

September 30, 2022

Board of Commissioners
Memphis Light, Gas & Water
220 South Main St.
Memphis, TN 38103
Via email to PowerSupply@MLGW.org

Re: MLGW should keep its current 5-year contract with TVA and keep our community's options open to get a better, cleaner, and more just deal for all Memphians

Dear MLGW Commissioners:

We write on behalf of Protect Our Aquifer, Memphis Community Against Pollution, and Sierra Club to urge you to keep the current 5-year contract with TVA and keep our community's options open to get a better, cleaner, and more just deal for all Memphians.

The Board's power supply decision provides a once-in-a-generation opportunity for MLGW to reduce economic, health, water consumption, and energy burdens in our communities. But that negotiation has not occurred. And, as TVA CEO Lyash plainly stated to this Board on September 7, it *never will* occur once MLGW signs a Never-ending Contract.¹ For that reason alone, the Board should not bind our community forever to TVA.

As detailed in the attached report by the Applied Economics Clinic,² the September 1 analysis presented to the Board on September 1 by outgoing MLGW CEO and staff consultant GDS was flawed in several vitally important aspects, including:

- Undercounting risk related to TVA's Long-Term Agreement, which shifts the majority of TVA's financial risk onto its locked-in, captive customer base;
- Creating a bias for gas-heavy portfolios by failing to update gas price forecasts and re-optimize results based on that updated forecast;

¹ Keely Brewer, *TVA CEO Jeff Lyash says 20-year contract term with MLGW is nonnegotiable*, Daily Memphian (Sept. 7, 2022), <https://dailyemphian.com/article/30791/memphis-light-gas-water-tva-ceo-jeffrey-lyash-long-term-mlgw-contract-benefits> ("During the meeting, MLGW board chair Mitch Graves also asked about opportunities to negotiate the terms of the deal, but Lyash said that would contradict TVA's public power model.")

² Elizabeth A. Stanton, et al., *Review of MLGW RFP Update and Staff Power Supply Recommendation*, Applied Economic Clinic (Sept. 28, 2022) (attached as an appendix) [hereinafter AEC Report], **Attachment 1**.

- Creating a bias against renewables by using current-day “snapshot” PPA prices rather than longer-range price forecasts for renewable PPAs;
- Apparently omitting to incorporate tax credits for renewables from the Inflation Reduction Act;
- Failing to explain that neither TVA supply option (current or Never-ending Contract) meets MLGW renewables requirements;
- Failing to disclose that most of TVA’s solar power is and will be spoken for by corporations and other municipal customers, so the savings from that energy are not available to everyday ratepayers in Memphis;
- Failing to evaluate sufficient alternatives that include battery storage; and
- Failing to be based on an all-resources bid and be transparent about the GDS bid aggregation methodology.

The September 1 analysis departed significantly from both the IRP and the June 9 RFP presentation. As Protect Our Aquifer and Memphis Community Against Pollution previously observed, a key takeaway from the June 9 GDS presentation is that MLGW should not lock its ratepayers into paying for TVA’s or *any* power supplier’s unnecessary and risky new gas plants.³ Portfolio 9—the portfolio with the most renewables and the least new gas—performed the best in terms of cost, both in the base case and the sensitivity analyses.⁴ Notably, in the June 9 presentation, the renewables-focused Portfolio 9 outperformed the TVA long-term contract option in terms of cost, resulting in net savings even if MLGW forgoes five years of TVA long-term contract so-called “benefits.”⁵

Only after GDS heaped unjustified costs on renewable bids and downplayed the increasing volatility of gas prices in its September 1 presentation did GDS conclude that the Never-ending Contract was the best deal from an economic perspective. In reality, as our previous comments and the AEC Report make clear, the Never-ending Contract is a risky business proposition that runs contrary to Memphis’s climate, clean energy,

³ Letter from Protect Our Aquifer and Memphis Community Against Pollution to MLGW Board, re: RFP results show MLGW must keep its options open and demand more investment in clean, renewable energy from TVA and other potential suppliers (Jul. 19, 2022), **Attachment 2**.

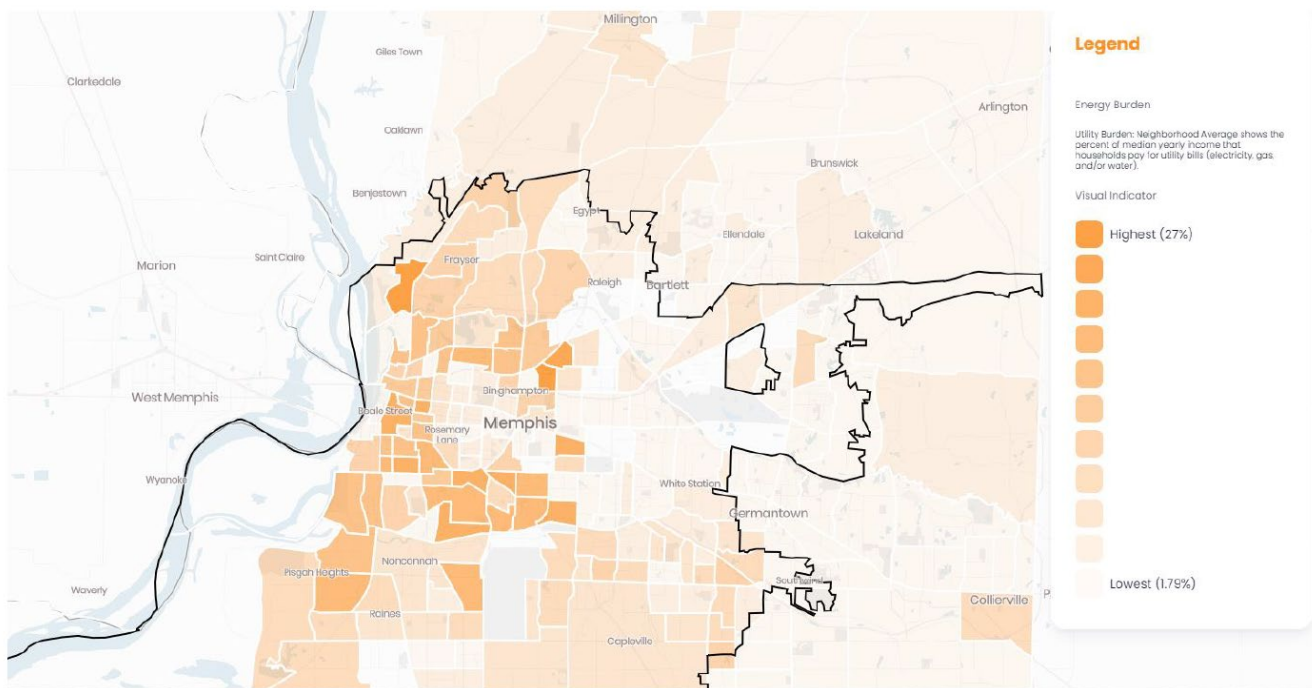
⁴ MLGW Bd. of Comm’rs & Memphis City Council, *MLGW RFP Evaluation & Savings Validation*, MLGW 50 (Jun. 9, 2022) [hereinafter June 9 Presentation], https://www.mlgw.com/images/content/files/pdf/MLGW%20RFP%20Evaluation%20and%20Savings%20Validation_06-09-22_Final.pdf (showing savings from Portfolio 9 in all sensitivity analyses).

⁵ *Id.* at 46 (Portfolio 9 results in \$30.9 million in annual savings even after factoring in savings from five years of TVA long-term agreement).

drinking water, and climate justice goals. Future negotiations with TVA and other power supply providers should take the Never-ending Contract off the table.

Further, future negotiations with TVA should demand a proposal to address energy burden in Memphis in a meaningful way. As detailed in the attached report by Greenlink Analytics, Memphis has some of the highest energy burden in the state and the nation, ranking second in Tennessee counties and fourth among cities across the country.⁶ Energy burden is measured in the percent of median yearly income that goes toward utility bills, including electricity, gas, and water. An energy burden equal to or greater than 6% is considered high and energy burden equal to or greater than 10% is considered severe.⁷ Total median energy burden in Memphis is 8.1%, and energy burden is highest in predominantly Black neighborhoods in Memphis.⁸

Figure 1: Energy Burden Across Census Tracts in Memphis, TN (2019 data)



Source: Greenlink Equity Map. Greenlink Analytics. 2022.

⁶ Samantha McDonald & Matt Cox, *Energy Burden & Efficiency Solutions for Households in Memphis, TN* 2-3 (2022) (attached as an appendix) [hereinafter Greenlink Energy Burden Report], **Attachment 3**.

⁷ *Id.* at 2.

⁸ *Id.* at 2; *EJScreen Socioeconomic Indicators*, <https://ejscreen.epa.gov/mapper/> (last visited Sep. 23, 2022).

TVA insinuated in their proposal that the energy burden in Memphis is high primarily due to low incomes in the city.⁹ Though energy burden is normalized by income and therefore low income is a factor, this narrative falsely places the blame of high energy burden on those with the least ability to control the cost of energy. As demonstrated in the Greenlink Energy Burden Report, the energy bills of the poorest quartile of Memphians are on average higher than the remaining 75% of Memphis residents.¹⁰ Past Home Uplift participants have attested to the effects of weatherization on their energy bills, stating that it lowered their bills. TVA itself reports that the program on average reduces overall home energy use by 25% and saves participants on average \$500 a year.¹¹ This indicates that the energy burden is high in part due to homes that lack sufficient weatherization and efficiency measures—challenges that TVA and MLGW have the demonstrated ability to address.

Although TVA has committed to continuing its investment in Home Uplift if MLGW remains with TVA, the need far exceeds the amount included in TVA's offer. TVA's proposal seeks to invest an additional \$850,000 in the Home Uplift program matching MLGW's investment up to \$1.7M for an unknown amount of time.¹² But according to the Greenlink Energy Burden Report, approximately 149,000 households in Memphis are suffering from high energy burden.¹³ TVA's Home Uplift program has invested an average of \$10,000 dollars into each home in the program. At this rate, the investment necessary to reach every energy burdened household in the city would be nearly \$1.5B.¹⁴ Even if TVA were to reduce the amount distributed to each home, under NREL's energy efficiency standard the total investment necessary to upgrade all of the households with high energy burden would be more than \$250M.

TVA's proposed level of investment is just a drop in the bucket in terms of addressing energy burden for Memphians. The lack of clarity or commitment to maintaining even its proposed level of support for the program creates concern, because the scale of the problem mandates long-term, high-dollar support. Further, because TVA has proposed to increase its reliance on gas plants, energy burden may get worse. The

⁹ Letter from Jeffrey Lyash, President and CEO, TN Valley Auth., to J.T. Young, President and CEO, MLGW, 2 (Jul. 6, 2020) [hereinafter TVA's MLGW Recommitment offer] ("Although the cost of electricity provided by TVA and MLGW is one of the lowest in the country, the energy burden in Memphis remains high"); *see id.* at 4 ("MLGW has some of the lowest electric rates in the country. However, energy burden remains high due to distribution-level reliability issues, lower than average household incomes and inefficient infrastructure"), [http://www.mlgw.com/images/content/files/pdf/MLGW%20Proposal%20Letter%20Package_Final_06Jul2020_1\(1\).pdf](http://www.mlgw.com/images/content/files/pdf/MLGW%20Proposal%20Letter%20Package_Final_06Jul2020_1(1).pdf).

¹⁰ *See*, Greenlink Energy Burden Report, at 2 (finding that households in the lowest 25% of income have energy bills that are 13% higher than those in the remaining 75%).

¹¹ TVA ENERGYRIGHT, <https://energyright.com/residential/home-uplift/> (last visited Sept. 20, 2022).

¹² TVA's MLGW Recommitment offer, 4.

¹³ Greenlink Energy Burden Report, 5.

¹⁴ U.S. Dept Energy, *TVA's Home Uplift Program: Reaching Underserved Communities*, at 2 (Jun. 2022), [hereinafter Home Uplift Program Review] <https://www.energy.gov/sites/default/files/2022-06/bto-hpwes-tva-casestudy-v5-061622.pdf>.

volatility of gas prices as was demonstrated just this summer, when electricity bills increased nearly 100% from last year.¹⁵ TVA is continuing to leave behind already overburdened primarily Black and low-income residents in Memphis. We cannot accept another TVA deal that does not invest in the health and well-being of all Memphians.

MLGW also has an obligation to serve as a steward of our drinking water source by minimizing water-intensive new gas plants in our region, regardless of who supplies its power. How MLGW provides power affects the quantity and quality of water in the Memphis Sand Aquifer, Memphis's sole drinking water source. Protect Our Aquifer has consistently advocated for MLGW and TVA to maximize reliance on clean, reliable renewable power because gas plants, including TVA's Allen Gas Plant, extract enormous amounts of water from our drinking water aquifer. In fact, TVA is one of the most significant users of the Memphis Sand Aquifer and uses more than 1.5 billion gallons of Aquifer water per year.¹⁶ If MLGW binds itself to TVA in a long-term contract, the threats to our Aquifer from TVA's activities may become more dire. Without viable power supply competition, TVA will be able to ignore the Memphis community's concerns about pollution and overuse of the Memphis Sand Aquifer, including calls to equitably and completely clean up TVA's toxic coal ash, or to switch to using gray water or another source to operate the Allen Gas Plant. Recent announcements of energy-intensive economic development like Ford's Blue Oval City raise concern about whether TVA will rely more heavily on its existing gas units at Allen or build more water-intensive gas plants in or near our community, putting even more strain on the Aquifer.

The Board's decision comes at a crucial moment. MLGW leadership is changing. Memphis has climate goals in line with our national climate goals, and is already suffering significant weather and water-related impacts due to our changing climate. Far from meeting this moment, TVA has proposed the biggest investment in new gas infrastructure in the nation.¹⁷ The federal utility is using the Never-ending Contract to shift the financial risk of that buildout onto its locked-in, captive customer base, and it is asking MLGW to be one of them. But while the Never-ending Contract includes a base

¹⁵ Zaria Oates, *A Breakdown of Surging MLGW Bills*, ABC24 (Jul. 1, 2022, 7:45 PM), <https://www.localmemphis.com/article/money/mlgw-tva-electric-local-nonprofit-memphis/522-396c46f3-fda2-4328-9291-24c305193ca7>.

