Tacoma Power 2026 Integrated Resource Plan (IRP):

Resource findings and Draft Action Plan

June 10, 2026

Outline

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1. Review of previous study session
2. Analysis findings on resource options
3. Draft action plan
4. Next Steps

Review of May 27 study session

IRP Schedule

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We are here

April 21

Public meeting

May 27

Public Utility Board (PUB) study session: Draft findings

June 10

PUB study session: Draft recommendations & action plan

Draft IRP available for public review

July 22 (tentative)

PUB Meeting: Request approval of IRP

CCA no-cost allowance forecast to be included in appendix for approval

September 1

2026 IRP submitted to Department of Commerce

Summary of needs assessment

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1. We **do not** anticipate a need for additional energy resources beyond conservation

- Even with expected changes to climate, current resources are enough to meet energy needs under nearly all load scenarios

2. We will **likely** see winter capacity gaps emerge under high load events and drought conditions in the late 2030's or early 2040's.

- Around 30 MW in certain years only in early 2040's under base case, around 15 MW to 30 MW by mid-2030's under somewhat higher electrification growth

3. We have time to prepare

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Summary of resource analysis

Resource options modeled in our IRP

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Utility-scale Resources

- Wind
- Solar
- Nuclear
- Short-duration (4-hour) battery
- Addition of hydro generator at Mossyrock Dam
- Pumped storage hydro at Cowlitz River Project
- Natural gas peaking plant

Demand-side (Customer) Resources

- Energy efficiency/ Conservation
- Demand response
- Rooftop solar

Most promising new resources are those unique to Tacoma Power

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- **Demand response (DR)**
  - ***Advantages:***
    - Many DR opportunities are lower cost than alternative capacity investments (e.g., battery)
    - Can scale with need
    - Builds upon established conservation program infrastructure
  - ***Considerations:***
    - Cost-effective DR opportunities may not be enough to mitigate capacity risks on their own
- **Additional hydro generator at Mossyrock Dam**
  - ***Advantages:***
    - Builds upon existing physical infrastructure
    - Potentially lower cost than many alternative capacity investments (e.g., battery)
  - ***Considerations:***
    - Additional analyses needed to refine operational feasibility, costs, etc.
    - Tied to relicensing
    - Does not scale with need

- **Note:** Both these opportunities require long lead times!

Draft strategy and action plan

Draft strategy and action plan

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Strategy	Two-year action plan	Ten-year Clean Energy Action Plan (CEAP)
Continue to invest in cost-effective conservation	Acquire 2-year conservation target of 26,214 MWh (3 aMW)	Regularly update CPA and continue to acquire 2-year targets set in subsequent CPAs
Ramp up demand response programs	Implement 2 pilots and acquire 0.6 MW of demand response	Acquire 12 MW of DR
Continue work to restore Riffe Lake elevation by 2031	Continue to seek FERC authorization to restore Riffe Lake elevation	Restore Riffe Lake elevation by 2031 if authorized by FERC
Develop a strategy for mitigating intermittent capacity risks during generator rebuilds	Analyze non-resource alternatives to prepare for intermittent capacity risks during generator rebuilds	Develop long-term strategy to prepare for intermittent capacity risks during generator rebuilds
Continue to explore opportunities to build upon existing hydro system	Conduct further analysis of costs and benefits of adding a conventional hydro generator at Mossyrock Dam	Evaluate opportunities to add incremental capacity to existing generators during planning stage of scheduled rebuilds

Next steps

IRP Schedule

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Appendix A: CCA no-cost allowance forecast

General background

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- CCA is a cap and invest program that sets a limit on overall emissions in the state of WA
  - Cap goes down over time
  - Allowances can be acquired through Department of Ecology auction and can be bought and sold
- Utilities receive some no-cost allowances to mitigate the compliance cost burden for utilities that are also subject to Clean Energy Transformation Act (CETA) compliance
  - Department of Ecology determines the number of allowances using a formula defined in WAC 173-446-230
  - WAC 173-446-230 also defines a rank order of data sources to be used as inputs to the formula
  - First in rank order is a CCA-specific forecast of supply and demand if the forecast is approved by the utility's governing body.

