Northwest **Power** and **Conservation** Council

September 4, 2024

MEMORANDUM

TO: **Council Members**

FROM: **Annika Roberts, John Shurts**

SUBJECT: **Methodology for quantifying environmental costs and benefits in the Plan**

BACKGROUND:

Presenter: Annika Roberts & John Shurts

Summary: When developing the new resource strategy for the power plan, the Northwest Power Act requires that the Council compare the incremental system costs of different generating and conservation resources and give priority to those resources which the Council determines to be cost-effective. In estimating the system cost of a particular resource, the Council must include any quantifiable environmental costs and benefits directly attributed to that resource over its effective life.

The Act directs the Council to develop a methodology to determine and apply these quantifiable environmental costs and benefits as part of the overall system cost of a new resource or measure. The Council not only has to develop the methodology – the methodology is a required element of the power plan.

Staff will propose a methodology for discussion with Council Members at this meeting. While a “final” methodology is not adopted until the Plan itself is adopted, staff need to understand the approach in order to apply it to the resource cost analysis, and to describe it as an element in the draft

power plan. After this discussion with Councilmembers, staff will present the methodology to advisory committees for their feedback. If those sessions prompt any changes, staff will bring a revised methodology back to the Council at a future meeting.

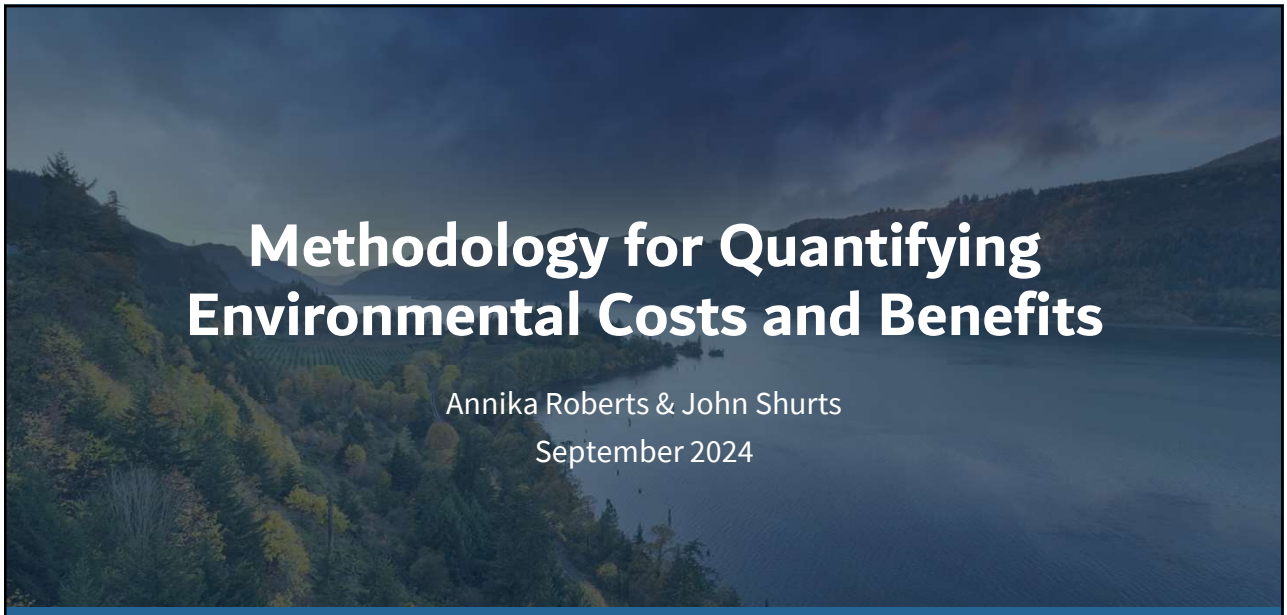
The Act also requires that in developing the power plan's resource strategy that the Council give "due consideration" to environmental quality and fish and wildlife concerns. These are broader considerations than the methodology for quantifying environmental costs and benefits, which is strictly part of the new resource cost-effective comparison.

Relevance: As we prepare for the 9th Plan, staff is working with its advisory committees to develop inputs and assumptions for analysis. This methodology for quantifying the environmental costs and benefits of new resources is a required element of the power plan and needs to be defined early in the planning process so it can be applied to the resource cost assumptions.