¹⁶ Samuel Hardiman, *Memphis' Largest Water Users Use Billions of Gallons Every Year. Here's Who Uses the Most*, Memphis Com. Appeal (Jan. 17, 2022, 9:00 PM), <https://www.commercialappeal.com/story/news/2022/01/18/mlgws-top-water-customers-memphis-use-billions-gallons-every-year/9169674002/>.

¹⁷ TVA recently made a splash in the press by announcing "the nation's largest" carbon-free energy RFP. *See TVA Issues One of the Nation's Largest Requests for Carbon-Free Energy*, Tenn. Valley Auth. (Jul. 12, 2022), <https://www.tva.com/newsroom/press-releases/tva-issues-one-of-the-nation-s-largest-requests-for-carbon-free-energy>. Do not be misled. That RFP does not commit TVA to procure any of the resources on offer. TVA has not backed away from its gas buildout, for which it has already signed contracts to purchase gas. Further, it is unclear whether the carbon-free resources TVA seeks will be for the benefit of everyday ratepayers or will be sold at a premium to corporations seeking to satisfy their own climate goals.

rate credit, it puts no guardrails on TVA passing volatile gas fuel costs along to MLGW and its ratepayers, as we saw the federal utility do this past summer.

As a so-called public power utility, TVA should know better than to recklessly invest in new gas plants and force its captive customers to bear the costs. MLGW can help the utility do better. And if TVA won't do better, MLGW should walk away. Only **keeping the current contract** will keep that option open.

Thank you for the opportunity to provide comments on MLGW's power supply decision.

Sincerely,

Sarah Houston
Executive Director
Protect Our Aquifer

Amanda Garcia
Senior Attorney and Tennessee
Office Director
Southern Environmental Law
Center

Justin J. Pearson
Founder
Memphis Community
Against Pollution

Amy Kelly
Tennessee Beyond
Coal Campaign
Representative
Tennessee Chapter
Sierra Club

Scott Banbury
Conservation Program
Coordinator
Tennessee Chapter
Sierra Club

Carl Richards and
Dennis Lynch
Chapter Representatives
Chickasaw Group
Sierra Club

Attachment 1



MEMO

To: Amanda Garcia, Southern Environmental Law Center

From: Elizabeth A. Stanton, PhD, Joshua R. Castigliero, Myisha Majumder, Eliandro Tavares, Sachin Peddada

Date: September 28, 2022

Re: Review of MLGW RFP Update and Staff Power Supply Recommendation

I. Overview

Memphis Light, Gas and Water (MLGW) is currently in the process of choosing among supply options to best meet its electric customers' needs. This Applied Economics Clinic (AEC) memo reviews documents related to MLGW's power supply Request for Proposals (RFP) update and the MLGW Board consultant's related recommendations with the goal of assisting the Southern Environmental Law Center and its clients with the preparation of comments to the MLGW Board.

AEC's assessment of MLGW's 2020 Integrated Resource Plan (IRP), its June 2022 RFP Update, and its September 2022 RFP Update (along with numerous supporting documents) found multiple instances of biases in favor of gas resources and against renewables and batteries. It is in the context of these biases that MLGW's consultant GDS Associates and MLGW staff conclude that MLGW should enter into the Tennessee Valley Authority's (TVA) Long-Term Partnership (LTP) agreement. Our assessment finds that correction of the biases enumerated in this memo has the potential to change the findings on which GDS and MLGW staff base their recommendation and that these biases should therefore be addressed prior to the MLGW Board making a decision on the power supply alternatives.

II. MLGW is undercounting risk related to contract design

MLGW's 2020 IRP and 2022 RFP updates understate risks associated with entering into a perpetual contract for its energy supply. An IRP is a comprehensive plan created by a local distribution company to show how it plans to obtain an adequate supply of the resources needed to serve its customers—resources that are secured through contract agreements with owners of generation. The structure of these contracts—including the number of agreements, start date, and duration of each contract—directly affects the risk profile of the distribution company. A contract with a longer duration (whether it is 20 years instead of five, or a perpetual contract like TVA's LTP¹) may pose greater risks to MLGW and other electric distributors by limiting flexibility and the ability to make different decisions in the future with the potential result of higher costs to customers. Similarly, risks differ between a single contract that covers all supply and multiple contracts that add up to total supply and that have different start and end dates. Longer

¹ MLGW. July 2020. *Integrated Resource Plan Report*. Prepared by Siemens. Available at: <https://www.mlgw.com/about/IRPFinalDocument>. p. 39.



contracts and fewer contracts may both result in greater risk. This difference in risk among contract types is not accounted for in the MLGW 2020 IRP or the 2022 IRP updates.²

MLGW 2020 IRP describes the terms of TVA’s LTP, which in effect extends another 20-year duration with each new year of service:

MLGW currently purchases all its electric power needs from the Tennessee Valley Authority (TVA) under an All Requirements Contract. MLGW has the option of exiting its All Requirements Contract with TVA with 5 years of advance notice. TVA has the option of terminating the contract with 10 years of advance notice. As an alternative to the current contract, TVA has offered to MLGW (and all the Local Power Companies it serves) an option of extending the notice period to 20 years, in exchange for a 3.1% discount on the Standard Service non-fuel components of the wholesale rate. In addition, TVA is offering the flexibility to MLGW to provide up to 5% of its load with local generation solutions other than TVA. In addition to evaluating the two alternatives available from TVA, MLGW is evaluating the option of terminating its contractual relationship with TVA and developing its own resources and/or acquiring them from the neighboring Midcontinent Independent System Operator (MISO) market.³

MLGW, in its September 1 RFP Update, recommends TVA’s new LTP as an opportunity for cost reductions (see Table 1). This characterization, however, omits some of the key drawbacks of a perpetual, all-eggs-in-one-basket contract.

Table 1. TVA contract terms from MLGW IRP Update September 1, 2022 presentation

Key Contract Items	TVA Base	TVA LTP
1. Termination Notice	5 Years	20 Years
2. Base Rate Charge	n/a	3.1% Decrease
3. Acquire Renewables	n/a	Up to 5% of MLGW energy needs
4. Additional Benefits (can be fully realized via LTP)	1. \$100M for Community Revitalization Programs 2. Additional \$8.5M Home Energy Uplift Program	

Source: Reproduced from MLGW Board of Commissioners. September 1, 2022. MLGW Power Supply RFP Update & Management Recommendation [PowerPoint Slides]. Memphis Light, Gas and Water. Available at: <https://www.mlqw.com/about/powersupply>. p. 20.

One of the negative consequences of longer and larger contracts is a diminished option value (that is, the value of having an option to do something in the future) for MLGW. TVA’s LTP takes away MLGW’s ability

² Ibid.

³ Ibid. p.1.

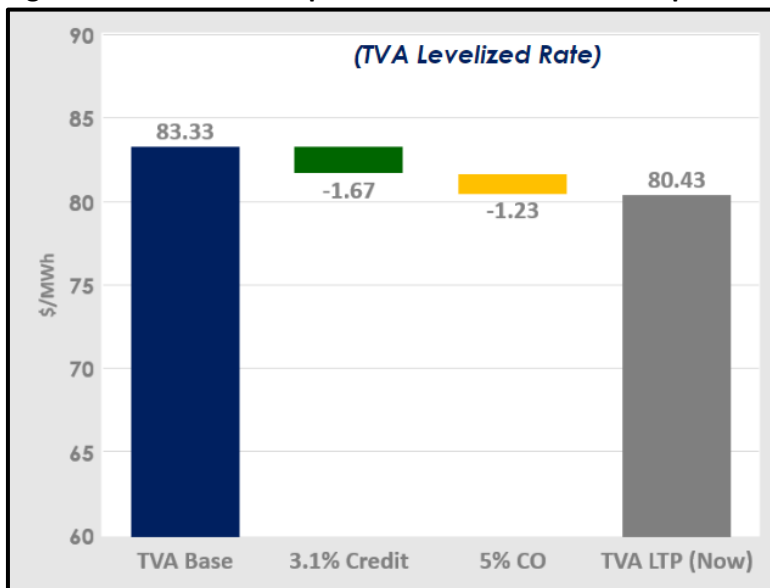
to make new decisions in the future. This loss can be viewed as an opportunity cost of giving up the option to change to a different source of supply.

In MLGW's 2020 IRP, Siemens (the firm that developed MLGW's IRP) points to both costs and benefits of the LTP:

Assess further the LTP option. On one hand there will be a reduction on the costs and the NPVRR with the LTP is approximately \$400 million lower than without it. On the other hand, MLGW will be locked for 20 years and unable to control or take advantage of developments in the electric power industry such as deeper drops in the cost of renewable generation and storage that could increase the economic savings for reconsidering exiting TVA and joining MISO at a later date...⁴

The September 1 RFP Update illustrates expected cost reductions associated with TVA's LTP from its 3.1 percent rate base rate reduction and 5 percent energy carve-out benefit (see Figure 1).

Figure 1. 2018-2047 TVA power cost from MLGW IRP Update September 1, 2022 presentation



Source: Reproduced from MLGW Slides September 1, 2022. p. 14.

AEC's research regarding ways in which opportunity costs could be monetized in IRP modeling found extensive options for and examples of monetizing risk in utility IRP processes but only a few examples directly related to the risks and potential costs of power purchasing arrangements. A Smart Electric Power Alliance report discussing the monetization of curtailment risks of renewable generation systems offers the most closely related example.⁵ Curtailment risk is the risk that a generation resource will have its power

⁴ Ibid. p. 248.

⁵ Sterling J., C. Stearn, T. Davidovich, P. Quinlan, J. Pang, C. Vlahoplus. (no date) *Proactive Solutions to Curtailment*



output reduced below its theoretical or claimed output level thereby affecting variable generation.⁶ Curtailment risk can be addressed in one of two ways: putting the entire onus on the developer (the independent power producer (IPP) approach) or placing all the risk on the utility purchasing power and its customers (the customer risk model). In the former approach, the utility can curtail power and expect the developer to pick up the cost of forgone sales; in the latter, the utility and customers pay for a given amount of output no matter if it is received or not—thereby paying a premium that factors in curtailment risk. In the former, the developer factors curtailment risk into its prices; in the latter, utilities and their customers pay a higher effective price as some purchased power goes undelivered.⁷

TVA's LTP introduces an analogous customer risk by placing all of the risk of its future investment strategy on a captive customer base. The LTP lowers risks for TVA (as discussed by TVA's Chief Financial Officer and Chief Executive Officer's in an August 2019 presentation to the TVA Board⁸) by placing risks on customers willing to sign the LTP contract.

MLGW's 2020 IRP examines cutting off the TVA contract in 5 years (the minimum "heads up" TVA requires) and joining MISO together with contracted supply, keeping the current 5 year contract, or taking TVA's LTP 20-year extension deal.⁹ Currently, MLGW purchases all its electric power needs from TVA under an "All Requirements" contract, also referred to as the "Wholesale Power Contract" (WPC). Under the WPC, MLGW has the option of exiting with 5 years of advance notice. The WPC is MLGW's status quo, or the "business-as-usual" strategy in which TVA exclusively supplies all of MLGW's transmission and generation needs.¹⁰ However, the MLGW 2020 IRP acknowledges that it has not assessed the risk associated with the LTP, and recommends that if MLGW is inclined to stay with TVA, MLGW should "assess further" whether to keep the current contract or sign the LTP.¹¹

GDS Associates' (the consulting firm that prepare MLGW's 2022 IRP update) Vice President Chris Dawson addressed but dismissed contractual risk as non-monetizable in his June 9, 2022 presentation:

That is true, right at the end of every contract. This is the way these things work, right? You take a risk about what the future is going to hold for you a lot of times, right, and try to anticipate prepare, manage, plan accordingly. For example, specifically with that when it is a risk, right, it could drop off, they may have a plan that may start to sell into the MISO market, we no longer want to sell it to you. that that would be mitigated and offset through contract negotiations, where you say, hey, we want an option at the end of year 17, to do something differently, or have a buyout provision so you can manage that. But

Risk: Identifying New Contract Structures For Utility-Scale Renewables. Smart Electric Power Alliance and ScottMadden Inc. Available at: <https://www.firstsolar.com/-/media/First-Solar/Documents/Grid-Evolution/Proactive-Solutions-to-Curtailment-Risk.ashx?la=en>.

⁶ Ibid, p. 12.

⁷ Ibid, p. 14.

⁸ TVA Board Meeting. August 22, 2019. *Financial Performance Update*.

⁹ MLGW IRP. July 2020. p. 29.

¹⁰ Ibid, p. 35.

¹¹ Ibid. p. 29



*you're right. It's another one of those risks that you face that you can't exactly put dollar value on today.*¹²

MLGW's IRP and RFP update do not attempt to set a monetary value on the high contractual risks introduced by TVA's LTP. The extent of risk that MLGW acknowledges and monetizes in its IRP and RFP update does not adequately account for the full scope of potential outcomes associated with a long-term contract with TVA, such as the effects of mitigating its own investment risks through a captive customer base. MLGW's IRP limits its exploration of risk and uncertainty to fuel prices, load, technology prices, and carbon dioxide (CO₂) prices, and then looks at the mean and 95 percentile values of results varying these parameters in a limited sensitivity analysis.¹³ Risks associated with contract length and type are not considered in the IRP or RFP updates, creating a bias that benefits portfolios with riskier contractual arrangements.

III. MLGW's RFP update methodology creates a bias for gas

MLGW's RFP update understates risks associated with a gas-reliant energy system by favoring gas (and introducing biases against renewables and battery storage) in its methodology. In 2022, MLGW hired GDS to update the results of its 2020 IRP and RFP to better reflect current prices and supply constraints. GDS' update methodology included issuing an RFP for new resource bids. According to MLGW's September 1, 2022 presentation:

*Purpose of RFP was to "validate" potential savings identified in IRP. RFP acquired 'real-world' information for (1) new transmission facilities, (2) thermal generation, and (3) Local / MISO solar resources. Validation analysis replaces IRP assumptions for those three items BUT, analysis does rely on several IRP assumptions.*¹⁴

In mid-summer 2022, GDS received updated RFP bids from potential vendors and recalculated the 2020 IRP and June 2022 RFP findings with those new bids. GDS did not, however, update IRP modeling: GDS' "updates" are post-modeling adjustments only and do not include re-optimization (i.e. re-running models to identify least-cost results).

