

BEFORE THE NEW MEXICO PUBLIC REGULATION COMMISSION

**IN THE MATTER OF SOUTHWESTERN
PUBLIC SERVICE COMPANY’S 2021
INTEGRATED RESOURCE PLAN FOR
NEW MEXICO**

Case No. 21-00169-UT

SIERRA CLUB’S COMMENTS

Under 17.7.3.12 NMAC and the Commission’s Order extending the public comment period, Sierra Club respectfully submits these comments on Southwestern Public Service Company’s (“SPS” or the “Company”) 2021 Integrated Resource Plan (“2021 IRP”) and its analysis of Tolk Station (“Tolk Analysis”) which is incorporated into the 2021 IRP. In addition, Sierra Club incorporates by reference the attached August 20, 2021 report captioned, *Review of Southwestern Public Service Company’s 2021 IRP and Tolk Analysis*, prepared by Synapse Energy Economics for Sierra Club.

Sierra Club has been engaged in IRP processes across the country and knows the value of a thorough and transparent planning process for reducing long-term costs and risks to ratepayers. Sierra Club appreciates the opportunity to submit these comments on SPS’s 2021 IRP, and we commend the Company for its effort to provide some level of transparency in the IRP process, and its willingness to engage in discussions with stakeholders about certain data and planning assumptions.

As detailed in the attached technical comments, however, SPS’s 2021 IRP and Tolk Analysis contain numerous methodological errors, omissions, and questionable assumptions, each of which fundamentally bias the analysis in favor of SPS’s preferred scenario—Tolk Scenario 2 (seasonal operations of both units through 2032)—even though the savings from that scenario are small in comparison to the risks. Specifically, SPS’s analysis and report are flawed in numerous respects:

- SPS’s results do not show meaningful savings in its preferred scenario, in which both units operate seasonally through 2032, relative to an alternative where one unit retires early (in 2023). Despite this, the Company strongly asserts that the Tolk Analysis supports continued operation of both Tolk units through 2032.
- In its scenarios evaluating the early retirement of one Tolk unit, SPS assumed a minimal reduction in total fixed costs resulting from the shift from seasonal operation of two units to one, and provided no explanation for that assumption.
- SPS omitted a carbon dioxide (CO₂) price sensitivity from its Tolk Analysis despite including one in its subsequent IRP analysis (which was conducted once the unit’s retirement dates were locked into the model).
- Synapse’s modeling shows that Scenario 5 with the 2023 retirement of Tolk Unit 1 becomes the lowest cost option when fixed costs are adjusted down incrementally to represent a more reasonable level of savings and a CO₂ price is modeled.
- If SPS were planning its system to minimize risk in the case that a carbon price was implemented, it would choose to retire at least one of the Tolk units in 2023.
- SPS has not identified the most economical retirement dates for the Tolk plant, and in fact Synapse’s modeling shows that retirement of Tolk 1 in 2023 and Tolk 2 in 2026 is a more optimal retirement scenario than SPS’s preferred 2032 retirement dates.
- SPS has failed to consider the impact of other likely risks in selecting its preferred scenario, including increasing water limitations and costs, as well as environmental upgrade costs to comply with regional haze regulations. This is despite a clear recommendation from Guidehouse that the Company do so.
- Many of SPS’s IRP results are unclear and counterintuitive, and the Company did not provide a clear narrative to explain the drivers behind the results it presented.

Ultimately, SPS’s Tolk Analysis fails to answer the fundamental question posed by the Commission-approved Stipulation in Case No. 19-00170-UT: what are “the economically optimal (in terms of the public interest) abandonment dates for Tolk”? Using SPS’s own workpapers and data files, however, Sierra Club, with the assistance of Synapse Energy Economics (“Synapse”), attempted to answer that question. Specifically, Synapse corrected

many of the flawed inputs and assumptions identified above, and conducted several additional EnCompass modeling runs. While Synapse's analysis was constrained by the compressed comment timeline and a lack of full transparency into all of SPS's data inputs and modeling methodology, the results indicate clearly that the best course of action for SPS's portfolio, and the path that reduces both costs and risks for ratepayers, would be to retire one of the Tolk units by 2023 and the second by 2026.

Based on our review of the Tolk Analysis and SPS's 2021 IRP, and as more fully explained in the attached report, we recommend that the Commission require SPS to do the following:

- Provide the Commission with a complete accounting of all costs associated with the Tolk units in the EnCompass model. This would include all variable costs, fixed costs, sustaining capex costs, well water costs, labor loading costs, book value, tax, and any others that are input as hard-coded cost streams.
- Provide the Commission with (1) a breakdown of what is included in all projected sustaining capex, fixed O&M, and labor loading costs included in all scenarios used in the Tolk analysis; (2) an accounting of recent actual historical costs from before and after the Company switched to seasonal operations that show the change in cost after the switch; (3) a clear narrative that explains the cost assumptions used across scenarios, and all actions the Company has taken to minimize costs.
- Conduct additional modeling runs that test the impact of a CO₂ price on the Tolk Analysis and update the report to include these sensitivities.
- Conduct additional modeling runs that test intermediate retirement dates for the Tolk units, including the scenario Synapse tested in which Tolk Unit 1 retires in 2023 and Tolk Unit 2 in 2026.
- Provide the Commission with an explanation of how the Company factors into the Tolk Analysis risks posed by addition water costs and shortages and environmental regulations.

