STATE OF WISCONSIN

BEFORE THE
PUBLIC SERVICE COMMISSION OF WISCONSIN

Application of Wisconsin Public Service Corporation for Authority to Adjust Electric and Natural Gas Rates	**)** **)** **)** **)** **)** **)** **)** **)**	**DOCKET NO. 6690-UR-128**

DIRECT TESTIMONY OF LUCY METZ

ON BEHALF OF

SIERRA CLUB

August 19, 2024

PUBLIC – REDACTED VERSION

TABLE OF CONTENTS

LIST OF TABLES 3

LIST OF FIGURES 3

1. Introduction and purpose of testimony 4

2. Findings and recommendations 9

3. Introduction to WPS's coal assets and capacity position 11

4. Utilization levels have been declining and outage rates rising at Weston Units 3 and 4 in recent years 19

5. Weston 3 and 4 have had marginal to declining economic performance in recent years, and WPS has conducted no analysis to justify continued reliance on the units 25

6. Continued reliance on the Weston units will likely increase costs and risks to ratepayers relative to reliance on alternatives 32

   i. WPS will reduce costs and risks to ratepayers with early retirement of Weston 3 and 4 32

   ii. Procurement of alternative resource options to replace Weston 3 and 4 will likely reduce costs for WPS ratepayers 36

7. Long-term planning should be an integral part of rate case proceedings in Wisconsin 44

LIST OF TABLES

Confidential Table 1. WPS projected energy mix in 2025 12

Confidential Table 2. WPS net capacity position under SAC framework....13

Confidential Table 3. Summary of Weston 3 and 4....15

Table 4. Weston net book value....17

Table 5. Test-year expenditures at Weston 3 and 4 18

Confidential Table 6. Test-year capacity factors of West 3 and 4....22

Confidential Table 7. WPS projection of variable margin at Weston 3 30

Confidential Table 8. WPS projection of variable margin at Weston 4 30

Confidential Table 9. WPS resource additions 2019–2024 39

Table 10. Replacement resource costs from the NREL Annual Technology Baseline (2024$) 41

Table 11. WPS costs for solar added during test years....42

LIST OF FIGURES

Figure 1. Historical capacity factors of Weston 3 and 4....20

Figure 2. Historical forced outage rates at Weston 3 and 4 compared to the national average 23

Confidential Figure 3. Weston 3 historical net revenue 27

Confidential Figure 4. Weston 4 historical net revenue (WPS share of unit)....28

Figure 5. Historical levelized cost of energy for wind and solar PV technologies....38

1. INTRODUCTION AND PURPOSE OF TESTIMONY

Q Please state your name and occupation.

A My name is Lucy Metz. I am an Associate at Synapse Energy Economics, Inc. ("Synapse"). My business address is 485 Massachusetts Avenue, Suite 3, Cambridge, Massachusetts 02139.

Q Please describe Synapse Energy Economics.

A Synapse is a research and consulting firm specializing in energy and environmental issues, including electric generation, transmission, and distribution system reliability, ratemaking and rate design, electric industry restructuring and market power, electricity market prices, stranded costs, efficiency, renewable energy, environmental quality, and nuclear power.

Synapse's clients include state consumer advocates, public utilities commission staff, attorneys general, environmental organizations, federal government agencies, and utilities.

Q Please summarize your work experience and educational background.

A At Synapse, I conduct analysis and write publications on a variety of topics related to power plant economics and integrated resource planning. I regularly support the development of comments and testimony in litigated dockets across the country, including performing analyses of electric power systems using industry-standard models such as EnCompass and spreadsheet tools. I recently co-sponsored testimony before the Georgia Public Service Commission and have

assisted in the preparation of testimony in several other jurisdictions, including Indiana, Florida, and Virginia.

I hold a Bachelor of Science in Engineering Science from Smith College. A copy of my current resume is attached as Ex.-SC-Metz-1.

Q On whose behalf are you testifying in this case?

A I am testifying on behalf of Sierra Club.

Q Have you previously testified before the Public Service Commission of Wisconsin ("Commission")?

A No.

Q What is the purpose of your testimony in this proceeding?

A The purpose is to review the economics of Wisconsin Public Service Corporation's ("WPS" or "Company") coal units that are not slated for near-term retirement, and to determine whether the continued operation of these units is in the best interest of ratepayers. Specifically, I focus on the economics of Weston Power Plant Units 3 and 4 ("Weston 3" and "Weston 4," respectively). I evaluate the units' recent historical performance and how they are likely to perform going forward, and I discuss the cost and avoided risks from alternatives. I then provide my recommendations for WPS to commit to retirement or conversion dates for the units and proactively work to procure replacement resources. Finally, I recommend that the Commission require more robust long-term planning as part of rate cases going forward.

Q Why focus your testimony on the Company's coal units?

A WPS's rate case application and initial testimony did not address the economic performance of its coal units or otherwise provide analysis to justify its plans to operate Weston 3 through 2031 and convert Weston 4 to gas operation rather than retire and replace it. WPS's ratepayers would benefit from a more rigorous examination of the ongoing economic benefit of operating these two coal units. Solar and wind alternatives have zero marginal cost and are increasingly cheaper sources of energy than legacy fossil resources such as coal plants. WPS itself is adding solar to its portfolio to capture these benefits. Coal units typically have large fixed costs that do not vary with generation levels. They are also slow to ramp up and down and inflexible—they cannot be turned on and off to respond to hours- or even day-long peaks in load or demand. Therefore, coal units are economically efficient only where they are economically competitive in the MISO market over extended periods of time. But that is rarely true anymore. WPS data shows that Weston 3 had a capacity factor of 19 percent in the past year—meaning ratepayers incurred the costs associated with maintaining a baseload plant for the services of a peaker plant. Despite the declining performance of the units, WPS does not appear to have assessed their economics or started to plan proactively for their replacement. There are more economic ways to get peaking capacity and energy services than from Weston 3.

Q Does it appear that continued operation of Weston 3 and 4 is beneficial to ratepayers?

A No. The costs of fuel, operations and maintenance (O&M), and ongoing capital additions for Weston 3 exceed the value of its energy output and capacity in the MISO market, and Weston 4 has earned only marginal net revenues in years without the impacts of COVID and energy market price spikes to help its economics. WPS

ratepayers would have been better off in 2023 relying on the MISO capacity and energy markets rather than on Weston 3. More importantly, this is likely to be true for Test Years 2025 and 2026 and until WPS retires Weston 3.

Q How should WPS have responded to these findings about the units' economics?

A WPS should have been tracking Weston 3's all-in, avoidable costs either relative to the market or to other alternatives on a regular basis, especially as its utilization dropped. The MISO energy and capacity markets provide an important signal to utilities about the relative cost of a generating unit to market alternatives. Where a utility is regularly paying more to maintain and operate a unit than it would to purchase equivalent energy and capacity, that should trigger resource planning analysis. Resource planning analysis considers the forward-looking, avoidable cost of existing generation resources, the cost of alternatives, the grid services each provide, and the services the grid actually needs. If an existing unit is costly to operate, then retiring and replacing the unit will benefit ratepayers by reducing the overall cost of providing electrical service. Issuing All-Source Requests for Proposals (RFPs) that include power purchase agreements as well as self-build options is important to provide the costs of those alternatives to the existing unit.

WPS's failure to assess the continued economic viability of Weston 3—and the cost of alternatives—after several sustained years or net revenues losses (2018–2020) passed on to ratepayers was imprudent. WPS's own forecasts indicate that Weston 3 will have [redacted]) in the test year. The Commission should direct WPS to conduct retirement planning to identify replacement resources. As long as WPS delays, ratepayers will be on the hook for

all excessive costs associated with Weston 3 and Weston 4. All of these are avoidable with prudent resource planning analysis.

Q How is your testimony structured?

A In Section 2, I summarize my findings and recommendations for the Commission.

In Section 3, I describe Weston 3 and 4 and discuss WPS's current plans for the units. I also summarize WPS's resource portfolio and its capacity position.

In Section 4, I summarize my analysis of the historical utilization and economic performance of each unit based on data I received from the Company and discuss WPS's minimal efforts to evaluate the forward-going economics of the units.

In Section 5, I discuss the costs and risks that WPS could avoid by retiring the units, and I recommend steps the Company should take to determine optimal retirement dates for the units and to proactively procure replacement resources.