Workplan: B.2.1. Prepare for the ninth power plan, developing a draft scope, preparing models and inputs, and developing environmental methodology.

Background: Northwest Power Act Sections 3(4) (definition of "cost effective"), 4(e)(1) (cost-effective priority); 4(e)(2) ("due consideration" provision); 4(e)(3)(C) (environmental methodology as element of the power plan)

2021 Plan Section 11 (p. 121-137):
https://www.nwcouncil.org/fs/17680/2021powerplan_2022-3.pdf
2021 Plan Supporting Materials:
https://www.nwcouncil.org/2021powerplan_methodology-determining-quantifiable-environmental-costs-and-benefits/



Methodology for Quantifying Environmental Costs and Benefits

Annika Roberts & John Shurts

September 2024

Northwest Power and Conservation Council

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Today

Place setting:
How does the environmental methodology fit into the plan work?

Background:
What is the environmental methodology and what is said about it in the Act?

Context:
How else do we think about the environment in our planning?

Proposal:
What are the pieces of the methodology and how do we consider them?

Conclusion:
Any reactions, feedback, proposed changes to the current methodology?

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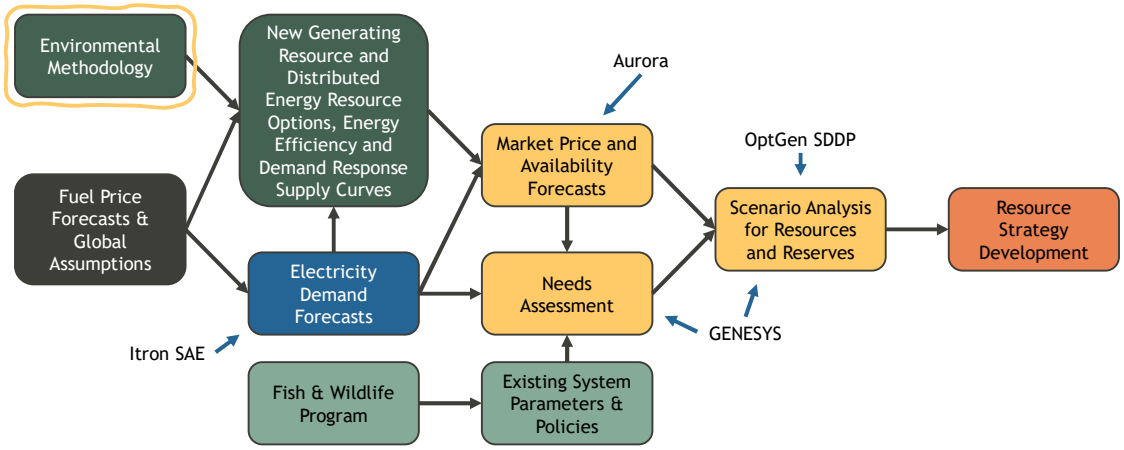
What is the environmental methodology?

& why are we talking about it now



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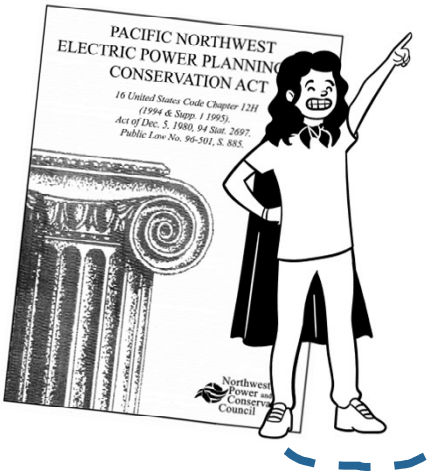
Let's go for a trip around the power act



- Pacific Northwest Electric Power Planning and Conservation Act (*16 U.S.C. § 839-839h, December 5, 1980*)
  - Section 1 Summary
  - Section 2 Congressional declaration of purpose
  - Section 3 Definitions
  - Section 4 Regional planning and participation
    - 4(a)(b)(c)Est. the Council
    - 4(d)(e)(f)(g)Regional Conservation and Electric Power Plan
    - 4(h)Fish and Wildlife Program
    - 4(i)(j)(k)Review of Administrator's actions
  - Section 5 Sale of power
  - Section 6 Conservation and resource acquisition
  - Section 7 Rates
  - Section 8 Provisions and legislative history

