Xcel Energy®

Tolk Analysis: 2nd Technical Conference

04/19/2021

Agenda

2nd Technical Conference

1. Introduction
2. Tolk Analysis Overview
3. SPS System Overview
4. Conclusion 1: Replacement Resources
5. Conclusion 2: Preliminary Results
6. Final Review

Preliminary Results

Disclaimer

The results presented today are preliminary and are subject to change

Xcel Energy / SPS will release a new natural gas forecast between now and filing the Tolk Analysis. SPS will update the results preliminary results presented today to incorporate the new natural gas forecast in the final analysis

INTRODUCTION

Introduction
Stipulation

The uncontested comprehensive stipulation in New Mexico Case No. 19-00170-UT requires SPS to submit a robust analysis of Tolk abandonment and potential means of replacement by June 2021 (“The Tolk Analysis”)

- The Tolk Analysis will be incorporated into SPS’s 2021 Integrated Resource Plan (“IRP”) application
- The Tolk Analysis shall include:
  - **Two technical conferences**
  - A review by an independent evaluator (“IE”)
  - **Replacement resources priced based on an RFP or RFI process**

Introduction
Technical Conferences

- First Technical Conference – Present and solicit feedback on the basic parameters and approach of the Tolk analysis
  - Completed four technical conferences between June 2020 and February 2021
- **Second Technical Conference – Provide and solicit feedback on the preliminary conclusions of the Tolk analysis**

Introduction

Replacement resources priced based on an RFP or RFI process

- The intent of the 2020 request for information (“RFI”) is to provide SPS with the type, technical characteristics, and cost of the resources needed or available to conduct the Tolk Analysis
- The expansion plans presented today are only intended to demonstrate how the Encompass model selected different portfolios of resources to potentially replace, or supplement, the capacity and energy provided by the Tolk Units
- As discussed during this presentation, the Tolk Analysis incorporates several critical variables and external drivers that impact the quantity and timing of potential additional resources
- If applicable, SPS will conduct a thorough and separate procurement process before acquiring any additional resources
- The selection of proposals in the Tolk Analysis will have no bearing on any possible future procurement process

Introduction

Preliminary Conclusions

Conclusion 1 – Resources Submitted in the RFI Process

- The Tolk analysis provides indication that SPS should continue to explore the acquisition of economic energy resources
- Potential cost savings provided by new resources are highly dependent on critical variables and external drivers

Conclusion 2 – Retirement of the Tolk Units

- The preliminary results of the Tolk Analysis do not conclusively support an earlier retirement of the Tolk Units
- Without clear and obvious data to the contrary, SPS recommends continued operation of the Tolk units on a seasonal basis through end-of-year 2032

Note: The two conclusions are not mutually exclusive

THE TOLK ANALYSIS OVERVIEW

Tolk Analysis Overview

Tolk Station – Overview of Benefits & Costs

Benefits captured in Encompass

- Relatively low-cost, *dispatchable* energy
- Over 1GW of year-round capacity

Costs captured in Encompass (not exhaustive)

- Cost Recovery of Capital Investment
- Fixed Costs
  - Operations and Maintenance (labor expenses, maintenance, coal handling etc.)
- Variable Costs
  - Operations and Maintenance (chemicals, water)
  - Fuel Costs

Tolk Analysis Overview

Objective

Establish the optimal operation and retirement dates of the Tolk Units, considering availability of economical water. The Tolk Analysis evaluates alternative benefits (and costs) provided by the Tolk Units:

1. **Maximize Energy Value**
   - ➢ Continue to operate the Tolk units year-round (economically) – at the expense of an earlier retirement date, or

2. **Preserve Capacity Value**
   - ➢ Preserve Tolk’s >1GW capacity – at the expense of deferred energy production, or

3. **Is There a More Optimal Approach? (i.e Early Retirement)**
   - ➢ Retire the Tolk Units early – regardless of the availability of economic water
   - ➢ Obtain capacity and energy from alternative resources

Tolk Analysis Overview

Scenarios

Maximize Energy Value

- **Scenario 1**
  - Operate the Tolk Units year-round (economically)
  - Retire Tolk units EOY2025

Preserve Capacity Value

- **Scenario 2**
  - Operate the Tolk Units seasonally (economically)
  - Retire Tolk units EOY2032

Early Retirement

- **Scenario 3**
  - Operate the Tolk Units year-round (economically)
  - Retire Tolk units EOY2023
- **Scenario 6**
  - Operate the Tolk & Harrington Units year-round (economically)
  - Retire all units EOY2023

Hybrid Approach

- **Scenario 4**
  - Operate the Tolk Units year-round (economically)
  - Retire Tolk unit 1 EOY2023
  - Retire Tolk unit 2 EOY2031
- **Scenario 5**
  - Operate the Tolk Units seasonally (economically)
  - Retire Tolk unit 1 EOY2023
  - Retire Tolk unit 2 EOY2032

Throughout todays presentation, Scenarios 2 & 3 will be used to demonstrate SPS's preliminary conclusions

SPS SYSTEM OVERVIEW

SPS System Overview

Capacity & Planning Reserve Margin

- To provide reliable service, all electric utilities must have more capacity available than the projected peak load
- The available capacity in excess of the projected peak load is referred to as the " planning reserve margin" ("PRM")
- SPS is a member of the Southwest Power Pool ("SPP")
- SPP requires each member to have a planning reserve margin of at least 12% of its peak demand forecast
- SPS's current Summer Peak demand is approximately 4,000MW
- Including the PRM, SPS are required to have a ***minimum*** of ~4,500MW of accredited capacity to meet Summer Peak Demand

SPS System Overview

Meeting the capacity need

- SPS currently has sufficient accredited capacity through the late 2020's to early 2030's
- The early retirement of the Tolk Units will create an immediate capacity need – requiring SPS to acquire additional resources
- Renewable resources are treated as contributing towards SPS's projected peak load (although not 100% of the nameplate capacity), for example:
  - Wind accredited capacity towards the Summer peak is ~20%
  - Solar accredited capacity towards the Summer peak is ~55%
- SPS must be able to serve *load in all hours, during variable weather conditions* – therefore, firm resources or long-duration energy storage will be required

SPS System

Firm Resources / Fuel Diversity

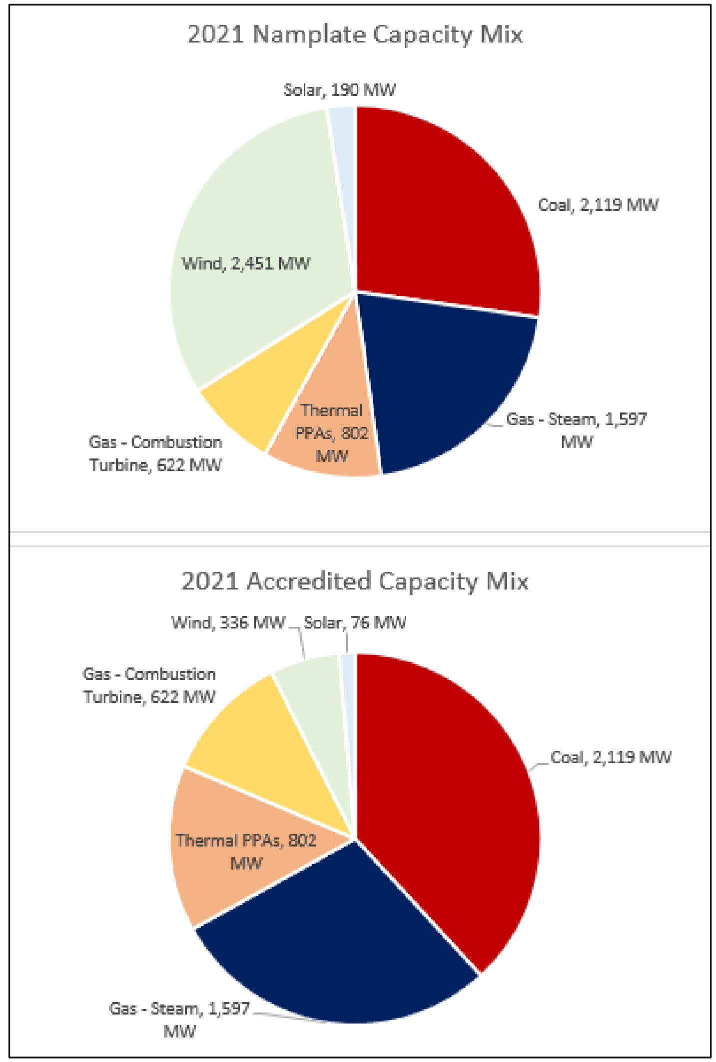
- For the purposes of the Encompass analysis, SPS utilize standard modeling inputs, such as weather-normalized load forecasts and average annual production profiles
- While extreme events like Winter Storm Uri are not fully captured in capacity/price modeling, this uncertainty is captured as part of our planning reserve
- During this cold-weather event, the Tolk and Harrington units were critical in serving SPS's customers and as a hedge against high energy prices
  - *Between 2/13/2021 and 2/19/2021 the Tolk and Harrington units produced ~270,000 MWh*
  - *Cost of energy was between $19.00 - $20.00 / MWh*
  - *Without Tolk and/or Harrington SPS would have incurred much greater costs to dispatch other resources or purchase from the market*

SPS System Overview
Existing System

SPS currently has:

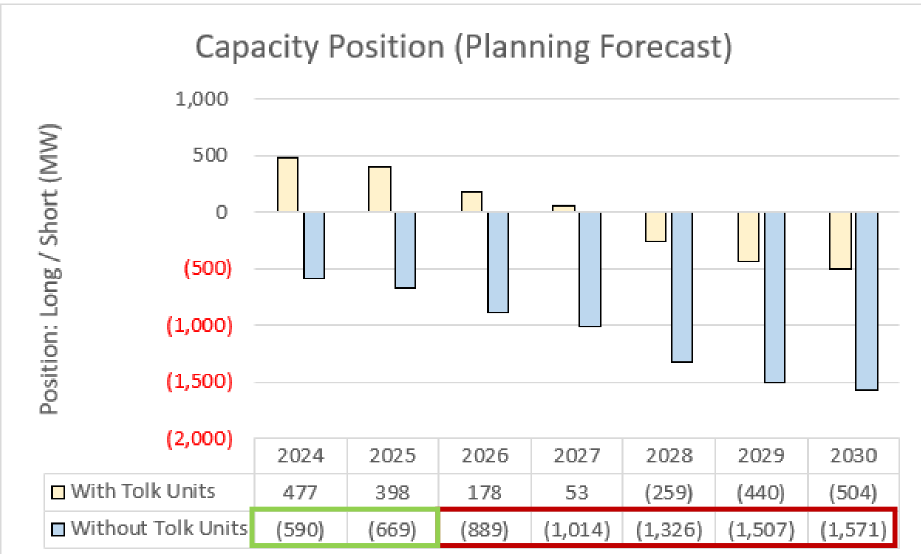
- 7,781MW of generating resources
  - ➢ 5,140MW of firm resources
  - ➢ 2,641MW of wind and solar resources
- 5,548MW of accredited summer capacity

- *1,600MW of gas steam generation*
  - *1,100MW scheduled to retire by EOY 2030*
  - *1,350MW scheduled to retire by EOY 2032*

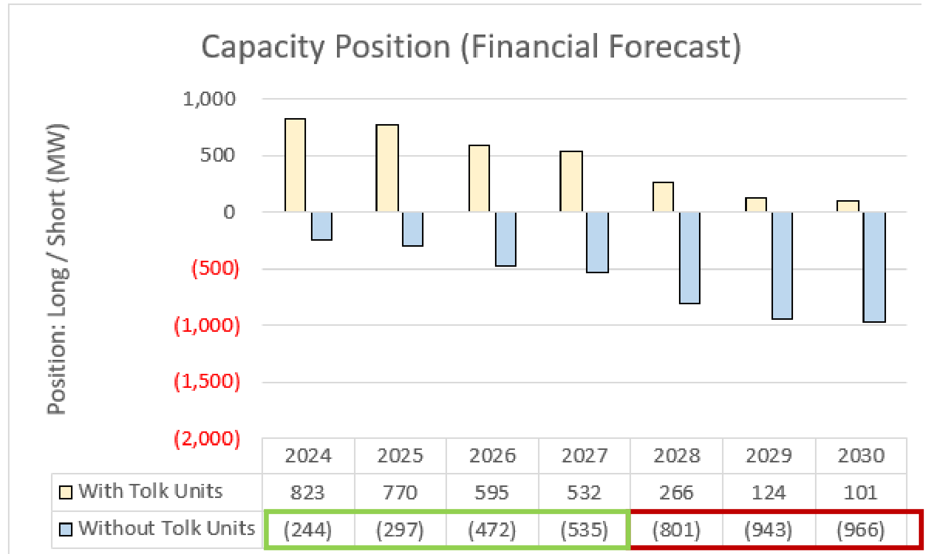


SPS System

Capacity Position



	2024	2025	2026	2027	2028	2029	2030
With Tolk Units	477	398	178	53	(259)	(440)	(504)
Without Tolk Units	(590)	(669)	(889)	(1,014)	(1,326)	(1,507)	(1,571)



	2024	2025	2026	2027	2028	2029	2030
With Tolk Units	823	770	595	532	266	124	101
Without Tolk Units	(244)	(297)	(472)	(535)	(801)	(943)	(966)

- As discussed in detail in the next section, all scenarios modeled add significant renewable generation between 2023 and 2025
- Generally, the accredited capacity of the new renewable generation initially fulfills the lost capacity of the Tolk Units (green). However, the Encompass model then adds firm resources (combined cycles, combustion turbines, or energy storage) as this need increases (red)

CONCLUSION 1 – RESOURCES SUBMITTED IN THE RFI PROCESS

Additional Resources

Overview

The Encompass production cost model will not necessarily replace the Tolk Units with like-in-kind generation. Instead, the model will optimally create an 'expansion plan' for each scenario based on the resource need, for example, replacing the Tolk Units could consist of a combination of solar, wind, battery storage, combustion turbines etc. – all at different locations, with different in-service dates.

While the expansion plan must meet SPS's planning reserve margin, the model may also select additional resources to provide economical energy (i.e even when there is no resource need)

- Economically selected resources are not necessarily economical in all-years, nor are they necessarily lower cost than existing resources
- Encompass's logic does not include a benefit-to-cost ratio threshold – for example, Encompass could select a project that lowers the PVRR by a marginal amount, even if it requires a multi-year, multi-million-dollar commitment
- Encompass evaluates system-wide costs over a long-term planning horizon, not necessarily the immediate impact to SPS's ratepayers

Replacement Resources

Overview

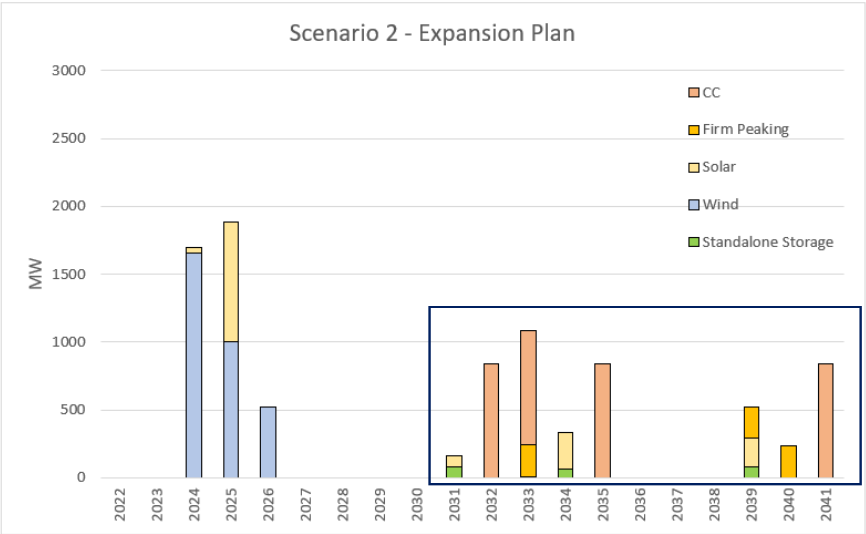
As the Encompass model must maintain SPS's planning reserve margin, the early retirement of over 1GW of generation could be expected to produce a substantially different optimized expansion plan than the continued operation of Tolk Station (i.e there is a greater 'need' in one scenario)

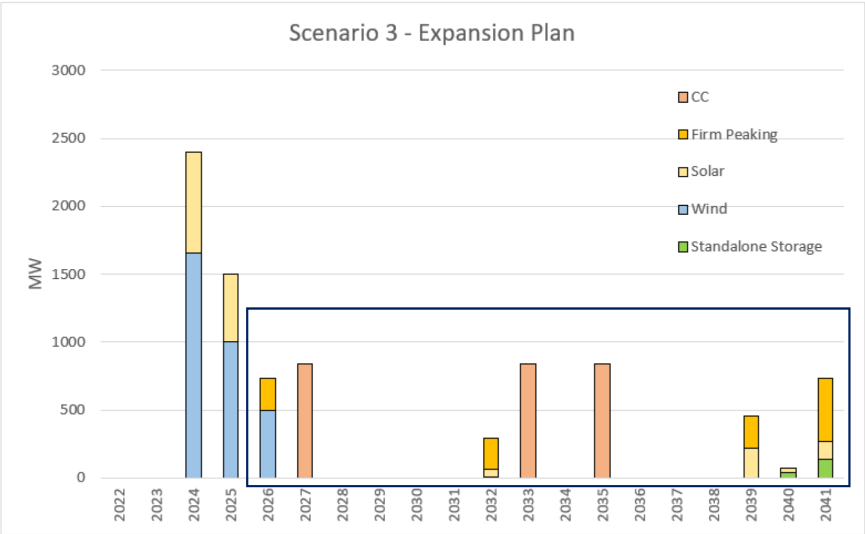
However, critical variables and external drivers fundamentally impact the optimized expansion plans for each scenario – this resulted in similar expansion plans between each retirement scenario

Scenario 2: Seasonal operations, 2032 retirement
Scenario 3: 2023 retirement

Expansion Plan

Sample Expansion Plan using Planning Load Forecast



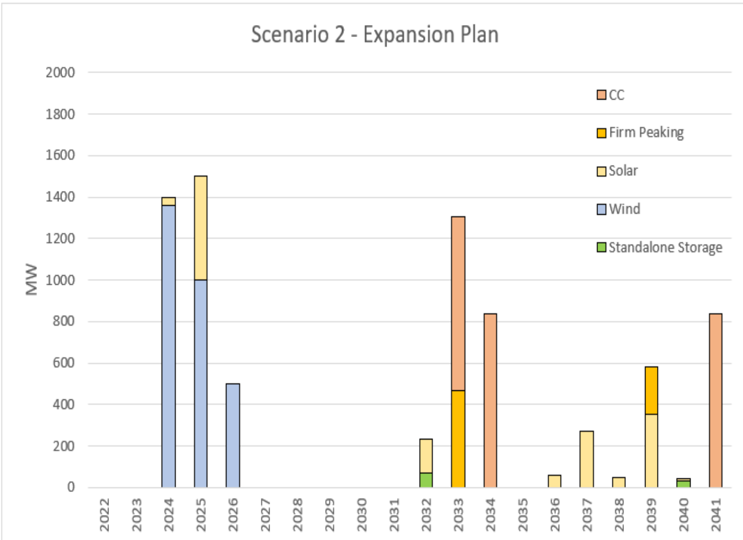


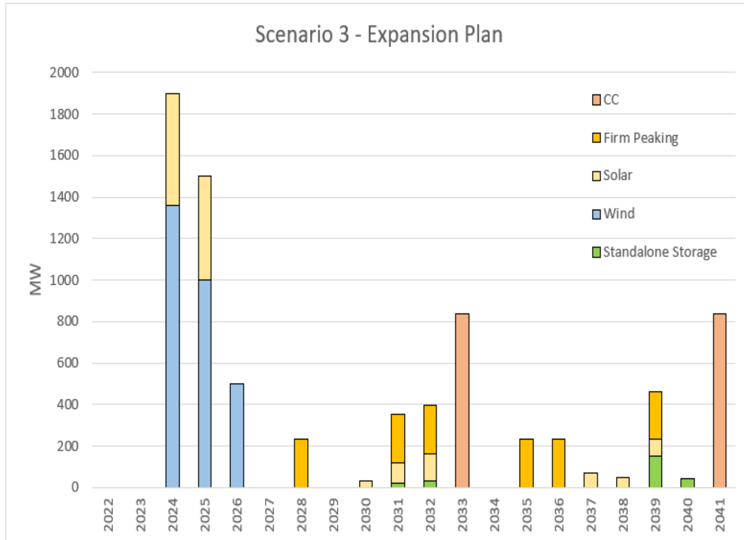
- Regardless of the retirement of the Tolk Units both Scenarios aggressively acquired the same amount of wind, and large quantities of solar generation between 2023 and 2025
- Renewable resources initially met the capacity need if the Tolk Units were retired early, however, as this capacity need grew the model added firm generation (as discussed on slide 16)

