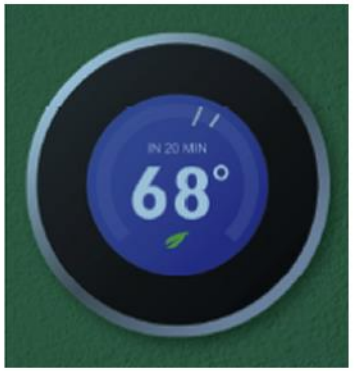
2019 Integrated Resource Plan (IRP) Public Input Meeting December 3-4, 2018



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Agenda

December 3 – Day One

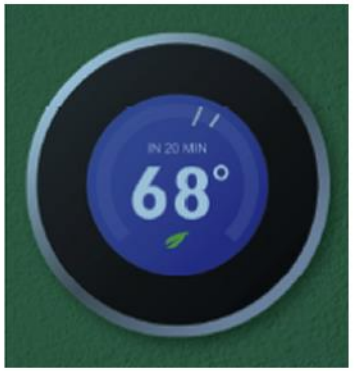
- 9:00am-11:30am pacific – Coal Studies Discussion
- 11:30am-12:15pm pacific – Lunch Break
- 12:15pm-4:00pm pacific – Coal Studies Discussion (continued)

December 4 – Day Two

- 8:30am-11:15am pacific – Coal Studies Discussion (continued)
- 11:15am-12:00pm pacific – Lunch Break
- 12:00pm–3:00pm pacific – Coal Studies Discussion (continued)
- 3:00pm-3:30pm pacific – Stakeholder Feedback Form Recap
- 3:30pm-4:00pm pacific – Wrap-Up / Next Steps

Coal Studies Overview



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Overview

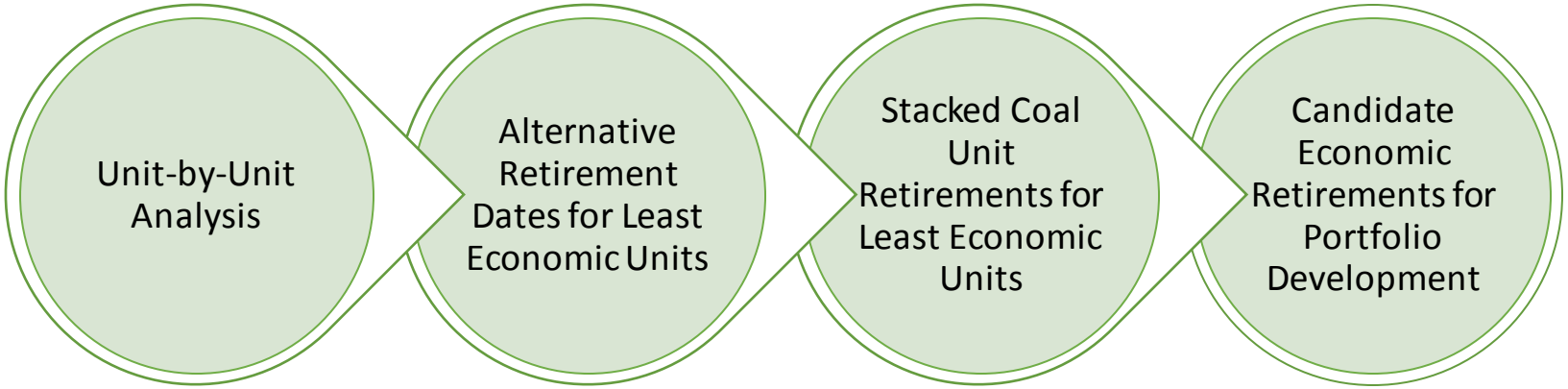
- As previously discussed, this set of analysis will inform PacifiCorp's long-term resource decisions, but it does not on its own determine how long specific coal units will stay in service—none of the resource portfolios that will be discussed today represent the company's preferred portfolio.

- A preliminary reliability assessment shows that portfolios in early coal-retirement cases can stress system reliability—reliability considerations will continue to be evaluated within the 2019 IRP and coal-retirement cases summarized herein may not include all of the costs required to meet reliability targets.

- PacifiCorp understands the impact of its resource decisions on its customers and communities. These and other important considerations that are not included in this analysis and must be studied before future resource decisions are made.

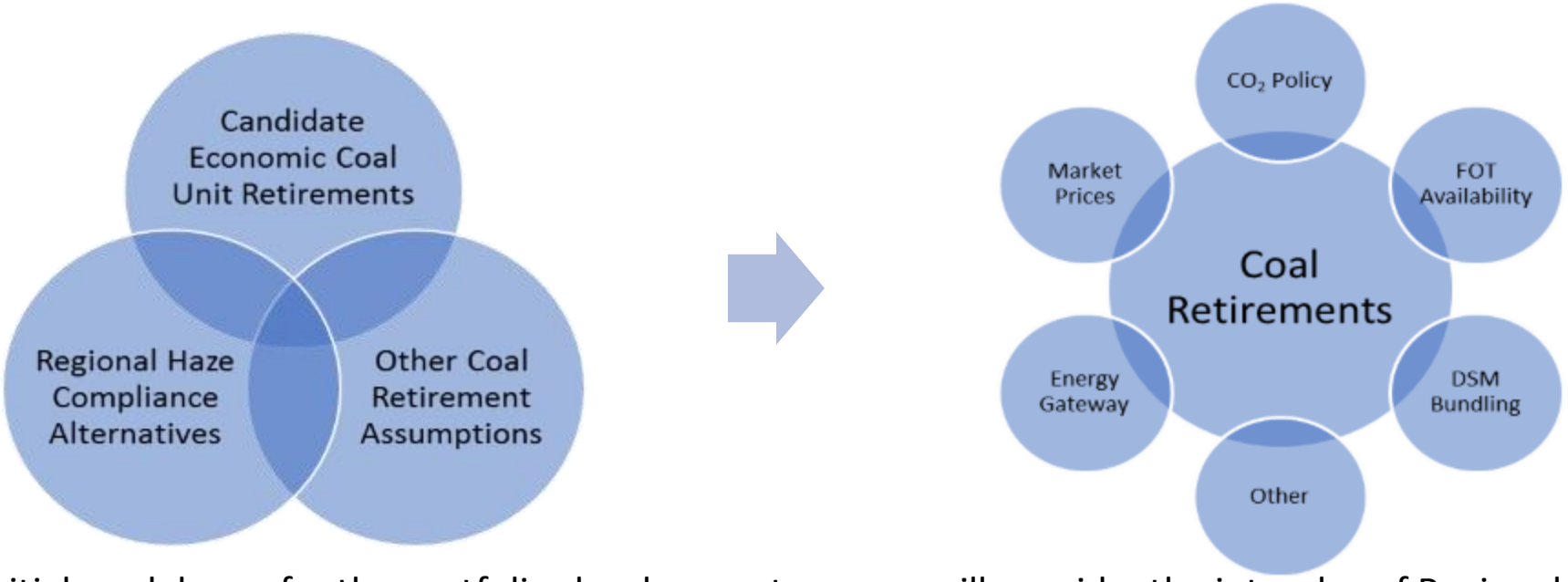
- In the updated coal-retirement discussion, we will cover:
  - Unit-by-unit coal retirement results.
  - Alternate-year results.
  - Stacked-retirement results.
  - Preliminary reliability-assessment findings.
  - Impact of intra-hour flexible resource credit assumptions.

Economic Coal Unit Retirement Analysis Process



- Updated unit-by-unit analysis will reflect 2019 IRP planning assumptions, consider impacts on system reliability, and be evaluated using the Planning and Risk model (PaR).
- PacifiCorp will assess alternative retirement dates for the least economic units (2022, 2025, 2028, and 2031).
- Stacked analysis will be performed on the least economic units, assuming retirement dates that are consistent those identified from the alternative retirement date studies.
- Potential economic retirements, informed by the analysis described above, will be further evaluated in the 2019 IRP portfolio development process.
- Portfolios will be developed using the System Optimizer model with base case price-policy assumptions, and cost-and-risk analysis will be performed using PaR under three different price-policy scenarios.
- In developing the updated coal studies, PacifiCorp developed over 40 resource portfolios that were analyzed in over 130 PaR runs.

Portfolio-Development Process



- Initial model runs for the portfolio-development process will consider the interplay of Regional Haze compliance alternatives with potential economic coal unit retirements while evaluating near-term coal unit decisions (*i.e.*, Naughton 3, Jim Bridger 1 and 2), updating analysis from the 2017 IRP (*i.e.*, Cholla 4), and incorporating commission-ordered analysis (*i.e.*, Colstrip 3 and 4).
- Additional portfolio will be developed, using coal retirement assumptions that can meet compliance obligations and that minimize system costs, using alternative assumptions for other system variables (*i.e.*, CO_2 policies, market prices, FOT availability, Energy Gateway, and DSM).
- Once initial model results are available, additional portfolios may be developed.
- Cost-and-risk analysis will be performed using PaR under three different price-policy scenarios.

Unit-by-Unit Summary Results

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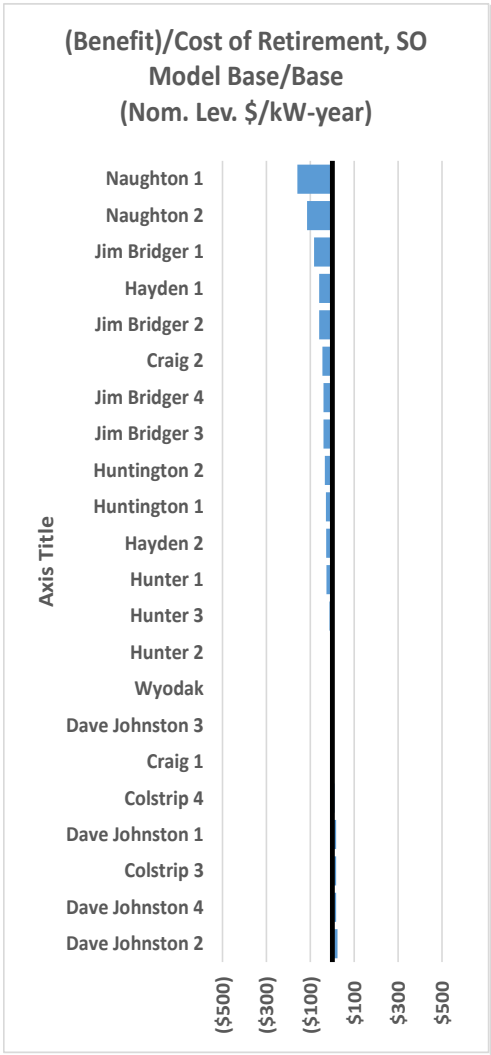
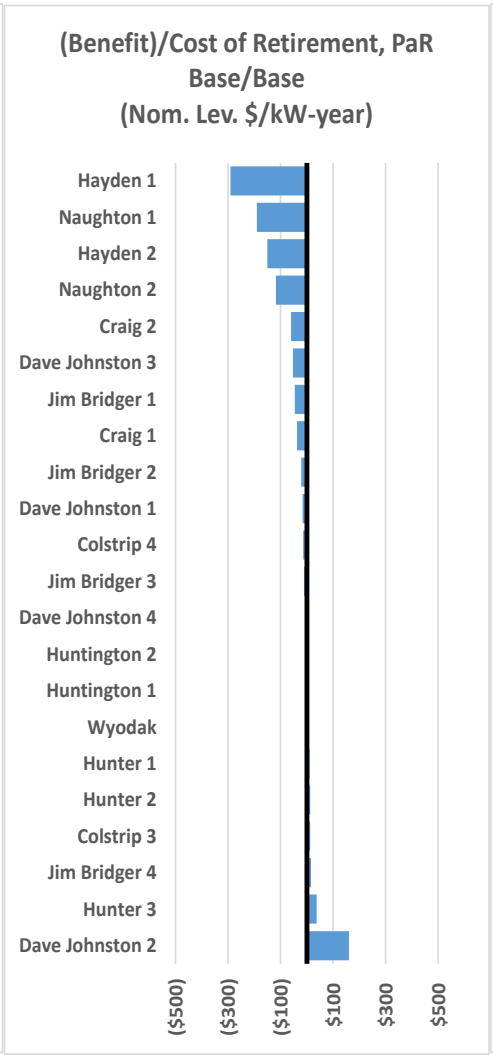
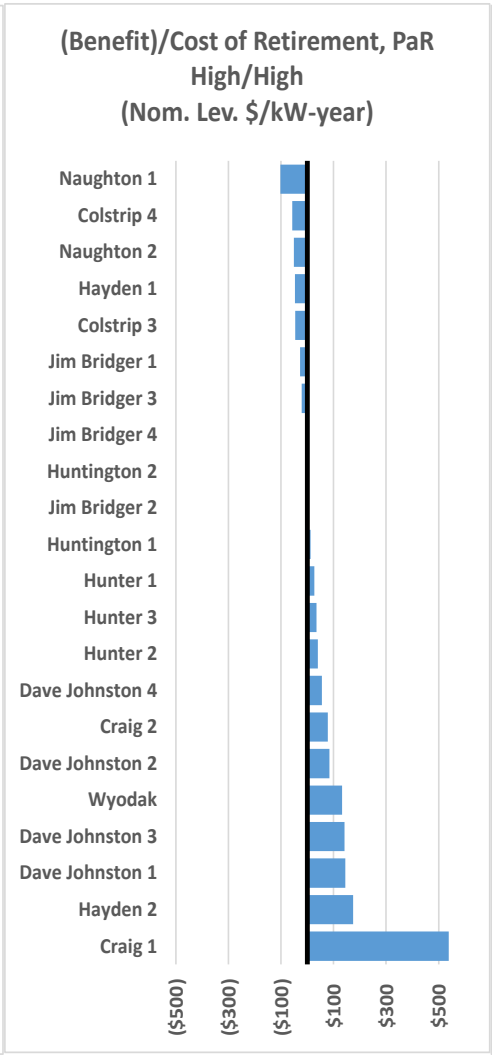
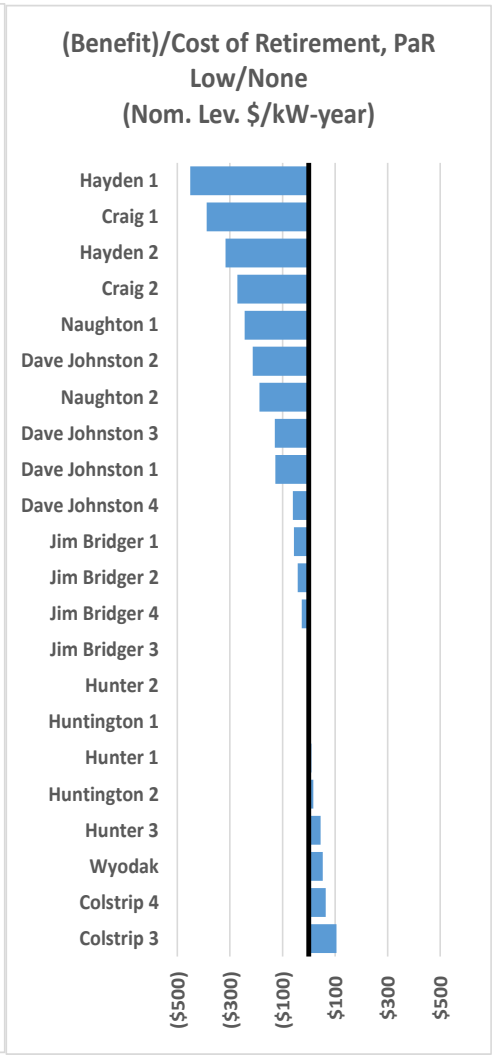
Unit-by-Unit Rankings (Without Intra-Hour Flexible Resource Credit)









*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

System Optimizer Unit-by-Unit Results (Base/Base Scenario)

Study	PVRR ($m)	PVRR(d) (Benefit)/Cost of 2022 Retirement	Nom. Lev. (Benefit)/Cost of 2022 Retirement
C-01 (Benchmark)	$21,897	n/a	n/a
C-02 (Colstrip 3)	$21,906	$9m	$17/kW-yr
C-03 (Colstrip 4)	$21,902	$5m	$10/kW-yr
C-04 (Craig 1)	$21,897	($0m)	($2/kW-yr)
C-05 (Craig 2)	$21,875	($22m)	($45/kW-yr)
C-06 (Dave Johnston 1)	$21,903	$6m	$17/kW-yr
C-07 (Dave Johnston 2)	$21,905	$8m	$24/kW-yr
C-08 (Dave Johnston 3)	$21,895	($2m)	($3/kW-yr)
C-09 (Dave Johnston 4)	$21,916	$19m	$18/kW-yr
C-10 (Hayden 1)	$21,885	($12m)	($60/kW-yr)
C-11 (Hayden 2)	$21,893	($4m)	($28/kW-yr)
C-12 (Hunter 1)	$21,816	($81m)	($27/kW-yr)
C-13 (Hunter 2)	$21,878	($19m)	($10/kW-yr)
C-14 (Hunter 3)	$21,853	($44m)	($13/kW-yr)
C-15 (Huntington 1)	$21,808	($89m)	($29/kW-yr)
C-16 (Huntington 2)	$21,794	($103m)	($34/kW-yr)
C-17 (Jim Bridger 1)	$21,690	($207m)	($84/kW-yr)
C-18 (Jim Bridger 2)	$21,748	($149m)	($59/kW-yr)
C-19 (Jim Bridger 3)	$21,800	($97m)	($40/kW-yr)
C-20 (Jim Bridger 4)	$21,797	($100m)	($40/kW-yr)
C-21 (Naughton 1)	$21,794	($102m)	($159/kW-yr)
C-22 (Naughton 2)	$21,801	($96m)	($115/kW-yr)
C-23 (Wyodak)	$21,880	($17m)	($8/kW-yr)

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

PaR Unit-by-Unit Results (Base/Base Scenario)

Study	PVRR ($m)	PVRR(d) (Benefit)/Cost of 2022 Retirement	Nom. Lev. (Benefit)/Cost of 2022 Retirement
C-01 (Benchmark)	$23,310	n/a	n/a
C-02 (Colstrip 3)	$23,317	$7	$12/kW-yr
C-03 (Colstrip 4)	$23,302	($8)	($14/kW-yr)
C-04 (Craig 1)	$23,304	($6)	($38/kW-yr)
C-05 (Craig 2)	$23,281	($29)	($60/kW-yr)
C-06 (Dave Johnston 1)	$23,305	($5)	($16/kW-yr)
C-07 (Dave Johnston 2)	$23,363	$53	$160/kW-yr
C-08 (Dave Johnston 3)	$23,273	($37)	($53/kW-yr)
C-09 (Dave Johnston 4)	$23,304	($6)	($6/kW-yr)
C-10 (Hayden 1)	$23,252	($58)	($290/kW-yr)
C-11 (Hayden 2)	$23,287	($23)	($150/kW-yr)
C-12 (Hunter 1)	$23,341	$31	$10/kW-yr
C-13 (Hunter 2)	$23,334	$24	$12/kW-yr
C-14 (Hunter 3)	$23,438	$128	$37/kW-yr
C-15 (Huntington 1)	$23,326	$17	$5/kW-yr
C-16 (Huntington 2)	$23,310	$0	$0/kW-yr
C-17 (Jim Bridger 1)	$23,197	($113)	($46/kW-yr)
C-18 (Jim Bridger 2)	$23,257	($53)	($21/kW-yr)
C-19 (Jim Bridger 3)	$23,283	($27)	($11/kW-yr)
C-20 (Jim Bridger 4)	$23,349	$39	$16/kW-yr
C-21 (Naughton 1)	$23,187	($123)	($190/kW-yr)
C-22 (Naughton 2)	$23,212	($98)	($118/kW-yr)
C-23 (Wyodak)	$23,323	$13	$7/kW-yr

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

PaR Unit-by-Unit Results (High/High Scenario)

Study	PVRR ($m)	PVRR(d) (Benefit)/Cost of 2022 Retirement	Nom. Lev. (Benefit)/Cost of 2022 Retirement
C-01 (Benchmark)	$28,176	n/a	n/a
C-02 (Colstrip 3)	$28,152	($25)	($46/kW-yr)
C-03 (Colstrip 4)	$28,145	($31)	($57/kW-yr)
C-04 (Craig 1)	$28,265	$89	$538/kW-yr
C-05 (Craig 2)	$28,214	$37	$78/kW-yr
C-06 (Dave Johnston 1)	$28,225	$48	$145/kW-yr
C-07 (Dave Johnston 2)	$28,205	$28	$85/kW-yr
C-08 (Dave Johnston 3)	$28,275	$98	$142/kW-yr
C-09 (Dave Johnston 4)	$28,234	$58	$55/kW-yr
C-10 (Hayden 1)	$28,167	($9)	($47/kW-yr)
C-11 (Hayden 2)	$28,203	$26	$174/kW-yr
C-12 (Hunter 1)	$28,258	$81	$27/kW-yr
C-13 (Hunter 2)	$28,255	$79	$40/kW-yr
C-14 (Hunter 3)	$28,297	$121	$35/kW-yr
C-15 (Huntington 1)	$28,215	$38	$12/kW-yr
C-16 (Huntington 2)	$28,172	($4)	($1/kW-yr)
C-17 (Jim Bridger 1)	$28,107	($69)	($28/kW-yr)
C-18 (Jim Bridger 2)	$28,183	$7	$3/kW-yr
C-19 (Jim Bridger 3)	$28,123	($53)	($22/kW-yr)
C-20 (Jim Bridger 4)	$28,156	($20)	($8/kW-yr)
C-21 (Naughton 1)	$28,110	($66)	($103/kW-yr)
C-22 (Naughton 2)	$28,134	($42)	($51/kW-yr)
C-23 (Wyodak)	$28,434	$258	$133/kW-yr

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

PaR Unit-by-Unit Results (Low/None Scenario)

Study	PVRR ($m)	PVRR(d) (Benefit)/Cost of 2022 Retirement	Nom. Lev. (Benefit)/Cost of 2022 Retirement
C-01 (Benchmark)	$19,644	n/a	n/a
C-02 (Colstrip 3)	$19,701	$57	$106
C-03 (Colstrip 4)	$19,678	$35	$64
C-04 (Craig 1)	$19,579	($64)	($389)
C-05 (Craig 2)	$19,513	($131)	($271)
C-06 (Dave Johnston 1)	$19,601	($42)	($127)
C-07 (Dave Johnston 2)	$19,572	($71)	($213)
C-08 (Dave Johnston 3)	$19,554	($89)	($129)
C-09 (Dave Johnston 4)	$19,581	($62)	($60)
C-10 (Hayden 1)	$19,553	($91)	($452)
C-11 (Hayden 2)	$19,596	($48)	($317)
C-12 (Hunter 1)	$19,675	$31	$10
C-13 (Hunter 2)	$19,658	$14	$7
C-14 (Hunter 3)	$19,796	$153	$45
C-15 (Huntington 1)	$19,670	$26	$8
C-16 (Huntington 2)	$19,696	$53	$17
C-17 (Jim Bridger 1)	$19,504	($140)	($56)
C-18 (Jim Bridger 2)	$19,537	($106)	($42)
C-19 (Jim Bridger 3)	$19,642	($2)	($1)
C-20 (Jim Bridger 4)	$19,578	($65)	($26)
C-21 (Naughton 1)	$19,486	($157)	($244)
C-22 (Naughton 2)	$19,488	($156)	($187)
C-23 (Wyodak)	$19,746	$103	$53

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

Conclusions from Unit-by-Unit Summary Results

- To ensure studies were prepared in advance of this meeting, PacifiCorp selected units for further alternate-year cases based on SO model results (before PaR studies were completed)—these results are summarized later in the presentation:
  - Naughton 1
  - Naughton 2
  - Jim Bridger 1
  - Hayden 1

- As base/base PaR runs became available, PacifiCorp selected the following units to analyzed in its stacked-retirement cases—these results are also summarized later in this presentation:
  - Hayden 1
  - Naughton 1
  - Hayden 2
  - Naughton 2
  - Craig 2
  - Dave Johnston 3
  - Jim Bridger 1
  - Craig 1
  - Jim Bridger 2

- Detailed unit-by-unit results for those units analyzed in stacked-retirement cases are summarized in the following section.