Documentation and approval of CCA-specific forecast

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- CCA-specific forecast of 2027-2030 supply and demand is included in Appendix A of the IRP

- We will seek approval of the 2027-2030 CCA-specific supply and demand forecast at the same time as we seek approval of the 2026 IRP
  - CCA-specific forecast will appear in a separate resolution

About the forecast

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- Forecast based on methodology defined in WAC and very similar to methodology approved by PUB on August 24, 2022 (U-1138)
- Major components
  - Load projections consistent with Tacoma Power load forecast and IRP
  - Generation and BPA purchases consistent with IRP (~50% of forecast emissions)
    - 2027-2030 forecast of emissions is higher than previous period primarily due to higher assumption regarding emissions in BPA purchases*
  - Offset for unspecified wholesale market purchases based on historical data (~50% of forecast emissions)
- Resulting forecast of emissions from all sources ($MTCO_2e$):

2027	2028	2029	2030	Total 2027-2030 Forecast	Total 2022-2026 Forecast
337,449	335,131	332,045	334,972	**1,339,597**	**1,122,136**

*Emissions assumptions come from California Air Resource Board (CARB) Asset Controlling Supplier (ACS) emissions factors (https://ww2.arb.ca.gov/mrr-acs). BPA's emissions factor for Data Year 2026 is 0.0496 MTCO2e per MWh.

Appendix B: Summary of pumped storage study

Study Basics

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Study objective: Evaluate the potential of adding PHES capabilities and other hydro-generation possibilities at Tacoma Power's Mossyrock Dam and Powerhouse

Who performed the work: HDR Consulting was contracted to perform work, with participation & review from a large team of internal SMEs within Generation, Power Management and T&D sections of Tacoma Power

Funding

The Pumped Storage Feasibility Study at Tacoma Power's Mossyrock Dam is supported with funding from Washington's Climate Commitment Act. The CCA supports Washington's climate action efforts by putting cap-and-invest dollars to work reducing climate pollution, creating jobs, and improving public health. Information about the CCA is available at www.climate.wa.gov/.

Study process

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Initial List of Alternatives

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Preliminary Screening Analysis

- Engineering Feasibility
- Constructability
- Capacity Increase

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Shortlist

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Pre-Feasibility Analysis

- Engineering considerations
- Social considerations
- Environmental considerations
- Operational considerations
- Lifecycle cost analysis

Final list of alternatives in study

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Alternative/Description	System Capability Impact
Alternative 1 - Pumped Hydro - Third Bay Powerhouse	Increases peak power generation by approximately 28 MW and allows for pumping at a rated power of 25 MW.
Alternative 2 - Pumped Storage Hydro - New Upper Reservoir New Powerhouse	Increases power generation and energy storage by approximately 900 MW (8-hour), or 87MW (82-Hour) at minimum load.
Alternative 2B - Pumped Storage Hydro - New Upper Reservoir, New Aboveground Powerhouse	Increases power generation and energy storage by approximately 100 MW (8-hour), or 3.5 MW (215-Hour) at minimum load.
Alternative 5 - Conventional Hydropower - Third Bay Powerhouse	Increases peak power generation by approximately 100 MW.