- Require SPS to amend its IRP report with a narrative that clearly explains the results it presents in its IRP and the drivers of each.

Although Sierra Club takes issue with several aspects of SPS's IRP and Tolk Analysis analytical processes, Sierra Club does wish to commend SPS for its public advisory process. We found it was informative and allowed for dialogue with Sierra Club and other stakeholders. We also commend the Company for its willingness to continue to engage with Sierra Club on the 2021 IRP after its filing.

We do believe, however, that the stakeholder process would have been more helpful to SPS, the Commission, and the public if the process had allowed more time for a dialogue between the Company and stakeholders *after* the filing of the IRP, and if SPS had disclosed considerably more detail in its underlying modeling files. Given the complexity of prevailing IRP modeling platforms and the volume of data integrated into the process, the Commission's 20-day period for public comment is simply insufficient for a rigorous and comprehensive evaluation of the utility's data assumptions or methodologies. The lack of discovery or immediate disclosure of all of the Company's modeling data creates additional obstacles to a meaningful evaluation of the utility's planning process. While Sierra Club appreciates the Commission's extension of the comment deadline in this case, we respectfully submit that 45 to 60 days is more appropriate. Moreover, full transparency, with some opportunity for discovery should be the rule, rather than the exception. Going forward, we believe New Mexico utilities, the Commission, and ratepayers would benefit from a Commission order indicating that variances from the IRP rule's comment deadline and discovery will be liberally granted.

For these reasons, Sierra Club respectfully requests that the Commission issue an order requiring SPS to amend and re-file its 2021 IRP and Tolk Analysis consistent with Sierra Club's

Comments. If you have any questions or would like clarification or further detail regarding any of the issues raised in the attached comments, please do not hesitate to contact us.

Respectfully submitted,

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Review of Southwestern Public Service Company's 2021 IRP and Tolk Analysis

NM PRC Case No. 21-00169-UT

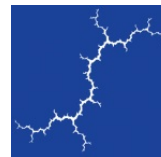
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CONTENTS

- 1. INTRODUCTION 1
- 2. FINDINGS AND RECOMMENDATIONS..... 1
- 3. 2021 TOLK ANALYSIS..... 4
 - 3.1. SPS’s results did not show meaningful savings in its preferred scenario, relative to an alternative in which one unit retires early. 4
 - 3.2. SPS made various errors in modeling the Tolk units..... 6
 - 3.3. SPS relied on unsupported input assumptions and omitted key sensitivities in conducting the Tolk analysis..... 6
 - 3.4. Synapse adjusted SPS’s unsupported assumptions and found that an earlier retirement of one Tolk unit is lower cost than keeping both online through 2032 9
 - 3.5. SPS did not model a scenario with optimized or intermediate retirement dates 10
 - 3.6. SPS did not factor in additional risks from increasing water limitation and environmental compliance costs 12
- 4. SPS 2021 INTEGRATED RESOURCE PLAN 14
 - 4.1. SPS did not clearly explain the drivers behind the sensitivity results in the IRP 14

1. INTRODUCTION

Synapse Energy Economics is a research and consulting firm specializing in energy, economic, and environmental topics. Since its inception in 1996, Synapse has grown to become a leader in providing rigorous analysis of the electric power and natural gas sectors for public interest and governmental clients. Synapse's staff of 40+ includes experts in energy and environmental economics, resource planning, electricity dispatch and economic modeling, all-sector emissions modeling, energy efficiency, renewable energy, transmission and distribution, rate design and cost allocation, risk management, cost-benefit analysis, environmental compliance, and both regulated and competitive electricity and natural gas markets.

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

Sierra Club engaged Synapse to participate on its behalf in Southwestern Public Service Company's ("SPS" or "the Company") processes for evaluating the optimal retirement dates for the two units at the Tolk coal-fired power plant and for integrated resource planning (IRP). SPS conducted these analyses using the EnCompass capacity optimization and production cost model, licensed by Anchor Power Solutions, after recently switching from the Strategist model. The Tolk Analysis and the subsequent 2021 IRP represent the Company's first published analyses using EnCompass. Synapse, in contrast, was one of the original users of the EnCompass modeling software and has used the tool for dozens of projects over the past five years.

The following report outlines Synapse's assessment of the Company's Tolk Analysis Report and subsequent 2021 IRP based on the filed reports, confidential data provided by the company, and information provided at both the Stakeholder Workshops and Technical Workshops that have been held over the past year.

2. FINDINGS AND RECOMMENDATIONS

Using the Synapse EnCompass license, we were able to use the datasets that SPS provided in discovery to model the Company's system using its own data and also set off our own unique model runs. This allowed us to evaluate whether SPS had indeed identified an economically optimal retirement date for the Tolk units.

Synapse's review resulted in the following primary findings:

1. The results of SPS's Tolk Analysis do not show meaningful savings in its preferred scenario, in which both units operate seasonally through 2032, relative to an alternative where one unit



retires in 2023. Despite this, the Company insists that the Tolk Analysis strongly supports continued operation of both Tolk units through 2032.

