IRP Preliminary Results

July 22, 2020

1 Portfolio Performance & Preliminary Recommendations

2 Next Steps

Portfolio Performance & Preliminary Recommendations

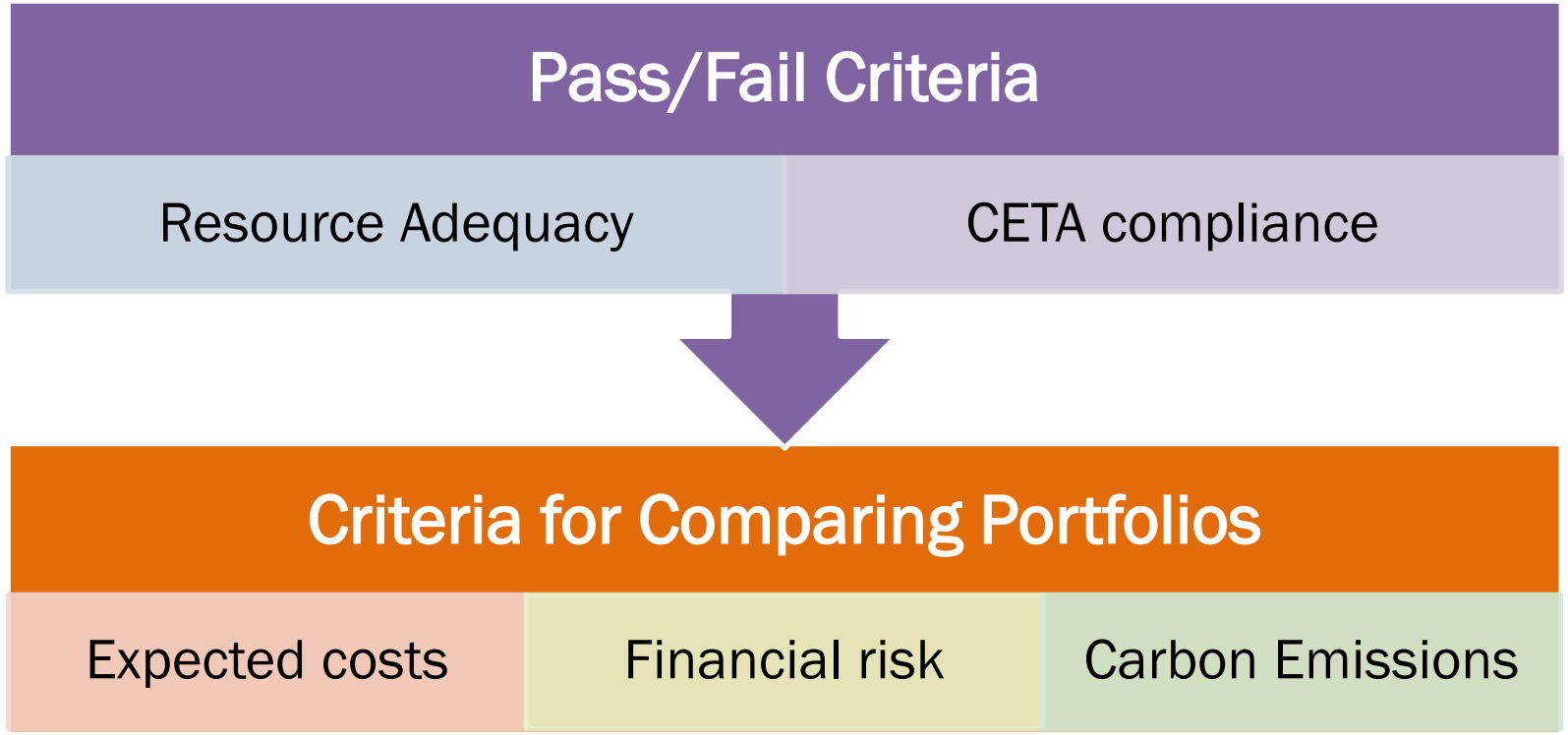
Section 1

What are we recommending?

Preliminary portfolio recommendations

- ✓ Renew BPA Slice/Block contract if offered
- ✓ Don’t renew Columbia Basin Hydro (CBH) contract
- ✓ Further explore feasibility of adding 10MW demand response
- ✓ Continue to evaluate options to diversify BPA with wind or solar but don’t acquire anything now

Review: How do we evaluate portfolios?



Resource Adequacy: Which portfolios made the cut?