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Section 4. What's in a Power Plan

- Section 4. Regional planning and participation
- 4(e). Plan Priorities and Requisite Features
- 4(e)(1) The plan shall give priority to resources which the council determines to be cost effective…
- 4(e)(2) The plan shall set forth a general scheme for implementing conservation measures and developing resources with due consideration by the Council for
  - (A) environmental quality
  - (B) compatibility with the existing regional power system
  - (C) protection enhancement of fish and wildlife
  - (D) and other criteria which may be set forth in the plan
- 4(e)(3)To accomplish the priorities established in this subsection, the Plan shall include the following elements
  - 4(e)(3)(A)Conservation program
  - 4(e)(3)(B)R&D recommendations
  - 4(e)(3)(C)a methodology for determining quantifiable environmental costs and benefits (under Section 3(4) of this title)
  - 4(e)(3)(D)a demand forecast of at least 20 years & a forecast of power resources required to meet that demand
  - 4(e)(3)(E)an analysis of reserve requirements to insure adequate electric power
  - 4(e)(3)(F) the fish and wildlife program (describe in detail elsewhere in the act)
  - 4(e)(3)(G) any surcharges the Council recommends (also detailed elsewhere)

Prior subsections:
- **4(a)** Pacific Northwest Electric Power and Conservation Planning Council; establishment and operation as regional agency
- **4(b)** Alternative establishment of Council as Federal agency
- **4(c)** Organization and operation of Council
- **4(d)** Regional conservation and electric power plan

Next subsections:
- **4(f)** Model conservation standards
- **4(g)** Public information; consultation; contracts and technical assistance
- **4(h)** Fish and wildlife
- **4(i)** Review
- **4(j)** Requests by Council for Action
- **4(K)** Review and analysis of 5-year period of Council activities

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Section 3. Key Concepts Defined

- Section 3. Definitions
  - Section 3(4)(A) "Cost-effective" when applied to any measure or resource referred to in this chapter, means that such measure or resource must be forecast—
    - 3(4)(A)(ii) to be reliable and available within the time it is needed, and
    - 3(4)(A)(iii) to meet or reduce the electric power demand as determined by the Council, of the consumers of the customers at an estimated incremental *system cost* no greater than that of the least-cost similarly reliable and available alternative measure or resource
  - Section 3(4)(B) "System cost" means an estimate of all direct costs of a measure or resource over its effective life, including, the cost of distribution and transmission to the consumer and, among other factors, waste disposal costs, end-of-cycle costs, and fuel costs (including projected increases), and such quantifiable environmental costs and benefits as determined on the basis of a methodology developed by the Council as part of the plan, are *directly attributable* to such measure or resource.

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Quantifying Environmental Costs & Benefits

- From that walk through we now know:
  - The Northwest Power Act requires the Council (1) develop and (2) apply a "methodology for determining [the] quantifiable environmental costs and benefits" of **new** electric generating and conservation resources §4(e)(3)(C)
  - Those cost and benefits are a part of the incremental system cost of a new resource
  - The environmental methodology itself is an element of the power plan.
- SO, the environmental methodology
  - Considers **costs *and* benefits** to the **environment** with the understanding that…
    - These costs and benefits are **quantifiable**, recognizing that not all environmental effects can be reduced to quantified costs and benefits…
    - And, the costs must be **directly attributable** to the resource, not incidental or indirect

Notably, these terms are not defined in the Act; And so, the Council has had to use common sense understanding/discretion, as guided by context of the Act and discussions in legislative history

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Due Consideration

- A different section of the Act (Section 4(e)(2)) calls on the Council, in developing the new resource strategy for the plan, to give "due consideration" for environmental quality, fish and wildlife matters, compatibility with the existing system, and other criteria the Council may set forth.
- This is a broader set of considerations, many qualitative, than the "methodology for quantifying environmental costs and benefits," which is strictly about the cost-effective comparison of new resource costs.
- For Example:
  - Fish & Wildlife program
  - Compliance with clean energy regulations
  - Climate change analysis

Each of these considerations flows through to other processes and impacts eventual resource strategy decision

