BEFORE THE MISSISSIPPI PUBLIC SERVICE COMMISSION

MISSISSIPPI POWER COMPANY **DOCKET NO. 2019-UA-231**
EC-120-0097-00

IN RE: MISSISSIPPI POWER COMPANY'S NOTICE OF IRP CYCLE PURSUANT TO COMMISSION RULE 29

SIERRA CLUB'S COMMENTS ON MISSISSIPPI POWER COMPANY'S 2021 IRP

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Comments on Mississippi Power Company 2021 IRP

June 2021

I. Introduction

Pursuant to Commission Rule 29, Sierra Club, with the assistance of Synapse Energy Economics, Inc., submits these comments on Mississippi Power's Company's ("the Company" or "Mississippi Power") 2021 Integrated Resource Plan ("IRP").

In adopting Mississippi Rule 29, the Commission noted that the:

> primary motivations for adopting a formal IRP rule has been and continues to be the desire to provide Mississippi ratepayers with more transparency regarding their utilities' long-term planning processes. A high degree of transparency provides important protection for the Commission and ratepayers against potentially unnecessary and costly capital expenditures and long-term operational costs. As a result, adoption of an IRP Rule is "consistent with long-term management and conservation of energy resources by avoiding wasteful, uneconomic and inefficient uses of energy," and it "foster[s] the continued service of public utilities on a well-planned and coordinated basis.[1]

Sierra Club's comments identify areas in which Mississippi Power's 2021 IRP failed to advance the goals of protecting ratepayers, providing transparency, and operating a well-planned and efficient electricity system. We have serious concerns about the Company's IRP process, which continued a "business as usual" approach, where critical resource and planning assumptions and decisions are made behind closed doors only to be disclosed to the public and the Commission when it is too late to change course. A more transparent and robust planning process is needed, and we hope these comments and recommendations can influence positive changes to MPC's 2021 IRP and future resource planning efforts.

A. Recommendations

Sierra Club offers the following recommendations, which are intended to ensure that Mississippi Power implements an IRP that protects ratepayers, retires fossil units in a cost-effective manner, and accurately models all renewable and demand-side resources available to MPC's electricity system:

[1] Mississippi Public Service Commission, Final Order Amending Rule 29 to Establish Integrated Resource Planning and Annual Energy Delivery Reporting Requirements, filed November 2019 in Docket No. 2018-AD-64, p. 5-6 (hereinafter, "Final IRP Order").

Plant Daniel

1. MPC should conduct optimized capacity expansion modeling, without "hardwiring" any resources into the model, to determine the least-cost, optimal retirement date for Plant Daniel.
2. MPC should study and quantify the employment and economic impacts of retiring and replacing Plant Daniel as part of its IRP.

Scenario Design

3. MPC should take actions to put the Company on track to cut emissions to near the level needed to meet Southern Company's net zero by 2050 goal. To meet those emission reduction goals, the Company must take more aggressive action in retiring fossil resources in the near term—including Daniel as well as existing gas generation—and replacing them with renewable and battery options.

IRP Process Design

4. MPC should re-design its IRP process to focus on using a robust, transparent and technically defensibly analysis framework.
5. MPC's should design scenarios that ensure that the model is armed with all supply and demand side resources at the same time, and the IRP process as a whole takes a committed full-portfolio approach to decarbonization.
6. MPC should issue an all-source RFPs, or else utilize industry recognized sources for the most up-to-date cost information on renewables and batter storage.
7. MPC should not overly constrain the characteristics of, and ability for the model to select, renewables and battery storage resources.

EE and DSM

8. MPC should model DER/solar PV separately from EE and develop peak and energy savings factors as a percentage of projected sales and peak loads.
9. For Scenario 8, the high EE and DER scenario, annual incremental EE energy savings should reach a 1.5 percent of projected sales by 2034 and the level of annual incremental savings should stay at the same level in terms of percentage of sales thereafter. MPC can model this by assuming a gradual decay of energy savings effects over time (e.g., over 20 years with an average life of 10 years) and estimating annual cumulative energy savings through the study period. MPC should assume that DER/solar PV reaches about 3 percent of sales by 2030 and 10 percent of sales by 2040.
10. For the reference load forecast, MPC should assume that DER/solar PV reaches about 1.5 percent of sales by 2030 and 5 percent of sales by 2040.

11. MPC should update the EE assumptions in the IRP as soon as the potential study on its service area is complete. If there is still time to update key assumptions and approaches for this study, we also recommend MPC incorporate the following in the potential study: (a) emerging measures, (b) expected cost reductions on certain measures (e.g., heat pumps), (c) factors on marketing activities, customer outreach, and financing into the calculation of measure adoption rates, (d) the level of savings achievement and measure adoption rates by leading states (e.g., Massachusetts, Vermont, California), and (e) avoided costs of T&D, avoided costs of carbon, and NEBs in the cost-effectiveness screening.
12. MPC should consider incorporating NEBs into its cost-effectiveness analysis or at least evaluate and report NEBs (as recommended in the attached Synapse report on the evaluation of Mississippi's low-income EE programs).
    a. MPC should acquire services to conduct an analysis of NEBs in MPC's area—including avoided arrearages and collection costs—and include the resulting values in the BCA. This is especially important if MPC chooses to use the TRC as the primary test. EE that produces utility-side NEBs (such as reduced collection costs) will result in lower NPVRR.
    b. MPC should incorporate NEBs in the cost-effectiveness analysis for all programs. This is especially important for LI programs. We recommend that MPC include a factor to account for NEBs in the TRC test.
    c. MPC should estimate rate and bill impacts in terms of percentage of the baseline rates and bills (monthly or annual). The RIM test should not be used as it does not produce any meaningful picture of expected rate and bill impacts.
13. MPC should increase savings levels across the board, seek more comprehensive savings, and pursue longer-lived savings.
    a. Reduce emphasis on/budget for EE School Kits.
    b. Couple HERs with longer-lived, deep energy savings offerings to help customers manage their bills.
    c. Increase comprehensive savings measure offerings for all programs, including SELECT (based on the attached Synapse report).
14. MPC should implement and scale up pilot efforts as soon as possible, and should develop offerings to target customer segments that face large barriers to implementing EE. This includes developing and implementing DR programs for non-low-income residential customers as well as for business customers.
15. Based on the attached Synapse report on the evaluation of the EnergyWise program, we have following recommendations for the SELECT program:
    a. Budget: Considering the current low level of funding for SELECT program relative to low-income programs in other jurisdictions as well as the high energy

burdens and high poverty rate in the state, we recommend MPC increase the budget per participant for the SELECT program.

b. Eligible measures: MPC should consider offering all of the measures provided by EnergyWise such as HVAC, appliances, and air sealing.
c. Customer targeting: MPC should consider using a fine geographic area to identify or target customers for SELECT. Alternatively, SELECT could use a targeting methodology focused on individual household eligibility, such as that used by EnergyWise. In particular, MPC should consider prioritizing customers or neighborhoods with mean income levels closer to 100 percent of the federal poverty level, as EnergyWise does.
d. Repairs: MPC should conduct health and safety screening and consider providing repair work for building condition issues that will reduce the effectiveness of recommended energy efficiency measures or where such measures could result in or worsen existing health and safety problems.

Public Participation

16. The Commission should revise the IRP Rule 25 § 105.2 to also provide that:
In accordance with the requirements of any Confidentiality Agreement under Section 108, the utility shall publish on its website at least ten days before the public workshop any workshop presentation and the data assumptions it intends to use and a description of studies it plans to perform as part of its IRP process. This will allow stakeholders the opportunity to review that information and prepare for the public workshop.

17. The Commission should revise the IRP Rule 25 § 105.3 to also provide that:
In accordance with the requirements of any Confidentiality Agreement under Section 108, at least ten days before the technical conference, the utility shall provide all participants with any presentation materials, the data assumptions it intends to use, a description of studies it plans to perform as part of its IRP process, and the results of any preliminary modeling runs performed. This will allow stakeholders the opportunity to review that information and prepare for the technical conference.

18. The Commission should further revise the IRP Rule 25 § 105.3 to provide:
No later than ninety (90) days prior to an electric utility filing its Integrated Resource Plan, the electric utility shall notice and conduct a technical conference for those interested parties that have executed a nondisclosure agreement in accordance with Section 108 of this Rule. require electric utilities to conduct a technical conference at least 90 days before filing its proposed IRP.

19. The Commission should revise the IRP Rule 25 § 105.5 to also provide:
The utility will be required to consider the recommended data assumptions and sensitivity cases, but the utility will have no obligation to adopt them. Regardless of whether the utility adopts the recommendations, the utility will be required to include an appendix to the IRP report documenting all of the stakeholder's recommendations, and explaining the Company's reasons for accepting or rejecting each recommendation. Stakeholder involvement is intended to be a collaborative process that will provide valuable insight regarding the utility's IRP.

20. The Commission should revise the IRP Rule 25 § 108 to explicitly incorporate Commission Rule 26 § 109, making clear that:
Utilities may not file non-confidential information confidentially, and any confidential information or items that can be reasonably redacted from any document or material shall be so redacted, and the document or material shall be filed publicly. To the extent that an electric utility asserts a claim of confidentiality, the utility shall file the material under seal in the Commission docket and include an explanation of the basis for the redaction or withholding sufficient to allow the Commission to evaluate the reasonableness of the utility's confidentiality claim.

II. Plant Daniel Coal Unit Retirement Year Considerations

A key consideration in an IRP docket is the retirement schedule for existing resources that no longer provide an economic benefit to ratepayers. MPC has substantially more capacity on its system than it needs to meet its planning reserve margins (15.03% summer / 25.25% winter).[2] This fact has been highlighted previously by Sierra Club. Specifically, we found that MPC ratepayers have paid $225 million[3] more in unit costs to operate and maintain Plant Daniel than it received in value for the unit's services (namely energy, as the unit's capacity is not needed) in recent years (2016 – 2019). Looking forward, we projected that the Plant Daniel units will cost ratepayers an estimated half a billion dollars by 2040.[4]

Our analysis looked at public data on historic plant performance (Figure 1) and found that the units have been operating uneconomically in recent years (2016–2019). Each coal unit incurred

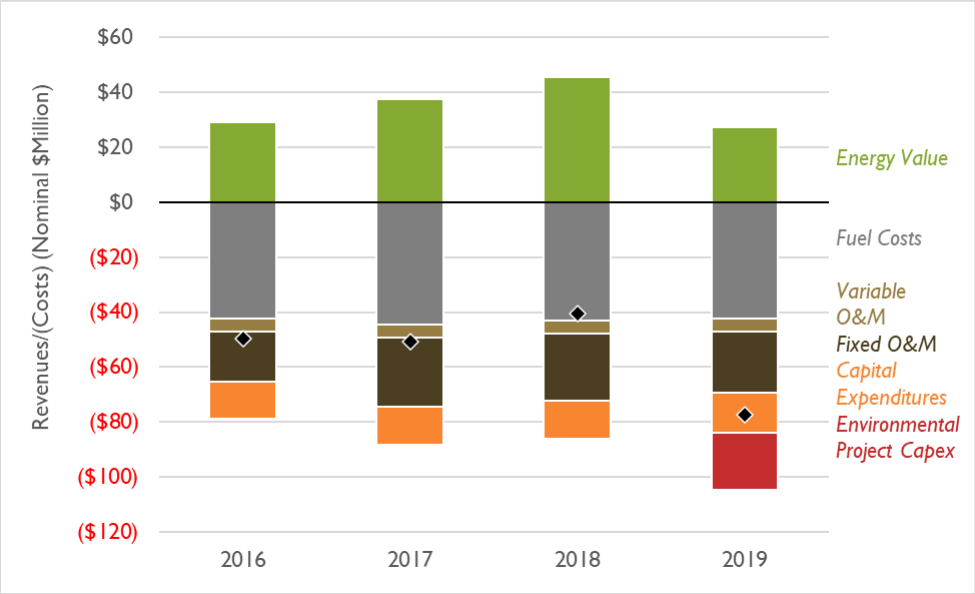
[2] Mississippi Power Company IRP Technical Conference, Slide Deck. February 25, 2021. Page 16.

[3] "Sierra Club's Comments on Mississippi Power Company's February 25, 2021 IRP Technical Conference," Docket No. 2019-UA-231, p. 7-8.

[4] Direct Testimony of Rachel Wilson, Docket No. 2019-UA-116. Page 14.

approximately $56 million in net revenue losses per year over this time for a total of nearly $450 million at both units (half of which was passed on to MPC's ratepayers):[5]

Figure 1: Plant Daniel Unit 1, Historical Cash Flow[6]



Source: *EIA Form 923; EPA CAMD hourly data for Daniel 1 and 2; FERC Form 1; FERC Form 714; US EIA Generating Unit Annual Capital and Life Extension Costs Analysis, December 2019.*

These findings were confirmed earlier this year when the Commission Staff's consultant, Bates White Economic Consulting, published its final report as part of the Reserve Margin Plan ("RMP") docket.[7] The Bates White retirement study in the RMP docket identified the extent of MPC's capacity surplus and assessed the value of retiring or retaining the Daniel coal units compared to retiring or retaining Watson 5. Bates White found that retiring Plant Daniel provides

[5] EIA Form 923; EPA CAMD hourly data for Daniel 1 and 2; FERC Form 1; FERC Form 714; US EIA Generating Unit Annual Capital and Life Extension Costs Analysis, December 2019. Accessible at https://www.eia.gov/analysis/studies/powerplants/generationcost/pdf/full_report.pdf.

[6] The Environmental Project Capex is a one-time cost incurred to comply with CCR regulations. We assume that the cost was spread across the years 2019 – 2021, therefore only one third of the project costs is included in the historical cash flow analysis.

[7] Docket No. 18-AD-145.

higher value for ratepayers than retiring Watson 5,[8] especially after Gulf Power retires its 50 percent share of the plant and MPC's share becomes essentially a single unit. As a result of this report, the Commission ordered MPC to include a plan to retire 950 MW of capacity in its 2021 IRP. MPC accomplished this goal by identifying retirement dates for Watson 4, Greene County 1 and 2, and the Daniel coal units (as shown in Table 1).[9]

Table 1: MPC IRP Unit Retirement Schedule

Generating Unit	Net Capability	Planned Retirement
Watson 4	268 MW	Dec. 2023
Greene County 1	103 MW	Dec. 2025
Greene County 2	103 MW	Dec. 2026
Daniel Coal	502 MW	Dec. 2027
Total	**976 MW**	

Source: MPC IRP 2021, Table 3: Generating Unit Retirement Plan

The 2027 retirement announcement resulting from the RMP docket will reduce ratepayer costs and carbon emissions relative to the prior 2040 retirement date. But MPC has conducted no analysis to support selection of the 2027 retirement date (relative to an earlier date), and our analysis found that substantial ratepayer losses will continue to be incurred in every year that the plant continues to operate. For this reason, MPC should have conducted robust modeling to identify the optimal retirement date for Plant Daniel.