Scenario 2: Seasonal operations, 2032 retirement
Scenario 3: 2023 retirement

Expansion Plan

Sample Expansion Plan using Financial Load Forecast





- Lower load forecast provides similar results (Large-scale renewable build out, before firm generation resources are required

Expansion Plan

Critical Variables & External Drivers

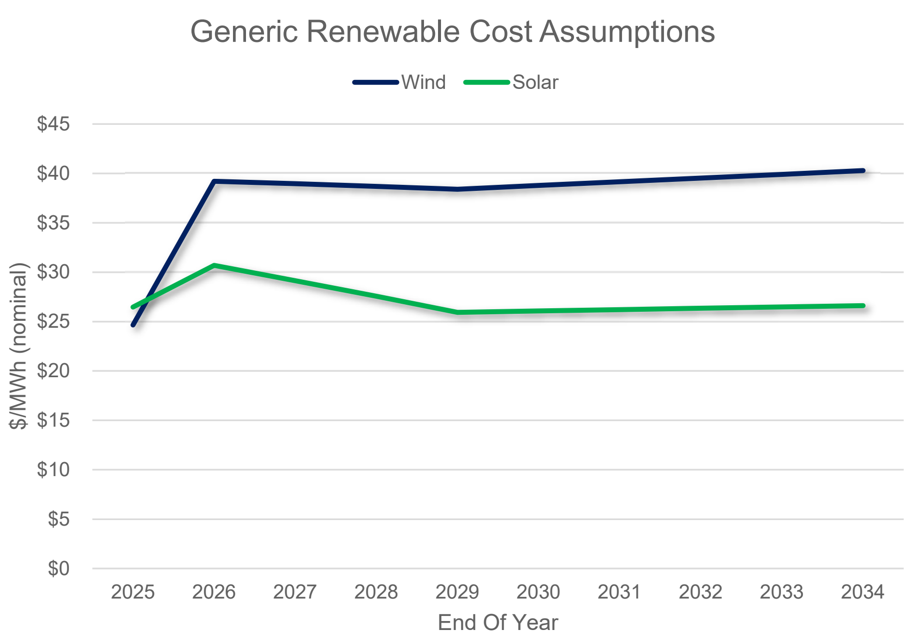
Questions: Why are the short-term expansion plans so similar between scenarios? Why does the model select such large quantities of renewables between EOY 2023 and EOY 2025?

Answer: Critical variables and external drivers fundamentally impact the expansion plan. They include:

1. Expiring Renewable Tax Credits
2. RFI proposals vs Generic Costs
3. Future cost of Generic Resources
4. Uncertainty in generator interconnection costs

Expiring Renewable Tax Credits

Impact to Replacement Generation



'Generic' Wind

- Increases from $24.65/MWh to $39.20/MWh after 60% PTC expires
- Relatively flat thereafter

'Generic' Solar

- Increases from $26.46/MWh to $30.68/MWh after 26% ITC steps down to 10%
- Pricing continues to decline until EOY 2029 – relatively flat thereafter

Prices stated exclude network upgrades costs

Expiring Renewable Tax Credits

Impact To Replacement Generation

Generic Wind

Driver: Without an extension of Production Tax Credits, wind generation will permanently, and substantially, increase in cost EOY2025

Result: Regardless of the retirement of Tolk Station, Encompass will add additional wind 'today', as it will be more expensive in the future – even if the wind generation operates 'at-a-loss' for several years

Generic Solar

Driver: Declining solar prices through EOY 2029 offset step-down of ITC

Result: Without a capacity need, Encompass will add economic solar 'today', but could acquire economically competitive solar in the future as costs continue to fall

RFI Proposals vs Generic Costs

Impact To Replacement Generation

- SPS used the approximate average cost of proposals received in the RFI process to baseline generic resource cost assumptions after 2025
- By default, multiple RFI proposals are lower cost than the generic resources available for selection in future years
- All-else-being-equal, expansion plans will favor selection of RFI proposals that are lower cost than the generic resources

Future cost of Generic Resources

Impact To Replacement Generation

- The Tolk Analysis incorporates conservative assumptions about the future costs of renewable generation – particularly wind generation (i.e generic wind gets more expensive after PTCs expire and technological / cost improvements do little to reduce future costs)
- The Encompass model may delay the acquisition of renewable resources if more lower future costs were anticpated

Generator Interconnection Costs

Impact to Replacement Generation

- Generic Overnight Construction Costs (excluding network upgrades):
  - Wind: ~$1,500/kW
  - Solar: ~$1,000/kW
- Developers ‘typically’ include up to $100k/W for network upgrades
- Multiple proposals received in the RFI did not include network upgrade costs
- DISIS 2017-01 PH1 study assigned average network upgrade costs of $933/kW

Generator Interconnection Costs

2017-01 DISIS Study

06 - South Texas Panhandle/New Mexico

Project	MW	Cost	
ASGI-2016-001	3	$ 5,266,054	
ASGI-2017-007	4	$ 5,266,054	
GEN-2016-039	112	$ 85,519,389	
GEN-2016-077	54	$ 92,570,250	
GEN-2016-078	108	$ 114,066,484	
GEN-2016-090	100	$ 182,258,203	
GEN-2016-171	64	$ 74,054,920	
GEN-2016-172	231	$ 180,145,565	
GEN-2017-007	298	$ 345,638,774	
GEN-2017-012	202	$ 132,909,887	
GEN-2017-016	33	$ 39,499,129	
GEN-2017-026	235	$ 278,096,169	
GEN-2017-033	200	$ 155,964,413	
GEN-2017-039	200	$ 230,851,902	
GEN-2017-059	90	$ 63,082,485	
GEN-2017-065	200	$ 156,198,900	
GEN-2017-069	4	$ 6,234,077	
GEN-2017-078	300	$ 31,295,541	
GEN-2017-079	50	$ 47,661,051	
GEN-2017-080	525	$ 620,624,115	
GEN-2017-081	300	$ 187,034,112	
GEN-2017-084	89	$ 74,161,043	
GEN-2017-087	128	$ 149,778,167	
GEN-2017-091	26	$ 24,655,395	
GEN-2017-104	240	$ 260,003,531	
	3,795	**$ 3,542,835,609**	**$ 933,522**

1st Phase Study

- 25 projects totaling 3,795MW
- $3.5 Billion of network upgrades assigned
- Average $933,522 / MW

Generator Interconnection Costs

2017-01 DISIS Study

06 - South Texas Panhandle/New Mexico

Project	MW	PH1 Cost	PH2 Cost	
ASGI-2016-001		$ 5,266,054		
ASGI-2017-007		$ 5,266,054		
GEN-2016-039	112	$ 85,519,389	$ 79,247,305	
GEN-2016-077		$ 92,570,250		
GEN-2016-078		$ 114,066,484		
GEN-2016-090		$ 182,258,203		
GEN-2016-171		$ 74,054,920		
GEN-2016-172	231	$ 180,145,565	$ 161,709,493	
GEN-2017-007	298	$ 345,638,774	$ 272,291,602	
GEN-2017-012		$ 132,909,887		
GEN-2017-016	33	$ 39,499,129	$ 31,255,333	
GEN-2017-026	235	$ 278,096,169	$ 218,110,082	
GEN-2017-033	200	$ 155,964,413	$ 132,147,219	
GEN-2017-039	200	$ 230,851,902	$ 186,732,066	
GEN-2017-059	90	$ 63,082,485	$ 69,317,561	
GEN-2017-065	200	$ 156,198,900	$ 132,337,566	
GEN-2017-069	2	$ 6,234,077	$ 3,225,604	
GEN-2017-078	220	$ 31,295,541	$ 409,052,046	
GEN-2017-079		$ 47,661,051	$ -	
GEN-2017-080	525	$ 620,624,115	$ 484,787,832	
GEN-2017-081		$ 187,034,112		
GEN-2017-084		$ 74,161,043		
GEN-2017-087	128	$ 149,778,167	$ 118,640,773	
GEN-2017-091		$ 24,655,395		
GEN-2017-104	240	$ 260,003,531	$ 235,065,577	
	2,714	**$ 3,542,835,609**	**$ 2,533,920,059**	**$ 933,699**

2nd Phase

- 11 projects totaling 1,000MW dropped out
- $2.5 Billion of network upgrades still assigned
- Average $933,648/ MW
- 20% of network upgrades costs due by Mid-May

Generator Interconnection Costs

Impact to Replacement Generation

- SPS assigned various indicative network upgrade costs to all proposals that do not require a new GIA*
- Network upgrade costs assigned: $200/kW, $400/kW and $600/kW
- The same costs were applied to all wind, solar and combined cycle resources in **all future** years (assumed there is no benefit in waiting to acquire resources)
- The greater the network upgrades assigned; the more expansion plans will favor proposals with fully costed or executed GIAs

**Proposals not assigned network upgrade costs: (1) Proposals with existing GIA's, (2) BOT proposals at existing SPS generator locations (surplus interconnection / generator replacement)*