2. SPS's Tolk Analysis assumed a minimal reduction in total fixed costs of only 17 percent when moving from seasonal operation of two units to seasonal operation of one unit. These costs included fixed operation and maintenance ("FOM"), sustaining capital expenditures ("capex"), and labor loaders. SPS provided no explanation for this assumption.
3. SPS omitted a carbon dioxide (CO₂) price sensitivity from its Tolk Analysis despite including one in its subsequent IRP analysis (which was conducted once the unit's retirement dates were locked into the model).
4. Synapse's modeling shows that Scenario 5 with the 2023 retirement of Tolk Unit 1 becomes the lowest cost option when fixed costs are adjusted down incrementally to represent a more reasonable level of savings and a CO₂ price is modeled.
5. If SPS were planning its system to minimize risk in the case that a carbon price was implemented, it would choose to retire at least one of the Tolk units in 2023.
6. SPS has not identified the most economical retirement dates for the Tolk plant, and in fact Synapse's modeling shows that retirement of Tolk Unit 1 in 2023 and Tolk Unit 2 in 2026 is a more optimal retirement scenario than SPS's preferred 2032 retirement dates.
7. Despite a clear recommendation from its consultant, Guidehouse, SPS has failed to consider the impact of other likely risks in selecting its preferred scenario, including increasing water limitations and costs, as well as environmental upgrade costs to comply with regional haze regulations.
8. Many of SPS's IRP results are unclear and counterintuitive, and the Company did not provide a narrative to explain the drivers behind its results.

Based on our review of the Tolk Analysis and SPS's 2021 IRP, we recommend that the Commission require SPS to do the following:

1. Provide the Commission and stakeholders with a clear accounting of all costs associated with the Tolk units in the EnCompass model in a spreadsheet or other accessible format. This would include all variable costs, fixed costs, sustaining capex costs, well water costs, labor loading costs, book value, tax, and any others that are input as hard-coded cost streams.
2. Provide the Commission and stakeholders with (1) a breakdown of what is included in all projected sustaining capex, fixed O&M, and labor loading costs included in all scenarios used in the Tolk Analysis; (2) an accounting of recent actual historical costs from before and after the Company switched to seasonal operations that show the change in cost after the switch; (3) a clear narrative that explains the cost assumptions used across scenarios, and all actions the Company has taken to minimize costs.
3. Conduct additional modeling runs that test the impact of a CO₂ price on the Tolk Analysis. Update the Tolk Analysis with these results and include the resulting retirement dates in the relevant IRP sensitivities.



4. Conduct additional modeling runs that test intermediate retirement dates for the Tolk units, including the scenario Synapse tested in which Tolk Unit 1 retires in 2023 and Tolk Unit 2 in 2026.
5. Provide the Commission with an explanation of how the Company considers risks posed by additional water costs and shortages and environmental regulations as part of its analysis of the Tolk units.
6. Require SPS to amend its IRP report with a narrative that clearly explains the results it presents in its IRP and the drivers of each.



3. 2021 TOLK ANALYSIS

3.1. SPS’s results did not show meaningful savings in its preferred scenario, relative to an alternative in which one unit retires early.

SPS modeled five scenarios as part of the Tolk Analysis (and a sixth, which included an early retirement of the Harrington units) as summarized in the table below. In the first five scenarios, SPS assumed that there was summer-only economic dispatch for Tolk starting in 2021, and Harrington was converted to gas at the end of 2024.¹ The sixth scenario assumed all Tolk and Harrington units retired at the end of 2023.

Table 1. Summary of SPS scenarios for its 2021 IRP

Scenario	Dispatch	Retirement
Scenario 1 – Annual Economic Dispatch	Annual economic dispatch	Both Tolk units retire at end of economically available water (end of year 2025)
Scenario 2 – Summer-Only Economic Dispatch	Summer-only economic dispatch	Both Tolk units retire at end of economically available water (end of year 2032)
Scenario 3 – Earliest Retirement of Tolk Units	Annual economic dispatch	Both Tolk units retire end of year 2023
Scenario 4 – Staggered Retirement of Tolk Units	Annual economic dispatch	Unit 1 retires end of year 2023 Unit 2 retires at end of economically available water (end of year 2031)
Scenario 5 – Staggered Retirement of Tolk Units and Seasonal Operations	Summer-only economic dispatch	Unit 1 retires end of year 2023 Unit 2 retires end of year 2032
Scenario 6 – Earliest Retirement of Tolk & Harrington Units	Annual economic dispatch for all units	All Tolk and Harrington Units Retire EOY 2023.

Based on the results of the Tolk Analysis, SPS selected Scenario 2, where both units operate seasonally through 2032, as the preferred plan. SPS made this decision despite a lack of meaningful results to differentiate it from Scenario 5, where one unit retires in 2023 (but all other Tolk assumptions remain unchanged). The cost difference observed between Scenario 2 and Scenario 5 is extremely small over the near term (2022–2025) and over the 20-year planning horizon (around \$30 million for both time periods) and represents only 0.23 percent of the Company’s total revenue requirement over the

¹ 2021 Tolk Analysis Report, pages 12-13.

Planning Period.² This indicates that the results showing minimal cost savings from keeping both units online is unlikely to actually be meaningful relative to the alternative of retiring one early.

