December 3, 2024

MEMORANDUM

TO: **Council Members**

FROM: **Annika Roberts, Resource Policy Analyst**

SUBJECT: **Ninth Plan Methodology for Ensuring Consistent Treatment of Costs Across New Resource Options**

BACKGROUND:

Presenter: Annika Roberts, Resource Policy Analyst & Jennifer Light, Director of Power Planning

Summary: The Council always strives for consistent valuation of resources in its power planning. To provide increased clarity around this approach, the Council developed the Quantifiable Resource Cost Framework during the 2021 Plan process. This framework highlights which new resource costs are considered in the Power Act, and therefore able to be quantified in our planning. At this meeting, staff will present on the framework to orient the Council to the treatment of resource costs in preparation for the ninth power plan.

Relevance: Establishing consistency at the beginning of the planning process is critical to the development of a cost-effective resource mix for the region. This presentation is an opportunity to raise questions/concerns about the proposed methodology for ensuring we're approaching costs in a way that is both consistent with the Act and consistent between resources. This will allow us to compare new resource options most fairly and arrive at the resource strategy that best provides an economic, efficient, and reliable electric system to meet the needs of consumers in the Pacific Northwest.

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

More Info: The Resource Cost Framework workbook can be found here: https://nwcouncil.box.com/s/vq8q91zmci8u3ps3qj7zlmj8la1qhqyx

Section 11 of the 2021 Power Plan includes the 2021 Power Plan's approach on the Methodology for Determining Quantifiable Environmental Costs and Benefits. The proposed approach for the Ninth Power Plan is consistent. Staff recommend reviewing this as a starting point reference: https://www.nwcouncil.org/fs/17680/2021powerplan_2022-3.pdf

Ninth Plan Methodology for Ensuring Consistent Treatment of Costs Across New Resource Options

Quantifiable Resource Cost Framework

December 2024 Council Meeting

Annika Roberts, Resource Policy Analyst

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

Overview

What

- What is the framework and what prompted us to build it
- Who is the framework for
  - Intended uses

Structure

- Act considerations behind what costs we considered
- How does the actual workbook function

Specifics

- Changes/Updates since the 2021 Plan
  - Tax Credits
  - Resiliency
- Environmental Methodology

Advisory Committee

- Response from Advisory Committees

What are we doing and why

Intention of the framework more broadly

- This is not a new way for us to treat resources—the Council has always strived for consistent valuation—but the framework format was a 2021 Plan development
- The goal of this is to promote consistency, transparency, & clarity in our treatment of resource costs

Intention of *this* meeting

- We will be walking through the resource cost framework with the group in preparation for the 9th Plan with specific attention on pieces that are different from the last plan, with built in discussion time for those topics
- We will be focused on the methodology of the framework, while any details of application will go through the appropriate committee
- We hope you leave this meeting well oriented with the Council's consistent treatment of resource costs

Who is it for

Audience	Provides	Use Case
Council Staff	Single reference for all staff on treatment of resource costs	Working document to reflect current accounting, ensuring communication and consistency among staff
Council Members	More detailed understanding of resource costs	Starting point for questions and feedback
Stakeholders & Advisory Committees	Broadens the understanding, with a look across all resources, rather than the narrow look at a single resource	Informing and seeking feedback on method and inputs
Regional Technical Forum	Direction on how Council accounts for costs	Enables updates to a single measure while maintaining consistency, with clear understanding of what is in/out of cost consideration

Structure

How was the framework developed?
How does the Act guide this development?
What does the actual framework look like?

A brief history

1.

- The idea behind this methodology was borrowed from the national standard practice manual's resource value framework, a resource for assessing cost effectiveness of energy efficiency resources.
- A resource value framework: Identifies and articulates the jurisdiction's applicable policy goals
- To ensure:
  - symmetrical consideration of costs and benefits
  - accounting for all relevant impacts including those that are hard to quantify
  - transparent presenting of inputs and results

2.