The MLGW Board's September 1 presentation of GDS' update of IRP findings does not change fuel prices, capacity prices, interest and inflation rates, or PILOT (payments in lieu of taxes) costs from the values used in the 2020 IRP. GDS notes that, compared to 2020, natural gas price outlooks are higher, it has become more difficult to procure long-term capacity, and interest rates (modeled at 3.5 percent in the IRP) are much higher today.¹⁵ Bids for thermal resources gathered in the 2022 RFP update do not appear to include fuel prices; instead, the 2022 bids update only technology costs. The choice to not update fuel prices in line

¹² Quoted from GDS presentation to MLGW Board of Commissioners. June 9, 2022. *MLGW RFP Evaluation & Savings Validation*. Memphis Light, Gas and Water.

¹³ MLGW IRP. July 2020. p. 226.

¹⁴ MLGW Slides. September 1, 2022. p. 9 (original emphasis).

¹⁵ Ibid. p. 9-10.



with long-term forecasts, in particular, creates a bias for gas-reliant portfolios and against renewables-reliant portfolios.

GDS did not re-optimize the two-year old IRP portfolios given the updated cost information. Instead, GDS conducted partial updates to existing results without optimization.¹⁶ That means that the updated results are not chosen to minimize customer costs. All portfolios (both TVA and non-TVA) have substantial amounts of gas generation. Had the GDS update included re-optimization with more recent gas price forecasts, the balance of gas dispatch and build-out of new gas resources would likely be different than that of the 2020 IRP. Assuming the outdated IRP optimization results for generation dispatch and portfolio selection creates a bias for gas generation dispatch and portfolios that are gas-heavy.

Electric prices have also risen since the 2019 forecasts used in MLGW's 2020 IRP and these increases are not captured in the RFP update. Renewables, especially solar, would benefit from higher peak hour energy prices in new optimization modeling. This is an additional bias for gas-heavy portfolios and against renewables.

In addition, in MLGW's IRP Siemens emphasizes that its recommendations and selection of preferred portfolios is based not only on costs but also on several non-cost criteria:

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.¹⁷

In contrast, GDS' RFP update bases its recommendation to award TVA the MLGW contract on just one metric: cost. The substantial flaws in the cost methodology described throughout this memo raise concerns about GDS's approach.

IV. MLGW's RFP update uses the wrong renewable prices

In addition to creating a favorable bias for gas by omitting recent fuel price increases and in other ways described in Section III above, MLGW's September 2022 RFP update creates unreasonable barriers to renewable energy sources by overestimating their cost. The MLGW Board's RFP update shifts the IRP analysis to start in 2028¹⁸ and applies present-day price increases (based on the most recently updated RFP bids) to technology costs without updating other key factors. This is cherry picking. (MLGW's 2020 IRP uses a modeling period of 2020-2039; the June 2022 update uses 2028-2047 with bids received in December 2021¹⁹; the September 2022 update uses 2028-2047 with bids received in August 2022.²⁰) The September update illustrates rising current-day solar costs (see Figure 2), explaining that:

¹⁶ Ibid.

¹⁷ MLGW IRP. July 2020. p.247.

¹⁸ MLGW Slides. September 1, 2022.

¹⁹ MLGW Board of Commissioners. June 9, 2022. MLGW RFP Evaluation & Savings Validation [PowerPoint Slides]. *Memphis Light, Gas and Water*. Available at: <https://www.mlqw.com/about/powersupply>. p. 17.

²⁰ Ibid.



Solar PPA pricing has increased across the country (some regions more than others). Reasons for cost increases are inflation, supply constraints, higher materials cost, labor shortages, higher interest rates, etc.²¹

Figure 2. Renewable costs (2020-2022) from MLGW IRP Update September 1, 2022 presentation

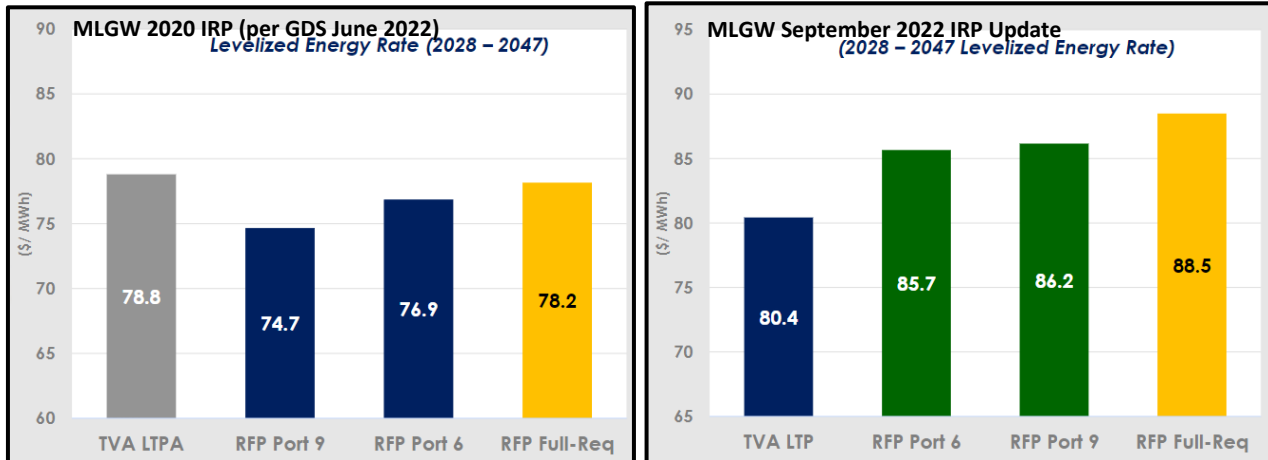


Source: Reproduced from MLGW Slides. September 1, 2022. p. 12.

As a consequence of this current-day cost increase, GDS assumes that future projections of levelized energy costs increase from their original values. In MLGW’s 2020 IRP and June 2022 RFP Update renewables-focused Portfolios 6 and 9—as well as GDS’ assessment of a “full requirements” comparison to meet all services provided by TVA—cost less than TVA’s LTP (see left panel in Figure 3) whereas GDS’ September 2022 RFP Update shows TVA’s LTP as the lowest cost option (see right panel).

²¹ Ibid. p. 12.

Figure 3. 20-year levelized costs comparison, June 2022 update versus September 2022 update



Source: MLGW Slides. June 9, 2022. p. 42; MLGW Slides. September 1, 2022. p. 17.

GDS' RFP update concludes:

Numerous changes in the electric industry (and nationwide) since MLGW's IRP was completed in 2020. Using real-world, current cost information for new transmission facilities, new thermal generation, and new renewable resources, the costs of the power supply alternatives are more expensive than TVA. TVA's LTP proposal is the most cost-effective power supply arrangement. MLGW can achieve immediate savings by executing the LTP.²²

GDS' assessment, however, relies on a faulty assumption. The current supply chain issues that are raising renewable and battery prices are not relevant to the September 2022 updated RFP results. MLGW's suppliers will not install solar until 2027 or 2028 (with a few outlying bids having earlier start dates).²³ Today's renewables prices (relevant to a period of severe supply constraint) should not be used to model installations in 2027-2028. Long-term projections need long-term forecasts, which National Renewable Energy Laboratory (NREL), among others, provides for renewables costs.²⁴ This modeling choice misrepresents and overestimates renewable and battery costs, creating a bias against renewables-heavy portfolios. While the September 2022 bids likely include cost increases related to today's supply constraints, NREL's forecast suggests that prices for solar contracted in future years will not.

GDS should not apply a cost premium to long-term forecasts based on today's conditions. Long-term forecasts have fallen since the 2019 vintage used in the IRP (see Figure 4 below). It is not appropriate to assume that there will be supply chain or inflation issues five or six years from now, nor does GDS provide any basis for that extraordinary assumption. This is the key assumption making the updated non-TVA

²² MLGW Slides September 1, 2022. p. 24.

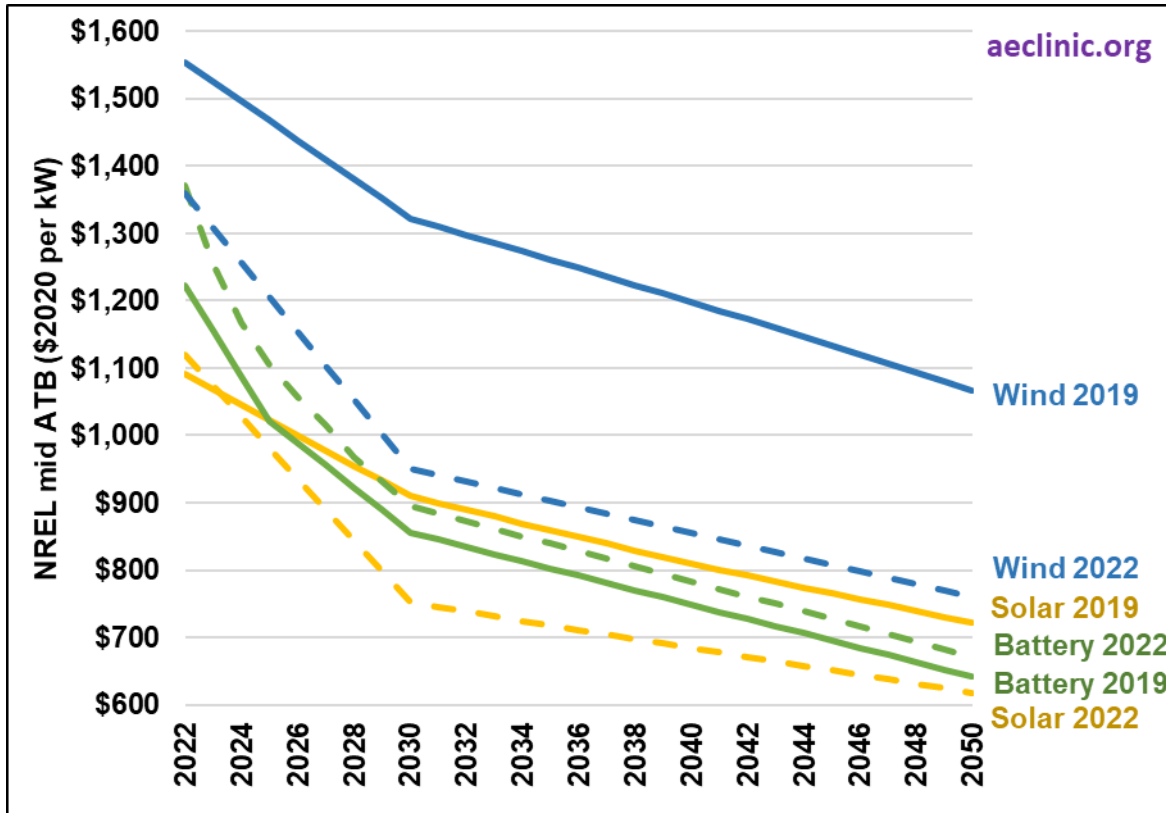
²³ Power Supply Alternatives. *Power Supply Proposals – Request for Proposals*. Presented September 1, 2022. <https://www.mlgw.com/about/powersupply>

²⁴ NREL. *Annual Technology Baseline (ATB), 2019 and 2022 versions* (available at: <https://atb.nrel.gov/electricity/2022/data> and <https://atb.nrel.gov/archive>). *Mid-case forecasts of capital expenditures. Dollars adjusted to \$2020 using the Consumer Price Index.*



portfolios more expensive than TVA's LTP. Inflated renewables costs bias the updated RFP results against renewables-heavy portfolios.

Figure 4. NREL ATB long-term renewables cost forecasts published in 2019 and 2022



Data source: National Renewable Energy Laboratory (NREL). Annual Technology Baseline (ATB), 2019 and 2022 versions (available at: <https://atb.nrel.gov/electricity/2022/data> and <https://atb.nrel.gov/archive>). Mid-case forecasts of capital expenditures. Dollars adjusted to \$2020 using the Consumer Price Index.

V. TVA fails to disclose that most of its renewable energy is spoken for by other cities and corporate customers

Contrary to claims made by GDS and TVA, some portion of TVA's renewable energy supplies are guaranteed to other entities and cannot be available to MLGW. In GDS' presentation before the MLGW Board, Vice President Chris Dawson repeatedly emphasized TVA's renewables and zero-carbon focus referencing a July RFP issued by TVA for 5,000 megawatts (MW) of carbon-free energy but otherwise without presenting specific evidence:



And if you look at TVA lately, they're on a quest to build out an enormous amount of solar resources over the next 10 years.²⁵

But I'm going to start first with TVA because that is the basis for comparison and everything that we are doing here. So we last talked about this in June, they showed some comparisons TVA's projected power cost over the 2028 to 47. Period. I know that TVA right is not immune to anything that's going on and they had challenges. Last, not last month, back in July, TVA announced and issued RFPs, where they are seeking up to 5,000 MW of carbon free generation. And they also went on to say that after they procure that 5,000 MW of carbon-free generation, which they hope to have in place by 2029. They're going to be procured another 10,000 MW of carbon-free generation that they hope to have in place by 2035-2036 timeframe. This is part as I understand it, what they've said publicly, their goal is to achieve a certain level of carbon reduction, I think by 70 percent by 2030, and 80 percent, maybe not 2035. So that announcement came out. And of course, you know, it's important to keep in mind, TVA is not immune or insulated from any of these other challenges we just talked about. Even 5,000 MW is just a small portion of TVA's overall portfolio.

... You know so, today, you know, TVA, and there's renewable energy, right, there's also a carbon-free energy, and you're probably well aware of the TVA's current resources. Nuclear and hydro alone provide more than 50 something percent of the clean carbon free energy here in MLGW, for its retail customers. You know, in addition, I think you're also aware that TVA has been adding a good bit of solar generation over the past five years and continues to add more solar generation. I don't know exactly how much that is or what they're going to have in place today versus tomorrow. But it is quickly approaching 60 percent of their total supply would be carbon free, because of those efforts and their existence.²⁶

In response to MLGW Commission Vice Chair Leon Dickson's question regarding TVA's renewables commitment in comparison to that of utilities of a similar size to Memphis, Mr. Dawson replied:

So, depending on where you're in the region of the country, and I know y'all appreciate this, but I do want to touch on this right? If I'm in the Northeast, right, it is very difficult to get carbon-free energy right, there's solar, wind generation, offshore wind just so they can get more carbon free. They have very little there but if I'm in the northwest of the country, right you think Bonneville Power...you think about all that hydro, the other nuclear in effect, they battle a lot of solar and wind. They're immensely right. It's like 80 percent, carbon free. I mean, they have a much different makeup. And if I moved to different

²⁵ Quoted from GDS presentation to MLGW Board of Commissioners. June 9, 2022. *MLGW RFP Evaluation & Savings Validation..* Memphis Light, Gas and Water.

