Review of
MLGW Transmission RFP and Thermal Generation RFP
in reference to Memphis City Council Amendment #1 to Work Plan

EnerVision was requested to provide an assessment of MLGW's compliance to the April 6, 2021 Resolution of the Memphis City Council in approving the MLGW contract with GDS Associates, Inc. to perform the RFPs following the Integrated Resource Plan Specific to the Resolution were amendments to the work plan outlined in the preamble. **Amendment #1 to Work Plan** states "MLGW will make it clear in the RFPs issued that the three recommended portfolios from the Integrated Resource Plan are the desired scenarios but that bidders may include proposals for other methods of providing transmission and generation to Memphis and Shelby County." The following is EnerVision's assessment of compliance to the Resolution by the Transmission RFP and Thermal Generation RFP.

Overall conclusion: Neither the Transmission RFP or the Generation RFP made it clear that "bidders may include proposals for other methods of providing transmission and generation to Memphis and Shelby County." Pertinent language is highlighted below in Yellow and Green.

Key Excerpts from the Transmission RFP

1.2 Background

In 2019, MLGW commissioned Siemens PTI to complete a comprehensive Integrated Resource Plan (IRP) for the purpose of evaluating reliable and cost-effective alternatives to the existing full requirements contract with the Tennessee Valley Authority (TVA). As a result of this IRP process, which included extensive stakeholder input, a set of three (3) resource portfolios were recommended for further evaluation. The three resource portfolios contain various levels of natural gas-fired generation as well as renewable energy resources to be installed in Memphis/Shelby County. In addition, all three resource portfolios are coupled with a set of interconnection projects designed to permit up to 2,400 MW of simultaneous import capability from MISO South to MLGW. Additionally, MISO completed a Membership Assessment Report in July 2020 which supports the findings contained in the IRP and affirmed the need for a Base Transfer of 2,400 MW from MISO to MLGW under 2024 Summer Peak conditions.

Note: This is the only place where it links the interconnection projects to the resource portfolios.

2.1 Summary of the Project

This section of the RFP presents an executive summary of the Interconnection Projects, whereas Section 5 of this RFP contains the Project description that shall be utilized in developing Proposals.

The Interconnection Projects consists of the following:

1. Entergy MISO to Shelby-MLGW Interconnection consisting of:

   a. New 500 kV line from demarcation structure/tower located in Arkansas at the Mississippi River to New Shelby substation (MLGW), 3,000 A, 2,598/2,598 MVA summer rating, and
   b. New Shelby substation (MLGW) 500/161 kV with two new 500/161 kV transformers, rated 1,300 MVA each.

2. Entergy MISO to New Allen-MLGW Interconnection consisting of:

   a. New 500 kV line from demarcation structure/tower located in Arkansas at the Mississippi River to New Allen substation (MLGW), 3,000 A, 2,598/2,598 MVA summer rating, and
   b. New 500/230/161 kV, New Allen substation (MLGW) with two new 500/161 kV transformers, rated 1,300 MVA each.

3. Entergy MISO to New Allen-MLGW interconnection consisting of:

   a. New 230 kV line from demarcation structure/tower located in Mississippi at the Tennessee-Mississippi state line to New Allen substation (MLGW), 5,000 A, 1,991/1,991 MVA summer rating, and

   b. Two new 230/161 kV transformers at New Allen substation (MLGW), rated 1,000 MVA each.

Section 5: Technical Description of Interconnection Projects

The technical description of the Project is provided below. MLGW requires that all Proposals strictly adhere to the technical description of the Project. Any Proposals failing to do so may be disqualified from further evaluation and consideration. The project is made up of three (3) interconnections to Entergy MISO resulting in two (2) new substations in MLGW's territory, New Allen, and New Shelby:

1. Entergy MISO Interconnect Point to MLGW New Shelby (500 kV) – SSMISO-NS
2. Entergy MISO Interconnect to MLGW New Allen (500 kV) – WMMISO-NA
3. Entergy MISO Interconnect to MLGW New Allen (230 kV) – TTMISO-NA

Transmission RFP Conclusion: As noted in Section 5 (highlighted in green above), the Transmission RFP requires that all Proposals "strictly adhere to the technical description of the Project and any proposal failing to do so may be disqualified." The 3 Interconnection Projects are clearly defined in Section 3 above. Although these Interconnection Projects could most

likely serve other generation portfolios, the Transmission RFP is not allowing responses for "proposals for other methods of providing transmission to Memphis and Shelby County".