- Based on that framing, we identified our *jurisdiction*: **the Region**, and our *policy driver*, the **Power Act**, and developed a list of potential resource cost considerations.
- We applied the Act's definition of system cost to our list to determine whether they were quantifiable and applicable under the Act

3.

- That allowed us to start putting the framework together with the goal of building something that addressed all of the "ensure" goals listed in the first step.
- This informed the formatting of the framework where for every potential cost each resource type is addressed ensuring symmetry, transparency, and thoroughness.
- This ultimately didn't add to or change our approach to quantifying costs, it just allows for clarity by compiling all our decisions in one spot.

The Power Act: *Our Policy Driver*

Plan Priority:

- The plan shall…give priority to resources which the Council determines to be cost-effective. Priority shall be given: first, to conservation; second, to renewable resources; third, to generating resources utilizing waste heat or generating resources of high fuel conversion efficiency; and fourth, to all other resources.

[Northwest Power Act, §4(e)(7), 94 Stat. 2705]

Due Consideration:

- The plan shall set forth a general scheme for implementing conservation measures and developing resources pursuant to section 839d of this title to reduce or meet the Administrator's obligations with due consideration by the Council for
  - (A) environmental quality,
  - (B) compatibility with the existing regional power system,
  - (C) protection, mitigation, and enhancement of fish 92"::' NW Power Act and wildlife and related spawning grounds and habitat, including sufficient quantities and qualities of flows for successful migration, survival, and propagation of anadromous fish, and
  - (D) other criteria which may be set forth in the plan.

[Northwest Power Act, §4(ef(2), 94 Stat. 2706.]

Cost effective:

- "Cost-effective", when applied to any measure or resource referred to in this chapter, means that such measure or resource must be forecast
  - I. to be reliable and available within the time it is needed, and
  - II. to meet or reduce the electric power demand, as determined by the Council or the Administrator, as appropriate, 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, or any combination thereof.

[Northwest Power Act, §3(4)(A)(i)&(ii), 94 Stat. 2698.)

Costs to be Considered (1)

"System Cost" as defined by the Act:

"… an estimate of all **direct costs of a measure or resource over its effective life**, including, if applicable, 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 the Administrator determines, on the basis of a methodology developed by the Council as part of the plan, or in the absence of the plan by the Administrator, are directly attributable to such measure or resource."

[Northwest Power Act, §3(4)(B), 94 Stat. 2698-9.]

Costs to be Considered (2)

Direct costs of measure or resource over its effective life

- Capital/incremental costs
- Operations and maintenance
- Administrative costs
- Tax credits

Distribution and transmission

- Transmission (existing, new)
- Transmission and distribution (deferral)
- Generation (deferral)

Waste disposal costs, end-of-cycle costs, and fuel costs

- Fuel costs
- Decommissioning and end-of-lifecycle costs
- Disposal of hazardous waste

Quantifiable environmental costs and benefits

- Greenhouse gas emissions
- Particulates
- Impacts on land, water, and air
- Water use (volume)

Other Costs

- Regional preference adder
- Resiliency
- Reliability
- Ancillary services

The Power Act gives preference to resources that meet the definition of conservation (§3(4)(D), 94 stat. 2699)

The Power Act seeks an "adequate, efficient, economical, and reliable power supply" (§2(2), 94 stat. 2697)