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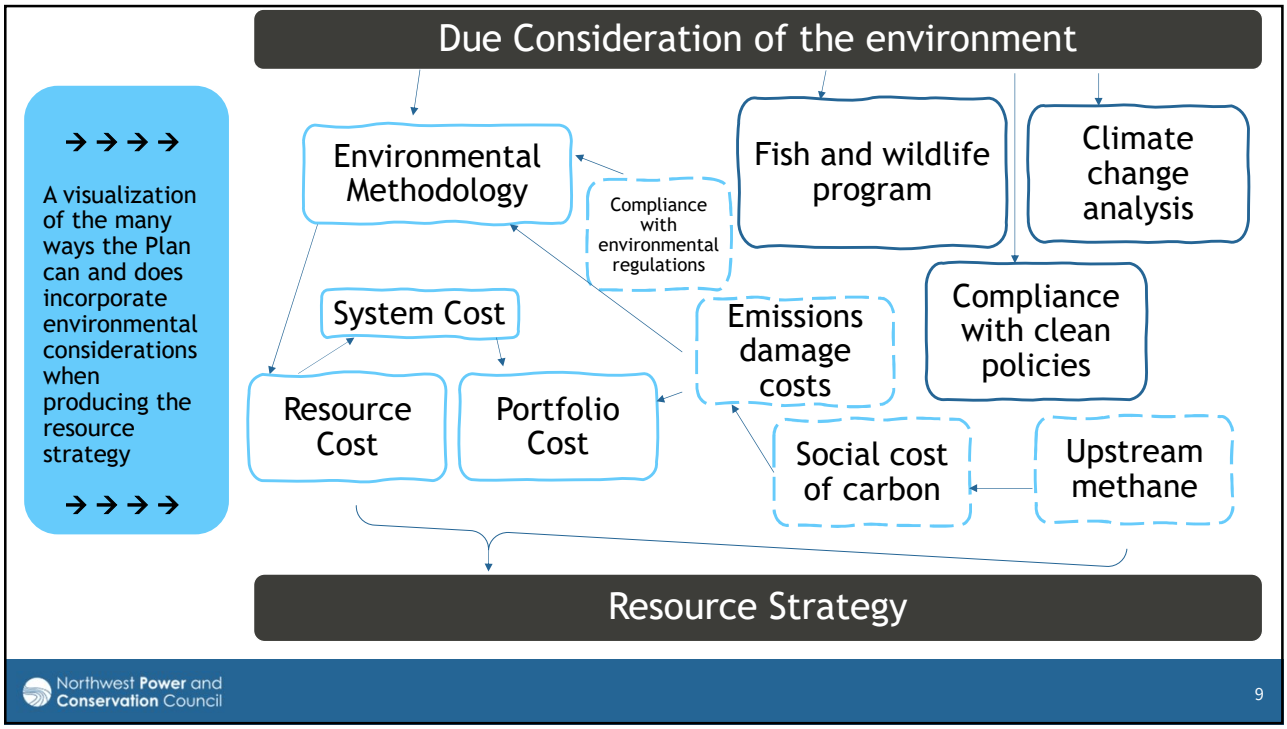

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Methodology for quantifying the environmental costs and benefits of new resources

1. Costs of compliance with existing environmental regulations
2. Environmental effects beyond regulatory controls
3. Costs of compliance with proposed environmental regulations
4. Quantifiable environmental benefits

Our experience with the environmental methodology over 40+ years of power planning has yielded four components or categories that the Council needs to consider as it decides on and applies the methodology to determine and quantify the costs and benefits of new resources.

Within each component are considerations to make which we will walk through over the next few slides

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1. Costs of compliance with existing environmental regulations

- Council's planning assumes all generating and conservation resources will meet existing federal, state, tribal, and local environmental regulations
- Therefore, the estimated costs of compliance – when quantifiable – are included as part of the total system cost of a new resource
- This has been the primary method for capturing and quantifying environmental costs and benefits in past plans & and remains the proposed method for the 9th Plan