In fact, the very small cost differential between Scenario 2 and Scenario 5 indicates that other factors and sensitivities, especially consideration of risks, should be factored into the decision-making process. The sensitivities tested by the Company include the following:

- Time window: planning period (2022–2041), decision period (2022–2032), action period (2022–2025).
- Interconnection cost sensitivity (\$200/kW, \$400/kW, \$600/kW)
- Load sensitivity (low load, financial load, planning load)
- Gas price sensitivity (low, base, high)

Based only on the results of the Company’s sensitivity analyses, it becomes clear that, as discussed below, retiring one Tolk unit can be considered a no-regrets decision. (The weight in favor of an immediate one-unit retirement is even higher when the Synapse modeling is considered). This option reduces risk to the Company’s customers relative to keeping both units online (Scenario 2) under a range of likely future scenarios and time spans.

Guidehouse Consulting, SPS’s independent evaluator acknowledges that for many sensitivities the delta between the preferred Scenario 2 and Scenario 5 (and even Scenario 3) is likely insignificant, stating:

“The sensitivity analysis does reveal, however, that there are situations where Scenario 5, and to a lesser extent Scenario 3, have a cost advantage under specified assumptions. There are five (5) total cases where Scenario 3 is not either of the top two positions. In most cases, Scenario 5 is 2nd to Scenario 2. In virtually all cases, the NPVRR gap differentiating the cases is relatively narrow (between \$0 to \$32 million over 20 years). The differences between the cases is considered within the planning margin of error, therefore, decisions on the optimal scenario should be rendered from a qualitative risk perspective.”³

Despite this, SPS has framed the results of its analysis as unambiguously supporting the continued operation of both Tolk units seasonally through 2032 without being clear on how meaningful its findings and results were, stating that:

“The Tolk Analysis continues to support summer-only seasonal operations and a 2032 retirement date as the optimal economical solution for serving SPS’s customers. Maintaining the

² The results in the 2021 Tolk Analysis report do not reflect the corrected capex cost streams that SPS acknowledged should have been used in its analysis and provided to Sierra Club for our analysis.

³ Independent Evaluator Report of the Southwestern Public Service Company’s Tolk Analysis and RFI. Guidehouse, June 30, 2021. Submitted as part of the SPS Tolk Analysis, Appendix D, Page 12.

existing depreciated Tolk Units through 2032 is a low-risk option to ensure SPS can reliably and economically serve customers and meet its planning reserve margin requirements.”⁴

SPS’s statement in these proceedings that its preferred scenario is a “low-risk” option does not correspond to the results of its own analysis.

3.2. SPS made various errors in modeling the Tolk units

In its review of reviewed SPS’s EnCompass modeling files, Synapse found several errors in how the Company modeled sustaining capex and well water costs. SPS acknowledged these errors⁵ for Scenario 2 and provided a corrected capital cost file. The corrected files also contained new cost streams for Scenario 5 for reasons that were unexplained.

This is concerning for several reasons. First, SPS worked with an Independent Evaluator (“IE”), Guidehouse, in creating the Tolk Analysis; yet Guidehouse apparently did not catch this mistake. This raises questions about the role of the IE in evaluating the Tolk Analysis and whether it performed adequate oversight. SPS’s use of an IE sends the impression that there was a level of scrutiny and due diligence on the Company’s modeling, yet the Company still published an analysis with very straightforward errors. Additionally, although the material impact of these particular errors was not large, it does raise questions about what other errors might be contained in the Company’s modeling.

Synapse appreciates SPS’s willingness to make its modeling files available, but given the compressed timeframe for comments, the complexity of the EnCompass tool, and the lack of clarity or explanation around many of the Company hard-coded inputs and assumptions, it was impossible for us to fully vet the Company’s modeling.

Given these concerns, ***we recommend that SPS provide to the Commission and stakeholders a complete accounting of all costs used to model the Tolk units. This would include all variable costs, fixed costs, sustaining capex costs, well water costs, labor loading costs, book value, tax, and any others that are input as hard-coded cost streams.***

3.3. SPS relied on unsupported input assumptions and omitted key sensitivities in conducting the Tolk analysis

In addition to the errors described above, Synapse found several concerning and unsupported modeling assumptions and omissions in our review of the Tolk Analysis.

⁴ 2021 Tolk Analysis Report, page 3.

⁵ Sierra Club and Synapse had a call with SPS on 7/26/2021.

a) FOM, Capex, and Labor loading costs

SPS assumed a very small reduction in fixed costs—including FOM, sustaining capex, and well water project costs—in moving from operating two units to one (Scenario 2 to Scenario 5). As shown in Table 2, the Company assumed that the switch from operating two units seasonally to one unit would reduce fixed costs a total of 17 percent, with capex costs dropping only 19 percent and FOM costs dropping only 15 percent (well water costs dropped a more reasonable 51 percent).

Table 2: Fixed and capex cost reduction for Scenarios 2 and 5

	% Reduction in NPV when moving from two units to one unit
Capex	19%
FOM (including labor loading)	15%
Water	51%
Total	17%

Source: Analysis based on SPS Tolk Analysis Encompass Input Files: SPS_ReferenceCase_1H21_2021-06-21.xlsx with corrections provided by Company on 8/2/2021.