Renew BPA Slice/Block

- Tacoma Power Hydro + BPA Slice/Block
- Tacoma Power Hydro + BPA Slice/Block + renew CBH
- Tacoma Power Hydro + BPA Slice/Block + 60MW Solar (partially replace BPA)
- ~~Tacoma Power Hydro + BPA Slice/Block + 100 MW WA Wind (partially replace BPA)~~
- ~~Tacoma Power Hydro + BPA Slice/Block + 100 MW Gorge Wind (partially replace BPA)~~
- Tacoma Power Hydro + BPA Slice/Block + 150 MW Pumped Storage at Cowlitz
- Tacoma Power Hydro + BPA Slice/Block + 150 MW 3rd Generator at Cowlitz
- Tacoma Power Hydro + BPA Slice/Block + 50 MW Demand Response
- Tacoma Power Hydro + BPA Slice/Block + 10 MW Demand Response - **NEW**
- Tacoma Power Hydro + BPA Slice/Block + 80 MW WA Wind - **NEW**
- Tacoma Power Hydro + BPA Slice/Block + 60 MW WA Wind + 10 MW Demand Response - **NEW**

Renew BPA with Shapeable Block

- Tacoma Power Hydro + BPA Block
- Tacoma Power Hydro + BPA Block + 60MW Solar (partially replace BPA)
- Tacoma Power Hydro + BPA Block + 100 MW WA Wind (partially replace BPA)
- ~~Tacoma Power Hydro + BPA Block + 100 MW Gorge Wind (partially replace BPA)~~
- Tacoma Power Hydro + BPA Block + 150MW Pumped storage at Cowlitz
- Tacoma Power Hydro + BPA Block + 150MW 3rd Generator at Cowlitz
- Tacoma Power Hydro + BPA Block + 50MW Demand Response (DR)

No BPA Renewal (not technically feasible at this time)

- ~~Tacoma Power Hydro + 650MW WA Wind + 650MW Gorge Wind + 100MW MT Wind + 300MW DR~~
- Tacoma Power Hydro + 700MW WA Wind + 700MW Gorge Wind + 100MW MT Wind + 250MW DR + 150MW Pumped storage
- Tacoma Power Hydro + 700MW WA Wind + 700MW Gorge Wind + 100MW MT Wind + 250MW DR + 150MW Cowlitz Generator
- ~~Tacoma Power Hydro + 700MW WA Wind +700MW Gorge Wind + 100MW MT Wind + 200MW DR + 100MW Small Nuclear~~
- ~~Tacoma Power Hydro + 650MW WA Wind + 650MW Gorge Wind + 100MW MT Wind + 100MW DR + 200MW Natural Gas~~