Examples of Regulated Environmental Effects of New Resources

- Air emissions from generation (e.g., SOx, NOx, particulates, CO2, methane, toxics such as mercury) – Clean Air Act
- Wastewater discharges from generation – Clean Water Act and state water quality regulations
- Solid wastes from generation, including toxic/hazardous wastes (e.g., coal ash; chemicals in solar panels) and nuclear wastes
- Regulated environmental effects of fuel production
- Direct operational effects on fish and wildlife (e.g., birds at wind turbines; new hydro effects on fish)
- Costs of environmental compliance in siting and construction

❖These apply to conservation measures as well as generation (e.g., potential waste disposal costs of efficiency measures)

2. Environmental effects beyond regulatory controls

Including both residual and unregulated effects:

- Residual—Regulations control or mitigate *some* portion of the targeted effects from a new resource on the environment, but not *all*
- Unregulated—Environmental effects that are not currently under regulation

We recognize that there are environmental damage or social costs of environmental effects that are not yet comprehensively regulated. We have made efforts to capture what we can, how we can, but there remains insufficient data available to determine and quantify all effects into new resource costs

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Examples of environmental effects beyond regulatory control

- Residual— generating facility effects beyond regulated levels
  - Generating facilities have effects on regulated environmental attributes beyond the level of regulation. E.g., coal plants emits certain levels of particulates, sulfur dioxide, and hazardous gases even as those emissions are regulated to strict limits. Wind towers cause bird mortality even after the inclusion of regulatory requirements to reduce mortality effects.
  - These residual effects cause some level of damage. But, putting a quantified cost on those damages as part of the new resource costs has proved illusive.

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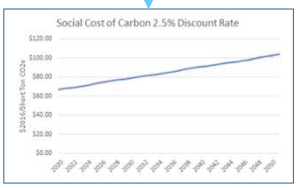
Examples of environmental effects beyond regulatory control (cont'd)

- Unregulated/residual—greenhouse gases and the "social cost of carbon"
  - Power plants emit greenhouse gases (carbon dioxide, nitrous oxide, and methane) that have not been subject to comprehensive emissions control and beyond what is regulated. Those emissions contribute to climate change which causes damages to things like ag production, human health, property damage etc. which the SCC attempts to estimate and capture in a dollar value
  - In the 2021 Plan, for the first time, the social cost of carbon was incorporated into the portfolio analysis to account for the damage cost of emissions from generating resources and accounted for in the *total system cost*
  - **Note** that this has mostly been an issue for others and for us with regard to *existing* generating resources and our understanding of the "cost" of the existing system and not the *new* resource cost comparison. But, also relevant to new gas resources in particular and thus relevant to the "environmental methodology."

The SCC in the 2021 Plan came from the intergovernmental Panel on Climate Change's Fifth Assessment Report— There is new federal guidance on the SCC value & discount rate that we will explore with our advisory committees



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Examples of environmental effects beyond regulatory control (cont'd)

- Unregulated/residual — upstream methane emissions in the 2021 Plan
  - Methane is the primary component of natural gas, and is a potent greenhouse gas. Oil and natural gas production and distribution facilities are emission sources.
  - For the 2021 Plan, upstream methane emissions were not subject to emissions limits. So, staff estimated upstream methane emissions related to the extraction, production and transport of natural gas to be used for generation and included these estimates when calculating the social cost of greenhouse gas emissions of a gas plant
  - Methane emissions from oil and gas production and distribution are now subject to emissions limits under the Clean Air Act, although the regulations are being contested in federal court.
  - This should put the situation with upstream methane more in the nature of regulated emissions with residual emissions and effects.

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3. Costs of compliance with proposed Regulation

- Quantifying compliance costs with existing regulations is a primary method; an additional consideration is how to capture and quantify effects under *proposed* regulatory controls
- Typically dealt with on a case-by-case basis, depending on the environmental effect and the quantitative data available

This has showed up as a consideration in past Plans, but wasn't a factor in the 2021 Plan, and is not yet something we're aware of for the 9th Plan. This is something Staff will continue to monitor.