Key Excerpts from the Generation RFP:

1.2 Background

In April 2019, MLGW released a Request for Proposal (RFP) for an Integrated Resource Plan (IRP) to accurately determine the most viable options should the utility elect to procure electricity from sources other than TVA. MLGW extended invitations to qualified firms to assist in developing the IRP which incorporated a Transmission Analysis (TA) to evaluate the current MLGW-TVA "All-Requirements" Wholesale Power Agreement versus that of entering into the Wholesale Power Market to meet the future needs for reliable electric energy for MLGW customers at the least cost. Proposals were due on May 17, 2019. The IRP and the input from the community and advisory committee was to be considered when deciding options for other power sources. On July 22, 2019, MLGW announced that it had selected Siemens Industry Incorporated (Siemens) as its consultant for the development of MLGW's integrated resource plan. Following consultation with the MLGW Power Supply Advisory Team (PSAT) and community stakeholders, Siemens released its final IRP report in July 20201. In its report, Siemens identified potentially significant savings for MLGW if it pursued a Purchased Power Agreement (PPA) for local generation resources in conjunction with transmission system improvements and the development of renewable resources.

On August 19, 2020, the MLGW staff presented its recommendation to continue investigating IRP Portfolios 6, 9, and 10. The basis for this recommendation is outlined in a presentation (MLGW Board IRP Presentation). Portfolio 10 was later removed from consideration due to reliability concern during outages and siting issue at MLGW substation of the 950 MW 2X1 Combined Cycle Gas Turbine (CCCT).

1.4 Purpose of this RFP

As noted on slide 4 of the MLGW Board IRP Presentation, the Board directed that a power supply Request for Proposals be issued to confirm the potential power supply savings identified in the IRP Final Report under various local generation options vs. continuing service with TVA (see Section 14 of the IRP report for Siemens' estimate of future TVA rates). The RFP is focused on the acquisition of resources identified in Portfolios 6 and 9 with proposals provided by RFP Respondents in order to validate Siemens' IRP assumptions. The resources will be obtained through PPAs with generation owners and/or developers. Siemens assumptions to be validated include:

- Cost
- Schedule
- Location

- Water use
- CO_2 emissions
- Reliability

In addition, this RFP will be used to identify qualified candidates for eventual unit-contingent PPA engagements in the event PPAs can be secured at an evaluated cost below that of the rates offered by TVA.

MLGW is not contemplating any self-build generation that would compete with any proposals received in this RFP.

Detailed descriptions of Portfolios 6 and 9 are contained within the Siemens IRP Report. Expected in-service date is no later than January 2, 2028.

For each technology, the IRP was modeled considering ISO conditions (59F, 60% relative humidity, and sea level barometric pressure) – for example for the SCCT 7FA 237 MW and for the 1x1 CCCT 450 MW (with duct firing). For the summer months the outputs under ISO conditions are derated by multiplying the ISO output by 0.91 for the SCCT and 0.92 for the CCCT. This RFP is seeking tolling agreements for the following configurations:

- Portfolio 6 – 2 X 450 MW 1X1 Combined Cycle Gas Turbine (CCCT) with Duct Burners (DB) + 1 x 237 MW Simple Cycle Combustion Turbine (SCCT), both utilizing Frame FA combustion turbine technology. Capacity is to be divided into two sites with no more than 687 MW being developed at any single site.