Unit-by-Unit Detailed Results

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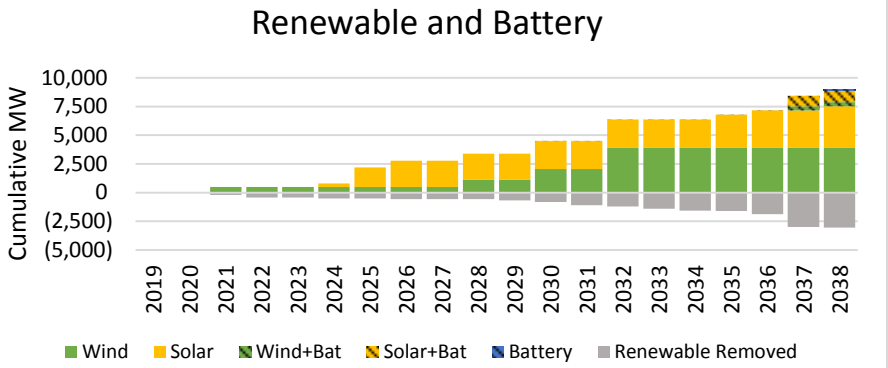
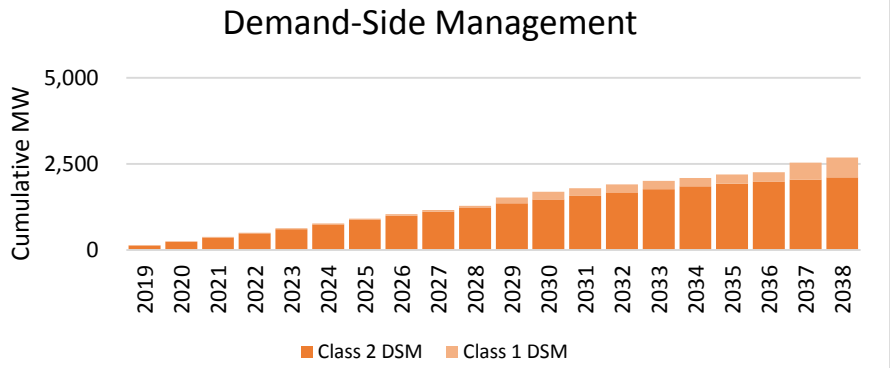
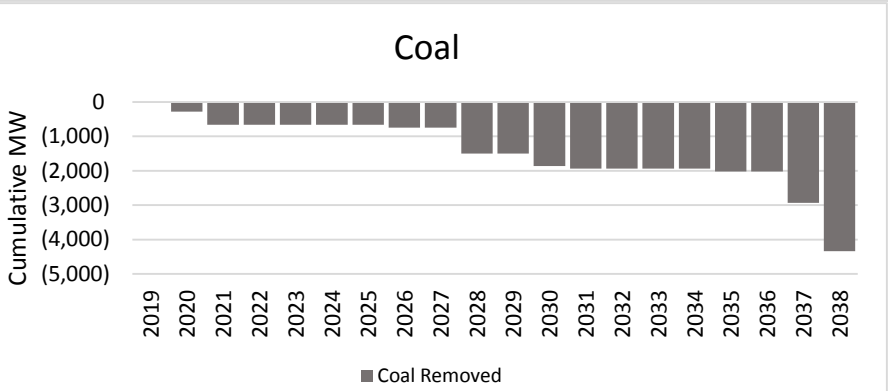
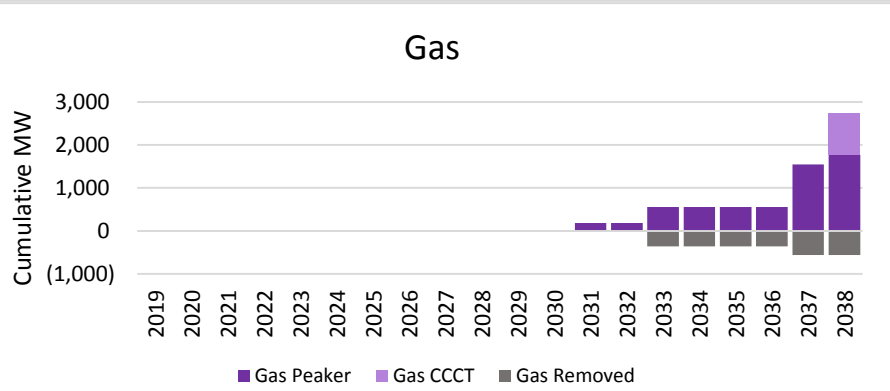
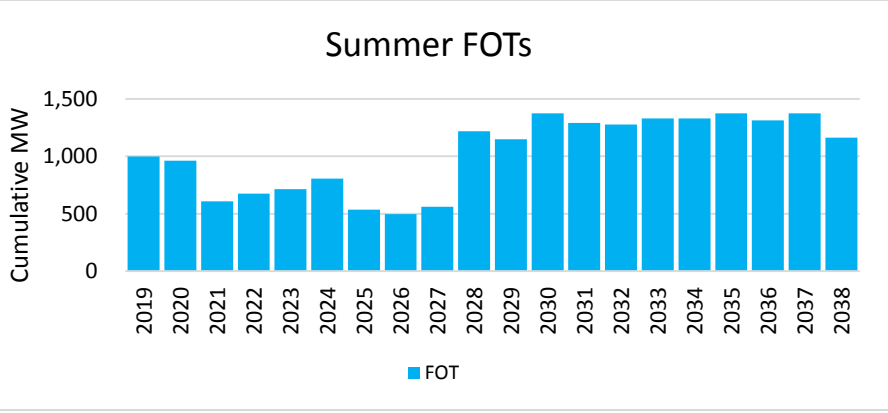
Benchmark Case (C-01)
Resource Portfolio











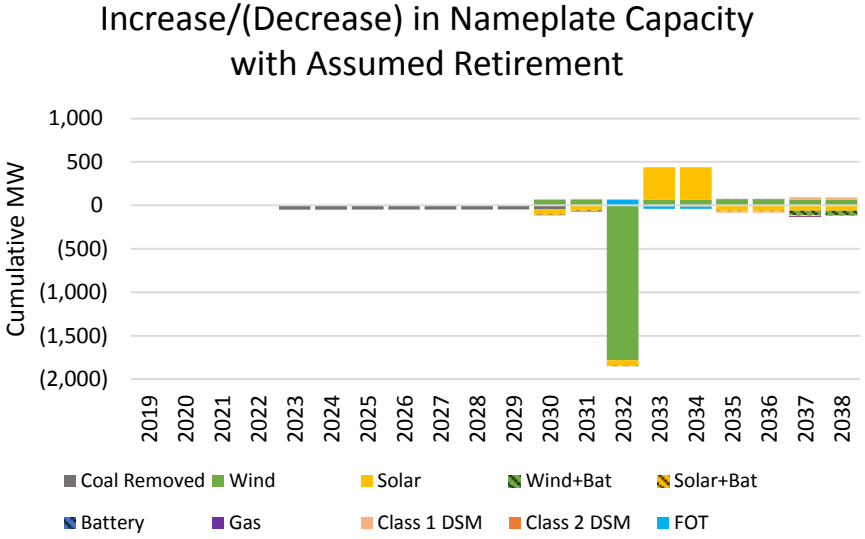
Resource Type	2038 Nameplate Capacity
Net Wind	2,842
Net Solar	2,973
New Battery	443
New Class 1 DSM	584
New Class 2 DSM	2,107
Net Gas	2,185
Net Coal	(4,337)

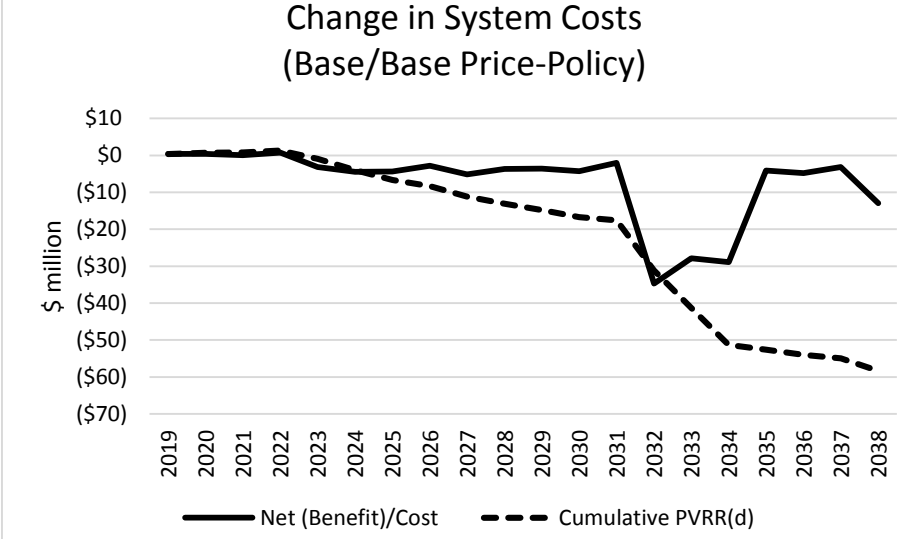
Benchmark Case (C-01) Transmission Upgrades

Year	Resource Location	From	To	ATC	Max Interconnection	Nominal Capital ($m)
2024	UT South	UT South	UT South	0	300	$8.6
2025	Yakima WA	Yakima WA	Yakima WA	0	405	$3.1
2025	Southern OR	Southern OR	Southern OR	0	975	$85.2
2026	UT South	UT South	UT South	0	800	$188.0
2026	SW WY	SW WY	SW WY	0	100	$9.0
2030	Goshen ID	Goshen ID	UT North	800	1,100	$253.7
2032	Aeolus	Aeolus	UT South	1,500	1,850	$2,319.2
2035	Yakima WA	Yakima WA	Southern OR	450	835	$249.2
2037	Portland/N.C. OR	Portland/N.C. OR	Willamette V. OR	450	580	$322.0
2037	UT North	UT North	UT North	0	500	$50.9
2037	SW WY	SW WY	SW WY	0	500	$38.8
2038	Willamette V. OR	Willamette V. OR	Willamette V. OR	0	615	$41.2
					Total	$3,568.9

*Note, capital is applied in the model reflecting real-levelized revenue requirement based on 88% of the nominal capital shown in the table above. The 12% reduction to capital is applied to capture assumed third-party revenue credits via the OATT formula rate.

Hayden 1 Case (C-10) Overview





Change in Transmission Upgrades

Change in Year	Resource Location	From	To	ATC	Max Interconnection	Change in Nominal Capital ($m)
Delayed from 2032 to 2033	Aeolus	Aeolus	UT South	1,500	1,850	$52.9
Accelerated from 2035 to 2033	Yakima WA	Yakima WA	Southern OR	450	835	($11)
Accelerated from 2038 to 2037	Willamette V. OR	Willamette V. OR	Willamette V. OR	0	615	($0.9)
					Total	$41.0

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

Hayden 1 Case (C-10)
(PaR Base/Base Scenario)

Study	PVRR(d) (Benefit)/Cost of 2022 Retirement ($m)	Nom. Lev. (Benefit)/Cost of 2022 Retirement per MWh of Retired Generation ($/MWh)
Cost Savings from Retired Unit		
Fuel	($19)	($30.21)
Inc. Capital Rev. Req. and Fixed O&M	($31)	($48.66)
Variable O&M	$0	$0.00
Emissions	($8)	($12.52)
Decommissioning	$0	$0.08
Total Net Cost Savings from Retired Unit	($57)	($91.31)
Net Replacement Costs		
Fuel	$78	$123.70
Inc. Capital Rev. Req. and Fixed O&M	($53)	($85.13)
Variable O&M	$5	$7.83
Emissions	$40	$63.18
Demand-Side Management	($1)	($1.54)
Long-Term Contracts	($5)	($7.57)
Market Purchases	$14	$23.07
Market Sales	($41)	($64.79)
Reserve/Energy Deficiencies	$0	$0.14
Transmission Upgrades	($38)	($60.67)
Transmission Reinforcements	$0	$0.00
Total Net Replacement Cost	($1)	($1.81)
Net (Benefit)/Cost of Assumed Early Retirement	($58)	($93.12)

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

Hayden 1 Case (C-10)
(PaR High/High Scenario)

Study	PVRR(d) (Benefit)/Cost of 2022 Retirement ($m)	Nom. Lev. (Benefit)/Cost of 2022 Retirement per MWh of Retired Generation ($/MWh)
Cost Savings from Retired Unit		
Fuel	($19)	($30.11)
Inc. Capital Rev. Req. and Fixed O&M	($31)	($48.56)
Variable O&M	$0	$0.00
Emissions	($11)	($17.40)
Decommissioning	$0	$0.08
Total Net Cost Savings from Retired Unit	($60)	($95.99)
Net Replacement Costs		
Fuel	$81	$128.80
Inc. Capital Rev. Req. and Fixed O&M	($53)	($84.81)
Variable O&M	$5	$7.28
Emissions	$65	$103.71
Demand-Side Management	($1)	($1.57)
Long-Term Contracts	($5)	($7.46)
Market Purchases	$21	$33.22
Market Sales	($27)	($43.51)
Reserve/Energy Deficiencies	$4	$5.98
Transmission Upgrades	($38)	($60.55)
Transmission Reinforcements	$0	$0.00
Total Net Replacement Cost	$51	$81.09
Net (Benefit)/Cost of Assumed Early Retirement	($9)	($0.71)

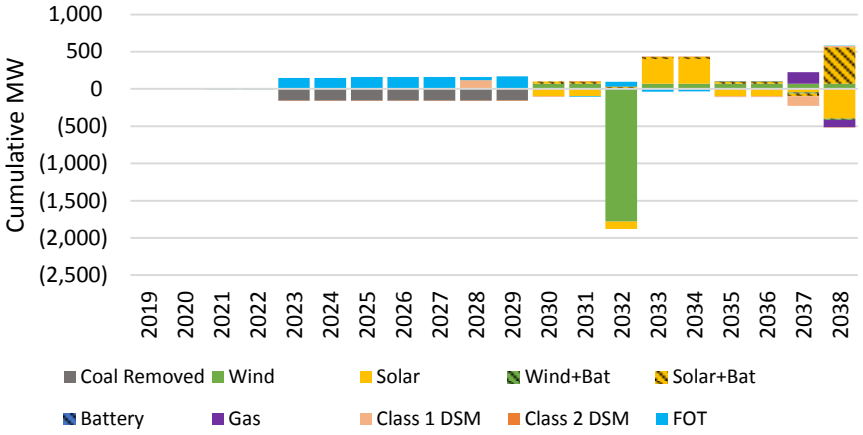
*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

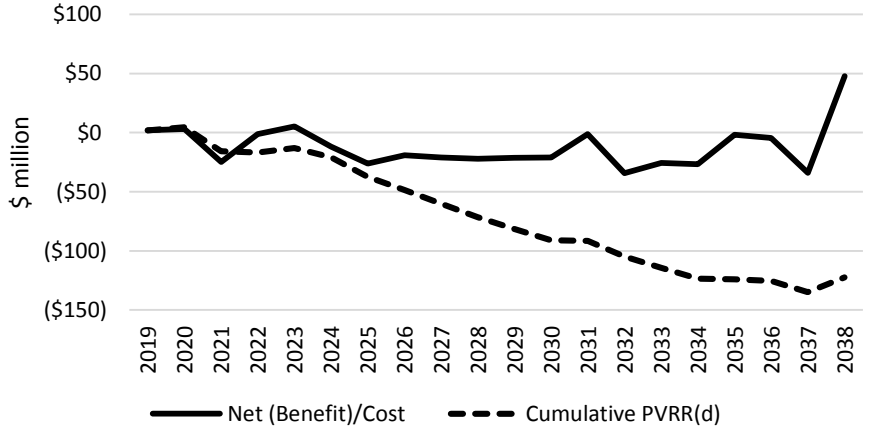
Hayden 1 Case (C-10)
(PaR Low/None Scenario)

Study	PVRR(d) (Benefit)/Cost of 2022 Retirement ($m)	Nom. Lev. (Benefit)/Cost of 2022 Retirement per MWh of Retired Generation ($/MWh)
Cost Savings from Retired Unit		
Fuel	($16)	($29.73)
Inc. Capital Rev. Req. and Fixed O&M	($31)	($55.52)
Variable O&M	$0	$0.00
Emissions	$0	$0.00
Decommissioning	$0	$0.09
Total Net Cost Savings from Retired Unit	($47)	($85.17)
Net Replacement Costs		
Fuel	$64	$115.65
Inc. Capital Rev. Req. and Fixed O&M	($53)	($96.98)
Variable O&M	$5	$8.97
Emissions	$0	$0.00
Demand-Side Management	($1)	($1.66)
Long-Term Contracts	($5)	($8.72)
Market Purchases	$6	$11.69
Market Sales	($23)	($42.11)
Reserve/Energy Deficiencies	$1	$2.52
Transmission Upgrades	($38)	($69.23)
Transmission Reinforcements	$0	$0.00
Total Net Replacement Cost	($44)	($79.87)
Net (Benefit)/Cost of Assumed Early Retirement	($91)	($165.04)

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

Naughton 1 Case (C-21) Overview





Change in Transmission Upgrades

Change in Year	Resource Location	From	To	ATC	Max Interconnection	Change in Nominal Capital ($m)
Delayed from 2032 to 2033	Aeolus	Aeolus	UT South	1,500	1,850	$52.9
Accelerated from 2035 to 2033	Yakima WA	Yakima WA	Southern OR	450	835	($11)
					Total	$41.9

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

Naughton 1 Case (C-21)
(PaR Base/Base Scenario)

Study	PVRR(d) (Benefit)/Cost of 2022 Retirement ($m)	Nom. Lev. (Benefit)/Cost of 2022 Retirement per MWh of Retired Generation ($/MWh)
Cost Savings from Retired Unit		
Fuel	($58)	($30.88)
Inc. Capital Rev. Req. and Fixed O&M	($98)	($51.97)
Variable O&M	$0	$0.00
Emissions	($17)	($8.86)
Decommissioning	$3	$1.81
Total Net Cost Savings from Retired Unit	($170)	($89.91)
Net Replacement Costs		
Fuel	$98	$51.63
Inc. Capital Rev. Req. and Fixed O&M	($64)	($33.98)
Variable O&M	$5	$2.74
Emissions	$44	$23.09
Demand-Side Management	($3)	($1.61)
Long-Term Contracts	($4)	($2.29)
Market Purchases	$42	$22.28
Market Sales	($43)	($22.49)
Reserve/Energy Deficiencies	$12	$6.23
Transmission Upgrades	($39)	($20.46)
Transmission Reinforcements	$0	$0.00
Total Net Replacement Cost	$48	$25.14
Net (Benefit)/Cost of Assumed Early Retirement	($123)	($64.77)

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

Naughton 1 Case (C-21)
(PaR High/High Scenario)

Study	PVRR(d) (Benefit)/Cost of 2022 Retirement ($m)	Nom. Lev. (Benefit)/Cost of 2022 Retirement per MWh of Retired Generation ($/MWh)
Cost Savings from Retired Unit		
Fuel	($77)	($29.57)
Inc. Capital Rev. Req. and Fixed O&M	($98)	($37.67)
Variable O&M	$0	$0.00
Emissions	($43)	($16.62)
Decommissioning	$3	$1.28
Total Net Cost Savings from Retired Unit	($216)	($82.59)
Net Replacement Costs		
Fuel	$130	$49.78
Inc. Capital Rev. Req. and Fixed O&M	($64)	($24.59)
Variable O&M	$5	$2.04
Emissions	$76	$28.97
Demand-Side Management	($3)	($1.19)
Long-Term Contracts	($4)	($1.61)
Market Purchases	$55	$21.23
Market Sales	($20)	($7.53)
Reserve/Energy Deficiencies	$13	$4.92
Transmission Upgrades	($39)	($14.83)
Transmission Reinforcements	$0	$0.00
Total Net Replacement Cost	$149	$57.18
Net (Benefit)/Cost of Assumed Early Retirement	($66)	($25.41)

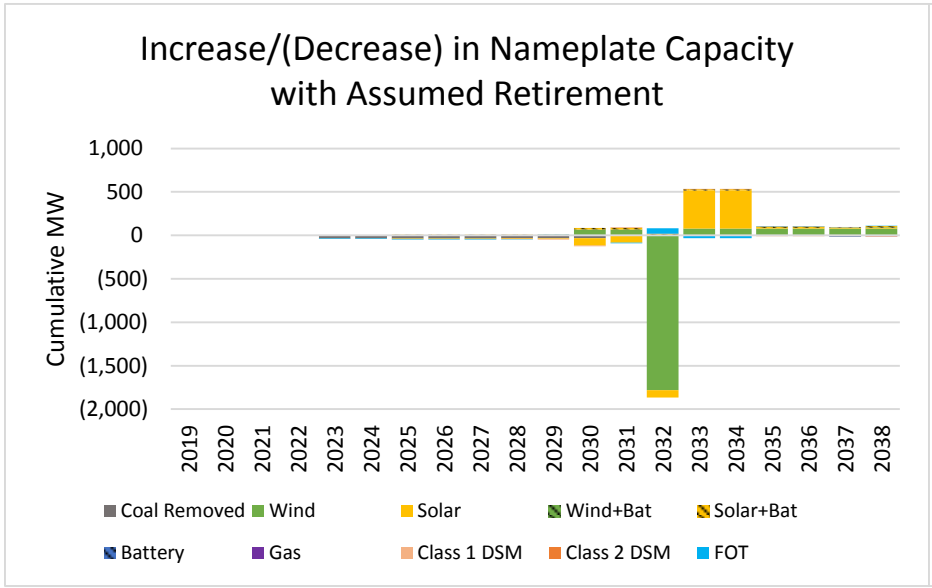
*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

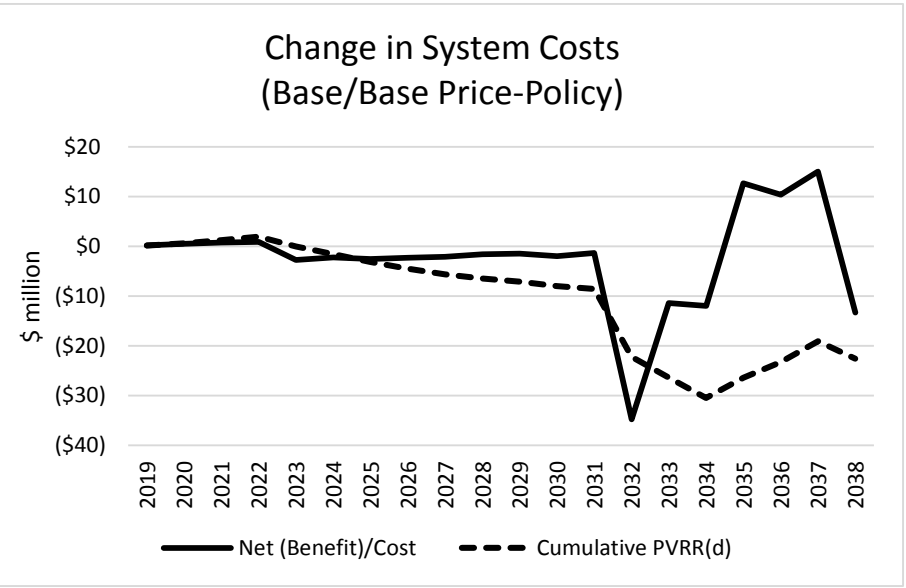
Naughton 1 Case (C-21) (PaR Low/None Scenario)

Study	PVRR(d) (Benefit)/Cost of 2022 Retirement ($m)	Nom. Lev. (Benefit)/Cost of 2022 Retirement per MWh of Retired Generation ($/MWh)
Cost Savings from Retired Unit		
Fuel	($38)	($33.83)
Inc. Capital Rev. Req. and Fixed O&M	($98)	($87.20)
Variable O&M	$0	$0.00
Emissions	$0	$0.00
Decommissioning	$3	$2.96
Total Net Cost Savings from Retired Unit	($133)	($118.07)
Net Replacement Costs		
Fuel	$73	$64.69
Inc. Capital Rev. Req. and Fixed O&M	($64)	($56.92)
Variable O&M	$5	$4.28
Emissions	$0	$0.00
Demand-Side Management	($1)	($0.74)
Long-Term Contracts	($4)	($3.92)
Market Purchases	$22	$19.67
Market Sales	($29)	($25.87)
Reserve/Energy Deficiencies	$13	$11.53
Transmission Upgrades	($39)	($34.33)
Transmission Reinforcements	$0	$0.00
Total Net Replacement Cost	($24)	($21.62)
Net (Benefit)/Cost of Assumed Early Retirement	($157)	($139.68)

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

Hayden 2 Case (C-11) Overview





Change in Transmission Upgrades

Change in Year	Resource Location	From	To	ATC	Max Interconnection	Change in Nominal Capital ($m)
Delayed from 2032 to 2033	Aeolus	Aeolus	UT South	1,500	1,850	$52.9
Added in 2033	Walla Walla WA	Walla Walla WA	Yakima WA	200	100	$74.8
Accelerated from 2035 to 2033	Yakima WA	Yakima WA	Southern OR	450	835	($11)
Accelerated from 2038 to 2037	Willamette V. OR	Willamette V. OR	Willamette V. OR	0	615	($0.9)
					Total	$115.8

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

Hayden 2 Case (C-11)
(PaR Base/Base Scenario)