Starting with sustaining capital costs, SPS did not explain why there was such a small decrease in capex costs between Scenarios 2 and 5.⁶ While the economies of scale present when operating two units would cease to exist when one unit is retired, it does not explain why the Company cannot necessarily cut costs 50 percent when moving from two units to one, a prudent utility should be able to reduce costs by more than 15 percent when reducing its generating capacity by 50 percent.

SPS explained⁷ the small decrease in FOM by stating that because a large portion of FOM costs is labor-related and because the switch from annual to seasonal operations has already resulted in a significant reduction of labor costs; according to SPS, there was little more the Company could do to reduce FOM when subsequently moving from two units to one.

Breaking apart this explanation, we find that SPS modeled a 71 percent and 83 percent incremental reduction in capex and FOM respectively (based on annual average spending over the time period that each unit was assumed to operate) when switching from full annual operation to seasonal operation (Scenario 1 to 2, as shown in Table 3). SPS then modeled a 20 percent incremental reduction in both capex and FOM costs in the move from seasonal operations at two units to season operations at one unit (Scenario 2 to 5). This means the Company assumed that the move from two units to one would only reduce capex and FOM costs an additional 20 percent. This is an extremely small reduction; it is

⁶ The Capex files that SPS originally provided to Sierra Club contained several errors. SPS acknowledged these errors on a July 26, 2021 call with Sierra Club and provided the corrected files after the call. Because Sierra Club did not have the corrected files until after the phone call, we were unable to ask SPS about the drivers of capex costs.

⁷ Call with SPS, July 27, 2021.

also counterintuitive, given the reduction of approximately 530 MW of generation capacity fixed costs, and the associated with the operation and maintenance of that capacity.

Table 3:CONFIDENTIAL Incremental change in fixed costs associated with changing operational assumptions

Fixed and Capex Costs	FOM	Capex
	Incremental reduction from prior step	Incremental reduction from prior step
Tolk 1 & 2, full operation	-	-
Tolk 1 & 2 seasonal operation	83%	71%
Tolk 2 seasonal operation	20%	20%

Source: Analysis based on SPS Tolk Analysis Encompass Input Files: SPS_ReferenceCase_1H21_2021-06-21.xlsx with corrections provided by Company on 8/2/2021.

The Company provided no data to support these assertions and therefore we had no ability to assess any of its claims, including how much of the Company’s FOM spending was actually labor-related and what FOM costs were truly avoidable in moving from two units to one.

It is also unclear whether the cost reduction values in the switch from Scenario 1 to 2 are based on actual changes in labor practices that have been implemented or are simply an estimate or projection by the Company. But it is concerning that SPS estimates such a small reduction in costs in moving from two units to one but such a large one in moving from full annual operation to seasonal operations. This raises the question about whether the Company is overestimating the reduction in Scenario 2 and underestimating it in Scenario 5.

SPS also included labor loading adders on top of its FOM cost streams for Scenarios 2 and 5. The Company critically did not explain what the labor loading adders represent and how they are distinct from the other FOM costs.

Given the above concerns, ***we recommend that SPS provide the Commission and stakeholders with the following: (1) a clear breakdown of what is included in all projected sustaining capex, fixed O&M, and labor loading costs included in all scenarios used in the Tolk Analysis; (2) a clear breakdown of actual recent historical costs from before and after the Company switched to seasonal operations that show the change in cost after the switch; (3) a clear narrative that explains the cost assumptions used across scenarios, and all actions the Company has taken to minimize costs.***

b) SPS did not evaluate a CO₂ price sensitivity as part of its Tolk Analysis

SPS did not evaluate a carbon price sensitivity as part of the Tolk Analysis, and therefore did not incorporate carbon risk into its evaluation of when to retire each Tolk unit. SPS did evaluate carbon sensitivities as part of the subsequent IRP modeling, but the retirement dates for Tolk were locked in by the time SPS performed the IRP modeling based on the results of the Tolk Analysis. Because SPS selected Scenario 2 as its preferred scenario, the locked-in retirement dates were 2032 for both units. This is

concerning because the carbon price sensitivity had a large impact on the IRP results; given the carbon intensity of the Tolk units, it should have a meaningful impact on the Tolk Analysis as well.

SPS provided Synapse with input and output files from carbon scenarios modeled as part of the IRP process.⁸ In the sections below, we present the results of our own modeling, which add CO₂ price sensitivities to the Tolk Analysis.

Because of the exclusion of the CO₂ price sensitivities from the Tolk Analysis, the Company presented no results where the model was allowed to determine the optimal retirement date for the Tolk units with a carbon price. Specifically, none of the Company's modeling answers the question "*What is the optimal retirement date for the Tolk units assuming a carbon price is implemented?*"

The inconsistency between how SPS conducted its Tolk Analysis and its IRP modeling, and the resulting omission of a CO₂ price from the evaluation of the Tolk units' retirement dates is very concerning. Assuming that it was not SPS's intention to hide the impact of a CO₂ price on Tolk's retirement decision from the Commission, ***we recommend that SPS conduct additional modeling runs that test the impact of CO₂ price on the Tolk Analysis and update the report to include these sensitivities.***

3.4. Synapse adjusted SPS's unsupported assumptions and found that an earlier retirement of one Tolk unit is lower cost than keeping both online through 2032

In light of cost discrepancies in SPS's modeling inputs, Synapse adjusted the FOM and Capex costs in Scenario 5 to assume a more reasonable level of savings in moving from two units to one and re-ran the Company's modeling. As shown in Table 4, we found that with increased efficiencies in FOM and sustaining capex cost reductions (40 percent), the difference between scenarios essentially disappeared, going from \$39 million to \$9 million.