  - Developers are additionally requested to provide an estimate for installing an additional 237 MW simple cycle unit in 2030, at whichever site does not have a SCCT scheduled for installation in 2028.

- Portfolio 9 – 1 x 450 MW 1X1 CCCT with DB + 4 x 237 MW SCCT, all utilizing Frame FA combustion turbine technology. Capacity is to be divided into three sites, with one site including both the CCCT and one of the SCCTs, and with no more than 687 MW being developed at any single site.

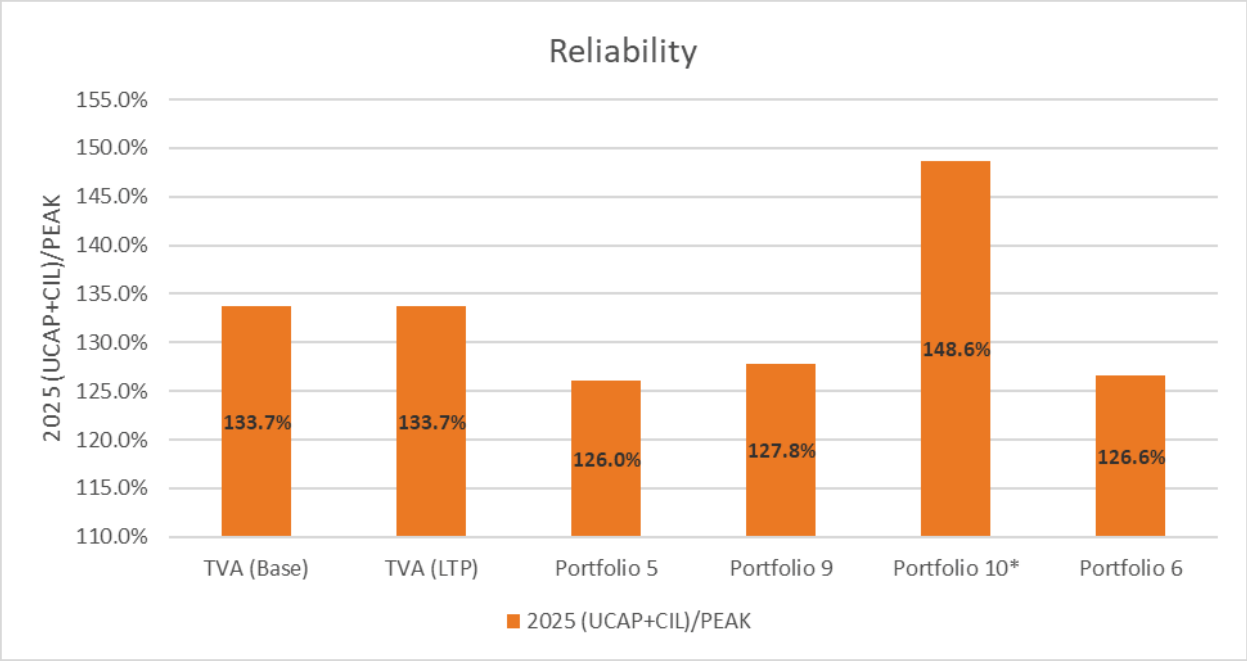
MLGW has determined that the most advantageous sites for the desired CCCT and SCCT generating plants would most likely be located on the east side of Shelby County where natural gas pipelines are prevalent (see Figure 1 below and Exhibit 76 of the Integrated Resource Plan Report).

RFP Respondent is responsible for design, permitting, construction, testing, operation and maintenance of the thermal project natural gas radial line from the main gas pipeline to the thermal project gas yard. Sites located near proposed electric transmission improvements may be also advantageous. Proposed plant interconnections should be limited to the points of interconnection (POIs) identified in Figure 2 below. MLGW recognizes that the generating plant sizes requested may not be accommodated by MLGW's existing 161 kV transmission system. With that limitation in mind, any connections planned by RFP Respondents to MLGW's existing

electric transmission system will be evaluated by incorporating MLGW's estimated costs of any upgrades required to MLGW's system to accommodate delivery. RFP Respondent is responsible for design, permitting, construction, testing, operation and maintenance of the thermal project electric lead line to the POI within the MLGW system and preferred POI locations. RFP Respondent shall bear such costs, not including network upgrade costs which MLGW will evaluate separately as part of the bid review.