4. Quantifiable environmental benefits

- In addition to costs, the Act calls for the methodology to include quantified environmental **benefits** in new resource costs.
- This has been a difficult & contentious piece of the environmental methodology
  - Benefits are difficult to capture quantitatively—what is the dollar cost of improved human health outcomes for example
  - They are easily double counted, since they are so tied to an environmental cost. How can we separate the additional (*monetary*) environmental benefit of a new resource that reduces an activity that has an environmental cost from that environmental cost that has already been accounted for
  - They are difficult to directly attribute to a specific resource or measure
  - They are difficult to apply consistently—often data is available for one source but not another—so we risk skewing our cost comparisons

Because of these challenges, we are unable to quantify any environmental benefits through the environmental methodology at this time. This does not prohibit the Council from recognizing and emphasizing in the resource strategy the value of certain resource choices in helping to mitigate harmful environmental effects

Summary: Proposal for methodology for quantifying the environmental costs and benefits of new resources

Staff Proposal for the 9th Plan:

1. Continue to account for the financial costs of compliance with **existing regulations** in the cost of new resources.
2. Continue to recognize that **residual and unregulated** environmental effects exist, describe them qualitatively in the narrative of the plan, and consider them when determining a resource strategy
3. Continue to address and consider costs of compliance with **proposed regulations** on a case-by-case basis
4. Continue our approach to environmental benefits: Do not attempt to include quantified environmental benefits in new resource costs beyond the few historic examples.
   - ❖ This leaves room to emphasize in other ways the value of certain resource choices in helping to mitigate harmful environmental effects outside of this methodology.

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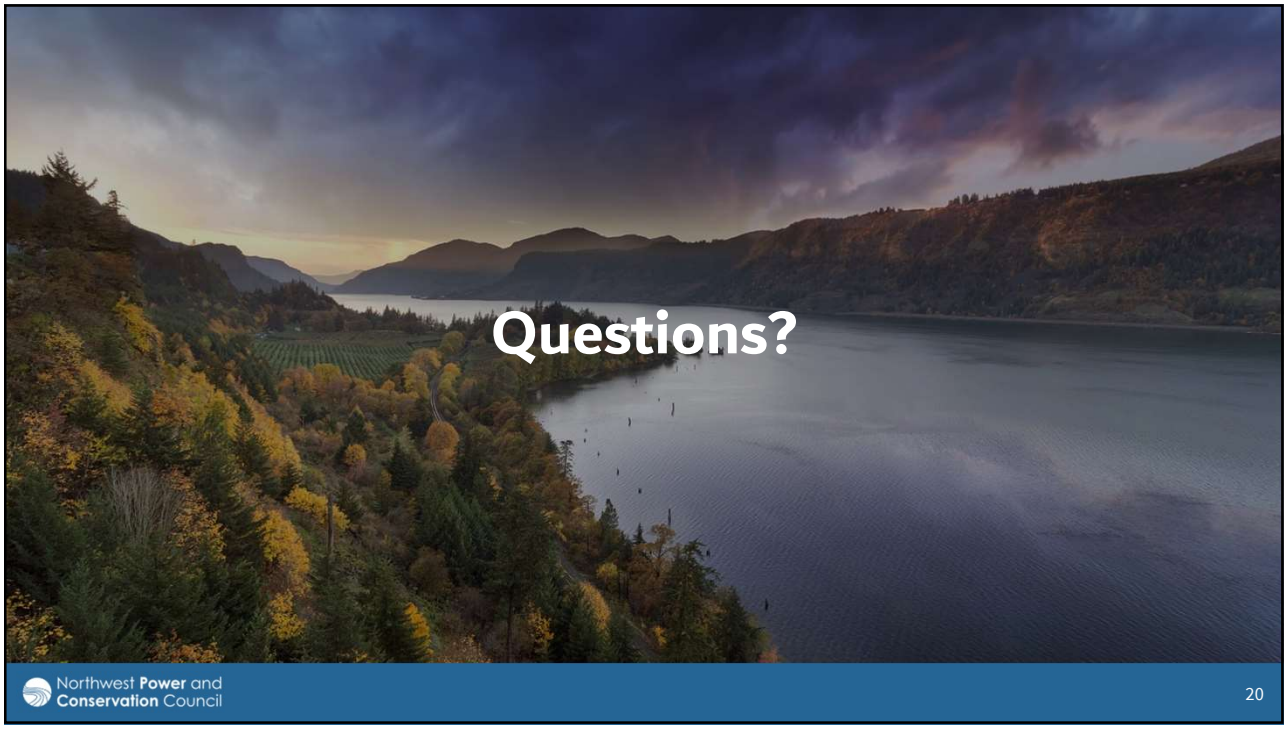

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