



2020 Budget and Five-Year Service Improvement Plan

November 5, 2019

(All dollars in Thousands unless otherwise noted)

** The numbers presented exclude all non-cash Pension and OPEB expense related to GASB 68 and GASB 75.*

Highlights of MLGW's budget plan

- It is a 5-year plan with rate and bond actions proposed over the first 3 years.
- Our budget and service improvement plan includes bond issues of **\$495 million** and proposed **total** average residential rate increases of **\$9/month for electric; \$0.74/month for gas; and \$4.33/month for water**...all incorporated over a 3-year period.
- The plan includes **~\$1 billion** for improvements to our system and increased maintenance spending over the next 5-years funded in part by debt and rate increases
- New efficiencies/savings of over **\$91 million** have been incorporated into our service improvement plan with savings of **~\$40 million/year** included annually thereafter.

Highlights of MLGW's budget plan (cont'd)

- Infrastructure upgrades remain a central focus and a review conducted by Baker Tilly & HDR Engineering confirms the *urgent* need to move forward with these upgrades and improvements.
- Our customers and other stakeholders have spoken regarding their concerns and we are listening.
- Our plan includes opportunities to help move our community forward including additional initiatives with the Smart Cities (i.e., 5G) initiatives, LED street lighting and converting overhead lines to underground where feasible.
- We have worked hard to find ways to add value at reasonable costs.

MLGW Mission & Vision

Mission

(Why we exist)

*To safely deliver services that
create and sustain superior
customer experiences.*

Vision

(Where we're headed)

*To be the trusted provider of exceptional
customer value in the communities we are
privileged to serve.*

The MLGW Way, our Budget Objectives and Customer Value Proposition

- MLGW is dedicated to improving the customer experience...for all customers.
- The condition of our aging infrastructure dictates that we must make upgrades with a sense of urgency.
- MLGW has low rates. MLGW has had the lowest average residential bills in the nation four of the past seven years.
- Thousands of customers take advantage of our numerous customer assistance programs each year which cost MLGW ~\$4 million annually to administer.
- Proposed improvements will contribute to the overall viability of our community.



Opportunities for value

- MLGW Way Forward – Operational efficiency conducted by Baker Tilly and infrastructure review by HDR Engineering
 - Overall estimated phased in internal savings over the next 5 years of \$91.7 million and \$40 million per year ongoing thereafter
 - Incorporated in our budget plan
- New revenue & sources
 - Prepay natural gas savings
 - Tariffs
 - Other

MLGW Way FORWARD...The Plan

- The goal was to ensure that MLGW is delivering exceptional customer value in a optimal way as we seek budget and/or rate approvals.
- We benchmarked our operations with similarly situated utilities.
- We drew no lines around certain processes or functions to be excluded from this assessment...Therefore, to be fair, everything was on the table for consideration.

MLGW Way FORWARD...The Plan (cont'd)

- Part 1: Review MLGW's organizational structure, policies, and business segments, including key business functions and processes, to identify opportunities...
 - Increase efficiencies
 - Enhance productivity
 - Reduce unnecessary expenditures
 - Reduce overall operational costs
 - Improve asset utilization
 - Increase revenue
 - Enhance cash flow and cash position
- Part 2: To provide a condition assessment of MLGW's electric, gas, and water infrastructure, working in conjunction with MLGW engineering, operations, and construction staff. The objective of this assessment was to identify investments that deliver the greatest value to MLGW and its customers, comply with regulatory requirements, optimize the use of scarce resources, and mitigate risks.

MLGW Way FORWARD...High Level Results

Overall estimated phased in internal savings over the next 5 years of \$91.7 million and \$40 million per year ongoing thereafter

- Reduction in Staff (phased in over time) – 11-13% reduction, savings range from \$30 to \$36 million.
- Cost recovery for manual meter reading - \$2.5 million/year (labor only... **not** in 2020 Budget; incorporated in 2021 and beyond...evaluation continues)
- Other opportunities:
 - Centralization of certain services in Human Resources
 - Leveraging Systems and Improving Supporting Processes
 - Inventory Level adjustments/reductions
 - Community Offices

MLGW Way FORWARD...High Level Results

- HDR Engineering performed a Risk Severity Analysis on MLGW's assets.
- The analysis assigned a score based on the frequency and impact of the potential system component failure.
- The overall analysis confirmed that MLGW's infrastructure needs are valid, urgent and that our budget focus is on the correct areas.
- Examples of components that received high risk scores:
 - Substation equipment (transformers and circuit breakers)
 - Tree Trimming (reduce the cycle trim to 3 years and look at this more aggressive in back lots).
 - Gas regulatory work (cast iron, steel services, casings)
 - Water pumping stations equipment (main pumps, booster pumps, electrical safety issues)

Opportunities for value (2019 & beyond)

- Additional value plans incorporated in budget
 - LED Streetlight pilot and plan
 - Strategic underground expansion
 - Smart Cities (5G) roll-out
 - Two-way text messaging for outage alerts
- Other savings
 - 2019 Budget included additional OPEB funding reduction of \$13 million due in part to medical plan changes made in 2018.
 - Proposed change to a tiered OPEB medical premium for retirees with less than 25 years applicable to new hires after January 1, 2020. A \$440,000 per year savings.
 - Net position reduction of 61 at a dollar value of \$2.5 million.
- Economic Development Results and Pipeline Activity
 - 2018-2019: 22 projects translating to 2,910 new jobs, 1,882 jobs retained, \$417.2 million new investment.
 - Current Pipeline: 30 active projects involving 9,388 potential new jobs, potentially \$3.24 billion of capital investment.



Budget and Rate Request

2020 Budget Summary

Category (\$ in Thousands)	Electric	Gas	Water	Total
Operating Revenue	\$1,313,864	\$243,928	\$105,903	\$1,663,695
O&M Expense	\$223,978	\$91,401	\$85,916	\$401,295
Purchased Power and Gas	\$1,023,188	\$107,337	\$0	\$1,130,525
Depreciation & Amortization	\$60,878	\$23,107	\$12,083	\$96,068
PILOT & Taxes	\$49,894	\$21,149	\$3,004	\$74,046
Total Operating Expense	\$1,357,938	\$242,994	\$101,003	\$1,701,935
Total Capital Expenditures	\$109,974	\$24,078	\$30,625	\$164,677
Total Operating & Capital Budgets	\$1,467,912	\$267,072	\$131,628	\$1,866,612

* We have proposed an overall 3.1% wage increase into the total labor budget.

Electric Division

Category	2018 Actual	2019 Budget	2019 Proj	2020 Budget
Operating Revenue	\$1,289,907	\$1,281,926	\$1,272,926	\$1,313,864
Power Cost	\$1,035,898	\$1,013,472	\$1,013,472	\$1,023,188
Operating Margin	\$254,009	\$268,454	\$259,454	\$290,676
Operating Margin Variance			\$22,222	Increase
O&M	\$200,144	\$183,190	\$185,690	\$223,978
Depreciation & Amortization	\$55,844	\$61,198	\$55,790	\$60,878
PILOT & Taxes	\$50,076	\$56,707	\$47,462	\$49,894
Total Operating Expense	\$306,064	\$301,095	\$288,942	\$334,750
Expense Variance			\$33,655	Increase
Other Income	\$47,951	\$38,600	\$39,150	\$39,968
Debt Expense	\$10,357	\$5,959	\$5,959	\$10,569
Change in Net Position	(\$14,461)	\$0	\$3,703	(\$14,675)
Change in Net Position Variance			(\$14,676)	Decrease
Capital Expenditures	\$83,816	\$60,000	\$60,000	\$109,974
Total Operating & Capital	\$1,425,777	\$1,374,567	\$1,362,414	\$1,467,912

Gas Division

Category	2018 Actual	2019 Budget	2019 Proj	2020 Budget
Operating Revenue	\$274,188	\$249,312	\$252,134	\$243,928
Gas Cost	\$138,107	\$115,786	\$115,786	\$107,337
Operating Margin	\$136,081	\$133,526	\$136,348	\$136,591
Operating Margin Variance			\$3,065	Increase
O&M	\$87,573	\$84,378	\$85,878	\$91,401
Depreciation & Amortization	\$21,483	\$23,494	\$21,467	\$23,107
PILOT & Taxes	\$20,959	\$23,314	\$20,563	\$21,149
Total Operating Expense	\$130,015	\$131,186	\$127,908	\$135,657
Expense Variance			\$4,471	Increase
Other Income	\$899	(\$0)	(\$0)	\$281
Debt Expense	\$2,401	\$2,341	\$2,341	\$4,369
Change in Net Position	\$4,565	\$0	\$6,099	(\$3,154)
Change in Net Position Variance			(\$3,154)	Decrease
Capital Expenditures	\$47,965	\$26,000	\$26,000	\$24,078
Total Operating & Capital	\$316,086	\$272,972	\$269,694	\$267,072

Water Division

Category	2018 Actual	2019 Budget	2019 Proj	2020 Budget
Operating Revenue	\$103,140	\$101,666	\$102,166	\$105,903
Operating Revenue Variance			\$4,237	Increase
O&M	\$82,724	\$84,085	\$83,085	\$85,916
Depreciation & Amortization	\$9,653	\$11,230	\$10,388	\$12,083
PILOT & Taxes	\$2,972	\$4,889	\$2,989	\$3,004
Total Operating Expense	\$95,350	\$100,204	\$96,462	\$101,003
Expense Variance			\$799	Increase
Other Income	\$1,177	\$900	\$800	\$800
Debt Expense	\$1,864	\$2,362	\$2,362	\$4,204
Change in Net Position	\$7,104	\$0	\$4,141	\$1,496
Change in Net Position Variance			\$1,496	Increase
Capital Expenditures	\$32,340	\$15,000	\$15,000	\$30,625
Total Operating & Capital	\$127,690	\$115,204	\$111,462	\$131,628