Thermal Generation RFP Conclusion: As noted above, the Generation RFP states that it is focused on the "acquisition of resources identified in Portfolios 6 and 9". It also states that it is seeking tolling agreements for the specific resource configurations of Portfolio 6 and 9. But, it does not state that proposals failing to adhere to these configurations may be disqualified, as did the Transmission RFP. But it also does not state that it will entertain "proposals for other methods of providing generation to Memphis and Shelby County."

Regarding the elimination of Portfolio 10, a more detailed explanation of the 950MW combined cycle generator is needed – specifically to explain why it would not provide "adequate reliability" and what are the siting issues at any MLGW substation. In the IRP, Siemens recognized this portfolio requiring larger investment in transmission. Siemens evaluated portfolios considering several factors: reliability, least cost, price risk, sustainability, market risk, economic growth and resiliency. Siemens did indicate that siting and permitting was one of several factors to consider for all Portfolios (including regulatory, land, construction, etc.); however, Portfolio 10 topped the reliability metric (see chart below from the August 19, 2020 IRP presentation to the MLGW Board – "higher the better"). Elimination of this large-sized generator eliminates other possible large sized generators (i.e., nuclear).



Overall Conclusion

Neither the Transmission RFP or the Generation RFP made it clear that "bidders may include proposals for other methods of providing transmission and generation to Memphis and Shelby County."

ADDENDUM

Adherence to the Four Points:

This addendum to this initial report, "Review of MLGW Transmission RFP and Thermal Generation RFP in reference to Memphis City Council Amendment #1 to Work Plan," identifies any inconsistencies between the 2 RFPs (the Transmission RFP and Thermal Generation RFP) to the Four Points approved by the MLGW board on March 31, 2021. Only Points 1 and 2 are addressed currently. Noted statements/suggestions are highlighted in Yellow.

Four Points approved March 31, 2021:

1. MLGW will make it clear in the RFPs issued that the three recommended portfolios from the IRP are the desired scenarios but that bidders may include proposals for other methods of providing transmission and generation to Memphis and Shelby County.
2. GDS and MLGW shall, at a minimum, consider the following in evaluating bids: Reliability of transmission and generation compared with present experience, Economics, Relevant risks, Counterparty creditworthiness and counterparty market credibility, and Past performance, etc.
3. At Task 8 "Bid Evaluation and Short List" in the Proposal Work Plan, GDS will present to the Board (for informational purposes only) a cost comparison analysis of the most competitive and viable bidder proposals to the estimated costs presented in the IRP Portfolio(s) and update the estimated savings compared to MLGW's expected power cost from TVA. Members of the Board will have an opportunity to provide feedback on additional areas for evaluation and information requested to be included in any final recommendation to be made to the Board for approval following negotiation and final offers with the short list of bidders. Following presentation to the Board, GDS will make a similar presentation to the City Council for a similar purpose.
4. To preserve the integrity of the bid process, the identity of all bidders and the details of individual proposals shall not be shared as part of the presentations in Paragraph 3 above.

Transmission RFP:

GridLiance (a NextEra Energy transmission company) contacted EnerVision to discuss the MLGW RFPs. Since the Transmission RFP has been released, GridLiance is contemplating their plans to submit a proposal. GridLiance stated that the Transmission RFP "severely limits the universe of respondents, responses, and thus solutions for MLGW." GridLiance and possibly other providers will not be submitting bids satisfying the requirements in the Transmission RFP as written because they are also transmission owners, not just Engineering, Procurement, and Construction (EPC) contractors.