Next, Synapse re-ran Scenarios 2 and 5 in the Tolk Analysis with the mid-carbon price of \$20/ton that SPS used in its subsequent IRP analysis. We allowed the model to re-optimize the builds with this carbon price consideration (except for the Tolk units, which had retirement dates locked in). As shown in Table 4, we find that with this carbon price included in dispatch, Scenario 5 would save ratepayers \$53 million relative to Scenario 2 over the next two decades. This means that that if SPS was planning its system to minimize risk in the case that a carbon price was implemented, it would choose to retire at least one of the Tolk units early.

⁸ SPS included the carbon price in both the capacity expansion and production cost scenarios. This means that the carbon price was taken into consideration when coming up with optimized builds for all resources that did not have locked retirement dates (such as Tolk) and for the dispatch of all units inclusive of the Tolk units.

Table 4: Scenarios 2 and 5 with CO₂ price and incremental fixed-cost savings assumed in moving from two Tolk units to one

(\$M)	Action Period (2022-2025)		Decision Period (2022-2032)		Planning Period (2022-2041)	
	NPV	Delta from Scenario 2	NPV	Delta from Scenario 2	NPV	Delta from Scenario 2
Scenario 2	\$3,209	-	\$7,423	-	\$11,944	-
Scenario 5	\$3,272	\$62	\$7,528	\$104	\$11,984	\$39
Scenario 5, adjusted FOM and CAPEX	\$3,264	\$55	\$7,498	\$74	\$11,954	\$9
Scenario 2, \$20 CO ₂	\$3,757	-	\$8,359	-	\$12,993	-
Scenario 5, \$20 CO ₂	\$3,766	\$8	\$8,309	(\$50)	\$12,940	(\$53)
Scenario 5, adjusted FOM & Capex, \$20 CO ₂	\$3,756	(\$1)	\$8,277	(\$82)	\$12,908	(\$85)

Note: SPS provided Sierra Club with the EnCompass modeling files that it used to conduct the Tolk analysis. The Company provided two sets of files – (1) a locked set of files, where all expansion plants were locked and the model could only change resource dispatch decisions; and (2) an optimized set of files, where Tolk’s retirement dates were locked in, but the model could otherwise optimize its expansion plan and resource dispatch. When Synapse ran the locked versions of Scenarios 2 and 5 without making any changes, we got the same results as what SPS published. But, when we ran the Scenarios 2 and 5 optimized files without making any changes, we got slightly different results than what SPS published. In order to test alternative resource expansion plans, we had to use the optimized files. Additionally, SPS admitted that it made a mistake in inputting several cost streams into EnCompass. The Company provided the corrected files for us. These two factors explain why our “results” for Scenarios 2 and 5 are slightly different than what SPS published in the Tolk analysis report.

3.5. SPS did not model a scenario with optimized or intermediate retirement dates

SPS tested a series of scenarios with near-term retirement dates for Tolk Units 1 and 2 “hard-coded,” meaning that the Company did not allow the model to determine the optimal retirement date for each unit under each sensitivity. Instead, the only retirement dates allowed under seasonal operation were 2023 and 2032. SPS explained this choice with reference to its expectation that benefits renewable energy tax credits would diminish after 2023,⁹ and the shorter period for potential avoided coal plant costs. But it never tested how such factors would actually play-out in interaction with the other factors included in the modeling. By failing to test an optimized and unconstrained capacity expansion run, SPS does not answer the question of what are “the economically optimal (in terms of the public interest) abandonment dates for Tolk,” as required by Section II of the Commission-approved Stipulation in Case No. 19-00170-UT.

In an effort to answer that question, Synapse tested several scenarios with intermediate retirement dates. We originally planned to run a scenario in which the EnCompass model was allowed to select the

⁹ There are a number of proposals in Congress right now that will extend, and in some cases even increase, tax credits for renewables.

optimal retirement dates for the units. But, SPS includes cost streams for each of the Tolk units that are specific to both the scenario and the retirement date of the unit. SPS did not provide any workpapers showing the calculation of the cost streams, nor any explanation of the drivers behind them, and so it was not possible to run a purely optimized retirement scenario for the purpose of this report.¹⁰

Instead, we tested several intermediate retirement dates. First, we moved the retirement of Unit 1 in Scenario 5 from 2023 to 2026 and compared the resulting costs. We used conservative assumptions to adjust the hard-coded capex cost stream for Tolk 2 to reflect an earlier retirement date. We found this scenario was more expensive than Scenario 5. This result is explained by two main factors: (1) SPS does not have a capacity need in the near term, even with the retirement of one unit. This means there is minimal incremental benefit in pushing a 2023 retirement back to 2026. In fact, doing so will simply incur excess fixed and sustaining capex costs and provide unnecessary capacity; (2) SPS modeled the expiration of production tax credits; therefore, the model will build renewables prior to there being a capacity need to capture these tax credit before they expire. Pushing a 2023 retirement back to 2026 does not change the timing of when the model builds solar PV in the near term.