²⁶ Quoted from GDS presentation to MLGW Board of Commissioners. September 1, 2022. *MLGW Power Supply RFP Update & Management Recommendation.* Memphis Light, Gas and Water.



regions of the country, and I'll come back down to the Southeast here, right, the Midwest used to be so much coal. And to be fair, the Midwest is still over 50 percent coal generation supplying the energy that is used to meet their needs. But if you come down to the Southeast, right, that's been changing. And so it's evolving, the Southeast is adding more solar generation. And it's building up its carbon-free footprint...Today, you are probably one of the leaders in the country in terms of carbon-free energy that TVA provides...So you are certainly a leader in this region when it comes to carbon-free.²⁷

As discussed below, however, TVA's claims to high shares of renewable generation may not be accurate. At the September 7, 2022 presentation to the MLGW Board, TVA's President and Chief Executive Officer Jeff Lyash also made claims regarding TVA's share of carbon-free energy and progress in developing renewable resources:

Let me talk a bit about the scale of TVA because it's important, we are the third largest generator of electricity in the country, the third largest one of the nation's largest transmission systems. Today, we are the leader in carbon reduction in the southeast and have in fact reduced carbon more than almost any utility in the country committed to that. We're also the Southeast's largest renewable energy provider. And we are committed to expanding renewable energy as a percentage of our mix over the coming years...One of the most diverse energy portfolios generating portfolios in the nation and at a scale that can make them cost effective.

TVA is committed to a clean energy system. Matter of fact, against the 2005 benchmark, TVA has reduced greenhouse gas about 60 percent. Already, that's not an aspiration, that's a delivered result. We are committed to reducing it by 70 percent by 2030, 80 percent by 2035. And again, that's a plan that's in execution and...we know we can do that without raising price. And without affecting reliability. We aspire to net zero by 2050. And we are focused on developing the technologies that are going to get us there...We are constructing 10,000 MW of solar power over the next decade. As a matter of fact, TVA, just a month or so ago, issued an RFP for 5,000 MW of clean energy. That's the largest clean energy RFP in the history of the industry. We will receive those proposals between now and the end of the year in a position to make some decisions on those in the first half of next year. This is all driven for maintaining reliable, resilient, affordable and evermore clean electricity.

Yeah, so, TVA is an exporter of renewables, which people typically define as wind and solar, I would add hydroelectric to that. I think it's the original renewable and still the best renewable, and we are working to expand and optimize our pilot, as well. But the problem we all face is climate change. Climate change is driven by greenhouse gas emissions. So the outcome we're trying to produce here is a carbon-free electricity supply that can be

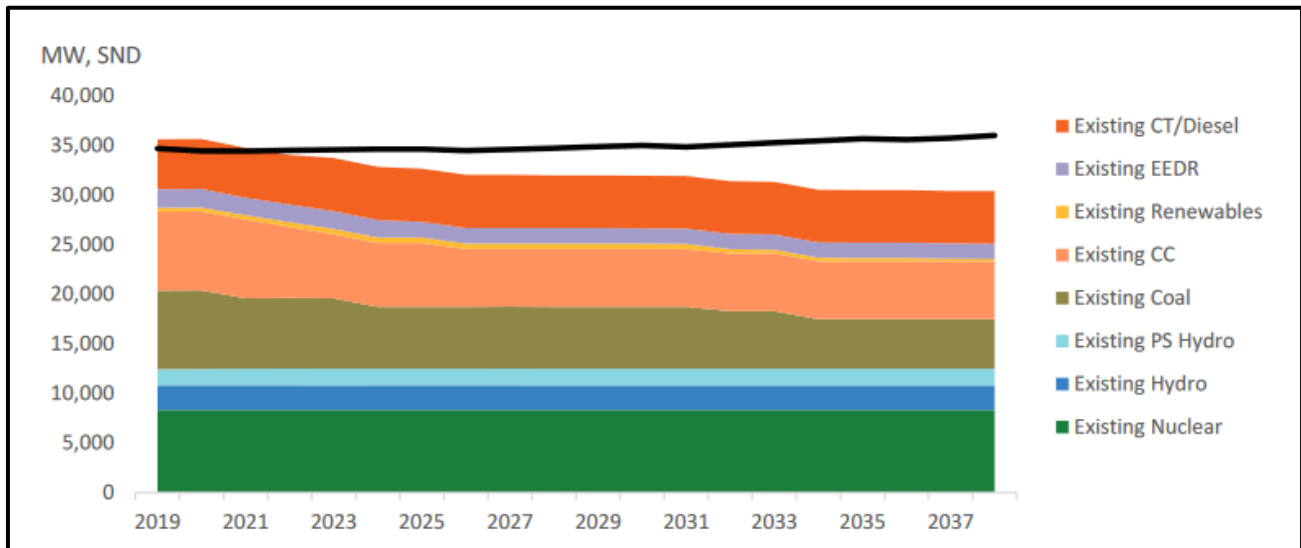
²⁷ Quoted from GDS presentation to MLGW Board of Commissioners. September 1, 2022. *MLGW Power Supply RFP Update & Management Recommendation*. Memphis Light, Gas and Water.



used to decarbonize other sectors of the economy through electrification. Renewables is a critical part of that. That's why we're actively in the process of building solar across the footprint, 10,000 MW. That's why we issued the RFP. But as we plan the system for the next 30 years, what you must do in this business, we cannot reach that outcome with just renewables. We need a portfolio of assets, a diverse portfolio, we need to preserve and extend our existing nuclear fleet. We're evaluating constructing, we need to build 10,000 MW of solar, as much as land use the supply chain and the system can integrate. But we also need to build on our assets to bring to the table what solar does not to give you the stability and reliability system. So you know, I want to be clear, we are renewable advocates, we are building significant amounts of solar, if we can build more, we will but it is not enough. If we're going to reach the outcome that we're all focused on, which is affordable, reliable, resilient, and zero-carbon energy.²⁸

TVA's existing capacity supply is approximately 36-42 percent carbon free including nuclear, hydro, other renewables and demand response (see Figure 5). TVA anticipates that its customer load may grow to as high as 43,000 MW (from 30,000 MW in 2019) by 2038 (see Figure 6).

Figure 5. TVA summer baseline firm capacity from TVA 2019 IRP

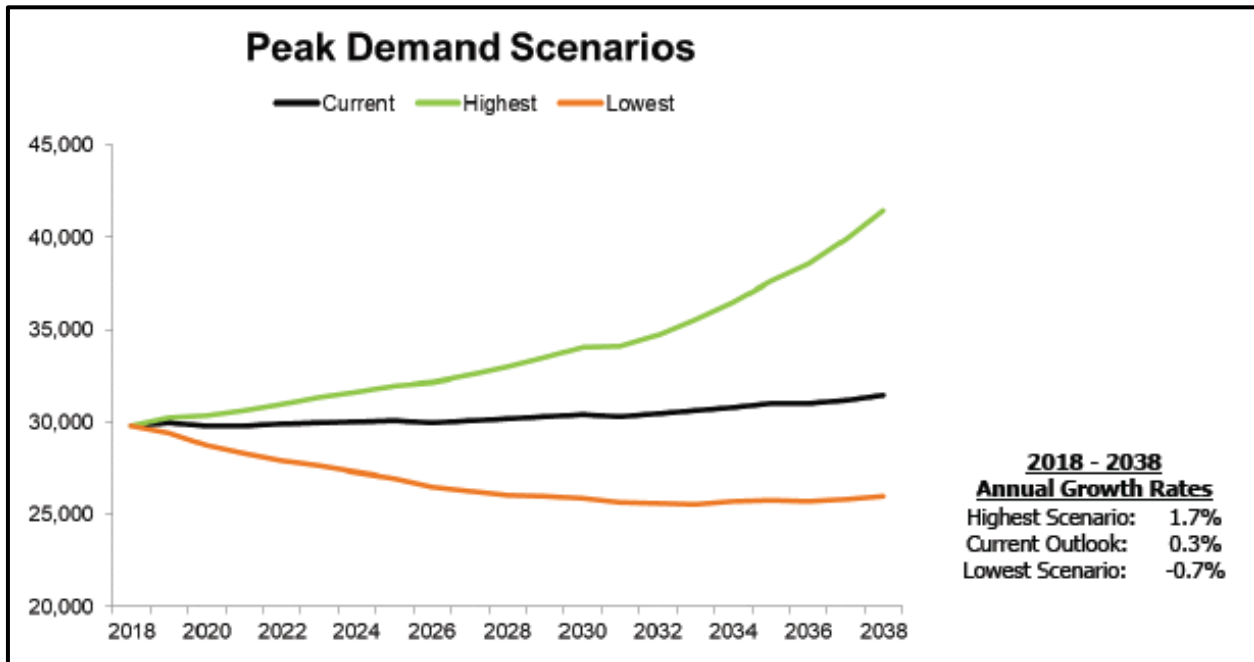


Source: Reproduced from Tennessee Valley Authority. 2019. Integrated Resource Plan. Tennessee Valley Authority. Available at: <https://www.tva.com/environment/environmental-stewardship/integrated-resource-plan>, p. 4-11.

²⁸ Quoted from GDS presentation to MLGW Board of Commissioners. September 7, 2022. MLGW Power Supply Meeting. Memphis Light, Gas and Water.



Figure 6. TVA peak demand forecast from TVA 2019 IRP



Source: Reproduced from TVA 2019 IRP. p. 4-6.

TVA's 2019 IRP recommends the following additions, which would greatly increase its share of renewables and bring its carbon-free generation above 50 percent in 2038:

Wind: Existing wind contracts expire in the early 2030s. Consider the addition of up to 1,800 MW of wind by 2028 and up to 4,200 MW by 2038 if cost-effective.

Storage: Add up to 2,400 MW of storage by 2028 and up to 5,300 MW by 2038. Additions may be a combination of utility and distributed scale. The trajectory and timing of additions will be highly dependent on the evolution of storage technologies.

Solar: Add between 1,500 and 8,000 MW of solar by 2028 and up to 14,000 MW by 2038 if a high level of load growth materializes. Additions may be a combination of utility and distributed scale. Future solar needs are driven by pricing, customer demand, and demand for electricity.²⁹

Mr. Lyash's presentation, however, fails to mention that its primary renewables program, "export" Green Invest, accepts payment from municipalities and private companies to retire the renewable energy certificates associated with TVA's renewable energy production. According to TVA's website:

Green Invest is a proven, award-winning model that offers business and industry an effective, timely, and cost-competitive solution to aggressively meet their sustainability goals. The program matches customer driven commitments for renewable energy with

²⁹ TVA 2019 IRP. p. ES-4.



new-to-the world, in-Valley renewable projects by leveraging a competitive procurement process. Businesses who partner with TVA are able to benefit from TVA's scale and negotiating expertise in attracting a wide variety of potential renewable projects at economic prices.³⁰

In essence, TVA is selling—and plans to sell more of—the rights to its renewable energy. If TVA's renewables are sold to other entities and their renewable energy certificates retired, these same renewable megawatt-hours cannot be available to MLGW or counted as part of MLGW's or Memphis's greenhouse gas emission reductions. If MLGW signs the LTP and wants to invest in renewable energy over and above the 3-5 percent cap in that contract, MLGW will likely have to purchase power at a premium from TVA through Green Invest.

VI. TVA supply does not meet MLGW renewables requirements

While MLGW's 2020 IRP lacks explicit language around its receipt of renewable energy from TVA, it seems evident that its two TVA portfolios do not meet MLGW's own renewables requirements. The MLGW IRP assumes that MLGW receives a proportional (8.5 percent) share of total TVA supply: It does not consider (1) proximity/adjacency of the resources; (2) any dedicated or contract-specific allocation; and (3) the impacts on renewable availability of TVA's Green Invest program.³¹ This lack of specificity is of special import when the 8.5 percent share assumption is applied to Memphis' receipt of renewable energy and its emissions and other environmental impacts. The only mention of this share of TVA supply in MLGW's IRP is in reference to how MLGW determined metrics of CO₂ emissions and water consumed by the entire TVA fleet, and then used the percentage of TVA energy delivered to MLGW to meet its renewable portfolio standard.³² Siemens has presented no evidence that MLGW will receive 8.5 percent of TVA's renewables and has not addressed the issue of the allocation of renewable supply among TVA's customers through Green Invest.

In addition, MLGW's IRP's TVA portfolios do not meet its renewables goals:

MLGW wanted to consider the cost associated with meeting Climate Action Plan goals rather than requiring they be met regardless of cost. A base Renewable Portfolio Standard (RPS) target of 5%-15% RPS from 2025-2039 was imposed as a floor, expecting that higher levels would be achieved. This percentage is expressed as a function of the energy consumed in a year.³³

Under all non-TVA supply portfolios, the base level of the RPS target was exceeded, with most producing 46 percent of load from renewables by the end of the forecast period.³⁴

³⁰ TVA website, <https://www.tva.com/energy/valley-renewable-energy/green-switch/green-invest>

³¹ MLGW IRP. July 2020. p. 215.

³² Ibid. p. 235.

³³ Ibid. p. 89.

³⁴ Ibid. p. 89.



MLGW's minimum renewables level (5-15 percent) was not applied to MLGW's TVA portfolios:

Considering only photovoltaic and wind generation, TVA fares poorly on an RPS measure. Even if large hydro were considered [which is not included in the RPS measure], this value would only increase to 16%.³⁵

The MLGW IRP's TVA portfolios' non-hydro (i.e., solar and wind) RPS percentage is 6.5 percent.³⁶ Our rough calculation of the RPS-eligible percentages across TVA's IRP portfolios is 8-11 percent by 2038. Siemens does not provide a clear account of how it calculated the 6.5 percent value for the TVA portfolios in the MLGW IRP. Using either the 6.5 percent renewables stated in the MLGW IRP's Exhibit 165 or the 8-11 percent inferred by AEC from the TVA's IRP, the TVA portfolios' RPS percentages are far below those of the Memphis IRP's non-TVA portfolios.

In Siemen's MLGW 2020 IRP scorecard analysis each portfolio receives a score based on the percentage of renewable sources offered (see Figure 7 below). The higher the percentage, the higher the score. The MLGW IRP scorecard figure does not report score values; rather, it reports the metric value (i.e., the percent of renewables, etc.) on which the score is based and uses a color-coding system (shades of green, yellow, and red) to display how each portfolio compares to the others. Meeting the 15 percent RPS floor for 2039 does not result in a maximum score (dark green); some portfolios have RPS percentages as high as 75.3 percent in 2039. All but the two TVA portfolios far exceed the 15 percent RPS minimum target.³⁷

³⁵ Ibid, p. 42.