In Section 6, I outline why WPS's existing long-term planning processes are insufficient. I also recommend analyses that the Commission should require WPS to include in its rate case applications to justify test-year spending going forward.

Q What documents do you rely upon for your analysis, findings, and observations?

A My analysis relies primarily upon the workpapers, exhibits, and discovery responses provided by WPS, as well as publicly available data.

2. FINDINGS AND RECOMMENDATIONS

Q Please summarize your findings.

A My primary findings are:

1. Weston 3 and 4 have seen declining utilization over the past six years. Weston 3 in particular operated with low capacity factors and higher-than-average outage rates over this time period.
2. Weston 3 was uneconomic to operate relative to the market in four out of the past six years (i.e., the costs of fuel, O&M, and ongoing capital additions exceeded the market value of its energy output and capacity). Weston 4 saw only marginally positive net revenue over the same time period. There is no reason to think that either unit's economic performance will improve going forward.
3. Weston 3 is projected to earn [redacted] This means the unit [redacted].
4. Given that Weston 3 is already more expensive to operate than market alternatives, it is in the public interest to retire this unit as soon as replacement generation is available. Replacing Weston 3 will save ratepayers money even if ratepayers continue to pay depreciation costs on the unit after its retirement.
5. At no point in the past six years has WPS analyzed whether the Weston units are projected to continue to provide value to ratepayers relative to alternatives. This does not reflect prudent resource planning practices and indicates that the Company has not justified its request to include in test-year rates the costs associated with operating and maintaining the units.

6. Replacing Weston 3 and 4 with alternative generation would likely save ratepayers money and would reduce their exposure to risk from fuel price volatility, coal market contraction, and environmental regulation. Specifically, [redacted] at Weston 3.
7. WPS's existing processes for long-term planning, including its processes for establishing unit retirement dates and procuring replacement resources, are inadequate. The Company needs to evaluate the economics of existing resources it includes in test-year costs to justify that the Company's test-year costs are consistent with prudent utility practices over the long term.

Q Please summarize your recommendations.

A Based on my findings, I offer the following recommendations:

1. WPS should commit to a retirement date for Weston 3 of no later than 2031.
2. WPS should analyze whether an earlier retirement date for Weston 3 would be more economic than the one it has proposed (2031) and whether replacing Weston 4 with other resources would be more cost-effective than converting it to operate on gas.
3. The Commission should warn WPS that cost recovery for Weston 3 and possibly Weston 4 in any future rate case will be contingent on a showing that incremental investments and operating costs are justified by the continued operation of the resources.
4. The Commission should require WPS to demonstrate in a supplemental filing that it is taking measures required to retire or repower these units, such as transmission studies and procurement of replacement resources.

5. WPS should proactively procure replacement resources for the units, including both self-owned and resources procured through power purchase agreements, and should issue All-Source Requests for Proposals (RFPs) to open up the process to wind, solar, and battery energy storage system (BESS) resources from the market.
6. The Commission should direct WPS to include more robust long-term planning in its future rate case applications to ensure that WPS is utilizing lowest-cost resources to meet its capacity and customer service obligations.

3. INTRODUCTION TO WPS'S COAL ASSETS AND CAPACITY POSITION

Q What is WPS proposing in this docket related to Weston 3 and 4?

A WPS is seeking approval to include in rates the costs to operate and maintain Weston 3 and 4, including sustaining capital expenditures and O&M costs incurred during the test years. WPS is also requesting approval of its fuel cost plan for 2025, which includes costs to test gas co-firing at Weston 4 as well as the ongoing fuel costs to operate Weston 3 and 4.[1]

Q What are the application test years?

A The application is based on two forward-looking test years, calendar year 2025 and calendar year 2026.[2]

[1] Direct-WPSC-Gerlikowski-c at 10.

[2] Ex.-WPSC-Application: WPSC Application Filing Letter at 1.

Q Provide an overview of WPS's resource portfolio.

A [redacted] of WPS's annual generation is from company-owned coal and gas resources, and [redacted] is from solar and wind (Confidential Table 1). The remainder is from hydro [redacted]) and net purchases [redacted] WEC Energy Group, the parent company of WPS, has pledged to exit coal by 2032.[3] It also has a goal to reduce the greenhouse gas emissions from its generation fleet 80 percent below 2005 levels by 2030 and to be net zero by 2050.[4]

Confidential Table 1. WPS projected energy mix in 2025

Resource type	Generation (MWh)	Percent of Total Generation
Coal	[redacted]	[redacted]
Gas	[redacted]	[redacted]
Hydro	[redacted]	[redacted]
Wind	[redacted]	[redacted]
Solar	[redacted]	[redacted]
Net purchases	[redacted]	[redacted]

Source: Company response to PSC-Field-AJF-6.2, "Response-Data Request-PSC-Field-AJF-6.2 Attach 03 CONFIDENTIAL.xlsx."[5]

[3] Ex.-SC-Metz-32. (WEC Energy Group, Inc. 2023. "2023 Third Quarter Earnings." Available at: https://s22.q4cdn.com/994559668/files/doc_earnings/2023/q3/generic/2023-Q3-WEC-Earnings-Package-Final.pdf.)

[4] Ex.-SC-Metz-2 (WEC Energy Group. 2022. *Pathway to a Clean Energy Future: 2022 Climate Report.* Available at: https://www.wecenergygroup.com/csr/climate-report2022.pdf.)

[5] Ex.-SC-Metz-3c.

Q Provide an overview of WPS's current and projected capacity position.

A WPS operates under the Midcontinent Independent System Operator (MISO), which sets utility capacity obligations under its recently implemented seasonal accredited capacity (SAC) framework. Under the framework, utilities must own or obtain accredited capacity in each season equal to their demand obligation in that season plus a reserve margin. WPS projects that it will have accredited capacity [redacted] (Confidential Table 2).

Confidential Table 2. WPS net capacity position under SAC framework

Season	2024/ 25	2025/ 26	2026/ 27	2027/ 28	2028/ 29	2029/ 30	2030/ 31	2031/ 32	2032/ 33	2033/ 34	2034/ 35
Summer	[redacted]										
Fall	[redacted]										
Winter	[redacted]										
Spring	[redacted]										

Source: Company response to 02-SC-07, "Response-Data Request-Sierra Club-SC-2.07 CONFIDENTIAL Attach 01.xlsx." MISO planning years run from June 1 to May 31 of the following year.[6]

Q Provide an overview of the Company's coal units.

A WPS currently owns shares in four coal units. My testimony focuses on Weston 3 and 4, which I describe in more detail below. WPS also owns a minority share in

[6] Ex.-SC-Metz-19c.

two coal units at the Columbia Energy Center (Units 1 and 2), which are scheduled to retire in 2026.[7]

Q Please describe the Weston Power Plant in more detail.

A The Weston Power Plant is located in central Wisconsin. It has two remaining coal units, Weston 3 and 4 (Confidential Table 3). Weston 3 is a 350.5 MW coal steam unit that began operating in 1981. WPS owns the unit in its entirety[8] and added a Regenerative Activated Coke Technology (ReACT) system to the unit in 2016 to control sulfur dioxide (SO_2), nitrogen oxides (NO_x), and mercury emissions.[9] The ReACT system uses activated coke pellets to adsorb pollutants, removing them from the unit's exhaust stream.[10]

Weston 4 is a 595 MW supercritical coal steam unit that began operating in 2008. WPS has a 70 percent ownership share of the unit, and Dairyland Power Cooperative owns the remaining 30 percent.[11] Each owner is responsible for dispatch decisions affecting its share of the unit.[12] As the majority owner, WPS makes operational decisions about the unit and initiates long-term planning decisions "while involving the minority owner, Dairyland Power Cooperative, in

[7] U.S. Energy Information Administration (EIA) 860 2023 Early Release data. Any information contained in this citation, based solely on this citation, is not record evidence. (NRE).

[8] Ex.-SC-Metz-5 (Response-Data Request-Sierra Club-SC-2.01).

[9] Ex.-SC-Metz-6 (WPS, Weston 3 ReACT emission control project, https://www.wisconsinpublicservice.com/environment/react).

[10] *Id.*

[11] Ex.-SC-Metz-5 (Response-Data Request-Sierra Club-SC-2.01).

[12] Ex.-SC-Metz-5 (Response-Data Request-Sierra Club-SC-2.02).

the impacts to operation and decision on proceeding."[13] The "operational decisions" that WPS refers to are most likely decisions about unit commitment, i.e., decisions about whether to bring the unit online. In contrast, dispatch refers to decisions about what level to run the unit at once it has been brought online.

