Colonial PT	125.00	70.00	0.62	0.25	-492
18,602	Salem PT	125.00	55.00	0.73	0.26	-3,465
2,211	Shoebox	125.00	88.00	0.46	0.31	-31
14,300	Cobra	187.50	105.00	0.81	0.41	-684
102	General PT	187.50	39.00	1.08	0.91	17
283	Salem PT	187.50	76.00	0.95	0.43	-24
13	Shoebox	187.50	105.00	0.77	0.49	0
801	General PT	218.75	39.00	1.19	1.12	187
946	Salem PT	218.75	76.00	1.08	0.55	-13
13	Shoebox (closed)	218.75	105.00	0.92	0.67	1
18,240	Cobra	312.50	145.00	1.16	0.86	2,675
886	Flood (closed)	312.50	199.00	0.97	0.46	-48
1,646	Shoebox	312.50	133.00	1.19	1.28	438
131	Cobra	437.50	133.00	1.44	1.61	59
51	Flood	437.50	199.00	1.32	0.97	11
323	Shoebox	437.50	182.00	1.36	1.65	133
13,355	Cobra	500.00	182.00	1.45	1.52	6,128
2,043	Flood	500.00	199.00	1.43	1.18	701
375	Mongoose	500.00	225.00	1.39	0.88	71
1,380	Shoebox (closed)	500.00	182.00	1.45	2.05	758
534	Cobra	500.00	133.00	1.51	2.18	339
1,031	Flood	500.00	199.00	1.43	1.35	409
4,570	Shoebox	500.00	247.00	1.35	1.63	1,849
2,165	Flood	1,250.00	255.00	1.79	3.24	3,890
3,365	Shoebox	1,250.00	330.00	1.78	3.91	5,881

12. Complete the table below for each tariff conversion. If the tariff value is different for wattage or energy than the amount claimed for savings in the Company's Exhibit C, please provide in a separate row results for this variance. Please provide the response in electronic spreadsheet (Excel) format.

a. If a variance exists, please provide an explanation for the variance between the wattage or energy of each tariff and the amount claimed for savings in the Company's Exhibit C for each item.

b. If a variance exists, explain which is used in the cost-effectiveness calculation.

Old Tariff	Tariff Name	
	Number of Units to be Replaced	
	Monthly Energy (Kilowatt-Hours)	
	Wattage (Watts)	
	Base Energy ($/mo)	
	Base Facilities Charge ($/mo)	
	Maintenance Charge ($/mo)	
	Subtotal of Base Charges ($/mo)	
	Fuel Charge ($/mo)	
	Capacity (CCR) Charge ($/mo)	
	Conservation (ECCR) Charge ($/mo)	
	Environmental (ECRC) Charge ($/mo)	
	Subtotal Energy Charge ($/mo)	
	Gross Receipt Tax Charge ($/mo)	
	Total Bill ($/mo)	
New Tariff Rates	New Tariff Name	
	Monthly Energy (Kilowatt-Hours)	
	Wattage (Watts)	
	Base Energy ($/mo)	
	Base Facilities Charge ($/mo)	
	Maintenance Charge ($/mo)	
	Subtotal of Base Charges ($/mo)	
	Fuel Charge ($/mo)	
	Capacity (CCR) Charge ($/mo)	
	Conservation (ECCR) Charge ($/mo)	
	Environmental (ECRC) Charge ($/mo)	
	Subtotal Energy Charge ($/mo)	
	Gross Receipt Tax Charge ($/mo)	
	Total Bill ($/mo)	

A. The table, in electronic spreadsheet (Excel) format, for each tariff conversion is included in the accompanying CD. Where a variance exists between the tariff value wattage or energy and the claimed savings as provided in the company's petition Exhibit C, a separate row shows the results of this variance. Please see the response to question 11, this set.

a. The variance that exists between the tariff conversion and the company's Exhibit C is due to the inclusion of the wattage required by the ballast to drive the lamp in the company's petition. This wattage

difference also impacts the variance in the amount of annual energy that will be saved by the proposed LED luminaires.

b. Tampa Electric is using the values that were provided in Exhibit C for the performance of the cost-effectiveness test. These values would be the real wattage and energy saved from the replacement of the existing MH and HPS luminaires with the new LED luminaires.