Next, we tested a scenario where we retired Tolk Unit 1 in 2023 and moved up the retirement of Tolk Unit 2 to 2026. We knew that moving Tolk Unit 1's retirement from 2023 back to 2026 did not result in cost savings, but we now wanted to see whether moving Tolk Unit 2's 2032 retirement up to 2026 would result in cost savings. We found that this new scenario was cheaper than the original Scenario 5, which kept Unit 2 on through 2032, and even closer in cost to Scenario 2 than the original Scenario 5. These results provided strong evidence that an optimal retirement scenario includes retirement of one unit in the near term (2023) and a second in the next five years (2026).

We layered the FOM reduction and CO₂ price on top of this new scenario and found that a 2023 and 2026 retirement scenario is cheaper than SPS's preferred scenario over the planning period.

¹⁰ We do appreciate the Commission's order extending the comment period by fifteen days, but given the complexity of the EnCompass modeling, the volume of data that goes into the modeling, and the hard-coded assumptions, it was not feasible to conduct a fully optimized modeling exercise.

Table 5: NPVRR results by scenario

(\$M)	Action Period (2022-2025)		Decision Period (2022-2032)		Planning Period (2022-2041)	
	Delta from Scenario 2	NPV	Delta from Scenario 2	NPV	Delta from Scenario 2	NPV
Scenario 2	\$3,209	-	\$7,423	-	\$11,944	-
Scenario 5	\$3,272	\$62	\$7,528	\$104	\$11,984	\$39
2023 Retirement of Tolk 1, 2026 Retirement of Tolk 2	\$3,343	\$133	\$7,546	\$123	\$11,964	\$20
Scenario 2, \$20 CO ₂	\$3,757	-	\$8,359	-	\$12,993	-
Scenario 5, \$20 CO ₂	\$3,766	\$8	\$8,309	(\$50)	\$12,940	(\$53)
2023 Retirement of Tolk 1, 2026 Retirement of Tolk 2, adjusted FOM & capex, \$20 CO ₂	\$3,764	\$6	\$8,187	(\$172)	\$12,786	(\$206)

This leads us to the conclusion that SPS has not identified the most economical retirement dates for the Tolk plant, and in fact retirement of Tolk Unit 1 in 2023 and Tolk Unit 2 in 2026 is likely a more optimal retirement scenario than the one SPS identified. ***We recommend that the Commission require SPS to conduct additional modeling runs that test intermediate retirement dates for the Tolk units, including the scenario Synapse tested where Tolk Unit 1 retires in 2023 and Tolk Unit 2 in 2026.***¹¹

3.6. SPS did not factor in additional risks from increasing water limitation and environmental compliance costs

In Guidehouse’s report, as stated above, the IE states that “The differences between the cases is considered within the planning margin of error, therefore, decisions on the optimal scenario should be rendered from a qualitative risk perspective.” Given this conclusion, we would expect SPS to provide a

¹¹ We also note that only one scenario tested early retirement dates for the Harrington units in addition to Tolk, but that scenario similarly fails to evaluate the optimal retirement dates for all five coal units. Instead, Scenario 6 assumes the retirement of all five coal units (approximately 2,080 MW) at the end of 2023, rather than staggering those retirements. We understand that SPS has agreed to cease burning coal at Harrington by the end of 2024, but Scenario 6 does not evaluate retirement of one or two units and conversion of the other(s). Nor does the early coal retirement scenario evaluate optimal, staggered Tolk retirements, as discussed above. As a result, Scenario 6 is significantly more expensive on a PVRR basis than the other scenarios; and in the time allotted for comments, we were unable to re-run the modeling to evaluate optimal Harrington retirement dates. We recommend the Commission direct SPS to conduct additional modeling scenarios to assess the optimal retirement dates for each of the coal units.

clear explanation of the risks that it has evaluated and considered. Specifically, we expected to see a discussion of how the Company incorporated risks from increased water constraints and costs, and risks from costs imposed from requirements to comply with environmental regulations for regional haze. It is not reasonable to expect that a 35+ year old coal plant can operate through 2032 without facing any additional environmental compliance costs.

a) Water shortage risks

On August 16, 2021, the Bureau of Reclamation declared a water shortage on Lake Meade, one of the main reservoirs for the Colorado River. This was the first time the federal government has taken such action to issue mandatory cuts (referred to as Tier 1 reductions), which will go into effect next year. Even though SPS does not rely on the Colorado river at Tolk, the factors that are driving the water shortage, mainly climate change and long-term droughts, are prevalent throughout the west. SPS is aware of these conditions. This is closely related to SPS's proposal to use Tolk seasonally moving forward.

Water shortages might be expected to worsen in the future. This means higher costs to procure the same amount of water, which fundamentally would drive up the cost to keep the Tolk units online. While SPS did incorporate the cost associated with water wells in its Tolk analysis, the Company did not appear to consider the real risk that drought-driven demand could shorten the remaining life for plants' water supply beyond projected levels when selecting its preferred scenario. Early retirement of one or both units, as in Scenario 5 or Sierra Club's early retirement scenario, fundamentally reduces the risk to ratepayers posed by water scarcity and water costs.

b) Regional Haze risk

SPS's IRP—and Scenario 2, in particular—also fails to meaningfully evaluate the potential compliance costs associated with the Clean Air Act's Regional Haze requirements.