A. MPC did not model an optimized retirement date for Plant Daniel and did not analyze the job creation potential of renewable projects and energy efficiency investments

MPC did not select 2027 as a retirement year for Plant Daniel because it was found to be the least cost option based for ratepayers based on rigorous optimized capacity expansion and production cost modeling. Instead, MPC appears to have manually staggered retirement dates for Watson 4, Greene County 1, Greene County 2, and Plant Daniel in order to address "local economic and employment impacts that are not included in traditional economic analyses

[8] The reason that MPC's share of Daniel becomes more expensive after Gulf retires its share is that "fixed costs [will] not be reduced by half, and per-kW costs [will] therefore increase" (Bates White RMP Review, p. 22).

[9] Note that the Daniel coal units are co-owned with Gulf Power, who have already announced a 2024 retirement for its share of the plant. Unless otherwise noted, any mention of the Daniel coal units refers to MPC's share of the plant. Similarly, any reference to Plant Daniel's retirement only includes Daniel 1 & 2 and not combined-cycle units 3 & 4.

performed when evaluating unit economics."[10] This is particularly surprising given that the Commissions' consultant in the recent RMP docket, Bates White, did include local economic impacts in the RMP evaluation of Plant Daniel. Specifically, "[local economic] impacts are counted as *benefits* in the form of avoided costs and avoided ad valorem taxes that are explicit components of the resource valuations."[11]

Minimizing job losses and local economic impacts is important for MPC when planning its future electricity system. But MPC is responsible for studying the issue and presenting defensible analysis that shows how and where the job impacts are expected to occur as a result of resource planning actions, and how its actions will mitigate or minimize those impacts. Instead, MPC has made up a staggered retirement schedule and is using the claim of job and economic impacts to obscure the reality that it has not studied the economics of an earlier retirement. Countless studies have found that investments in renewables and energy efficiency can results in significantly more jobs than the fossil resources that they are replacing.

Renewable resources and energy efficiency program deployment can provide new employment opportunities and local economic benefits. RFPs for renewable energy procurement regularly include evaluation criteria for direct, indirect, and induced job creation. Table 2 shows a comparison of net summer capacity and solar and fossil fuel employment in Mississippi in 2020. This data demonstrates that there is significant potential for solar projects to create local jobs in the state.

Table 2: Mississippi Solar and Fossil Fuel Jobs in 2020

2020	Total Jobs	Capacity (MW)	Jobs per MW
Mississippi Solar	847	227	3.7
Mississippi All Fossil Fuels	11,798	12,661	0.9
U.S. Solar	248,000	75,572	3.3
U.S. All Fossil Fuels	1,646,021	733,630	2.2

Sources: U.S. Energy and Employment Report 2020 (Mississippi State Profile and National Report); EIA Electric Power Monthly February 2021 (Tables 6.02a and 6.02b)[12]

[10] Mississippi Power Company, 2021 IRP, p. 13.

[11] Bates White, Review and Assessment of Mississippi Power Company's Reserve Margin Plan (Redacted Version), Sept 2020, p. 24.

[12] Job estimates include both Electric Generation and Fuel employment categories in the U.S. Energy and Employment Report 2020. For solar, only jobs that are dedicated to solar more than 50% of the time are included.

The opportunity to create solar jobs in Mississippi is especially clear in comparison with neighboring states. A recent report compared existing solar jobs in all 50 states with the overall technical solar potential in those states. Table 3 below compares Mississippi to each neighboring state:

Table 3: Solar Jobs compared to Solar Technical Potential by State, 2020

State	Solar Technical Potential (TWh)	Solar Jobs in 2020	Solar Jobs per TWh of Technical Potential
Tennessee	2,296	4,927	2.1
Louisiana	4,185	3,750	0.9
Alabama	3,758	991	0.3
Mississippi	5,016	1,209	0.2
Arkansas	5,024	411	0.1
U.S. Total	283,600	248,000	0.9

Sources: U.S. Energy and Employment Report 2020; Anthony Lopez et al., "U.S. Renewable Energy Technical Potentials: A GIS-Based Analysis," NREL, July 2012;" Karin Kirk, "Wind and Solar Are Job Creators: Which States Are Taking Advantage?" Yale Climate Connections, 07 April 2021.[13]

Despite having the highest overall technical potential for solar electricity generation compared to neighboring states, Mississippi has the second-lowest ratio of existing solar jobs to solar potential in the region. The state performs especially poorly in relation to Tennessee and Louisiana, both of which have less solar potential than Mississippi yet have between three and four times as many existing solar jobs.

Energy Efficiency and other DSM programs also can provide significant job benefits. According to the U.S. Energy and Employment Report 2020 ("USEER"), Mississippi's energy efficiency industry employed 15,668 people in 2020.[14] And jobs created by investment in EE and DSM are

Including jobs that are dedicated to solar less than 50% of the time, there were 1,209 total solar jobs in Mississippi in 2020. Using this higher figure increases the solar jobs per MW in Mississippi to 5.3. In order to be conservative, the solar capacity category includes both utility-scale and distributed solar while the solar job category does not include jobs related to microgrids.

[13] Solar technical potential includes utility-scale and rooftop solar.

[14] National Association of State Energy Officials and the Energy Futures Initiative, "U.S. Energy and Employment Report 2020," available at: https://www.usenergyjobs.org/.

not just high in number, they are also often high wages, are more likely to be permanent, and are less geographically constrained.

A recent report by National Association of State Energy Officials ("NASEO") found that 99.8% of all counties in the U.S. had EE jobs.[15] Jobs in EE are so widespread because "energy efficiency technologies and services are applicable to commercial, industrial, and residential sectors across the economy. Unlike many other energy jobs, installation, maintenance, and repair jobs in the energy efficiency sector are more universally distributed."[16] Utility investment in EE and DSM programs also provides a more effective and certain way to spur job creation across Mississippi relative to investment in large fossil plants that face an uncertain future (due to carbon policy and low-cost renewables). Renewable projects can also be smaller and more modular than traditional fossil resources, further distributing economic and employment benefits more widely.

The wages associated with EE and DSM sector jobs are also high quality and high paying. The NASEA Wages report cited that the median hourly income of EE/DSM jobs is 28% higher on average than the national median income.[17] EE/DSM was also the fastest growing sector included in the USEER report, creating over 400,000 jobs in three years nationwide, a growth rate of 5.8%.

B. Retirement of Plant Daniel does not drive the need for transmission upgrades – the upgrades were long overdue and required long before MPC considered retiring the plant

Sierra Club notes that MPC cited transmission support constraints as a primary reason for keeping Plant Daniel in service, despite its cost to ratepayers. The Commission should order MPC to identify any transmission issues which will affect its choice of generation resources, or retirement options, and provide plans and timelines for addressing those constraints. This will protect customers from being locked into costly legacy resources when there are other, lower cost alternatives available.

[15] National Association of State Energy Officials and the Energy Futures Initiative, "Wages, Benefits, and Change: A Supplement Report to the Annual U.S. Energy and Employment Report," p. 5, available at: https://www.usenergyjobs.org/.

[16] Id.

[17] National Association of State Energy Officials and the Energy Futures Initiative, "Wages, Benefits, and Change: A Supplement Report to the Annual U.S. Energy and Employment Report," p. 10.

C. Gulf's decision to retire its share of Plant Daniel will further drive-up unit costs due to lost economies of scale

As discussed above, Gulf Power's decision to retire its share of Plant Daniel in 2024 impacts the economics of MPC continuing to operate its share of the plant. All efficiencies that currently exist in running the two plants at the same time will be eliminated, and all remaining shared unit costs will fall to MPC ratepayers.[18] The historical negative cash flow of Plant Daniel (see Figure 1) and the absence of a capacity need for MPC makes the choice of continuing to operate Plant Daniel beyond 2024 even less defensible, and it is the rate payers of Mississippi who will be asked to bear the burden of MPC's lack of analysis and imprudent choices regarding Daniel's retirement. If MPC had conducted a full retirement analysis of Plant Daniel, it is likely that the optimal retirement date would be earlier than 2027.

D. While MPC will not face a capacity deficit until 2031, the energy output of Plant Daniel could be replaced sooner with renewable resources

In its 2021 IRP, MPC projects that it will not face a capacity need until 2031.[19] However, there are benefits in obtaining energy-only resources even in the absence of a capacity requirement. MPC recognized this possibility in its IRP, and made solar resources available for selection by the model if the solar project energy benefit exceeded the cost of a generic solar PPA (either $25/MWh or $20/MWh depending on the scenario). Solar was not available to the model prior to 2025.

But because MPC hard-coded Plant Daniel in with a 2027 retirement date and did not allow the model to select solar prior to 2025, the Company did not actually evaluate whether it was more economic to retire the plant at an earlier date and replace any required energy with solar generation. This is a critical flaw, and one that will place high near-term costs on MPC's ratepayers.

Recommendations

1. MPC should conduct optimized capacity expansion modeling, without "hardwiring" any resources into the model, to determine the least-cost, optimal retirement date for Plant Daniel.
2. MPC should study and quantify the employment and economic impacts of retiring and replacing Plant Daniel as part of its IRP.

[18] Bates White, Review and Assessment of Mississippi Power Company's Reserve Margin Plan (Redacted Version), Sept 2020, p. 22.

[19] Mississippi Power Company, 2021 IRP, p. 4.

III. Most of MPC's scenarios do not put the Company on track to meet Southern Company's carbon reduction goals.

MPC's parent company, Southern Company, announced an emissions reduction goal of "low-to-no" carbon emissions by 2050. Specifically, Southern Company has indicated a commitment to an intermediate goal of a 50 percent reduction in carbon emissions from 2007 levels by 2030 and a long-term goal of net zero carbon operations by 2050.[20] To meet those emission reduction goals, MPC, as a Southern Company subsidiary with some of the largest CO_2 emitting facilities in Mississippi, must also take action to reduce its CO_2 emissions.

In 2019, MPC's generators were responsible for approximately ten percent of Southern Company's total emissions, with about half of that generation going to MPC retail customers[21] (Southern Company dispatches all its unit as a single pool rather than just dispatching MPC's units to meet MPC's load). MPC's current resource portfolio is composed almost exclusively of fossil resources. Although the Company announced retirement dates for some of these resources in the IRP, the Company's apparent baseline portfolio[22] in its IRP contains no new renewable resources or battery storage, and instead continues to rely on fossil resource (new Combustion Turbines ("CT") and Combined Cycle Plants ("CC")). MPC's IRP shows that the Company is making virtually no meaningful efforts to reduce its carbon emissions. In its refence scenario, which relies on a $0 carbon price, the Company assumes that carbon capture is installed at all new combined cycle units beginning in 2040. This indicates that the Company is not planning to take actions to move away from carbon-intensive resources but is instead hoping for a future technological solution that will allow it to continue down its current fossil-fuel intensive path.

MPC admits in its IRP that only two out of its ten modeled scenarios result in a carbon emissions trajectory to meet net zero carbon by 2050.[23] As shown in Figure 2, the Carbon intensity of MPC's portfolio is projected to be roughly the same as it is now.

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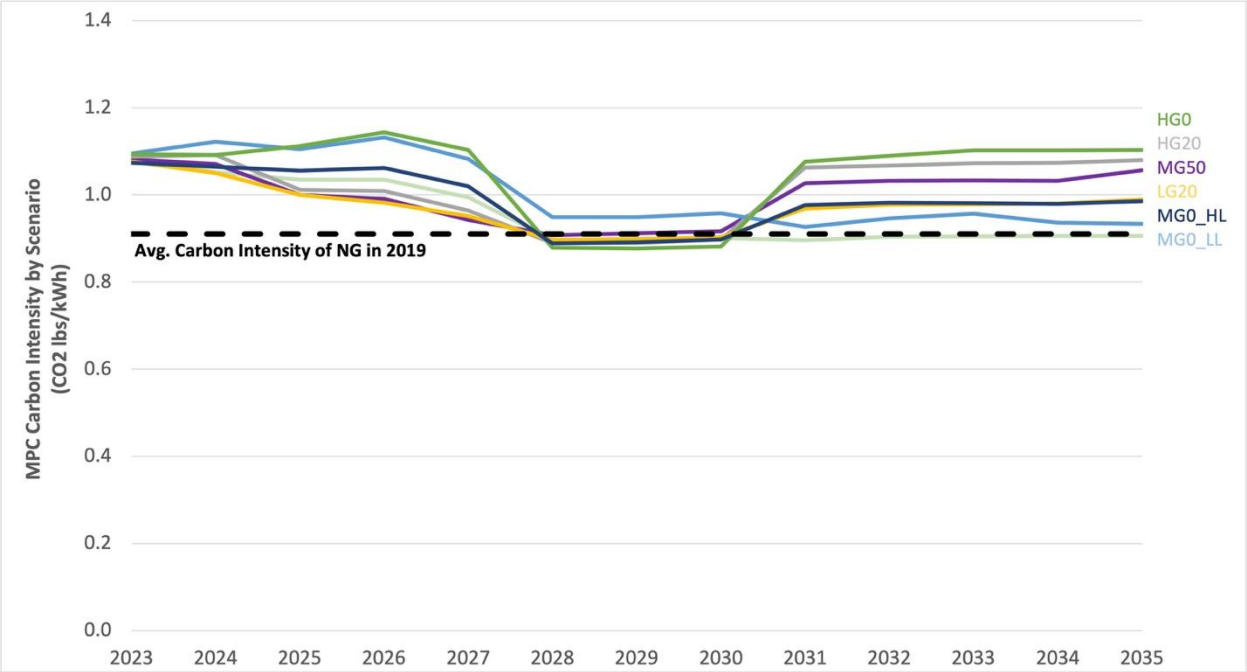
[20] Southern Company: Implementation and action toward net zero. September 2020. Accessible at https://www.southerncompany.com/content/dam/southerncompany/pdfs/clean-energy/Net-zero-report.pdf.

[21] EIA 2019 Carbon Dioxide Emission at Electric Power Plants, Accessible at https://www.eia.gov/electricity/data/emissions/; EIA form 923; EIA form 960; EIA form 861; Southern Company: Implementation and action toward net zero. September 2020.

[22] We refer to the portfolio labeled MG0 as the Baseline portfolio. It utilizes a moderate natural gas price path, $0 CO_2 fee, baseline technology costs and performance assumptions, and reference load forecast.

[23] Mississippi Power Company, 2021 IRP, p. 2.