All Division Summary

Category	2018 Actual	2019 Budget	2019 Proj	2020 Budget
Operating Revenue	\$1,667,234	\$1,632,904	\$1,627,226	\$1,663,695
Power & Gas Cost	\$1,174,005	\$1,129,258	\$1,129,258	\$1,130,525
Operating Margin	\$493,230	\$503,646	\$497,968	\$533,170
Operating Margin Variance			\$29,524	Increase
O&M	\$370,441	\$351,653	\$354,653	\$401,295
Depreciation & Amortization	\$86,980	\$95,922	\$87,645	\$96,068
PILOT & Taxes	\$74,007	\$84,911	\$71,014	\$74,046
Total Operating Expense	\$531,428	\$532,485	\$513,312	\$571,410
Expense Variance			\$38,924	Increase
Other Income	\$50,027	\$39,500	\$39,950	\$41,049
Debt Expense	\$14,621	\$10,662	\$10,662	\$19,141
Change in Net Position	(\$2,792)	\$0	\$13,944	(\$16,332)
Change in Net Position Variance			(\$16,332)	Decrease
Capital Expenditures	\$164,121	\$101,000	\$101,000	\$164,677
Total Operating & Capital	\$1,869,553	\$1,762,743	\$1,743,570	\$1,866,612

Rate Request By Year

		2020	2021	2022	2023	2024	Total
Average Residential Bill Impact							
Electric		\$5.19	\$1.89	\$1.92	\$0.00	\$0.00	\$9.00
Gas		\$0.00	\$0.00	\$0.74	\$0.00	\$0.00	\$0.74
Water		\$2.23	\$1.19	\$0.91	\$0.00	\$0.00	\$4.33
Total		\$7.42	\$3.08	\$3.57	\$0.00	\$0.00	\$14.07
Division Revenue Request							
Electric		4.2%	1.5%	1.5%	0.0%	0.0%	7.2%
Gas		0.0%	0.0%	2.0%	0.0%	0.0%	2.0%
Water		15.0%	7.0%	5.0%	0.0%	0.0%	27.0%

- The 2020 increase would be effective in July. All other rate increases effective in January.
- The overall rate request is smaller than the 2019 request and provides greater customer value.
- The overall request for 5 years has decreased by \$4.51 per month (From \$18.58 to \$14.07, a **24% decrease.**)

Other Administrative Rate Actions Requested

- Renewable Natural Gas tariff creation that will generate approximately \$250 thousand in additional annual revenue.
- Industrial Prepay Gas tariff creation that could generate almost \$2 million savings to be shared with customers.
- Lighting tariff modification to provide better customer service in lighting choices related to LEDs.



Service Improvement Plan

Electric System Modernization Needs Remain

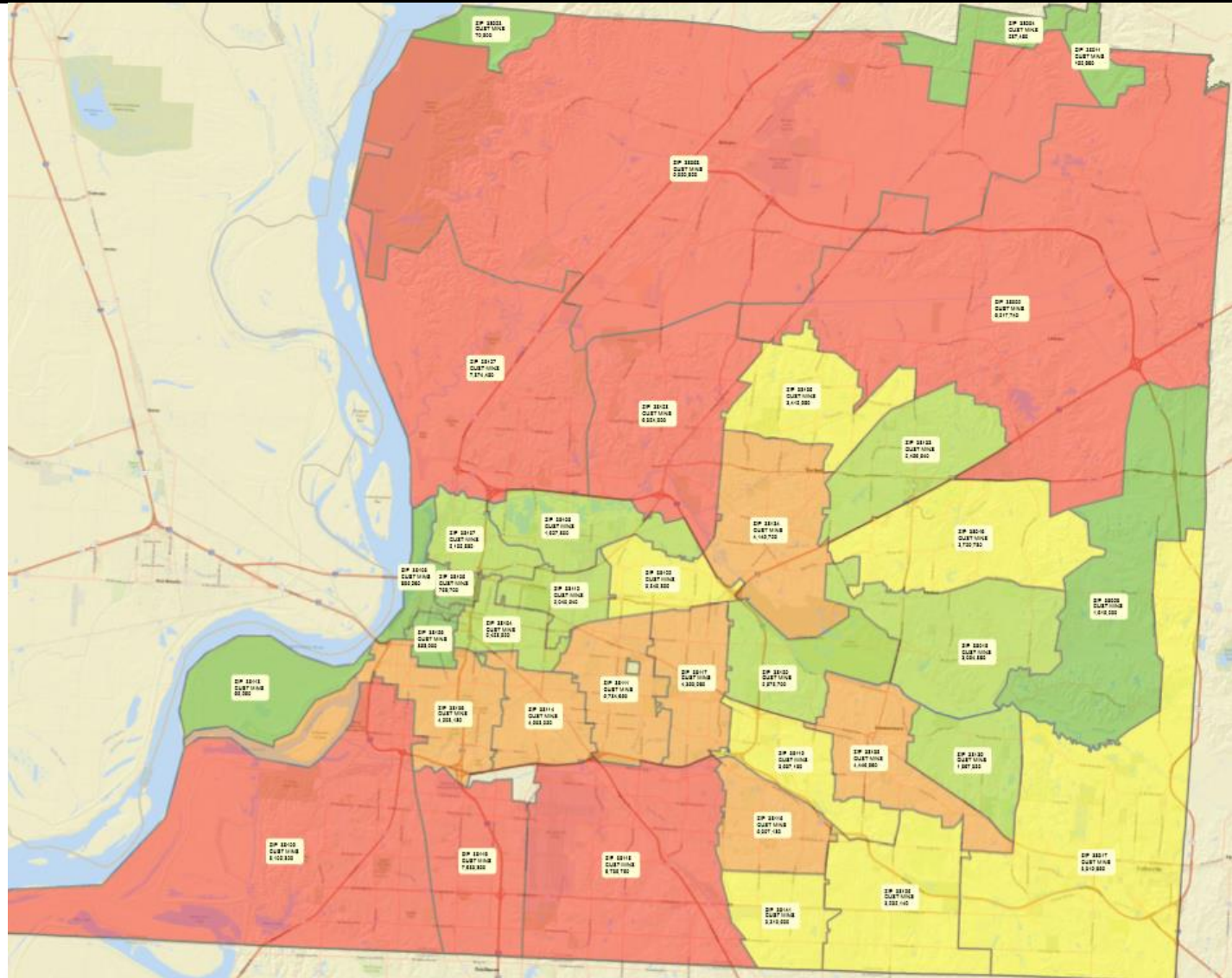
- Embarking on an electric reliability and modernization improvement plan
- The plan involves several components:
 - Substation circuit breakers and transformers
 - Tree trimming
 - Pole replacements
 - Cable retrofits (and strategic underground conversions)
 - Distribution Automation
 - Smart Cities (5G rollout)
 - LED street lighting



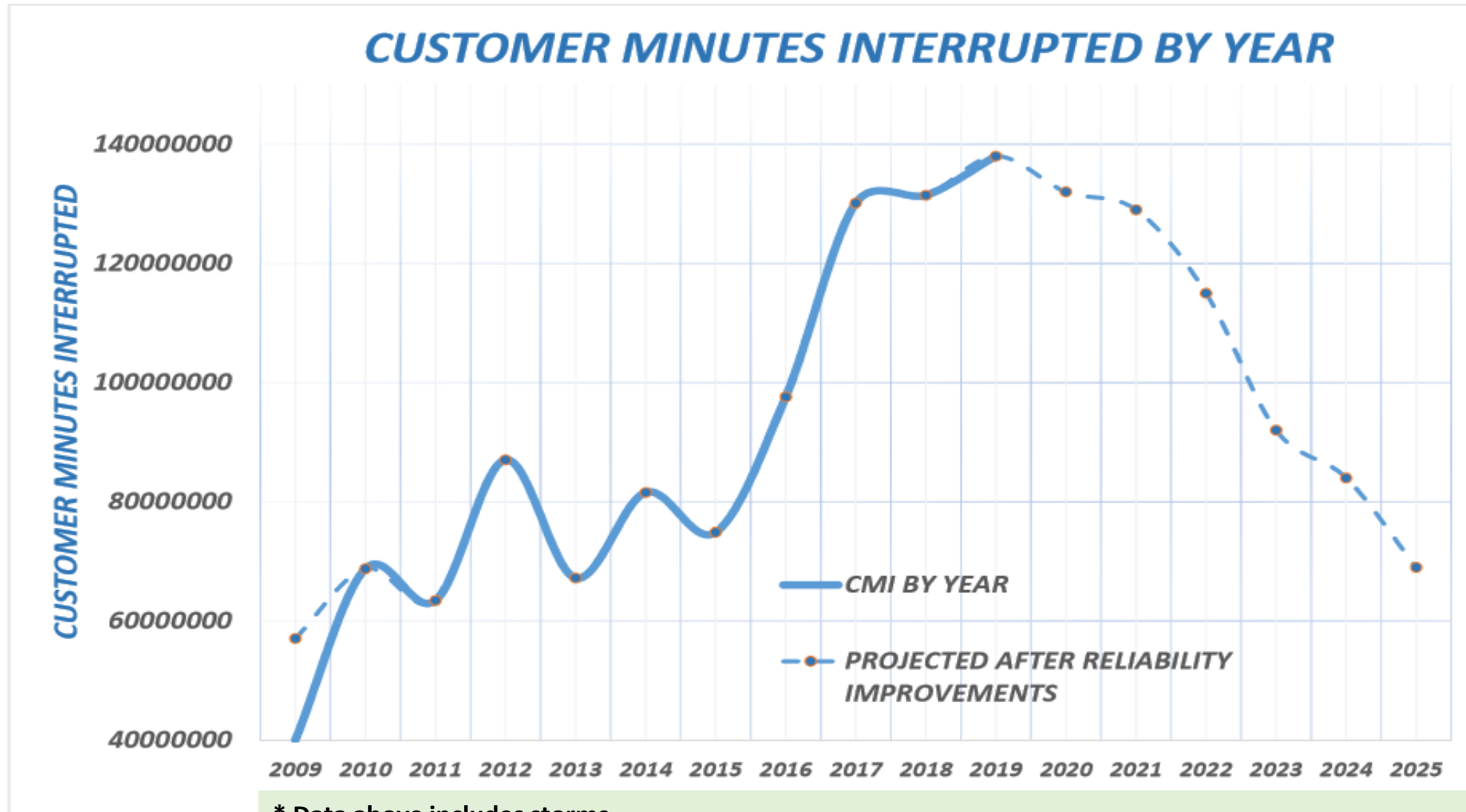
Five-Year Outage Data By Zip Code

Customer Minutes of Interruption (CMI)

- Dark Green: less than 1.6 million
- Light Green: between 1.6 million and 3.15 million
- Yellow: between 3.15 million and 3.9 million
- Orange: between 3.9 million and 6 million
- Red: greater than 6 million



Customer Minutes of Interruption Before and After



* Data above includes storms

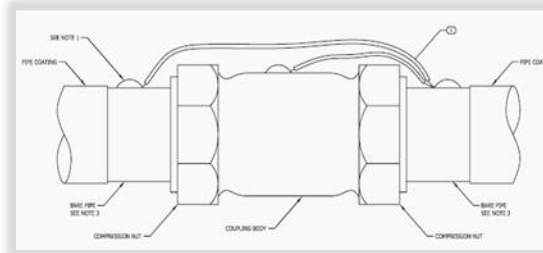
Select Neighborhood Customer Minutes of Interruption (CMI)

Neighborhood	2005-2008	2014-2018	% Change
Frayser	131.3	143.2	9.1%
Lakeland	97.7	132.9	36.0%
North Memphis	101.6	135.6	33.5%
Berclair-Grahamwood	99.7	147	47.4%
Midtown	132.4	140.7	6.3%
East Memphis	159.5	184.8	15.9%
Orange Mound-Glenview	158.4	163.5	3.2%
Germantown	146.9	153.7	4.6%
Whitehaven	168.3	222.8	32.4%
Hickory Hill	98.2	150.7	53.5%

Outages are getting longer for many communities.