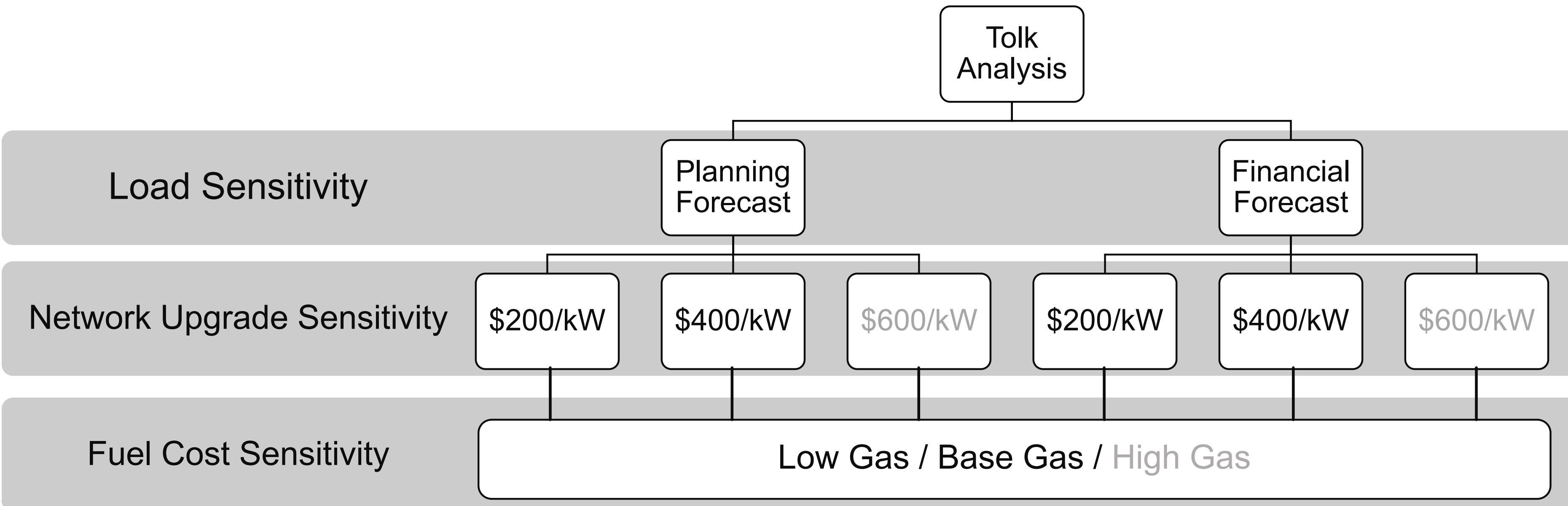
Replacement Resources
Conclusion

- Drivers and variables, such as expiring PTCs/ITCs, generic costs assumptions (both present and future) and the cost of network upgrades (both present and future), fundamentally impact when the expansion plans for each scenario
- This often results in the earlier selection of additional resource in the model
- While it is unlikely all these assumptions are correct, the Tolk Analysis is primarily a retirement analysis – not a thorough resource acquisition analysis
- As such, allowing the model to acquire potentially infeasible amounts of new generation on a possibly unrealistic timeline, allows SPS to stress-test the economic of continued operation of the Tolk Units

CONCLUSION 2 – PRELIMINARY RESULTS

Tolk Analysis Overview

Sensitivities



Tolk Analysis Overview

Scenarios

Maximize Energy Value

- **Scenario 1**
  - Operate the Tolk Units year-round
  - Retire Tolk units EOY2025

Preserve Capacity Value

- **Scenario 2**
  - Operate the Tolk Units seasonally
  - Retire Tolk units EOY2032

Early Retirement

- **Scenario 3**
  - Operate the Tolk Units year-round
  - Retire Tolk units EOY2023
- **Scenario 6**
  - Operate the Tolk & Harrington Units year-round
  - Retire all units EOY2023

Hybrid Approach

- **Scenario 4**
  - Operate the Tolk Units year-round
  - Retire Tolk unit 1 EOY2023
  - Retire Tolk unit 2 EOY2031
- **Scenario 5**
  - Operate the Tolk Units seasonally
  - Retire Tolk unit 1 EOY2023
  - Retire Tolk unit 2 EOY2032

Throughout todays presentation, Scenarios 2 & 3 will be used to demonstrate SPS's preliminary conclusions

Preliminary PVRR Analysis

Base Gas - $400/kW Network Upgrades

IRP Action Period:	*2022 - 2025*
Decision Period:	*2022 - 2032*
IRP Planning Period	*2022 - 2041*

Planning Forecast - Base Gas - $400/kW							
		Action Period		Decision Period		Planning Period	
		Delta	PVRR	Delta	PVRR	Delta	PVRR
Scenario 1	2025 Retirement	$ 152	$ 3,533	$ 366	$ 7,957	$ 299	$ 12,593
Scenario 2	2032 Retirement	$ -	$ 3,381	$ -	$ 7,591	$ -	$ 12,294
Scenario 3	2023 Retirement	$ 88	$ 3,469	$ 203	$ 7,794	$ 152	$ 12,446
Scenario 4	Staggered Retirement	$ 42	$ 3,423	$ 110	$ 7,701	$ 41	$ 12,335
Scenario 5	Staggered Retirement	$ 35	$ 3,415	$ 52	$ 7,643	$ (9)	$ 12,285
Scenario 6	Tolk/Har 2023	$ 258	$ 3,639	$ 800	$ 8,391	$ 933	$ 13,227

Excludes potential revenue for selling existing Water rights – Estimated at $0 - $20M (if sold TODAY!)

Financial Forecast - Base Gas - $400/kW							
		Action Period		Decision Period		Planning Period	
		Delta	PVRR	Delta	PVRR	Delta	PVRR
Scenario 1	2025 Retirement	$ 148	$ 3,252	$ 123	$ 6,819	$ 62	$ 10,629
Scenario 2	2032 Retirement	$ -	$ 3,104	$ -	$ 6,697	$ -	$ 10,567
Scenario 3	2023 Retirement	$ 85	$ 3,189	$ 49	$ 6,746	$ (7)	$ 10,560
Scenario 4	Staggered Retirement	$ 47	$ 3,151	$ 100	$ 6,797	$ 46	$ 10,613
Scenario 5	Staggered Retirement	$ 45	$ 3,149	$ 67	$ 6,764	$ (9)	$ 10,558
Scenario 6	Tolk/Har 2023	$ 250	$ 3,354	$ 700	$ 7,397	$ 798	$ 11,365

Preliminary PVRR Analysis

Base Gas - $200/kW Network Upgrades

IRP Action Period:	*2022 - 2025*
Decision Period:	*2022 - 2032*
IRP Planning Period	*2022 - 2041*

Planning Forecast - Base Gas - $200/kW							
		Action Period		Decision Period		Planning Period	
		Delta	PVRR	Delta	PVRR	Delta	PVRR
Scenario 1	2025 Retirement	$ 76	$ 3,448	$ 92	$ 7,565	$ 133	$ 12,000
Scenario 2	2032 Retirement	$ -	$ 3,371	$ -	$ 7,473	$ -	$ 11,867
Scenario 3	2023 Retirement	$ 48	$ 3,420	$ 104	$ 7,577	$ 138	$ 12,006
Scenario 4	Staggered Retirement	$ (27)	$ 3,344	$ 5	$ 7,478	$ 22	$ 11,889
Scenario 5	Staggered Retirement	$ 6	$ 3,378	$ 19	$ 7,492	$ 9	$ 11,877
Scenario 6	Tolk/Har 2023	$ 202	$ 3,573	$ 579	$ 8,052	$ 945	$ 12,812

Financial Forecast - Base Gas - $200/kW							
		Action Period		Decision Period		Planning Period	
		Delta	PVRR	Delta	PVRR	Delta	PVRR
Scenario 1	2025 Retirement	$ 92	$ 3,182	$ (5)	$ 6,704	$ 53	$ 10,360
Scenario 2	2032 Retirement	$ -	$ 3,090	$ -	$ 6,709	$ -	$ 10,307
Scenario 3	2023 Retirement	$ 53	$ 3,143	$ (19)	$ 6,690	$ (10)	$ 10,297
Scenario 4	Staggered Retirement	$ 4	$ 3,094	$ (38)	$ 6,671	$ (28)	$ 10,279
Scenario 5	Staggered Retirement	$ 2	$ 3,092	$ (43)	$ 6,665	$ (42)	$ 10,265
Scenario 6	Tolk/Har 2023	$ 229	$ 3,319	$ 649	$ 7,358	$ 884	$ 11,191

Excludes potential revenue for selling existing Water rights – Estimated at $0 - $20M (if sold TODAY!)

IRP Action Period:	*2022 - 2025*
Decision Period:	*2022 - 2032*
IRP Planning Period	*2022 - 2041*

Preliminary PVRR Analysis

Financial Forecast - Base Gas vs Low Gas - $400/kW Network Upgrades

Financial Forecast - Base Gas - $400/kW							
		Action Period		Decision Period		Planning Period	
		Delta	PVRR	Delta	PVRR	Delta	PVRR
Scenario 1	2025 Retirement	$ 148	$ 3,252	$ 123	$ 6,819	$ 62	$ 10,629
Scenario 2	2032 Retirement	$ -	$ 3,104	$ -	$ 6,697	$ -	$ 10,567
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Scenario 6	Tolk/Har 2023	$ 250	$ 3,354	$ 700	$ 7,397	$ 798	$ 11,365

Financial Forecast - Low Gas - $400/kW							
		Action Period		Decision Period		Planning Period	
		Delta	PVRR	Delta	PVRR	Delta	PVRR
Scenario 1	2025 Retirement	$ 176	$ 3,235	$ 215	$ 6,859	$ 146	$ 10,515
Scenario 2	2032 Retirement	$ -	$ 3,059	$ -	$ 6,644	$ -	$ 10,369
Scenario 3	2023 Retirement	$ 103	$ 3,162	$ 94	$ 6,739	$ 24	$ 10,393
Scenario 4	Staggered Retirement	$ 61	$ 3,120	$ 105	$ 6,749	$ 53	$ 10,422
Scenario 5	Staggered Retirement	$ 60	$ 3,119	$ 67	$ 6,711	$ 15	$ 10,383
Scenario 6	Tolk/Har 2023	$ 245	$ 3,305	$ 733	$ 7,377	$ 978	$ 11,346

Excludes potential revenue for selling existing Water rights – Estimated at $0 - $20M (if sold TODAY!)