Figure 2: MPC Carbon Intensity (lbs CO_2/kWh) by Scenario



Source: MPC Response to SC DR 2-13a/b, MPC Response to SC DR 2-10b

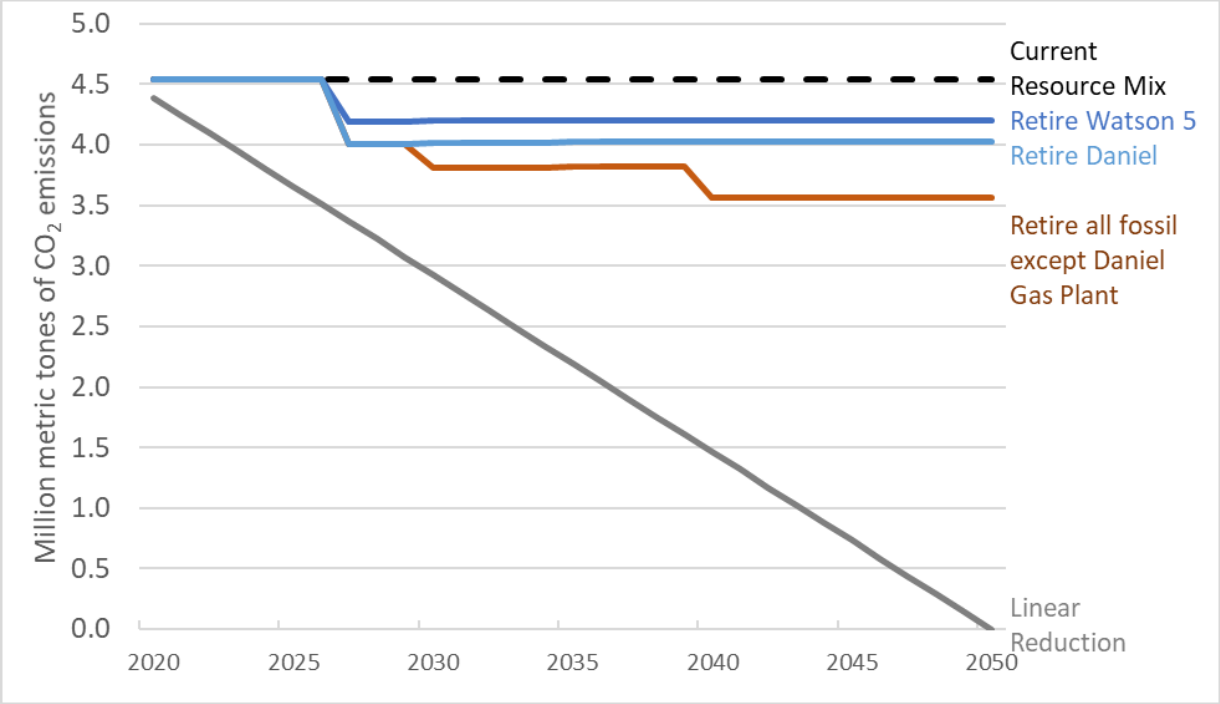
Based on the Company's known current resource mix, and data the Company provided on its cumulative resource additions by resource type for each portfolio over the years 2021-2040, we were able to estimate the Company's likely future resource mix and emissions trajectory.

As shown in Figure 3, we find that the Company is extremely far off track to reduce its emission to near the level needed to meet a net zero by 2050 goal based on its reference portfolio. MPC's decision to retire Plant Daniel instead of Watson 5 by 2027 does result in lower cumulative CO_2 emissions on MPC's system than if Daniel had not been retired.[24] But overall, given that the Company has no new renewable resources or battery storage included in its base portfolio, the Company is on track to reduce its CO_2 emission only marginally over the next two decades. Even if MPC retires all its existing fossil units except for the Plant Daniel Gas unit, based on the new gas resources it has planned, it will only reduce its CO_2 emissions by less than 20 percent by 2040. In order to even approach the level of emission reductions needed to reach Southern

[24] For all trajectories except for the Current Resource Mix also assumed the retirement of Greene County Units 1 and 2, and Watson Unit 4 in 2027.

Company's corporate emission reduction goal of net zero by 2050, MPC has to build renewables and battery storage instead of new gas resources, and transition off its existing fossil resources.[25]

Figure 3: CO_2 emission trajectory for MPC



Source: EIA 2019 Carbon Dioxide Emission at Electric Power Plants; EIA form 923; EIA form 960; EIA form 861; Southern Company: Implementation and action toward net zero. September 2020; Cost and Performance Characteristics of New Generating Technologies, Annual Energy Outlook 2021; MPC IRP Technical Conference Slide Deck.

The Company's own data provided in response to a discovery request shows a decline in emissions, but these results are incredibly misleading, as the majority of MPC's projected decrease in emissions comes from a decline in generation that the Company exports to other parts of Southern Company, and not a decline in generation to serve MPC's own native load.[26]

[25] EIA 2019 Carbon Dioxide Emission at Electric Power Plants; EIA form 923; EIA form 960; EIA form 861; Southern Company: Implementation and action toward net zero. September 2020; Cost and Performance Characteristics of New Generating Technologies, Annual Energy Outlook 2021. Accessible at https://www.eia.gov/outlooks/aeo/assumptions/pdf/table_8.2.pdf. Mississippi Power Company IRP Technical Conference, Slide Deck. February 25, 2021.

[26] MPC Response to SC DR 2-13a.

As the Commission is aware, there is strong scientific consensus that damage from climate change is presently occurring, and if anthropogenic greenhouse gas emissions are not controlled, impacts will become increasingly severe.[27] Public opinion strongly supports action to control climate change.[28] Any new fossil fuel resources added to a utility portfolio will face increased regulatory risk and will likely become a stranded asset. The Commission is already familiar with this from the hundreds of millions in unnecessary costs expended on Plant Daniel over the past decade.

Short and mid-term deployment of non-emitting technologies are critical to addressing the climate crisis on any effective timeframe.[29] Planning processes like this one are the fundamental building blocks of a transition to sources that will allow mitigation of climate change damage. While there are multiple technically and economically feasible pathways to addressing energy sector emissions, action within the next few decades is critical.[30] MPC's use of inflated costs for renewables and its failure to plan for accelerated deployment of non-emitting technologies will place customers at greater economic and social risk.

Recommendations

1. MPC should take actions to put the Company on track to cut emissions to near the level needed to meet Southern Company's net zero by 2050 goal. To meet those emission reduction goals, the Company must take more aggressive action in retiring fossil resources in the near term—including Daniel as well as existing gas generation—and replacing them with renewable and battery options.

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[27] IPCC, 2018: Summary for Policymakers. In: Global warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [V. Masson-Delmotte, P. Zhai, H. O. Pörtner, D. Roberts, J. Skea, P. R. Shukla,A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J. B. R. Matthews, Y. Chen, X. Zhou, M. I. Gomis,E. Lonnoy, T. Maycock, M. Tignor, T. Waterfield (eds.)]. World Meteorological Organization, Geneva, Switzerland. Available at https://report.ipcc.ch/sr15/pdf/sr15_spm_final.pdf. Powell, James, *"Scientists Reach 100% Consensus on Anthropogenic Global Warming".* Bulletin of Science, Technology & Society. 37 (4): 183–184.

[28] Pew Research Center, June 2020. *Two Thirds of Americans Think* Government *Should Do More on Climate Change.* Available at https://www.pewresearch.org/science/2020/06/23/two-thirds-of-americans-think-government-should-do-more-on-climate/.

[29] National Academies Press, Accelerating Decarbonization of the U.S. Energy System (2021).

[30] Williams, et al, Carbon Neutral Pathways for the United States, AGU Advances 2 (2021).

IV. MPC should re-design its IRP process to focus on using MPC's IRP modeling assumption are flawed, and reliance on them will produce biased and inaccurate modeling results.

Scenario design and the cost of replacement resources is one of the primary drivers behind the selection of a least cost resource portfolio in capacity optimization modeling. In both areas, MPC has fallen short while developing its 2021 IRP.

A. MPC did not conduct a robust IRP modeling exercise that evaluates an optimal future resource mix

MPC has failed to conduct a robust modeling exercise that answers the question "what is the least cost resource mix that can reliably meet MPC customer needs." MPC has locked in retirement dates for existing resources, unnecessarily constrained replacement resources, relies on conservative resource inputs that are skewed in favor of tradition fossil resources, ignores the risks from CO_2 price in it reference scenario, makes unjustified assumptions around EE and DSM adoption levels, and tested only a narrow range of scenarios.

The Mississippi Public Service Commission has emphasized the importance of taking a total portfolio approach to resource planning. In its 2019 IRP order, the Commission wrote that MPC's IRP should "be holistic and should include a thorough evaluation of all energy delivery processes, including demand response efforts, distributed energy resources, and energy efficiency programs in addition to traditional supply-side resources."[31] But MPC has failed to model a single IRP scenario that adheres to the holistic approach previously ordered by the Commission.

Best practices in IRP demand that MPC engage in a robust analytical resource planning process, using up-to-date input values that are based on a combination of historical experience, current market conditions, third-party forecasts, and benchmarks to leading utilities. Both supply- and demand-side resources should be evaluated as part of a least-cost resource portfolio to minimize long-term costs and risks to customers. New resource options should not be unreasonably constrained, and retirement dates for existing resources should not be hardcoded. Scenarios and sensitivities should be designed to capture the future as it might be expected to occur, but also to reasonably model uncertainties and their impact on resource choices. Lastly, a stakeholder process in which there are ample opportunities for meaningful participation from a diverse group

[31] Mississippi Public Service Commission, Final Order Amending Rule 29 to Establish Integrated Resource Planning and Annual Energy Delivery Reporting Requirements, filed November 2019 in Docket No. 2018-AD-64.

of entities is essential to the resource planning process. MPC has failed to properly execute or incorporate many of these elements into its resource planning process.

B. Although MPC claims to model scenarios covering a range of natural gas prices, load forecasts, and carbon prices, the Company did not evaluate specific scenarios with critical combinations of these key inputs.

MPC's 2021 IRP includes ten scenarios that incorporate various natural gas price forecasts, carbon prices, technology costs, and load forecasts.[32] However, the company did not construct its scenarios in a manner that actually allowed it to evaluate the true least-cost resource portfolios that also meet Southern Company's trajectory to net zero by 2050.

The most glaring example is the treatment of energy efficiency ("EE") and distributed energy resources ("DERs"). MPC models these resources as load modifiers. Five of the ten modeled scenarios are based on load forecasts that are lower than the reference case due to inclusion of energy savings from these EE and DERs.[33] However, the only scenario that models an annual cap on CO_2 (Scenario 10) uses the reference load forecast instead of a reduced load forecast that takes energy savings from EE and DERs into account. This means that the model is attempting to apply a CO_2 limit on MPC's system, but not considering EE and DERs, which are some of the most cost-effective tools for carbon reduction.

A similar dynamic occurs in Scenario 9, the only scenario where MPC models lower costs for solar, wind, storage, and next-generation nuclear technology.[34] This scenario also uses the reference load forecast instead of reduced load forecast that incorporates EE and DERs. There are no scenarios where low-cost renewables and EE/DERs are modeled together. Table 4 shows all IRP scenarios that included either (A) a CO_2 price or cap, (B) the most aggressive EE/DER forecast, or (C) the lowest clean energy cost assumptions.

[32] Mississippi Power Company, 2021 IRP, p. 27. Accessible at: https://www.psc.state.ms.us/InSiteConnect/InSiteView.aspx?model=INSITE_CONNECT&queue=CTS_ARCHIVEQ&docid=658803

[33] Two of ten scenarios are based on load forecasts that are higher than the reference case, and three of ten scenarios rely on the reference load forecast.

[34] Mississippi Power Company, 2021 IRP, p. 27. Accessible at: https://www.psc.state.ms.us/InSiteConnect/InSiteView.aspx?model=INSITE_CONNECT&queue=CTS_ARCHIVEQ&docid=658803

Table 4: MPC IRP Scenario Design

Scenario Number	Scenario Name	CO_2 Price or Cap?	Aggressive EE/DER Adoption?	Low Cost Clean Energy Technology?
Scenario 2	$50	Yes ($50/ton)	No	No
Scenario 4	LG20	Yes ($20/ton)	No	No
Scenario 6	HG20	Yes ($20/ton)	No	No
Scenario 8	LL	No	Yes	No
Scenario 9	Tech	No	No	Yes
Scenario 10	CI	Yes (Carbon Intensity Cap)	No	No

Source: MPC IRP 2021, Table 6.[35]

There is no single resource that can take an electricity system to net zero. Instead, a least-cost zero-carbon energy system requires a portfolio of complementary clean energy resources on both the supply-side and the demand-side. Solar, wind, storage, paired resources, energy efficiency, and customer-sited generation each have a role in MPC's future energy system. If MPC was serious about reducing its carbon emissions, it would develop scenarios that evaluate the optimal mix of these resources all together. Table 4 above demonstrates that MPC has failed to model a single IRP scenario that does this. MPC's scenario design choices ensure that the model is never armed with all of these resources at the same time, and the IRP process as a whole has avoided a committed full-portfolio approach to decarbonization.

C. MPC relied on generic cost assumptions rather than issuing an All-Source RFP for accurate regional pricing

Utilities have a history of overstating the costs associated with renewable and storage technologies while underestimating the benefits, and simultaneously understating the costs and overstating the benefits of traditional fossil resources. This practice systematically disadvantages renewables and locks in incumbent fossil resources.

Cost data from around the United States suggests that the generic cost assumptions that MPC is using for renewables and battery storage resources are too high. An All-Source RFP would provide more accurate regional pricing. A recent RFP done by MPC's sister company, Alabama Power, demonstrated that paired solar-and-storage projects provided a least-cost resource options

[35] Although Scenarios 2, 4, and 6 are modeled with a reduced load forecast, they are listed as "No" in the "Aggressive EE/DR Adoption" column because they are not modeled with the most aggressive load reduction forecast developed by MPC while developing its IRP.

for its customers when compared to other resources. This makes the failure of MPC to even model paired solar-and-storage projects even more of a hindrance to a least-cost resource portfolio.

D. Solar and battery storage costs have experienced dramatic cost declines over the past decade and are forecast to decline even further in the future

The cost of clean energy generation technologies has fallen dramatically over the previous decade, such that the levelized cost of energy (LCOE) and storage is competitive with new gas-fired resources.[36] Our preliminary comments filed on March 22, 2021 provided an in-depth discussion on the declining cost of solar PV and battery storage, but MPC did not take our findings or recommendation into account.[37]

Given the rapidly changing trends in resource costs, MPC's admitted "lack of historical experience" with renewables and battery storage in the IRP,[38] and the importance of the resource cost assumptions used to the portfolio outcomes, it is essential that MPC use up-to-date and defensible resource cost data and provide transparent information about the cost assumption it uses for all current and new resources (both renewable and conventional).