³⁶ Ibid, p. 42.

³⁷ Ibid, p. 22.



Figure 7. MLGW 2020 IRP Exhibit 10. Scorecard results

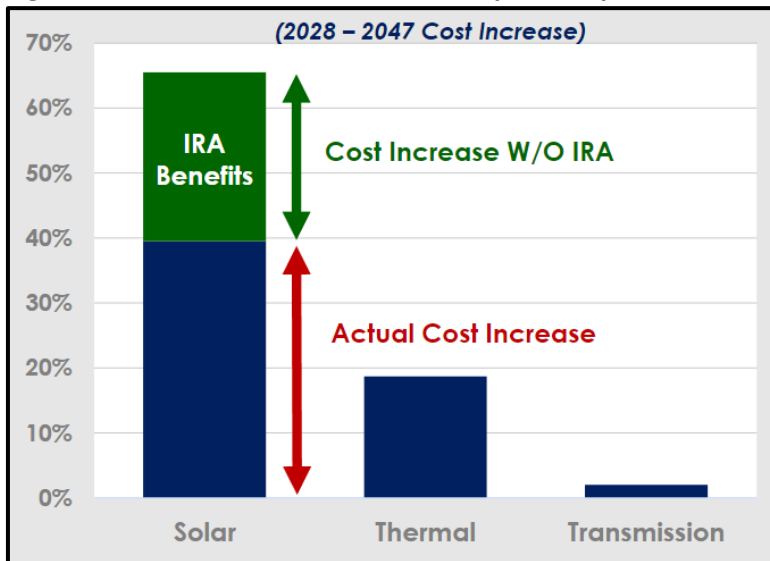
Objective	Measure	Unit	TVA (Base)	TVA (LTP)	Portfolio 5 1 CC + 4 CT	Portfolio 9 1 CC + 4 CT	Portfolio 10 ⁹ 1 CC + 0 CT	Portfolio 8 2 CC + 1 CT	Portfolio 8 2 CC + 2 CT	All MISO 1 CC + 0 CT	Portfolio 1 2 CC + 1 CT	Portfolio 7 2 CC + 2 CT	Portfolio 4 3 CC + 1 CT	Portfolio 2 3 CC + 2 CT	Portfolio 3 3 CC + 0 CT
Least Cost	NPVRR 2020 - 2039	\$ Millions	10,411	10,020	14,504	14,463	14,304	14,014	14,027	14,522	14,490	14,503	14,511	14,088	14,709
	Stochastic Mean NPVRR 2020 - 2039	\$ millions	10,386	15,966	14,458	14,465	14,571	14,747	14,760	14,789	14,790	14,806	15,052	15,076	15,203
	Levelized Cost of Energy	\$/MWh	87.47	65.86	59.32	59.34	59.48	60.51	60.50	60.68	60.60	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
Min Risk	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
	95th Percentile Value of NPVRR	\$ millions	17,221	16,930	16,576	16,517	16,993	16,945	16,944	17,211	17,051	17,074	17,648	17,535	17,844
Min Emv. Risk	CO ₂ Emissions Mean 20-Year	Milion 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
	Energy from Renewable Sources 2039 (RFS)	% of Energy Consumed	6.5%	6.5%	75.3%	75.3%	62.7%	54.9%	54.9%	62.7%	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%
Reliable	2025 Local Water Consumption	Milion Gallon	3,103	3,103	3,061	3,782	4,809	4,782	4,789	3,103	4,788	4,795	5,645	5,651	5,607
	2025 (UCAP+OJ)PEAK	%	133.7%	133.7%	126.0%	127.8%	148.6%	126.6%	127.2%	115.4%	126.6%	127.2%	126.7%	130.6%	137.3%
Resilient	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
	% Energy Purchased in Market	%	10.8%	10.9%	31.2%	31.2%	23.0%	17.4%	16.2%	23.0%	16.7%	15.0%	7.4%	7.0%	7.7%
Min Market Risk	% 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%
	Local T&G CapEx	\$ millions			2,969	2,854	2,894	2,645	2,965	1,014	2,811	2,932	3,138	3,299	3,404

Source: Reproduced from MLGWIRP. July 2020. Exhibit 10.

VII. MLGW’s misinterpretation of the IRA biases against renewables

MLGW updated its RFP pricing as a result of the 2022 Inflation Reduction Act³⁸ (IRA), noting that without the IRA, the cost of solar proposals would be 25 percent higher (see Figure 8). GDS’ IRA analysis, however, excludes key IRA provisions the absence of which creates a bias against renewables-heavy portfolios.

Figure 8. IRA benefits from MLGW IRP Update September 1, 2022 presentation



Source: Reproduced from MLGW Slides. September 1, 2022. p. 13.

According to GDS’ September 1, 2022 presentation the MLGW Board:

Solar proposal had largest price increase—cost would have been 25% higher WITHOUT benefits of the IRA. Multiple solar vendors stated that higher cost (sic) were the result of supply chain issues and higher cost associated with supplies & materials, financing cost, wage / labor, land lease, etc.³⁹

As a result, GDS’ RFP update forecasted cost increase from 2028-2047 is around 40 percent rather than the 65 percent identified in the new solar bids.⁴⁰ (The RFP bids themselves were submitted prior to the adoption of the IRA and, therefore, do not include its effects.)

GDS’s September 1 presentation makes no reference to two key IRA provisions capturing: (1) investment tax credits (ITC) for standalone batteries, and (2) production tax credit (PTC) extensions for wind and solar. (The RFP bids presented on September 1 were submitted in early August; the IRA was signed into law on August 16, 2022.) Short-listed Portfolios 6 and 9 have a large share of generation dedicated to MISO and Local Solar. Portfolio 9 has more MW for gas combustion turbines (CT), and Portfolio 6 has more MW for

³⁸ Inflation Reduction Act of 2022. H.R. 5376. Passed August 16, 2022. Available at: <https://www.congress.gov/bill/117th-congress/house-bill/5376/text>

³⁹ MLGW Slides. September 1, 2022. p. 13.

⁴⁰ Ibid.



combined cycle gas turbine (CCGT) generation. As a result of the RFP update, Portfolio 6 costs were increased \$15/MWh due to higher costs for resources and transmission; similarly, Portfolio 9 were increased \$17/MWh.⁴¹ The inclusion of ITC and PTC benefits from the IRA would reduce the costs of, and increase the preference for, renewables- and battery-reliant portfolios.

VIII. MLGW's updated RFP bid aggregation is opaque

GDS' RFP bid aggregation method lacks transparency. GDS curates and combines bids such that RFP submissions are not discernible to stakeholders. At the same time, GDS' over-specification of the RFP into separate bidding categories by resource types damages the "all-resource" intent of the bidding process. MLGW will have received the bids as specified in the RFP, and not bids representing all resource solutions available in the marketplace.

Reliable and least-cost IRP results combine diverse sets of resources in a single assessment of distributor-wide resource needs and supplies, rather than requiring a separate planning process for each resource. MLGW has a single aggregate need for electric supply sufficient to meet its customers' needs. GDS' choice to issue three RFPs (one each for thermal, solar, and transmission resources) prevented the submission of any real-world mixed resource bids or bids designed to bundle resources together to meet MLGW's specific need. By over-specifying and constraining the RFP in this way, GDS has made it unlikely that the RFP resulted in truly "all-resource" bids, and instead taken creative license in assembling a discrete set of imaginary bundles bids. As MLGW President and CEO J.T. Young explained at the June 9 presentation to the Board:

So if you're if the question is will bidders be allowed to present their individual bids, so let me just back up a quick minute. The role the GDS had in this process was to aggregate the arrangements that would be beneficial to all customers. So if you have any individual bidder that they get and you add all of bids. Just to be clear. As is the case when we do contracts, bids, obviously will become public once we have an intent to award recommendations, that does not mean there will be a final decision at that point, as you saw there, there's still going to be time for comments and questions.⁴²

The other negative impact of structuring the RFP this way is that the individual bids received do not appear in the Board's September 1 update and recommendations. Instead, GDS uses the bids as ingredients that are mixed into bid-packages and thereby used to (partially) update the RFP findings. The result is a lack of transparency. Stakeholders can see the bids but cannot see the GDS-constructed bid-packages, or how these packages were used to update IRP findings with RFP data.

⁴¹ Ibid.

⁴² Quoted from GDS presentation to MLGW Board of Commissioners. June 9, 2022. *MLGW RFP Evaluation & Savings Validation*. Memphis Light, Gas and Water.

IX. MLGW future scenario selection introduces biases

MLGW’s IRP also evidences a lack of transparency in the model parameters uses to construct the future scenarios (or descriptions of future conditions) modeled. The distribution of parameter values under high/low load, high transmission, high gas prices, and low storage costs are not addressed in the MLGW IRP; only distributions under reference conditions are presented. If portfolios-scenario pairings assigned other-than-reference central values have been explored stochastically using the reference scenario parameter distributions, risk is being misrepresented and undercounted.

The IRP also fails to consider a full range of potential scenarios and as a consequence severely underexplores the extent of possible risks associated with each portfolio considered. The MLGW IRP model selectively pairs portfolios and scenarios, and does not model portfolios under a range of scenarios (the appropriate method). Again, risk is undercounted through modeler selection. In particular, the two TVA portfolios are only analyzed under reference conditions (and the reference distributions of parameter values) and not under any of the sensitivities to fuel prices, load, transmission, or technology costs, thereby misrepresenting and undercounting risk under TVA’s LTP. (The same can be said of Portfolios “All Miso”, 1, 2, 7, and 10.)

Rather than exploring all possible combinations of portfolios and scenarios, MLGW models only 13 portfolio-scenario pairings, at least five of these under reference case conditions and either most or all under reference case parameter distributions (see Figure 9). Without exploration of the different portfolios under sensitivity conditions, MLGW’s IRP fails to consider the scope of the potential risks to each portfolio.

Figure 9. Portfolio-scenario pairings modeled in MLGW 2020 IRP Update

Scenarios / Portfolios		Strategy		
		Strategy 1 (TVA)	Strategy 3 Self + MISO	Strategy 4 All MISO
State of the World	Scenario 1 Reference	S1S1	S3S1	S4S1
	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	

Source: Reproduced from MLGW. July 2020. Integrated Resource Plan. Memphis Light, Gas and Water Division. Available at: <https://www.mlqw.com/about/IRPFinalDocument>. p. 4.



X. MLGW introduces bias in its selection of portfolios

Siemens' portfolio selection introduces biases for gas-reliant portfolios and against battery-reliant portfolios. In standard IRP modeling, portfolios are selected by modelers, utility leadership, or stakeholder working groups. (Scenarios are also selected in this same way in an effort to explore a likely range of future conditions.) In MLGW's 2020 IRP, four "supply strategies" are identified—each of which is represented by a set of portfolios. The four strategies are as follows:

1. Strategy 1: All Requirements Contract with TVA (status quo), business as usual.
2. Strategy 2: Self-supply where MLGW self-serves 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.⁴³

According to MLGW's IRP:

Strategy 2 is simply not achievable. There is not enough land available in MLGW's service territory and its vicinity to economically acquire the needed renewable resources, nor would there be adequate backup generation capacity to meet the reliability and resource adequacy requirements, without major investments in generation resources. For these reasons, Siemens focused our attention on Strategies 1, 3 and 4.⁴⁴

Portfolio selection is an art, not a science, and there is always significant opportunity for IRP findings to be biased by portfolio selection. For example, if all portfolios selected for modeling are heavily fossil fuel dependent, optimization (or "least-cost") modeling will determine that one of the selected portfolios is the "preferred", but that determination should always be understood explicitly as "preferred among the portfolios subjected to modeling" and not as "preferred among all portfolios". Importantly, modelers always have the option to permit open optimization modeling in which portfolios are not pre-identified but instead the model itself identifies the portfolio. Any other form of optimization modeling should always be referred to as "constrained optimization" modeling.

Siemens' MLGW IRP modeling designates a truncated set of scenarios, optimizes some of these scenarios to identify portfolios, and then adapts most of these least-cost-under-a-given-scenario portfolios by adding or subtracting resources and by eliminating numerous portfolios. The portfolios selected and adapted in this manner are then subjected to constrained optimization. The result is a comparison of carefully curated options, and not a transparent investigation of a full range of potential least-cost resource portfolios.

Only a minority of the portfolios include batteries. The MLGW IRP forces the model to select gas CTs for reliability purposes, but a battery could serve the same function. While a majority of the portfolios do not include any added battery storage, Portfolios 5 and 9 consist of 100 MW each of planned battery storage

⁴³ MLGW IRP. July 2020. p. ES-1.

⁴⁴ MLGW IRP. July 2020. p. 2.



compared to one 450 MW CC and four 237 MW CTs each for planned gas.⁴⁵ With more recent battery cost forecasts and the IRA, batteries (including long-duration) are a viable capacity resource⁴⁶ that is ignored in the MLGW IRP because of the modelers' portfolio selection.

⁴⁵ Ibid. p. 8.

⁴⁶ National Renewable Energy Laboratory (NREL). September 2019. "Grid-Scale Battery Storage". Greening the Grid.

Available at: <https://www.nrel.gov/docs/fy19osti/74426.pdf>.

Attachment 2

July 19, 2022

Board of Commissioners
Memphis Light, Gas & Water
220 South Main St.
Memphis, TN 38103
Via email to PowerSupply@MLGW.org

Re: RFP results show MLGW must keep its options open and demand more investment in clean, renewable energy from TVA and other potential suppliers

Dear MLGW Commissioners:

We write on behalf of Protect Our Aquifer and Memphis Community Against Pollution to insist that our future power supplier invest in more renewable energy and energy efficiency rather than costly, polluting and water-dependent new gas plants. MLGW has both an opportunity and an obligation to make sure that whoever supplies our electricity gets the most bang for our community's buck, in terms of our power bills, our Aquifer, and the health of our community. This Board's power supply decision provides a once-in-a-generation opportunity for MLGW to reduce economic, health, and energy burdens in our communities.