In 2023, WPS added seven reciprocating internal combustion engine (RICE) gas units with a combined capacity of 128 MW to the Weston site.[14] It co-owns the units with We Energy, another subsidiary of WEC Energy Group. [15]

Confidential Table 3. Summary of Weston 3 and 4

Unit	Nameplate Capacity (MW)	Summer Accredited Capacity (MW)	In-Service Year	Planned Retirement Year	WPS Ownership Share
Weston 3	350.5	[redacted]	1981	2031	100%
Weston 4	595	[redacted]	2008	None	70%

Sources: Company responses to 02-SC-01, 02-SC-03, and 02-SC-20 (b) CONFIDENTIAL; WPS, Weston Power Plant, https://www.wisconsinpublicservice.com/company/weston.[16]

[13] *Id.*

[14] Ex.-SC-Metz-7 (WPS, Weston RICE units begin full operation, https://wps.myenergysites.com/news/Energy-Insights/weston-rice-units-begin-full-operation).

[15] *Id.*

[16] Ex.-SC-Metz-4c (Response-Data Request-Sierra Club-SC-2.20 CONFIDENTIAL); Ex.-SC-Metz-5 (Response-Data Request-Sierra Club-SC-2.01, Response-Data Request-Sierra Club-SC-2.03); Ex.-SC-Metz-8.

Q What is the Company's plan for Weston 3 and 4?

A WPS plans to retire Weston 3 in 2031.[17] The Company has not established a retirement date for Weston 4 and instead intends to convert Unit 4 to operate on gas.[18] WPS indicated that it plans to begin testing gas co-firing at the unit as soon as it obtains the necessary air permit.[19] It will initially test a blend of 10 percent gas by heat input, which can be done using existing equipment at the unit, and will fully convert Weston 4 to gas by 2030.[20] WPS hired Black & Veatch to perform an engineering study of the equipment upgrades that would be necessary to enable full gas conversion.[21]

Q What is the undepreciated balance at each plant?

A In discovery, WPS stated that it does not track plant balance by unit.[22] It did provide data for the Weston Power Plant as a whole (Table 4). Weston 3 and 4 have a total undepreciated balance of $767 million, including $285 million for the ReACT pollution control system at Weston 3.

[17] Ex.-SC-Metz-5 (Response-Data Request-Sierra Club-SC-2.03).

[18] *Id.*; Ex.-SC-Metz-9 (Response-Data Request-PSC- Field-AJF-2.04_CONFIDENTIAL (Redacted Copy)).

[19] Ex.-SC-Metz-9 (Response-Data Request-PSC- Field-AJF-2.04_CONFIDENTIAL (Redacted Copy)).

[20] *Id.*

[21] Ex.-SC-Metz-10 (Data Request-Sierra Club-SC-2.13 Attach 2" (REDACTED COPY)).

[22] Ex.-SC-Metz-5 (Response-Data Request-Sierra Club-SC-2.18).

Table 4. Weston net book value

Category	Net Book Value
Weston	$477,598,000
Weston Land	$4,062,000
Weston REACT	$285,491,000
TOTAL	$767,152,000

Source: Company response to 02-SC-18 (b), "Sierra Club-SC-2.18 Attachment 01.xlsx." Net book value includes accumulated cost of removal. WPS did not specify whether the Weston net book value includes the RICE units in addition to Weston 3 and 4.[23]

Q Why are the undepreciated balances of the units significant?

A Utilities set depreciation schedules based on the anticipated useful life of an asset. WPS calculated depreciation expenses for this rate case filing using depreciation rates from its most recent depreciation proceeding, Docket 6690-DU-105.[24] That docket relied on a 2019 depreciation study that assumed a book life of 60 years for Weston 3 and 42 years for Weston 4, meaning that the units would not be fully depreciated until 2041 and 2050, respectively.[25]

Utilities often view a large undepreciated balance as a barrier to retiring a unit before its originally planned date. They may keep units in rate base even when they are uneconomic or no longer providing value to ratepayers to ensure the undepreciated balances can be recovered.

[23] Ex.-SC-Metz-11 (Response-Data Request-Sierra Club-SC-2.18 Attach 01)

[24] Direct-WPSC-Zgonc at 26.

[25] Final Decision at PSC REF: 426885; Ex.-SC-Metz-12 (Response-Data Request-Sierra Club-SC-2.17 Attach 01.pdf).

Importantly, retirement decisions should be based on forward-going costs only. There are alternative rate mechanisms that the Company can use to address undepreciated balances, and this issue should be dealt with separately from the decision to retire a unit.

Q What costs associated with each unit are included in the test year?

A WPS included $14 million in capital expenditures and $33 million in O&M at Weston in its Test Year 2025 expenditures (Table 5). In Test Year 2026, it included $7.5 million in capital expenditures and $32 million in O&M. These costs are comparable to the Company's annual spending at Weston 3 and 4 in recent years; between 2021 and 2023, annual capex at the units ranged between $5.7 million and $18.4 million, and O&M ranged between $25.2 million and $30.0 million ($2023).[26]

Table 5. Test-year expenditures at Weston 3 and 4

	Test Year 2025		Test Year 2026	
Unit	**Capital Expenditures**	**O&M**	**Capital Expenditures**	**O&M**
Weston 3	$3,337,463		$3,090,000	
Weston 4	$6,530,670		$2,930,388	
Shared	$4,186,447	$33,355,498	$1,502,544	$31,736,133
Total	**$14,054,580**	**$33,355,498**	**$7,522,932**	**$31,736,133**

Source: Company response to 02-SC-18, "Response-Data Request-Sierra Club-SC-2.18 Attach 01.xlsx."[27]

[26] Ex.-SC-Metz-11 (Response-Data Request-Sierra Club-SC-2.18 Attach 01.xlsx); adjusted for inflation using GDP implicit price deflators from the Federal Reserve Bank of St. Louis, available at: https://fred.stlouisfed.org/series/GDPDEF.

[27] *Id.*

4. UTILIZATION LEVELS HAVE BEEN DECLINING AND OUTAGE RATES RISING AT WESTON UNITS 3 AND 4 IN RECENT YEARS

Q How has WPS utilized Weston 3 and 4 in recent years?

A The capacity factors of Weston 3 and 4 decreased from 2018 to 2023 (Figure 1). Utilization of Weston 4 fell from 75 percent in 2018 to 63 percent in 2023, while at Weston 3, utilization dropped from 39 percent in 2018 to only 19 percent in 2023. These reductions were driven by a combination of increased hours spent in outage—the equivalent availability factor (EAF) of both units declined over this time period[28]—and reduced economic competitiveness, especially for Weston 3, leading to lower dispatch levels during periods when the unit was available. The capacity factors of both units increased temporarily in 2021 as a result of market disruptions caused by the COVID-19 pandemic and the war in Ukraine, but then declined again in the following years.

The capacity factor of Weston 3 was particularly low in 2023. The unit had a capacity factor [redacted] It spent [redacted] percent of the hours in April, May, June, and December in outage.[30] [redacted] In the other months, [redacted]

[28] Ex.-SC-Metz-13 (Response-Data Request-Sierra Club-SC-2.19 e, g, h.xlsx.)

[29] Ex.-SC-Metz-14c (Response-Data Request-Sierra Club-SC-2.29 CONFIDENTIAL Attach 01.xlsx.)

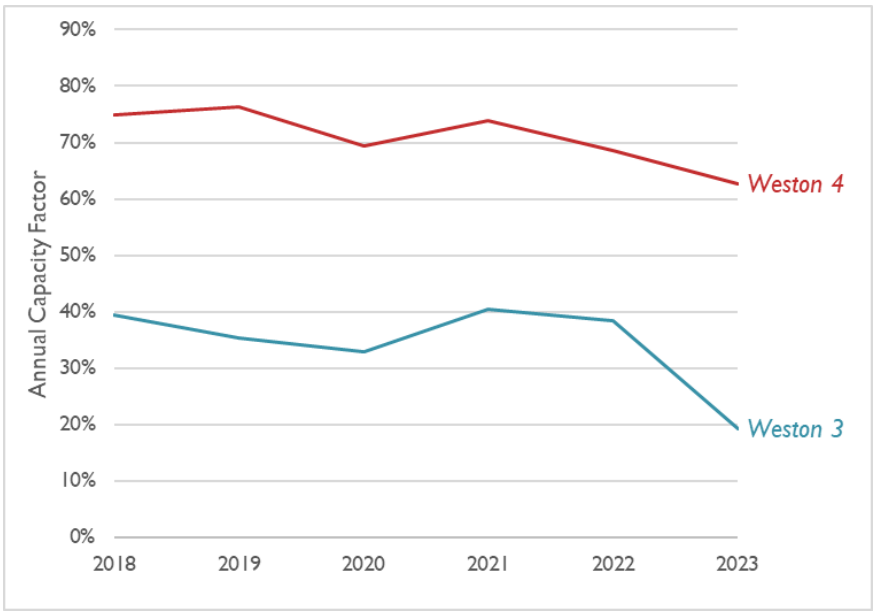
[30] *Id.*

[31] *Id*.