Section 1: Portfolio Performance & Preliminary Recommendations

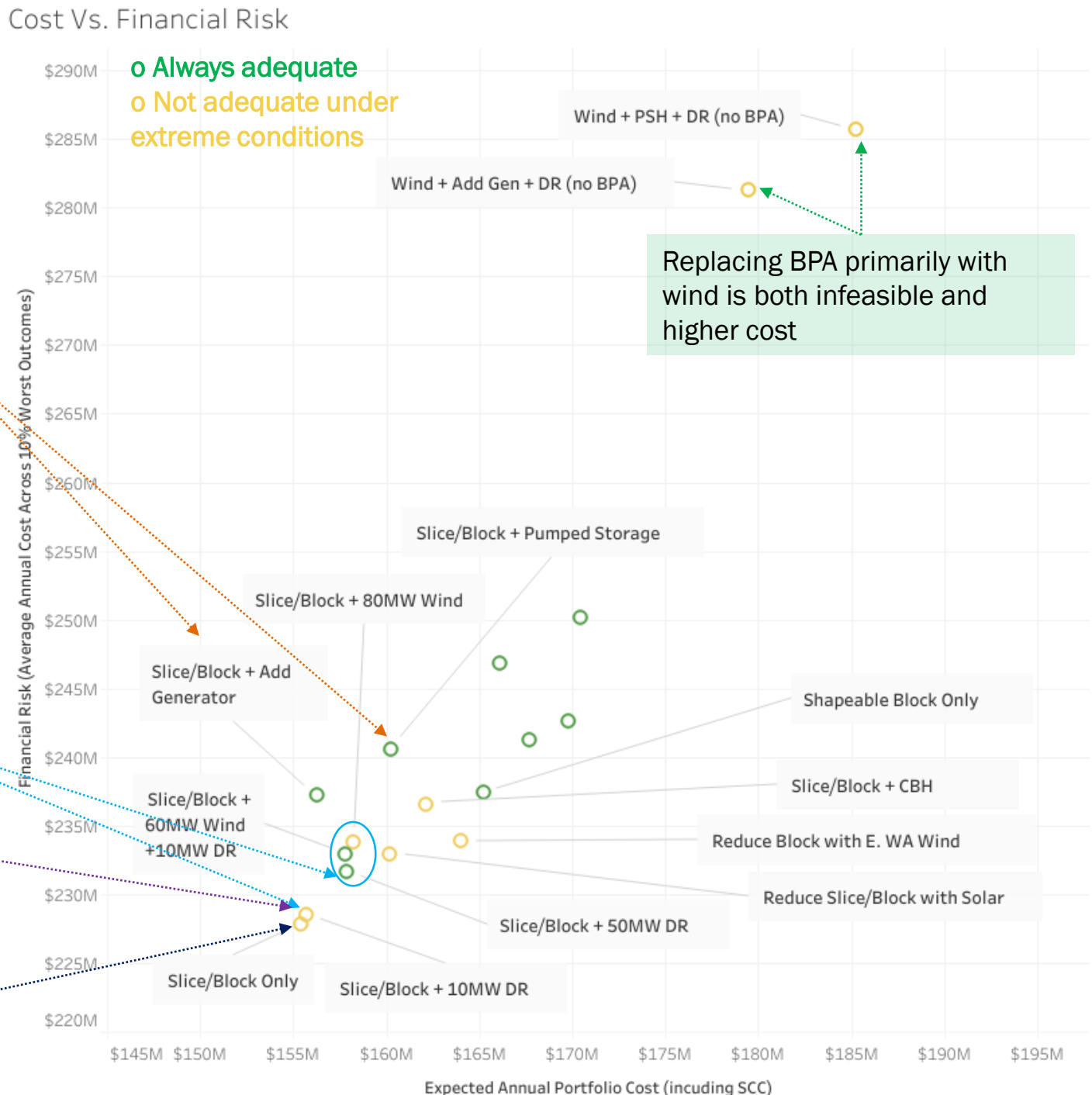
Cost vs. Financial Risk

Adding pumped storage or a generator at Cowlitz presents higher financial risk, partially due to significant licensing cost risk

Small adjustments to Slice/Block portfolio improve resource adequacy at a lower cost than switching to a Block product.

Adding 10MW of DR is lowest cost and least risk way to improve adequacy

Slice/Block only is lowest cost & lowest financial risk.



Overview of Climate Change Findings

Temperature & Loads

- **Temperatures are generally higher & loads are generally lower**

Inflows & Generation

- **Inflows & generation are generally higher for both Tacoma Power and BPA, especially in winter**
- Summer inflows & generation tend to be lower, but not as pronounced as winter increases

Resource Adequacy

- **Adequacy of Slice/Block portfolio improves**
- Potential adequacy issues that occur under extreme conditions with Slice/Block portfolio disappear

More work needs to be done to refine our approach to incorporating climate change projections into our modeling

Review of Key Findings

- ✓ **CETA Compliance:** All portfolios are CETA-compliant
- ✓ **CBH Renewal:** Unlikely to recommend CBH renewal, as it does not improve adequacy
- ✓ **BPA Renewal:** BPA renewal is more feasible and less costly than a wind-heavy portfolio
- ✓ **BPA Product Choice:** Slice/Block product is looking most promising from a cost standpoint
- ✓ **BPA Diversification:** Replacing BPA partially with wind or solar worsens adequacy. If there is a desire to diversify with wind or solar, adding a small amount of wind without replacing BPA would be lowest-cost way to diversify while preserving adequacy
- ✓ **Potential Capacity Addition:** Adding 10MW of demand response appears to be the lowest cost and least risk way to improve adequacy of Slice/Block in extreme low water conditions

Draft IRP Action Items

	Next 2 years	Next 10 years
Resource Acquisition/ Retirement	Acquire 2-year CPA potential Notify parties of CBH renewal decision	Acquire 10-year CPA target Pilot cost-effective demand response options
Further Investigation into Resources	Actively participate in discussions with BPA on future product options Conduct demand response (DR) "potential assessment"	Continue to evaluate BPA renewal options Continue to follow development of new technologies
Continue Improving Modeling & Analysis	Incorporate impacts of electrification Refine climate change modeling Refine approach to modeling DR Model EE as a resource in system model Refine modeling of storage in WECC model & system model	Continue improving functionality of system model (SAM)
Equity	Develop metric(s) to account for equity in resource acquisition decisions Continue to improve inclusiveness of stakeholder outreach	Fully incorporate equity into resource acquisition decisions

Next Steps

Section 3

Section 2: Next Steps

What's next?

	Topic	Date
1	Resource planning 101	August 28 (complete)
2	Resource adequacy	October 9 (complete)
3	Our current portfolio & resource options	October 23 (complete)
4	Small nuclear reactors	November 13 (complete)
5	Energy storage	December 4 (complete)
6	Pump storage hydro	January 7 (complete)
7	IRP Update	June 24 (complete)
8	Preview of findings and recommendations	July 22 (today)
9	Release draft IRP to public for review	July 31
10	Approve IRP (BOARD MEETING)	August 12
11	Submit IRP	Before September 1
12	Public-friendly summary document	October 1