A key takeaway from the June 9 GDS presentation is that MLGW should not lock its ratepayers into paying for TVA's or *any* power supplier's unnecessary and risky new gas plants. Portfolio 9—the portfolio with the most renewables and the least new gas—performed the best in terms of cost, both in the base case and the sensitivity analyses.¹ Notably, the renewables-focused Portfolio 9 outperformed the TVA long-term contract option, resulting in net savings even if MLGW forgoes five years of TVA long-term contract so-called “benefits.”²

In fact, during their presentation, MLGW's GDS consultants indicated that if MLGW were designing its Integrated Resource Plan (IRP) today, there would be even more renewables and battery storage across the portfolios.³ The implication is clear:

¹ MLGW Bd. of Comm'rs & Memphis City Council, *MLGW RFP Evaluation & Savings Validation*, MLGW 50 (June 9, 2022) [hereinafter June 9 Presentation],

https://www.mlgw.com/images/content/files/pdf/MLGW%20RFP%20Evaluation%20and%20Savings%20Validation_06-09-22_Final.pdf (showing savings from Portfolio 9 in all sensitivity analyses).

² *Id.* at 46 (Portfolio 9 results in \$30.9 million in annual savings after factoring in savings from five years of TVA long-term agreement).

³ [RFP Broadcast - YouTube](#) at time stamp 2:30:15 (“If the IRP had been conducted today, there's a good chance they probably would have developed slightly different portfolios, and that's only because they said, well, gas prices are not going to be \$3.00, they're going to be \$7.00, right. PPAs or solar may not be that [sic] they would have taken different approaches to determine different outcomes”), available at <https://www.mlgw.com/about/powersupply>.

MLGW should demand more affordable, available renewable resources from TVA and other bidders and refuse to pay for risky and polluting new gas.

The Board's decision comes at a crucial moment. The Tennessee Valley Authority has proposed the biggest gas buildout in the nation,⁴ even as the federal utility's "fuel cost adjustment" is forcing MLGW to raise rates by 20 to 40 percent due to volatile gas prices.⁵ TVA has proposed replacing its retiring Cumberland coal plant with a new 1450 MW gas plant—a proposal opposed by TVA's other biggest municipal customer, Nashville Electric Service, on financial and economic development grounds.⁶

To the extent that MLGW is leaning toward staying with TVA, MLGW should follow the advice given by its IRP consultant: ask for more access to utility-scale solar to provide affordable power, and carefully weigh the risk-benefit ratio of binding itself forever to TVA.⁷ Like Nashville Electric Service, MLGW should also oppose the proposed Cumberland gas plant and advocate for TVA to instead add more solar and battery storage to its grid for the benefit of all ratepayers.

The option of remaining with TVA under the terms of MLGW's current contract—with its five-year notice of termination provision—was not adequately addressed or considered in the June 9 presentation or in the response to comments document posted on MLGW's website. TVA's previous offer to MLGW included an option to preserve the existing contract and invest in more solar and low-income energy efficiency programs in the Memphis community.⁸ This offer must be more fully explored and used as the basis for further negotiations by the Board.

⁴ TVA has proposed nearly 5,000 MW of new gas plants in the past two years. Lisa Friedman, *Largest Federal Utility Chooses Gas, Undermining Biden's Climate Goals*, N.Y. Times (Mar. 18, 2022), <https://www.nytimes.com/2022/03/17/climate/tennessee-valley-authority-biden-climate.html>. TVA's 2019 Integrated Resource Plan calls for up to 18,400 MW by 2038. Tenn. Valley Auth., *2019 Integrated Resource Plan: Volume 1 – Final Resource Plan 9-3 to 9-4* (2019), https://tva-azr-eastus-cdn-ep-tvawcm-prd.azureedge.net/cdn-tvawcma/docs/default-source/default-document-library/site-content/environment/environmental-stewardship/irp/2019-documents/tva-2019-integrated-resource-plan-volume-i-final-resource-plan.pdf?sfvrsn=44251e0a_4.

⁵ Samuel Hardiman, *Your MLGW Bill Could Go Up by \$60 a Month. Why? Because TVA Is Charging Its Customers More.*, Memphis Com. Appeal (July 1, 2022, 1:11 PM), <https://www.commercialappeal.com/story/news/2022/06/30/mlgw-bill-could-increase-60-dollars-this-summer/7777298001/>.

⁶ Caroline Eggers, *NES Board, for the First Time Ever, Comes Out Against TVA Fossil Fuel Plans*, WPLN (May 26, 2022), <https://wpln.org/post/nes-board-for-the-first-time-ever-comes-out-against-tva-fossil-fuel-plans/>.

⁷ Siemens, *Integrated Resource Plan Report: Memphis Light, Gas, and Water 29* (2020) [hereinafter 2020 MLGW IRP], http://www.mlgw.com/images/content/files/pdf/MLGW-IRP-Final-Report_Siemens-PTI_R108-20.pdf.

⁸ Letter from Jeff Lyash, Tenn. Valley Auth., to J.T. Young, President & Chief Exec. Officer, Memphis Light, Gas & Water Div. 12–13 (July 6, 2020) [hereinafter TVA's MLGW Recommitment Offer], [http://www.mlgw.com/images/content/files/pdf/MLGW%20Proposal%20Letter%20Package_Final_06Jul2020_1\(1\).pdf](http://www.mlgw.com/images/content/files/pdf/MLGW%20Proposal%20Letter%20Package_Final_06Jul2020_1(1).pdf).

Given the results of the RFP, MLGW should not consider any deal that is simply “take it or leave it,” such as TVA’s long-term contract.⁹ Instead, MLGW should use its purchasing power to negotiate with TVA and other potential suppliers to get the best deal for Memphis’s future: a future that relies on affordable, available renewable energy, battery storage, and energy efficiency. Not only are unnecessary new gas plants costly for ratepayers, they also risk harming the health of our Memphis communities and are a wasteful use of our Aquifer, as explained in the detailed comments we include with this letter. MLGW should also demand that TVA clean up its coal ash at the Allen Fossil Plant in a manner that fully protects our Aquifer and does not add to the air and water pollution burdens already borne by South Memphis.

Thank you for the opportunity to provide comments on the RFP results and MLGW’s power supply decision. These comments are based on the limited information currently available to the public. As we have done previously,¹⁰ we strongly urge MLGW to improve the transparency of the process surrounding this urgently important decision for our community.

Sincerely,

Sarah Houston
Executive Director
Protect Our Aquifer

Amanda Garcia
Senior Attorney and
Tennessee Office Director
Southern Environmental
Law Center

Justin J. Pearson
Founder
Memphis Community
Against Pollution

⁹ Protect Our Aquifer is a plaintiff in litigation challenging the legality of TVA’s long-term contracts under the TVA Act and the National Environmental Policy Act. The case is *Protect Our Aquifer, et al. v. Tennessee Valley Authority*, Case No. 2:20-cv-02615-TLP-atc (W. D. Tenn.).

¹⁰ Toby Sells, *MLGW Again Declines To Name Power Bidders*, Memphis Flyer (May 6, 2022, 3:00 PM), <https://www.memphisflyer.com/mlgw-again-declines-to-name-power-bidders>.

COMMENTS OF PROTECT OUR AQUIFER AND MEMPHIS COMMUNITY AGAINST POLLUTION ON MLGW POWER SUPPLY RFP RESULTS

I. To gain public confidence in its power supply decision, MLGW must improve the transparency of the process.

Because MLGW's power supply decision will affect hundreds of thousands of Memphians, it is critical that this process is open and transparent. Despite the importance of this decision, MLGW has largely shut the public out of its RFP process. The public still lacks critical information about this decision, including basic details like the names of firms, groups, or companies that have submitted proposals to supply MLGW with power. MLGW has repeatedly rebuffed calls for transparency, even when those calls have come from Memphis city leaders. Community groups have submitted record requests and the Memphis City Council has passed a resolution asking for additional information about the power supply proposals, but the utility has refused to release basic details.

It is particularly important this decision is open and transparent because TVA comes into this process with an unfair advantage. TVA is MLGW's current power provider, and the utilities' decades-long relationship gives TVA unique access to MLGW and its customers. TVA is also MLGW's largest water customer, giving it another advantage in this decision-making process and adding another reason why it is important that the public have relevant information about how this decision is being made.

These comments are based on the information that is currently publicly available.

II. The RFP results make clear that renewables are the least-cost option.

In the Request for Proposals (RFP) presentation last month, MLGW's consultants put a lot of emphasis on their findings that the RFP resulted in lower cost savings than the IRP had projected. MLGW's consultants also emphasized the economic uncertainty associated with leaving TVA.

But the information in the consultants' slide deck tells another story: the portfolio with the most renewable energy and the least new natural gas (Portfolio 9) performed the best from a cost perspective—better than TVA's long-term contract option.¹¹ In fact, Portfolio 9 resulted in cost savings even in the sensitivity analyses that looked at high interest rates, high capacity price, and high gas price.¹² MLGW's consultants also suggested during their presentation that if MLGW were designing its Integrated Resource

¹¹ June 9 Presentation, 46 (Portfolio 9 results in \$30.9 million in annual savings even after factoring in potential savings from five years of TVA long-term agreement).

¹² *Id.*, 50.

Plan (IRP) today, there would be even more solar and battery storage and less gas across the portfolios.

The RFP results track the findings of a recently-released report, which shows that TVA would save \$9.4 billion over the next twenty years by investing in a clean, renewable energy portfolio instead of new gas plants.¹³ But instead, TVA has proposed plans to invest in 5,000 MW of new gas over the coming decade.¹⁴ That matters because MLGW's ratepayers will be paying for TVA's gas buildout for decades to come, when they could have been paying less for clean, affordable renewable energy.

Building solar in Shelby County and selling it at a premium to corporations doing business hundreds of miles away, as TVA has recently proposed to do with its Graceland Solar Project, is not the answer.¹⁵ MLGW should demand that TVA add solar and battery storage and other affordable, available renewables to its portfolio so that both corporations and everyday ratepayers in Memphis can benefit from the cost savings.¹⁶

The RFP results confirm that the economic uncertainty identified by the consultants regarding inflation and gas price volatility don't just apply to leaving TVA. Those uncertainties—and their associated costs—also pertain to staying with TVA, especially considering the federal utility's proposal to double down on expensive, volatile fossil fuels in the next several years.

To the extent that MLGW is leaning toward staying with TVA, the utility should **not** lock itself into a long-term contract, particularly given TVA's reckless gas buildout plans. TVA's other largest customer, Nashville Electric Service, is locked into a long-term contract with TVA and has objected to the gas plans in part because renewables would "prevent TVA from investing in long-term assets that leave ratepayers with high stranded asset costs...."¹⁷ NES, along with 140-plus other distributors, will be footing the bill for

¹³ Rachel Wilson, Iain Addleton, & Jon Taberner, Synapse Energy Econ., Inc., *Clean Portfolio Replacement at Tennessee Valley Authority: Economic and Emissions Benefits for TVA Customers 2* (2022), <https://www.sierraclub.org/press-releases/2022/06/report-release-tva-saves-billions-choosing-clean-energy>.

¹⁴ Lisa Friedman, *Largest Federal Utility Chooses Gas, Undermining Biden's Climate Goals*, N.Y. Times (Mar. 18, 2022), <https://www.nytimes.com/2022/03/17/climate/tennessee-valley-authority-biden-climate.html>.

¹⁵ Tennessee Valley Authority, WR Graceland Solar Project Draft Environmental Assessment 1-7 (April 2022) ("On May 19, 2021, TVA announced to their press room that a new Green Invest partnership with Facebook and RWE Renewables to build this 150-MW solar facility"), [https://tva-azr-eastus-cdn-ep-tvawcm-prd.azureedge.net/cdn-tvawcma/docs/default-source/environment/wr_graceland_solar_project_final_draft_ea-\(1\)824418fd-6c82-4933-9a37-88ebd20675ff.pdf?sfvrsn=2acf1912_7](https://tva-azr-eastus-cdn-ep-tvawcm-prd.azureedge.net/cdn-tvawcma/docs/default-source/environment/wr_graceland_solar_project_final_draft_ea-(1)824418fd-6c82-4933-9a37-88ebd20675ff.pdf?sfvrsn=2acf1912_7).

¹⁶ Comments available at https://static1.squarespace.com/static/5b7b3e99d274cb770c84b404/t/62a8e2df3707521137f2d7c3/1655235295841/POA_Graceland+Solar_TVA+EA_05.25.2022.pdf.

¹⁷ Nashville Electric Service Board of Directors, Resolution Recommending TVA Pursue Solar and Storage in Middle Tennessee (May 25, 2022), available at <https://wpln.org/wp-content/uploads/sites/7/2022/05/2022-05-25-Board-Resolution-on-Cumberland-Plant-FINAL.pdf>.

TVA's gas plants because they have no way out after signing long-term contracts. MLGW has the opportunity to chart a different course.

TVA's long-term contracts automatically roll over every year and require 20 years' notice to terminate, making it practically impossible for power distributors like MLGW to leave. With a guaranteed customer base, TVA can ignore local power companies and their ratepayers' calls for cheaper renewable energy options. As MLGW's IRP consultants observed about the risk of signing TVA's long-term contract, MLGW will be "unable to control or take advantage of future developments in the electric power industry, such as deeper drops in the cost of renewable generation and storage that could increase the economic savings for reconsidering exiting TVA and joining MISO at a later date."¹⁸

In contrast, because TVA is currently having to compete to retain MLGW as a customer, TVA has offered a number of incentives to the utility and the city, including more access to renewable energy and energy efficiency.¹⁹ If MLGW signs a "take it or leave it" long-term contract instead, as NES has done, neither MLGW nor the ratepayers it serves will ever see this kind of negotiation again.

The option of remaining with TVA under the terms of MLGW's current contract—with its five-year notice of termination provision—was not adequately addressed or considered in the June 9 presentation or in the response to comments document posted on MLGW's website. TVA's previous offer to MLGW included an option to preserve the existing contract and invest in more solar and low-income energy efficiency programs in the Memphis community.²⁰ This offer must be more fully explored and used as the basis for further negotiations by the Board.

At a minimum, MLGW should follow its own IRP consultants' advice in the Integrated Resource Plan (IRP) if it is leaning toward staying with TVA: (1) Push for more utility-scale solar from TVA; (2) Evaluate TVA's long-term contract very carefully to assess whether the benefits outweigh the risks (they don't); and (3) seek written guarantees from TVA to ensure long-term rate stability.²¹ With respect to this last category, MLGW should seek assurances regarding fuel cost adjustments in addition to base rates. This summer, TVA's "fuel cost adjustment" is forcing MLGW to raise rates by 20 to 40 percent due to volatile gas prices.²² As MLGW's consultants explained, the volatility of gas prices is a major source of uncertainty over the coming decades.²³

¹⁸ 2020 MLGW IRP, 29.