Because Texas failed to submit a lawful haze plan, on January 5, 2016, EPA finalized a federal plan, addressing Texas's reasonable progress obligations for the first planning period, and requiring the installation of dry flue gas desulfurization technology (i.e., "scrubbers") at 15 Texas electric generating units, including Tolk units 1 and 2.¹² Compliance with the federal plan could be as much as \$300 million for *each* of the Tolk units.¹³

SPS includes a qualitative description of the potential impacts of the Regional Haze Rule, but the IRP fails to model a scenario that includes the compliance costs that could be required to continue operating each Tolk unit until 2032. As an initial matter, EPA's 2016 rule was supported by an extensive administrative record demonstrating that installing \$300 million scrubbers at Tolk would be technically feasible and cost-effective—largely because of the massive pollution reductions achievable with dry scrubber technology. In fact, similar scrubber technology is widely used throughout the electric sector,

¹² 81 Fed. Reg. 296 (Jan. 5, 2016).

¹³ IRP, Appendix K at 8.

and the Tolk units are essentially uncontrolled for SO₂ pollution. Even if EPA declines to impose dry scrubber technology at Tolk, the agency's rulemaking record makes clear that less-expensive dry sorbent injection technology would also be cost-effective.¹⁴ Thus, whether SPS is required to install \$300 million scrubbers or less expensive pollution technology, compliance with the Clean Air Act's Regional Haze requirements will almost certainly drive up the cost to keep the Tolk units online.

While SPS acknowledges the uncertainty around Regional Haze compliance, the Company did not incorporate potential costs of compliance when selecting its preferred scenario. If it had, the analysis would confirm that the early retirement of one or both Tolk units, as in Scenario 5 or Sierra Club's early retirement scenario, would obviate or mitigate the risk to ratepayers posed by compliance with the Regional Haze Rule. Moreover, the Company's refusal to account for those risks deprives the public and the Commission of information that is critical to meaningfully and rigorously evaluate the prudence of the Company's long-term plan, or the costs and risks of the Company's planning decisions to ratepayers.

4. SPS 2021 INTEGRATED RESOURCE PLAN

4.1. SPS did not clearly explain the drivers behind the sensitivity results in the IRP

In reviewing the IRP results, we find that SPS did not provide a thorough explanation for all the results it presented. This is especially concerning for the results where the driving factors or reasoning for the results are not intuitively clear. For example, as shown in Table 6, many of the sensitivities result in less battery storage than the base case (the preferred) scenario.¹⁵ In the low load sensitivity, gas CT builds increase and renewable builds decrease. Additionally, the model inexplicably only selected paired solar and storage options in the carbon price sensitivities.

¹⁴ 79 Fed. Reg. 74,818, 74,876, Table 32 (Dec. 16, 2014) (indicating that dry sorbent injection at Tolk would have a capital cost of approximately \$19 million per unit, and annual O&M costs of up to \$32 million for each unit, each of which are within the range of costs EPA found to be cost-effective).

¹⁵ Tolk Analysis, Table 7.1 to Table 7.9.

Table 6: Planning Period (2022-2041) resource additions across SPS's IRP scenarios

Resource Type	Base Case	Low Gas and Energy Price	High Gas and Energy Price	Low Load	High Load	\$200/kW Tx	\$600/kW Tx	\$8/ton CO ₂	\$20/ton CO ₂	\$40/ton CO ₂
Standalone Storage	180	-	100	10	60	50	110	120	90	330
Solar + Storage	-	-	-	-	-	-	-	200	200	200
Wind	2,158	1,658	2,858	2,158	2,308	2,409	2,158	2,408	2,558	2,558
Solar	1,820	1,470	2,130	1,610	1,920	1,210	1,440	1,700	1,835	1,985
Firm Peaking	3,033	3,500	3,033	3,266	3,966	3,033	3,266	2,800	2,800	2,566
CC	-	-	-	-	-	-	-	-	-	-
Total	7,191	6,628	8,121	7,044	8,254	6,702	6,974	7,228	7,483	7,639

We do not contend that all these results are necessarily wrong, but it is difficult (if not impossible) to assess the reasonableness of the Company's modeling without a complete and thorough explanation for the resource additions reflected in Table 6. There are many factors, mainly relating to input assumptions and model design parameters and settings, that drive resource dispatch and build decisions in a model like EnCompass. It is critical that the Company knows why the model is producing the results it sees, and that the Company shares that information with the Commission and the public. ***Therefore, we recommend that the Commission request SPS to amend its IRP report with a narrative explaining the results it presents in its IRP.***

BEFORE THE NEW MEXICO PUBLIC REGULATION COMMISSION

**IN THE MATTER OF SOUTHWESTERN
PUBLIC SERVICE COMPANYS’S 2021
INTEGRATED RESOURCE PLAN FOR
NEW MEXICO**

Case No. 21-00169-UT

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that this day, a true and correct copy of Sierra Club’s Comments was sent to the following by email:

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