E. Delayed resource availability and overly conservative capacity credit assumptions for solar and battery storage

In addition to cost inputs, MPC's IRP modeling constrains solar and battery resources in other ways. Solar only becomes available for selection by the model in 2025, and battery storage is only available for selection starting in 2028 or 2031, depending on the scenario. This delays investment in zero carbon resources that can provide low-cost energy to Mississippi ratepayers, and create barriers against local job creation.

Another way MPC constrains solar and storage resources is by adjusting the capacity values assigned to these resources. MPC claims that it is a winter-peaking utility, and assigns a capacity value of zero to solar resources. MPC should instead be evaluating solar paired with storage, and targeted winter DSM measures to reduce and manage winter peak instead of driving the narrative

[36] The LCOE metric does not include any transmission and distribution costs associated with the addition of new resources. Those cost are often site-specific and should be considered on a case-by-case basis. Transmission and distribution costs are not resource-specific and may apply to new gas additions as well as to renewable resources.

[37] Sierra Club Comments on Mississippi Power Company's February 25, 2021 IRP Technical Conference Pursuant to Commission Rule 29. Docket No. 209-UA-231. March 22, 2021.

[38] Mississippi Power Company, 2021 IRP, p. 4. Accessible at: https://www.psc.state.ms.us/InSiteConnect/InSiteView.aspx?model=INSITE_CONNECT&queue=CTS_ARCHIVEQ&docid=658803

that generation must be built to meet peak. Duke Energy Carolinas ("DEC") studied the winter effective load carrying capability ("ELCC") of paired solar and storage while developing their most recent IRP. DEC found that solar paired with 4-hour storage could offer an ELCC of 15-45% depending on the capacity of the battery. As a result of the study, DEC "assumed that "solar plus storage provided 25% of the solar nameplate capacity towards meeting winter peak demand."[39] Given that the majority of MPC's service territory receives greater solar irradiance than DEC's service territory, it is likely that a similar study conducted by MPC would result in similar or improved results for solar plus storage.[40]

MPC models battery storage with a declining capacity value as deployment increases. The capacity value of storage does decline at higher penetration levels, but those levels are usually far higher than the ones presented in the IRP. MPC separates battery storage into four tranches, with a declining capacity value as the total amount of storage increases. By contrast, a recent Astrapé Report for SPP determined that the first 1,500MW of storage could receive a credit of 100% and that the average capacity credit of the first 4,000MW would still be about 90%.[41] A comparison of the two approaches shows that MPC may underestimate the capacity value of storage by 25-53% depending on the amount of deployed storage:

[39] Duke Energy Carolinas, "Integrated Resource Plan 2020," p. 353, available at: https://www.duke-energy.com/_/media/pdfs/our-company/irp/202296/dec-2020-irp-full-plan.pdf?la=en.

[40] National Renewable Energy Laboratory, "National Solar Radiation Database," available at: https://www.nrel.gov/gis/solar.html.

[41] "Sierra Club's Comments on Mississippi Power Company's February 25, 2021 IRP Technical Conference," Docket No. 2019-UA-231, p. 14; Astrapé Consulting. "SPP Energy Storage Study: Final Report," (November 2019), available at: https://www.Astrapé.com/?ddownload=9141.

Table 5: Comparison of MPC and Astrapé Storage Capacity Value Evaluations

	MPC		Astrapé SPP Study		Delta
Storage Tranche	Capacity Value	MW Limit	Capacity Value	MW Limit	Capacity Value
1	75%	600 MW	100%	600 MW	-25%
2	60%	600 MW	100%	600 MW	-40%
3	50%	2100 MW	92%	2100 MW	-42%
4	25%	3000 MW Annual	78%	3000 MW Annual	-53%

Source: MPC Response to SC DR2-6; Astrapé Consulting. "SPP Energy Storage Study: Final Report," (November 2019).[42]

It is unclear how MPC determined the capacity value for each storage tranche, but future modeling of storage should include both additional durations for the model to select and further analysis of the capacity value that battery storage can provide. The capacity benefits and lower costs of stand-alone solar and storage are enhanced when these resources are modeled as paired resources, and MPC should make paired resources available to the model for selection in future IRP proceedings.

Recommendations

1. MPC should re-design its IRP process to focus on using a robust, transparent and technically defensibly analysis framework.
2. MPC's should design scenarios that ensure that the model is armed with all supply and demand side resources at the same time, and the IRP process as a whole takes a committed full-portfolio approach to decarbonization.
3. MPC should issue an all-source RFPs, or else utilize industry recognized sources for the most up-to-date cost information on renewables and batter storage.
4. MPC should not overly constrain the characteristics of, and ability for the model to select, renewables and battery storage resources.

[42] Astrapé's capacity values were presented based on cumulative amount of storage capacity instead of the incremental amount used by MPC. Astrapé's cumulative amount of storage was separated into tranches that matched the capacity of each MPC tranche. A weighted average capacity value was then assigned to each interval of storage that still matches Astrapé's cumulative findings but provides a better basis of comparison with MPC's storage capacity values.

V. Energy Efficiency and Distributed Energy Resources

A. MPC's approach to EE and DER in the IRP

MPC models two levels of EE and DER in its IRP: the reference load forecast which is used for most of the scenarios; and a low load forecast with a more aggressive adoption of EE and DER as used in Scenario 8.

For most of the IRP scenarios, MPC uses its reference load and energy forecast that solely relies on variables within its "econometric models for customer usage that represent the efficiency gains from cooling, lighting, and heating end use technologies."[43] MPC indicates that using this methodology captures recent, naturally occurring energy efficiency improvements in the reference load and energy forecast. Within these efficiency improvements, MPC assumes that a "small part" is related to its EE programs.[44] MPC indicates that the 2021 DSM Program Projected Results reflect a reasonable estimate of the efficiency improvements that are related to its EE programs.[45] According to the Energy Delivery Plan, projected savings for MPC's EE program in 2021 are 21,996 MWh and 4.96 MW.[46] For DER, it appears that MPC assumes the reference load forecast already captures the level of DER, as MPC does not provide any information about DER for this load forecast.

For the low load scenario (Scenario 8), it appears that MPC created two factors for modifying load: one to represent a higher level of EE program effort than the reference load and energy forecast, and another to reflect an increase in DER adoption. The EE factor is based on the "Achievable with 100% incentive" case from the 2018 potential study for Georgia Power. [47] This case assumes that customers making EE improvements are provided incentives equal to 100 percent of incremental cost.[48,49] Scenario 8 also assumes low cost of renewable energy resources. To calculate a factor to represent the

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[43] Resp. to Sierra Club Request for Information 1-1.

[44] Id.

[45] Id.

[46] MPC Energy Delivery Plan, Nov. 16, 2020.

[47] MPC Work Paper H, Scenario Load Forecasts.

[48] Id.

[49] Incremental cost represents the difference in cost between a high efficiency measure and a standard efficiency measure.

decrease in sales associated with behind the meter solar PV adoption, MPC indicates that it relied on the "Low Renewables Cost" case from the U.S. Energy Information Administration's 2020 Annual Energy Outlook.

The way that MPC has addressed EE and DER within the IRP is problematic in several ways: MPC's EE and DER forecasts are substantially underestimated, in both the reference and low load/high DER scenario; MPC's EE and DER assumptions are either flawed or not clear; MPC's savings are overly conservative; the current and planned EE programs are inadequate; and there are many opportunities for more comprehensive, cost effective savings that MPC is not planning to tap.

B. MPC substantially underestimates the potential of Distributed Energy Resources in the Reference Load Forecast in its IRP

MPC's approach to capturing the expected level of sales and peak load reductions from DER in the reference load forecast is flawed. The primary reason why this approach is flawed is that the historical trend of consumption that MPC utilizes does not fully capture the expected sales impacts from distributed solar PV facilities. An econometric analysis uses numerous data, in particular energy usage, economic and demographic data over 10 to 20 years, to derive the "historical trend" and forecast energy usage over the next decade or two. Thus, an econometric model is typically not adequate for predicting a future in which (a) a recent trend is expected to continue or to become more intense in the near future or (b) the future trend is expected to be substantially different from a historical trend.

The cost of solar PV has been declining over the past decade and is expected to decline even further in the future, as discussed in Sierra Club's March 22, 2021 comments.[50] As a result, solar PV, including distributed solar, has seen rapid growth over the past several years and is expected to grow even more in the future. In a recent analysis, the Southern Alliance for Clean Energy (SACE) reviewed and summarized historical solar PV installations over the past few years and the expected PV installations for the next few years in the Southeast region.[51] This analysis (Figure 4) clearly shows a rapid growth of this resource (including utility-scale solar facilities) in the region, doubling the capacity over the past two years from 5 GW in 2016 to nearly 10 GW in 2019.

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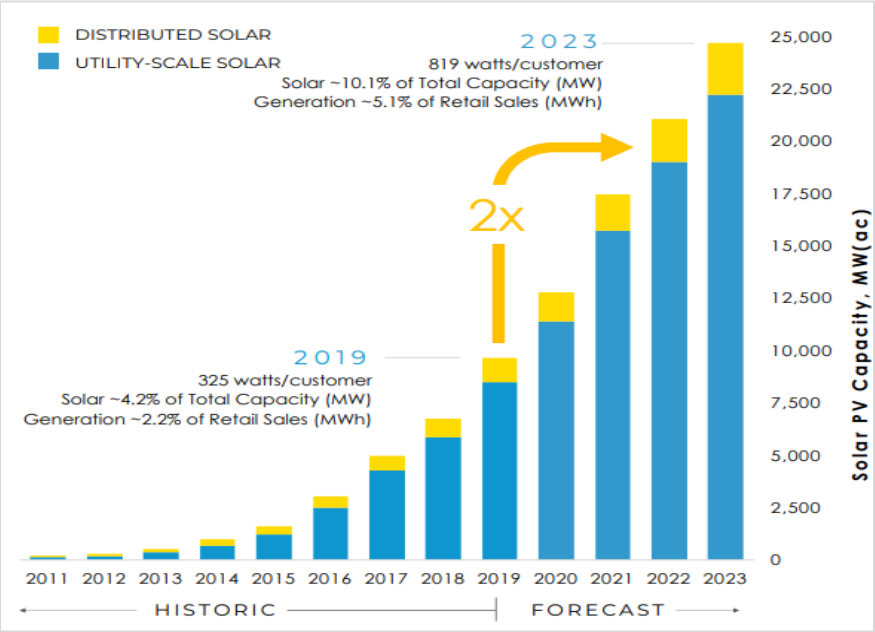
[50] Sierra Club Comments on Mississippi Power Company's February 25, 2021 IRP Technical Conference Pursuant to Commission Rule 29. Docket No. 209-UA-231. March 22, 2021.

[51] SACE. 2020. Solar in the Southeast – Annual Report. Available at: https://cleanenergy.org/wp-content/uploads/Solar-in-the-Southeast-Report-2020.pdf.

Figure 4: Historical and Forecasted Solar PV Capacity in the Southeast by SACE



Source: SACE. 2020. Solar in the Southeast – Annual Report

For Scenario 8 with a high EE and DER adoption rate, MPC uses solar PV forecasts by the Energy Information Administration (EIA)'s Annual Energy Outlook (AEO).[52] However, MPC does not use AEO's PV forecast for the reference load forecast or any other PV forecast. This is a critical flaw of MPC's IRP analysis. As mentioned above, an econometric model's predictive power is poor when the future is likely to differ markedly from long term historical trends, as is the case with the recent, rapid increase in solar PV adoption. The econometric approach is especially ill-suited for MPC, as the historical penetration rate of solar PV in its territory or Mississippi in general is much lower than in other jurisdictions.[53]

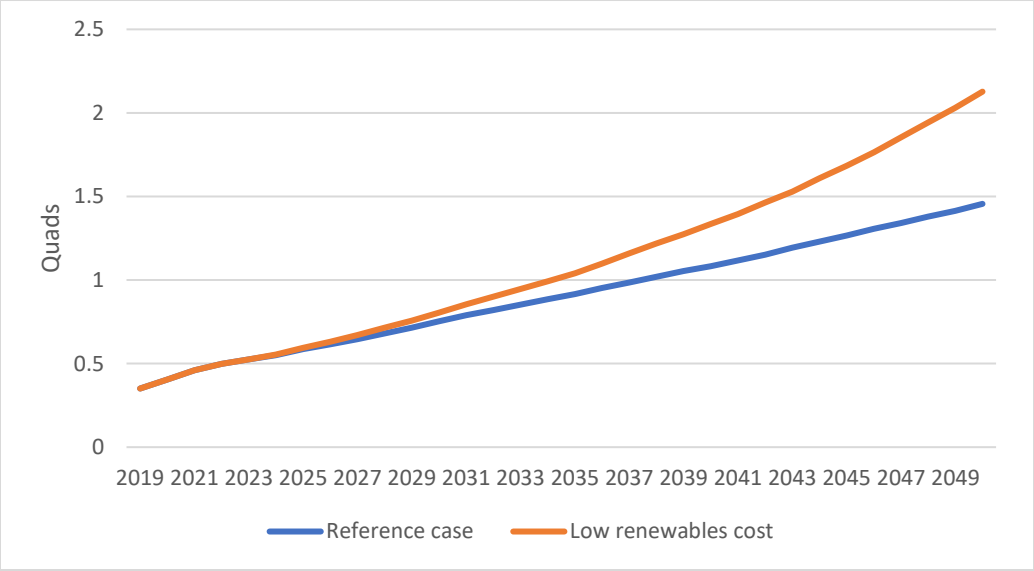
EIA AEO has detailed solar PV adoption models that take into account the economics of the resource and incorporates the effect of the declining costs of the resource on

[52] MPC Work Paper H, Scenario Load Forecasts.

[53] SACE. 2020. Solar in the Southeast – Annual Report. Available at: https://cleanenergy.org/wp-content/uploads/Solar-in-the-Southeast-Report-2020.pdf

technology adoption.[54] Figure 5 and Figure 6 show the AEO's projections of residential and commercial solar PV for the entire country for AEO's Reference case and for the Low Renewables cost case in terms of quads of energy production and percentage of projected sales. As discussed in the following section, MPC uses the Low Renewables cost case for its DER for its high EE and DER scenario, Scenario 8. These graphs show solar PV systems are projected to increase continuously even under the Reference case.