Study	PVRR(d) (Benefit)/Cost of 2022 Retirement ($m)	Nom. Lev. (Benefit)/Cost of 2022 Retirement per MWh of Retired Generation ($/MWh)
Cost Savings from Retired Unit		
Fuel	($18)	($28.91)
Inc. Capital Rev. Req. and Fixed O&M	($20)	($32.78)
Variable O&M	$0	$0.00
Emissions	($7)	($11.47)
Decommissioning	$0	$0.06
Total Net Cost Savings from Retired Unit	($45)	($73.10)
Net Replacement Costs		
Fuel	$76	$122.63
Inc. Capital Rev. Req. and Fixed O&M	($33)	($53.78)
Variable O&M	$4	$6.32
Emissions	$39	$62.37
Demand-Side Management	($1)	($2.35)
Long-Term Contracts	($2)	($3.75)
Market Purchases	$14	$22.56
Market Sales	($46)	($74.47)
Reserve/Energy Deficiencies	$4	$5.89
Transmission Upgrades	($30)	($49.08)
Transmission Reinforcements	$0	$0.00
Total Net Replacement Cost	$22	$36.34
Net (Benefit)/Cost of Assumed Early Retirement	($23)	($36.76)

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

Hayden 2 Case (C-11)
(PaR High/High Scenario)

Study	PVRR(d) (Benefit)/Cost of 2022 Retirement ($m)	Nom. Lev. (Benefit)/Cost of 2022 Retirement per MWh of Retired Generation ($/MWh)
Cost Savings from Retired Unit		
Fuel	($18)	($28.76)
Inc. Capital Rev. Req. and Fixed O&M	($20)	($31.84)
Variable O&M	$0	$0.00
Emissions	($12)	($19.01)
Decommissioning	$0	$0.06
Total Net Cost Savings from Retired Unit	($51)	($79.55)
Net Replacement Costs		
Fuel	$76	$119.98
Inc. Capital Rev. Req. and Fixed O&M	($30)	($46.63)
Variable O&M	$4	$5.61
Emissions	$64	$99.78
Demand-Side Management	($1)	($2.33)
Long-Term Contracts	($2)	($3.55)
Market Purchases	$20	$31.71
Market Sales	($29)	($45.28)
Reserve/Energy Deficiencies	$6	$9.33
Transmission Upgrades	($30)	($47.66)
Transmission Reinforcements	$0	$0.00
Total Net Replacement Cost	$77	$120.95
Net (Benefit)/Cost of Assumed Early Retirement	$26	$41.40

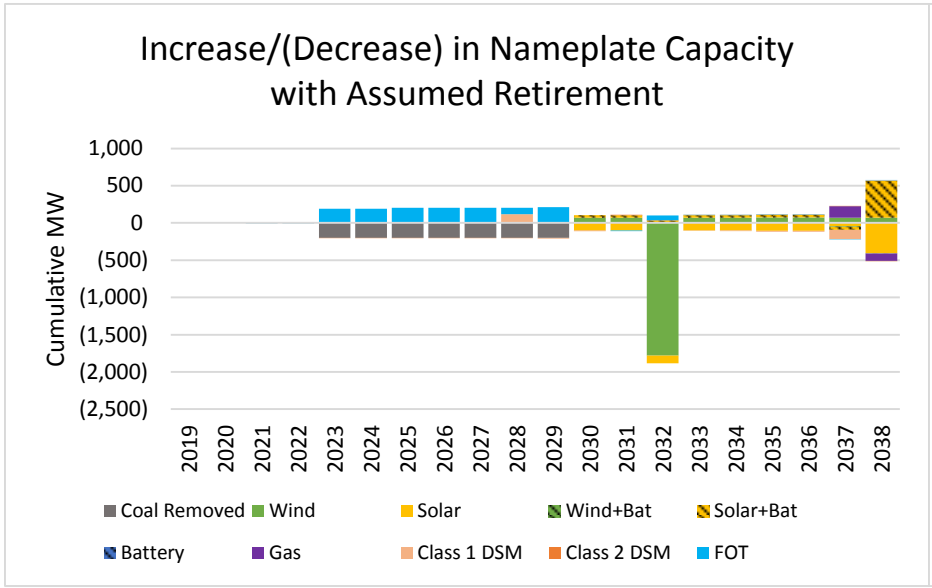
*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

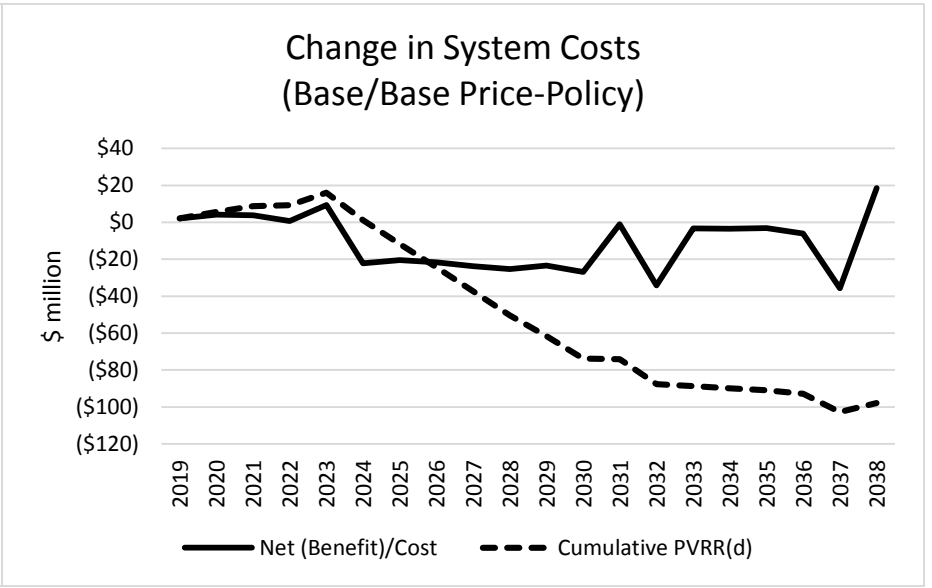
Hayden 2 Case (C-11)
(PaR Low/None Scenario)

Study	PVRR(d) (Benefit)/Cost of 2022 Retirement ($m)	Nom. Lev. (Benefit)/Cost of 2022 Retirement per MWh of Retired Generation ($/MWh)
Cost Savings from Retired Unit		
Fuel	($15)	($28.59)
Inc. Capital Rev. Req. and Fixed O&M	($20)	($38.26)
Variable O&M	$0	$0.00
Emissions	$0	$0.00
Decommissioning	$0	$0.07
Total Net Cost Savings from Retired Unit	($35)	($66.78)
Net Replacement Costs		
Fuel	$62	$117.80
Inc. Capital Rev. Req. and Fixed O&M	($30)	($56.04)
Variable O&M	$4	$7.36
Emissions	$0	$0.00
Demand-Side Management	($1)	($2.65)
Long-Term Contracts	($2)	($4.46)
Market Purchases	$6	$12.20
Market Sales	($27)	($50.15)
Reserve/Energy Deficiencies	$5	$9.47
Transmission Upgrades	($30)	($57.28)
Transmission Reinforcements	$0	$0.00
Total Net Replacement Cost	($13)	($23.74)
Net (Benefit)/Cost of Assumed Early Retirement	($48)	($90.53)

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

Naughton 2 Case (C-22) Overview





Change in Transmission Upgrades

Change in Year	Resource Location	From	To	ATC	Max Interconnection	Change in Nominal Capital ($m)
Delayed from 2032 to 2033	Aeolus	Aeolus	UT South	1,500	1,850	$52.9
					Total	$52.9

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

Naughton 2 Case (C-22)
(PaR Base/Base Scenario)

Study	PVRR(d) (Benefit)/Cost of 2022 Retirement ($m)	Nom. Lev. (Benefit)/Cost of 2022 Retirement per MWh of Retired Generation ($/MWh)
Cost Savings from Retired Unit		
Fuel	($48)	($36.21)
Inc. Capital Rev. Req. and Fixed O&M	($108)	($82.02)
Variable O&M	$0	$0.00
Emissions	($13)	($10.25)
Decommissioning	$4	$3.27
Total Net Cost Savings from Retired Unit	($164)	($125.20)
Net Replacement Costs		
Fuel	$59	$45.13
Inc. Capital Rev. Req. and Fixed O&M	($76)	($58.03)
Variable O&M	$5	$3.86
Emissions	$27	$20.44
Demand-Side Management	($3)	($2.38)
Long-Term Contracts	($5)	($3.52)
Market Purchases	$47	$35.42
Market Sales	$44	$33.50
Reserve/Energy Deficiencies	$16	$12.37
Transmission Upgrades	($48)	($36.29)
Transmission Reinforcements	$0	$0.00
Total Net Replacement Cost	$66	$50.50
Net (Benefit)/Cost of Assumed Early Retirement	($98)	($74.70)

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

Naughton 2 Case (C-22)
(PaR High/High Scenario)

Study	PVRR(d) (Benefit)/Cost of 2022 Retirement ($m)	Nom. Lev. (Benefit)/Cost of 2022 Retirement per MWh of Retired Generation ($/MWh)
Cost Savings from Retired Unit		
Fuel	($70)	($33.87)
Inc. Capital Rev. Req. and Fixed O&M	($108)	($52.21)
Variable O&M	$0	$0.00
Emissions	($34)	($16.65)
Decommissioning	$4	$2.08
Total Net Cost Savings from Retired Unit	($208)	($100.65)
Net Replacement Costs		
Fuel	$100	$48.65
Inc. Capital Rev. Req. and Fixed O&M	($76)	($36.90)
Variable O&M	$6	$2.80
Emissions	$51	$24.64
Demand-Side Management	($3)	($1.63)
Long-Term Contracts	($5)	($2.19)
Market Purchases	$63	$30.64
Market Sales	$60	$29.09
Reserve/Energy Deficiencies	$17	$8.16
Transmission Upgrades	($48)	($23.10)
Transmission Reinforcements	$0	$0.00
Total Net Replacement Cost	$165	$80.15
Net (Benefit)/Cost of Assumed Early Retirement	($42)	($20.49)

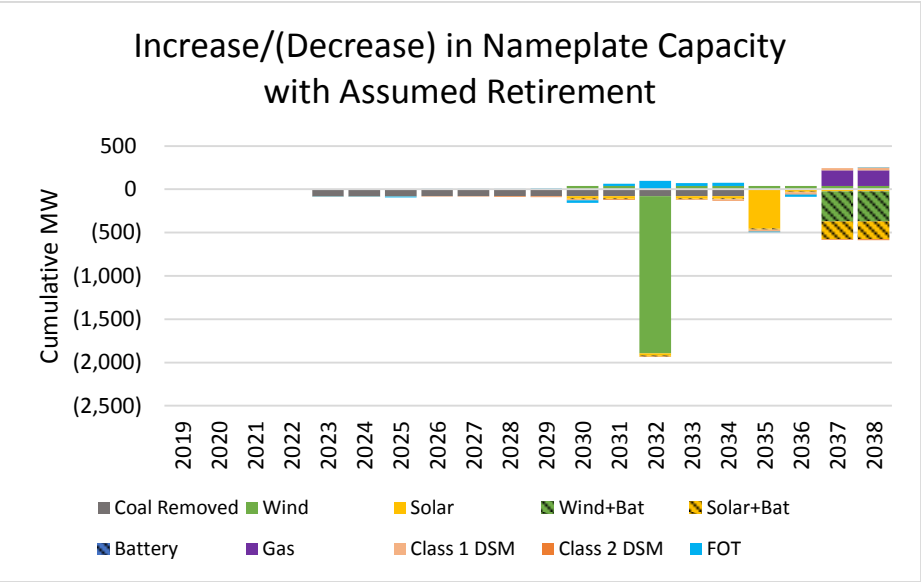
*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

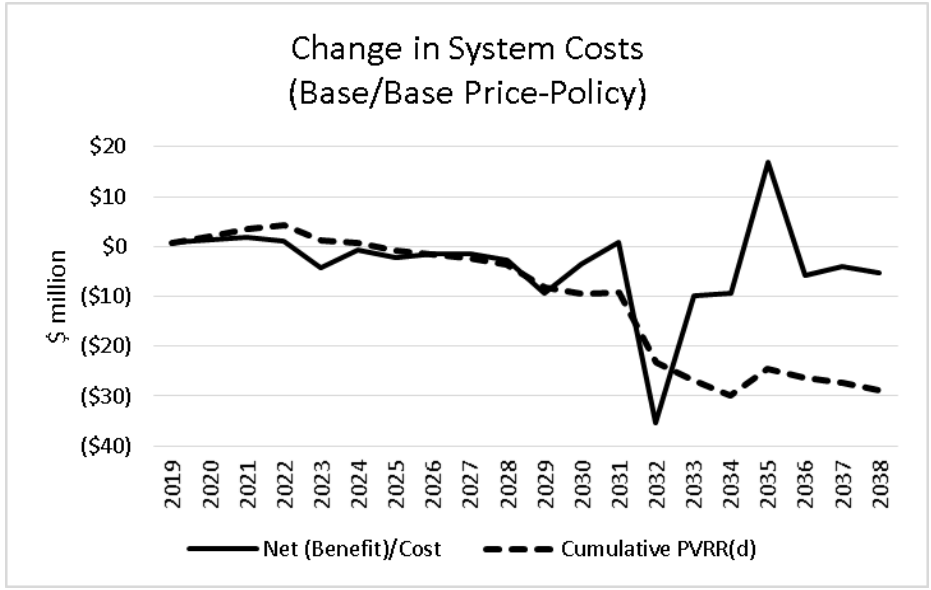
Naughton 2 Case (C-22)
(PaR Low/None Scenario)

Study	PVRR(d) (Benefit)/Cost of 2022 Retirement ($m)	Nom. Lev. (Benefit)/Cost of 2022 Retirement per MWh of Retired Generation ($/MWh)
Cost Savings from Retired Unit		
Fuel	($29)	($42.52)
Inc. Capital Rev. Req. and Fixed O&M	($108)	($160.10)
Variable O&M	$0	$0.00
Emissions	$0	$0.00
Decommissioning	$4	$6.39
Total Net Cost Savings from Retired Unit	($132)	($196.23)
Net Replacement Costs		
Fuel	$40	$58.82
Inc. Capital Rev. Req. and Fixed O&M	($76)	($113.15)
Variable O&M	$5	$7.09
Emissions	$0	$0.00
Demand-Side Management	($3)	($4.54)
Long-Term Contracts	($5)	($6.98)
Market Purchases	$25	$36.50
Market Sales	$22	$32.56
Reserve/Energy Deficiencies	$17	$25.41
Transmission Upgrades	($48)	($70.84)
Transmission Reinforcements	$0	$0.00
Total Net Replacement Cost	($24)	($35.13)
Net (Benefit)/Cost of Assumed Early Retirement	($156)	($231.36)

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

Craig 2 Case (C-05) Overview





Change in Transmission Upgrades

Change in Year	Resource Location	From	To	ATC	Max Interconnection	Change in Nominal Capital ($m)
Delayed from 2032 to 2033	Aeolus	Aeolus	UT South	1,500	1,850	$52.9
Delayed from 2035 to 2036	Yakima WA	Yakima WA	Southern OR	450	835	$5.7
Accelerated from 2038 to 2037	Willamette V. OR	Willamette V. OR	Willamette V. OR	0	615	($0.9)
Removed in 2037	Portland/N.C. OR	Portland/N.C. OR	Willamette V. OR	450	580	($322.0)
					Total	($264.4)

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

Craig 2 Case (C-05)
(PaR Base/Base Scenario)

Study	PVRR(d) (Benefit)/Cost of 2022 Retirement ($m)	Nom. Lev. (Benefit)/Cost of 2022 Retirement per MWh of Retired Generation ($/MWh)
Cost Savings from Retired Unit		
Fuel	($78)	($25.36)
Inc. Capital Rev. Req. and Fixed O&M	($83)	($27.13)
Variable O&M	$0	$0.00
Emissions	($41)	($13.51)
Decommissioning	$0	$0.11
Total Net Cost Savings from Retired Unit	($202)	($65.89)
Net Replacement Costs		
Fuel	$94	$30.69
Inc. Capital Rev. Req. and Fixed O&M	($127)	($41.50)
Variable O&M	$10	$3.13
Emissions	$36	$11.70
Demand-Side Management	($5)	($1.64)
Long-Term Contracts	($12)	($3.84)
Market Purchases	$25	$8.17
Market Sales	$206	$67.28
Reserve/Energy Deficiencies	$7	$2.23
Transmission Upgrades	($61)	($19.75)
Transmission Reinforcements	$0	$0.00
Total Net Replacement Cost	$173	$56.47
Net (Benefit)/Cost of Assumed Early Retirement	($29)	($9.42)

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

Craig 2 Case (C-05)
(PaR High/High Scenario)

Study	PVRR(d) (Benefit)/Cost of 2022 Retirement ($m)	Nom. Lev. (Benefit)/Cost of 2022 Retirement per MWh of Retired Generation ($/MWh)
Cost Savings from Retired Unit		
Fuel	($69)	($25.29)
Inc. Capital Rev. Req. and Fixed O&M	($83)	($30.59)
Variable O&M	$0	$0.00
Emissions	($71)	($26.17)
Decommissioning	$0	$0.13
Total Net Cost Savings from Retired Unit	($223)	($81.92)
Net Replacement Costs		
Fuel	$122	$44.71
Inc. Capital Rev. Req. and Fixed O&M	($127)	($46.77)
Variable O&M	$10	$3.52
Emissions	$72	$26.53
Demand-Side Management	($5)	($1.85)
Long-Term Contracts	($12)	($4.31)
Market Purchases	$40	$14.74
Market Sales	$216	$79.28
Reserve/Energy Deficiencies	$6	$2.10
Transmission Upgrades	($61)	($22.27)
Transmission Reinforcements	$0	$0.00
Total Net Replacement Cost	$260	$95.69
Net (Benefit)/Cost of Assumed Early Retirement	$37	$13.78

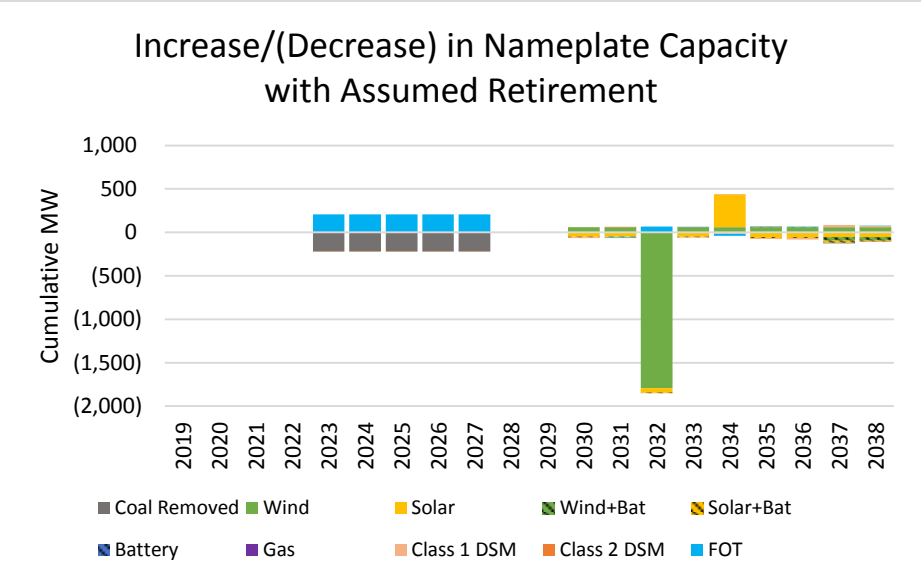
*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

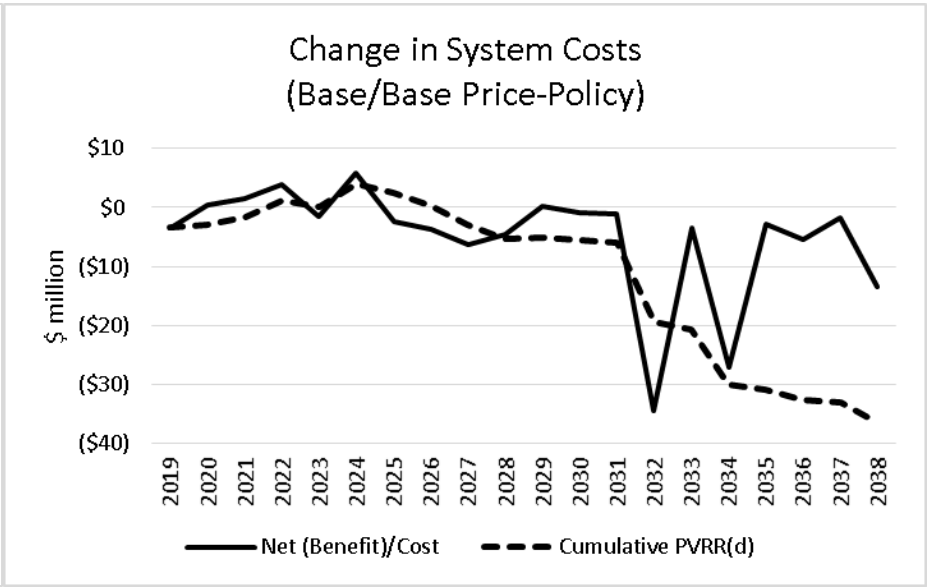
Craig 2 Case (C-05)
(PaR Low/None Scenario)

Study	PVRR(d) (Benefit)/Cost of 2022 Retirement ($m)	Nom. Lev. (Benefit)/Cost of 2022 Retirement per MWh of Retired Generation ($/MWh)
Cost Savings from Retired Unit		
Fuel	($81)	($25.55)
Inc. Capital Rev. Req. and Fixed O&M	($83)	($26.30)
Variable O&M	$0	$0.00
Emissions	$0	$0.00
Decommissioning	$0	$0.11
Total Net Cost Savings from Retired Unit	($164)	($51.74)
Net Replacement Costs		
Fuel	$65	$20.44
Inc. Capital Rev. Req. and Fixed O&M	($127)	($40.20)
Variable O&M	$9	$2.92
Emissions	$0	$0.00
Demand-Side Management	($5)	($1.59)
Long-Term Contracts	($12)	($3.73)
Market Purchases	$10	$3.26
Market Sales	$147	$46.38
Reserve/Energy Deficiencies	$6	$2.01
Transmission Upgrades	($61)	($19.14)
Transmission Reinforcements	$0	$0.00
Total Net Replacement Cost	$33	$10.36
Net (Benefit)/Cost of Assumed Early Retirement	($131)	($41.38)

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

Dave Johnston 3 Case (C-08) Overview





Change in Transmission Upgrades

Change in Year	Resource Location	From	To	ATC	Max Interconnection	Change in Nominal Capital ($m)
Delayed from 2032 to 2033	Aeolus	Aeolus	UT South	1,500	1,850	$52.9
Accelerated from 2035 to 2034	Yakima WA	Yakima WA	Southern OR	450	835	($5.6)
					Total	$47.3

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

Dave Johnston 3 Case (C-08) (PaR Base/Base Scenario)

Study	PVRR(d) (Benefit)/Cost of 2022 Retirement ($m)	Nom. Lev. (Benefit)/Cost of 2022 Retirement per MWh of Retired Generation ($/MWh)
Cost Savings from Retired Unit		
Fuel	($72)	($14.31)
Inc. Capital Rev. Req. and Fixed O&M	($80)	($15.92)
Variable O&M	$0	$0.00
Emissions	($38)	($7.47)
Decommissioning	$1	$0.12
Total Net Cost Savings from Retired Unit	($189)	($37.59)
Net Replacement Costs		
Fuel	$163	$32.45
Inc. Capital Rev. Req. and Fixed O&M	($54)	($10.72)
Variable O&M	$7	$1.40
Emissions	$56	$11.14
Demand-Side Management	$0	$0.03
Long-Term Contracts	($5)	($0.97)
Market Purchases	$30	$5.97
Market Sales	($13)	($2.67)
Reserve/Energy Deficiencies	$12	$2.29
Transmission Upgrades	($43)	($8.59)
Transmission Reinforcements	$0	$0.00
Total Net Replacement Cost	$153	$30.32
Net (Benefit)/Cost of Assumed Early Retirement	($37)	($7.27)

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

Dave Johnston 3 Case (C-08) (PaR High/High Scenario)

Study	PVRR(d) (Benefit)/Cost of 2022 Retirement ($m)	Nom. Lev. (Benefit)/Cost of 2022 Retirement per MWh of Retired Generation ($/MWh)
Cost Savings from Retired Unit		
Fuel	($71)	($14.31)
Inc. Capital Rev. Req. and Fixed O&M	($80)	($16.17)
Variable O&M	$0	$0.00
Emissions	($82)	($16.48)
Decommissioning	$1	$0.12
Total Net Cost Savings from Retired Unit	($232)	($46.84)
Net Replacement Costs		
Fuel	$179	$36.19
Inc. Capital Rev. Req. and Fixed O&M	($54)	($10.89)
Variable O&M	$7	$1.37
Emissions	$74	$14.99
Demand-Side Management	($0)	($0.04)
Long-Term Contracts	($5)	($0.99)
Market Purchases	$16	$3.26
Market Sales	$143	$28.82
Reserve/Energy Deficiencies	$13	$2.66
Transmission Upgrades	($43)	($8.73)
Transmission Reinforcements	$0	$0.00
Total Net Replacement Cost	$330	$66.63
Net (Benefit)/Cost of Assumed Early Retirement	$98	$19.79

