

Integrated Resource Plan – Draft Results Executive Summary

Overview

The overarching objective of the Integrated Resource Plan (IRP) was to identify a power supply resource portfolio (or portfolios) that performs best across agreed performance metrics (least cost, reliability & resiliency, sustainability, etc.). The strategies, representing the available options to MLGW to supply its load, are combined with scenarios (i.e. future states of the world) to determine least cost portfolios of Generation and Transmission Assets, which are subjected to a range of future outcomes, and then ranked using a balanced scorecard.

Strategies/Scenarios/Portfolios Analyzed

MLGW initially identified four distinct supply strategies to be evaluated in the IRP. These consisted of:

1. **Strategy 1:** All Requirements Contract with TVA (status quo), business as usual.
2. **Strategy 2:** Self-supply where MLGW self-supplies all needs from local resources.
3. **Strategy 3:** Combination of self-supply (i.e. local supply) with procurement of resources in MISO market.
4. **Strategy 4:** Procure all resources from MISO.

The following exhibit provides an overview of the 10 selected Portfolios for analysis and the All MISO Portfolio. Portfolio 5, 9, 10 and the All MISO Portfolio share the same overall characteristics: large amount of renewable generation and one combined cycle unit only.

11 Resource Portfolios under Self-Supply plus MISO (Strategy 3) and ALL MISO (Strategy 4) were Evaluated

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
S3S1_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
S3S5	Portfolio 5	1398	1000	100	2498	3450	1183	0	1	4
S3S7_BB	Portfolio 6	1137	1000	0	2137	2200	1761	0	2	1
S3S1_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

Findings

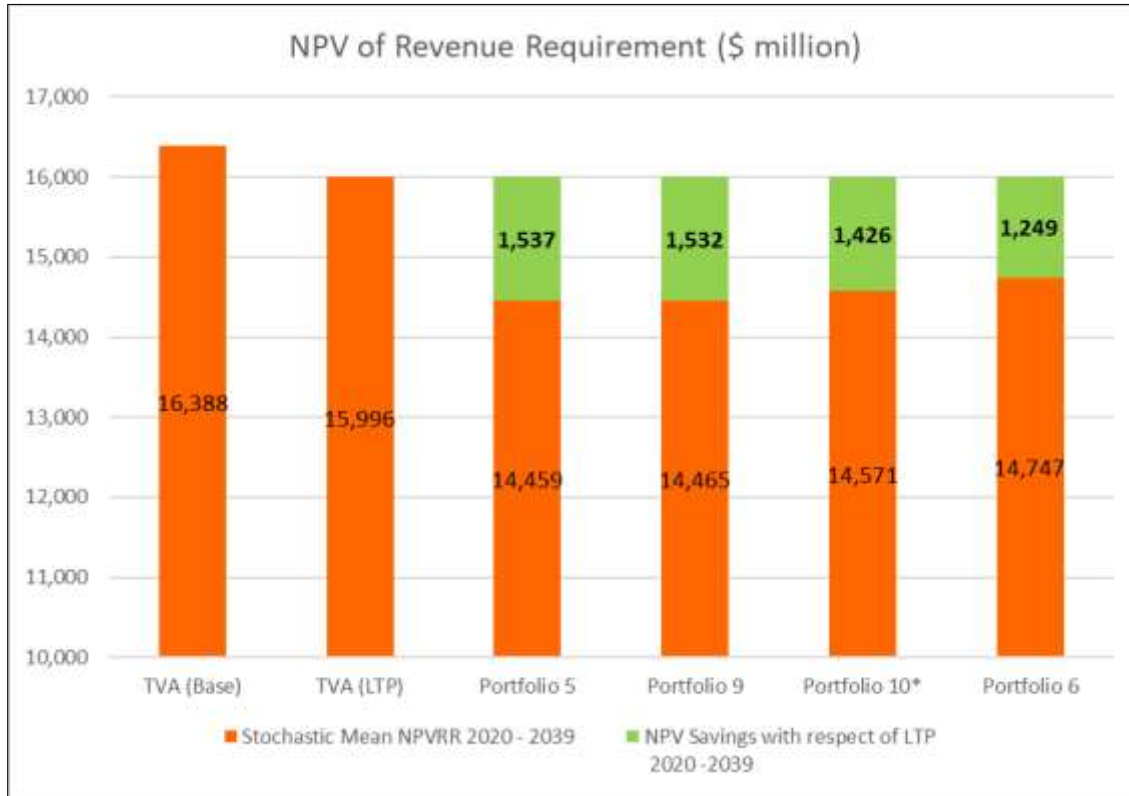
The selection of the best portfolios for MLGW is not simply a cost-based decision. It factors in risk, sustainability, resilience, reliability, and economic impacts. Hence, no final recommendation is made here. Rather we developed a series of strategies and actions to be taken by MLGW to make its final determination.