SAMPLE EXPANDED VIEW – PLANNING FORECAST

PVRR Analysis

Planning Load Forecast including $400/kW network upgrades

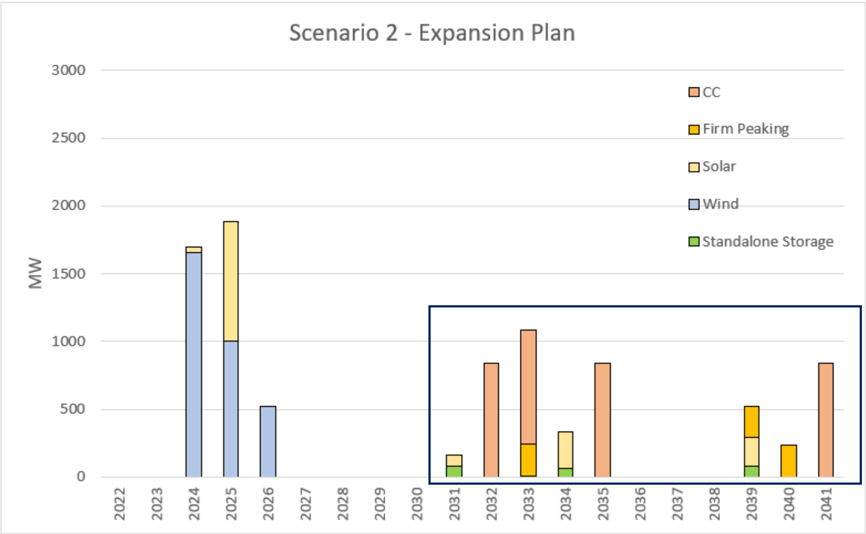
Planning Forecast - Base Gas - $400/kW							
		Action Period		Decision Period		Planning Period	
Scenario	Description	Delta	PVRR	Delta	PVRR	Delta	PVRR
Scenario 1	2025 Retirement	$ 152	$ 3,533	$ 366	$ 7,957	$ 299	$ 12,593
Scenario 2	2032 Retirement	$ -	$ 3,381	$ -	$ 7,591	$ -	$ 12,294
Scenario 3	2023 Retirement	$ 88	$ 3,469	$ 203	$ 7,794	$ 152	$ 12,446
Scenario 4	Staggered Retirement	$ 42	$ 3,423	$ 110	$ 7,701	$ 41	$ 12,335
Scenario 5	Staggered Retirement	$ 35	$ 3,415	$ 52	$ 7,643	$ (9)	$ 12,285
Scenario 6	Tolk/Har 2023 Retirement	$ 258	$ 3,639	$ 800	$ 8,391	$ 933	$ 13,227

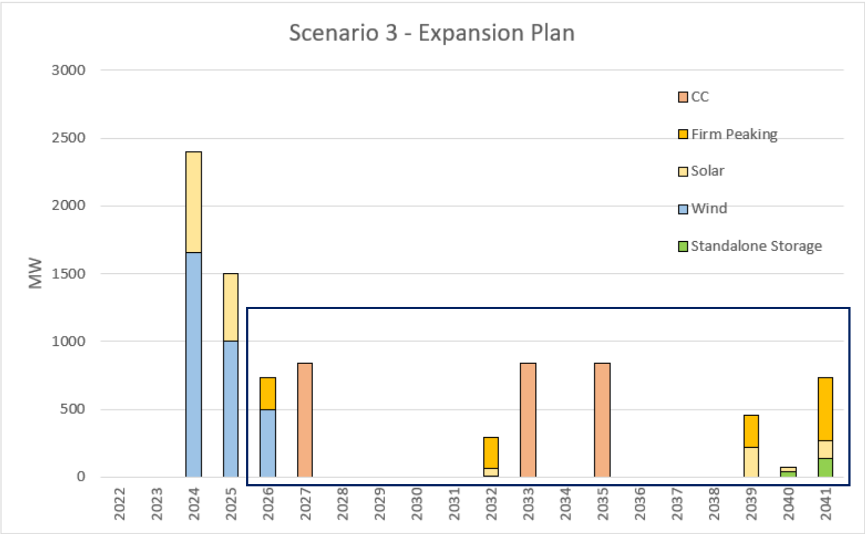
- Scenario 2 (seasonal operation 2032) vs Scenario 3 (2023 retirement) Comparison
  - ➢ Over the 4-year action period Scenario 3 is $88M higher cost than Scenario 2 (PVRR)
  - ➢ Between 2022 and EOY 2032, Scenario 3 is $203M higher cost than Scenario 2 (PVRR)
  - ➢ Over the 20-year planning period, Scenario 3 is $152M higher cost than Scenario 2 (PVRR)

Scenario 2: Seasonal operations, 2032 retirement
Scenario 3: 2023 retirement

Expansion Plan

Sample Expansion Plan using Planning Load Forecast



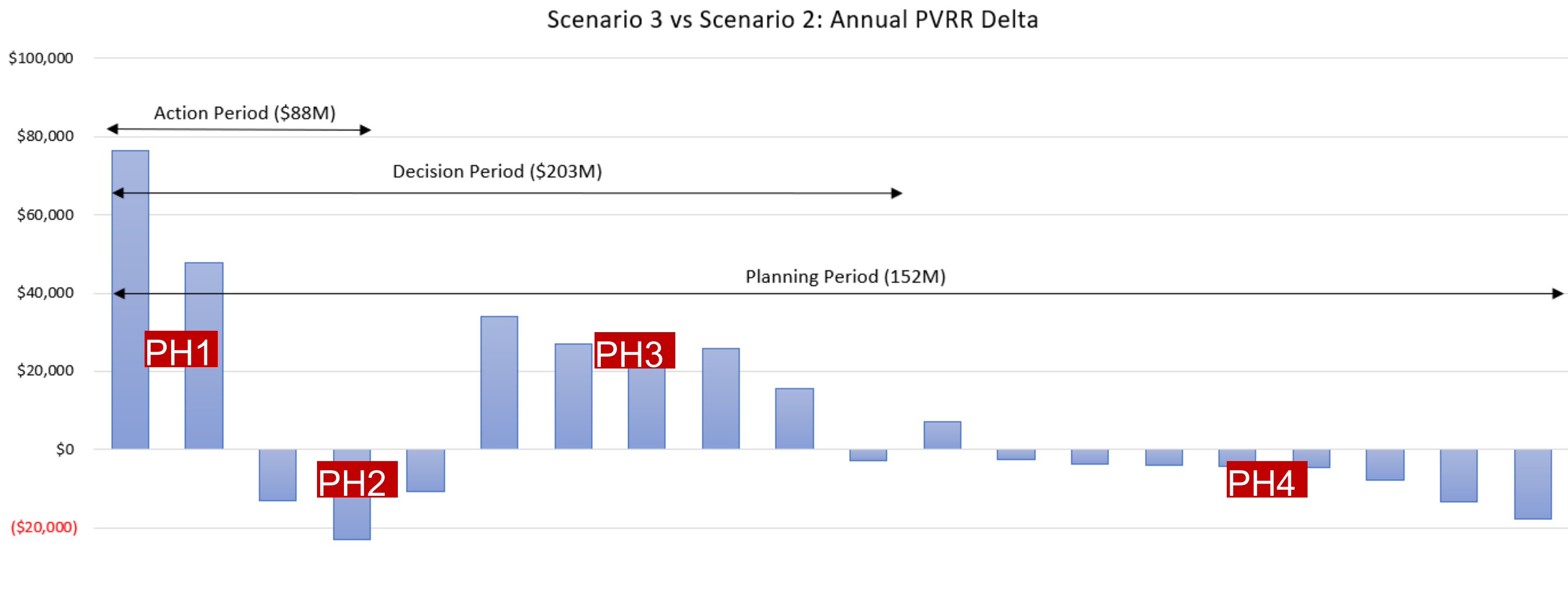


- Regardless of the retirement of the Tolk Units both Scenarios aggressively acquired the same amount of wind, and large quantities of solar generation between 2023 and 2025
- Renewable resources initially met the capacity need if the Tolk Units were retired early, however, as this capacity need grew the model added firm generation (as discussed on slide 16)