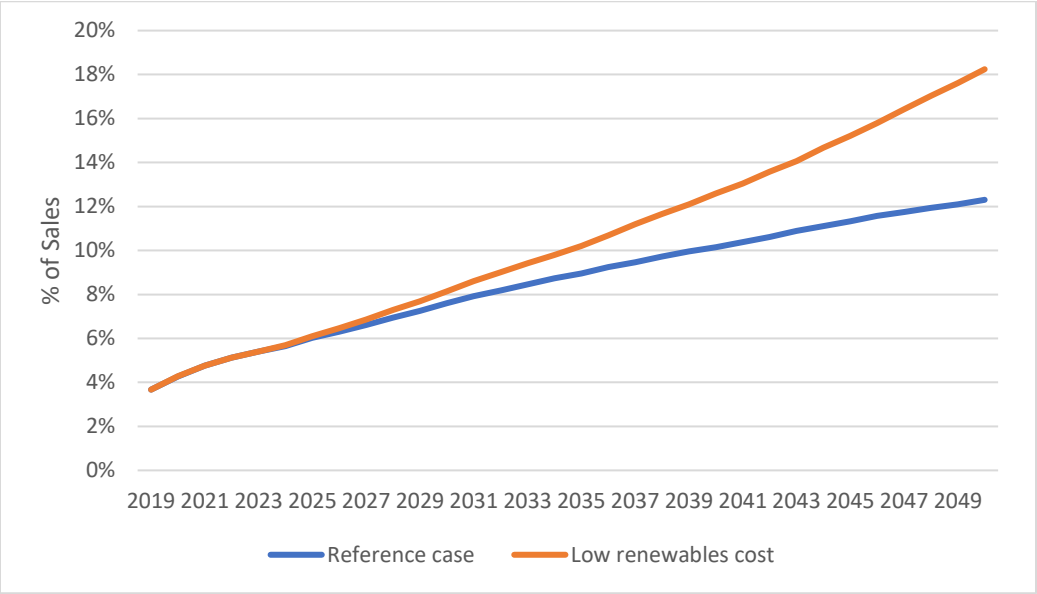
Figure 5: EIA AEO 2021 Projection of Residential and Commercial Solar PV (Quads)



Source: EIA 2020 AEO, Table 4. Residential Sector Key Indicators and Consumption and Table 5. Commercial Sector Key Indicators and Consumption

[54] See EIA. 2020. Residential Demand Module of the National Energy Modeling System: Model Documentation 2020. Available at: https://www.eia.gov/outlooks/aeo/nems/documentation/residential/pdf/m067(2020).pdf; EIA. 2020. Commercial Demand Module of the National Energy Modeling System: Model Documentation 2020. Available at: https://www.eia.gov/outlooks/aeo/nems/documentation/commercial/pdf/m066(2020).pdf.

Figure 6: EIA AEO 2021 Projection of Residential and Commercial Solar PV (% of projected sales)



Source: EIA 2020 AEO, Table 4. Residential Sector Key Indicators and Consumption and Table 5. Commercial Sector Key Indicators and Consumption

AEO's forecast growth rates for PV are not directly transferable to MPC for one major reason. The starting point in the AEO forecast, based on distributed PV (DPV) generation representing 4 percent of sales, is applicable to the entire country, not for the Southern region. In contrast, we estimate that DPV generation in MPC's service area is currently only about 0.14 percent of residential and commercial sales based on the data provided in SACE's 2020 solar report mentioned above.[55,56] From a low starting point, the amount of DPV can be very quickly doubled or tripled, while from a higher penetration level, it would take longer for the capacity to be doubled or tripled. As can be seen in SACE's PV projection (see Figure 4), the region's DPV capacity has doubled over the past two years,

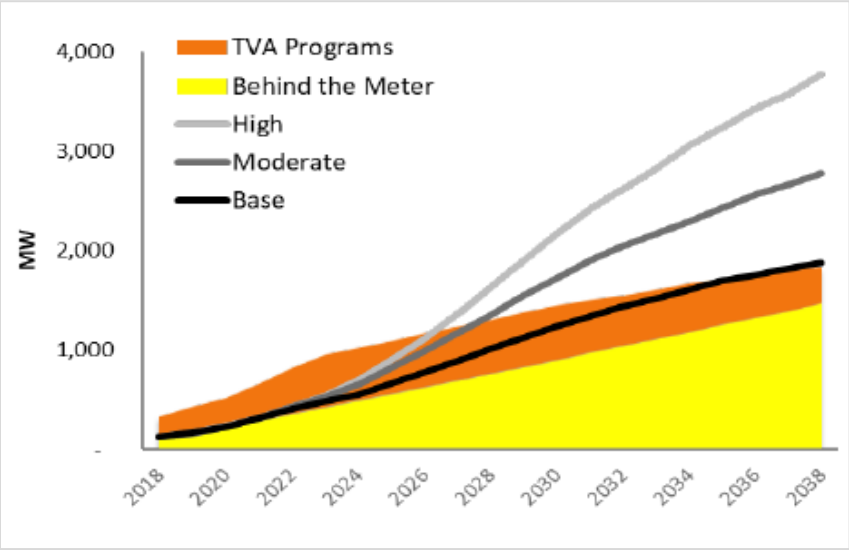
[55] SACE report provides PV data in terms of watts per customer. We converted this into (a) the total MW installations using the customer counts from EIA 861 database and (b) energy production in MWh based on a 16 percent capacity factor for Mississippi from the PVWatts Calculator. We then used historical sales data to estimate PV energy production as a percentage of sales.

[56] MPC had 163 customers in 2019 and 189 customers in 2020 who are under MPC's renewable energy net metering rate. These represent about 0.09 to 0.1 percent of the total customers, which are close to the share of energy production from DPV we estimated as a percentage of sales based on SACE's watts per customer estimate for MPC.

and SACE projects that the cumulative adoption of solar PV will double over the next 3 to 4 years. On the other hand, AEO's forecasts show the doubling of the current capacity occurs over the next 8 years.

MPC needs to conduct a study to develop a DPV forecast suitable to its own service area. Until it has conducted this study, we recommend that MPC use TVA's 2019 IRP and SACE's DPV projection for MPC. DPV projections from these sources provide a more realistic forecast of DPV growth. TVA projects three levels of DPV capacity – Base, Moderate, and High cases as shown in Figure 7. Table 6 presents approximate solar PV capacity amounts, derived from Figure 7, in terms of a percentage of TVA's total peak load (approximately 30,000 MW according to TVA's 2019 IRP). Under its Base case, TVA projects that DPV will increase to 3 percent of its current peak load by 2028 (or in 10 years) and 6 percent of the peak load by 2038 (or in 20 years). MPC should develop a DPV forecast for its reference load forecast based on TVA's DPV forecast for the Base case.

Figure 7: TVA 2019 IRP – Forecast of Distributed Solar Capacity



Source: TVA. 2019. 2019 Integrated Resource Plan, Volume 1. Figure C-8.

Table 6: Approximate Distributed Solar Forecasts in TVA's 2019 IRP

	2018	2028	2038
TVA Base			
DPV (MW)	100	900	1,800
DPV (% of peak)	0.3%	3.0%	6.0%
TVA High			
DPV (MW)	100	1,500	3,700
DPV (% of peak)	0.3%	5.0%	12.3%

Source: Developed based on TVA. 2019. 2019 Integrated Resource Plan, Volume 1. Figure C-8.

As discussed above, the current DPV penetration is about 0.14 percent in MPC's territory in 2019 based on SACE's watts per customer estimate for the year (26 watts per customer). For 2023, SACE projects 136 watts per customer in MPC's territory. This results in production equivalent to approximately 0.74 percent of sales.[57] These estimates are lower than TVA's DPV penetration in 2018 and TVA's DPV projection. This reflects the fact that Mississippi's net metering does not provide adequate compensation compared to TVA. However, the Commission is currently considering changes to the rule and its questions indicate it intends to strengthen to rule to increase customers' ability to self-supply. Thus, we expect that the installations DPV in MPC territory will gradually increase over time and the gap in TVA's forecast will narrow toward 2040. Based on this understanding of MPC's current DPV rule constraints as well as TVA's DPV forecasts, we recommend that MPC assumes that DPV penetration in MPC territory reaches 5 percent of its projected sales by 2040 under the reference load forecast and 10 percent of sales by 2040 under the High EE and DER scenario. Our near term DPV projections for MPC are also provided in Table 7 for 2023 and 2030. We recommend that MPC adopt these DPV projections.

Table 7. Synapse forecast of DPV for MPC (% of sales)

	2023	2030	2040
DPV for reference load scenario	0.5%	1.5%	5.0%
DPV for high EE and DER scenario	0.75%	3.0%	10.0%

[57] Using the same method described in footnote 55.

C. MPC also substantially underestimates the potential of Distributed Energy Resources in the Low Load Forecast in its IRP

For projecting DER for low load Scenario 8, MPC uses AEO's projections of DPV for the residential and commercial sectors under the low renewables cost case. In addition to the 4 percent starting point issue we described above regarding the use of AEO forecast, MPC made a serious error in the way it uses AEO DPV forecasts. According to its "Scenario Load Forecasts" document,[58] MPC's DPV forecast compares usage levels "relative to a reference usage amount."[59] This means that MPC only added the amount of delta DPV forecasts from AEO between AEO's reference case and the Low Renewables Cost case (as shown in Figure 6 above) for estimating its DPV forecast, and MPC assumed that its reference load forecast includes the full amount of a baseline DPV forecast despite the fact that DPV generation is not at 4 percent of sales as discussed in the previous section. Thus, MPC is substantially underestimating the amount of DPV for Scenario 8, the high EE and DER scenario. As discussed in the previous section, we recommend MPC use our DPV forecast for the High EE and DER scenario as presented in Table 7.

D. MPC's EE assumptions are either flawed or not clear.

As noted above, MPC used EE factors to modify the reference load and energy forecast for Scenario 8, the low load scenario. In response to discovery, MPC provided these factors by year and rate class, which suggests that MPC's load and energy forecast is at least broken out along these lines.[60] However, MPC has not provided a load forecast by rate class that would allow review of savings by customer type.[61] A review of savings by rate class could reveal a number of issues, such as whether a customer class's savings are out of alignment with its potential savings.

Information on MPC's methodology regarding increasing DER penetration is even more lacking than for EE. As with EE, MPC used DER energy savings factors to create a new energy forecast. However, MPC provided no energy savings factors for DER, even at the aggregated system wide level. Furthermore, MPC provided no information about how the

[58] MPC. 2021. Scenario Load Forecasts. 2021 IRP Filing Workpapers.

[59] Ibid. page 1.

[60] Resp. to SACE IDR 1-1.

[61] See, Workpaper A, Load Forecast vs Capability by Scenario.

EE and DER factors were applied. It is not clear how the impacts from EE and DER were combined.

As another example of a problematic assumption, MPC does not base its EE factors on a potential study on its service area. Instead, MPC bases its EE factors on a potential study for Georgia Power.[62] The assessment of EE potential should be based on MPC's area, because there may be critical differences between the appliance saturation, customer characteristics, buildings, and other energy related factors in Georgia Power's and MPC's service areas. MPC indicates that it is procuring a market potential study.[63] Pending completion of that study, MPC could have provided but did not provide support for the assumption that Mississippi and Georgia have comparable EE potential, e.g. by documenting similarities in the two service areas.

A bigger problem is that the potential study MPC uses various conservative assumptions, which underestimates the true cost-effective EE potential. Details of these flaws will be discussed in the following section.

It is also not clear whether or how MPC optimized its DSM portfolio in its Plan and/or in the IRP. MPC indicates that it used a benchmarking study of peer utility DSM programs to inform the attributes of its DSM Plan. MPC also identified criteria that were used to optimize the DSM Plan, including cost effectiveness, customer type, measure life, and participation rate.[64] However, MPC has not provided any information on how these factors were considered or the specific process for creating the portfolio or used to develop the EE component in Scenario 8 of the IRP.

E. MPC's savings targets are overly conservative

Historically, MPC's energy savings achievements have been just 0.2 percent of sales. This is slightly lower than the regional average, and much lower than the national average of 0.7 percent. MPC's one-year plan projects annual energy savings of 21,996 MWh and 4.96 MW in demand.[65] This equates to 0.24 percent of sales (based on sales projections provided in response to SC 1-23), only slightly higher than historical levels.

[62] Work Paper H, Scenario Load Forecasts

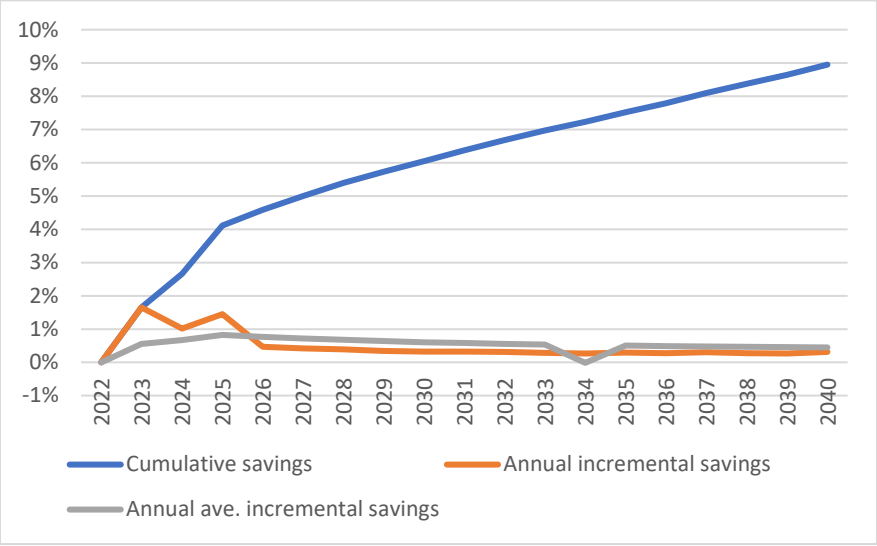
[63] Resp. to Sierra Club 1-12.

[64] Resp. to SACE IDR 1-4 and 1-7.

[65] MPC Energy Delivery Plan, Nov. 16, 2020.

The IRP's high EE and DER scenario also projects a low level of EE savings. Figure 8 shows the incremental peak load savings under Scenario 8 (LL), which includes DER, relative to the Reference scenario 1 (MG0). The annual average incremental savings represent a rolling average of annual incremental savings. The graph shows that total annual incremental savings relative to the Reference scenario are about 0.5 to 0.8 percent. Taking into account the current savings of 0.2 percent per year, the total savings would be just about 1 percent of sales including DER.