Framework Snapshot

List of potential resource costs or benefits

Determination of whether it is quantifiable

Discussion of costs accounted for in the power system models

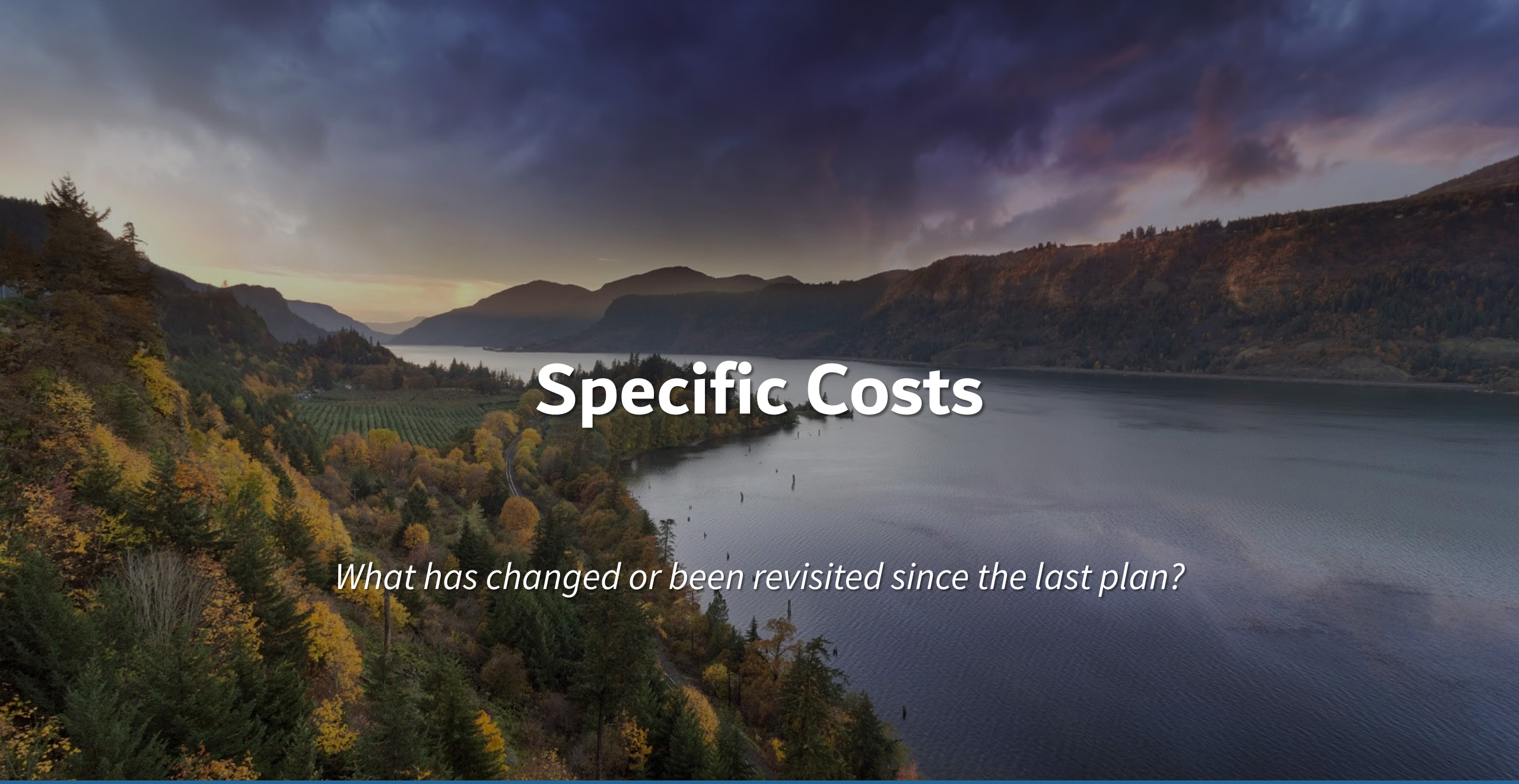
Working Document - Direct Quantifiable Resource Costs