[redacted]

[redacted]

Figure 1. Historical capacity factors of Weston 3 and 4



Source: Company response to 02-SC-19, "Response-Data Request-Sierra Club-SC-2.19 c,d,f,k.xlsx."[33]

Q How does WPS project that Weston 3 and 4 will perform going forward?

A For Weston 3, WPS projects an [redacted] for Test Year 2025, in part because the plant [redacted] for Test Year 2026 (Confidential Table 6). Company Witness Gerlikowski notes that projected coal generation in 2025 decreased by [redacted] compared to WPS's 2024

[32] *Id.*

[33] Ex.-SC-Metz-15.

fuel order, in part because of decreased generation at Weston 3 resulting from lower LMPs.[34] In other words, the Company acknowledges in its filing that Weston 3 is becoming less competitive relative to the market than in previous years and this trend is projected to continue.

Over the long term, WPS projects that the capacity factor of Weston 3 will drop even further. The PLEXOS modeling provided by the Company shows the capacity factor of Weston 3 dropping below 10 percent in 2025.[35] Strikingly, this result is consistent across all 46 scenarios and sensitivities included in the results file.[36] Capacity factors fall to near-zero levels in subsequent years until the unit finally retires at year-end 2031.[37] The retirement dates were programed in, and it is likely that if the model had been allowed to select an earlier retirement year for the unit, it would have done so.[38]

For Weston 4, WPS projects that the [redacted] (Confidential Table 6). The PLEXOS modeling provides limited insight on the long-term utilization of the unit since it does not include the gas conversion, but it similarly shows high near-term

[34] Direct-WPSC-Gerlikowski-c at 13.

[35] Ex.-SC-Metz 16 (PLEXOS modeling output produced in Docket 5-BS-276, WPS HN PLEXOS Output (3 of 3).xlsx, PSC REF# 503309).

[36] *Id*.

[37] *Id*.

[38] Ex.-SC-Metz-17 (Response-Data Request-Sierra Club-SC-2.09 CONFIDENTIAL Attach 01.pdf) at 24.

utilization in the range of 74–82 percent in the 2020s and 45–75 percent in the 2030s.[39]

Confidential Table 6. Test-year capacity factors of West 3 and 4

Unit	Actual 2023	Test Year 2025	Test Year 2026
Weston 3	[redacted]	[redacted]	[redacted]
Weston 4	[redacted]	[redacted]	[redacted]

Source: Company response to PSC-Field-AJ-6.2, "Response-Data Reqest-PSC-Field-AJF-6.2 Attach 03 CONFIDENTIAL.xlsx"; Company response to FCP (DM-02), "FCP (DM-02) CONFIDENTIAL Attach 02.xlsx"; and Company response to 02-SC-19, "Response-Data Request-Sierra Club-SC-2.19 c,d,f,k.xlsx."[40]

A How reliable have Weston 3 and 4 been in recent years?

A Weston 3 in particular has not been very reliable. The forced outage rate at Weston 3 increased substantially over the past six years, more than doubling between 2018 and 2023 (Figure 2). The unit's forced outage rate was higher than the national average for coal units every year except for 2019, and it rose as high as 26 percent in 2023. In contrast, Weston 4 generally has a low forced outage rate that compares favorably with the fleet average.

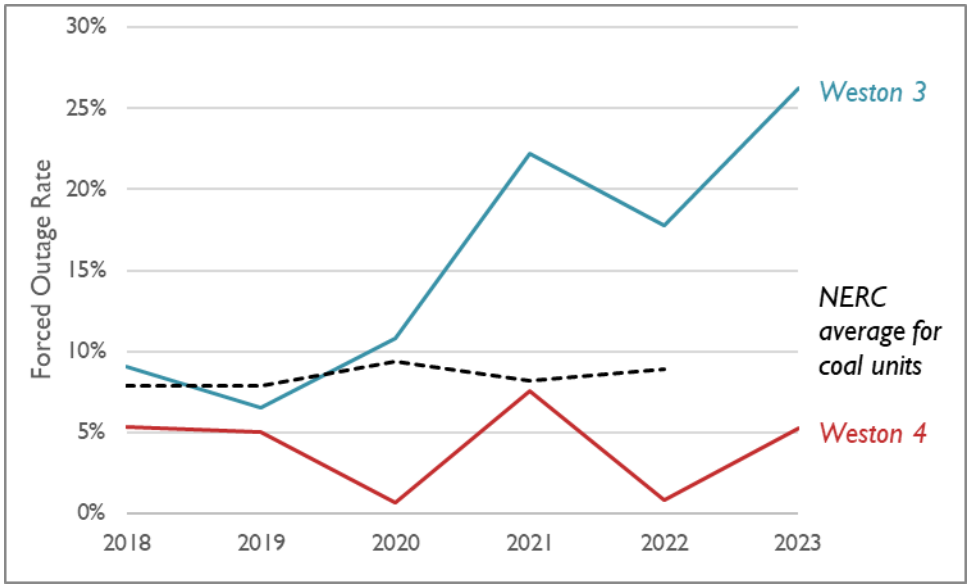
Weston 3 is an old unit and slated for retirement. Given its age, it is expected to have a higher outage rate than a comparable newer resource. Additionally, best practices are to minimize capital investments as a unit approaches retirement. What is concerning is that the plant's force outage rate is so high that it is not likely to be available around a quarter of the time it is needed. But WPS continues to maintain the plant for capacity purposes. A plant that is too uneconomic to

[39] Ex.-SC-Metz 16 (PLEXOS modeling output produced in Docket 5-BS-276, WPS HN PLEXOS Output (3 of 3).xlsx, PSC REF# 503309). Results presented here are for Cases 7a and 8a.

[40] Ex.-SC-Metz-3c; Ex.-SC-Metz-18c; Ex.-SC-Metz-15.

continue to invest in but also too unreliable to rely on for capacity should be retired and replaced.

Figure 2. Historical forced outage rates at Weston 3 and 4 compared to the national average



Sources: Company response to 02-SC-19, "Response-Data Request-Sierra Club-SC-2.19 e, g, h.xlsx" and North American Electric Reliability Corporation (NERC) Generating Unit Statistical Brochures for 2018–2022.[41]

Q Is WPS likely to see an improvement in the utilization or outage rates at its coal units going forward?

A No. Coal units like Weston 3 and 4 are increasingly unable to compete economically, as illustrated by the units' declining capacity factors and negative to marginal net revenues (discussed next). Rising levels of renewables and other zero-marginal cost and low-operating cost resources are pushing coal units out of

[41] Ex.-SC-Metz-13; Ex.-SC-Metz-20.

the baseload role for which they were designed and into load-following roles that they are poorly suited to fill.

A recent analysis by the North American Electric Reliability Corporation (NERC) found that coal units' equivalent forced outage rates tend to increase as their capacity factors decrease, especially once the capacity factor drops below 60 percent.[42] This effect is partially driven by increased forced outage hours, but NERC finds that it is also a result of increased time spent in planned and maintenance outages, leading to decreased service hours.[43] Both of these factors (increased forced outage hours and decreased service hours) are likely driven by the same cause: Coal units that operate at low capacity factors are acting as load-following resources, which requires more cycling than these units were designed for. Cycling (ramping up and down and startup/shutdown) causes physical damage to coal units through several mechanism, including thermal fatigue, thermal expansion, corrosion-related issues, fireside corrosion, and rotor bore cracking.[44]

[42] Ex.-SC-Metz-21 at 59 (North American Electric Reliability Corporation. 2024. *2024 State of Reliability: Technical Assessment of 2023 Bulk Power System Performance.* Available at: https://www.nerc.com/pa/RAPA/PA/Performance%20Analysis%20DL/NERC_SOR_2024_Technical_Assessment.pdf.)