Figure 8: MPC Savings as a Percent of Sales for the Low Load Scenario (8)



Source: MPC's workpaper "A Load Forecast vs Capability by Scenario"

The cumulative savings of Scenario 8 relative to the reference case (MG0) is about 7 percent over the next 12 years (which is the study period for Georgia Power's EE potential study MPC used). Including the cumulative EE savings under the reference case, the total cumulative savings is about 9 percent, which [redacted] As discussed earlier on DER, MPC includes a very small amount of distributed solar during these early years because the delta between AEO's reference case and Low renewables cost case is almost identical during the same period. This means that the majority of the savings included in the MPC's forecasts over the next several years mainly come from energy efficiency

[66] Nexant. 2018. Achievable Energy Efficency Potential Assessment. Submitted to Georgia Power Company, January 31, 2018

and are based on Georgia Power's EE potential study. However, we cannot know this for sure because MPC did not provide energy savings factors for DER.

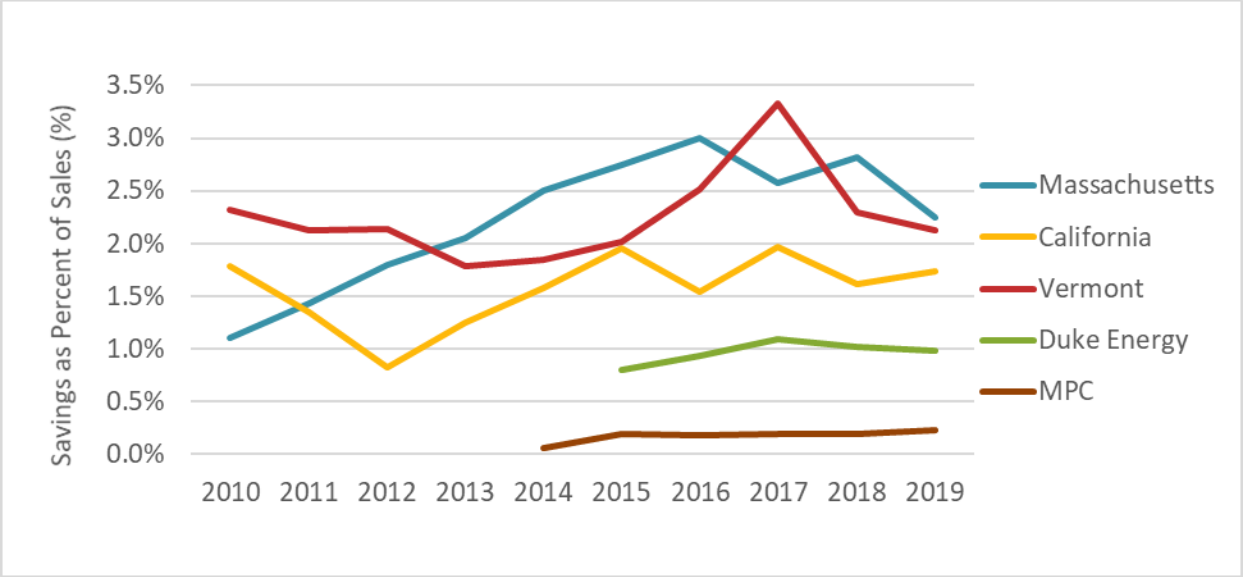
We found several conservative assumptions in Georgia Power's EE potential study as follows:

We believe that there is much more cost-effective savings potential for MPC than what MPC assumes in Scenario 8 (the high EE and DER scenario) and what Georgia Power's EE potential study indicates. While comprehensive EE potential studies are not available for MPC to assess the true achievable potential, leading states' achievements over many years provide solid evidence that MPC has missed an enormous amount of energy savings potential in the past, which could still be tapped.

Figure 9 presents historical EE program savings achievements by MPC and leading jurisdictions in the region and nation-wide. Duke Energy, a leader in the South, has been achieving savings at 1 percent per year. Leading states in other parts of the country like Massachusetts, Vermont and California have achieved annual energy savings of about 1.5 percent to even 3 percent per year despite their long history of achieving high savings levels over the past two to three decades.

[67] BrightLine Group. 2021. Cost Effectiveness Calculations for MPC 2021 DSM Program and Strategic Load Growth Program, prepared for MPC.

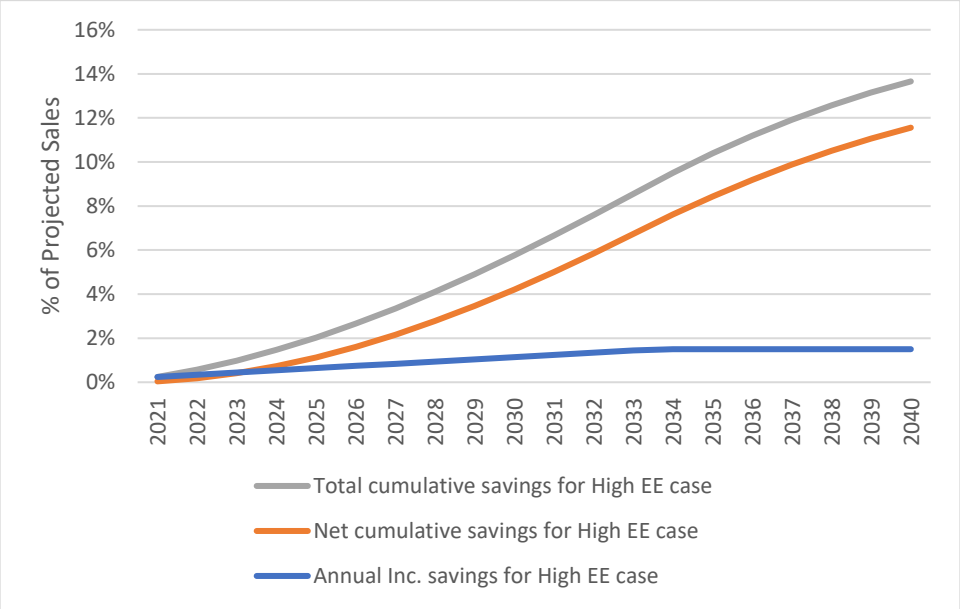
Figure 9: Comparison of Historical EE Savings Achievements by MPC and Regional and National Leading Jurisdictions



Source: EIA 861; Synapse Energy Economics. 2021. Clean, Affordable, and Reliable – A Plan for Duke Energy's Future in the Carolinas, Figure 8.

Based on this comparison, we believe that reaching a 1.5 percent savings level per year is a reasonable target for a high EE and DER scenario for MPC. Under such a scenario, we calculate that MPC could reduce its energy and peak load forecasts by 11.6 percent relative to the reference load forecast by 2040, as shown in Figure 10. In this forecast, we assume that MPC increases its annual incremental energy savings from today's level of 0.24 percent per year by 0.1 percent per year until it reaches 1.5 percent per year in 2034 and maintains the annual incremental savings at this level through 2040. We then assume that annual savings decay gradually over 20 years with an average measure life of 10 years based on EIA 861 data for annual and lifetime savings for MPC. Total cumulative energy savings by 2040 are 13.7 percent. For the reference load forecast, we assume 0.2 percent per year of annual incremental savings, which results in a cumulative savings of 2.1 percent by 2040. Subtracting this cumulative savings, we estimate that the net cumulative savings from energy efficiency alone is 11.6 percent by 2040.

Figure 10: Projection of alternative High EE case for MPC for Scenario 8



Source: Synapse Energy Economics, Inc.

MPC should model a scenario that achieves annual incremental savings of 1.5 percent per year by 2034 from energy efficiency alone, and model solar PV separately.

F. Current and planned DSM programs are inadequate.

MPC's recent and planned DSM efforts appear to be light-touch and produce short-lived savings, for both residential and business customers.

1. Residential programs

On the residential side, current and planned DSM programs do not cover all major residential end uses and customer segments.[68] For example, MPC does not have a program for residential new construction.[69] MPC indicates that it may implement a Residential New Homes Pilot but has not committed to doing so.[70] The lack of a program targeting new construction means that lost opportunities for cost-effective energy

[68] Resp. to Sierra Club 1-17.

[69] MPC offers welcome kits to new customers, who may live in new or existing structures.

[70] Work Paper M, MPC 2021 Annual Energy Delivery Plan, p. 12.

efficiency savings abound. While other utilities and jurisdictions are considering net zero energy homes, MPC has not even implemented a basic program type, one that can produce energy savings for the entire lifetime of the building.

Likewise, MPC is implementing only one demand response program, Smart Thermostat Demand Response, which will be only be offered to low income customers and only on a pilot basis. Demand response can be offered to all customer classes cost effectively. As electrification measures become more prevalent, demand response will become an increasingly important resource.

As another example, MPC has no efficiency programs targeting multi-family homes. MPC indicates that it may implement a Residential New Homes Pilot that covers new multi-family homes, however MPC has not committed to implementing the pilot. Further, MPC's potential pilot would not address existing buildings.[71] The best practice for addressing multi-family properties is to create targeted energy efficiency offerings that specifically mitigate the high barriers experienced by this customer segment, including but not limited to split incentives and a high proportion of low- and moderate income customers, who often lack access to funds to pay higher costs up front.[72,73]

Besides missing coverage for key customer segments, MPC's portfolio lacks comprehensive EE programs for residential customers. Some programs are particularly lacking in depth, including school kits and behavioral analysis. Programs like School Kits can have high free ridership and low percentage of measures installed and operating.[74] Unsurprisingly, MPC expects low cost-effectiveness for this program with a Utility Cost Test (UCT) ratio of 0.55.[75]

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[71] Id.

[72] Split incentives refers to a lack of alignment between who experiences the costs of energy efficiency investments with who experiences the benefits. They arise, for example, in apartment buildings where residents benefit from reduced energy bills associated with energy savings but building owners must authorize, manage, and pay for energy efficiency retrofits.

[73] L. Ross, M. Jarrett, and D. York 2016. Reaching More Residents: Opportunities for Increasing Participation in Multifamily Energy Efficiency Programs. American Council for an Energy-Efficient Economy.

[74] For example, Ameren Missouri's School Kits experienced a free ridership rate of 19 percent. Installation rates by measure ranged from 39 to 90 percent, with most measures between 51 and 64 percent. (Cadmus 2019. Energy Efficiency Kits Program Impact and Process Evaluation: Program Year 2018. https://efis.psc.mo.gov/mpsc/commoncomponents/viewdocument.asp?DocId=936232333)

[75] Table 4, Work Paper M, MPC 2021 Annual Energy Delivery Plan

Savings from MPC's Behavioral Analysis program, similar to Home Energy Reports (HER) programs in other jurisdictions, may have short-lived savings. Depending on the design of HER programs, savings may decay quickly once the participant stops receiving HER reports.[76] One benefit of HER programs is that they can be used to increase participation in more comprehensive programs.[77] However, MPC's portfolio generally lacks comprehensive programs that the Behavior Analysis reports can promote. Also, MPC's 2021 Behavioral Analysis program is not quite cost effective, with a 0.95 UCT ratio.

2. The EnergyWise Low-Income Energy Efficiency Program

Related to review of Mississippi Power's EE programs, Sierra Club asked Synapse to conduct an evaluation of the grant-funded EnergyWise Low-Income Energy Efficiency Program in Mississippi. The funding for EnergyWise comes from a legal settlement between Sierra Club and MPC regarding the Kemper plant, whereby the utility agreed to contribute $15 million to Gulf Coast Community Foundation for renewable energy and energy efficiency projects. EnergyWise has been operating since 2015 and has helped about 700 low-income households improve their building energy use and reduce annual energy bills.

Attached as an exhibit is Synapse's Evaluation report of the program. Synapse's bill analysis of the sample participants found that the projects decreased average monthly energy bills by $9.46, or about $113 per year on average, using the latest electric rates. They also found that customer usage decreased by about 78 kWh per month or 935 kWh per year across the sample households on average. This decrease represents about 6.7 percent of the usage prior to EnergyWise projects. Energy use reductions were not uniform however. Residents with higher consumption showed greater reductions, while homes with low consumption actually increased electric use.

Real-world electric use among the sample participants was higher than the modeled savings of about 17 percent due to some participants' who actually increased usage after the projects. One possible explanation for the usage increase, as explained in Synapse's

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[76] See, e.g., Navigant 2020. ComEd Home Energy Report Program Decay Rate and Persistence Study – Year Five Research Report. https://ilsag.s3.amazonaws.com/ComEd_HER_Year_Five_Persistence_and_Decay_Study_2020-02-04_Final.pdf.

[77] Takahashi, K., A. Napoleon. 2015. "Pursue Behavioral Efficiency Programs." Ed. John Shenot. In Implementing EPA's Clean Power Plan: A Menu of Options. National Associate of Clean Air Agencies.

Evaluation report is the rebound effect where residents use more energy when they have more energy efficient appliances or equipment because it is now cheaper to use those efficient appliances or equipment. Alternatively, residents may be more comfortable using a certain piece of equipment more frequently because it is now functional. In fact, Synapse's Evaluation report found that many program participants with lower electricity usage did not have working air conditioning units before the EnergyWise retrofit projects. These consumption increases benefit program participants by improving the indoor environment and improving safety during summer heat. Further, while Synapse's survey found some program participants found their bills remained the same even after the energy retrofits, the participants noted improved safety and comfort. Other participants also noted other non-energy benefits (NEBs) such as improved ability to pay for food and other necessities, as well as reduced illness.

3. Mississippi Power's SELECT low-income program

As part of its evaluation, Synapse conducted a high-level comparison of the EnergyWise and MPC's low-income program and identified four specific areas from EnergyWise that could be incorporated into SELECT:

- **Budget.** SELECT should receive a larger budget overall based on our review of program budget within MPC's energy efficiency programs, and in comparison to budget levels dedicated to low-income programs in other jurisdictions. The budget for SELECT averages only 0.12 percent of residential revenue, while programs in other jurisdictions are spending over 0.4 percent of residential revenue for programs serving customers under 200 percent of the federal poverty level. A higher budget and spending per participant like the EnergyWise $5,000 to $7,500 per participant would allow the program to provide more comprehensive, long-lasting measures.
- **Measures.** SELECT provides 10 light bulbs & attic insulation. The predecessor program in the Quick Start program portfolio, Neighborhood Efficiency, offered a wider range of measures, as does the EnergyWise program This relatively comprehensive set of offerings will generally achieve deep savings, and in fact the American Council for an Energy-Efficiency Economy (ACEEE) found that high-performing low-income programs offer a similarly wide range of measures.[78] This approach is appropriate, especially given the high electricity savings

[78] Gilleo, A., S. Nowak, and A. Drehobl. 2017. *Making a Difference: Strategies for Successful Low-Income Energy Efficiency Programs*. American Council for an Energy-Efficient Economy. Available at: https://www.aceee.org/research-report/u1713

potential of low-income households in Mississippi and other southern states (ranging from 25 to 29 percent).[79] In contrast, projected savings per participant for SELECT are relatively low at 5 percent.[80]

- **Customer targeting.** It is not clear how MPC targets its low-income customers. The EnergyWise program guidelines call for giving priority to applicants who are: At or below 100 percent of the FPL; Elderly (age 65 years and older); Disabled (receiving public or private disability payments); Have children in primary or secondary schools or younger; or In a home with a high energy burden. Synapse also recommends prioritizing customers or neighborhoods with mean income levels closer to 100 percent of the federal poverty level, as EnergyWise does. This approach is particularly important in light of the prevalence of low-income households in Mississippi. In 2019, Mississippi's share of the population with an income of less than 200 percent of the federal poverty level was over 40 percent, second only to Puerto Rico.[81] EIA estimates that low-income customers in Mississippi have the highest energy burden across all the states in the nation. On average, low-income customers in the state are using about 12 to 14 percent of their income on energy bills, with electricity being a critical input to remaining safe during summer heat.[82]
- **Repairs.** SELECT does not address any observed health and safety issues in a customer's home. This aspect of the program limits who can receive services, because problems with building conditions are common in low-income households. In order to address these problems, SELECT should include health and safety screening to prevent installation of measures that could potentially create or exacerbate health and safety problems. In addition, MPC should consider providing repair work, free of charge, for building condition issues that will reduce the effectiveness of recommended, covered energy efficiency measures or where such measures could result in or worsen existing health and

[79] U.S. Department of Energy. 2018. Low-Income Household Energy Burden Varies Among States.