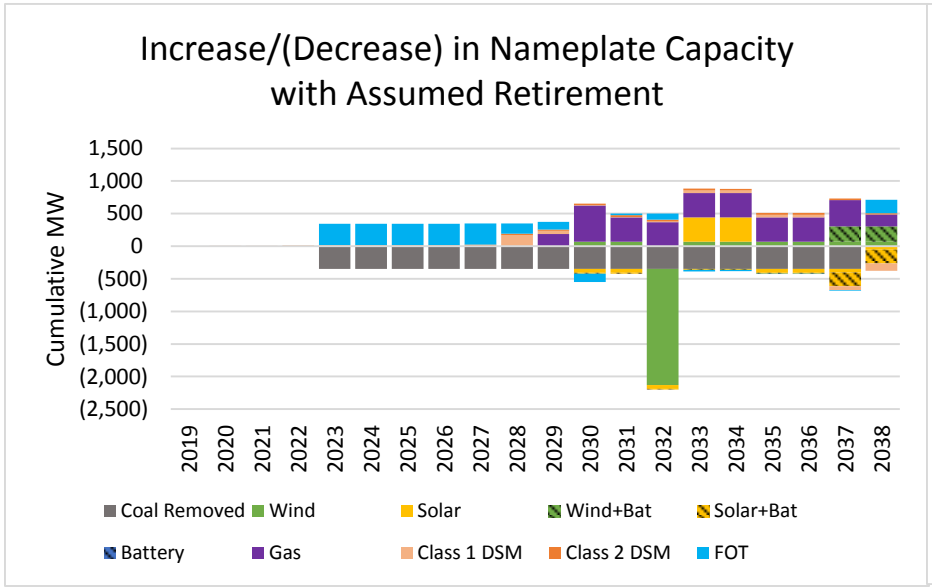
*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

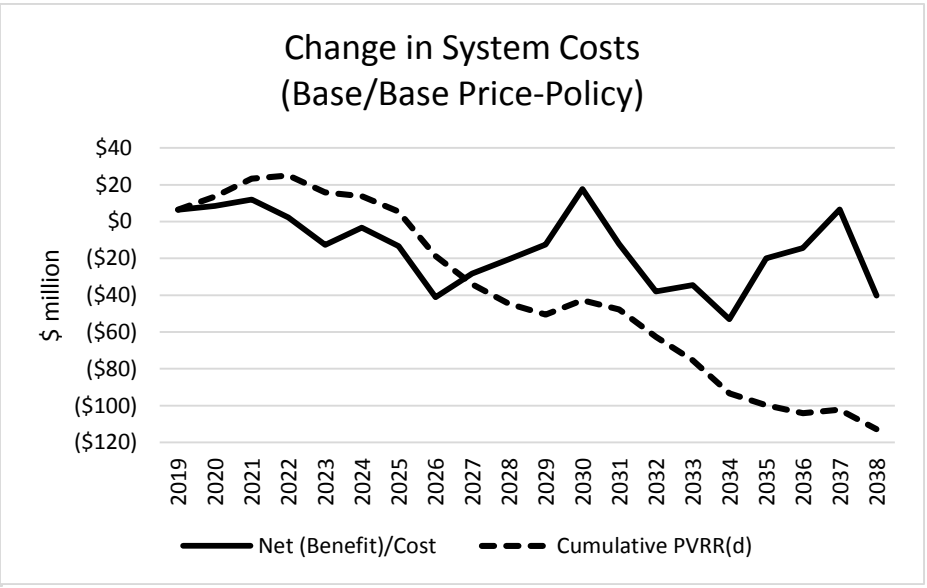
Dave Johnston 3 Case (C-08) (PaR Low/None Scenario)

Study	PVRR(d) (Benefit)/Cost of 2022 Retirement ($m)	Nom. Lev. (Benefit)/Cost of 2022 Retirement per MWh of Retired Generation ($/MWh)
Cost Savings from Retired Unit		
Fuel	($72)	($14.32)
Inc. Capital Rev. Req. and Fixed O&M	($80)	($15.92)
Variable O&M	$0	$0.00
Emissions	$0	$0.00
Decommissioning	$1	$0.12
Total Net Cost Savings from Retired Unit	($152)	($30.12)
Net Replacement Costs		
Fuel	$136	$26.92
Inc. Capital Rev. Req. and Fixed O&M	($54)	($10.71)
Variable O&M	$6	$1.26
Emissions	$0	$0.00
Demand-Side Management	$0	$0.07
Long-Term Contracts	($5)	($0.98)
Market Purchases	$20	$3.91
Market Sales	($9)	($1.75)
Reserve/Energy Deficiencies	$12	$2.32
Transmission Upgrades	($43)	($8.59)
Transmission Reinforcements	$0	$0.00
Total Net Replacement Cost	$63	$12.43
Net (Benefit)/Cost of Assumed Early Retirement	($89)	($17.69)

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

Jim Bridger 1 Case (C-17) Overview





Change in Transmission Upgrades

Change in Year	Resource Location	From	To	ATC	Max Interconnection	Change in Nominal Capital ($m)
Delayed from 2032 to 2033	Aeolus	Aeolus	UT South	1,500	1,850	$52.9
Accelerated from 2035 to 2033	Yakima WA	Yakima WA	Southern OR	450	835	($11.0)
Accelerated from 2037 to 2033	SW WY	SW WY	SW WY	0	500	($3.3)
Accelerated from 2038 to 2037	Willamette V. OR	Willamette V. OR	Willamette V. OR	0	615	($0.9)
					Total	$37.6

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

Jim Bridger 1 Case (C-17) (PaR Base/Base Scenario)

Study	PVRR(d) (Benefit)/Cost of 2022 Retirement ($m)	Nom. Lev. (Benefit)/Cost of 2022 Retirement per MWh of Retired Generation ($/MWh)
Cost Savings from Retired Unit		
Fuel	($217)	($31.40)
Inc. Capital Rev. Req. and Fixed O&M	($363)	($52.57)
Variable O&M	($3)	($0.48)
Emissions	($119)	($17.26)
Decommissioning	$5	$0.77
Total Net Cost Savings from Retired Unit	($696)	($100.94)
Net Replacement Costs		
Fuel	$255	$36.94
Inc. Capital Rev. Req. and Fixed O&M	$149	$21.58
Variable O&M	$15	$2.11
Emissions	$78	$11.28
Demand-Side Management	$33	$4.79
Long-Term Contracts	$1	$0.13
Market Purchases	$75	$10.88
Market Sales	($21)	($3.00)
Reserve/Energy Deficiencies	$35	$5.03
Transmission Upgrades	($36)	($5.15)
Transmission Reinforcements	$0	$0.00
Total Net Replacement Cost	$584	$84.59
Net (Benefit)/Cost of Assumed Early Retirement	($113)	($16.35)

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

Jim Bridger 1 Case (C-17) (PaR High/High Scenario)

Study	PVRR(d) (Benefit)/Cost of 2022 Retirement ($m)	Nom. Lev. (Benefit)/Cost of 2022 Retirement per MWh of Retired Generation ($/MWh)
Cost Savings from Retired Unit		
Fuel	($229)	($30.50)
Inc. Capital Rev. Req. and Fixed O&M	($363)	($48.31)
Variable O&M	($4)	($0.48)
Emissions	($238)	($31.73)
Decommissioning	$5	$0.70
Total Net Cost Savings from Retired Unit	($828)	($110.32)
Net Replacement Costs		
Fuel	$316	$42.12
Inc. Capital Rev. Req. and Fixed O&M	$149	$19.84
Variable O&M	$13	$1.71
Emissions	$147	$19.58
Demand-Side Management	$33	$4.41
Long-Term Contracts	$1	$0.16
Market Purchases	$89	$11.91
Market Sales	$9	$1.19
Reserve/Energy Deficiencies	$37	$4.92
Transmission Upgrades	($36)	($4.74)
Transmission Reinforcements	$0	$0.00
Total Net Replacement Cost	$759	$101.11
Net (Benefit)/Cost of Assumed Early Retirement	($69)	($9.21)

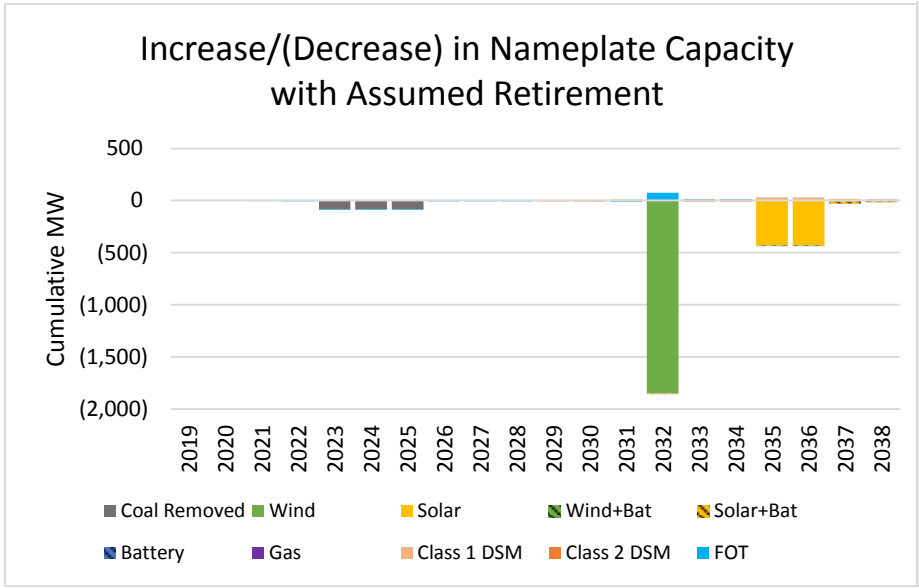
*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

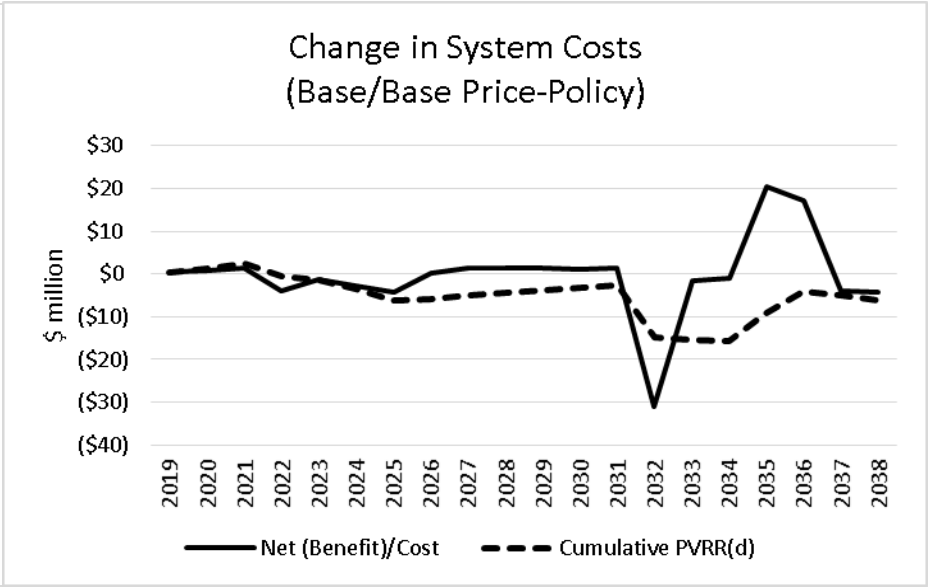
Jim Bridger 1 Case (C-17) (PaR Low/None Scenario)

Study	PVRR(d) (Benefit)/Cost of 2022 Retirement ($m)	Nom. Lev. (Benefit)/Cost of 2022 Retirement per MWh of Retired Generation ($/MWh)
Cost Savings from Retired Unit		
Fuel	($200)	($32.57)
Inc. Capital Rev. Req. and Fixed O&M	($363)	($59.06)
Variable O&M	($3)	($0.48)
Emissions	$0	$0.00
Decommissioning	$5	$0.85
Total Net Cost Savings from Retired Unit	($560)	($91.25)
Net Replacement Costs		
Fuel	$189	$30.75
Inc. Capital Rev. Req. and Fixed O&M	$149	$24.26
Variable O&M	$13	$2.04
Emissions	$0	$0.00
Demand-Side Management	$33	$5.36
Long-Term Contracts	$1	$0.12
Market Purchases	$49	$7.99
Market Sales	($12)	($2.02)
Reserve/Energy Deficiencies	$36	$5.82
Transmission Upgrades	($36)	($5.79)
Transmission Reinforcements	$0	$0.00
Total Net Replacement Cost	$421	$68.51
Net (Benefit)/Cost of Assumed Early Retirement	($140)	($22.74)

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

Craig 1 Case (C-04) Overview





Change in Transmission Upgrades

Change in Year	Resource Location	From	To	ATC	Max Interconnection	Change in Nominal Capital ($m)
Delayed from 2032 to 2033	Aeolus	Aeolus	UT South	1,500	1,850	$52.9
Delayed from 2035 to 2037	Yakima WA	Yakima WA	Southern OR	450	835	$11.5
					Total	$64.4

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

Craig 1 Case (C-04)
(PaR Base/Base Scenario)

Study	PVRR(d) (Benefit)/Cost of 2022 Retirement ($m)	Nom. Lev. (Benefit)/Cost of 2022 Retirement per MWh of Retired Generation ($/MWh)
Cost Savings from Retired Unit		
Fuel	($26)	($23.88)
Inc. Capital Rev. Req. and Fixed O&M	($24)	($21.85)
Variable O&M	$0	$0.00
Emissions	($3)	($2.97)
Decommissioning	$0	$0.10
Total Net Cost Savings from Retired Unit	($53)	($48.61)
Net Replacement Costs		
Fuel	$60	$55.44
Inc. Capital Rev. Req. and Fixed O&M	($108)	($99.19)
Variable O&M	$6	$5.89
Emissions	$19	$17.71
Demand-Side Management	$1	$0.57
Long-Term Contracts	($6)	($5.14)
Market Purchases	$17	$15.41
Market Sales	$108	$99.35
Reserve/Energy Deficiencies	$5	$4.18
Transmission Upgrades	($56)	($51.37)
Transmission Reinforcements	$0	$0.00
Total Net Replacement Cost	$47	$42.85
Net (Benefit)/Cost of Assumed Early Retirement	($6)	($5.76)

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

Craig 1 Case (C-04)
(PaR High/High Scenario)

Study	PVRR(d) (Benefit)/Cost of 2022 Retirement ($m)	Nom. Lev. (Benefit)/Cost of 2022 Retirement per MWh of Retired Generation ($/MWh)
Cost Savings from Retired Unit		
Fuel	($26)	($23.87)
Inc. Capital Rev. Req. and Fixed O&M	($24)	($21.49)
Variable O&M	$0	$0.00
Emissions	($7)	($6.25)
Decommissioning	$0	$0.09
Total Net Cost Savings from Retired Unit	($57)	($51.52)
Net Replacement Costs		
Fuel	$72	$64.77
Inc. Capital Rev. Req. and Fixed O&M	($108)	($97.66)
Variable O&M	$6	$5.64
Emissions	$41	$36.96
Demand-Side Management	$1	$0.49
Long-Term Contracts	($6)	($4.98)
Market Purchases	$24	$21.98
Market Sales	$169	$152.76
Reserve/Energy Deficiencies	$3	$2.60
Transmission Upgrades	($56)	($50.53)
Transmission Reinforcements	$0	$0.00
Total Net Replacement Cost	$146	$132.03
Net (Benefit)/Cost of Assumed Early Retirement	$89	$80.52

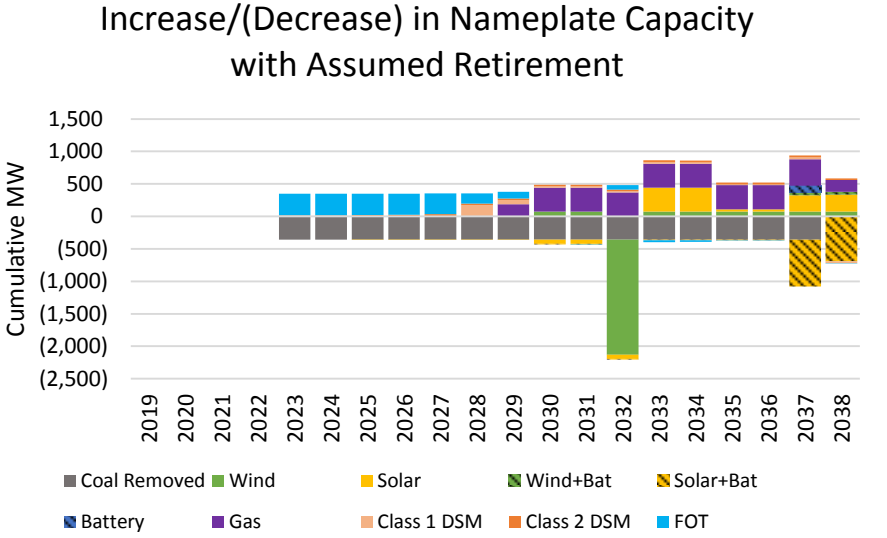
*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

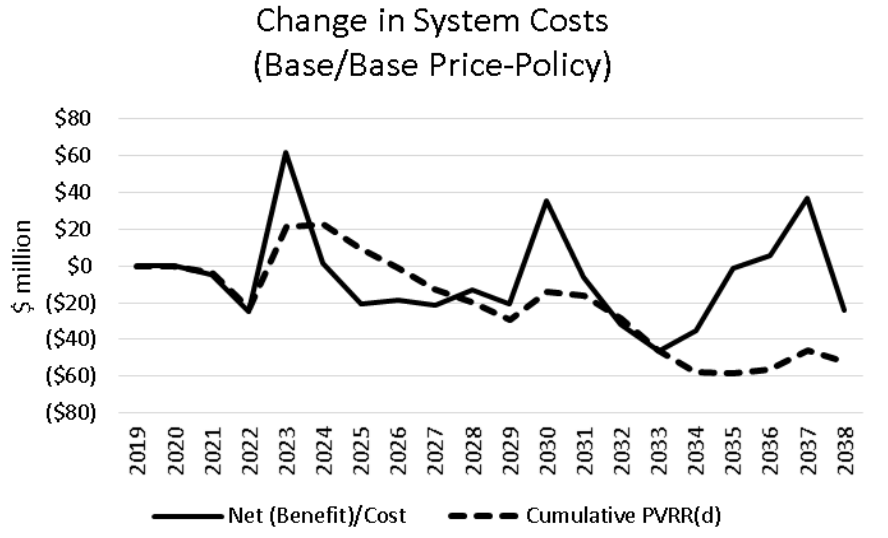
Craig 1 Case (C-04)
(PaR Low/None Scenario)

Study	PVRR(d) (Benefit)/Cost of 2022 Retirement ($m)	Nom. Lev. (Benefit)/Cost of 2022 Retirement per MWh of Retired Generation ($/MWh)
Cost Savings from Retired Unit		
Fuel	($22)	($24.03)
Inc. Capital Rev. Req. and Fixed O&M	($24)	($25.50)
Variable O&M	$0	$0.00
Emissions	$0	$0.00
Decommissioning	$0	$0.11
Total Net Cost Savings from Retired Unit	($46)	($49.42)
Net Replacement Costs		
Fuel	$26	$28.32
Inc. Capital Rev. Req. and Fixed O&M	($108)	($115.76)
Variable O&M	$5	$5.48
Emissions	$0	$0.00
Demand-Side Management	$1	$0.60
Long-Term Contracts	($6)	($5.99)
Market Purchases	$4	$4.15
Market Sales	$112	$120.32
Reserve/Energy Deficiencies	$3	$3.23
Transmission Upgrades	($56)	($59.95)
Transmission Reinforcements	$0	$0.00
Total Net Replacement Cost	($18)	($19.59)
Net (Benefit)/Cost of Assumed Early Retirement	($64)	($69.00)

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

Jim Bridger 2 Case (C-18) Overview





Change in Transmission Upgrades

Change in Year	Resource Location	From	To	ATC	Max Interconnection	Change in Nominal Capital ($m)
Delayed from 2032 to 2033	Aeolus	Aeolus	UT South	1,500	1,850	$52.9
Accelerated from 2035 to 2033	Yakima WA	Yakima WA	Southern OR	450	835	($11.0)
Added in 2035	Walla Walla WA	Walla Walla WA	Yakima WA	200	100	$78.3
Accelerated from 2038 to 2037	Willamette V. OR	Willamette V. OR	Willamette V. OR	0	615	($0.9)
Accelerated from 2037 to 2033	SW WY	SW WY	SW WY	0	500	($3.3)
					Total	$115.9

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

Jim Bridger 2 Case (C-18) (PaR Base/Base Scenario)

Study	PVRR(d) (Benefit)/Cost of 2022 Retirement ($m)	Nom. Lev. (Benefit)/Cost of 2022 Retirement per MWh of Retired Generation ($/MWh)
Cost Savings from Retired Unit		
Fuel	($250)	($28.90)
Inc. Capital Rev. Req. and Fixed O&M	($379)	($43.80)
Variable O&M	($5)	($0.55)
Emissions	($147)	($17.05)
Decommissioning	$46	$5.30
Total Net Cost Savings from Retired Unit	($735)	($85.00)
Net Replacement Costs		
Fuel	$302	$34.87
Inc. Capital Rev. Req. and Fixed O&M	$123	$14.23
Variable O&M	$16	$1.90
Emissions	$110	$12.67
Demand-Side Management	$35	$4.08
Long-Term Contracts	($2)	($0.26)
Market Purchases	$92	$10.64
Market Sales	($4)	($0.46)
Reserve/Energy Deficiencies	$42	$4.80
Transmission Upgrades	($31)	($3.54)
Transmission Reinforcements	$0	$0.00
Total Net Replacement Cost	$683	$78.93
Net (Benefit)/Cost of Assumed Early Retirement	($53)	($6.07)

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

Jim Bridger 2 Case (C-18)
(PaR High/High Scenario)

Study	PVRR(d) (Benefit)/Cost of 2022 Retirement ($m)	Nom. Lev. (Benefit)/Cost of 2022 Retirement per MWh of Retired Generation ($/MWh)
Cost Savings from Retired Unit		
Fuel	($265)	($28.43)
Inc. Capital Rev. Req. and Fixed O&M	($379)	($40.57)
Variable O&M	($5)	($0.56)
Emissions	($299)	($32.06)
Decommissioning	$46	$4.91
Total Net Cost Savings from Retired Unit	($903)	($96.71)
Net Replacement Costs		
Fuel	$370	$39.67
Inc. Capital Rev. Req. and Fixed O&M	$123	$13.18
Variable O&M	$15	$1.57
Emissions	$211	$22.64
Demand-Side Management	$35	$3.78
Long-Term Contracts	($2)	($0.21)
Market Purchases	$112	$12.01
Market Sales	$31	$3.35
Reserve/Energy Deficiencies	$44	$4.73
Transmission Upgrades	($31)	($3.28)
Transmission Reinforcements	$0	$0.00
Total Net Replacement Cost	$910	$97.45
Net (Benefit)/Cost of Assumed Early Retirement	$7	$0.74

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

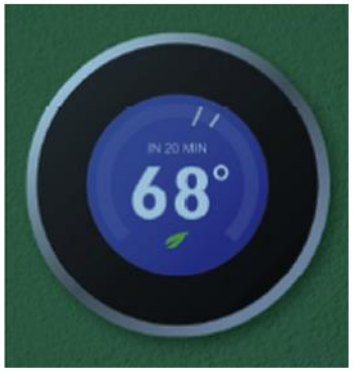
Jim Bridger 2 Case (C-18) (PaR Low/None Scenario)

Study	PVRR(d) (Benefit)/Cost of 2022 Retirement ($m)	Nom. Lev. (Benefit)/Cost of 2022 Retirement per MWh of Retired Generation ($/MWh)
Cost Savings from Retired Unit		
Fuel	($225)	($29.89)
Inc. Capital Rev. Req. and Fixed O&M	($379)	($50.21)
Variable O&M	($4)	($0.56)
Emissions	$0	$0.00
Decommissioning	$46	$6.06
Total Net Cost Savings from Retired Unit	($563)	($74.60)
Net Replacement Costs		
Fuel	$224	$29.75
Inc. Capital Rev. Req. and Fixed O&M	$123	$16.32
Variable O&M	$14	$1.91
Emissions	$0	$0.00
Demand-Side Management	$35	$4.66
Long-Term Contracts	($2)	($0.33)
Market Purchases	$57	$7.56
Market Sales	($5)	($0.60)
Reserve/Energy Deficiencies	$40	$5.28
Transmission Upgrades	($31)	($4.06)
Transmission Reinforcements	$0	$0.00
Total Net Replacement Cost	$456	$60.50
Net (Benefit)/Cost of Assumed Early Retirement	($106)	($14.09)

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

Alternate-Year Summary Results



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PaR Alternate-Year Results (Base/Base Scenario)

Study	PVRR ($m)	PVRR(d) (Benefit)/Cost of 2022 Retirement	Nom. Lev. (Benefit)/Cost of 2022 Retirement
C-01 (Benchmark)	$23,310	n/a	n/a
C-21 (Naughton 1 (2022))	$23,187	($123)	($190/kW-yr)
C-25 (Naughton 1 (2025))	$23,275	($35)	($55/kW-yr)
C-26 (Naughton 1 (2028))	$23,290	($20)	($31/kW-yr)
C-22 (Naughton 2 (2022))	$23,212	($98)	($118/kW-yr)
C-27 (Naughton 2 (2025))	$23,277	($33)	($39/kW-yr)
C-28 (Naughton 2 (2028))	$23,298	($12)	($14/kW-yr)
C-17 (Jim Bridger 1 (2022))	$23,197	($113)	($46/kW-yr)
C-29 (Jim Bridger 1 (2025))	$23,270	($40)	($16/kW-yr)
C-30 (Jim Bridger 1 (2028))	$23,262	($48)	($20/kW-yr)
C-31 (Jim Bridger 1 (2031))	$23,238	($72)	($29/kW-yr)
C-10 (Hayden 1 (2022))	$23,252	($58)	($290/kW-yr)
C-32 (Hayden 1 (2025))	$23,271	($39)	($193/kW-yr)
C-33 (Hayden 1 (2028))	$23,277	($33)	($166/kW-yr)

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

PaR Alternate-Year Results (High/High Scenario)

Study	PVRR ($m)	PVRR(d) (Benefit)/Cost of 2022 Retirement	Nom. Lev. (Benefit)/Cost of 2022 Retirement
C-01 (Benchmark)	$28,176	n/a	n/a
C-21 (Naughton 1 (2022))	$28,110	($66)	($103/kW-yr)
C-25 (Naughton 1 (2025))	$28,190	$13	$21/kW-yr
C-26 (Naughton 1 (2028))	$28,204	$28	$43/kW-yr
C-22 (Naughton 2 (2022))	$28,134	($42)	($51/kW-yr)
C-27 (Naughton 2 (2025))	$28,189	$12	$15/kW-yr
C-28 (Naughton 2 (2028))	$28,212	$35	$43/kW-yr
C-17 (Jim Bridger 1 (2022))	$28,107	($69)	($28/kW-yr)
C-29 (Jim Bridger 1 (2025))	$28,161	($16)	($6/kW-yr)
C-30 (Jim Bridger 1 (2028))	$28,157	($20)	($8/kW-yr)
C-31 (Jim Bridger 1 (2031))	$28,142	($34)	($14/kW-yr)
C-10 (Hayden 1 (2022))	$28,167	($9)	($47/kW-yr)
C-32 (Hayden 1 (2025))	$28,159	($17)	($84/kW-yr)
C-33 (Hayden 1 (2028))	$28,165	($11)	($56/kW-yr)

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

Conclusions from Alternate-Year Summary Results

- Results from the Low/None price-policy scenario were not finalized before this meeting.