[43] *Id*.

[44] Ex.-SC-Metz-22 (Hesler, S. 2011. "Mitigating the Effects of Flexible Operation on Coal-Fired Power Plants." *POWER.* Available at: https://www.powermag.com/mitigating-the-effects-of-flexible-operation-on-coal-fired-power-plants/)

Q What does Weston 3's low capacity factor signal about its economic value to WPS customers?

A Weston 3's low capacity factor speaks to its lack of economic competitiveness and low reliability. WPS is primarily using the unit for its capacity rather than as a baseload energy resource, which is the role it was designed to fill. Coal units are not suitable to act as peaking resources because they have high fixed costs, cannot ramp quickly, and incur physical damage from frequent cycling. This leads to high costs per megawatt-hour and high outage rates when the units are forced into load-following roles. Below, I discuss the recent economic performance of the units in more detail.

5. WESTON 3 AND 4 HAVE HAD MARGINAL TO DECLINING ECONOMIC PERFORMANCE IN RECENT YEARS, AND WPS HAS CONDUCTED NO ANALYSIS TO JUSTIFY CONTINUED RELIANCE ON THE UNITS

Q Please summarize your findings in this section.

A Weston Unit 3 incurred avoidable costs in excess of market value in the years (2018–2020) leading up to the COVID-19 pandemic and war in Ukraine, while Weston Unit 4 performed marginally with market revenues trending downward during the same time and becoming negative by 2020. After the energy price spikes associated with the pandemic and war subsided in 2023, Unit 3 continued to be uneconomic, and WPS analysis projects that Unit 3 [redacted] During this time that the units were performing uneconomically and marginally, WPS did not conduct any analysis to determine whether the units could be retired and replaced at a lower cost to ratepayers. This lack of analysis and failure to plan proactively has likely resulted in excess costs for ratepayers during 2023 and 2024 as well as the Test

Years that were avoidable with more prudent resource planning. WPS now plans to retire Weston 3 by 2031, but given the unit's recent and near-term projected economic performance, it is in ratepayers' best interest to retire Unit 3 as soon as WPS can procure replacement resources.

Q Describe the units' financial performance in recent historical years.

A Weston 3 incurred costs in excess of its market energy and capacity value during four out of the past six years (Confidential Figure 3). This means that it cost ratepayers more to operate Weston 3 than to purchase an equivalent amount of energy and capacity from the MISO market. The years 2021 and 2022 were exceptions in which Weston 3 showed positive net value. However, these results were driven by the impacts of the COVID-19 pandemic and the war in Ukraine, which are unusual circumstances that are not expected to continue going forward. Confidential Figure 3 includes the avoidable cost incurred in each year (and the revenue earned in that year) and does not include the depreciation expenses for past sunk costs.

Weston 4 earned marginal net revenue over the same time period, except in 2021–2022, when it saw increased revenue for the same reasons as Weston 3 (Confidential Figure 4).

Confidential Figure 3. Weston 3 historical net revenue

Sources: Fuel costs from WPS response to 02-SC-19 (k), "Attachment Response-Data Request-Sierra Club-SC-2.19 c,d,f,k.xlsx"; O&M and capital expenditures from WPS response to 02-SC-18 (c), "Attachment Response-Data Request-Sierra Club-SC-2.18 Attach 01.xlsx"; energy market revenues from WPS response to 02-SC-19 (l); capacity value calculated from MISO Market Reports of Planning Resource Auction Results 2018-2025 and CONFIDENTIAL Installed Seasonal Capacity from WPS response to 02-SC-19 (a).[45]

[45] Ex.-SC-Metz-15; Ex.-SC-Metz-11; Ex.-SC-Metz-4c (Response-Data Request-Sierra Club-SC-2.19 (a), (l)); Ex.-SC-Metz-23 at 25.

Confidential Figure 4. Weston 4 historical net revenue (WPS share of unit)

Sources: See Confidential Figure 4.

Q Explain the methodology that you used to develop this historical analysis.

A For both units, I summed historical fuel costs, O&M costs, and capital expenditures to find total historical unit costs. WPS does not track O&M costs separately by unit, so I allocated these costs based on unit capacity. For O&M and sustaining capex, WPS only provided data for 2021–2023, so I assumed that costs from 2018–2020 were comparable (in real dollars) to 2021–2023. I used energy revenue data reported by WPS. To estimate the capacity value that the units provided to WPS, I used Planning Reserve Auction prices for MISO Zone 2. Although the capacity market in MISO is a short-term (one year) residual auction, and is therefore not a true long-term replacement option, the capacity prices provide a reasonable proxy for capacity value. Full alternative analysis by the Company is required to determine the value of a permanent replacement capacity resource.

Q Did the unit's negative and marginal operations prior to 2021 trigger any economic evaluation or unit retirement analysis?

A No. WPS acknowledged in discovery that it has not, at any point in the last decade (as part of any rate case), evaluated whether operating Weston Units 3 and 4 was the least-cost option for meeting its customers' energy needs and MISO capacity obligations.[46] That means that WPS has not evaluated, in the past ten years, whether it could obtain the same energy and capacity that Weston Units 3 and 4 currently provide through lower-cost alternative resources. This does not represent prudent resource planning practices.

Q What does WPS's analysis of net revenue at Weston 3 and 4 show for the test years?

A WPS projects that variable energy and O&M costs at Weston 3 [redacted] (Confidential Table 7). Its analysis shows that the unit will have a variable margin of [redacted]

[46] Ex.-SC-Metz-5 (Response-Data Request-Sierra Club-SC-2.21; Response-Data Request-Sierra Club-SC-2.27).

Confidential Table 7. WPS projection of variable margin at Weston 3

Test Year	Net Output (GWh)	Variable Fuel Cost ($000)	Variable O&M Cost ($000)	LMP Revenue ($000)	Make-Whole Revenue ($000)	Variable Margin ($000)
2025	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
2026						

Source: Company response to FCP-WPSC-IDR-1.07, "FCP-WPSC-IDR-1.07 CONFIDENTIAL Attach 01.xlsx."[47]

Confidential Table 8. WPS projection of variable margin at Weston 4

Test Year	Net Output (GWh)	Variable Fuel Cost ($000)	Variable O&M Cost ($000)	LMP Revenue ($000)	Make-Whole Revenue ($000)	Variable Margin ($000)
2025	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
2026						

Source: Company response to FCP-WPSC-IDR-1.07, "FCP-WPSC-IDR-1.07 CONFIDENTIAL Attach 01.xlsx."[48]

Q Has WPS performed analysis demonstrating that Weston 3 and 4 provide value to ratepayers relative to alternatives going forward?

A No. WPS stated in discovery that it has not performed any analysis of whether continued reliance on Weston Units 3 and 4 through the 2025 and 2026 test years is in the best interest of its ratepayers (the Company only looked at energy margins, as discussed above).[49] Similarly, WPS has no analysis supporting its decision to co-fire natural gas at Weston Unit 4[50] or to retire Weston 3 by the end

[47] Ex.-SC-Metz-24c.f2

[48] *Id.*

[49] Ex.-SC-Metz-5 (Response-Data Request-Sierra Club-SC-2.14).

[50] *Id.* (Response-Data Request-Sierra Club-SC-2.15).

of 2031.[51] The Company did provide long-term PLEXOS modeling results from another docket,[52] but the modeling uses hard-coded retirement dates, relies on an outdated representation of the Clean Air Act 111(d) rules, does not include historical 2023 data, and does not include gas conversion at Weston 4.[53] Once again, this analysis does not reflect prudent resource planning practices.

Q How should WPS plan for the future of Weston 3 and 4 given these concerns?

A In the context of the changing grid, WPS is putting its ratepayers in a lose-lose situation by continuing to rely on its coal assets. If it reduces operations of its coal units in response to market signals, it will risk increasing the units' outage rates. Any forced outages during an energy price spike, in turn, expose ratepayers to those high prices. On the other hand, if WPS maintains high utilization of its coal plants, it will incur high uneconomic operating costs. The only way to reduce both cost and risk to its ratepayers is to reduce how much it relies on its coal fleet by retiring the units and procuring replacement resources.