[80] Based on average annual savings for SELECT participants in 2020, as a share of average annual residential sales per customers in 2019, per EIA 861 data.

[81] Kaiser Family Foundation, *Distribution of the Total Population by Federal Poverty Level (above and below 200% FPL).* Accessed May 17, 2021.Available at: www.kff.org/other/state-indicator/population-up-to-200-fpl/?currentTimeframe=0&sortModel=%7B%22colId%22:%22Under%20200%25%22,%22sort%22:%22desc%22%7D.

[82] U.S. Department of Energy. 2018. *Low-Income Household Energy Burden Varies Among States — Efficiency Can Help In All of Them*. https://www.energy.gov/sites/prod/files/2019/01/f58/WIP-Energy-Burden_final.pdf.

safety problems. At a minimum, SELECT should offer guidance to customers on how to address health and safety problems that are obvious to auditors.

- **Non-energy benefits**. Efficiency programs in other jurisdictions recognize and incorporate values of NEBs in their cost-effectiveness analysis and NEBs are typically higher for low-income programs. MPC is required to conduct cost-effectiveness analysis for its SELECT program. MPC should consider incorporating NEBs—including avoided arrearages and collection costs—into its cost-effectiveness analysis or at least evaluate and report NEBs that its program participants are experiencing.

4. Commercial and industrial programs

As with the residential programs, current and planned DSM programs do not cover major C&I end uses and customer segments.[83] Notable omissions from the portfolio include a retrocommissioning and Strategic Energy Management programs. Retrocommissioning involves optimizing energy performance in existing buildings by improving the control of energy-using equipment, such as heating, ventilation, and air conditioning equipment and lighting. Retrocommissioning can result in savings of 5 to 20 percent.[84] Strategic Energy Management (SEM) is an approach to achieving energy-efficiency improvements through systematic and planned changes in facility operations, maintenance, and behaviors (OM&B) and capital equipment upgrades. SEM programs have achieved between 1 percent and 8 percent of energy consumption, but individual facilities can save well in excess of 8 percent.[85]

It is not clear whether MPC offers any comprehensive programs for commercial customers. Historically, it appears that the Comm 100 program was limited to lighting. MPC is "expanding lighting solutions to ensure a comprehensive list of existing and emerging technologies and increasing the incentive cap from 60% of project cost to 70% of project cost."[86] Likewise, the Comm 500 program is being expanded beyond lighting solutions "to ensure a comprehensive list of existing and emerging technologies." MPC

[83] Resp. to Sierra Club 1-17.

[84] Tiessen, A. 2017. The Uniform Methods Project: Methods for Determining Energy Efficiency Savings for Specific Measures. Chapter 16: Retrocommissioning Evaluation Protocol. Available at: https://www.nrel.gov/docs/fy17osti/68572.pdf.

[85] Stewart, J. 2017.The Uniform Methods Project: Methods for Determining Energy Efficiency Savings for Specific Measures. Chapter 24: Strategic Energy Management (SEM) Evaluation Protocol. Available at: https://www.nrel.gov/docs/fy17osti/68316.pdf.

[86] Work Paper M, MPC 2021 Annual Energy Delivery Plan, p. 11.

appears to be moving toward more comprehensive measures, but the description provides little information on targeted end uses or measure offerings for either program going forward.

G. MPC is leaving cost effective savings on the table.

There appear to be opportunities for more comprehensive, cost effective savings that MPC is not planning to tap. The UCT of the 2021 portfolio is 1.46, well over the threshold of cost-effectiveness.[87] On a sector basis, the UCT is 1.12 for the residential EE programs and 2.84 for the non-residential programs.[88] As discussed in Sub-section E above, it is likely that this cost-effective analysis does not include avoided costs of transmission and distribution. This indicates that there is room for MPC to implement more comprehensive and higher cost measures to increase savings for both non-residential and residential customers. There would be even more room for deeper savings measures if the budgets for lighter-touch programs, such as school kits and behavioral savings, are reduced or eliminated.

The Total Resource Cost test indicates that the portfolio is cost effective (1.12). On a sector basis, the TRC is 1.01 for the residential EE programs and 1.61 for the non-residential programs.[89] These estimates do not likely include avoided T&D costs as with the benefit cost estimates under the UTC. As typically applied, the TRC test treat costs and benefits asymmetrically, e.g. by including participant costs but not accounting for participant benefits. Without symmetrical accounting for benefits and costs, the test may be skewed and provide misleading results.[90] MPC's TRC only includes one type of NEB (operations and maintenance cost), and only for one measure (LED lighting).[91] The fact that the TRC largely does not account for NEBs means that more EE is cost effective than is suggested by MPC's results. Not accounting for NEBs is likely to be a major factor in the cost effectiveness of programs targeting the residential sector, in particular for low-income customers.

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[87] Work Paper M, MPC 2021 Annual Energy Delivery Plan.

[88] Resp. to SACE IDR 1-2.

[89] Id.

[90] National Efficiency Screening Project 2017. National Standard Practice Manual for Assessing Cost-Effectiveness of Energy Efficiency Resources. Available at https://www.nationalenergyscreeningproject.org/wp-content/uploads/2017/05/NSPM_May-2017_final.pdf.

[91] Resp. to SC 1-20.

Recommendations

1. MPC should model DER/solar PV separately from EE and develop peak and energy savings factors as a percentage of projected sales and peak loads.
2. For Scenario 8, the high EE and DER scenario, annual incremental EE energy savings should reach a 1.5 percent of projected sales by 2034 and the level of annual incremental savings should stay at the same level in terms of percentage of sales thereafter. MPC can model this by assuming a gradual decay of energy savings effects over time (e.g., over 20 years with an average life of 10 years) and estimating annual cumulative energy savings through the study period. MPC should assume that DER/solar PV reaches about 3 percent of sales by 2030 and 10 percent of sales by 2040.
3. For the reference load forecast, MPC should assume that DER/solar PV reaches about 1.5 percent of sales by 2030 and 5 percent of sales by 2040.
4. MPC should update the EE assumptions in the IRP as soon as the potential study on its service area is complete. If there is still time to update key assumptions and approaches for this study, we also recommend MPC incorporate the following in the potential study: (a) emerging measures, (b) expected cost reductions on certain measures (e.g., heat pumps), (c) factors on marketing activities, customer outreach, and financing into the calculation of measure adoption rates, (d) the level of savings achievement and measure adoption rates by leading states (e.g., Massachusetts, Vermont, California), and (e) avoided costs of T&D, avoided costs of carbon, and NEBs in the cost-effectiveness screening.
5. MPC should consider incorporating NEBs into its cost-effectiveness analysis or at least evaluate and report NEBs (as recommended in the attached Synapse report on the evaluation of Mississippi's low income EE programs).
    a. MPC should acquire services to conduct an analysis of NEBs in MPC's area—including avoided arrearages and collection costs—and include the resulting values in the BCA. This is especially important if MPC chooses to use the TRC as the primary test. EE that produces utility-side NEBs (such as reduced collection costs) will result in lower NPVRR.
    b. MPC should incorporate NEBs in the cost-effectiveness analysis for all programs. This is especially important for LI programs. We recommend that MPC include a factor to account for NEBs in the TRC test.
6. MPC should estimate rate and bill impacts in terms of percentage of the baseline rates and bills (monthly or annual). The RIM test should not be used as it does not produce any meaningful picture of expected rate and bill impacts.
7. MPC should increase savings levels across the board, seek more comprehensive savings, and pursue longer-lived savings.

c. Reduce emphasis on/budget for EE School Kits.
d. Couple HERs with longer-lived, deep energy savings offerings to help customers manage their bills.
e. Increase comprehensive savings measure offerings for all programs, including SELECT (based on the attached Synapse report).

8. MPC should implement and scale up pilot efforts as soon as possible, and should develop offerings to target customer segments that face large barriers to implementing EE. This includes developing and implementing DR programs for non-low-income residential customers as well as for business customers.
9. Based on the attached Synapse report on the evaluation of the EnergyWise program, we have following recommendations for the SELECT program:
    f. Budget: Considering the current low level of funding for SELECT program relative to low income programs in other jurisdictions as well as the high energy burdens and high poverty rate in the state, we recommend MPC increase the budget per participant for the SELECT program.
    g. Eligible measures: MPC should consider offering all of the measures provided by EnergyWise such as HVAC, appliances, and air sealing.
    h. Customer targeting: MPC should consider using a fine geographic area to identify or target customers for SELECT. Alternatively, SELECT could use a targeting methodology focused on individual household eligibility, such as that used by EnergyWise. In particular, MPC should consider prioritizing customers or neighborhoods with mean income levels closer to 100 percent of the federal poverty level, as EnergyWise does.
    i. Repairs: MPC should conduct health and safety screening and consider providing repair work for building condition issues that will reduce the effectiveness of recommended energy efficiency measures or where such measures could result in or worsen existing health and safety problems.

VI. Public Participation

One of the Commission's "primary motivations" in adopting the Integrated Resource Planning and Reporting Rule 29 (the "IRP Rule") was:

> the desire to provide Mississippi ratepayers with more transparency regarding their utilities' long-term planning processes. A high degree of transparency provides important protection for the Commission and ratepayers against

potentially unnecessary and costly capital expenditures and long-term operational costs.[92]

The process is intended to ensure the development of "a resource plan that reflects the interests of a broad range of stakeholders - not just the utility."[93] To that end, the process "must include meaningful participation options for these stakeholders to provide input into the resource plan's development."[94]

The Commission's current rule allows utilities like Mississippi Power to avoid the transparency and fine-grained detail that are necessary for a resource plan that reflects the interests of a broad range of stakeholders, including ratepayers.

As described in detail below, Mississippi Power took full advantage of the weaknesses in the existing rule, and the result is a proposed IRP that is not a useful document and does not reflect the interests of any stakeholder except the utility. Although Sierra Club participated in the process with experienced energy lawyers and expert consultants, our experience in the MPC IRP process makes clear that additional safeguards are necessary to ensure a truly transparent and iterative process that actually "reflects the interests of a broad range of stakeholders - *not just the utility*."[95] We therefore recommend that the Commission revise the Rule, as explained below.

A. <u>The Commission should require electric utilities to make all IRP presentations and underlying data available at least 10 days before any public conference or technical conference.</u>

The stakeholder engagement process is designed to "provide Mississippi ratepayers with more transparency regarding their utilities' long-term planning processes," and to ensure a resource plan that ultimately reflects input from a broad range of interests.[96] To that end, the free flow of accurate and complete information between the electric utility, the Commission, and stakeholders is critical; and the electric utility should identify and explain the IRP's core assumptions to the public as early and as clearly as possible.

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[92] Final IRP Order at 5.

[93] *Id*. at 15 (emphasis added).

[94] *Id*. at 15 (internal quotation marks omitted).

[95] *Id*. at 15 (emphasis added).

[96] *Id.* at 5.

Unfortunately, at both the initial public workshop and the technical conference, MPC unreasonably withheld from public disclosure many of the key assumptions underlying the Company's proposed IRP until the day of the presentation or later. At the initial public workshop, for example, the Company waited until the *day of* the presentation to provide participants with a superficial, purely qualitative overview of the proposed IRP process. The Company refused to provide any quantitative data or explain any of its assumptions regarding energy demand, supply- or demand-side resources, risks, or cost assumptions. As a result, stakeholders had no opportunity to review those assumptions or provide feedback before the technical conference, just 45 days before Mississippi Power filed its IRP report. And at that point, as discussed below, the Company was already in "production mode," and it was clearly too late to influence Mississippi Power's inputs and methodologies or provide alternatives.

Mississippi Power's technical conference was similarly opaque. Although the Company later admitted that it had already selected key inputs and was in the process of developing the IRP, the Company again waited until just days before the conference to provide the stakeholders with its technical presentation. Although the parties who attended the technical conference signed an onerous non-disclosure agreement[97] with the expectation that substantive data and assumptions would be provided, the technical conference presentation was similarly lacking in substance. Indeed, the Company again provided a superficial "powerpoint" presentation without disclosing any of its underlying data inputs, methodologies, or assumptions. And because there was no meaningful opportunity to ask questions or request information, the participants were effectively precluded from scrutinizing or comprehensively evaluating the Company's IRP assumptions.

Without this information the technical workshop was at best an exercise in meeting the minimal letter of the rule and certainly did not serve to provide transparency to stakeholders or ensure an IRP that reflects public involvement.