Gas Regulatory Needs Remain

- Cast Iron Program
- Steel Tap Replacement Program
- PVC Pipe Program
- Casing Mitigation Program



Water Infrastructure Needs Remain

- Rehabilitation of water pumping stations
- Construct new wells
- Construct wash water recovery basin
- Distributed Process Control Systems
- Medium Voltage Circuit Breakers and Switchgear replacement



Customer Engagement Feedback

Memphis Light, Gas and Water



Community and Customer Engagement

- Radio, TV and Print Interviews (**18** broadcast interviews)
- **2** Social Media Town Hall Meetings
- **9** Community Meetings (Power Hour, Town Hall and Council Community Meetings)
- Phone Surveys
- Town Hall Meeting Surveys
- Neighborhood Advisory Council/Community Advisory Council (meets quarterly)
- Twitter, NextDoor, Facebook, Instagram



Town Hall Survey Results

Survey question: After attending MLGW's Public Awareness Community Meeting tonight regarding how we plan to improve the reliability of service, are you more willing to pay more per year to obtain more reliable service beginning in January of 2020?

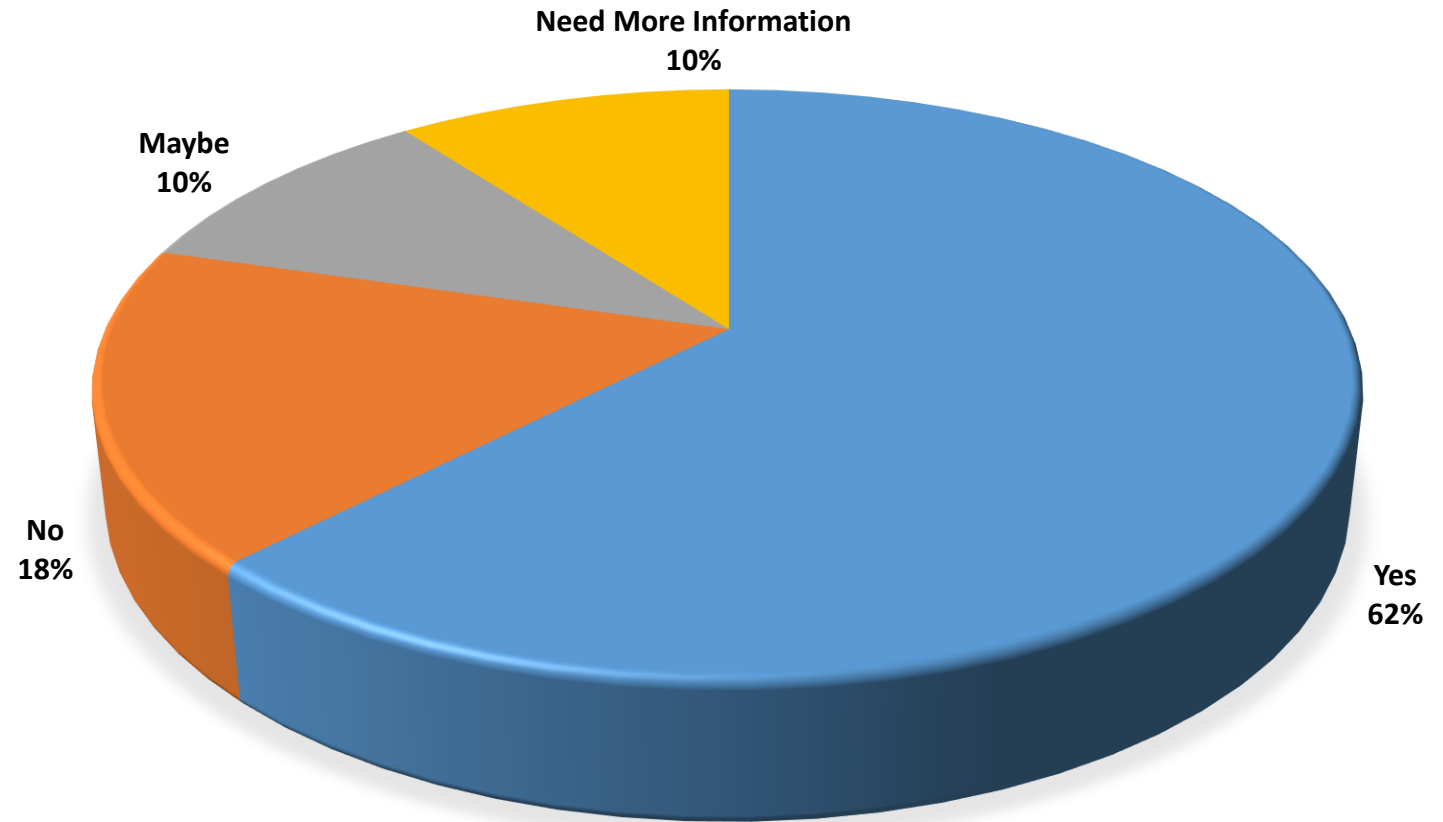
Total attendees: 114
Number of surveys: 90

Yes _____

No _____

Maybe _____

Need More Information _____



Customer Input



Assistance Programs

- Extended Payment Plans
- Plus-1
- On Track
- Budget Billing
- PrePay
- Share the Pennies
- Holiday Bill Break
- Winter Moratorium
- AutoPay
- Power of Warmth
- Gift Of Comfort
- Play it Cool
- Net Due Date Program
- Energy Smart Memphis
- Third Party Notification

(Note: The administrative cost estimate for these programs is \$4 million per year. Customer benefits are in excess of this.)



Summary

- Budget plan includes ~\$1 billion for urgently needed improvements to our system and increased maintenance spending over the next 5-years funded in part by debt and rate increases.
- In addition to efficiencies previously identified, additional efficiencies/savings of over **\$91 million** have been incorporated into our service improvement plan with savings of **~\$40 million/year** included annually thereafter.
- Our customers & our community have spoken regarding their concerns and we are listening.
- 5-year plan includes new opportunities to help move our community forward.
- We thank you for your consideration and seek your approval.



Appendix

2019 Budget Recap

- Original O&M Budget request was \$392.5 million across all three divisions.
- The final O&M Budget was \$351.6 million across all three divisions.
- We had to identify \$40.9 million in cuts
 - New positions, increased labor vacancies estimate along with a hiring “frost”, \$2.6 million.
 - Cut tree trimming, environmental spending, other O&M items related to capital work, \$14.4 million
 - 50% overtime cut across the board, \$7.7 million
 - Prorated the remainder needed to “Other” O&M category of spending to all areas, \$16.3 million.
- Received a credit downgrade from S&P for the Electric Division from AA to AA- on May 24, 2019.

2019 Budget Recap (cont.)

- Original Capital Budget request across all three divisions was \$252.9 million.
 - Original plan utilized a mix of debt and rate revenue to fund the capital plan.
- With no rate increase to support the debt service we scaled the capital plan back to a minimal maintenance capital level of \$101.0 million.
 - Cuts to the electric reliability related capital and to the water production related capital.
 - Electric reliability capital examples are: Substation Equipment Replacement, Pole Replacement, Cable Replacement, Distribution Automation.
 - Examples of water production capital are: Pumping Station Rehabilitation, Constructing New Wells, Digital Process Control Systems, Electric System Upgrades.



Cash Flows

Financial Metric Targets

- Days of cash
 - Target minimum of 45 days
 - Government Finance Officers Association (GFOA) best practice recommendation target minimum is 90 days
 - MLGW is projected to be below target in 2019 with no rate increases or debt issuances in the electric and water divisions
- Change in net position
 - Target is to have positive change in net position
 - State law prohibits two consecutive years of negative net position for the water division
 - MLGW is projected to have negative change in net position in electric and gas for the fourth consecutive year and negative in water division for 2019
- Debt Service Coverage
 - Minimum per debt covenants for senior lien is 1.2x
 - Both S&P and Moody's have developed a more stringent coverage calculation when evaluating utilities
 - MLGW is projecting to have sufficient debt service coverage per the rate covenant with no new debt issuances, but will not meet the S&P and Moody's coverage levels which could lead to further downgrades

Cumulative Phased In Savings By Year

Cumulative\$ Over the 5 Years	5 Year Totals Phased In
FMLA	\$0
Labor & Benefits	\$67,200
Meter Opt-Outs	\$8,750
Supplier Diversity	\$7,000
Community Offices	\$8,750
Cumulative Total	\$91,700

Electric Division Rate Proposal

Electric Division - Proposed	2018	2019	2020	2021	2022	2023	2024	5Yr Total
Ending Cash & Investments	198,375	188,602	222,061	220,537	297,830	230,056	193,546	
Days Cash of OpExp	56	55	62	62	83	64	53	
Debt Service Coverage	1.63	7.30	4.49	6.24	5.23	5.16	5.22	
Change in Net Assets (Net Income)	(14,460)	3,704	(14,599)	18,173	27,057	19,090	15,237	
Capital Expenditures	\$83,815	\$60,000	\$109,974	\$120,487	\$156,311	\$143,571	\$107,659	\$638,001
O&M Expenditures	\$201,810	\$187,419	\$225,683	\$231,483	\$234,844	\$239,628	\$240,049	\$1,171,686
Proposed Rate Increase %		0.0%	4.2%	1.5%	1.5%	0.0%	0.0%	7.2%
Proposed Rate Increase Revenue		-	28,606	19,743	20,070	-	-	\$380,749
Proposed Debt Issuance		-	160,000	-	160,000	0	-	\$320,000
Average Residential Bill Impact			\$5.19	\$1.89	\$1.92	\$0.00	\$0.00	\$9.00