- Nonetheless, assessment of later retirement dates across the units studied in the alternate-year cases for the base/base and high/high price-policy scenarios show that potential benefits for early retirement are greatest with assumed retirement at the end of 2022.

- Based on results of the alternate-year cases, stacked-retirement cases assume early retirement of units at the end of 2022.

Stacked-Retirement Summary Results




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Stacked-Retirement Cases

- C-34 (Stacked 1: 357 MW)
  - Naughton 1-2 (2022)
- C-35 (Stacked 2: 711 MW)
  - Naughton 1-2 (2022)
  - Jim Bridger 1 (2022)
- C-36 (Stacked 3: 510 MW)
  - Naughton 1 (2022)
  - Jim Bridger 1 (2022)
- C-37 (Stacked 4: 554 MW)
  - Naughton 1 (2022)
  - Jim Bridger 1 (2022)
  - Hayden 1 (2022)
- C-38 (Stacked 5: 755 MW)
  - Naughton 1-2 (2022)
  - Hayden 1 (2022)
  - Jim Bridger 1 (2022)
- C-39 (Stacked 6: 834 MW)
  - Naughton 1-2 (2022)
  - Hayden 1 (2022)
  - Jim Bridger 1 (2022)
  - Craig 2 (2022)
- C-40 (Stacked 7: 1,193 MW)
  - Naughton 1-2 (2022)
  - Hayden 1 (2022)
  - Jim Bridger 1-2 (2022)
  - Craig 2 (2022)
- C-41 (Stacked 8: 1,529 MW)
  - Naughton 1-2 (2022)
  - Jim Bridger 1-2 (2022)
  - Hayden 1-2 (2022)
  - Craig 1-2 (2022)
  - Dave Johnston 3 (2022)

*Note: in all cases it is assumed that Naughton 3 (280 MW) is retired in 2019 and that Cholla 4 (387 MW) is retired at the end of 2020—however, these units are retired in the benchmark case and therefore not incremental to the stacked-retirement cases listed above.

PaR Stacked-Retirement Results (Base/Base Scenario)

Base/Base	PVRR ($m)	PVRR(d) (Benefit)/Cost of Retirement ($m)
C-01 (Benchmark)	$23,310	n/a
C-34 (Stacked 1)	$23,180	($130)
C-35 (Stacked 2)	$23,009	($301)
C-36 (Stacked 3)	$23,286	($24)
C-37 (Stacked 4)	$23,288	($22)
C-38 (Stacked 5)	$23,002	($307)
C-39 (Stacked 6)	$22,993	($317)
C-40 (Stacked 7)	$23,483	$173
C-41 (Stacked 8)	$23,600	$290

- Before assessing hourly reliability, Cases C-35, C-38, and C-39 show the largest potential benefits—the PVRR(d) results for these three cases are very close.
- Cases C-40 and C-41, both in excess of 1,000 MW of incremental early retirements relative to the benchmark case, show a net cost before evaluating hourly reliability.

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

PaR Stacked-Retirement Results (High/High Scenario)

Base/Base	PVRR ($m)	PVRR(d) (Benefit)/Cost of Retirement ($m)
C-01 (Benchmark)	$28,176	n/a
C-34 (Stacked 1)	$28,109	($67)
C-35 (Stacked 2)	$27,897	($279)
C-36 (Stacked 3)	$28,252	$76
C-37 (Stacked 4)	$28,249	$72
C-38 (Stacked 5)	$27,896	($280)
C-39 (Stacked 6)	$27,877	($299)
C-40 (Stacked 7)	$28,397	$221
C-41 (Stacked 8)	$28,249	$368

- As in the base/base price-policy scenario, before assessing hourly reliability, Cases C-35, C-38, and C-39 show the largest potential benefits—the PVRR(d) results for these three cases are very close.
- Cases C-40 and C-41, both in excess of 1,000 MW of incremental early retirements relative to the benchmark case, continue to show a net cost before evaluating hourly reliability.

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

PaR Stacked-Retirement Results (Low/None Scenario)

Base/Base	PVRR ($m)	PVRR(d) (Benefit)/Cost of Retirement ($m)
C-01 (Benchmark)	$19,644	n/a
C-34 (Stacked 1)	$19,487	($156)
C-35 (Stacked 2)	$19,386	($257)
C-36 (Stacked 3)	$19,549	($95)
C-37 (Stacked 4)	$19,573	($71)
C-38 (Stacked 5)	$19,359	($285)
C-39 (Stacked 6)	$19,336	($308)
C-40 (Stacked 7)	$19,747	$103
C-41 (Stacked 8)	$19,828	$184

- As in the base/base and high/high price-policy scenarios, before assessing hourly reliability, Cases C-35, C-38, and C-39 show the largest potential benefits—the PVRR(d) results for these three cases are reasonably close.
- Cases C-40 and C-41, both in excess of 1,000 MW of incremental early retirements relative to the benchmark case, continues to show a net cost before evaluating hourly reliability.

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

Conclusions from Stacked-Retirement Summary Results

- Cases C-35, C-38, and C-39 consistently show the largest potential benefit of early retirement.

- Detailed results for these three cases, and Cases C-40 and C-41 are summarized in the next section.

Stacked-Retirement Detailed Results




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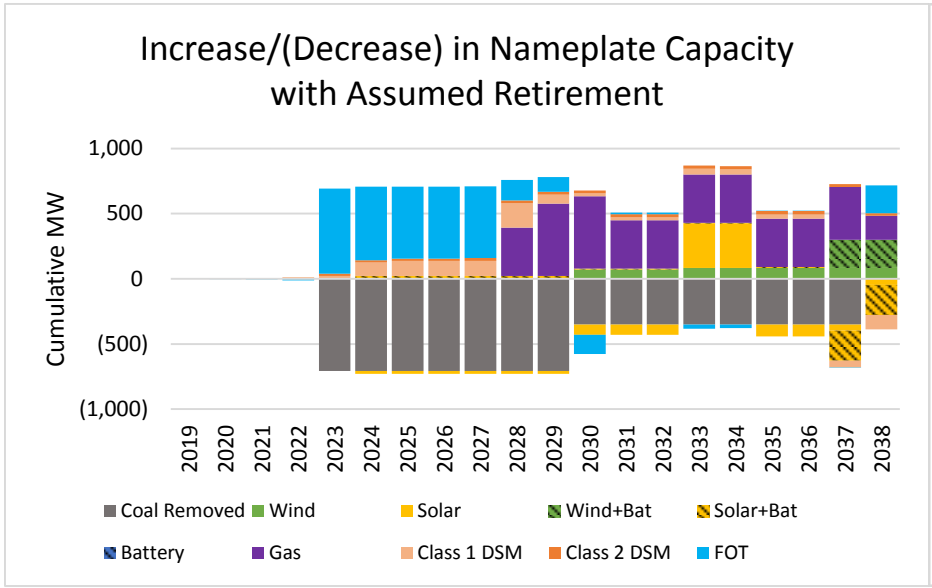
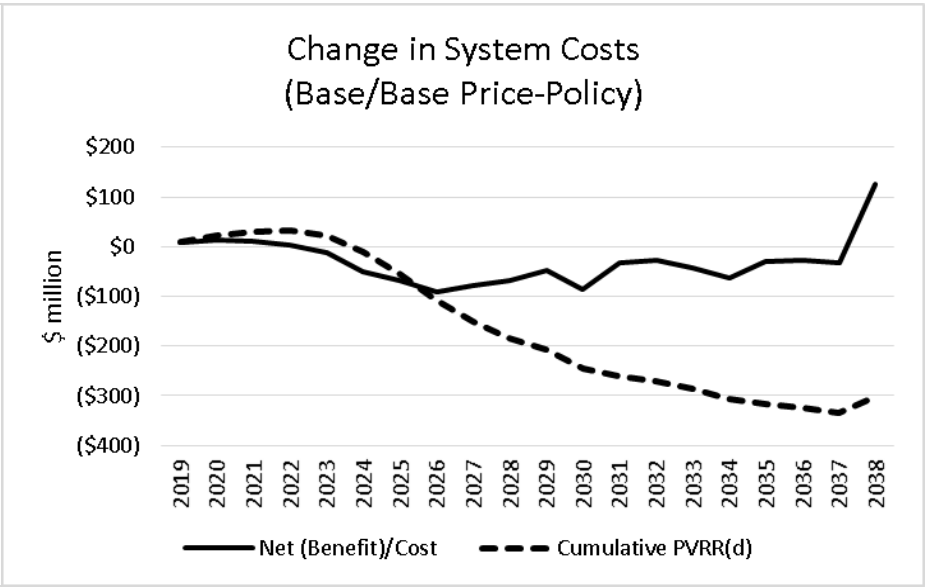
Stacked Case C-35 Overview





Change in Transmission Upgrades

Change in Year	Resource Location	From	To	ATC	Max Interconnection	Change in Nominal Capital ($m)
Accelerated from 2035 to 2033	Yakima WA	Yakima WA	Southern OR	450	835	($11.0)
Accelerated from 2037 to 2033	SW WY	SW WY	SW WY	0	500	($3.3)
Accelerated from 2038 to 2037	Willamette V. OR	Willamette V. OR	Willamette V. OR	0	615	($0.9)
					Total	($15.2)

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

Stacked Case C-35 (PaR Base/Base Scenario)

Study	PVRR(d) (Benefit)/Cost of 2022 Retirement ($m)	Nom. Lev. (Benefit)/Cost of 2022 Retirement per MWh of Retired Generation ($/MWh)
Cost Savings from Retired Unit		
Fuel	($106)	($29.12)
Inc. Capital Rev. Req. and Fixed O&M	($569)	($155.87)
Variable O&M	($0)	($0.03)
Emissions	($35)	($9.56)
Decommissioning	$13	$3.53
Total Net Cost Savings from Retired Unit	($697)	($191.05)
Net Replacement Costs		
Fuel	$149	$40.95
Inc. Capital Rev. Req. and Fixed O&M	$331	$90.72
Variable O&M	$9	$2.50
Emissions	$20	$5.37
Demand-Side Management	$34	$9.31
Long-Term Contracts	$6	$1.68
Market Purchases	($14)	($3.90)
Market Sales	($104)	($28.52)
Reserve/Energy Deficiencies	($47)	($12.99)
Transmission Upgrades	$12	$3.32
Transmission Reinforcements	$0	$0.00
Total Net Replacement Cost	$396	$108.44
Net (Benefit)/Cost of Assumed Early Retirement	($301)	($82.61)

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

Stacked Case C-35
(PaR High/High Scenario)

Study	PVRR(d) (Benefit)/Cost of 2022 Retirement ($m)	Nom. Lev. (Benefit)/Cost of 2022 Retirement per MWh of Retired Generation ($/MWh)
Cost Savings from Retired Unit		
Fuel	($145)	($28.15)
Inc. Capital Rev. Req. and Fixed O&M	($569)	($110.09)
Variable O&M	($0)	($0.02)
Emissions	($87)	($16.77)
Decommissioning	$13	$2.49
Total Net Cost Savings from Retired Unit	($788)	($152.54)
Net Replacement Costs		
Fuel	$215	$41.60
Inc. Capital Rev. Req. and Fixed O&M	$331	$64.08
Variable O&M	$9	$1.66
Emissions	$19	$3.65
Demand-Side Management	$34	$6.54
Long-Term Contracts	$6	$1.25
Market Purchases	$4	$0.72
Market Sales	($74)	($14.28)
Reserve/Energy Deficiencies	($47)	($9.01)
Transmission Upgrades	$12	$2.34
Transmission Reinforcements	$0	$0.00
Total Net Replacement Cost	$509	$98.54
Net (Benefit)/Cost of Assumed Early Retirement	($279)	($54.00)

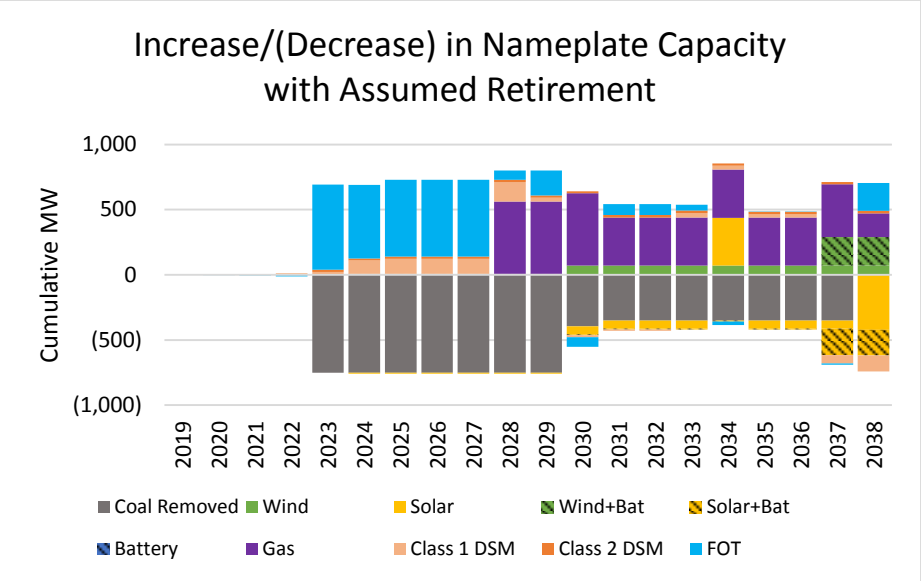
*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

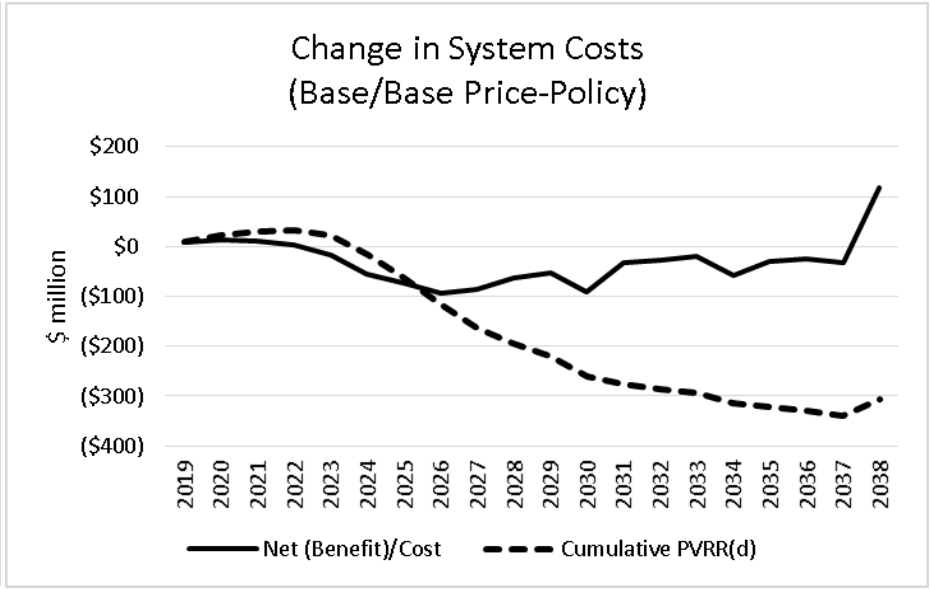
Stacked Case C-35 (PaR Low/None Scenario)

Study	PVRR(d) (Benefit)/Cost of 2022 Retirement ($m)	Nom. Lev. (Benefit)/Cost of 2022 Retirement per MWh of Retired Generation ($/MWh)
Cost Savings from Retired Unit		
Fuel	($68)	($30.66)
Inc. Capital Rev. Req. and Fixed O&M	($569)	($256.43)
Variable O&M	($0)	($0.07)
Emissions	$0	$0.00
Decommissioning	$13	$5.81
Total Net Cost Savings from Retired Unit	($624)	($281.34)
Net Replacement Costs		
Fuel	$97	$43.54
Inc. Capital Rev. Req. and Fixed O&M	$331	$149.25
Variable O&M	$6	$2.87
Emissions	$0	$0.00
Demand-Side Management	$34	$15.31
Long-Term Contracts	$6	$2.73
Market Purchases	($8)	($3.64)
Market Sales	($65)	($29.19)
Reserve/Energy Deficiencies	($47)	($20.99)
Transmission Upgrades	$12	$5.46
Transmission Reinforcements	$0	$0.00
Total Net Replacement Cost	$367	$165.34
Net (Benefit)/Cost of Assumed Early Retirement	($257)	($116.00)

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

Stacked Case C-38 Overview





Change in Transmission Upgrades

Change in Year	Resource Location	From	To	ATC	Max Interconnection	Change in Nominal Capital ($m)
Accelerated from 2035 to 2034	Yakima WA	Yakima WA	Southern OR	450	835	($5.6)
Accelerated from 2037 to 2033	SW WY	SW WY	SW WY	0	500	($3.3)
Accelerated from 2038 to 2037	Willamette V. OR	Willamette V. OR	Willamette V. OR	0	615	($0.9)
					Total	($9.8)

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

Stacked Case C-38
(PaR Base/Base Scenario)

Study	PVRR(d) (Benefit)/Cost of 2022 Retirement ($m)	Nom. Lev. (Benefit)/Cost of 2022 Retirement per MWh of Retired Generation ($/MWh)
Cost Savings from Retired Unit		
Fuel	($126)	($29.28)
Inc. Capital Rev. Req. and Fixed O&M	($599)	($139.44)
Variable O&M	($0)	($0.03)
Emissions	($43)	($10.11)
Decommissioning	$13	$3.01
Total Net Cost Savings from Retired Unit	($756)	($175.86)
Net Replacement Costs		
Fuel	$148	$34.33
Inc. Capital Rev. Req. and Fixed O&M	$320	$74.41
Variable O&M	$10	$2.38
Emissions	$16	$3.75
Demand-Side Management	$26	$6.09
Long-Term Contracts	$5	$1.12
Market Purchases	($11)	($2.46)
Market Sales	($25)	($5.83)
Reserve/Energy Deficiencies	($48)	($11.22)
Transmission Upgrades	$8	$1.75
Transmission Reinforcements	$0	$0.00
Total Net Replacement Cost	$448	$104.31
Net (Benefit)/Cost of Assumed Early Retirement	($307)	($71.54)

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

Stacked Case C-38
(PaR High/High Scenario)

Study	PVRR(d) (Benefit)/Cost of 2022 Retirement ($m)	Nom. Lev. (Benefit)/Cost of 2022 Retirement per MWh of Retired Generation ($/MWh)
Cost Savings from Retired Unit		
Fuel	($165)	($28.39)
Inc. Capital Rev. Req. and Fixed O&M	($599)	($103.23)
Variable O&M	($0)	($0.02)
Emissions	($99)	($16.98)
Decommissioning	$13	$2.23
Total Net Cost Savings from Retired Unit	($850)	($146.39)
Net Replacement Costs		
Fuel	$222	$38.22
Inc. Capital Rev. Req. and Fixed O&M	$320	$55.09
Variable O&M	$10	$1.69
Emissions	$15	$2.60
Demand-Side Management	$26	$4.48
Long-Term Contracts	$5	$0.88
Market Purchases	$12	$2.12
Market Sales	($0)	($0.07)
Reserve/Energy Deficiencies	($47)	($8.15)
Transmission Upgrades	$8	$1.30
Transmission Reinforcements	$0	$0.00
Total Net Replacement Cost	$570	$98.15
Net (Benefit)/Cost of Assumed Early Retirement	($280)	($48.25)

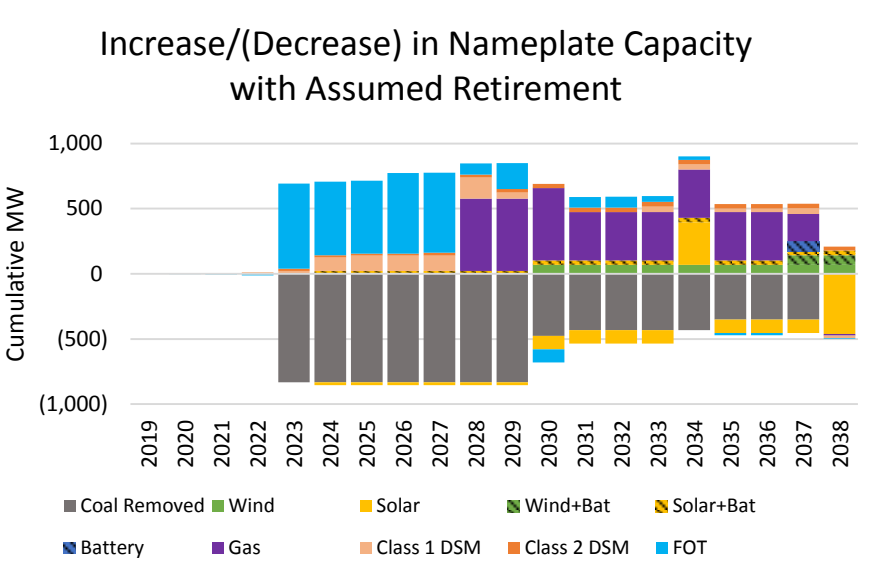
*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

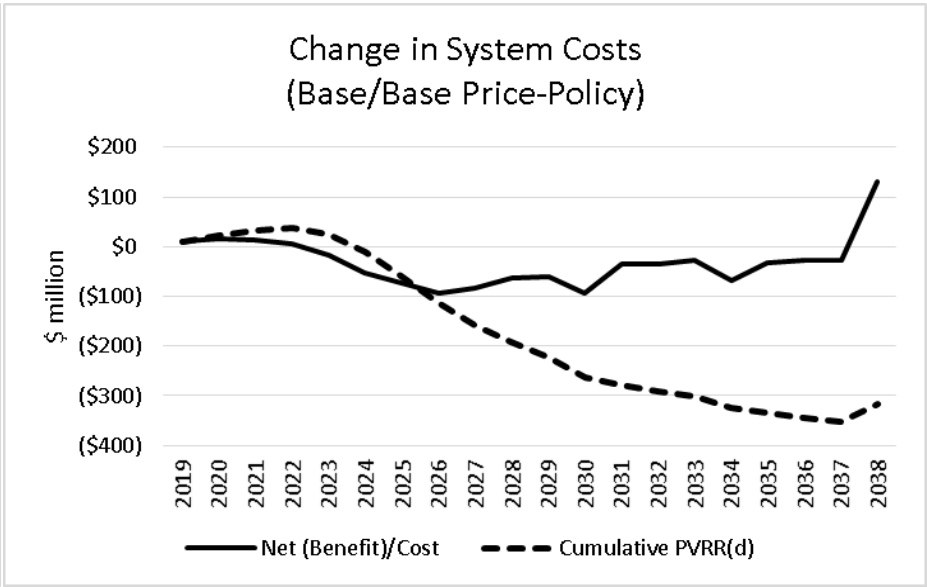
Stacked Case C-38
(PaR Low/None Scenario)