Scenario 2: Seasonal operations, 2032 retirement
Scenario 3: 2023 retirement

PVRR Analysis

Scenario 3 vs Scenario 2 – PVRR Annual Comparison

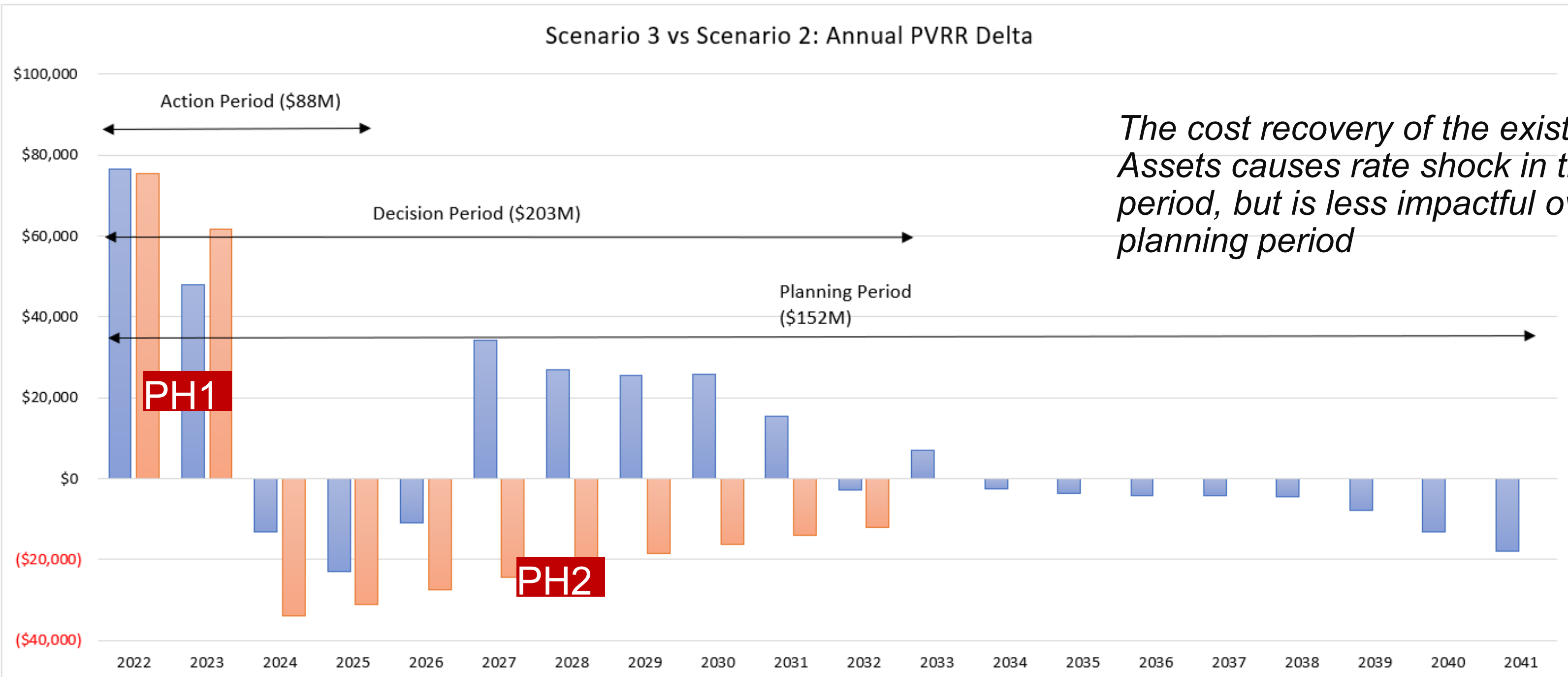


	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
Delta	$76,499	$47,880	($13,007	($22,935	($10,858	$34,092	$27,068	$25,514	$25,891	$15,501	($2,760)	$7,055	($2,627)	($3,634)	($4,104)	($4,283)	($4,577)	($7,679)	($13,259	($17,874

- *Ph1: Cost recovery of Tolk assets (Sc3), Ph2: Cost recovery of Tolk assets (Sc2) / Similar expansion plans capable of fulfilling capacity need, Ph3: Deferred generation (Sc2), Ph4: Additional generation (Sc2)*

PVRR Analysis – Cost Recovery of Tolk Asset

Scenario 3 vs Scenario 2



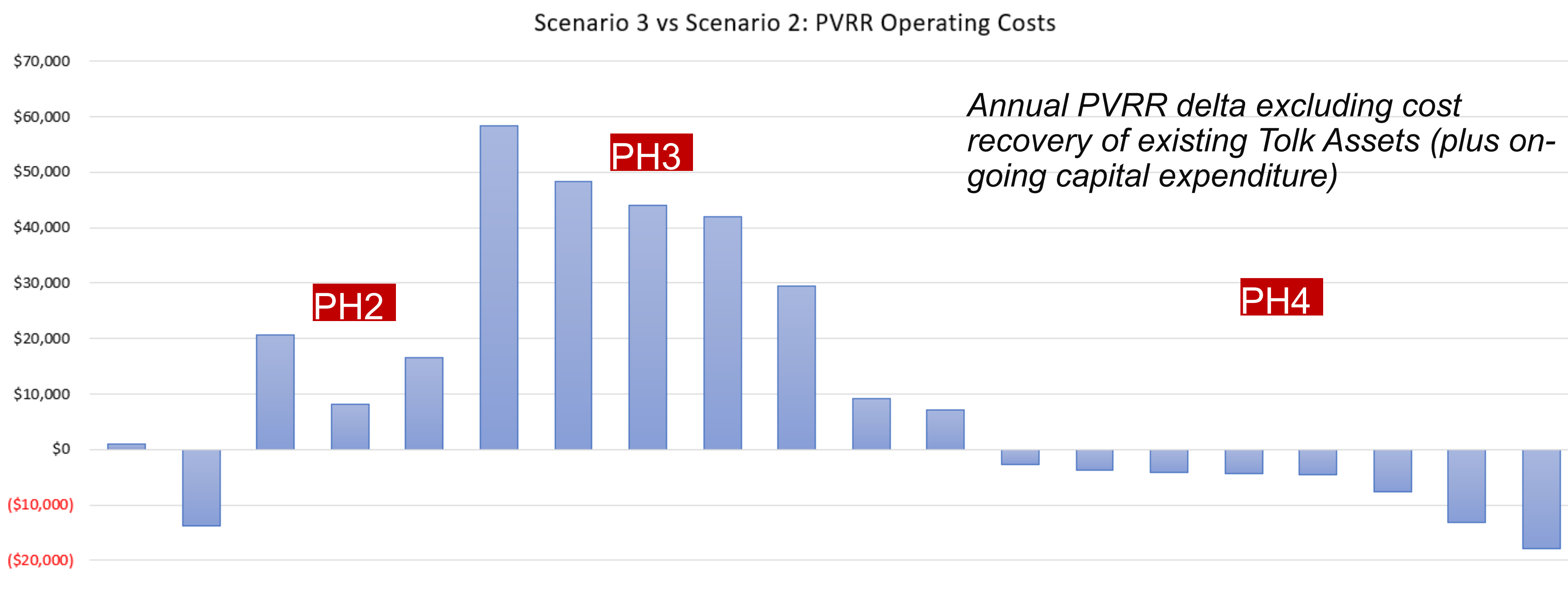
The cost recovery of the existing Tolk Assets causes rate shock in the action period, but is less impactful over the planning period

Blue: Annual PVRR Deltas (same as previous slide), Orange: Cost Recovery of Tolk Assets

Ph1: Cost recovery of Tolk assets (Sc3), Ph2: Continued cost recovery of Tolk assets (Sc2)

PVRR Analysis – Operating Costs

Scenario 3 vs Scenario 2

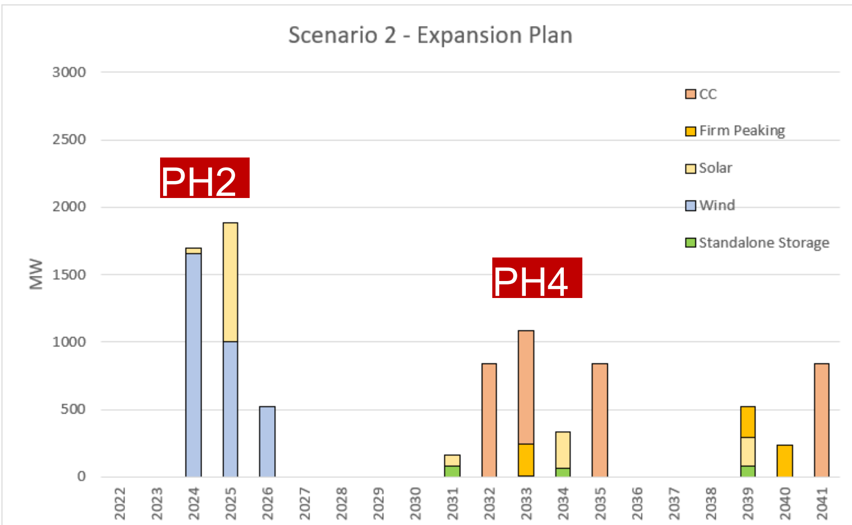


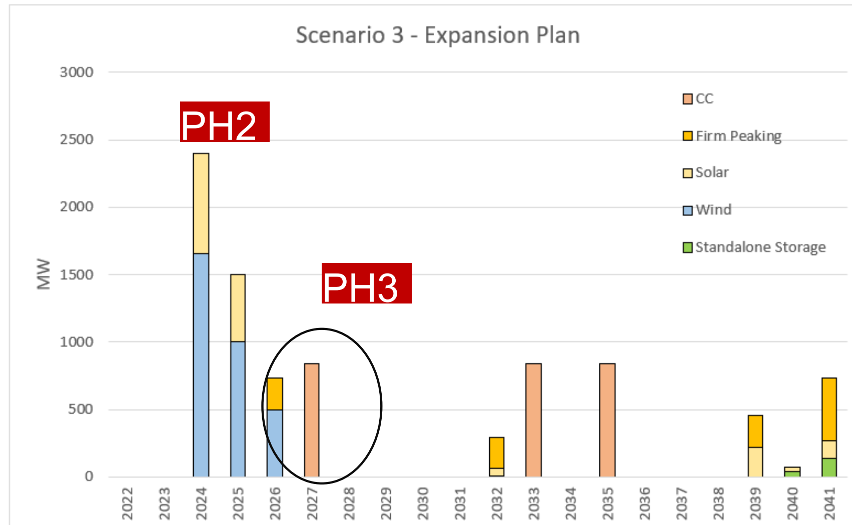
	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
OpCosts	$971	($13,778	$20,753	$8,241	$16,666	$58,312	$48,303	$44,056	$42,004	$29,429	$9,202	$7,055	($2,627)	($3,634)	($4,104)	($4,283)	($4,577)	($7,679)	($13,259	($17,874

Ph2: Similar expansion plans capable of fulfilling capacity need, Ph3: Deferred generation (Sc2), Ph4: Additional generation (Sc2)

PVRR Analysis – Operating Costs

Scenario 3 vs Scenario 2





Ph2: Similar expansion plans capable of fulfilling capacity need, Ph3: Deferred generation (Sc2), Ph4: Additional generation (Sc2)

SAMPLE EXPANDED VIEW FINANCIAL LOAD FORECAST

Preliminary PVRR Analysis

Financial Load Forecast including $400/kW network upgrades

IRP Action Period: *2022 - 2025*
Decision Period: *2022 - 2032*
IRP Planning Period *2022 - 2041*