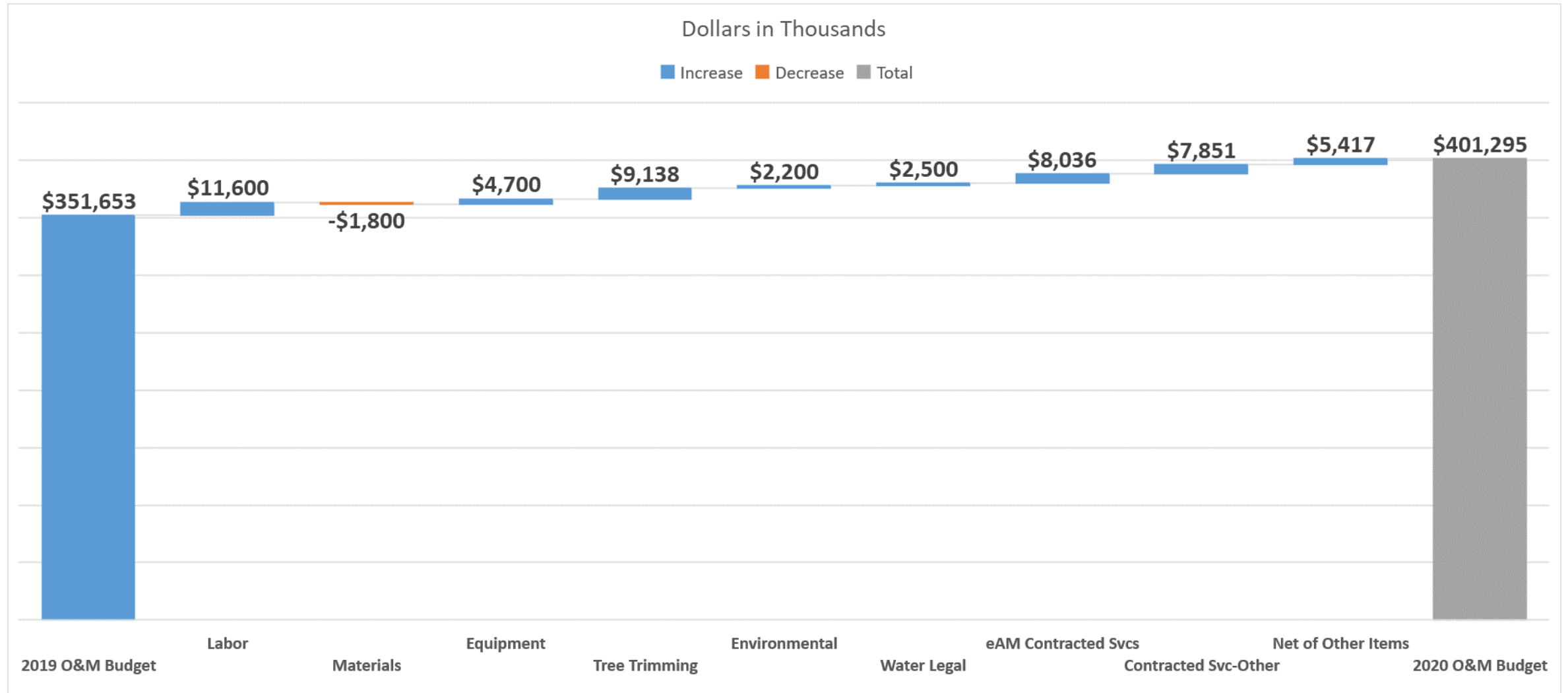
Gas Division Rate Proposal

Gas Division - Proposed	2018	2019	2020	2021	2022	2023	2024	5Yr Total
Ending Cash & Investments	60,254	57,930	72,703	83,471	96,321	82,225	50,534	
Days Cash of OpExp	89	95	121	136	155	131	80	
Debt Service Coverage	7.96	8.11	4.63	4.43	4.80	4.65	4.72	
Change in Net Assets (Net Income)	4,563	5,999	(3,003)	(8,033)	(6,651)	(10,307)	(12,071)	
Capital Expenditures	\$47,964	\$26,000	\$24,078	\$22,599	\$23,694	\$24,741	\$41,703	\$136,815
O&M Expenditures	\$88,212	\$86,537	\$91,928	\$94,226	\$95,365	\$97,098	\$96,828	\$475,446
Proposed Rate Increase %		0.0%	0.0%	0.0%	2.0%	0.0%	0.0%	2.0%
Proposed Rate Increase Revenue		-	-	-	4,354	-	-	\$13,081
Proposed Debt Issuance		-	70,000	-	-	-	-	\$70,000
Average Residential Bill Impact			\$0.00	\$0.00	\$0.74	\$0.00	\$0.00	\$0.74

Water Division Rate Proposal

Water Division - Proposed	2018	2019	2020	2021	2022	2023	2024	5Yr Total
Ending Cash & Investments	10,472	6,436	15,571	33,368	50,538	29,467	12,254	
Days Cash of OpExp	45	27	64	133	199	115	49	
Debt Service Coverage	4.28	3.94	2.33	3.40	3.18	3.02	2.99	
Change in Net Assets (Net Income)	7,105	4,141	1,606	10,462	13,842	11,658	10,755	
Capital Expenditures	\$32,340	\$15,000	\$30,625	\$29,745	\$48,710	\$40,755	\$36,501	\$186,336
O&M Expenditures	\$75,593	\$75,874	\$78,456	\$82,960	\$83,718	\$85,462	\$85,916	\$416,512
Proposed Rate Increase %		3.0%	15.0%	7.0%	5.0%	0.0%	0.0%	27.0%
Proposed Rate Increase Revenue		2,375	6,949	7,562	5,790	-	-	\$111,185
Proposed Debt Issuance	-	-	75,000	-	30,000	-	-	\$105,000
Average Residential Bill Impact (W1)		<u>\$0.45</u>	\$2.23	\$1.19	\$0.91	\$0.00	\$0.00	\$4.33

O&M Waterfall (changes from 2019 cut Budget)



Rate Request Comparison

		2020	2021	2022	2023	2024	Total
Electric Bill Impacts							
Proposed		\$ 5.19	\$ 1.89	\$ 1.92	\$ -	\$ -	\$ 9.00
Last Year		\$ 5.47	\$ 1.87	\$ 1.26	\$ 1.27		\$ 9.87
Gas Bill Impacts							
Proposed		\$ -	\$ -	\$ 0.74	\$ -	\$ -	\$ 0.74
Last Year		\$ 1.49	\$ 0.77	\$ 0.79	\$ 0.80	\$ -	\$ 3.85
Water Bill Impacts							
Proposed		\$ 2.23	\$ 1.19	\$ 0.91	\$ -	\$ -	\$ 4.33
Last Year		\$ 2.52	\$ 1.39	\$ 0.56	\$ 0.39	\$ -	\$ 4.86
Total Bill Impacts							
Proposed		\$ 7.42	\$ 3.08	\$ 3.57	\$ -	\$ -	\$ 14.07
Last Year		\$ 9.48	\$ 4.03	\$ 2.61	\$ 2.46	\$ -	\$ 18.58
Total Bill	Base						
Proposed	\$172.90	\$ 180.32	\$ 183.40	\$ 186.97	\$ 186.97	\$ 186.97	
Compound Average Growth Rate Over the Period						1.6%	

Electric Division

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Operating Revenue Variance			\$4,237	Increase
O&M	\$82,724	\$84,085	\$83,085	\$85,916
Depreciation & Amortization	\$9,653	\$11,230	\$10,388	\$12,083
PILOT & Taxes	\$2,972	\$4,889	\$2,989	\$3,004
Total Operating Expense	\$95,350	\$100,204	\$96,462	\$101,003
Expense Variance			\$799	Increase
Other Income	\$1,177	\$900	\$800	\$800
Debt Expense	\$1,864	\$2,362	\$2,362	\$4,204
Change in Net Position	\$7,104	\$0	\$4,141	\$1,496
Change in Net Position Variance			\$1,496	Increase

2020 Labor and Position Activity Excluding Wage Adjustments

	No. of Positions	Dollars
Positions Added	22	\$1,536,908
Positions and Other Deleted*	-63	-\$2,404,987
Net Effect	-41	-\$868,079
<i>Efficiency Savings</i>	-20	-\$1,600,000
<i>Net Including Efficiency Savings</i>	-61	-\$2,468,079

- The value of positions deleted is greater than the positions being added not including the promotions or re-classifications.
- We have proposed an overall 3.1% wage increase into the total labor budget.
- * Some of the deleted positions include only ½ year dollars.

