Integrated Resource Plan Final Report and Recommendation

MLGW BOARD OF COMMISSIONERS AUGUST 19, 2020

PRESENTATION AGENDA

- Now What?
- IRP Recap
- Summary of Findings
- Analysis of Portfolios
- MISO Membership Assessment
- Other Factors to Consider
- Recommendations
- Next Steps

THIS IS A VERY BIG DEAL... NOW WHAT?

CONFIRM PROJECTED IRP SAVINGS BEFORE MAKING A FINAL DETERMINATION

- A power supply Requests for Proposals (RFP) will be undertaken by MLGW to confirm the savings before making a Board recommendation.
- The IRP will be utilized to determine the general mix of assets and locations of interest in the RFP and the orders of magnitude of transmission required. Alternative proposals will be considered as well.
- Of the eleven portfolios in the IRP, the characteristics of three of them (6, 9, and 10) appear optimal and will be included among the parameters of the scope of the RFP. Differences between these portfolios can be reassessed with bids provided by potential suppliers.
- Options to manage fuel price risk will also be an element to be included in the RFP

INTEGRATED RESOURCE PLAN RECAP

INTEGRATED RESOURCE PLANNING

- The IRP process was an independent, unbiased, fully-transparent approach to evaluate options for MLGW to supply its current and forecasted load while meeting key objectives including:
 - Affordability / Least Cost / Rate Impact
 - Reliability / Resource Adequacy
 - Sustainability / CO2 / Water Use / RPS
 - Stability / Price Risk Mitigation / Reliance on Market
 - Economic Impact / Local Capital Investment



STRATEGIES, SCENARIOS, PORTFOLIOS

- Strategies represent the available options to MLGW to supply its load
- Multiple Strategies were assessed:
 - Strategy 1: Full Requirements
 Contract with TVA
 - Strategy 2: Self-Supply
 - Strategy 3: MLGW-MISO¹ combination
 - Strategy 4: All MISO
- Scenarios represent a range of plausible futures
- Strategies are combined with Scenarios and using a structured approach to identify Portfolios
- Portfolios represent the mix of generation and transmission resources

		Strategies						
S	cenarios	Strategy 1 (TVA)	Strategy 3 Self + MISO	Strategy 4 All MISO				
	Scenario 1 Reference	S1S1	S3S1	S4S1				
State of the World	Scenario 2 (High Load)		S3S2					
	Scenario 3 (Low Load)		S3S3					
	Scenario 4 (High Load/Low Gas)		S3S4					
	Scenario 5 (High Transmission)		S3S5					
	Scenario 6 (Promote BESS)		S3S6					
	Scenario 7 (Low Load/High Gas)		S3S7					

¹Midcontinent Independent System Operator

INTEGRATED RESOURCE PLAN RECAP

POWER SUPPLY ADVISORY TEAM (PSAT)

- A diverse, 20-member team of local business and community leaders, governmental officials and MLGW Executives
- Collaborated to provide input into MLGW's IRP objectives and metrics
- Helped MLGW consider various factors necessary to reach an optimal long-term power supply solution from the perspective of our customers and our community

IRP Community Engagement

PSAT Meetings (11)

- 4/30/19, MLGW Administration Building
- 5/16/19, Whitehaven Community Center
- 6/6/19, Benjamin L. Hooks Library
- 8/14/19, First Baptist Church-Broad Ave.
- 9/16/19, First Baptist Church-Broad Ave.
- 10/17/19, Benjamin Hooks Library
- 11/7/19, Benjamin Hooks Library
- 1/23/20, First Baptist Church-Broad Ave.
- 2/27/20, First Baptist Church-Broad Ave.
- 3/26/20, First Baptist Church-Broad Ave.
- 5/29/20, Virtual Meeting

IRP Community Meetings (3) "Your Power, Your Voice"

- 8/20/19, Hollywood Community Center
- 11/21/19, Southwest Tennessee

Community College, Whitehaven Campus

• 6/4/20, Virtual Meeting

Details from each Power Supply Advisory Team (PSAT) meeting and all IRP Community meetings are available online. Links to meeting notes, presentations, videos and stakeholder input can all be found at <u>mlgw.com/powersupplyinfo</u>.