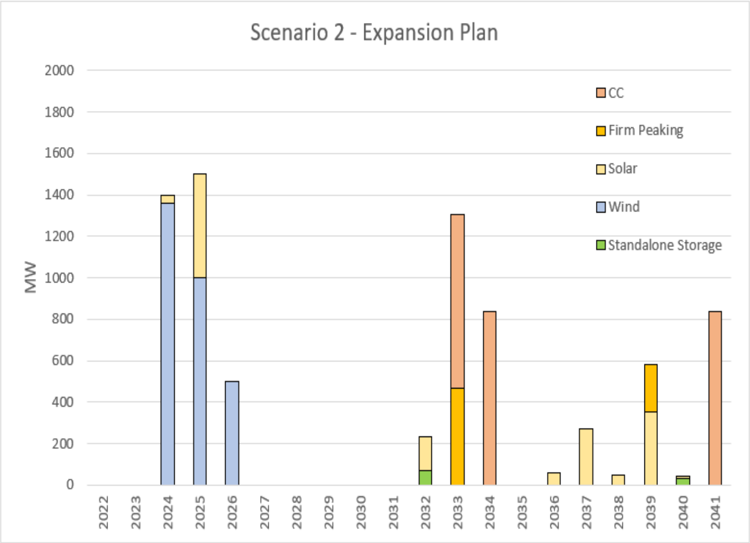
Financial Forecast - Base Gas - $400/kW							
		Action Period		Decision Period		Planning Period	
	Description	Delta	PVRR	Delta	PVRR	Delta	PVRR
Scenario 1	2025 Retirement	$ 148	$ 3,252	$ 123	$ 6,819	$ 62	$ 10,629
Scenario 2	2032 Retirement	$ -	$ 3,104	$ -	$ 6,697	$ -	$ 10,567
Scenario 3	2023 Retirement	$ 85	$ 3,189	$ 49	$ 6,746	$ (7)	$ 10,560
Scenario 4	Staggered Retirement	$ 47	$ 3,151	$ 100	$ 6,797	$ 46	$ 10,613
Scenario 5	Staggered Retirement	$ 45	$ 3,149	$ 67	$ 6,764	$ (9)	$ 10,558
Scenario 6	Tolk/Har 2023 Retirement	$ 250	$ 3,354	$ 700	$ 7,397	$ 798	$ 11,365

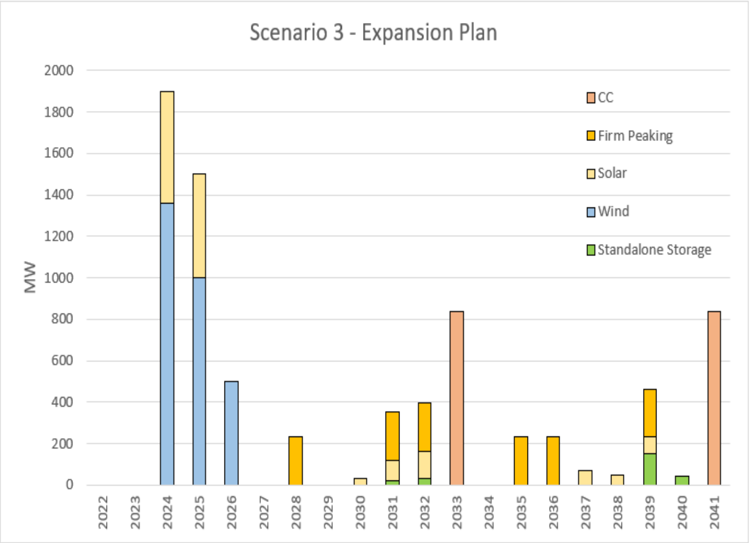
- Scenario 2 (continued operations) vs Scenario 3 (2023 retirement) Comparison
  - Over the 4-year action period Scenario 3 is $85M higher cost than Scenario 2 (PVRR)
  - Between 2022 and EOY 2032, Scenario 3 is $49M higher cost than Scenario 2 (PVRR)
  - Over the 20-year planning period, Scenario 3 is $7M lower cost than Scenario 2 (PVRR)

Scenario 2: Seasonal operations, 2032 retirement
Scenario 3: 2023 retirement

Expansion Plan

Sample Expansion Plan using Financial Load Forecast



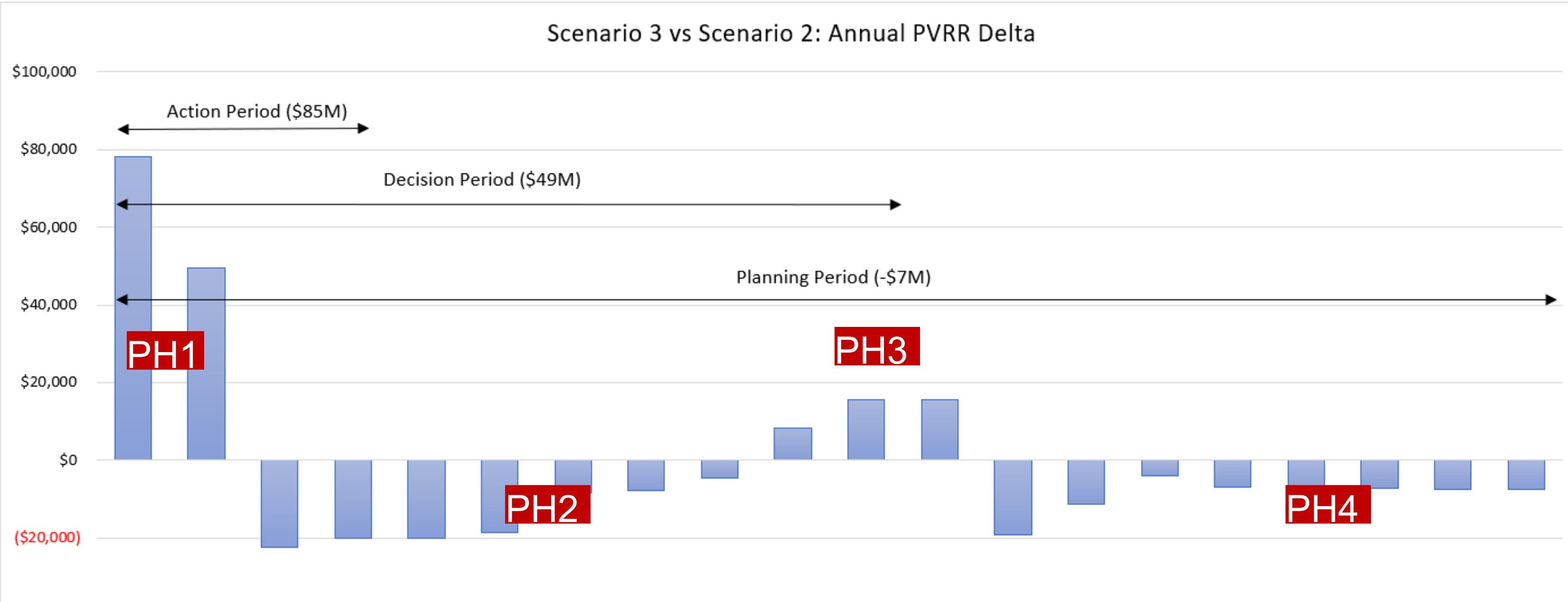


- Lower load forecast provides similar results (Large-scale renewable build out, before firm generation resources are required

Scenario 2: Seasonal operations, 2032 retirement
Scenario 3: 2023 retirement

PVRR Analysis

Scenario 3 vs Scenario 2 – PVRR Annual Comparison

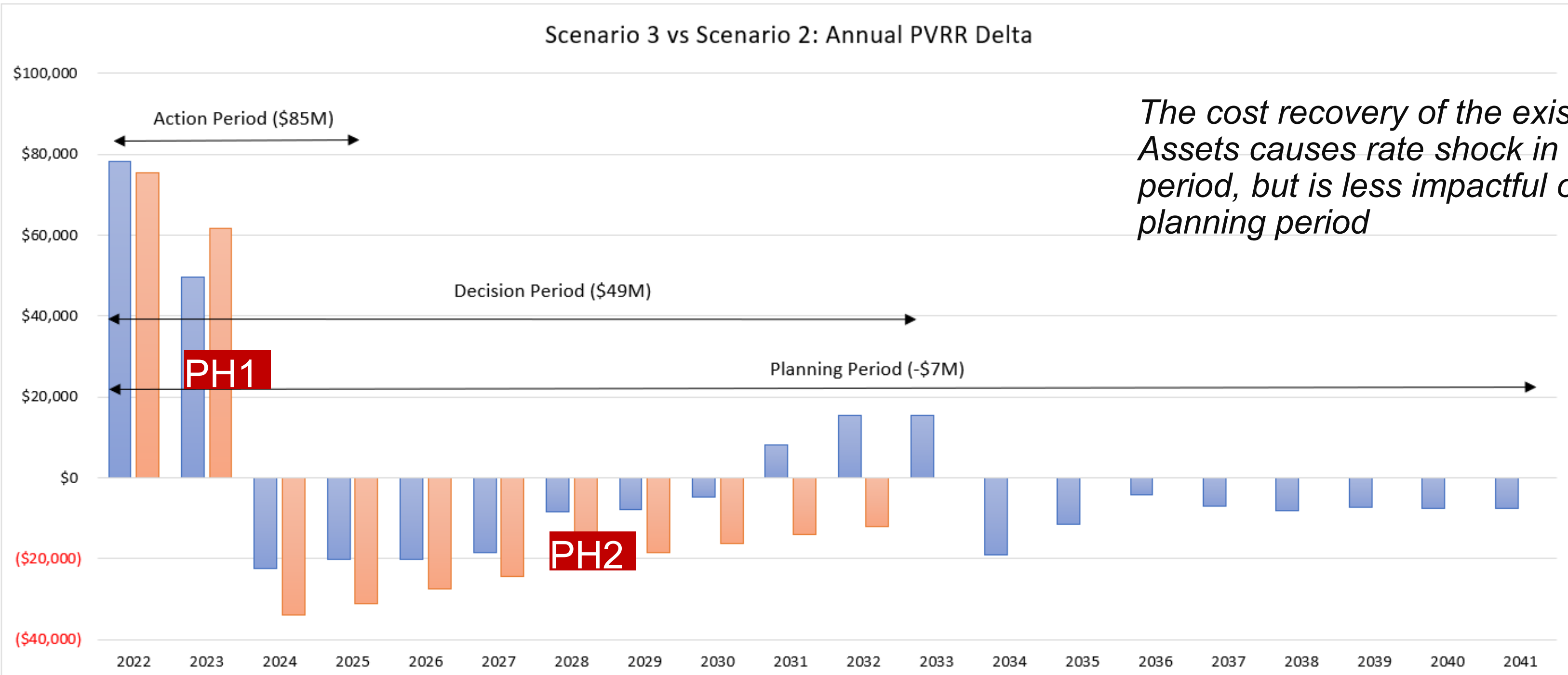


	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
Delta	$78,253	$49,540	($22,362	($20,166	($20,216	($18,582	($8,396)	($7,822)	($4,684)	$8,266	$15,472	$15,552	($19,148	($11,359	($4,054)	($7,012)	($8,054)	($7,186)	($7,587)	($7,503)