Capital Summary

Electric Division

2019 Budget	\$60,000
2020 Budget	\$109,974
\$ Change	\$49,974
% Change	54.6%

Gas Division

2019 Budget	\$26,000
2020 Budget	\$24,078
\$ Change	(\$1,922)
% Change	108.0%

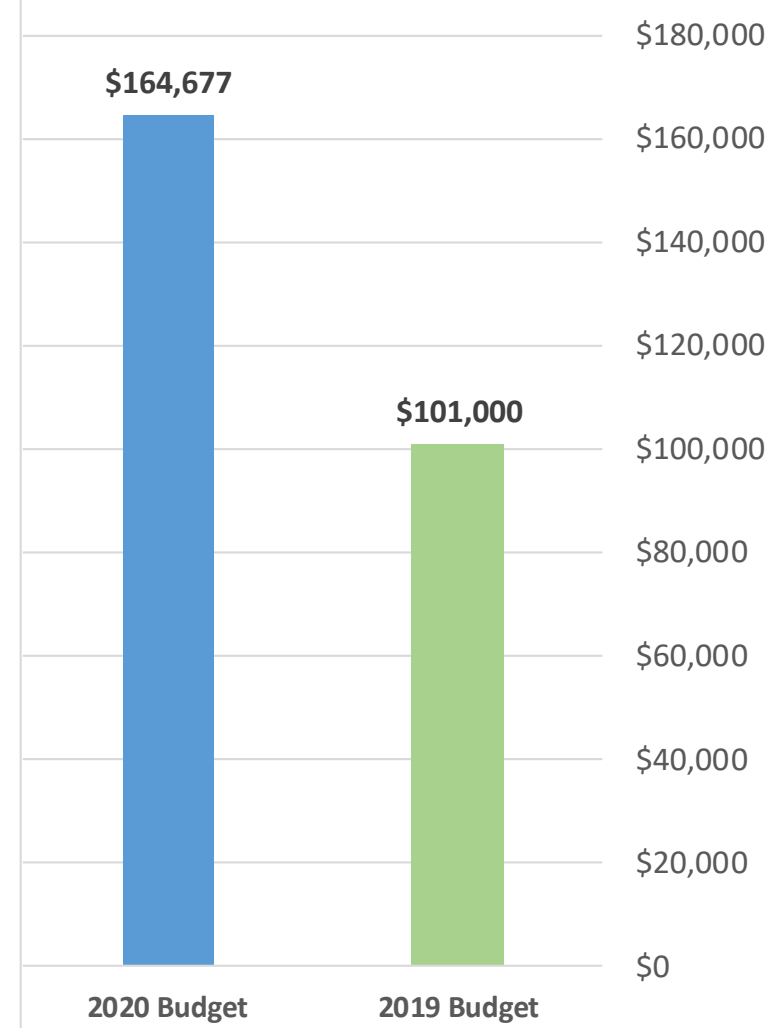
Water Division

2019 Budget	\$15,000
2020 Budget	\$30,625
\$ Change	\$15,625
% Change	49.0%

All Divisions

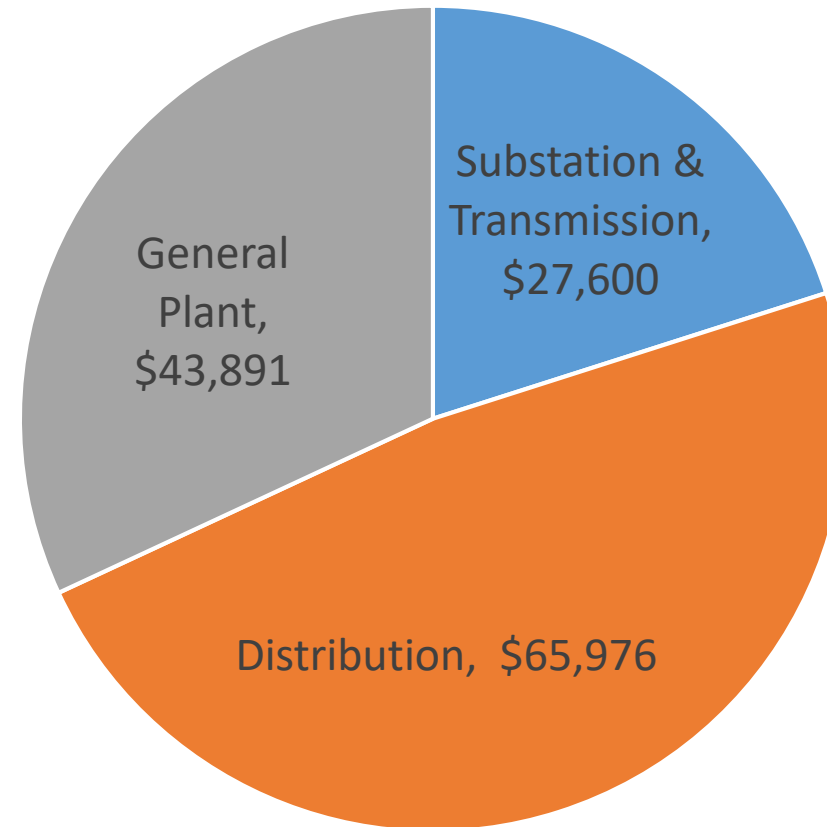
2019 Budget	\$101,000
2020 Budget	\$164,677
\$ Change	\$63,677
% Change	61.3%

CapEx Budget Comparison



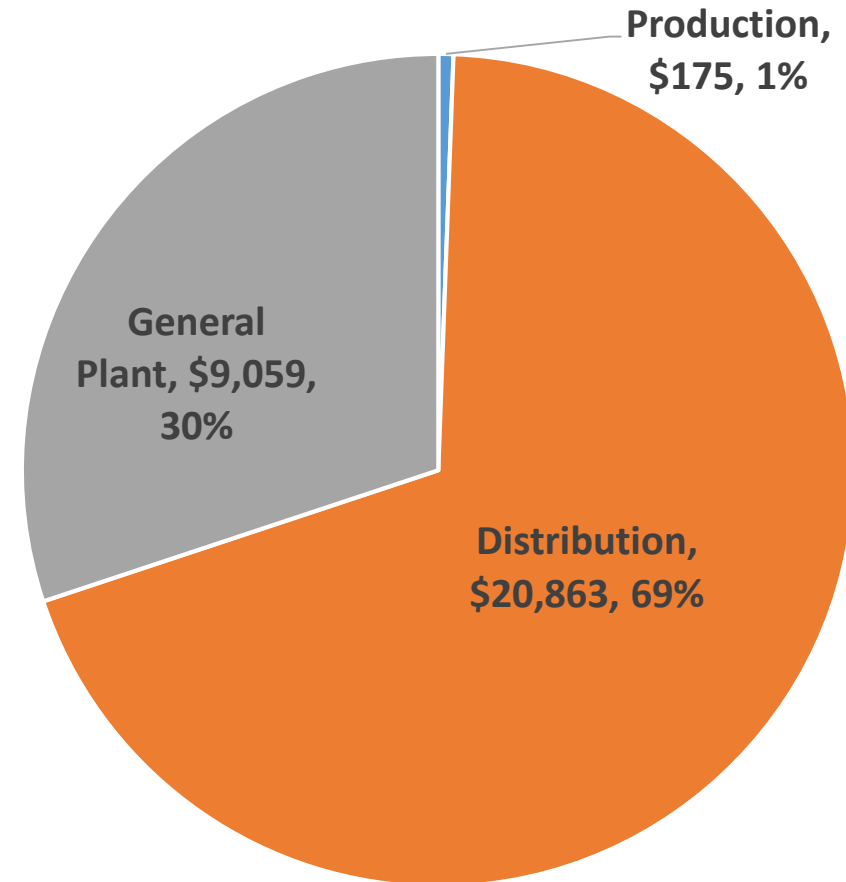
2020 Electric Capital Highlights

Electric Capital Highlights	Dollars
Extensions to Serve New Customers	\$ 30,971
Distribution Automation	\$ 22,000
Defective Cable Replacement	\$ 11,800
Information Technology Upgrades	\$ 11,140
Buildings & Structures	\$ 9,860
New Circuits	\$ 7,500
Transformer Replacement	\$ 6,155
Transportation and Power Operated Equipment	\$ 4,782
Line Reconstruction	\$ 3,375
Communication & Telecommunication Upgrades	\$ 3,095
Distribution Pole Replacement	\$ 3,000
Security Automation Upgrades	\$ 2,634



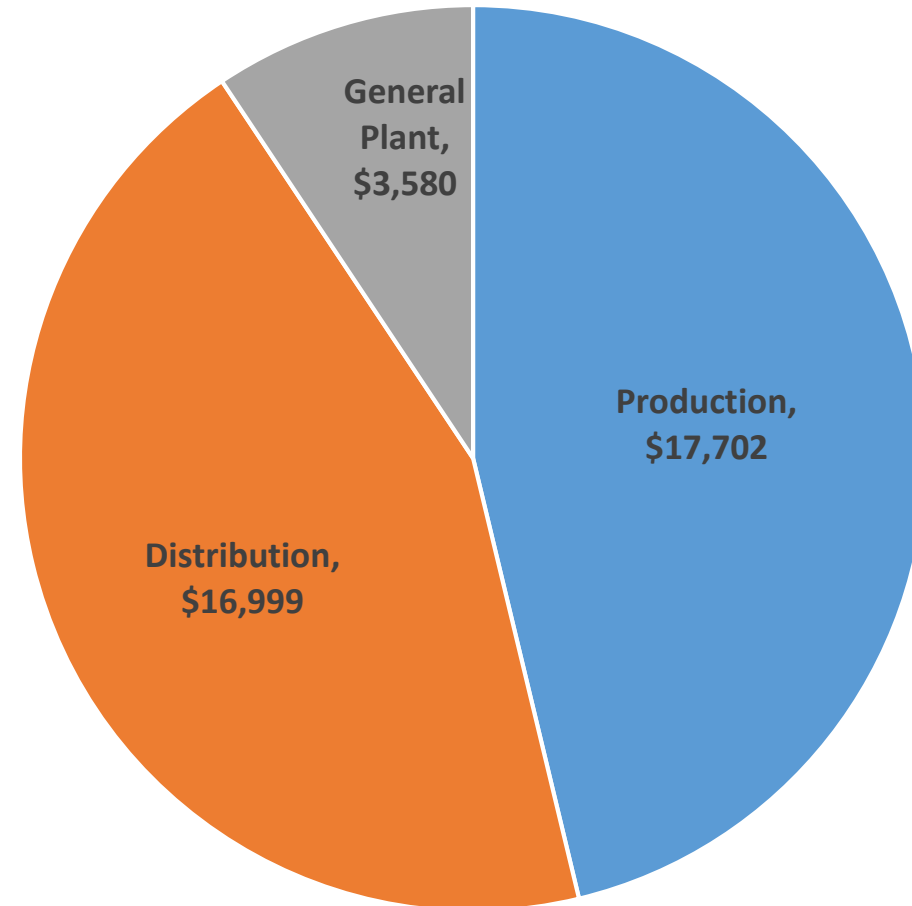
2020 Gas Capital Highlights

Gas Capital Highlights	Dollars
Gas Main Service Replacement	\$ 5,040
Extensions to Serve New Customers	\$ 4,814
Transportation & Power Operated Equipment	\$ 4,592
Street Improvements	\$ 3,571
Buildings & Structures	\$ 2,253
Transmission Pipeline/Facilities	\$ 2,500
Meters & Metering Equipment	\$ 1,363



2020 Water Capital Detail

Water Capital Highlights	Dollars
Pumping Station Upgrades	\$ 7,299
Extensions to Serve New Customers	\$ 4,730
Production Well Upgrades	\$ 4,323
Underground Storage Reservoirs	\$ 4,000
New Water Main	\$ 3,089
Relocation of Mains	\$ 2,820
Lead Service Replacement	\$ 2,500
Transportation Equipment	\$ 1,817



Value Proposition – Savings & Efficiencies

- TVA pre-pay cumulative savings of \$225 million since 2004.
- Natural gas prepay savings \$112.9 million since 2006.
- Pension cumulative savings of \$139.2 million since 2010.
- Medical cumulative savings of \$88.1 million since 2006.
- Cumulative sales revenue of Liquefied Natural Gas (LNG) of \$36.7 million since 2012.
- 2019 Budget included additional OPEB funding reduction of \$13 million due in part to medical plan changes made in 2018.
- Total cumulative impacts of **\$614.9 million**.