MLGW IRP OBJECTIVES AND METRICS

OBJECTIVES	METRICS
Reliability	Meets or exceeds NERC reliability requirements and manages intermittency. All Portfolios meet NERC Standards; thus, the metric is designed to assess the level by which NERC levels are exceeded. The ratio of the Capacity Import Limit (CIL) + Reliable Generation (Unforced Capacity UCAP) to Peak Load was selected. <i>Higher the better.</i>
Least Cost (Affordability)	Net Present Value (NPV) of revenue requirements. This NPV includes all costs in addition to the generation capital and operating costs, i.e. cost of transmission, MISO Membership, TVA costs, PILOT (payments in lieu of taxes), etc. <i>Lower the better.</i>
Price Risk (Minimization/Stability)	Measured as: (a) 95% confidence interval (e.g. Worst Plausible Outcome) and (b) Regret: i.e. the level by which MLGW would regret having chosen a Portfolio in case of an adverse future condition. <i>Lower Worst Plausible Outcome and Minimum Regret or No Regret (always optimal no matter the future) is the goal.</i>
Sustainability	Measured as (a) carbon (proxy for total emissions), (b) water consumption and (c) RPS limit – percentage of the energy coming from renewable resources (nuclear and large hydro, although "clean" on emission, do not count). <i>For "a" and "b" Lower the better, for "c" Higher the better.</i>
Market Risk	Energy Market Purchases or Sales as a percentage of load; Amount of Capacity Purchases. <i>Lower the better.</i>
Economic Growth	Job creation; Capital Expenditures in Shelby County and number of plants as a proxy. <i>Higher the better.</i>
Resiliency	Amount of load shed during extreme events. Lower the better.

TRANSMISSION ANALYSIS (TA)

Transmission Analysis as part of the IRP

- Included general upgrades/additions to the transmission system to provide reliable electric service at the lowest reasonable cost
- Included transmission costs to integrate new supply-side resources into the MLGW system, either new-build generation or imports from other utilities
- IRP objectives and metrics supported a conservative approach to "wheeling" (e.g. Anti-Cherrypicking Amendment - Federal Power Act, Section 212)

SUMMARY OF FINDINGS

COMPONENTS OF LEVELIZED WHOLESALE COST/MWH (PORTFOLIO 9)

- MLGW pays an all-in price today that includes fixed costs, energy, transmission, and other elements
- Similarly, the IRP includes multiple elements
- A Power Supply RFP might not be inclusive of all the value we receive today



It's more than just power cost

SUMMARY OF FINAL PORTFOLIOS (11 TOTAL)

Portfolio ID	Final Portfolio	Total Thermal 2039	Local Renew 2039	Battery 2039	Total Local Nameplate 2039	MISO Renew 2039	MISO Cap 2039	950 MW CC	450 MW CC	237 MW CT
S3S1_P	Portfolio 1	1137	1000	0	2137	2200	1761	0	2	1
\$3\$1_F	Portfolio 2	1587	1000	0	2587	1550	1487	0	3	1
S3S2_BB	Portfolio 3	1824	1000	0	2824	1350	1308	0	3	2
S3S3_BB	Portfolio 4	1350	1000	0	2350	1550	1697	0	3	0
\$3\$5	Portfolio 5	1398	1000	100	2498	3450	1183	0	1	4
S3S7_BB	Portfolio 6	1137	1000	0	2137	2200	1761	0	2	1
\$3\$1_2CT	Portfolio 7	1374	1000	0	2374	2200	1550	0	2	2
S3S7_2CT	Portfolio 8	1374	1000	0	2374	2200	1550	0	2	2
S3S5_YD	Portfolio 9	1398	1000	100	2498	3450	1186	0	1	4
S3S10	Portfolio 10	950	1000	0	1950	2250	1901	1	0	0
S4S1	Portfolio All MISO	950	0	0	0	3200	1909	1	0	0

Recognized that cost was not the sole basis for selecting Portfolios. The determination of the final Portfolios is a two-step process:

- First: a base capacity expansion is produced using the Long Term Capacity Expansion (LTCE) module of the optimization software (AURORA).
- Next: Expert judgement is used to adjust the initial expansion plan and the AURORA LTCE was re-run with these adjustments in place, resulting in a unique Portfolio that is better suited to manage risks, such as reduced dependence on remote resources.