As a stopgap solution, seasonal operation would allow WPS to operate the units just during the times of year when it needs the capacity most and to minimize cycling by keeping plants offline during parts of the year when they are not needed. This should be much easier for WPS to do with the introduction of MISO's seasonal capacity accreditation reform, which began with the 2023–2024 planning year.

[51] *Id.* (Response-Data Request-Sierra Club-SC-2.16).

[52] Ex.-SC-Metz-4c (Response-Data Request-Sierra Club-SC-2.20(c)).

[53] Ex.-SC-Metz-17 (Response-Data Request-Sierra Club-SC-2.09 Attach 01 REDACTED VERSION).

Most importantly, WPS should engage in planning processes to identify and seek Commission approval to replace Weston Units 3 and 4 with more economically efficient generation resources. However, WPS has not provided any documents, either in its direct testimony or in response to discovery requests, to indicate that it is engaged in this type of proactive planning.

6. CONTINUED RELIANCE ON THE WESTON UNITS WILL LIKELY INCREASE COSTS AND RISKS TO RATEPAYERS RELATIVE TO RELIANCE ON ALTERNATIVES

i. WPS will reduce costs and risks to ratepayers with early retirement of Weston 3 and 4

Q What costs could WPS avoid by retiring Weston 3 and 4?

A Retirement would allow WPS to avoid unnecessary fixed operating and capital expenditures at the plant, including the cost to convert Weston 4 to gas. Table 5 summarizes the O&M and sustaining capital expenditures that WPS included in its test-year expenditures. WPS has not yet estimated the cost of the gas conversion at Weston 4.[54] Using an EPA methodology for estimating coal-to-gas conversion costs, the incremental capital cost of converting Weston 4 would be approximately $103 million (2023$),[55] not including any additional gas pipeline

[54] Ex.-SC-Metz-5 (Response-Data Request-Sierra Club-SC-2.15).

[55] This estimate includes incremental boiler upgrade costs for a 595 MW pulverized coal unit only and does not include pipeline lateral costs. *See* Ex.-SC-Metz-25 (U.S. EPA. 2018. *Documentation for EPA's Power Sector Modeling Platform v6 Using the Integrated Planning Model.* Available at: https://www.epa.gov/sites/default/files/2018-08/documents/epa_platform_v6_documentation_-_all_chapters_august_23_2018_updated_table_6-2.pdf).

infrastructure that may be necessary. WPS would also need to acquire a firm gas contract for the units for them to provide capacity value.

Q What other risks does continued reliance on the coal units pose?

A As the power sector shifts away from coal generation, continued reliance on these assets poses a variety of risks. First, industry contraction creates the risk of increased fuel prices and uncertainty around fuel availability. Weston uses coal from the Powder River Basin, where coal output peaked in 2008 and has since declined by 48 percent, in line with trends for coal production in the United States as a whole.[56] Ten mines, collectively owned by only four companies, produced 87 percent of the coal from the Powder River Basin in 2022.[57] The U.S. coal industry has also faced labor challenges both at the mines and the railroad companies that transport coal, as coal workers demand better pay and have more options in the labor market. As demand for coal decreases and the coal industry contracts and consolidates, supply will become more and more concentrated in a smaller number of suppliers. This has the potential to give suppliers marker power and drives up costs for coal plants.

Additionally, as I discuss next, if WPS fails to procure resources to replace Weston 3 and 4 on schedule, it risks high costs from environmental regulations affecting coal plants. Higher regulatory risk impacts not just the economics of

[56] Ex.-SC-Metz-26 (U.S. Energy Information Administration. 2023. "Aggregate coal mine production for all coal." Available at: https://www.eia.gov/coal/data/browser/.)

[57] Ex.-SC-Metz-27 (Mine Safety and Health Administration. 2024. "Mines Data Set." Available at: https://www.msha.gov/data-and-reports/mine-data-retrieval-system); U.S. Energy Information Administration. 2023. "List of mines for all coal, total, United States, all mine statuses." Available at: https://www.eia.gov/coal/data/browser/ (Any information contained in this citation, based solely on this citation, is not record evidence. (NRE)).

individual resources, but also Company risk profiles, which can lead to downgraded credit ratings, impacting access to capital.

Finally, breakdown of parts and a lack of continued support from manufacturers based on the old age of coal plant technology can result in sustained outages and challenges in quickly repairing units and getting them back online.

Q Explain the impacts of the greenhouse gas rules that were recently finalized under Section 111(d) of the Clean Air Act.

A The U.S. Environmental Protection Agency recently finalized rules under Section 111(d) of the Clean Air Act that set guidelines for greenhouse gas emissions from existing fossil-fuel-fired generating units.[58] The rules primarily affect existing coal units, which have three options for compliance:

- Retire before January 1, 2032
- Retire before January 1, 2039 and co-fire with at least 40 percent gas starting on January 1, 2030
- Install carbon capture and storage (CCS) with at least a 90 percent capture rate by January 1, 2032

A unit that does not have a retirement date established must follow the CCS pathway, unless it converts to gas and no longer retains the capability to fire coal by December 31, 2029.[59] In that case, the unit will be considered as an existing gas-fired unit under the rule and can avoid compliance obligations related to retirement or CCS.

[58] 89 Fed. Reg. 39,798 (May 9, 2024).

[59] 40 C.F.R. § 60.588ob.

Q What is WPS's plan for 111(d) compliance at Weston 3 and 4?

A WPS plans to retire Weston 3 in 2031, thereby avoiding compliance costs at the unit. Weston 4 will co-fire with gas in order to comply. When asked about its 111 compliance strategy, WPS does not explicitly state whether the unit will follow the blending pathway (which requires retirement prior to 2039) or will convert entirely to gas in time to be considered an existing gas resource. WPS states in discovery that it will comply with the 111 rules at Weston 4 by blending gas[60] but also states that it will fuel Weston 4 exclusively on natural gas by the end of 2030.[61]

Q Are WPS's plans for 111 compliance at Weston 3 and 4 the best option for ratepayers?

A For the reasons described above, I agree that full retirement is likely the most economic choice for Weston 3. My analysis shows that customers have lost money on the unit in all years since 2018 except 2021 and 2022 (which were anomalous due to the impact of COVID and the war in Ukraine). Further, the Company's test-year analysis shows [redacted].

With respect to Weston 4, full retirement rather than gas conversion may also be the most economic choice. But WPS has conducted no forward-going analysis to compare the cost of full retirement of Weston Unit 4 to gas conversion as options

[60] Ex.-SC-Metz-5 (Response-Data Request-Sierra Club-SC-2.05).

[61] *Id.* (Response-Data Request-Sierra Club-SC-2.15; Response-Data Request-Sierra Club-SC-2.16; Response-Data Request-Sierra Club-SC-2.21).

to comply with the new 111(d) rules. In addition, if WPS were to convert the unit one year earlier, by year-end 2029, it would be considered as an existing gas unit under 111, which is an option WPS should analyze now.

Q What impact will the Effluent Limitation Guidelines (ELG) rule have on coal-burning at Weston 3 and 4?

A To comply with the 2024 ELG rule, WPS plans to opt into the new permanent cessation of coal combustion subcategory for Weston 3 and 4.[62] This will require WPS to permanently cease coal combustion at Weston 3 and 4 by 2034.[63]

ii. Procurement of alternative resource options to replace Weston 3 and 4 will likely reduce costs for WPS ratepayers

Q How should WPS determine the optimal portfolio of replacement resources for Weston 3 and 4?

A In competitive markets, firms must seek out lower-cost means of supplying their product or risk losing customers. Because utilities are not subject to market competition, regulators are responsible for ensuring utilities take reasonable steps to minimize the costs they pass on to captive customers, without threatening reliability. To do this, utilities must evaluate the comparative costs of different types of generation resources, including comparing existing resources to potential alternatives. WPS can and should regularly evaluate whether it is more

[62] C Ex.-SC-Metz-5 (Response-Data Request-Sierra Club-SC-2.05).

[63] 89 Fed. Reg. 40,198 (May 9, 2024).

economical to get the energy and capacity it needs from its existing fossil resources, or to retire and replace them with clean energy alternatives.

To determine the optimal retirement and/or conversion dates for Weston 3 and 4, WPS should prepare a replacement analysis based on optimized capacity expansion modeling. Crucially, WPS must allow the model to select endogenous retirement dates for existing units, rather than hard-coding retirement dates. This will allow WPS to evaluate whether it is more economical to operate Weston 3 through 2031 or to retire and replace it with clean energy alternatives earlier. Similarly, WPS will be able to compare conversion of Weston 4 to retirement and replacement of the unit.