Study provides Class 5 Opinion of Probable Construction Cost (OPCC) estimates

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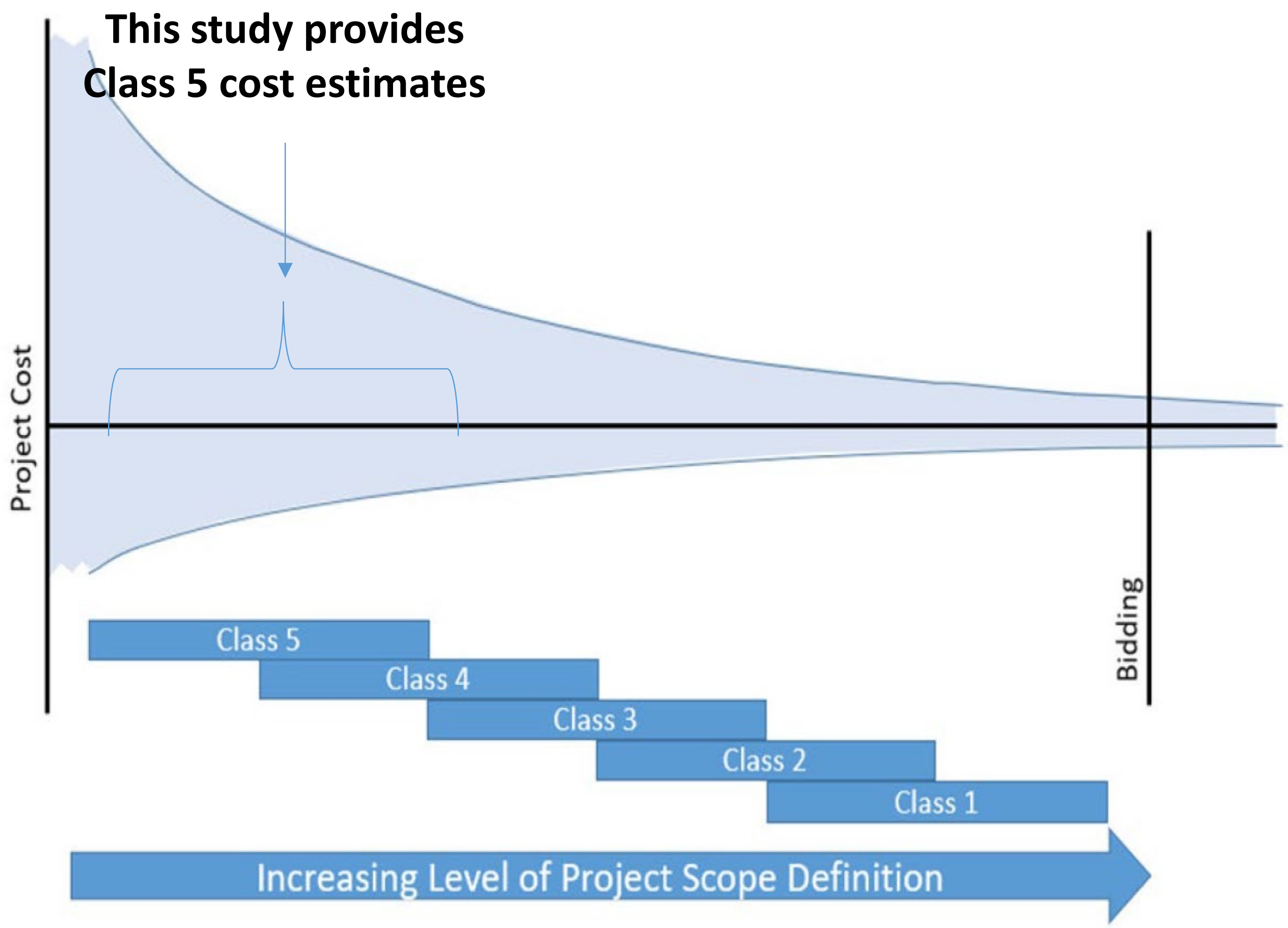

Association for the Advancement of Cost Engineering (AACE) Class 5 definition:

- Level of Project Definition: Between 0% and 2% complete
- End Usage: Concept Screening
- Methodology: Capacity Factored, Parametric Models, Judgment, or Analogy
- Expected Accuracy Range: Low = -20% to -50%; High = +30% to +100%
- Estimating Methods: Typically stochastic estimation methods such as cost/capacity curves and factors, scale of various factors, and other parametric and modeling techniques.