¹⁹ TVA's MLGW Recommitment Offer, 12-13.

²⁰ *Id.*

²¹ 2020 MLGW IRP, 29.

²² Samuel Hardiman, *Your MLGW Bill Could Go Up by \$60 a Month. Why? Because TVA Is Charging Its Customers More.*, Memphis Com. Appeal (July 1, 2022, 1:11 PM), <https://www.commercialappeal.com/story/news/2022/06/30/mlgw-bill-could-increase-60-dollars-this-summer/7777298001/>.

²³ July 9 Presentation, 10.

Memphis already has one the highest energy burdens in the country among Black, low-income households.²⁴ We simply can't afford to bankroll TVA's—or anyone else's—risky and unnecessary gas investments.

III. More renewables and less gas will result in better outcomes for Memphis's drinking water source, the Memphis Sand Aquifer.

MLGW has an obligation to serve as a steward of our drinking water source by minimizing water-intensive new gas plants in our region, regardless of who supplies its power. How MLGW provides power affects the quantity and quality of water in the Memphis Sand Aquifer, Memphis's sole drinking water source.

Protect Our Aquifer has consistently advocated for MLGW and TVA to maximize reliance on clean, reliable renewable power because gas plants, including TVA's Allen Gas Plant, extract enormous amounts of water from our drinking water aquifer. In fact, TVA is one of the most significant users of the Memphis Sand Aquifer and uses more than 1.5 billion gallons of Aquifer water per year.²⁵ In addition to being the least cost option, the renewables-heavy Portfolio 9 was also the non-TVA portfolio requiring the least water to be withdrawn from the Memphis Sand Aquifer, the drinking water source MLGW is charged with protecting.²⁶

If MLGW binds itself to TVA in a long-term contract, the threats to our Aquifer from TVA's activities may become more dire. Without viable power supply competition, TVA will be able to ignore the Memphis community's concerns about pollution and overuse of the Memphis Sand Aquifer, including calls to equitably and completely clean up TVA's toxic coal ash, or to switch to using gray water or another source to operate the Allen Gas Plant.

Signing a long-term contract is particularly concerning because TVA is planning to add thousands of megawatts of additional gas to its portfolio. Recent announcements of energy-intensive economic development like Ford's Blue Oval City raise concern about

²⁴ Ariel Dreihobl & Lauren Ross, Am. Council for an Energy Efficient Econ., *Lifting the High Energy Burden in America's Largest Cities: How Energy Efficiency Can Improve Low Income and Underserved Communities*, 19–20 tbl.4 (2016), <https://www.aceee.org/sites/default/files/publications/researchreports/u1602.pdf> (“[L]ow-income households face the greatest energy burden in Memphis (13.2%), Birmingham (10.9%), and Atlanta (10.2%), and African-American households face the greatest energy burden in Memphis (9.7%), Pittsburgh (8.3%), and New Orleans (8.1%).”).

²⁵ Samuel Hardiman, *Memphis' Largest Water Users Use Billions of Gallons Every Year. Here's Who Uses the Most*, Memphis Com. Appeal (Jan. 17, 2022, 9:00 PM), <https://www.commercialappeal.com/story/news/2022/01/18/mlgws-top-water-customers-memphis-use-billions-gallons-every-year/9169674002/>.

²⁶ The MLGW IRP concluded that the TVA options would have fewer impacts on the aquifer than Portfolio 9, but did so in reliance on TVA's 2019 Integrated Resource Plan, which did not account for the loss of MLGW or other distributors' load and the potential for that load loss to affect the operation of the Allen Combined Cycle Plant. 2020 MLGW IRP, 23, 219.

whether TVA will rely more heavily on its existing gas units at Allen or build more water-intensive gas plants in or near our community, putting even more strain on the Aquifer. This is not an abstract concern. Protect Our Aquifer recently commented on TVA's proposal to construct a new substation to serve the Blue Oval City Megasite project.²⁷ TVA did not disclose what kind of power plant would supply the electricity, or where that plant's water would come from.

IV. More renewables and less gas will result in better environmental and climate justice outcomes for predominantly Black, low-income communities across Memphis.

The South Memphis community bears the cumulative burdens associated with sixty years of TVA's burning of coal at the Allen Coal Plant and TVA's ongoing operation of the Allen Combined Cycle Plant. These polluting fossil fuel plants have contributed to Southwest Memphis being recognized as an air pollution hotspot.²⁸ An investigative map developed by ProPublica confirms that this area remains a toxic air pollution hot spot due to the presence of several industrial facilities, including, among others, the Valero Oil Refinery, Nucor Steel Mill, and Stella Jones, a pressure-treated wood manufacturer.²⁹ Other areas of South Memphis are burdened by pollution from the nearby airport and steel fabricator, among other industrial and mobile pollution sources.³⁰ In fact, the ProPublica map also identified this area as a toxic air pollution hot spot.³¹ More recently, TVA has chosen to run hundreds of polluting trucks through South Memphis to move its toxic coal ash to the South Shelby Landfill.³² These trucks are contributing to existing air pollution problems. Any new gas plant in Shelby County is likely to exacerbate the air pollution disparities that already exist due to decades of environmental racism.

No matter where TVA's (or any other power supplier's) new gas plants are located, investing in more gas will disproportionately harm Southwest Memphis and other predominantly Black, low-income communities by exacerbating climate change impacts. Though the impacts of climate change will be felt by everyone, frontline environmental justice communities like Southwest Memphis will be most affected.³³ Flooding, drought,

²⁷ Comments available at <https://www.protectouraquifer.org/blue-oval-city-ford-megasite>.

²⁸ See Chunrong Jia & Jeffrey Foran, *Air Toxics Concentrations, Source Identification, and Health Risks: An Air Pollution Hot Spot in Southwest Memphis, TN*, 81 *Atmospheric Env't* 112, 112 (2013); Al Shaw & Lylla Younes, *The Most Detailed Map of Cancer-Causing Industrial Air Pollution in the U.S.*, ProPublica (Mar. 15, 2022), <https://projects.propublica.org/toxmap/>.

²⁹ Shaw & Younes, <https://projects.propublica.org/toxmap/>.

³⁰ *Id.*

³¹ *Id.*

³² Justin J. Pearson, *TVA's Coal Ash Disposal Plan Leaves South Memphis Neighborhoods in the Dark | Opinion*, Memphis Com. Appeal (Dec. 9, 2021, 6:00 AM), <https://www.commercialappeal.com/story/opinion/2021/12/09/tvas-coal-ash-disposal-neglects-south-memphis-community/6435199001/>.

³³ *There Is No Such Thing as a Natural Disaster: Race, Class, and Hurricane Katrina* (Chester Hartman & Gregory D. Squires eds., 2006); see also, e.g., Zack Colman & Daniel Cusick, *2 Hurricanes Lay Bare the*

and severe hot and cold weather are all climate change impacts that are more likely to adversely affect low-income communities and communities of color, in part because such communities often lack the resources to mitigate those impacts and are already burdened by nearby polluting facilities and a lack of infrastructure investment.³⁴

The 2021 winter storm illustrates the point. In February 2021, cities across the South experienced an extreme winter weather event attributed to climate change.³⁵ In Memphis, as municipal and industrial infrastructure froze, residents lost access to clean water for several days. MLGW had to ask TVA to stop using its water to operate the Allen gas plant because it was putting too much strain on the well fields that provide drinking water for predominantly Black, low-income South Memphis communities.³⁶ And the Valero Memphis refinery experienced an extraordinary flaring event that rained toxic pollution on these same communities.³⁷

According to MLGW's Integrated Resource Plan, Portfolio 9 produces the fewest greenhouse gas emissions, relative to either the current or long-term TVA options or the other portfolios studied.³⁸ Whether MLGW ultimately stays with TVA or selects another power provider, it must drastically reduce its reliance on gas in order to create more environmental justice in South Memphis and throughout our city. Further, MLGW should demand, as a condition for doing business in Memphis, that TVA find a way to clean up its coal ash in a manner that fully protects the Aquifer and does not impose a decade or more of additional water and air pollution burdens on South Memphis.

Vulnerability of America's Poor, Sci. Am. (Oct. 1, 2018), <https://www.scientificamerican.com/article/2-hurricanes-lay-bare-the-vulnerability-of-americas-poor/> (describing the environmental justice challenges facing other frontline communities).

³⁴ Rachel Morello-Frosch et al., *The Climate Gap: Inequalities in How Climate Change Hurts Americans & How To Close the Gap* 5–7 (2009),

https://dornsife.usc.edu/assets/sites/242/docs/ClimateGapReport_full_report_web.pdf; Susan Cutter, *The Geography of Social Vulnerability: Race, Class, and Catastrophe*, items (June 11, 2006),

<https://items.ssrc.org/understanding-katrina/the-geography-of-social-vulnerability-race-class-and-catastrophe/>.

³⁵ Adam B. Smith, *2021 U.S. Billion-dollar Weather and Climate Disasters in Historical Context*, Climate.gov: Beyond the Data (Jan. 24, 2022), <https://www.climate.gov/news-features/blogs/beyond-data/2021-us-billion-dollar-weather-and-climate-disasters-historical>.

³⁶ Samuel Hardiman, *TVA Cuts Capacity at Memphis Plant Due to Water Shortage; Assures the Lights Will Stay On*, Memphis Com. Appeal (Feb. 19, 2021, 5:53 PM),

<https://www.commercialappeal.com/story/news/2021/02/19/tva-cuts-capacity-memphis-plant-due-water-shortage/4514345001/>.

³⁷ Micaela A. Watts, *Evening Flare from Valero Refinery in South Memphis Triggers Confusion and Concern*, Memphis Com. Appeal (Feb. 16, 2021, 3:26 PM),

<https://www.commercialappeal.com/story/news/2021/02/16/valero-memphis-fire-flame-refinery-during-winter-sky/6762146002/>; Elisabeth D'Amore, *Winter Blast Sets 8 Weather Records*, Fox13Memphis (Feb. 22, 2021, 1:53 PM), <https://www.fox13memphis.com/news/local/winter-blast-sets-8-weather-records/CZERjV6U4FBH7L7GMZBTIJFPGM/>.

³⁸ 2020 MLGW IRP, 20-21.

V. More renewables and less gas will help Memphis achieve its climate commitment—a commitment that is more important than ever after recent setbacks in Congress and at the Supreme Court.

More renewables and less gas will help Memphis achieve its climate commitments as outlined in Memphis 3.0. The City of Memphis has signed on to the Global Covenant of Mayors for Climate and Energy (GCoM) – a formal commitment of city leaders across the world to tackle climate change by taking steps to reduce greenhouse gas (GHG) emissions and enhance resilience and adaptation in their communities. The City’s Climate Action Plan was adopted as an addendum to Memphis 3.0.³⁹

The City of Memphis’s climate commitment is even more important now than ever before. In the past few weeks, the Supreme Court blocked the federal Environmental Protection Agency from adopting a holistic approach to reducing reliance on existing coal-fired power plants under the Clean Air Act. And just last week, the prospects for federal climate legislation dimmed entirely. Cities and states are poised to pick up some of the slack, and Memphis is particularly well-positioned to be part of this urgent effort.

The City’s Climate Action Plan provides a roadmap for MLGW’s involvement. The City describes its priorities for the power sector as centering on renewable energy and energy efficiency—not gas:

Transforming our energy supply over the next 30 years will need to take an “all-of-the-above” approach, with actions ranging from partnering with TVA to increase renewables in their portfolio, to encouraging and constructing local sources of renewable generation (particularly solar), to exploring purchasing agreements with other third-party renewable energy generators. Along with efforts to reduce energy consumption, transitioning to cleaner, renewable sources of electricity will help fulfill our community goals around health, quality of life, and resilience.⁴⁰

In Priority Action E. 6 Decarbonize the Electric Grid with Renewable Energy, the City states that it will “advocate for TVA to increase the amount of renewable energy sources – particularly wind and solar” and “work with TVA and MLGW to explore changes to current contract terms that require all local power be purchased through TVA and explore the feasibility of purchasing renewable energy from other third party providers.”⁴¹ The Climate Action Plan also includes Priority Action E.2: Improve Low-

³⁹ See *Memphis Area Climate Action Plan 1* (2020), https://shelbycountyttn.gov/DocumentCenter/View/37431/Memphis-Area-Climate-Action-Plan-2019-FINAL_4_JANUARY-2020.

⁴⁰ *Id.* at 64.

⁴¹ *Id.* at 65.

Income Housing Energy Efficiency.⁴² MLGW should advocate for TVA to increase its commitment to the Home Uplift program based on a needs assessment—not rely on TVA’s simple offer to double its investment in the program, as the federal utility had done in prior negotiations. MLGW can implement these actions in its ongoing contract negotiations with TVA and as it evaluates other power supply options.

Once again, the Board’s decision comes at a crucial moment. The Tennessee Valley Authority has proposed the biggest gas buildout in the nation.⁴³ MLGW must oppose the development of new gas plants for electricity generation. Just as Nashville Electric Service has done, MLGW should oppose the proposed Cumberland gas plant and pipeline, and ask TVA to select a renewables-focused alternative. MLGW would be in good company: Memphis Congressman Steve Cohen, the Mayor of Nashville, and Nashville Metro Council have all made similar asks.⁴⁴ And the federal Environmental Protection Agency has demanded that TVA go back to the drawing board and look more closely at clean energy alternatives and the climate and economic impacts of TVA’s preferred gas build.⁴⁵

As a federal utility and part of the current Administration’s whole-of-government approach to tackling the climate crisis, TVA knows better. MLGW can help the utility do better. And if TVA won’t do better, MLGW should walk away.

⁴² *Id.* at 40.

⁴³ TVA recently made a splash in the press by announcing “the nation’s largest” carbon-free energy RFP. *See TVA Issues One of the Nation’s Largest Requests for Carbon-Free Energy*, Tenn. Valley Auth. (July 12, 2022), <https://www.tva.com/newsroom/press-releases/tva-issues-one-of-the-nation-s-largest-requests-for-carbon-free-energy>. Do not be misled. That RFP does not commit TVA to procure any of the resources on offer. TVA has not backed away from its gas buildout, for which it has already signed contracts to purchase gas. Further, it is unclear whether the carbon-free resources TVA seeks will be for the benefit of everyday ratepayers or will be sold at a premium to corporations seeking to satisfy their own climate goals.