Study	PVRR(d) (Benefit)/Cost of 2022 Retirement ($m)	Nom. Lev. (Benefit)/Cost of 2022 Retirement per MWh of Retired Generation ($/MWh)
Cost Savings from Retired Unit		
Fuel	($85)	($30.45)
Inc. Capital Rev. Req. and Fixed O&M	($599)	($213.98)
Variable O&M	($0)	($0.06)
Emissions	$0	$0.00
Decommissioning	$13	$4.62
Total Net Cost Savings from Retired Unit	($672)	($239.87)
Net Replacement Costs		
Fuel	$92	$32.95
Inc. Capital Rev. Req. and Fixed O&M	$320	$114.18
Variable O&M	$7	$2.60
Emissions	$0	$0.00
Demand-Side Management	$26	$9.33
Long-Term Contracts	$5	$1.69
Market Purchases	($7)	($2.46)
Market Sales	($16)	($5.82)
Reserve/Energy Deficiencies	($47)	($16.92)
Transmission Upgrades	$8	$2.69
Transmission Reinforcements	$0	$0.00
Total Net Replacement Cost	$387	$138.24
Net (Benefit)/Cost of Assumed Early Retirement	($285)	($101.63)

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

Stacked Case C-39 Overview





Change in Transmission Upgrades

Change in Year	Resource Location	From	To	ATC	Max Interconnection	Change in Nominal Capital ($m)
Accelerated from 2035 to 2034	Yakima WA	Yakima WA	Southern OR	450	835	($5.6)
Accelerated from 2037 to 2033	SW WY	SW WY	SW WY	0	500	($3.3)
Accelerated from 2038 to 2037	Willamette V. OR	Willamette V. OR	Willamette V. OR	0	615	($0.9)
					Total	($9.8)

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

Stacked Case C-39
(PaR Base/Base Scenario)

Study	PVRR(d) (Benefit)/Cost of 2022 Retirement ($m)	Nom. Lev. (Benefit)/Cost of 2022 Retirement per MWh of Retired Generation ($/MWh)
Cost Savings from Retired Unit		
Fuel	($203)	($27.65)
Inc. Capital Rev. Req. and Fixed O&M	($683)	($92.76)
Variable O&M	($0)	($0.02)
Emissions	($85)	($11.50)
Decommissioning	$13	$1.80
Total Net Cost Savings from Retired Unit	($957)	($130.12)
Net Replacement Costs		
Fuel	$155	$21.02
Inc. Capital Rev. Req. and Fixed O&M	$315	$42.82
Variable O&M	$10	$1.32
Emissions	$16	$2.18
Demand-Side Management	$40	$5.42
Long-Term Contracts	$2	$0.26
Market Purchases	($5)	($0.69)
Market Sales	$136	$18.49
Reserve/Energy Deficiencies	($36)	($4.86)
Transmission Upgrades	$8	$1.02
Transmission Reinforcements	$0	$0.00
Total Net Replacement Cost	$640	$86.99
Net (Benefit)/Cost of Assumed Early Retirement	($317)	($43.13)

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

Stacked Case C-39
(PaR High/High Scenario)

Study	PVRR(d) (Benefit)/Cost of 2022 Retirement ($m)	Nom. Lev. (Benefit)/Cost of 2022 Retirement per MWh of Retired Generation ($/MWh)
Cost Savings from Retired Unit		
Fuel	($233)	($27.39)
Inc. Capital Rev. Req. and Fixed O&M	($683)	($80.09)
Variable O&M	($0)	($0.01)
Emissions	($169)	($19.87)
Decommissioning	$13	$1.56
Total Net Cost Savings from Retired Unit	($1,072)	($125.81)
Net Replacement Costs		
Fuel	$239	$28.07
Inc. Capital Rev. Req. and Fixed O&M	$315	$36.98
Variable O&M	$10	$1.13
Emissions	$21	$2.49
Demand-Side Management	$40	$4.66
Long-Term Contracts	$2	$0.26
Market Purchases	$15	$1.73
Market Sales	$158	$18.59
Reserve/Energy Deficiencies	($35)	($4.13)
Transmission Upgrades	$8	$0.88
Transmission Reinforcements	$0	$0.00
Total Net Replacement Cost	$773	$90.68
Net (Benefit)/Cost of Assumed Early Retirement	($299)	($35.14)

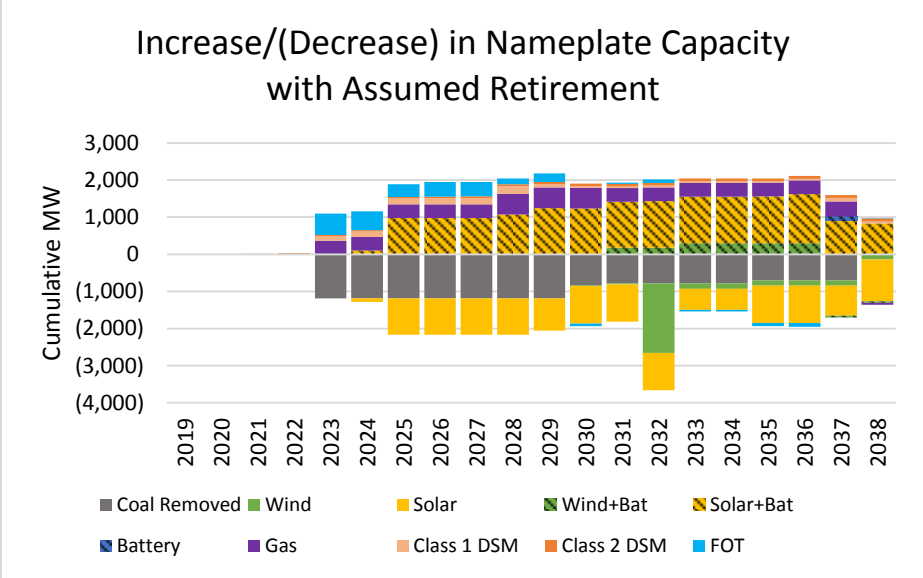
*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

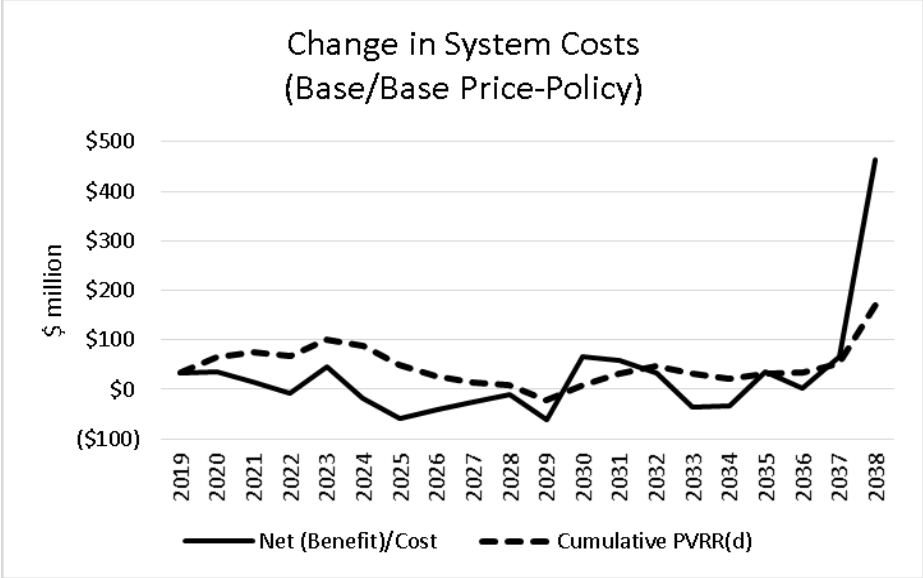
Stacked Case C-39
(PaR Low/None Scenario)

Study	PVRR(d) (Benefit)/Cost of 2022 Retirement ($m)	Nom. Lev. (Benefit)/Cost of 2022 Retirement per MWh of Retired Generation ($/MWh)
Cost Savings from Retired Unit		
Fuel	($166)	($27.84)
Inc. Capital Rev. Req. and Fixed O&M	($683)	($114.54)
Variable O&M	($0)	($0.03)
Emissions	$0	$0.00
Decommissioning	$13	$2.23
Total Net Cost Savings from Retired Unit	($835)	($140.18)
Net Replacement Costs		
Fuel	$95	$15.96
Inc. Capital Rev. Req. and Fixed O&M	$315	$52.88
Variable O&M	$7	$1.11
Emissions	$0	$0.00
Demand-Side Management	$40	$6.69
Long-Term Contracts	$2	$0.31
Market Purchases	($4)	($0.74)
Market Sales	$101	$16.94
Reserve/Energy Deficiencies	($35)	($5.85)
Transmission Upgrades	$8	$1.26
Transmission Reinforcements	$0	$0.00
Total Net Replacement Cost	$528	$88.56
Net (Benefit)/Cost of Assumed Early Retirement	($308)	($51.62)

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

Stacked Case C-40 Overview





Change in Transmission Upgrades

Change in Year	Resource Location	From	To	ATC	Max Interconnection	Change in Nominal Capital ($m)
Delayed from 2032 to 2033	Aeolus	Aeolus	UT South	1,500	1,850	$52.9
Accelerated from 2035 to 2033	Yakima WA	Wakima WA	Southern OR	450	835	($11.0)
Accelerated from 2037 to 2033	SW WY	SW WY	SW WY	0	500	($3.3)
Accelerated from 2038 to 2037	Willamette V. OR	Willamette V. OR	Willamette V. OR	0	615	($0.9)
Added in 2038	Bridger	Bridger	Populus	650	650	$1,519.5
					Total	$1,557.1

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

Stacked Case C-40
(PaR Base/Base Scenario)

Study	PVRR(d) (Benefit)/Cost of 2022 Retirement ($m)	Nom. Lev. (Benefit)/Cost of 2022 Retirement per MWh of Retired Generation ($/MWh)
Cost Savings from Retired Unit		
Fuel	($666)	($28.53)
Inc. Capital Rev. Req. and Fixed O&M	($1,058)	($45.29)
Variable O&M	($8)	($0.34)
Emissions	($346)	($14.81)
Decommissioning	$19	$0.80
Total Net Cost Savings from Retired Unit	($2,060)	($88.18)
Net Replacement Costs		
Fuel	$479	$20.52
Inc. Capital Rev. Req. and Fixed O&M	$599	$25.66
Variable O&M	$31	$1.35
Emissions	$115	$4.93
Demand-Side Management	$98	$4.19
Long-Term Contracts	($8)	($0.33)
Market Purchases	$262	$11.21
Market Sales	$329	$14.09
Reserve/Energy Deficiencies	$350	$14.99
Transmission Upgrades	($24)	($1.01)
Transmission Reinforcements	$0	$0.00
Total Net Replacement Cost	$2,233	$95.60
Net (Benefit)/Cost of Assumed Early Retirement	$173	$7.41

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

Stacked Case C-40 (PaR High/High Scenario)

Study	PVRR(d) (Benefit)/Cost of 2022 Retirement ($m)	Nom. Lev. (Benefit)/Cost of 2022 Retirement per MWh of Retired Generation ($/MWh)
Cost Savings from Retired Unit		
Fuel	($733)	($27.61)
Inc. Capital Rev. Req. and Fixed O&M	($1,058)	($39.85)
Variable O&M	($9)	($0.33)
Emissions	($697)	($26.27)
Decommissioning	$19	$0.70
Total Net Cost Savings from Retired Unit	($2,479)	($93.36)
Net Replacement Costs		
Fuel	$676	$25.45
Inc. Capital Rev. Req. and Fixed O&M	$599	$22.58
Variable O&M	$30	$1.12
Emissions	$248	$9.34
Demand-Side Management	$98	$3.69
Long-Term Contracts	($8)	($0.30)
Market Purchases	$327	$12.31
Market Sales	$401	$15.09
Reserve/Energy Deficiencies	$353	$13.30
Transmission Upgrades	($24)	($0.89)
Transmission Reinforcements	$0	$0.00
Total Net Replacement Cost	$2,699	$101.68
Net (Benefit)/Cost of Assumed Early Retirement	$221	$8.32

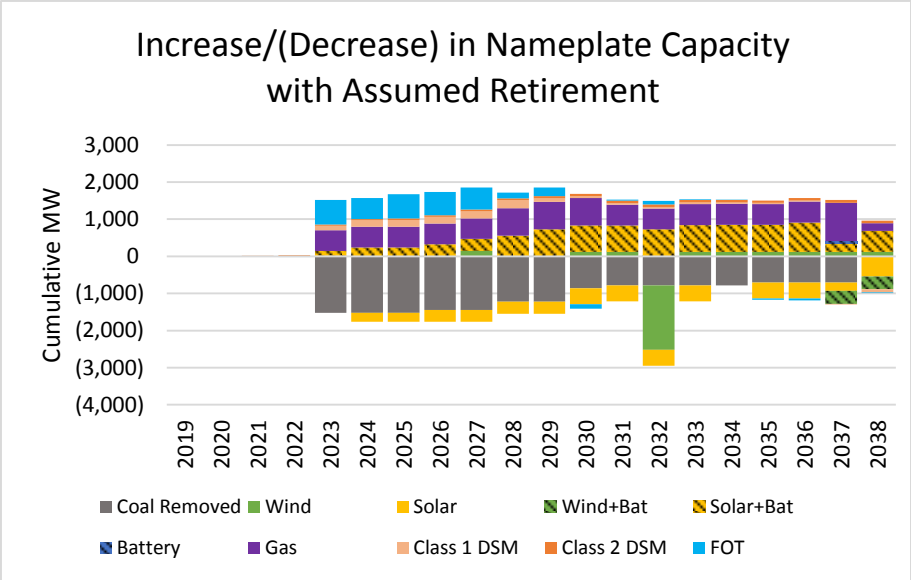
*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

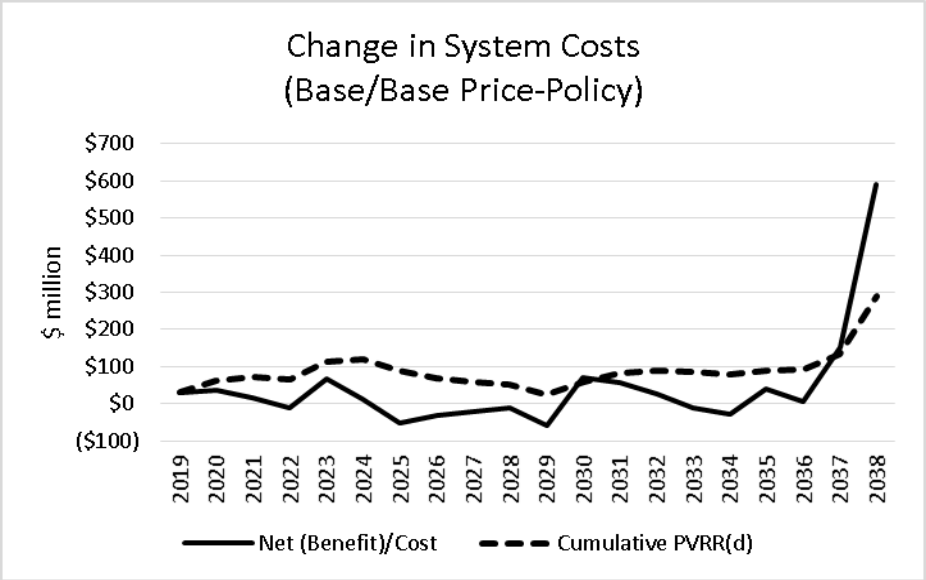
Stacked Case C-40 (PaR Low/None Scenario)

Study	PVRR(d) (Benefit)/Cost of 2022 Retirement ($m)	Nom. Lev. (Benefit)/Cost of 2022 Retirement per MWh of Retired Generation ($/MWh)
Cost Savings from Retired Unit		
Fuel	($587)	($29.30)
Inc. Capital Rev. Req. and Fixed O&M	($1,058)	($52.79)
Variable O&M	($7)	($0.36)
Emissions	$0	$0.00
Decommissioning	$19	$0.93
Total Net Cost Savings from Retired Unit	($1,634)	($81.51)
Net Replacement Costs		
Fuel	$323	$16.13
Inc. Capital Rev. Req. and Fixed O&M	$599	$29.90
Variable O&M	$25	$1.27
Emissions	$0	$0.00
Demand-Side Management	$98	$4.87
Long-Term Contracts	($9)	($0.43)
Market Purchases	$159	$7.93
Market Sales	$216	$10.76
Reserve/Energy Deficiencies	$349	$17.42
Transmission Upgrades	($24)	($1.18)
Transmission Reinforcements	$0	$0.00
Total Net Replacement Cost	$1,737	$86.67
Net (Benefit)/Cost of Assumed Early Retirement	$103	$5.16

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

Stacked Case C-41 Overview





Change in Transmission Upgrades

Change in Year	Resource Location	From	To	ATC	Max Interconnection	Change in Nominal Capital ($m)
Accelerated from 2024 to 2023	UT South	UT South	UT South	0	300	($0.2)
Accelerated from 2037 to 2028	SW WY	SW WY	SW WY	0	500	($7.1)
Delayed from 2032 to 2033	Aeolus	Aeolus	UT South	1,500	1,850	$52.9
Accelerated from 2037 to 2033	UT North	UT North	UT North	0	500	($4.4)
Accelerated from 2035 to 2034	Yakima WA	Yakima WA	Southern OR	450	835	($5.6)
Added in 2037	Willamette V. OR	Willamette V. OR	Southern OR	1,500	1,115	$548.7
Added in 2038	Bridger	Bridger	Populous	650	650	$1,519.5
Removed in 2038	Willamette V. OR	Willamette V. OR	Willamette V. OR	0	615	($41.2)
					Total	$2,062.6

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

Stacked Case C-41 (PaR Base/Base Scenario)

Study	PVRR(d) (Benefit)/Cost of 2022 Retirement ($m)	Nom. Lev. (Benefit)/Cost of 2022 Retirement per MWh of Retired Generation ($/MWh)
Cost Savings from Retired Unit		
Fuel	($782)	($25.99)
Inc. Capital Rev. Req. and Fixed O&M	($1,180)	($39.23)
Variable O&M	($8)	($0.27)
Emissions	($394)	($13.10)
Decommissioning	$20	$0.66
Total Net Cost Savings from Retired Unit	($2,344)	($77.93)
Net Replacement Costs		
Fuel	$675	$22.44
Inc. Capital Rev. Req. and Fixed O&M	$722	$24.00
Variable O&M	$48	$1.58
Emissions	$130	$4.31
Demand-Side Management	$93	$3.10
Long-Term Contracts	($9)	($0.29)
Market Purchases	$240	$7.99
Market Sales	$437	$14.52
Reserve/Energy Deficiencies	$304	$10.12
Transmission Upgrades	($6)	($0.20)
Transmission Reinforcements	$0	$0.00
Total Net Replacement Cost	$2,634	$87.57
Net (Benefit)/Cost of Assumed Early Retirement	$290	$9.64

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

Stacked Case C-41 (PaR High/High Scenario)

Study	PVRR(d) (Benefit)/Cost of 2022 Retirement ($m)	Nom. Lev. (Benefit)/Cost of 2022 Retirement per MWh of Retired Generation ($/MWh)
Cost Savings from Retired Unit		
Fuel	($848)	($25.52)
Inc. Capital Rev. Req. and Fixed O&M	($1,180)	($35.51)
Variable O&M	($9)	($0.27)
Emissions	($798)	($24.02)
Decommissioning	$20	$0.60
Total Net Cost Savings from Retired Unit	($2,815)	($84.72)
Net Replacement Costs		
Fuel	$921	$27.72
Inc. Capital Rev. Req. and Fixed O&M	$722	$21.72
Variable O&M	$44	$1.33
Emissions	$276	$8.30
Demand-Side Management	$93	$2.81
Long-Term Contracts	($9)	($0.26)
Market Purchases	$317	$9.54
Market Sales	$518	$15.58
Reserve/Energy Deficiencies	$307	$9.23
Transmission Upgrades	($6)	($0.18)
Transmission Reinforcements	$0	$0.00
Total Net Replacement Cost	$3,183	$95.79
Net (Benefit)/Cost of Assumed Early Retirement	$368	$11.07

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

Stacked Case C-41
(PaR Low/None Scenario)

Study	PVRR(d) (Benefit)/Cost of 2022 Retirement ($m)	Nom. Lev. (Benefit)/Cost of 2022 Retirement per MWh of Retired Generation ($/MWh)
Cost Savings from Retired Unit		
Fuel	($696)	($26.26)
Inc. Capital Rev. Req. and Fixed O&M	($1,180)	($44.49)
Variable O&M	($7)	($0.27)
Emissions	$0	$0.00
Decommissioning	$20	$0.75
Total Net Cost Savings from Retired Unit	($1,864)	($70.26)
Net Replacement Costs		
Fuel	$473	$17.82
Inc. Capital Rev. Req. and Fixed O&M	$722	$27.22
Variable O&M	$38	$1.44
Emissions	$0	$0.00
Demand-Side Management	$93	$3.53
Long-Term Contracts	($10)	($0.37)
Market Purchases	$147	$5.55
Market Sales	$286	$10.80
Reserve/Energy Deficiencies	$304	$11.46
Transmission Upgrades	($6)	($0.23)
Transmission Reinforcements	$0	$0.00
Total Net Replacement Cost	$2,048	$77.21
Net (Benefit)/Cost of Assumed Early Retirement	$184	$6.95

*Note: results presented here do not yet reflect potential incremental system-reliability costs, and do not include an intra-hour flexible resource credit applicable to flexible resources in each portfolio.

Conclusions from Stacked-Retirement Detailed Results

- Detailed results from Cases C-40 and C-41 show that energy/reserve deficiencies are a significant driver to the change in potential economic benefits associated with early retirement.

- PacifiCorp was unable to process hourly reliability studies for all cases, but did compile results for Cases C-01, C-35, and C-40—these results are summarized in the next section.

Reliability Assessment

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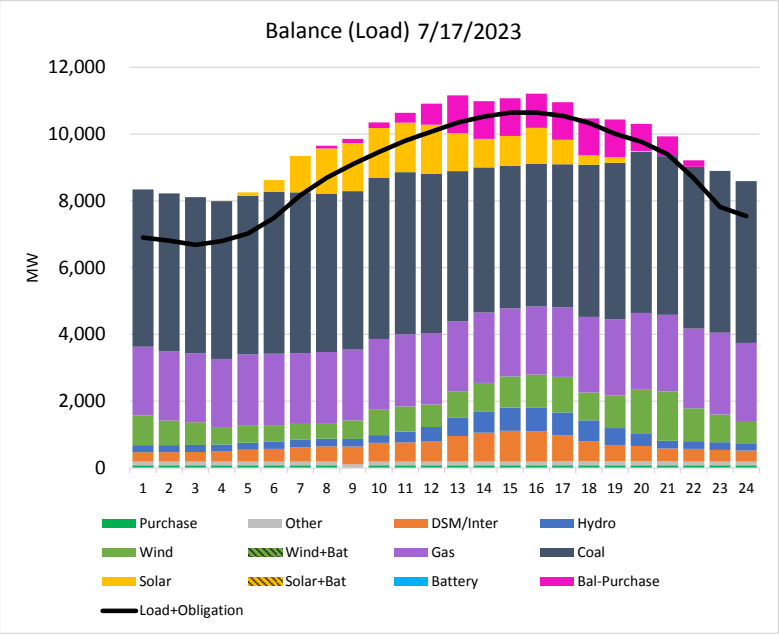
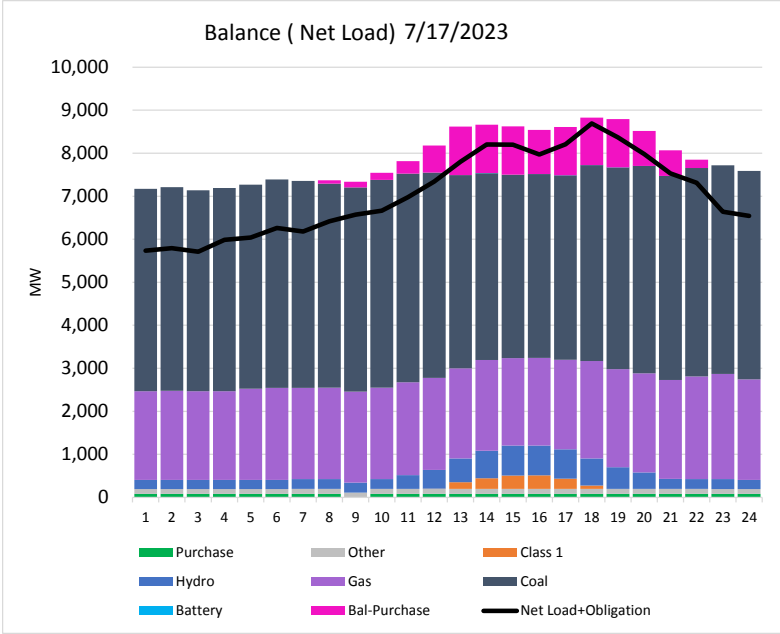
Deterministic PaR Runs

- PacifiCorp performed an initial reliability assessment using an hourly deterministic PaR run for 2023—the first full year after assumed coal unit retirements in the stacked-retirement cases.
- Without stochastic shocks, thermal units are modeled using de-rated capacity to account for unplanned outages.
- System balances are summarized and graphed for load , net load (load net of Class 2 DSM, wind, and solar), spinning reserves, non-spinning reserves, and regulation reserves.
- Graphs show the type of resources that are providing system services across each hour of a selected day (i.e., peak load, peak net-load ramp, etc.).
- PacifiCorp has not yet fully assessed the potential need for incremental frequency response.