- The Transmission RFP does not allow responses for "proposals for other methods of providing transmission to Memphis and Shelby County," as required in Point 1. MLGW requires that all Proposals strictly adhere to the technical description of the Project. And

MLGW ownership is the only option allowed. Any Proposals failing to do so may be disqualified from further evaluation and consideration.

- To widen the pool of bidders, MLGW should not eliminate the possibility of third-party ownership or shared ownership of transmission facilities.

GridLiance also states that MLGW is putting itself and Memphis and Shelby County residents at unnecessary risk by limiting its options to full ownership of transmission facilities. Risks identified include sole responsibility for transmission upgrades to integrate supply, which include upfront and future capital and operating expenditures. Risks identified also include expanded responsibility for NERC compliance obligations with potentially meaningful fines and penalties for violations. Full ownership means MLGW would have sole responsibility for handling MISO integration and MISO obligations, which GridLiance states can impact the economics of the transmission project.

- MLGW should discuss the Pros and Cons of the responsibilities and costs associated between being a Transmission Owner vs. being a Transmission Customer.

Thermal Generation RFP:

MLGW provides suggested generation site locations but does not limit proposals exclusively to those locations. The Points of Interconnection (POI), however, "should be limited" to the locations provided. It is up to the respondent to plan how to get the electric lead line connected to the POI (paid for by respondent).

MLGW is aware they may need network upgrades on their existing lines to accommodate generation - MLGW will pay for "network upgrade costs".

Thus, overall, there seems to be flexibility in location and how the respondent wants to connect with the three set POIs identified, but the POIs are in set locations. MLGW is specific on natural gas technology (combined cycle and combustion turbine) following Portfolios 6 and 9. There is no indication if different technologies and different sizes will be accepted.

Per the elimination of Portfolio 10, on August 13, 2021, JT Young informed Mayor Strickland, "In Portfolio 10, because of the concentration of generation in one unit, there are reliability concerns in the event this unit is down as a result of a forced outage or downtime for maintenance." In power supply planning, this risk is referred to as, "Loss of Load Probability, (LOLP)" and is a valid and understandable concern.

Renewables and Other Alternatives RFP:

To address this section, the following definitions are provided:

- Blocks of power – Wholesale power sources include power plants and market purchases. Blocks of power are market purchases where a supplier is providing shaped energy products. For example, a 7x24 block is energy provided 7 days a week, 24 hours a day. Other examples of standard block products include 5x16 block (5 days a week, 16 hours a

day), 2x8 block (2 days a week, 8 hours a day). Blocks of power can be directly sourced from a designated power plant in the market or a utility (like Entergy or TVA).

- Partial requirements – as opposed to Full requirements which is an obligation of a supplier to provide 100% capacity and energy needs of a customer; thus, Partial requirements is any obligation under 100%. The supplier's obligation is to provide for the amount of partial requirements which could be from the supplier's generation fleet and/or the market.

Mayor Strickland has been informed by JT Young on August 13, 2021 that "Other Alternatives" include blocks of power and/or partial requirements arrangements. NextEra has been told similarly and indicated that Other Alternatives does not include power plants. MLGW states that, "The alternative proposals [to satisfy Point 1] are to be part of the ***third*** RFP - renewables and other." However, the "Other Alternatives" is only to market purchases and does not accommodate for the potential missed opportunities in Transmission (other transmission paths) and Thermal Generation RFPs (other generation technologies).

Overall Conclusions

Point 1: The Transmission RFP made it clear that proposals outside of the 3 paths identified in the RFP would be "disqualified" which is contrary to Point 1, "bidders may include proposals for other methods of providing transmission and generation to Memphis and Shelby County."

The Thermal Generation RFP accepts varying locations for other generation; however, the Points of Interconnection should be to the locations provided in the RFP. The elimination of Portfolio 10 due to the large combined cycle being the largest single unit and the risk if that unit is forced out or lost is reasonable.

Point 2: MLGW is following the evaluation criteria outlined in Point 2 in both Transmission RFP and Thermal Generation RFP.

Points 3 & 4: Not applicable yet.