ANALYSIS OF PORTFOLIOS

BALANCED SCORECARD

Objective Measure	Measure	Unit	TVA (Base)) TVA (LTP)	Portfolio 5	Portfolio 9	Portfolio 10*	Portfolio 6	Portfolio 8	All MISO	Portfolio 1	Portfolio 7	Portfolio 4	Portfolio 2	Portfolio 3
					1 CC + 4 CT	1 CC + 4 CT	1 CC + 0 CT	2 CC + 1 CT	2 CC + 2 CT	1 CC + 0 CT	2 CC + 1 CT	2 CC + 2 CT	3 CC + 1 CT	3 CC + 2 CT	3 CC + 0 CT
	NBVBB 2020 2020	C Millione	16,411	16,020	14,504	14,453	14,304	14,614	14,627	14,522	14,490	14,503	14,511	14,668	14,709
	111 1111 2020 - 2033	a minoria								110					
	Stochastic Mean NPVRR 2020 -		16,388	15,996	14,459	14,465	14,571	14,747	14,766	14,789	14,790	14,808	15,052	15,076	15,203
	2039	\$ millions													
		\$ / MWh	67.47	65.86	59.32	59.34	59.48	60.51	60.59	60.68	60.69	60.76	61.77	61.87	62.39
Cost	Levelized Cost of Energy														
east	NPV Savings with Respect of				1,537.4	1,531.7	1,425.9	1,249.3	1,230.5	1,207.8	1,206.8	1,188.0	944.7	920.2	793.0
	LTP (wrt LTP) 2020 -2039	\$ Millions													
	Levelized Savings per Year				122.1	121.7	113.3	99.2	97.8	96.0	95.9	94.4	75.0	73.1	63.0
	(wrt LTP) 2025 -2039	\$ Millions													
	Levelized Savings per Year				153.2	152.8	144.4	130.3	128.8	127.0	127.0	125.5	106.1	104.2	94.1
	(wrt Base) 2025 -2039	\$ Millions													
بد خ		.	17,221	16,830	16,576	16,517	16,993	16,946	16,944	17,211	17,051	17,074	17,648	17,535	17,844
i≣ in getti	95th Percentile value of NPVRR	\$ millions													
	CO ₂ Emissions Mean 20-Year	Million Tons CO ₂	3.8	3.8	2.37	2.37	3.44	3.04	3.04	3.44	3.33	3.33	4.02	3.82	4.09
×															
r. Ris	Energy from Renewable	% of Energy	6.5%	6.5%	75.3%	75.3%	52.7%	54.9%	54.9%	52.7%	56.8%	56.8%	47.3%	46.1%	40.7%
л Е М	Sources 2039 (RPS)	Consumed													
Mir	Energy from Zero Carbon	% of Energy	58.6%	58.6%	75.3%	75.3%	52.7%	54.9%	54.9%	52.7%	56.8%	56.8%	47.3%	46.1%	40.7%
	Sources 2039	Consumed													
ible		Million Gallon	3,103	3,103	3,961	3,782	4,899	4,782	4,789	3,103	4,788	4,795	5,645	5,551	5,607
Relia	2025 Local Water Consumption														
		%	133.7%	133.7%	126.0%	127.8%	148.6%	126.6%	127.2%	115.4%	126.6%	127.2%	126.7%	130.8%	137.3%
2025 (U	2025 (UCAP+CIL)/PEAK														
Resil	Max Load Shed in 2025 under Extreme Event	MW	0	0	622.4	0.0	0.0	8.4	0.0	0.0	8.4	0.0	0.0	0.0	0.0
-					10 C						19				
Market Risk	% Energy Purchased in Market	%	10.9%	10.9%	31.2%	31.2%	23.0%	17.4%	16.2%	23.0%	16.7%	15.6%	7.4%	7.0%	7.7%
	% Energy Sold in Market	%	8.7%	8.7%	22.6%	22.6%	17.0%	9.7%	9.7%	17.9%	10.5%	10.6%	7.6%	6.7%	5.6%
Min															
ć₽	ର୍ଟ୍ଷ Local T&G CapEx	\$ Millions	10	10	2,989	2,864	2,984	2,845	2,965	1,014	2,811	2,932	3,138	3,299	3,404
G M															
Econ. Grwth	Local T&G CapEx	\$ Millions			2,989	2,864	2,984	2,845	2,965	1,014	2,811	2,932	3,138	3,299	3,404

RELIABILITY







SUSTAINABILITY METRIC (CO2 EMISSIONS)



LOCAL WATER CONSUMPTION

2025 Local Water Consumption (million of gallons)



PORTFOLIO 6 INSTALLED CAPACITY BY YEAR



PORTFOLIO 9 INSTALLED CAPACITY BY YEAR



PORTFOLIO 10 INSTALLED CAPACITY BY YEAR



MISO Membership Assessment Report

MISO INDEPENDENT REVIEW OF IRP OBJECTIVES

Resource Adequacy:

- Is the capacity expansion plan sufficient to join MISO Local Resource Zone (LRZ) 8 or to be a standalone Local Resource Zone
- What is the impact to the MISO Planning Reserve Margin (PRM)
- Is there adequate capacity for MLGW to purchase starting in 2025

Transmission Interconnection:

- Is the transmission expansion proposal a reliable solution
- What is the MLGW import capability
- What is MISO's estimate of the costs for transmission expansion, reliability upgrades, and generator interconnections

Market Impact:

- How will membership affect its Adjusted Production Costs (APC)
- What are the impacts to MISO's regional congestion patterns

MISO Cost:

What are the annual costs to MLGW of MISO membership



MISO INTEGRATION

Category	MLGW connects to MISO with Local Generation ¹	MLGW connects to MISO without Local Generation					
Resources	CT - 237 MW; CC - 1,350 MW; Solar - 600 MW	Assumes no local generation in MLGW					
Transmission Expansion ²	2 – 500 kV lines to AR; 1 – 230 kV to MS with a total cost of \$736.2M	3 – 500 kV lines to AR; 1 – 230 kV line to MS with a total cost of \$1,127M					
Resource Adequacy	 MLGW has adequate resources to participate in LRZ 8 or its own LRZ Participation in LRZ 8 is mutually beneficial to MLGW and MISO 	 PRM and LRR are nearly unchanged MISO is determining if the LRZ 8 CIL/CEL is adequate to incorporate MLGW with no additional resources 					
Transmission Reliability	The generation / transmission proposal is reliable up to a 2,400 MW import transfer	A 3,200 MW import transfer was assessed and identified numerous thermal, voltage, and stability issues					
Market Impact	 Production cost savings of \$116M in 2024 going to \$283M in 2034 Increased savings are due to adding low-cost solar/gas to the portfolio 	 Production cost savings of \$56M in 2024 going to \$117M in 2034 Savings are the result of MISO resources being cheaper than TVA's 					



FINANCIAL CONSIDERATIONS

NET PRESENT VALUE OF REVENUE REQUIREMENTS



LEVELIZED SAVINGS PER YEAR WITH RESPECT TO THE LONG TERM PARTNERSHIP AGREEMENT



LEVELIZED SAVINGS PER YEAR WITH RESPECT TO THE CURRENT TVA CONTRACT



PAYMENTS IN-LIEU-TAX IMPLICATIONS

There are two PILOTs that are potentially impacted by the IRP decision:

- TVA PILOT payments to the State of Tennessee which are subsequently allocated to Memphis, Shelby County and the local municipalities. This totaled over \$18 million in 2019.
- Local PILOT payments by MLGW's Electric Division to Memphis, Shelby County, and the local municipalities which totaled to \$45 million in 2019.

If MLGW leaves TVA, the allocated local share of the State PILOT payments to Memphis, Shelby County and the local municipalities would be eliminated (\$18 million annually).

Local PILOT would increase due to the construction of transmission assets. (\$24 million annually – this also assumes MLGW does not build and own any generation assets).

PAYMENTS IN-LIEU-TAX IMPLICATIONS (CONT.)

- Additionally, the Local PILOT payment per State law is paid on construction work in progress activity. Therefore, MLGW would be required to make these phased-in payments immediately before realizing any of the potential power supply savings. This would require short-term rate increase unless other alternative remedies were achieved.
- Based on a \$700 million phased-in transmission cost scenario, it is estimated that the Local PILOT on transmission would be over \$2 million in the first year of construction and rise to \$24 million upon completion over five years.

TRANSMISSION EXPANSION – POTENTIAL RATE IMPACTS

- The capital outlay for the transmission expansion would be accomplished through the use of capitalized interest.
- Funds in excess of those required for the capital investment are borrowed.
- The surplus is invested and the subsequent return is used to pay interest on the total amount borrowed during the construction period.
- This will increase future revenue requirements for the portfolios, but should not have any rate impact during the construction period.

NEXT STEPS

CONFIRM SAVINGS BEFORE MAKING A FINAL DETERMINATION

- A power supply Requests for Proposals (RFP) will be undertaken by MLGW to confirm the savings before making a final decision.
- The IRP will be utilized to determine the general mix of assets and locations of interest in the RFP and the orders of magnitude of transmission required. Alternative proposals will be considered as well.
- Differences between Portfolios 6, 9 and 10 can be reassessed with bids provided by potential suppliers.
- Options to manage fuel price risk will be an element to be included in the RFP

POWER SUPPLY REQUEST FOR PROPOSAL (RFP)

- There are multiple firms who serve MISO members and are capable of managing the RFP process
- Competition should yield best price and solution compared to a single-source contract award
- Relationship with this consultant has the potential to be longterm
- Seeking a consultant to manage the Power Supply RFP continues the open and transparent process we've strived for since the beginning

ENGAGEMENT SCHEDULE FOR CONSULTANT TO MANAGE THE RFP PROCESS



*via email

**electronic copy only

***Request Same Day Minutes

OTHER FACTORS TO CONSIDER

- Regulatory issues
- Environmental issues
- Land acquisition
- Siting and permitting processes
- Construction risk
- Public and Stakeholder input
- Incremental fuel risk due to a less diverse generation mix
- Relationship with local governments and large customers

IN CONCLUSION

- MLGW has remained open and transparent throughout the IRP process
- We are committed to maintaining the integrity of the RFP process
- The Integrated Resource Planning process is the industryaccepted approach to determining new resource needs
- MLGW is a TVA customer today and will continue to engage with TVA on its proposal for additional value that was not available for consideration in the IRP