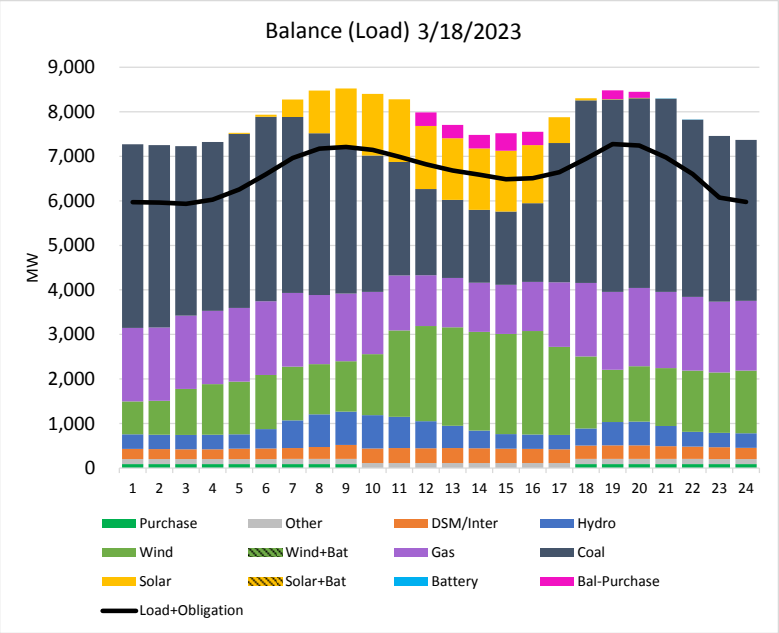
Benchmark (Case C-01)
Peak Load Day

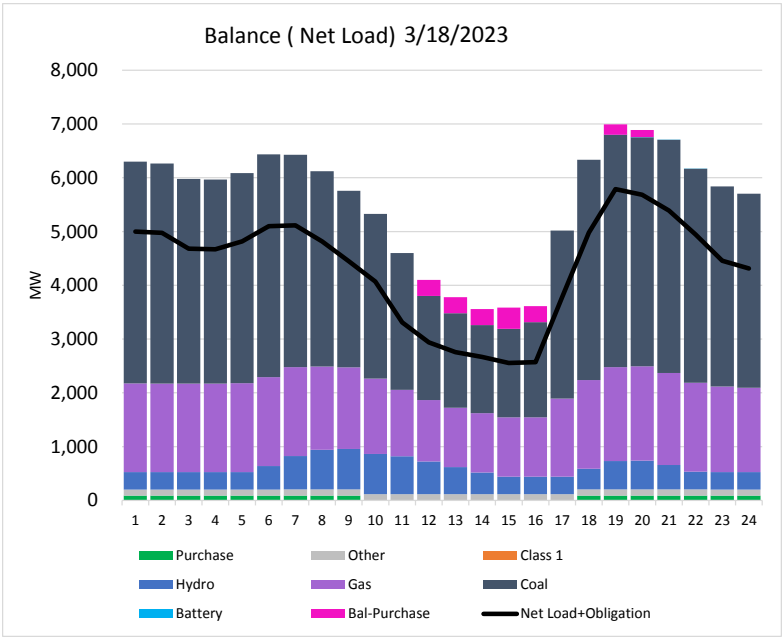




- The peak load day occurs on July 17, 2023.
- Peak load = 10,581 MW in hour-ending 16.
- Maximum three-hour net-load ramp = 1,226 MW between hour-ending 11 and hour-ending 14.
- No unserved energy is observed.

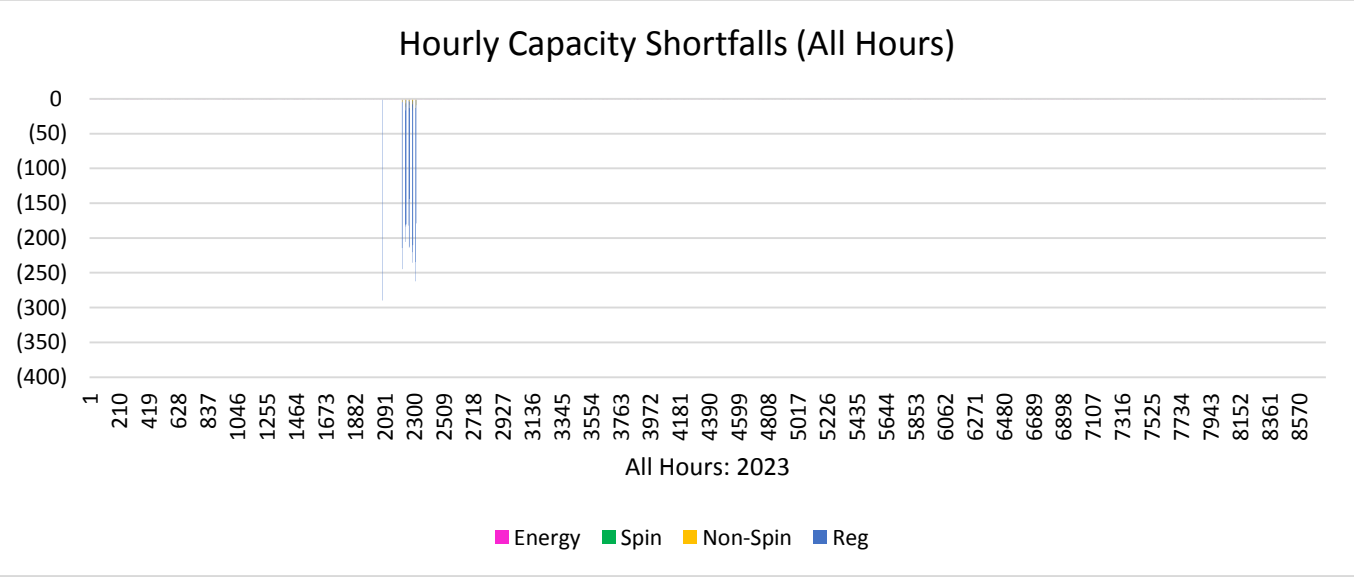
Benchmark (Case C-01)
Peak Net-Load Ramp Day





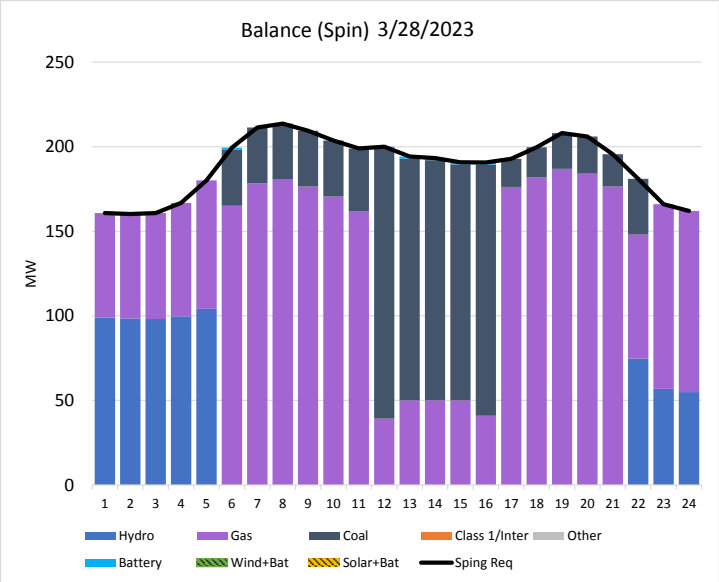
- The peak three-hour net-load ramp occurs on March 18, 2023.
- Maximum load = 7,162 MW in hour-ending 19.
- Peak three-hour net-load ramp = 3,218 MW between hour-ending 16 and hour-ending 19.
- No unserved energy is observed.

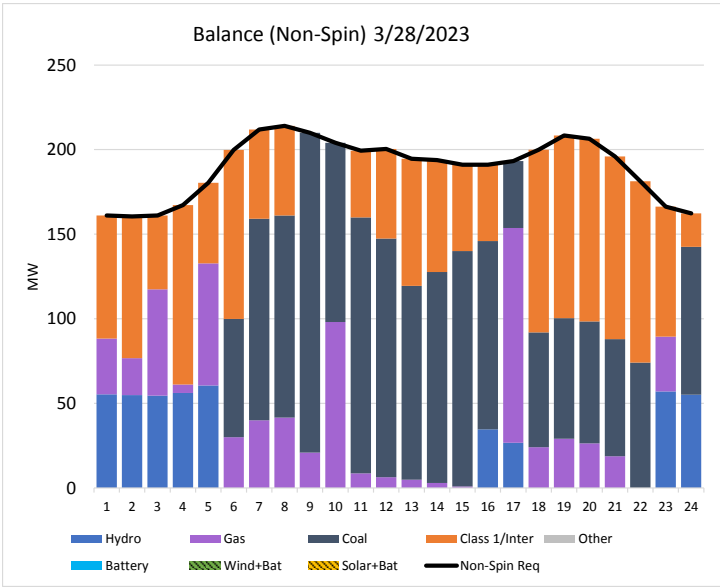
Benchmark (Case C-01)
Capacity Shortfalls

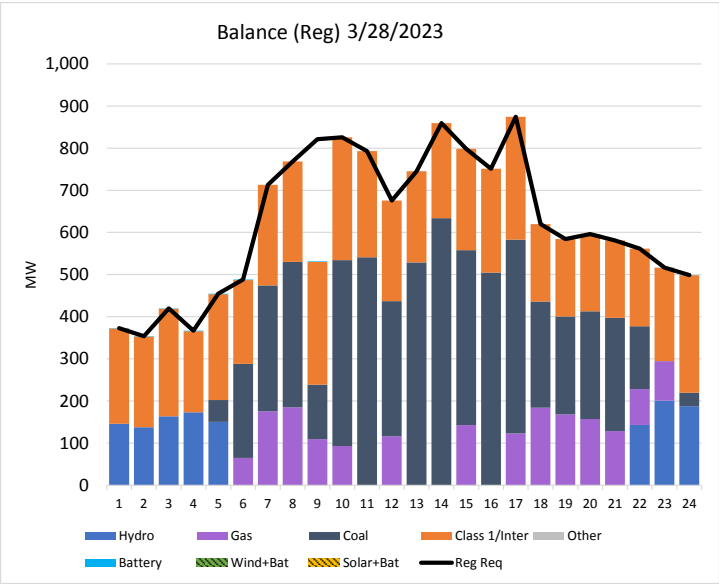


- 29 hours (0.3%) show a capacity shortfall in non-spin and/or regulation reserves (mostly regulation reserves) between the end of March 2023 and April 2023.
- The maximum capacity shortfall is 290 MW, which occurs in hour-ending nine on March 28, 2023.
- There are no energy or spinning reserve shortfalls.

Benchmark (Case C-01)
Peak Shortfall Day (Reserves)

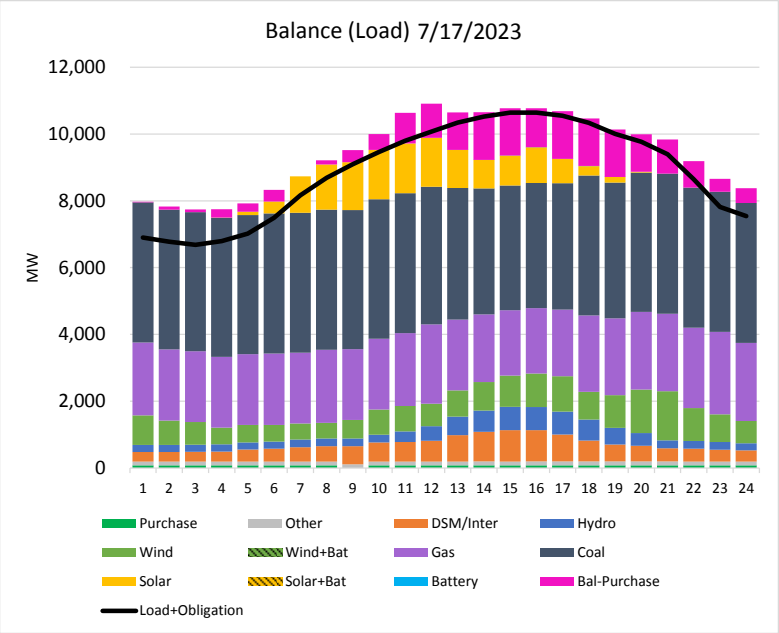


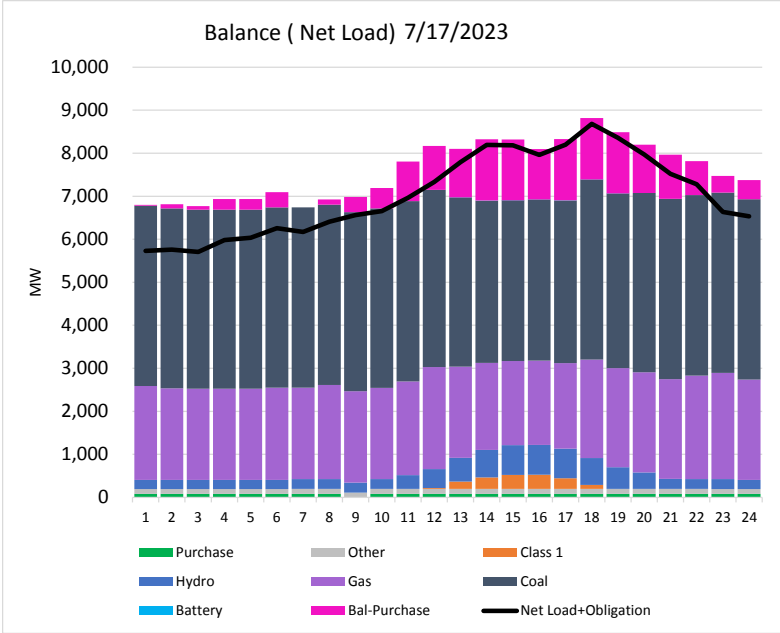




- Max aggregate shortfall = 290 MW.
- No spinning reserve shortfalls.
- No non-spinning reserve shortfalls.
- One hour of regulation shortfall totaling 290 MW in hour-ending nine.

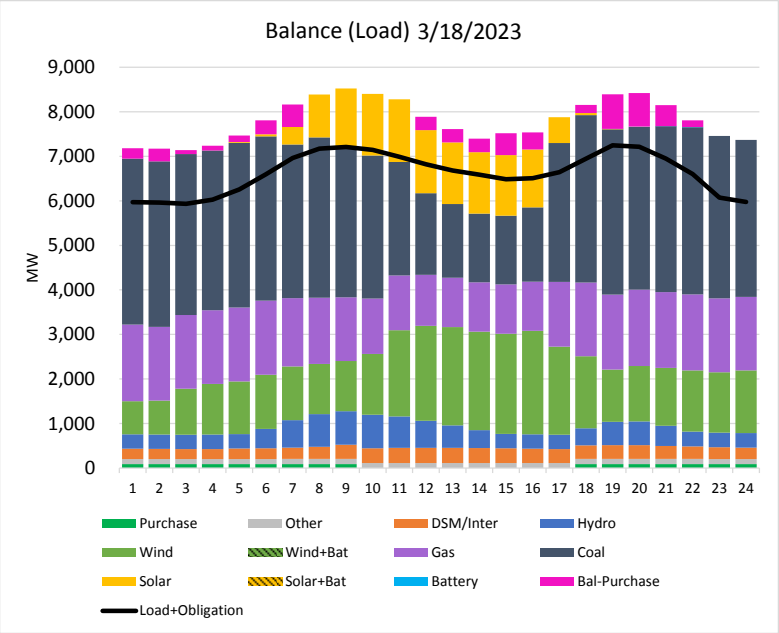
Stacked Case C-35
Peak Load Day

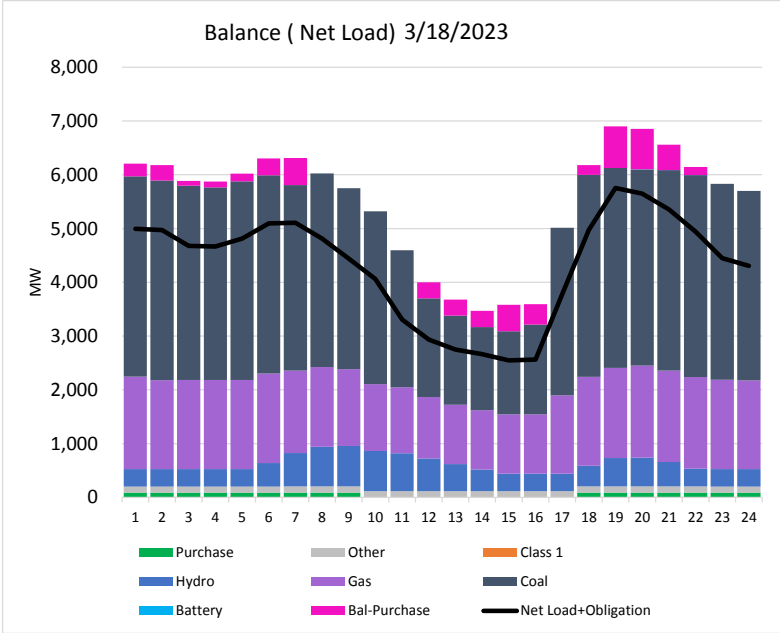




- The peak load day occurs on July 17, 2023.
- Peak load = 10,581 MW in hour-ending 16.
- Maximum three-hour net-load ramp = 1,225 MW between hour-ending 11 and hour-ending 14.
- No unserved energy is observed.

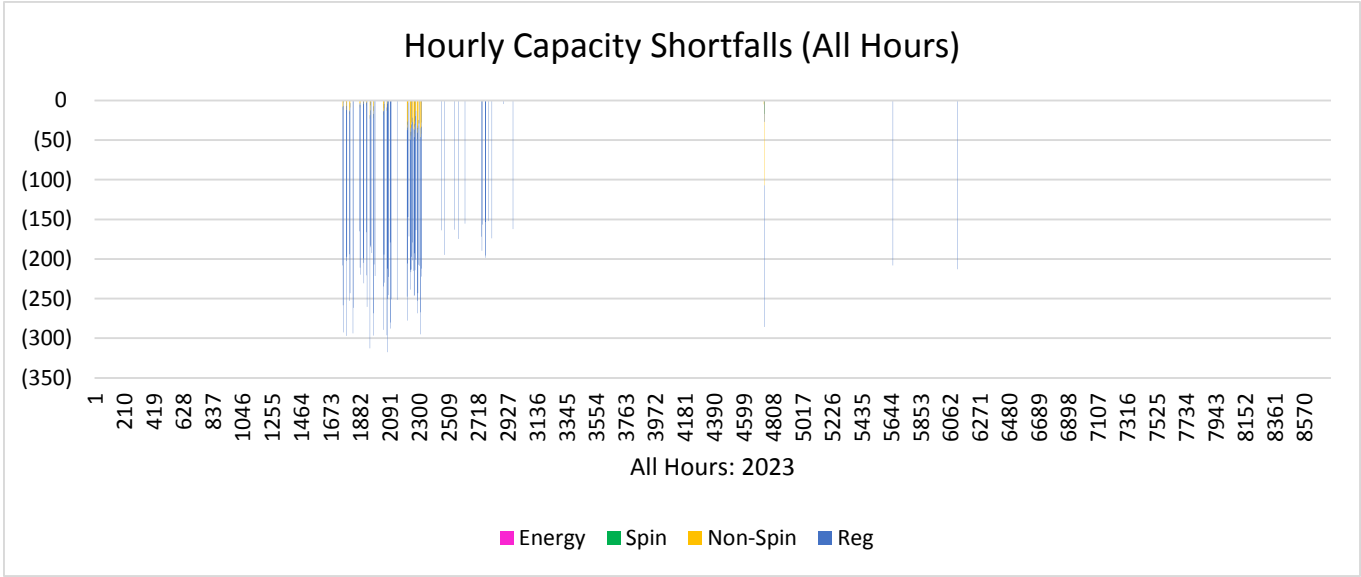
Stacked Case C-35
Peak Net-Load Ramp Day





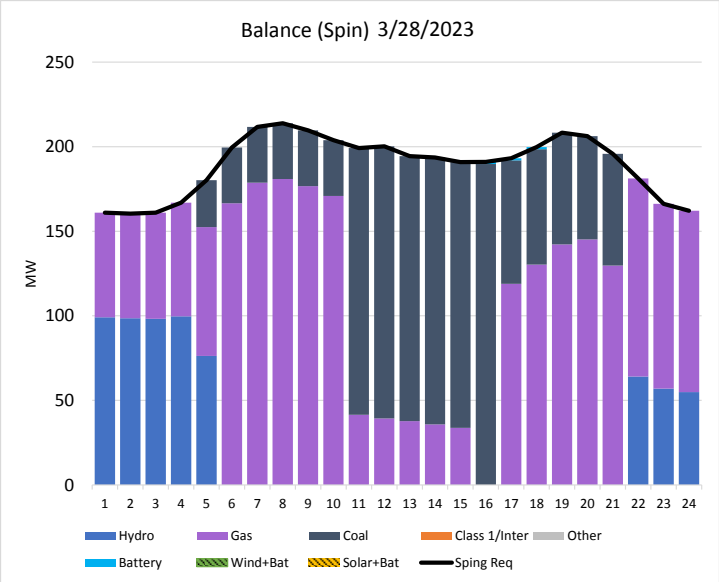
- The peak three-hour net-load ramp occurs on March 18, 2023.
- Maximum load = 7,162 MW in hour-ending 19.
- Peak three-hour net-load ramp = 3,190 MW between hour-ending 16 and hour-ending 19.
- No unserved energy is observed.

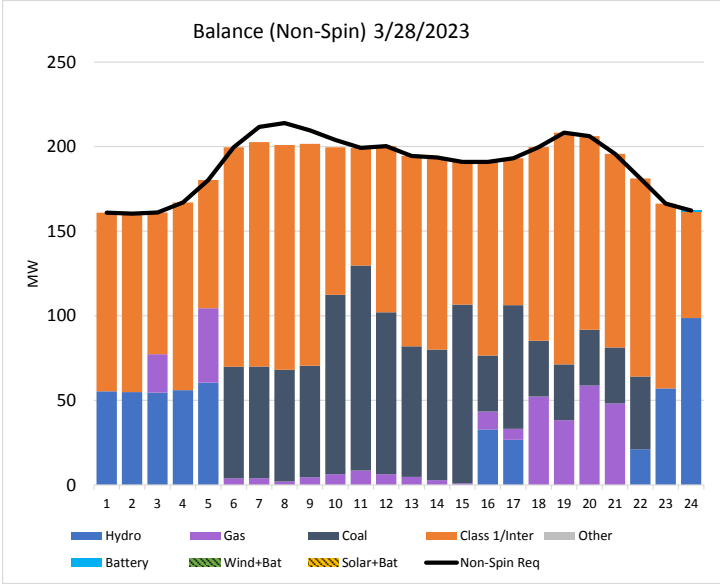
Stacked Case C-35 Capacity Shortfalls

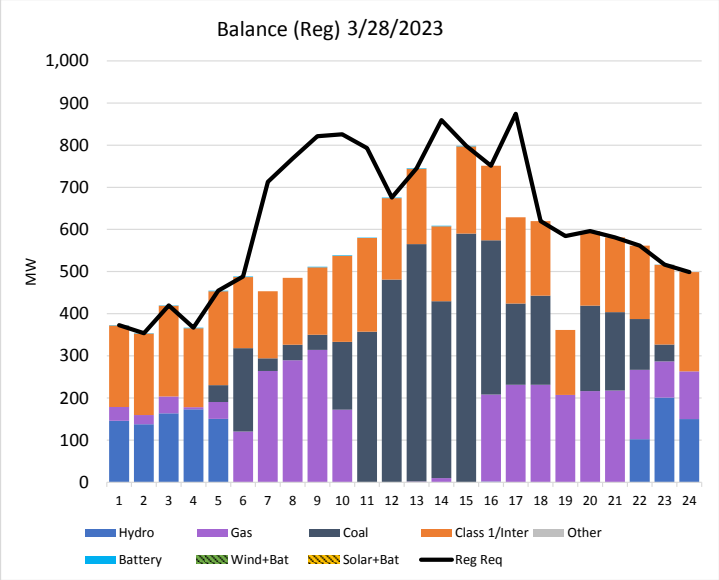


- 146 hours (1.7%) show a capacity shortfall in non-spin and/or regulation reserves (mostly regulation reserves) from March 2023 through May 2023 and from July 2023 through September 2023.
- The maximum capacity shortfall is 318 MW, which occurs in hour-ending nine on March 28, 2023.
- There are no energy shortfalls and one hour of a spinning reserve shortfall on July 17, 2023 (the peak-load day). The maximum hourly total shortfall on July 17, 2023 is 286 MW (17 MW spinning reserves, 90 MW non-spinning reserves, and 178 MW of regulation reserves).