Comparison of total expected costs

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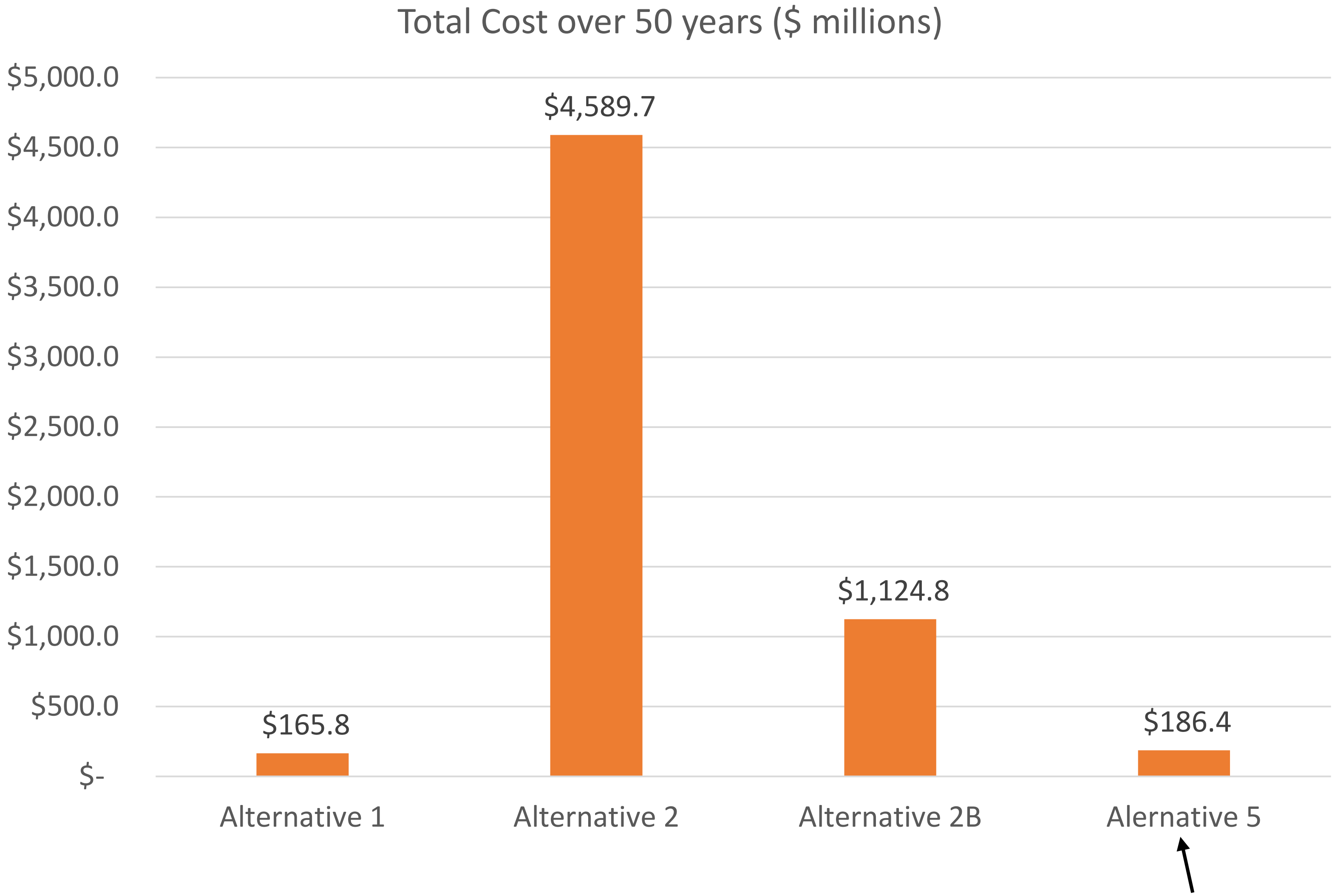
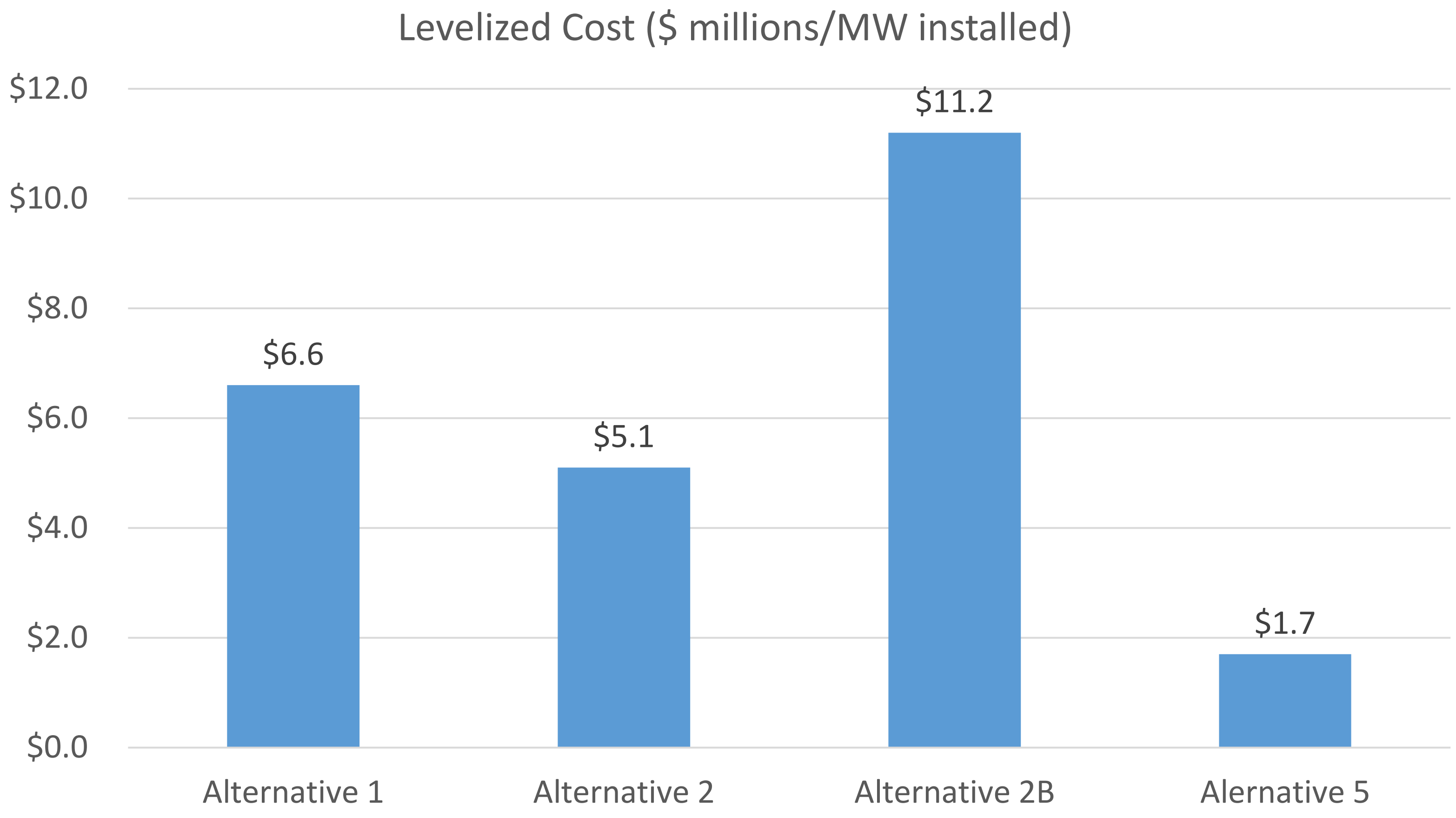