Q What types of replacement resources should WPS consider?

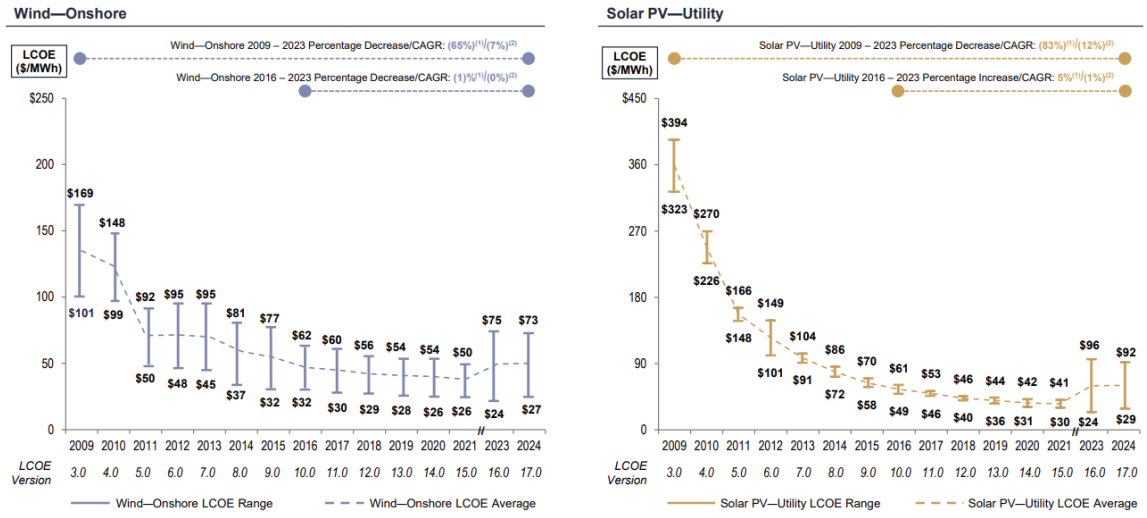
A WPS should consider a range of low-cost clean energy resources to replace its coal units, including solar photovoltaic (PV), battery storage, wind, energy efficiency, and demand response. The Company should test the market regularly and procure solar PV, BESS, and other clean energy resources to economically displace energy and capacity from existing high-cost fossil resources.

Q How have renewable costs changed over the past fifteen years?

A Prices of renewable energy resources have fallen substantially in recent years. On a levelized cost of energy (LCOE) basis, costs for wind are now 65 percent lower than in 2009, with a compound annual rate of decline of 7 percent per year. Costs for solar are now 83 percent lower than in 2009, with a compound annual rate of decline of 12 percent per year. Figure 5 shows those annual trends. As a result of these price decreases, many utilities are selecting a combination of low-variable-

cost renewables and flexible, dispatchable capacity as their preferred least-cost resource plan.

Figure 5. Historical levelized cost of energy for wind and solar PV technologies



Source: Lazard. 2024. "Lazard Levelized Cost of Energy + (V17.0, June 2024)" Available at: https://www.lazard.com/media/xemfey0k/lazards-lcoeplus-june-2024-_vf.pdf.[64]

Q What types of resources has WPS recently added to its portfolio?

A Over the past five years, WPS added [redacted] of new gas capacity, [redacted] of wind, and [redacted] of solar (Confidential Table 9). During the test years, WPS plans to add an additional 97.5 MW of solar to its portfolio (a 15 percent share of three different solar projects).[65] Converting Weston 4 to gas would add a significant amount of new gas capacity to WPS's portfolio. (The unit's current nameplate capacity is 595 MW.) Unlike more recently constructed units such as

[64] Ex.-SC-Metz-28.

[65] Ex.-SC-Metz-5 (Response-Data Request-Sierra Club-SC-2.31).

the Weston RICE units, which are designed to run as peakers, Weston 4 is a steam turbine and WPS currently operates the unit at a relatively high capacity factor.

It is unclear if this will be the case going forward, because the Company has provided no analysis on how it projects the unit will operate when converted to gas. In general, steam units are not flexible and nimble, and therefore are not good load-following resources. They are also inefficient relative to cleaner, newer gas plants, and may have lower capacity factors and higher costs, so it is likely that the unit will be relied on more as a capacity resource than an energy resource. But to be a reliable capacity resource, the unit will need a firm gas supply, which can be expensive to procure, even if a large volume of gas is not regularly required. On the other hand, if the unit does continue to operate at a high capacity factor, it will increase ratepayers' exposure to fuel price volatility.

Confidential Table 9. WPS resource additions 2019–2024

Unit	WPS Share of Capacity (MW)	Commercial Operation Year
Weston RICE units (gas)	[redacted]	[redacted]
Whitewater (gas)	[redacted]	[redacted]
Red Barn Wind	[redacted]	[redacted]
Badger Hollow I Solar	[redacted]	[redacted]
Two Creeks Solar	[redacted]	[redacted]
BTM Utility-Owned Solar	[redacted]	[redacted]

Source: CONFIDENTIAL Company response to O2-SC-32.[66]

Q Please describe the risks associated with gas fuel price volatility.

A High reliance on gas resources for energy is risky because when the market is constrained and prices spike, those costs are passed directly to ratepayers. Gas is a

[66] Ex.-SC-Metz-4c.

global commodity, which means that both domestic and global market forces can impact the price and demand for the resource. For example, when DTE Electric Company in Michigan filed its 2022 Fuel Reconciliation Docket, it noted that gas spending was 74 percent higher than planned. These higher-than-expected prices resulted in large part from the Russian invasion of Ukraine, after which European gas customers turned increasingly to U.S. gas. As a result, DTE is requesting to recover an additional $154 million for 2022 fuel costs alone.[67]

Absent action from the Michigan Public Service Commission, DTE and its shareholders are not impacted by these gas price spikes—these costs are entirely passed on to ratepayers. The same phenomenon could just as easily happen in Wisconsin, and WPS and the Commission should take this into account when planning and evaluating WPS's future resource mix. As it continues to transition away from coal, it should focus on renewable and BESS additions rather than gas, since these resources do not use fuel and so are not subject to price volatility once constructed.

Q What are the costs of clean energy resources available to WPS specifically?

A As I discuss in more detail below, the best way for WPS to obtain up-to-date data on replacement resource costs is for it to issue All-Source Request for Proposals (RFPs) and Requests for Information (RFIs) to obtain market data. As benchmarks, Table 10 shows representative costs for wind, solar, and battery storage reflecting typical conditions in Wisconsin. Overnight capital costs[68] are

[67] Ex.-SC-Metz-29 (DTE Elec. Co. 2023. Exhibit *A-7*. Mich. Pub. Serv. Comm'n Docket No. E-21051. March 31, 2023.)

[68] Overnight capital cost refers to the capital expenditures for a new resource, excluding financing costs incurred during construction.

approximately $1,524–$1,551 per kilowatt (kW) for onshore wind, $1,301 per kW for utility-scale solar PV, and $1,558 per kW for four-hour battery storage. Table 11 shows the costs of solar resources that WPS includes in its test-year expenditures. The overnight capital costs of these resources are higher at $1,373–$2,259 per kW. WPS's resource costs will likely decrease in the future as the market for renewables in Wisconsin develops and the Company begins procuring resources through power purchase agreements in addition to self-builds. According to the Company's test year projections (Confidential Table 7), [redacted]

Table 10. Replacement resource costs from the NREL Annual Technology Baseline (2024$)

Technology	Resource Class	Capacity Factor	Overnight Capital Cost ($/kW)	Fixed O&M ($/kW-year)	Levelized Cost of Energy ($/MWh)
Land-Based Wind	Class 8	36%	$1,551	$30	$29
	Class 9	34%	$1,524	$42	$34
Utility-Scale Solar PV	Class 8	23%	$1,301	$21	$37
	Class 9	22%	$1,301	$21	$40
Battery Storage	4-hour	17%	$1,558	$39	n/a

Source: National Renewable Energy Laboratory (NREL). 2024. Electricity Annual Technology Baseline (ATB). Available at: https://atb.nrel.gov/electricity/2024/data.[69] *Costs shown are for resources that come online in 2027 under moderate technology assumptions. The resource classes shown for wind and solar reflect typical conditions in Wisconsin.*

[69] Ex.-SC-Metz-29.