A few examples of 2020 Projects that could be impacted

Electric Division

- Tree Trimming Cycle effects
 - MLGW is already behind in cycle trim miles (1400 miles behind, almost a full-year behind)
 - Will we continue to fall behind and outage will increase due to tree damage
- Strategic Undergrounding work
 - Bishop's Bridge Subdivision (South Memphis), \$175,000 involving 165 customers
 - Lynndale East Subdivision (East Memphis), \$50,000 involving 139 customers
- Underground Cable Retrofit work
 - Indian Hills Subdivision, \$500,000 involving 26 customers (21 faults)
 - West Raines Subdivision, \$500,000 involving 50 customers (20 faults)

Water Division

- Distributed Process Controls at Allen Pumping Station
- No new wells
- Wash-water recovery basin at Mallory

Budget Schedule

- Preliminary presentation to MLGW Board, 10/10
- MLGW Board vote, 10/23 - *approved*
- MLGW City Council Committee, 11/5
- Full Council Meetings remaining for 2019 thereafter:
 - 11/19
 - 12/3
 - 12/17



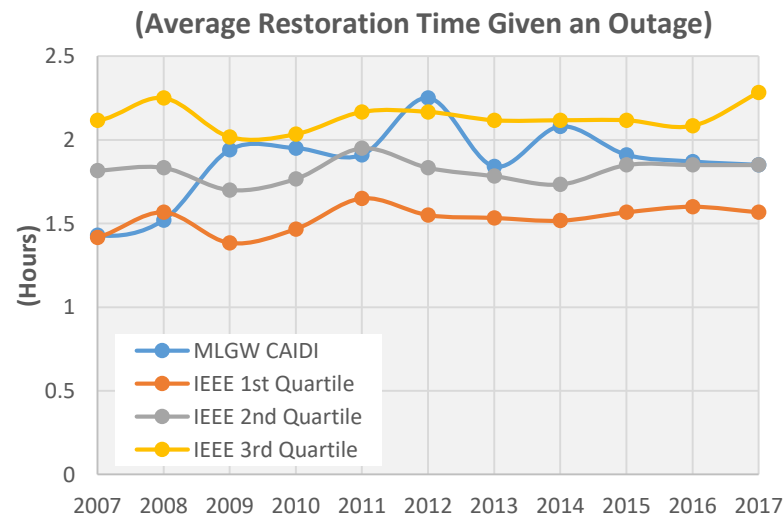
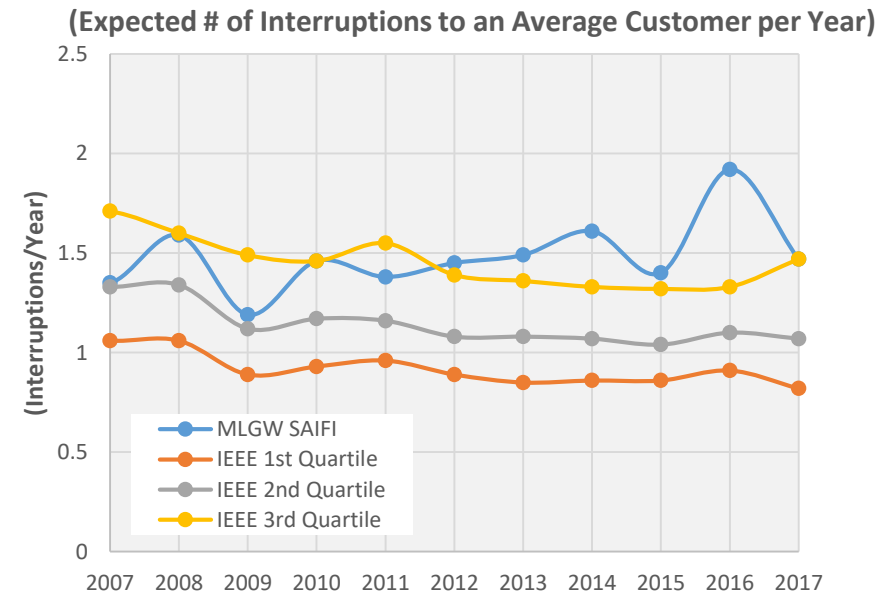
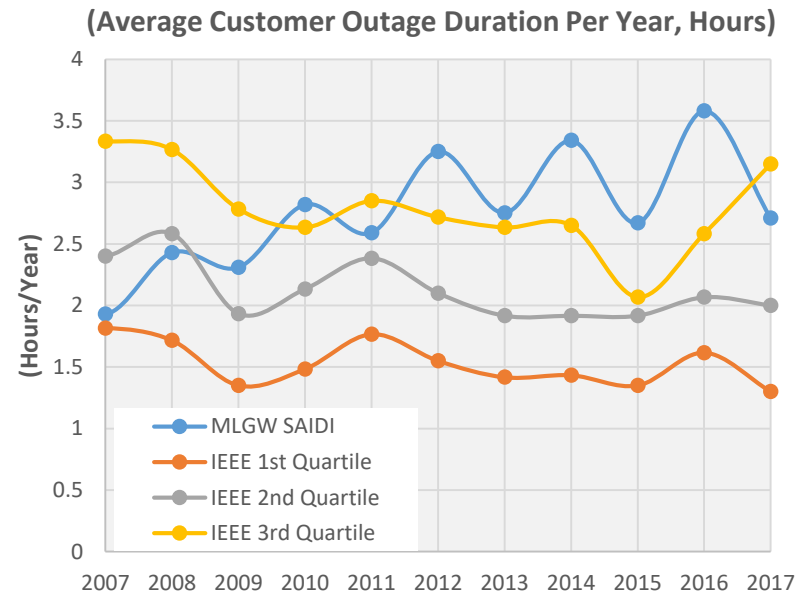
Electric Capital Request

Electric System Modernization

- Commencing an electric reliability and modernization improvement plan
- The plan involves five primary components:
 - Substation circuit breakers and transformers
 - Tree trimming
 - Pole replacements
 - Cable retrofits
 - Distribution Automation



RELIABILITY BENCHMARKING AT MLGW (Data Excludes Storms)



**THE GOAL: 1ST QUARTILE
RELIABILITY PERFORMANCE
AT MLGW**

Neighborhood Outage Data Over Time

NBR	NEIGHBORHOOD	2005-2008			2009-2013			2014-2018		
		Average Time Off Per Outage (Minutes)	Average Time Off Per Year (Hours)	Average Interruptions Per Year	Average Time Off Per Outage (Minutes)	Average Time Off Per Year (Hours)	Average Interruptions Per Year	Average Time Off Per Outage (Minutes)	Average Time Off Per Year (Hours)	Average Interruptions Per Year
1	SHELBY FOREST	212.8	7.45	2.1	181.6	6.30	2.1	249.1	12.58	3.0
2	MILLINGTON-ROSEMARK	130.8	3.82	1.8	113.7	3.41	1.8	142.2	4.77	2.0
3	FRAYSER	131.3	2.78	1.3	148.1	3.31	1.3	143.2	5.09	2.1
4	RALEIGH	182.8	5.18	1.7	123.1	3.33	1.6	110.7	4.50	2.4
5	BARTLETT	120.4	3.27	1.6	98.9	2.21	1.3	101.9	3.08	1.8
6	LAKELAND	97.7	2.30	1.4	106.5	2.01	1.1	132.9	3.74	1.7
7	ARLINGTON	139.2	3.97	1.7	110.5	1.97	1.1	100.7	2.74	1.6
8	NORTH MEMPHIS	101.6	3.39	2.0	106.1	2.71	1.5	135.6	4.79	2.1
9	BERCLAIR-GRAHAMWOOD	99.7	3.01	1.8	108.8	3.03	1.7	147.0	5.10	2.1
10	SHELBY FARMS	100.4	1.86	1.1	95.9	2.80	1.8	90.3	2.86	1.9
11	CORDOVA	104.4	2.45	1.4	91.4	1.55	1.0	106.6	2.24	1.3
12	FISHERVILLE-EADS	125.3	5.12	2.5	91.5	2.18	1.4	111.0	3.81	2.1
13	DOWNTOWN-MED DIST	139.2	3.04	1.3	97.6	2.47	1.5	105.5	3.57	2.0
14	MIDTOWN	132.4	3.91	1.8	132.6	3.67	1.7	140.7	4.32	1.8
15	EAST MEMPHIS	159.5	4.15	1.6	142.4	3.58	1.5	184.8	4.84	1.6
16	SOUTH MEMPHIS	158.4	4.36	1.7	156.6	4.62	1.8	156.7	4.62	1.8
17	CASTALIA HEIGHTS-PROSPECT PARK	154.0	5.29	2.1	135.1	4.57	2.0	138.3	6.43	2.8
18	ORANGE MOUND-GLENVIEW	158.4	4.23	1.6	136.3	3.30	1.5	163.5	8.12	3.0
19	BALMORAL-SHADY GROVE	133.2	3.06	1.4	135.1	3.24	1.4	167.5	4.77	1.7
20	GERMANTOWN	146.9	2.99	1.2	109.9	2.88	1.6	153.7	4.00	1.6
21	PRESIDENTS ISLAND-RIVERGATE	158.6	3.25	1.2	88.4	2.17	1.5	101.9	1.61	1.0
22	WESTWOOD-CORO LAKE	226.4	3.77	1.0	166.7	4.25	1.5	176.7	6.24	2.1
23	WHITEHAVEN	168.3	4.66	1.7	154.1	3.57	1.4	222.8	6.68	1.8
24	AIRPORT-OAKHAVEN	162.3	4.63	1.7	135.8	3.60	1.6	192.1	4.80	1.5
25	PARKWAY VILLAGE	165.9	3.82	1.4	148.3	3.88	1.6	165.3	5.29	1.9
26	LAMAR-CAPELVILLE	212.0	5.20	1.5	129.9	2.69	1.2	149.0	4.92	2.0
27	HICKORY HILL	98.2	2.08	1.3	109.6	2.59	1.4	150.7	4.72	1.9
28	SOUTHWIND	115.5	2.20	1.1	87.8	1.89	1.3	119.7	2.53	1.3
29	COLLIERVILLE	113.2	1.77	0.9	80.3	1.51	1.1	102.8	1.65	1.0