Stacked Case C-35
Peak Shortfall Day (Reserves)

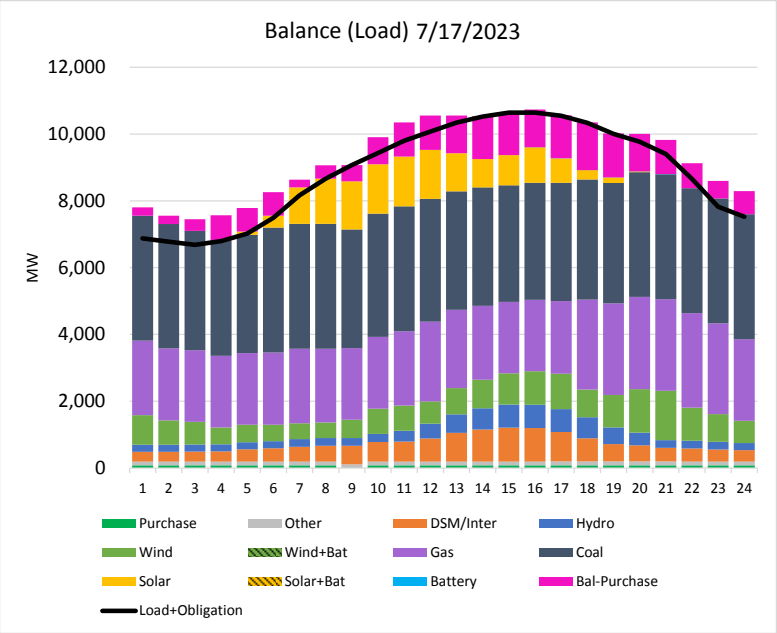


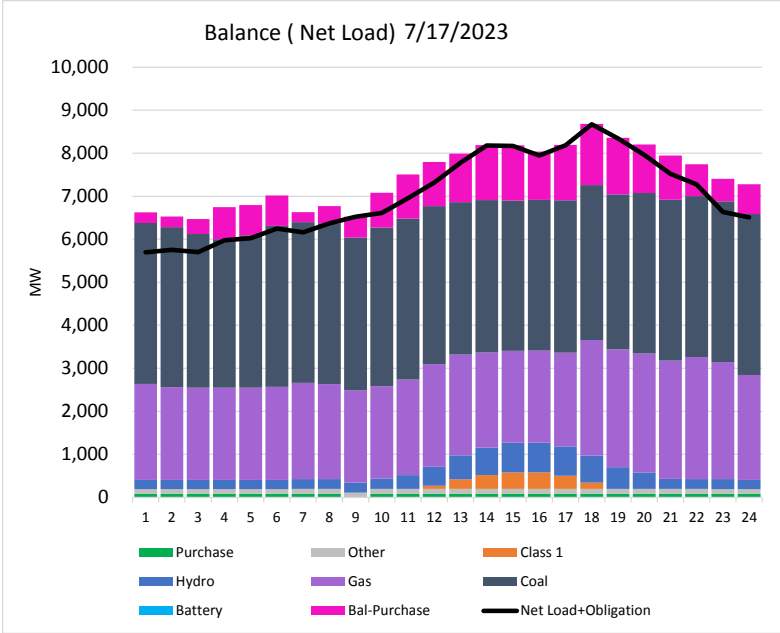




- Max aggregate shortfall = 318 MW in hour-ending nine.
- No spinning reserve shortfalls.
- Four hours of non-spinning reserve shortfalls from hour-ending seven through 10.
- Eight hours of regulation shortfall from hour-ending seven through 11, hour-ending 14, and hour-ending 17.

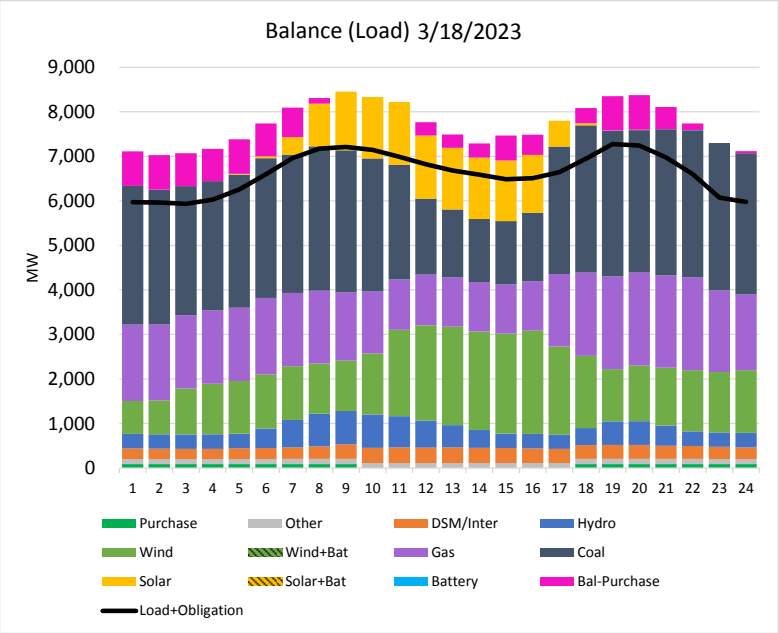
Stacked Case C-40
Peak Load Day

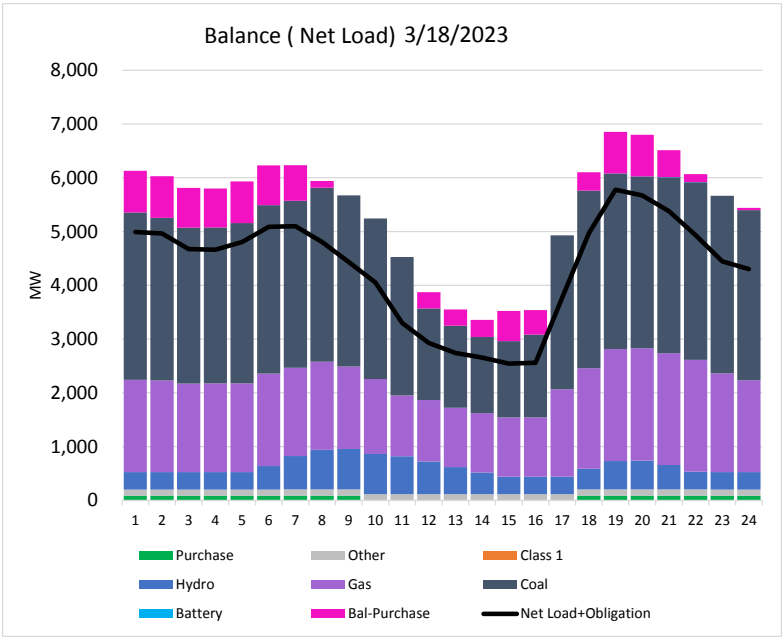




- The peak load day occurs on July 17, 2023.
- Peak load = 10,581 MW in hour-ending 16.
- Maximum three-hour net-load ramp = 1,224 MW between hour-ending 11 and hour-ending 14.
- No unserved energy is observed.

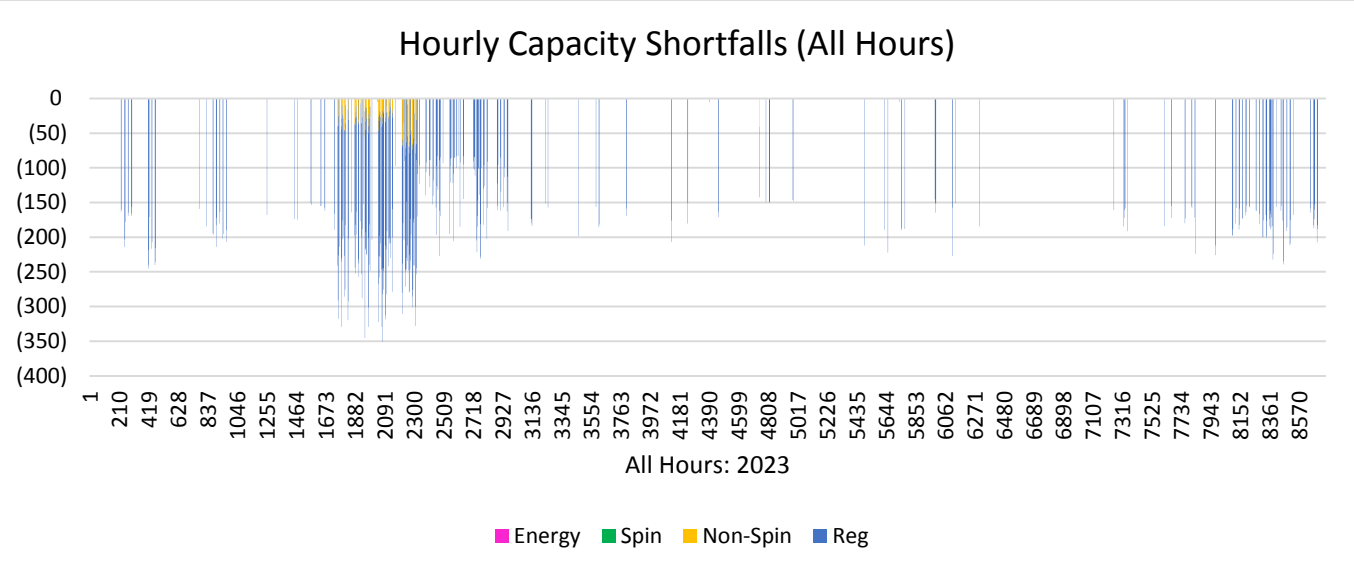
Stacked Case C-40
Peak Net-Load Ramp Day





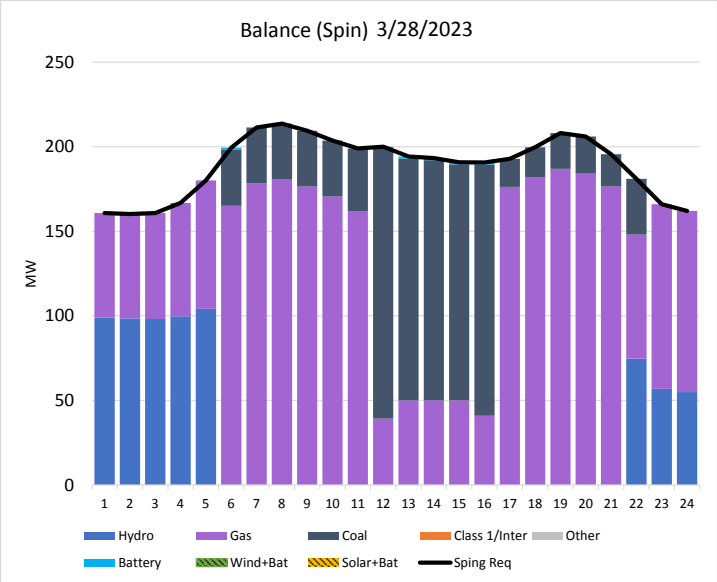
- The peak three-hour net-load ramp occurs on March 18, 2023.
- Maximum load = 7,162 MW in hour-ending 19.
- Peak three-hour net-load ramp = 3,218 MW between hour-ending 16 and hour-ending 19.
- No unserved energy is observed.

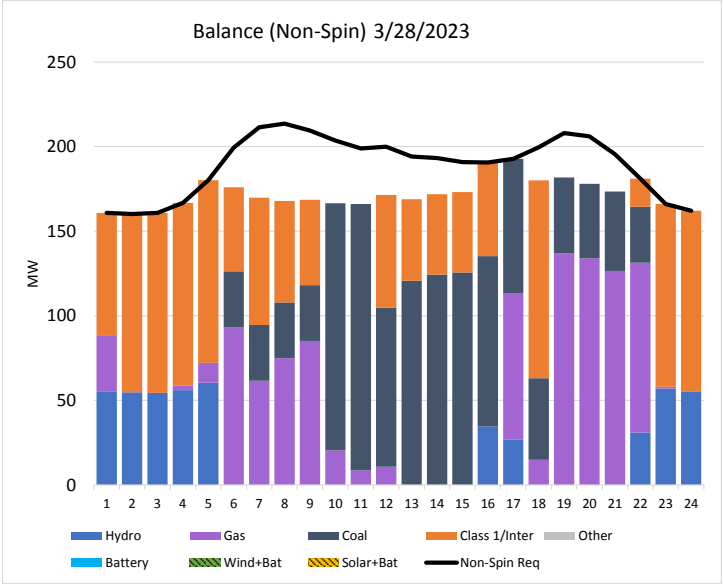
Stacked Case C-40 Capacity Shortfalls

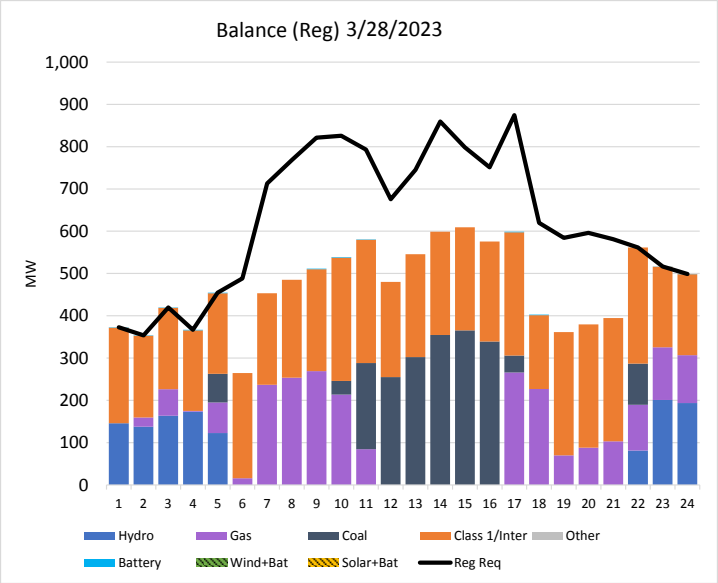


- 609 hours (7.0%) show a capacity shortfall in spinning, non-spinning and/or regulation reserves (mostly regulation reserves) in all months.
- The maximum capacity shortfall is 351 MW, which occurs in hour-ending nine on March 28, 2023.
- There are no energy shortfalls and several hours of a spinning reserve shortfall. The maximum hourly total shortfall on July 17, 2023 is 143 MW (41 MW non-spinning reserves, and 102 MW of regulation reserves).

Stacked Case C-40
Peak Shortfall Day (Reserves)







- Max aggregate shortfall = 351 MW in hour-ending nine.
- No spinning reserve shortfalls.
- 14 hours of non-spinning reserve shortfalls from hour-ending six through 15 and hour-ending 18 through 21.
- 16 hours of regulation shortfall from hour-ending six through 21.

Conclusions from the Initial Reliability Assessment

- Retirement cases can degrade system reliability, and the potential cost to remedy these issues is not directly factored into the results (i.e., via a potential addition or change in the resource mix to alleviate capacity shortfalls).

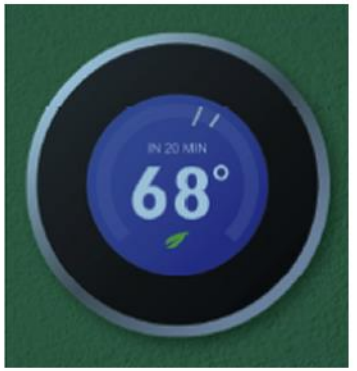
- Additional analysis is needed to evaluate potential reliability challenges and to assess potential costs to remedy these challenges.

- PacifiCorp will test alternative resource adjustments to address reliability issues for priority cases and review potential frequency-response shortfalls for these specific scenarios.

- PacifiCorp will continue to assess system reliability within the portfolio-development phase of the 2019 IRP.

Intra-Hour Flexible Resource Credit



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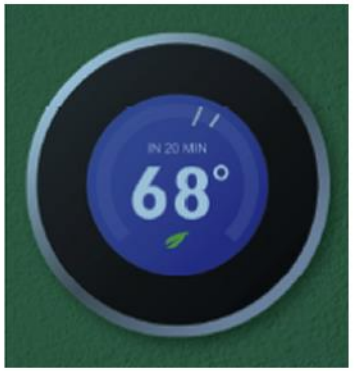
PVRR(d) Impact of Intra-Hour Flex Resource Credit (IHFRC) (PaR Base / Base Scenario)

Study	PVRR(d) (Benefit)/Cost of 2022 without IHFRC ($m)	PVRR(d) (Benefit)/Cost of 2022 with IHFRC ($m)	Delta of PVRR(d) with and without IHFRC ($m)
C-05 (Craig 2)	($29)	($28)	$1
C-10 (Hayden 1)	($58)	($58)	$0
C-17 (Jim Bridger 1)	($113)	($111)	$2
C-21 (Naughton 1)	($123)	($121)	$2
C-22 (Naughton 2)	($98)	($95)	$3
C-35 (N1, N2, JB1)	($301)	($298)	$3
C-38 (N1, N2, JB1, H1)	($307)	($305)	$2
C-39 (N1, N2, JB1, H1, C2)	($317)	($315)	$2

- The IHFRC was applied as an out-of-model adjustment to the benchmark and priority cases.
- The adjustment applies to all flexible resources in each portfolio—not just coal units.
- These results show that the IHFRC does not materially change the PVRR(d) results.

Next Steps



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Next Steps

- Conduct additional reliability studies, including deterministic runs on cases C-38, C-39, and C-41—evaluate potential operational adjustments or resource alternatives to remedy identified capacity shortfalls.
- Assess potential frequency-response shortfalls for priority cases.
- Run a benchmark study consistent with the company's recently filed depreciation study—focus on priority units.
- Evaluate sensitivities that restrict the selection of natural gas resources.
- Other?

Stakeholder Feedback Form Recap




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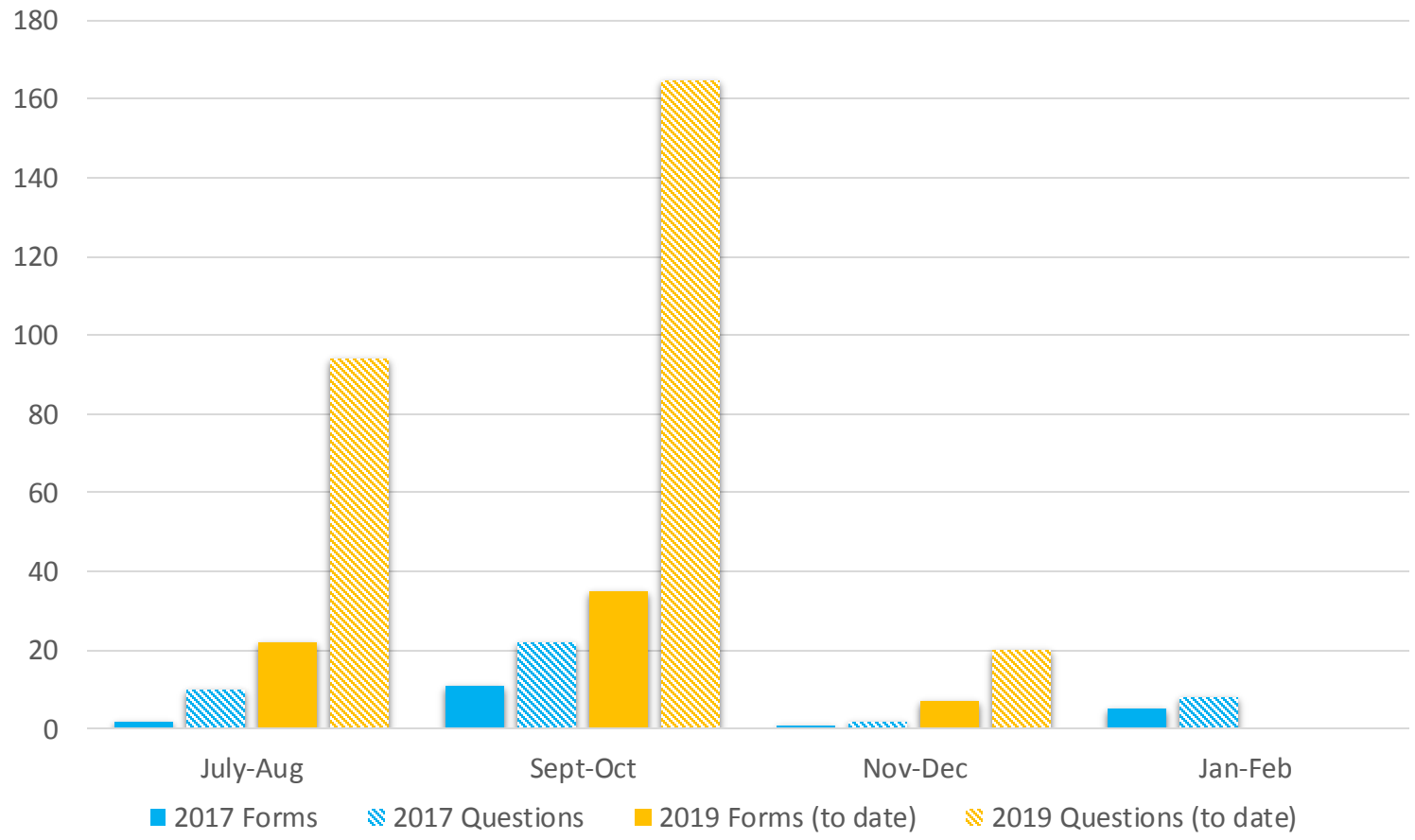
2019 IRP vs. 2017 IRP Stakeholder Feedback Form Activity to Date



Stakeholder Feedback Form

- 64 stakeholder feedback forms submitted to date.
- All stakeholder feedback forms can be located at: www.pacificorp.com/es/irp/irpcomments.html
- All responses to stakeholder feedback forms can also be located at: www.pacificorp.com/es/irp/irpcomments.html
- In addition to being captured on the website, responses may be provided in different ways depending on the type and complexity of the feedback including but not limited to a written response, a standalone response document, separate email, follow-up conversation, or incorporated in subsequent public input meeting material.
- Feedback received following the most recent public input meeting (November) is summarized on the following slides for reference.

Stakeholder Feedback Form

Stakeholder	Date	Topic	Brief Summary (complete form available online)	Response
Gridflex Energy, LLC	Nov 5	Portfolio Analysis	Inquiries on methodology used in Nov 1 supply-side table, pumped storage fuel cost, assumed capacity factor, and combinations of renewables/energy storage.	Provided explanation of methodology and assumptions.
Renewable Northwest	Nov 5	Portfolio Analysis	Requests detail of proposed $10/MWh adder.	Provided calculation.
UCE	Nov 6	Portfolio Analysis	Utah Clean Energy requests that PacifiCorp convene a workshop with interested stakeholders well in advance of the 2021 IRP to determine how to model an incentive for customer-sited battery storage in the 2021 IRP.	PacifiCorp is open to having a focused workshop on customer storage.
Interwest	Nov 18	Consultant Reports	Requests consultant reports related to 2019 IRP studies.	Reports on IRP website as available.
OPUC	Nov 27	Demand Response	Requests description and comparison of cost effectiveness methodology for demand response.	Response to be provided by December 12, 2018.
OPUC	Nov 27	Modeling & Updates	Request for detail regarding expanded renewable resources and transmission upgrade assumptions.	Response to be provided by December 12, 2018.
OPUC	Nov 27	Portfolio Analysis	Requests detail of proposed $10/MWh adder.	Response to be provided by December 12, 2018.

Additional Information and Next Steps

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Draft Topics for Upcoming PIMs*

January 24-25, 2018 PIM*:

- Additional Coal Studies
- Regional Haze Portfolios
- Portfolios / Sensitivity Cases
- Stakeholder Feedback Form Recap

February 21-22, 2019 PIM*:

- Load & Resource Balance
- Portfolios / Sensitivity Cases
- Stakeholder Feedback Form Recap

** Topics and timing are tentative and subject to change*

Additional Information and Next Steps

- Public Input Meeting Presentation and Materials:
  - pacificorp.com/es/irp.html
- 2019 IRP Stakeholder Feedback Forms and Summary Matrix:
  - pacificorp.com/es/irp/irpcomments.html
- IRP Email / Distribution List Contact Information:
  - IRP@PacifiCorp.com
- Upcoming Public Input Meeting Dates:
  - January 24-25, 2019
  - February 21-22, 2019
  - March 12-13, 2019 – *tentative/as needed*
  - *April 1, 2019 – 2019 IRP File Date*