⁴⁴ *See* Press Release, Congressman Steve Cohen, Congressman Cohen Urges TVA to Focus on Alternatives to Natural Gas (May 11, 2022), <https://cohen.house.gov/media-center/press-releases/congressman-cohen-urges-tva-focus-alternatives-natural-gas>; Caroline Eggers, *Nashville Mayor Calls on TVA To Convert Coal Plant to Solar Energy – Not Gas*, WPLN (June 9, 2022), <https://wpln.org/post/nashville-mayor-calls-on-tva-to-convert-coal-plant-to-solar-energy-not-gas/>; Metro. Gov’t of Nashville & Davidson Cnty., Tenn., Resolution RS2022-1603 (2022).

⁴⁵ Kristi E. Swartz, *Gas Instead of Coal? EPA Tells TVA To Look Again*, E&E News (July 7, 2022, 6:35 AM), <https://www.eenews.net/articles/gas-instead-of-coal-epa-tells-tva-to-look-again/>.

Attachment 3



Energy Burden and Efficiency Solutions for Households in Memphis, TN

Greenlink Analytics

Samantha McDonald, Master of Economics, and Matt Cox, PhD

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Energy Burden in Memphis, TN

Energy burden represents the percentage of income a household or individual pays toward their electricity and natural gas bill annually. It is the most-frequently used data point for assessing the distributional equity of energy across communities. Energy burden is a driver of other community-level inequities; for example, utility bills are the leading reason for the use of short-term loan services and other quick ways to raise personal funds.¹ Households struggling with high or severe energy burdens are also likely to experience economic hardships, health risks, and increased mental health issues.²

Energy burden is a normalized function of income and low-income households generally experience a higher energy burden in the US. However, income is not the only determinant. Previous research has demonstrated that high or severe energy burden has a statistically significant correlation with neighborhoods that are predominantly low-income, renters, or black, indigenous, and people of color.^{3,4} Energy burden is also driven by poor housing stock, outdated appliances, and other causes of high energy consumption.⁵ Low-income individuals often rent their homes, and rental homes are often less efficient,⁶ on average consuming 15% more energy per square foot than owner-occupied homes.⁷ In Shelby County, renters make up 44% of the households,⁸ and black and African American individuals make up 64% of the population.⁹ Households in the lowest 25th percentile of income in Shelby County have electricity bills that are 13% higher and an energy burden that is 80% higher than those in the highest 75th percentile, an indication that these households are living with less efficient housing and lower-performance appliances.

Memphis is home to roughly 255,000 households with a median income of \$41,900.¹⁰ The median energy burden across the city is 8.1% and ranks 2nd of 95 counties in Tennessee, and

¹ Levy, R. and J. Sledge. 2012. *A Complex Portrait: An Examination of Small-Dollar Credit Consumers*. Chicago. Center for Financial Services Innovation

² Mantripragada, M., Sharanya Madhavan, Samantha McDonald, Diamond Spratling, Kavin Manickaraj, and Matt Cox. "Driving Displacement: Energy, Social, and Environmental Determinants' Roles in Urban Gentrification." 2022 ACEEE Summer Study on Energy Efficiency in Buildings.

³ Dreihobl, A., L. Ross, and R. Ayala. 2020. *How High are Household Energy Burdens?* Washington, DC: American Council for an Energy-Efficient Economy.

⁴ Editorial, Energy justice towards racial justice, 5 NATUREENERGY551 (2020), <https://doi.org/10.1038/s41560-020-00681-w>; E. Lyubich. The Race Gap in Residential Energy Expenditures, Energy Institute at Haas Working Paper 36 (2020); J. Lewis et al. Energy efficiency as energy justice: addressing racial inequities through investments in people and places, 13 ENERGY EFFICIENCY419-432 (2020), <https://doi.org/10.1007/s12053-019-09820-z>.

⁵ Brown, MA, A Soni, MV Lapsa, KA Southworth, M Cox. forthcoming. "Low-Income Energy Affordability in an Era of Energy Abundance," *Progress in Energy*, Vol 1. <https://dx.doi.org/10.1088/2516-1083/ab250b>

⁶ B. Goldstein et al. Racial inequity in household energy efficiency and carbon emissions in the United States: An emissions paradox, 84 ENERGY RSCH.&SOC.SCI.(2022).

⁷ *Energy Equity for Renters*. (n.d.). Retrieved September 13, 2022, from <https://www.aceee.org/energy-equity-for-renters>

⁸ *Greenlink Equity Map*. (n.d.). Retrieved September 13, 2022, from <https://gem.equitymap.org/>

⁹ *U.S. Census Bureau QuickFacts: Memphis city, Tennessee*. (n.d.). Retrieved September 13, 2022, from <https://www.census.gov/quickfacts/memphiscitytennessee>

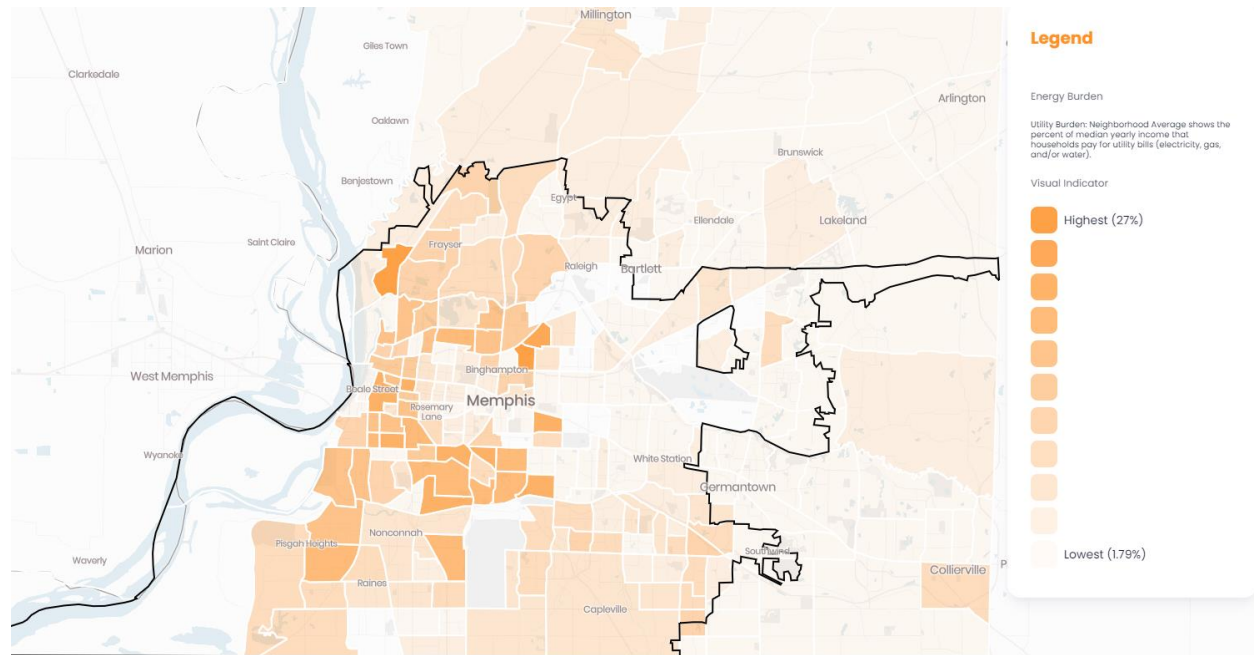
¹⁰ <https://www.census.gov/quickfacts/memphiscitytennessee>



4th of out 50 MSA's nationally for highest energy burdens.¹¹ The highest energy burden in Memphis is 27%, while the lowest energy burden is 2%.¹² A household is considered to have a 'high' or 'severe' energy burden when they experience an energy burden greater than 6% or 10%, respectively.¹³ In Memphis, 68% of households experience a high energy burden, and 31% experience a severe energy burden.

Figure 1 shows Memphis's energy burden at a census tract level. The darker color indicates a higher energy burden.

Figure 1: Energy Burden Across Census Tracts in Memphis, TN (2019 data)



Source: Greenlink Equity Map. Greenlink Analytics. 2022.

Along with increased financial stress, a higher energy burden is strongly correlated with poor health outcomes such as asthma, stroke, diabetes, and pulmonary diseases.^{14,15} In some neighborhoods, asthma rates can be as high as 15%, matching with energy burdens of 16%.^{16,17} The yellow census tracts in Figure 2 show these neighborhoods.

¹¹ Greenlink Equity Map. (n.d.). Retrieved September 13, 2022, from <https://gem.equitymap.org/>

¹² Ibid.

¹³ A. Drehobl&L. Ross. Lifting the High Energy Burden in America's Largest Cities: How Energy Efficiency Can Improve Low-Income and Underserved Communities, AMERICAN COUNCIL FOR AN ENERGY EFFICIENT ECONOMY(2016), www.aceee.org/research-report/u1602.

¹⁴ S. Jesselet al. Energy,Poverty, and Health in Climate Change: A Comprehensive Review of an Emerging Literature.,7 FRONTIERS PUB.HEALTH356(2019),www.ncbi.nlm.nih.gov/pmc/articles/PMC6920209.

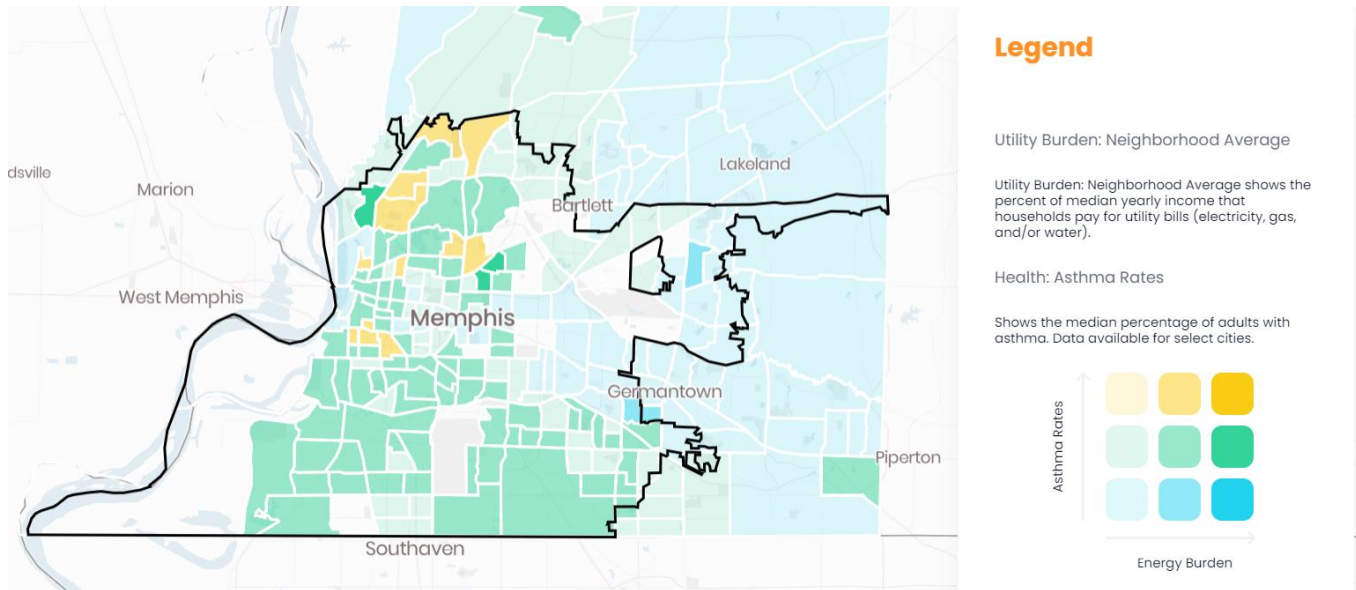
¹⁵ Greenlink Analytics. 6 Years of Energy Burden Impacts: Focusing on the 25 Cities of the American Cities Climate Challenge (2021).

¹⁶ PLACES: Local Data for Better Health. (n.d.). Retrieved September 13, 2022, from <https://experience.arcgis.com/experience/22c7182a162d45788dd52a2362f8ed65>

¹⁷ Greenlink Equity Map. (n.d.). Retrieved September 13, 2022, from <https://gem.equitymap.org/>



Figure 2: Energy Burden and Asthma Rates in Memphis, TN (2019)



Source: Greenlink Equity Map. Greenlink Analytics. 2022.

Energy Efficiency Solutions for Memphis

Programs designed to alleviate energy burden provide a temporary fix, as they tend to focus on bill assistance rather than home efficiency improvements.¹⁸ Energy efficiency enables homeowners to get the most out of their energy use, without compromising their comfort. Home efficiency improvements in Tennessee have the potential to reduce energy consumption by 26% for the average residence.¹⁹ As an indication of the difference in housing and equipment conditions for low to moderate-income households, the energy savings potential through energy efficiency is about 43%.²⁰ Frequently, energy investments are precluded by health and safety issues in the home, resulting in a large range in potential

¹⁸ M. A. Brown, et al. High energy burden and low-income energy affordability: conclusions from a literature review, *PROGRESS IN ENERGY*(2020), <https://iopscience.iop.org/article/10.1088/2516-1083/abb954>.

¹⁹ *Tennessee Residential Energy Efficiency Potential*. (n.d.). Retrieved September 12, 2022, from <https://resstock.nrel.gov/factsheets/TN>

²⁰ National Renewable Energy Laboratory. "LMI Single Family Home Bill Savings Potential," *State and Local Planning for Energy*, accessed 9/12/2022, <https://maps.nrel.gov/slope>.



costs to capture energy savings.²¹ A breakdown of potential costs and benefits can be found below:

Households with energy burden > 6%	Achievable Savings Level in LMI Households	Cost per Home	Total Cost to Capture Potential
149,000	43%	\$1,500	\$ 223,000,000
		\$2,675*	\$ 397,000,000
		\$6,000	\$ 891,000,000
		\$8,332**	\$ 1,240,000,000
		\$10,000	\$ 1,490,000,000

*Ceiling of energy-only investment required following NREL methodology (retrofit equipment upon burnout, investments have 5-year simple paybacks or better)

** TVA average investment per home

²¹ *Health and Safety Barriers to Weatherization Study (Yale 3/17/2017) – Efficiency For All.* (n.d.). Retrieved September 13, 2022, from <https://efficiencyforall.org/wordpress/2020/08/15/health-and-safety-barriers-to-weatherization-study/>