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The key findings of our study are:

- There are 20-year, levelized cost savings of about \$90 to \$122 million per year on an expected basis (probability weighted) associated with exiting the TVA contract and joining MISO under the TVA option ‘Long Tern Partnership’ for the 2020 to 2039 period. These savings increase to \$127 to \$153 million per year when compared to the current TVA contract.
- The TVA option provides a somewhat higher level of reliability as a percentage of load, though all Portfolios meet NERC requirements, and except for Portfolio 5, all can avoid load shedding under extreme conditions. While Portfolio 5 shows savings of \$122 million per year it has significant load shedding and is the worst of the selected portfolios regarding reliability.

Exiting TVA Could Save MLGW \$1.5 Billion over 20 Years Considering the LTP and 1.9 Billion with Current Contract



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Balanced Scorecard: Portfolios 9 and 10 of Strategy 3 Perform Best Across All Metrics

Objective	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
Least Cost	NPVRR 2020 - 2039	\$ Millions	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
	Stochastic Mean NPVRR 2020 - 2039	\$ millions	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
	Levelized Cost of Energy	\$/ 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
	NPV Savings with respect of LTP (wrt LTP) 2020 -2039	\$ Millions			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
	Levelized Savings per Year (wrt LTP) 2025 -2039	\$ Millions			122.1	121.7	113.3	99.2	97.8	96.0	95.9	94.4	75.0	73.1	63.0
	Levelized Savings per Year (wrt Base) 2025 -2039	\$ Millions			153.2	152.8	144.4	130.3	128.8	127.0	127.0	125.5	106.1	104.2	94.1
Min Risk	95th Percentile Value of NPVRR	\$ millions	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
Min Envir. Risk	CO ₂ Emissions Mean 20-Year	Millon Tons CO ₂	3.8	3.8	1.85	1.85	2.81	2.57	2.57	2.81	2.57	2.57	3.29	3.29	3.30
	Energy from Renewable Sources 2039 (RPS)	% of Energy Consumed	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%
	Energy from Zero Carbon Sources 2039	% of Energy Consumed	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%
	2025 Local Water Consumption	Millon 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
Reliability	2025 (UCAP+CIL)/PEAK	%	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%
Resiliency	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
Min Market Risk	% Energy Purchased in Market	%	10.9%	10.9%	31.2%	31.2%	23.0%	17.4%	16.2%	16.7%	16.7%	15.6%	7.4%	7.0%	7.7%
	% Energy Sold in Market	%	8.7%	8.7%	22.6%	22.6%	17.9%	9.7%	9.7%	10.5%	10.5%	10.6%	7.6%	6.7%	5.6%
Econ. Growth	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

Recommendations

An RFP should be undertaken by MLGW to confirm all estimated savings before making a final decision. The IRP can be utilized to determine the general mix of assets and locations of interest in the RFP and the orders of magnitude of transmission required.

References

Visit mlgw.com/about/IRPDraftDocument to view the full IRP Draft Report and presentation presented at the Power Supply Advisory Team (PSAT) meeting held on 05/28/20.

Visit mlgw.com/about/powersupply to view past PSAT meetings and Siemens presentations