Table 11. WPS costs for solar added during test years

Project	Overnight Capital Cost ($/kW)	FOM ($/kW-year)
Paris Solar	$1,769	$18.50
Darien Solar	$2,259	$15.60
Koshkonong Solar	$1,373	$17.00

Source: Company response to 02-SC-31.[70]

Q What efforts has the Company made to evaluate and procure replacement resources for the Weston 3 and 4?

A There is no evidence that the Company has evaluated retirement and replacement of Weston 3 and 4 or that it has solicited or evaluated the cost and timeline of replacement resources for the units. This does not represent adequate planning. As shown above, the cost of Weston 3 is high, and this is not expected to change even as its utilization falls. Because WPS has not evaluated the economics of retiring Weston 3 and replacing it with alternatives, nor has it issued RFPs for solar and BESS from the market, the Company has not demonstrated that the cost of maintaining Weston 3 is lower than the cost of these alternative resource options.

Q What actions should WPS take to ensure that it has sufficient replacement capacity for Weston 3 and 4?

A WPS should take steps to procure renewables and battery storage as rapidly as possible, including resources procured through power purchase agreements in addition to self-owned options. Only once it has exhausted its ability to economically procure wind, solar PV (both paired and stand-alone), and BESS

[70] Ex.-SC-Metz-5.

through issuing All-Source RFPs to the market and evaluating self-build costs should it turn to other resource options.

Issuing All-Source RFPs should be a central component of WPS's strategy for obtaining replacement capacity and energy. This will allow WPS to compare the cost of resources procured through power purchase agreements and self-built resources and obtain whichever is lower cost. It will also allow a range of resource types, including clean energy resources such as paired battery and solar PV, to offer their capacity and energy value.

Q When should WPS begin procuring replacement resources for Weston 3 and 4?

A WPS should start procuring replacement resources as soon as possible. The typical construction timeline for utility-scale solar is one year and for onshore wind is three years;[71] siting and permitting can add another two to four years. Because siting and constructing new resources takes time, WPS should recognize the energy value of renewables and push to bring them online on a rolling basis and whenever they are economically available, rather than trying to align resource additions perfectly with capacity needs.

Early renewable procurement will ensure that WPS can procure sufficient replacement resources to allow timely retirement of Weston 3, saving ratepayers money. It will also help WPS keep pace with national policy development, and it

[71] Ex.-SC-Metz-30 (National Renewable Energy Laboratory (NREL). 2024. Electricity Annual Technology Baseline (ATB). Available at: https://atb.nrel.gov/electricity/2024/data.)

will give the Company an opportunity to learn how to manage a system with a high level of renewable penetration, providing a safety net for system reliability.

7. LONG-TERM PLANNING SHOULD BE AN INTEGRAL PART OF RATE CASE PROCEEDINGS IN WISCONSIN

Q Please summarize your findings in this section.

A WPS does not evaluate its existing resource portfolio through a regular resource planning process or as a regular part of rate cases. It does conduct some modeling for the purposes of selecting resources for meeting new capacity obligations, but that is distinct from evaluating the economics of existing resources and is not sufficient for prudent utility planning. WPS should include more robust long-term planning in its rate cases going forward to allow for adequate Commission oversight over its decisions about continued investment in existing resources and the procurement of replacement resources. Waiting until Certificate of Public Convenience and Necessity (CPCN) dockets to review decisions about resources retirements and additions is insufficient, because by the time these applications are filed, it is often too late to examine the full range of alternatives.

To enable the near-term retirement of Weston 3, WPS must begin conducting such resource planning now, and the Commission should require a supplemental filing to begin this process as soon as possible, since WPS did not include an alternatives analysis as part of its rate case filing.

Q Are the Company's current methods for long-term planning sufficient?

A No. When asked in discovery to describe its resource adequacy planning process, WPS pointed to an analysis it prepared for Docket No. 5-BS-276, which is an ongoing docket in which WPS, Wisconsin Electric Power Company, and Madison

Gas and Electric Company are applying for approval to acquire a solar facility. This document describes WPS's resource planning process, which involves capacity expansion and production cost modeling in PLEXOS.[72] Importantly, this modeling only selects capacity additions and does not assess the ongoing economic viability of existing units, meaning that it cannot be used to study the economics of Weston 3 and 4 relative to alternatives. Specifically, the process WPS describes has several shortcomings:

- WPS hard-coded coal retirement dates in PLEXOS[73] and did not allow the model to select endogenous retirement dates for existing units.
- WPS did not model gas conversion at Weston 4. This should be a selectable option, so that WPS can examine the economics of gas conversion compared to other options such as retiring and replacing the unit.
- WPS recently adopted an "energy assurance" strategy of setting MISO market energy purchases to zero in its modeling starting in 2026.[74] While limiting market purchases to around 10 percent of the annual energy mix is reasonable, eliminating them completely is overly conservative and could result in over-procurement of resources.

These limitations indicate that WPS's processes for long-term planning are insufficient for protecting the public interest, which requires assessing the ongoing economic value of existing resources as well as identifying the most cost-effective new resources. Failure to evaluate the economics of its existing

[72] Ex.-SC-Metz-17c (Response-Data Request-Sierra Club-SC-2.09 Attach 01.pdf REDACTED VERSION).

[73] *Id*. at 24.

[74] *Id*. at 16.

resources could leave WPS vulnerable to future disallowances if alternatives would have been more economic. WPS cannot claim it was reasonable to rely on an uneconomic unit on the basis of ignorance.

Q How does long-term planning fit into the framework of a rate case?

A In rate cases, utilities obtain Commission approval to recover a specific set of test-year costs from their customers through rates. To be justified in recovering a given cost, a utility must show the cost was prudently incurred—i.e., that it was economic for ratepayers based on the information available at the time. If a utility seeks to recover the ongoing cost of maintaining a generating unit, it must show that it has performed analysis to show that relying on that unit for capacity and energy is cost-effective relative to alternatives.

While long-run costs that fall outside the test year are not directly at issue in rate cases, capital spending decisions in the present are often impacted by, and even driven by, future operational and planning decisions. For example, environmental upgrades to comply with known regulations are impacted by long-term retirement decisions. Additionally, sustaining capital investments occur on a schedule and cycle and ramp down in advance of retirement. In both cases, it is events occurring outside the test year that are driving test-year costs and operational decisions.

In most states, there are separate Integrated Resource Planning (IRP) dockets.[75] In these cases, the results from the IRP can be used to support test-year asks. In

[75] Ex.-SC-Metz-31 (U.S. Environmental Protection Agency. 2022. *State Energy and Environment Guide to Action: Electricity Resource Planning and Procurement.* Available at: https://www.epa.gov/system/files/documents/2022-08/Electricity%20Resource%20Planning%20and%20Procurement_508.pdf).

Wisconsin, however, there is no IRP process to reference. This makes it even more important for the utility to provide long-term analysis to support its test-year asks. Rate cases offer a chance for more holistic planning, and in particular for the continuing evaluation of existing resources, that other docket types such as CPCN applications, which focus narrowly on a yes/no decision about a specific new resource, cannot provide.

Q What types of analysis should WPS and other Wisconsin utilities include in their rate case applications going forward?

A WPS should complete modeling analysis that demonstrates that the costs for each generating asset it seeks to include in rates is justified by the ongoing value the asset provides to ratepayers, relative to alternatives. This determination involves three interrelated analyses:

1. **Long-term modeling**. WPS should complete up-to-date capacity expansion and production cost modeling evaluating the cost of continuing to operate existing resources compared to retirement and replacement with alternatives. This analysis should extend beyond the test year and go out at least 10–15 years.

2. **Ratepayer impact studies**. WPS should analyze the ratepayer impacts of early retirement of its coal units, including alternative depreciation schedules to address undepreciated plant balances.

3. **RFPs and market evaluation**. To keep its replacement resource costs current, WPS should regularly issue All-Source Request for Proposals (RFPs) and Requests for Information (RFIs) to obtain market data. It should use the data it receives from the RFPs and RFIs as inputs to its long-term modeling and alternatives analysis.

If WPS were to complete these analyses as part of its rate case filings, it would provide the Commission a more complete and accurate understanding of whether the costs that the Company proposes to recover reflect the best option for ratepayers. Without this analysis, the Commission cannot make an informed decision about what actions are in the best interest of ratepayers.

Q Does this conclude your testimony?

A Yes.