Alternative Description	Capability Increase
Alternative 1 - Pumped Hydro - Third Bay Powerhouse	28MW gen 25MW pump No additional storage
Alternative 2 - Pumped Storage Hydro - New Upper Reservoir New Powerhouse	900 MW (8-hour) 87MW (82-Hour)
Alternative 2B - Pumped Storage Hydro - New Upper Reservoir, New Aboveground Powerhouse	100 MW (8-hour) 3.5 MW (215-Hour)
Alternative 5 - Conventional Hydropower - Third Bay Powerhouse	114 MW gen No additional storage

Adding a conventional generator is expected to be similar in cost to pumped hydro without additional storage but would provide significantly more capacity (100MW vs. 28MW).

Levelized Cost Comparison



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Alternative 5 - Conventional Hydropower - Third Bay Powerhouse	114 MW gen No additional storage

Adding a conventional generator is expected to be more cost-effective per MW of installed capacity relative to pumped storage alternatives.

Comparison to battery energy storage (BESS)

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Description	Capability Increase	Capital Cost ($/kW)	Annualized O&M Cost ($/kW-year)
Alternative 1 - Pumped Hydro - Third Bay Powerhouse	28MW gen 25MW pump No additional storage	$5,256	$4
Alternative 2 - Pumped Storage Hydro - New Upper Reservoir New Powerhouse	900 MW (8-hour) 87MW (82-Hour)	$4,163	$16
Alternative 2B - Pumped Storage Hydro - New Upper Reservoir, New Aboveground Powerhouse	100 MW (8-hour) 3.5 MW (215-Hour)	$9,078	$45
Alternative 5 - Conventional Hydropower - Third Bay Powerhouse	114 MW gen No additional storage	$1,265	$8
BESS (4-hour)*	100 MW (4-hour)	$2,446	$61
BESS (8-hour)*	100MW (8-hour)	$3,534	$88

Adding a conventional generator is the only alternative that is ***potentially*** more cost-effective than a battery →

*Note: Battery storage estimates shown here were produced by HDR for the purposes of this study and differ slightly from NREL cost estimates used in

Summary of major sources of risk to cost and schedule

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Alternatives 1 (Pumped Hydro - Third Bay Powerhouse)

- Mossyrock Tailrace Modifications → cost increases and delays
- Transmission Capacity Limits → cost increases and delays
- Pumping Mode Restriction in summer → operations impacts/limits to usefulness
- Redundant Gate Condition → complications to unit installation and operations

Alternatives 2 & 2B (Pumped Storage Hydro - New Upper Reservoir New Powerhouse)

- Land acquisition → Delays
- Rock quality → Cost increases and delays
- Reservoir excavation → Cost increases
- External engagement/regulatory proceedings → Delays/ feasibility

Alternative 5 (Conventional Hydropower - Third Bay Powerhouse)

- Powerhouse modifications required → cost increases and delays

← Because it is simpler ***relative to the alternatives***, Alternative 5 presents fewer sources of cost and schedule risk

Study acknowledges that this is a first step in a long, multi-phase analysis process

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1. Conceptual-level screening study (**we are here**)

- Desktop review of data to assess whether the opportunity merits further consideration

2. Pre-feasibility study

- More accurate OPCC estimates
- More in-depth operational modeling
- Site visits to improve assessment of constructability
  Refinement of conceptual layouts
  Development of preliminary schedule
  Review of environmental and regulatory constraints

3. Feasibility study

- Define engineering features and functional performance for all project components
- Initial geotechnical investigations
- Cursory review of cultural and natural resources with potential to be affected
- Outreach to relevant interested parties may be initiated, depending on proposed project details

4. Request for construction proposals, and selection of construction contractor(s) and equipment supply

- Develop final functional design & project delivery method
- Prepare supporting documents for bid
- Bidder prequalification, evaluation

5. Licensing and construction

- This stage of the process is not described in the study

Fatal flaws may be identified at any point along the way!

How were the study results used?

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- 2026 IRP modeled the 2 most plausible alternatives (**Alternatives 2B and 5**)
  - Alternative 1 is similar in cost to Alternative 5 but adds significantly less capacity
  - Alternative 2 is too large in terms of both capacity and total investment
- Study information on capabilities and costs were used in IRP modeling
  - Alternative 5 identified as potentially promising and warrants further study

Alternative Description	Capability Increase	Expected cost over 50 years ($ millions)
Alternative 1 - Pumped Hydro - Third Bay Powerhouse	28MW gen 25MW pump No additional storage	$165.8
Alternative 2 - Pumped Storage Hydro - New Upper Reservoir New Powerhouse	900 MW (8-hour) 87MW (82-Hour)	$4,589.7
Alternative 2B - Pumped Storage Hydro - New Upper Reservoir, New Aboveground Powerhouse	100 MW (8-hour) 3.5 MW (215-Hour)	$1,124.8
Alternative 5 - Conventional Hydropower - Third Bay Powerhouse	114 MW gen No additional storage	$208.8