- *Ph1: Cost recovery of Tolk assets (Sc3), Ph2: Cost recovery of Tolk assets (Sc2) / Similar expansion plans capable of fulfilling capacity need, Ph3: Deferred generation (Sc2), Ph4: Additional generation (Sc2)*

PVRR Analysis – Cost Recovery of Tolk Asset

Scenario 3 vs Scenario 2



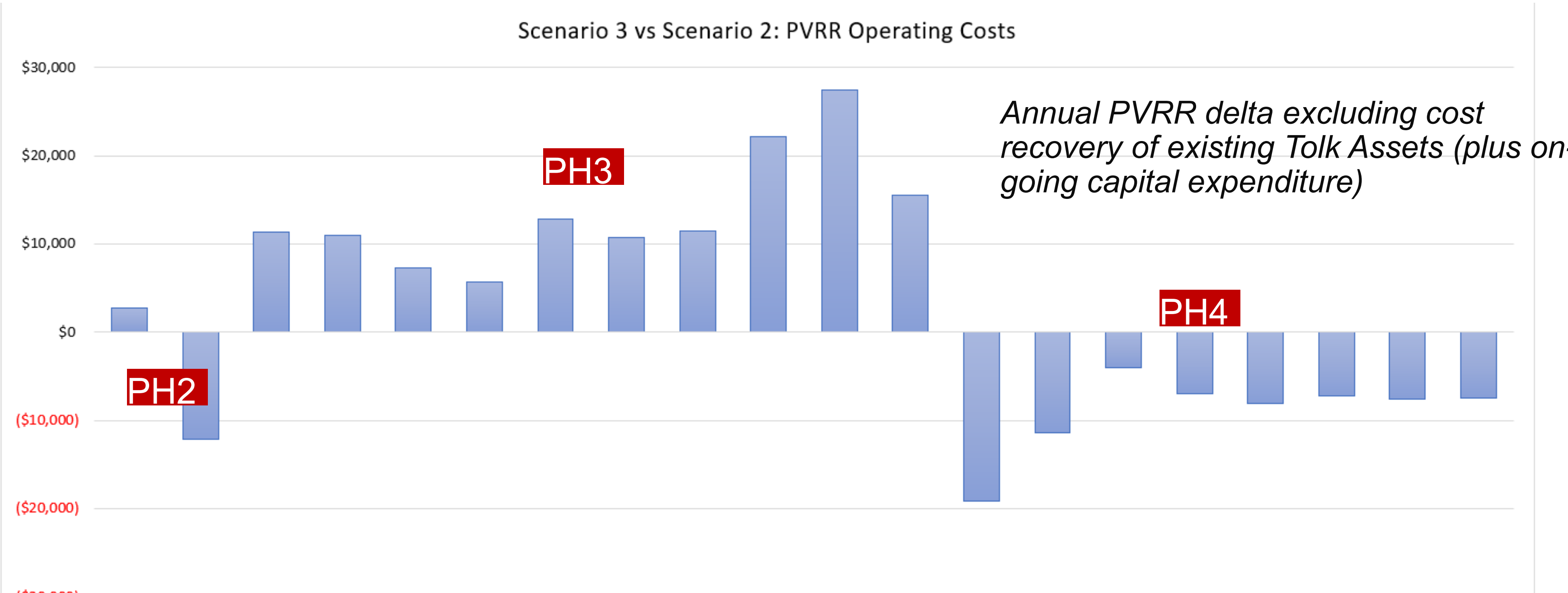
The cost recovery of the existing Tolk Assets causes rate shock in the action period, but is less impactful over the planning period

Blue: Annual PVRR Deltas (same as previous slide), Orange: Cost Recovery of Tolk Assets

Ph1: Cost recovery of Tolk assets (Sc3), Ph2: Continued cost recovery of Tolk assets (Sc2)

PVRR Analysis – Operating Costs

Scenario 3 vs Scenario 2

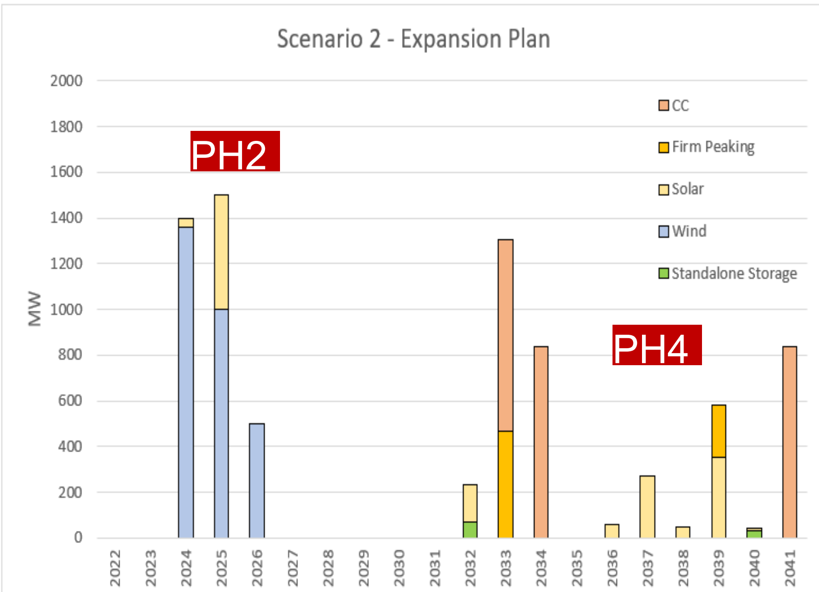


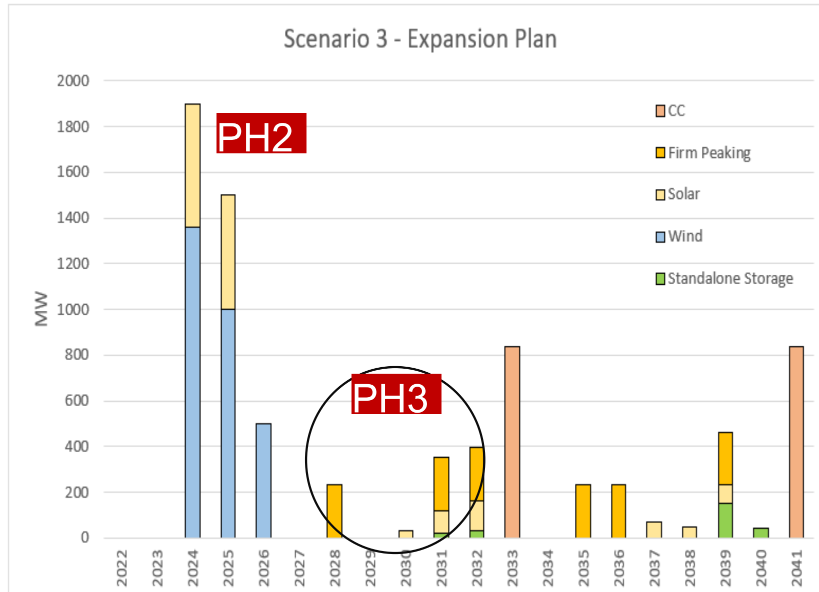
	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
OpCosts	$2,725	($12,118	$11,397	$11,010	$7,308	$5,638	$12,840	$10,720	$11,429	$22,194	$27,434	$15,552	($19,148	($11,359	($4,054)	($7,012)	($8,054)	($7,186)	($7,587)	($7,503)

Ph2: Similar expansion plans capable of fulfilling capacity need, Ph3: Deferred generation (Sc2), Ph4: Additional generation (Sc2)

PVRR Analysis – Operating Costs

Scenario 3 vs Scenario 2





Ph2: Similar expansion plans capable of fulfilling capacity need, Ph3: Deferred generation (Sc2), Ph4: Additional generation (Sc2)

FINAL REVIEW

Final Review

Conclusion 1

- The acquisition of economic energy is not dependent on the retirement of the Tolk units
- Regardless of the operation and retirement dates of the Tolk units, the Tolk Analysis indicates there could be opportunities for SPS to acquire economic energy
- Large uncertainty with key drivers, such as the potential extension of renewable tax credits and the cost of interconnecting new generation

Final Review

Conclusion 2

- Retirement of the Tolk Units creates an immediate resource need
- The acquisition of potentially economic renewable energy could theoretically fulfill a short-term capacity shortage
- However, load growth and/or plant retirements will require SPS to add firm resources and/or battery storage to meet load and capacity obligations
- The capacity cost of the Tolk units is relatively low cost when compared to the acquiring new generating resources (CT's, CC's or energy storage)
- The Tolk Analysis continues to support seasonal operations of the Tolk Units and a 2032 retirement
- The Tolk Analysis does not capture all benefits of the Tolk Units, as demonstrated during Winter Storm Uri