To achieve the Commission's intent in involving stakeholders in the IRP process, the Commission should require utilties to make available to parties that have signed the nondisclosure agreement *all* underlying IRP data and modeling inputs in electronic, native and unlocked formats. Without access to the Company's actual energy demand assumptions, commodities forecasts, existing and future generation cost and capacity assumptions, and a full

[97] Mississippi Power refused to remove the provision in the NDA allowing for unlimited monetary damages, 2019-UA-231, MPC NDA Agreement, Section 10 ("The Parties agree that MPC shall be entitled to specific performance as a remedy for any breach of this Agreement. Such remedy shall not be deemed to be the exclusive remedy for any breach of this Agreement but shall be in addition to all other remedies available at law or equity."), although it has not included or removed such a provision in the past at Sierra Club's request. *E.g.,* MPC NDA, 2019-UA-116 re Plant Daniel CCR Projects, Section 10 ("No Party shall be subject to any claim for damages as a result of alleged breach of this Agreement.").

range of supply- and demand-side alternatives, it is virtually impossible for any party, including the Commission itself, to "ground truth" or thoroughly evaluate the Company's IRP assumptions and decisions.[98]

IRP practices in other jurisdictions routinely require disclosure of this type of information on a time frame that allows for meaningful input from stakeholders. As an example, in Louisiana, utilities are required, subject to legitimate confidentiality claims, to publish all of the data assumptions it intends to use in the IRP process and descriptions of scenarios the utility plans to perform before the initial public workshop.[99] This allows stakeholders an opportunity to review that information and prepare for, and participate in, the first workshop. In South Carolina, the Public Service Commission has similarly ordered utilities to make available to stakeholders the modeling inputs and the ability to perform their own modeling runs in the same capacity-expansion software as the utility. Arkansas likewise requires utilities to disclose assumptions to stakeholders, and requires the utility to run a reasonable range of IRP scenarios with assumptions selected by the stakeholders. The Commission should require Mississippi utilities to do the same.

B. <u>The Commission should extend the compressed IRP timeline, and require the utility to respond to comments</u>

As noted, the IRP process is intended "to develop a resource plan that reflects the interests of a broad range of stakeholders - not just the utility," and it must "include meaningful participation options for these stakeholders to provide input into the resource plan's development."[100] Under the current IRP Rule, however, the utility has no obligation—and as a practical matter, no time—to adopt or even meaningfully consider any stakeholder comments. The IRP Rule provides that electric utilities must conduct a technical conference "[n]o later than forty-five (45) days prior to . . . filing its Integrated Resource Plan . . . ."[101] Interested parties may then submit comments within 25 days following the workshop. As a result, even if the utility wanted to incorporate stakeholder feedback (and we have serious doubts that MPC actually wanted to do so in this case), the utility has a mere 20 days to review and incorporate often voluminous and technical comments and re-run any IRP scenarios with updated inputs.

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[98] To the extent the Company has legitimate confidentiality concerns, Mississippi Power should provide that data to "*interested parties that have executed a nondisclosure agreement*," as contemplated by Rule 29, section 105.3.

[99] Louisiana Public Serv. Comm'n Integrated Resource Planning Rules § 10.f.ii & iii, *LPSC, ex parte, In re: Development and Implementation of Rule for Integrated Resource Planning for Electric Utilities*, La. Pub. Serv. Comm'n Docket No. R-30021 (Apr. 2, 2012) ("Louisiana IRP Rules").

[100] Final IRP Order at 15.

[101] Rule 29 § 105.3.

The IRP Rule's compressed timeline effectively precludes a resource plan that "reflects the interests of a broad range of stakeholders."[102] Indeed, a cursory review of Mississippi Power's IRP makes clear that the Company did not incorporate, respond to, or even mention *a single* stakeholder recommendation. And in fact, at the February 25, 2021 technical conference, MPC representatives indicated that although they "welcome comments" on the technical presentation, the Company was already in "production mode," making clear that it was already too late to incorporate stakeholder input into the final product.

While the Commission can (and should) order Mississippi Power to revise the IRP to address the various stakeholder comments in this proceeding, the public participation provisions of the IRP Rule serve little purpose if the timeline is so compressed that the utility cannot, as a practical matter, incorporate any those comments into the final product.

To give meaning and effect to the Commission's goal of producing a resource plan that reflects a broad range of interests and concerns, Sierra Club respectfully suggests that the Commission revise the IRP Rule to extend the period of time between the technical conference and the utility's submission of its proposed IRP. This will provide the utility with a realistic opportunity to make adjustment or incorporate new assumptions in response to stakeholder comments. Moreover, as discussed below, the Commission should also require utilities to provide an explanation for its decision to adopt or reject those recommendations.

C. <u>Although electric utilities are not required to adopt stakeholder recommendations, the Commission should require the utility to explain in its initial IRP the reasons for accepting or rejecting any such comments.</u>

The Commission's goal of ensuring that the resource plan "reflects the interests of a broad range of stakeholders"[103] is further undermined by the lack of any mandate that the utilities respond to (or even consider) stakeholder or Commission Staff comments. Indeed, the utility has no obligation at any point in the process to respond to, or even consider, any such comments.[104] And as noted, Mississippi Power's IRP did not incorporate, respond to, or even mention *a single* stakeholder recommendation. In short, Mississippi Power unfortunately treated the stakeholder engagement process as a mere box-checking exercise.

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[102] Final IRP Order at 15 (emphasis added).

[103] Final IRP Order at 15 (emphasis added).

[104] *See, e.g.,* Rule 29 § 105.7 ("Utilities *may* provide a response" to any comments on the proposed IRP within 100 days) (emphasis added).

Going forward, the Commission should make clear that it expects utilities to seriously consider stakeholder comments and recommendations and provide written explanations in its draft IRP for its decision to adopt or reject those recommendations. To be clear, we do *not* suggest that Mississippi Power or any electric utility *must* adopt stakeholder recommendations. Instead, to further the Commission's goal of producing a resource plan that actually reflects a broad range of interests, the Commission should mandate that electric utilities respond to stakeholder comments in their draft resource plans, including providing explanations for accepting or rejecting those recommendations.

This is consistent with IRP practices in other jurisdictions. In Louisiana, the Public Service Commission's IRP Rules provide, for example:

> The utility will be required to consider the recommended data assumptions and sensitivity cases, but the utility will have no obligation to adopt them. Regardless of whether the utility adopts the recommendations, the utility will be required to include a section in the IRP Report documenting all of the stakeholder's recommendations and explaining the Company's reasons for accepting or rejecting each recommendation. Stakeholder involvement is intended to be a collaborative process that will provide valuable insight regarding the utility's IRP.[105]

Other states take a similar approach. Georgia and Arkansas each allow renewable and energy efficiency advocates participating in the proceeding to develop modeling inputs and assumptions that the utility must evaluate (but are not obligated to adopt) in the IRP process.[106] Requiring utilities to consider and respond to stakeholder comments does not commandeer the process; rather it ensures a resource plan that actually "reflects the interests of a broad range of stakeholders - *not just the utility*."[107]

D. <u>The Commission should mandate that utilities refrain from overly-broad confidentiality designations.</u>

As Sierra Club noted in its comments on Mississippi Power's initial public workshop and the subsequent technical conference, MPC unreasonably withheld from public disclosure many of the key assumptions underlying the Company's proposed IRP. As an initial matter, the general public was not permitted to participate in, or attend, Mississippi Power's technical conference

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[105] Louisiana IRP Rules § 10.f.ii & iii.

[106] Ark. Admin. Code 126.03.22-4(4.8).

[107] Final IRP Order at 15 (emphasis added).

without signing an onerous nondisclosure agreement that provided for money damages, even in the event of inadvertent public disclosure. Participants who did sign the nondisclosure agreement were provided a set of purportedly confidential slides which contained almost no information that was even arguably confidential or proprietary. By way of example, the Company presentation claimed that the following information, among other data, was confidential: MPC current generation resource mix, publicly-available historical capacity factors, the qualitative descriptions of modeled scenarios, potential greenhouse gas regulations, qualitative descriptions of load growth, publicly-available energy efficiency and demand side management programs, publicly- and externally-developed estimates of capital costs for generation and battery costs, the Company's process, and even language in the Commission's orders directing the Company to evaluate retiring 950 MW of excess capacity.

On March 22, 2021, the deadline for stakeholder comments on Mississippi Power's IRP technical conference, the Company finally released (apparently only to the parties on the service list in this docket) a public version of the technical conference presentation. Notably, the document does not include a single redaction, making clear that none of the information was ever properly withheld as confidential or proprietary in the first place. Indeed, MPC has never explained or even attempted to justify its confidentiality claims with respect to the technical conference.

In any event, Mississippi Power's eleventh-hour disclosure of its technical conference presentation does not cure the Company's improper initial confidentiality claims. By claiming the entirety of the technical conference confidential, the Company precluded members of the general public from asking questions or even listening to the IRP presentation. And by waiting until the day of the deadline for comments on the technical conference to release the presentation to only the parties on the service list in this docket, the Company has precluded customers and the general public from reviewing the presentation and submitting meaningful comments. Indeed, only four parties filed substantive comments on the technical conference, and each of them were forced to file their comments (or portions of the comments) under seal due to Mississippi Power's confidentiality claims.[108]

Mississippi Power's proposed IRP includes similar and overly broad confidentiality claims. Although much of the proposed plan is correctly public, MPC once again designated portions of

[108] *See* Comments of Southern Renewable Energy Association, Mississippi Power Co. Technical Conference, Mississippi PSC Docket 2019-UA-231 (filed under seal Mar. 22, 2021); Comments of Southern Alliance for Clean Energy, Mississippi Power Co. Technical Conference, Mississippi PSC Docket 2019-UA-231 (filed Mar. 22, 2021); Comments of Advanced Energy Management Alliance, Mississippi Power Co. Technical Conference, Mississippi PSC Docket 2019-UA-231 (filed Mar. 22, 2021); Comments of Sierra Club, Mississippi Power Co. Technical Conference, Mississippi PSC Docket 2019-UA-231 (filed with redactions Mar. 22, 2021).

the IRP as confidential, even though they should be public. The Company designated as confidential, for example, a report captioned, "Georgia-Alabama Efficient Electrification Energy System Assessment," which was produced by a third party and is widely available on the internet. The Company also designated as confidential a different third-party report produced three years ago for a different utility regarding achievable energy efficiency potential. Moreover, the Company designated as confidential all its resource cost forecasts, even "generic" forecasts produced by third parties.[109]

MPC's overly-broad assertions of confidentiality are not only contrary to the "primary" purpose of the IRP to provide transparency, but inconsistent with the Commission's general rules "discourage[ing] the practice of filing non-confidential information confidentially,"[110] and its requirement that "[a]ny confidential information or items that can be reasonably redacted from any document or material shall be so redacted, and the document or material shall be filed publicly."[111] The Company's NDA itself acknowledges that such publicly available data cannot be confidential.

> The term "Confidential Information" does not include information that (1) becomes available to the public other than as a result of disclosure in violation of the terms hereof by a party hereto or its representatives, (2) was available on a non-confidential basis from any source prior to its disclosure to a party hereto, (3) becomes available on a confidential basis from a source other than a party hereto or its representatives, provided that such source is not bound by a confidentiality agreement with the pertinent party or its representatives or is not otherwise prohibited from transmitting the information to the party receiving such information by a contractual, legal, or fiduciary obligation, or (4) is subsequently developed by a party hereto through its independent efforts without use of the Confidential Information.[112]

As noted, Mississippi Power's overly broad confidentiality designations put the burden on interested members of the public to pick apart what information was public for the purposes of submitting comments. And because parties were forced to sign an NDA with unlimited monetary

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[109] Mississippi Power IRP at 22-23.

[110] Rule 26 § 109.

[111] Rule 26 § 109.6.b; see also § 109.6.d ("Information that has been publicly filed in any other forum . . . . shall not be filed as confidential . . . .").

[112] 2019-UA-231, MPC NDA Agreement, Section 6.

damages in order to view this information,[113] MPC's confidentiality designations put stakeholders at potentially great financial risk for talking about publicly available information. The burden should not be on interested stakeholders to challenge each of MPC's confidentiality assertions under these circumstances; rather, MPC should take the time to redact the few numbers that it may believe are truly confidential material. These unreasonable confidentiality designations impose additional costs on parties and prevent dissemination of information to the public.

Mississippi Power's unreasonable confidentiality designations make clear that the Commission must clarify its IRP Rules to prohibit electric utilities from these overly broad designations in the future, and make all IRP presentations and underlying data publicly available on the Company's website or a cloud-based website. To the extent that MPC can make a plausible confidentiality claim for any of information presented in future IRP development documents, MPC should be required to provide the public with appropriately redacted version of that presentation. Moreover, like similar resource planning processes in other states, the Company should be required to file any confidential information to the Commission docket with an explanation for the redaction.

Recommendations

1. The Commission should revise the IRP Rule 25 § 105.2 to also provide that:

   In accordance with the requirements of any Confidentiality Agreement under Section 108, the utility shall publish on its website at least ten days before the public workshop any workshop presentation and the data assumptions it intends to use and a description of studies it plans to perform as part of its IRP process. This will allow stakeholders the opportunity to review that information and prepare for the public workshop.

2. The Commission should revise the IRP Rule 25 § 105.3 to also provide that:

   In accordance with the requirements of any Confidentiality Agreement under Section 108, at least ten days before the technical conference, the utility shall provide all participants with any presentation materials, the data assumptions it intends to use, a description of studies it plans to perform as part of its IRP process, and the results of any preliminary modeling runs performed. This will allow stakeholders the opportunity to review that information and prepare for the technical conference.

[113] *Id*, Section 10.

3. The Commission should further revise the IRP Rule 25 § 105.3 to provide:

   No later than ninety (90) days prior to an electric utility filing its Integrated Resource Plan, the electric utility shall notice and conduct a technical conference for those interested parties that have executed a nondisclosure agreement in accordance with Section 108 of this Rule. require electric utilities to conduct a technical conference at least 90 days before filing its proposed IRP.

4. The Commission should revise the IRP Rule 25 § 105.5 to also provide:

   The utility will be required to consider the recommended data assumptions and sensitivity cases, but the utility will have no obligation to adopt them. Regardless of whether the utility adopts the recommendations, the utility will be required to include an appendix to the IRP report documenting all of the stakeholder's recommendations, and explaining the Company's reasons for accepting or rejecting each recommendation. Stakeholder involvement is intended to be a collaborative process that will provide valuable insight regarding the utility's IRP.

5. The Commission should revise the IRP Rule 25 § 108 to explicitly incorporate Commission Rule 26 § 109, making clear that:

   Utilities may not file non-confidential information confidentially, and any confidential information or items that can be reasonably redacted from any document or material shall be so redacted, and the document or material shall be filed publicly. To the extent that an electric utility asserts a claim of confidentiality, the utility shall file the material under seal in the Commission docket and include an explanation of the basis for the redaction or withholding sufficient to allow the Commission to evaluate the reasonableness of the utility's confidentiality claim.

CERTIFICATE OF SERVICE

I, Robert B. Wiygul, counsel for Sierra Club do hereby certify that in compliance with RP6.122(2) of the Commission's Public Utilities Rules of Practice and Procedure (the "Rules").

(1) An electronic copy of the filing has been filed with the Commission via e-mail to the following address: efile.psc@psc.state.ms.us

(2) An electronic copy of the filing has been served via e-mail to the following address:

See attached Exhibit A

This the 14tth day of June, 2021.

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