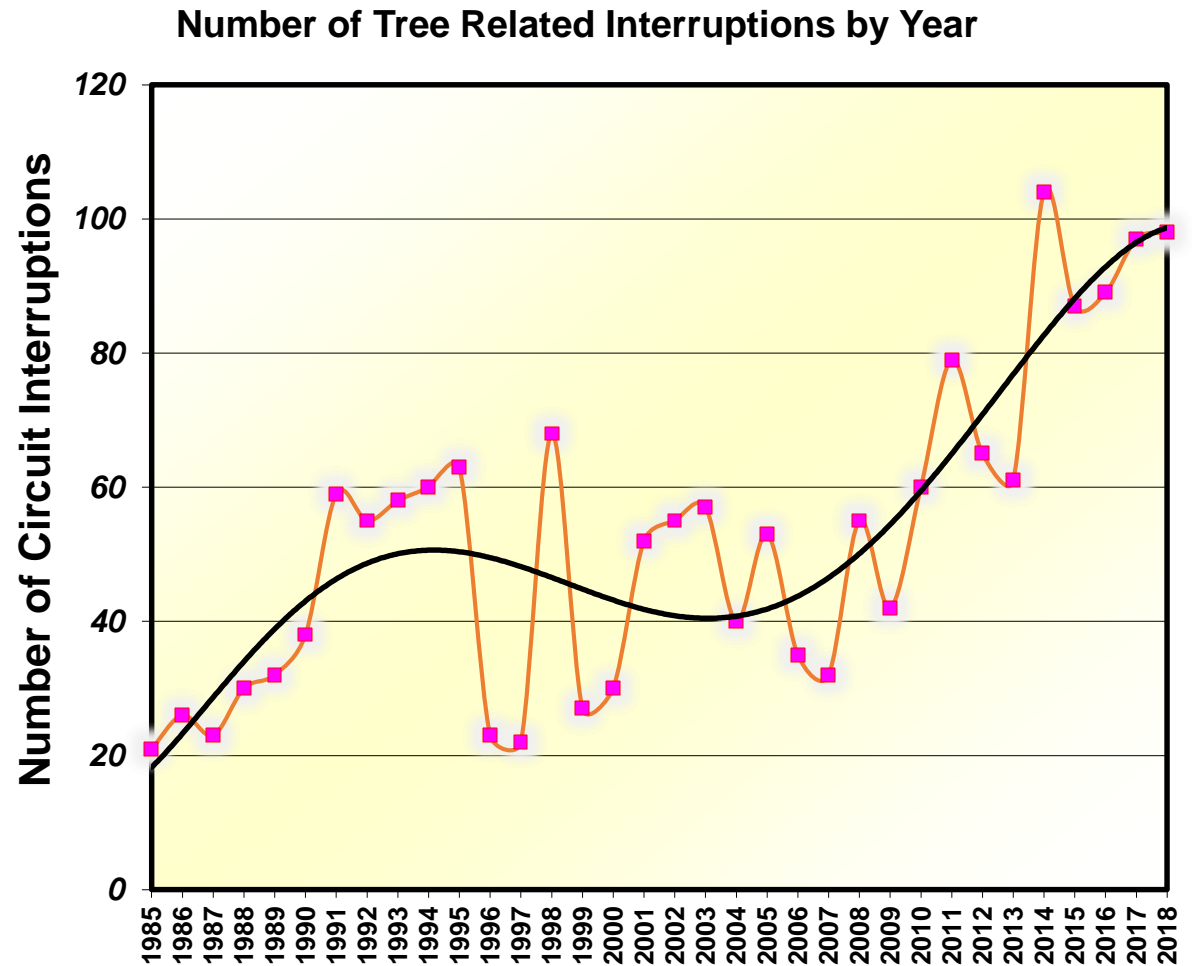
Reliability – Substation Circuit Breakers and Transformers

- Circuit breaker related outages are the leading cause of substation related outages.
- MLGW has approximately 500 substation feeder circuit breakers with a median age of 39 years and 151 power transformers with a median age of 30 years.
- Assets are evaluated based on condition, age, criticality and spare part availability and prioritized accordingly.
- Plan is to increase the number of breaker and transformer replacements.
- Replacing units in poor condition reduces the risk of catastrophic failures resulting in extended outages to large numbers of customers.



Reliability - Tree Trimming

- Trees are the #1 cause of outages (other than storms)
- 4,500 miles of overhead lines (many on rear property lines)
- 3-year trimming cycle is the target (at approximately 4 now)
- Fell short of the required annual target to get to a three-year cycle
- The annual tree trimming cost is \$18 million. This total includes \$14.2 million for the 3-year cycle trim and \$3.8 million for emergency tree trimming (storms).
- When fully implemented on a 3-year cycle plan, customers should see a 15% reduction in annual minutes interrupted



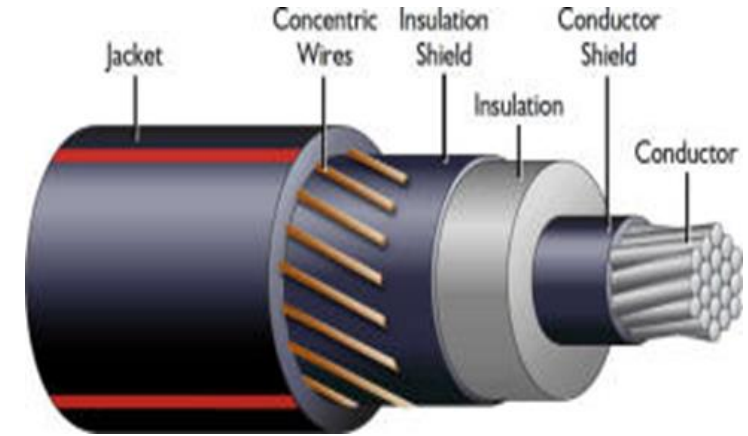
Reliability – Pole Replacements

- MLGW has approximately 150,000 wood poles.
- As poles age they decay and must be either treated in-place, reinforced, or replaced.
- To extend pole life and reduce failures, MLGW spent \$2.1 million on the inspection and treatment of over 122,000 wood poles between 2009 - 2013.
- 6,000 poles were rejected and required retrofit or replacement. This project will be completed in 2020 at a project cost of nearly \$14 million. 878 of these rejected poles failed prior to replacement during the eleven year project (2009-2020).
- \$1.5 million is budgeted to restart this work in 2020. The work is scheduled on a ten year cycle.



Reliability – Cable Replacements

- Feeder cables provide the backbone of the underground distribution system.
 - On average, a feeder cable fault results in an 117 minute outage to 1,100 customers.
- Underground Residential Distribution (URD) cable feeds neighborhoods.
 - On average, a URD cable fault results in an 9.5 hour outage to 27 customers.
- We plan to increase spending on the replacement of these end-of-life cables that have resulted in increased outages. This effort will likely require contracted resources.



Modernization – Distribution Automation

- Distribution Automation (DA) allows for remotely controlled and/or automatic isolation and reconfiguration of electric circuits using sensors, controls, switches and communication systems.
- The installation of these switches will make the power system more resilient for our customers.
- It has been shown that outage durations (SAIDI index) can be reduced by approximately 40% or more as reported in a U.S. Department of Energy report on DA.
- To modernize the power system with DA would require approximately 1,600 devices totaling \$130 million. This effort will likely require contracted resources.





Gas Capital Request

RELIABILITY & SYSTEM IMPROVEMENT

• Gas Regulator Stations

- Regulator, Relief, and Communication Upgrade
 - This project will replace obsolete (parts) Pressure Regulator Stations and add SCADA communication.
 - Total of 109 regulator stations in system. 19 regulators to be upgraded.
 - 63 regulator stations do not have SCADA communication.
 - Project will also add capacity and mitigate potential for over-pressurization on the multiple gas pressure systems.
 - Four regulator stations with communication will be addressed each year.
- Budget Spending
 - 2020 - \$1,000,000
 - 2021 - \$1,000,000
 - 2022 - \$1,000,000
 - 2023 - \$1,000,000
 - 2024 - \$1,000,000



RELIABILITY & SYSTEM IMPROVEMENT

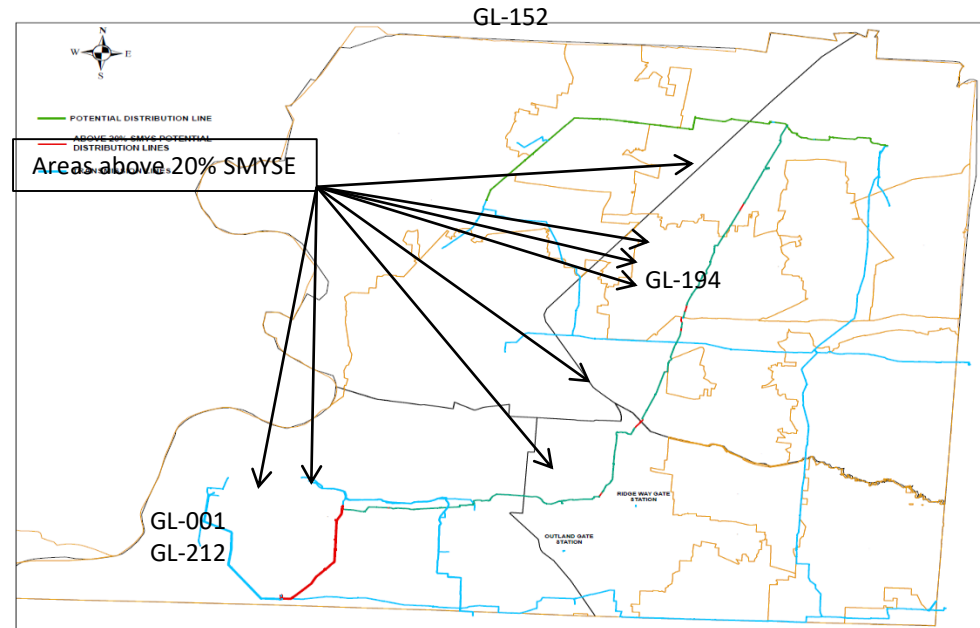
• Transmission Pipelines and Facilities

• Transmission Gas Line 194 Reclassification

- This project will replace eight (8) section of GL 194 to improve the tensile strength (SMYSE) of the overall pipeline.
- Pipeline is 31.89 miles and was installed pre 1970.
- Project will also reclassify pipeline from transmission to distribution and reduce regulatory inspection requirements. (potential \$1,042,200 savings on 7 year basis, GL-194 & GL-152 combined)
- Two sections will be replace each year.

• Budget Spending

- 2020 - \$1,000,000
- 2021 - \$1,000,000
- 2022 - \$1,000,000
- 2023 - \$1,000,000
- 2024 - \$0



RELIABILITY & SYSTEM IMPROVEMENT

• Transmission Pipelines and Facilities

• Transmission Gas Line 001 and 012 Replacement

- This project will replace the highest risk pipelines, GL-001 and GL-212, due to issues of age, construction, operation, and/or condition with a single pipeline.
- Transmission Gas Line 001 and 012 (5 miles each) were installed in 1929 and 1940 respectively.
- Project will also reclassify new single pipeline from transmission to distribution and reduce regulatory inspection requirements. (potential \$135,300 savings on 7 year basis)

• Budget Spending

- 2020 - \$
- 2021 - \$
- 2022 - \$
- 2023 - \$
- 2024 - \$12,000,000

Construction Practice



5 YEAR BUDGET SPENDING SUMMARY

(MAJOR CAPITAL INITIATIVES)

Categories <i>(In Thousands)</i>	2020	2021	2022	2023	2024
REGULATORY COMPLIANCE	\$5,100	\$5,980	\$5,120	\$5,120	\$5,120
Gas Main/Service Repl. (DOT)	\$4,600	\$5,180	\$5,120	\$5,120	\$5,120
Transmission Pipelines and Facilities	\$500	\$800	-	-	-
RELIABILITY & SYSTEM IMPROVEMENT	\$2,000	\$2,000	\$2,000	\$2,000	\$13,000
Gas Regulator Stations	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
Transmission Pipelines and Facilities	\$1,000	\$1,000	1,000	1,000	12,000
TOTAL BUDGET SPENDING	\$7,100	\$7,980	\$7,120	\$7,120	\$18,120
*Distribution Crew(s) annual workload: \$5,000,000 (44 Crews) *Transmission Crew(s) annual workload: \$2,000,000 (4 Crews)					

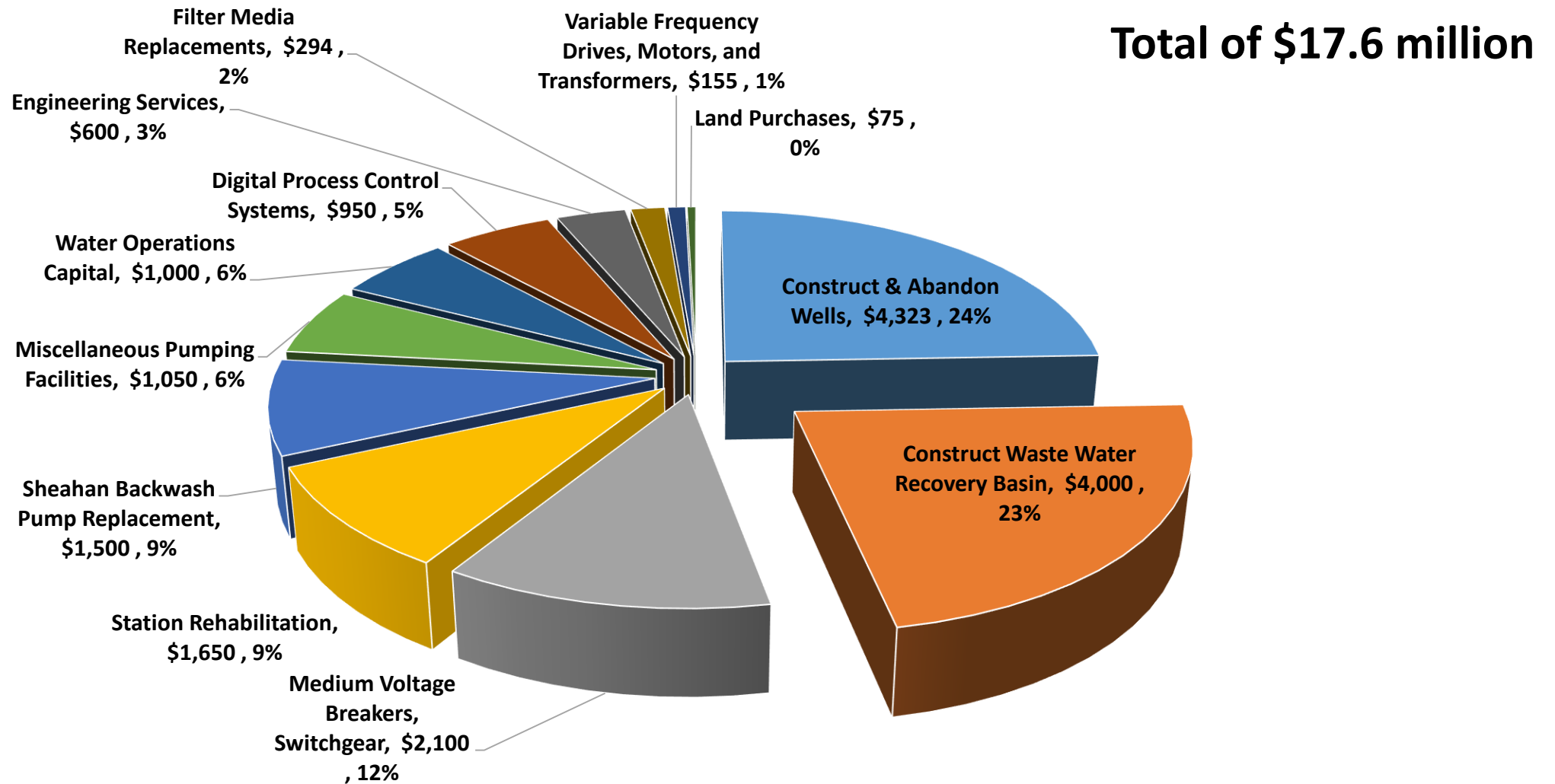


Water Capital Request

Water Pumping Stations are Aging

	Original Construction	Expanded	Rehabilitation
Mallory – 35 MGD	1924	1970	2016
Sheahan – 35 MGD	1932	1972	-
Allen – 30 MGD	1953	-	-
McCord – 35 MGD	1958	1973	-
Lichterman – 30 MGD	1965	1975	-
LNG – 1.1 MGD	1967	-	-
Palmer – 5.5 MGD	1970	-	-
Davis – 30 MGD	1971	1999	-
Morton – 30 MGD	1982	1994	-
Shaw – 30 MGD	1990	1997	-
Average Age	58 years old	-	-

2020 Budget - Production



* The pie graph excludes Buildings & Structures and Contingency funds.

2020 Budget and Five-Year Service Improvement Plan

11/5/2019

71

Rehabilitation of Pumping Stations

(5-Year Plan In Thousands)

Pumping Station	* Station Totals (All WO Types)	2019 (Projected)	2020	2021	2022	2023	2024
Allen	\$ 39,655	\$ 360	\$ 2,920	\$ 2,218	\$ 18,028	\$ 16,130	\$ 15,750
Mallory	\$ 16,550	\$ 1,275	\$ 5,114	\$ 6,999	\$ 3,163	\$ -	\$ -
Sheahan	\$ 12,983	\$ 1,270	\$ 1,680	\$ 1,423	\$ 5,118	\$ 3,493	\$ 1,000
Davis	\$ 9,343	\$ 710	\$ 1,503	\$ -	\$ 4,300	\$ 2,830	\$ 2,000
Shaw	\$ 4,718	\$ 300	\$ -	\$ -	\$ 2,000	\$ 2,418	\$ -
McCord	\$ 4,578	\$ 125	\$ 400	\$ 875	\$ 1,670	\$ 1,508	\$ 1,418
Lichterman	\$ 4,413	\$ 600	\$ 1,523	\$ 795	\$ 95	\$ 1,400	\$ 1,663
Morton	\$ 1,160	\$ -	\$ 175	\$ 895	\$ 90	\$ -	\$ 1,418
LNG	\$ 695	\$ -	\$ 120	\$ -	\$ 495	\$ 80	\$ -
Palmer	\$ 695	\$ -	\$ 120	\$ -	\$ 495	\$ 80	\$ -
Pickle	\$ 500	\$ -	\$ -	\$ -	\$ 250	\$ 250	\$ -
Total	\$ 95,288	\$ 4,640	\$ 13,554	\$ 13,204	\$ 35,703	\$ 28,188	\$ 23,248
* Excludes rehabilitative costs beyond 2024							

Mallory Pumping Station – Mechanical Rehab

Backwash Pump Suction & Discharge (Before and After)



Mallory Pumping Station - Structural Rehab

Aerator - Before



Aerator - After



Allen Pumping Station



Allen Pumping Station



Water Capital Highlights

- Rehabilitation of water pumping stations
- Construct new wells
- Construct wash water recovery basin
- Distributed Process Control Systems
- Medium Voltage Circuit Breakers and Switchgear replacement



Water Production Well Ratings

Well Rating	1	2	3	4
Mallory	4	6	4	6
Sheahan	2	7	10	2
Allen	7	2	4	11
McCord	8	0	8	5
Lichterman	1	5	13	4
Davis	4	5	3	8
Morton	3	9	0	4
Shaw	8	9	0	0
Palmer	1	0	3	1
LNG	0	0	2	0
* Total Wells	38	43	47	41

* MLGW has 128 operational wells (rating 4 wells are slated for abandonment)

Water Production Well Ratings

- Wells are assessed annually and assigned a “Reliability Rating”
- MLGW has 128 **operational** wells (rating 1, 2 & 3 wells)
- Rating 4 wells aren’t included in this count (ready to be abandoned)
- Current replacement rate is 2 wells per year in 2020 and 3 wells per year 2021 onward
- Abandonment rate is 0 wells per year

Well Reliability Ratings Scale:

1 – Reliable for at least 20 years:

- Relatively young well
- Has been fully lined with PVC

2 - Reliable for at least 10 years:

- Casing should have at least 10 years until failure based on well field history
- Casing has failed and been recently lined

3 - Reliable for less than 10 years:

- Is of the age where other wells in the field have failed
- Has failed and been patched
- Has failed and been partially lined

4 - Current well failure, needs major repair, or candidate for abandonment

Water Production Well Age Distribution

- Number of active wells: 128
- Average well age: 34 years
- Average time to well abandonment (TTA): 35 years