	Direction from the Power Act			Council approach to accounting for cost of new resource/technology competing in the power system models			Quantified in power system models
Potential Resource Cost Consideration	**Within the Power Act's definition of "system cost"?**	**Explanation for fit within the Power Act definition**	**Can the cost be quantified within the Council's Power Plan?**	**Generating Resources** Supply-side resources, demand-side generating resources (including distributed generation), and energy storage.	**Energy Efficiency**	**Demand Response**	**System** Quantified in Council's power system models - AURORA, Regional Portfolio Model, GENESYS
Capital/incremental cost: Cost of the resource or measure	Yes	The system cost, as defined in the Act, includes the direct cost of the resource. This is a key component of that direct cost.	Yes	Overnight capital cost is estimated for each new reference plant (technology and configuration).	Include the cost of the measure. For retrofit measures, it is the full cost of the measure. For lost opportunity, it is the incremental cost of measure over the cost of the assumed baseline equipment.	These would be enablement costs, including technology and installation of control device	
Operations and maintenance costs: Cost of operations and ongoing maintenance of the resource or measure, includin and equipment directly attributable	Yes	System costs, as defined in the Act, cons ders the direct cost of	Yes	Fixed and variable operating and maintenance costs are assigned to each new generating resou	These are accounted for directly in the cost of a measure. The O&M costs are estimated	Generally includes event notification and verification of savings. These costs would be unning the program. d-use O&M costs due to hich the incentive his could be captured in what portion of the incentive is included in the co	Operating and maintenance costs are calculated for the existing system.
Fuel cost (production): This includes the costs of fuel as part of the lifetime cost of the resource. For example, the cost of gas or coal to fuel production.	Yes	System cost, as defined by the Act, includes fuel costs.	Yes	Not explicitly quantified at the resource level. See system.	Not explicitly quantified at the resource level. See system.	Not explicitly quantified at See system.	included ith any
Fuel cost (end-use): This accounts for any change in fuel use at the end use as a direct result of the measure.	Yes	System cost, as defined by the Act, includes fuel costs.	Yes	Not currently quantifiable or not applicable	Where a measures results in a reduction (or increase) of a non-electric fuel, that is quantified and value. For wood savings, that is valued at the retail rate of electricity. For gas savings, it values it at the forecasted	End use fuel switching due to DR could be captured if data existed to do so.	

Determination of whether within Power Act definition

Discussion of accounting of costs in supply curves (where applicable)

Additional costs considered at RTF



Specific Costs

What has changed or been revisited since the last plan?

Tax Credits: State & Federal

- Past treatment:
  - Federal→ in
  - State→ transfer payment
- Proposing for 9th Plan:
  - Federal → in
  - Federally funded state programming → in
  - State → in when possible

This would be especially relevant to EE measures. Staff will work with the CRAC on how to implement this approach.

Non-exhaustive

Idaho
Residential alternative energy tax deduction
Property Tax Exemption for Wind, Solar, and Geothermal Energy Producers
Income Tax Deduction for Energy Efficiency Upgrades
Montana
Montana Energy Conservation and Installation Tax Credit
Alternative Energy System Credit
Property Tax exemption for renewable energy facilities under one megawatt
Personal income tax credits for installing a residential geothermal system
Alternative Energy Revolving Loan Program
Oregon
SB 1536
HB 2021: Community Renewable Energy Grant Program
Local Option - Rural Renewable Energy Development Zones
Washington
Sales tax exmption
Clean Alternative Fuel Commercial Vehicles and Vehicle Infrastructure Tax Credit
Electric Vehicle Infrastructure Batteries, and Fuel Cells Sales/Use Tax Exemption, Leasehold Tax Exemption
Clean Alternative Fuel and Plug-in Hybrid Vehicles Sales/Use Tax Exemptions

Resilience: Building vs System

- New since last plan, we are differentiating between bulk power system resiliency and building resiliency
  - The RTF conducted a whole home resiliency study, as recommended by the 2021 Power Plan, and have come up with a value that captures improved building resiliency from passive EE measures
    - We are working to extend this value to distributed solar/batteries
  - This value is distinct from *system* resiliency:
    - Defined as protection against high impact events that occurs with low frequency
    - These are:
      - Difficult to represent namely due to their low frequency
      - Captured as best we can elsewhere in adequacy/reliability efforts
    - We are still considering how to treat operational risk from wildfires.

Building Resiliency

- In the study, building resilience is defined as the ability for building to prepare for, mitigate and recover from the negative occupant and/or physical impact of infrequent but extreme events
- The value applies to passive EE measures like weatherization, as the home is without electricity during the event that is being quantified

An inefficient home requires more energy to maintain temperature during outage versus an efficient weatherized home.

- Estimate avoided cost of energy delivered during building resilience event
- Estimate the annual building resilience energy savings associated with energy efficient measure
- Multiply annual building resilience energy savings by avoided cost to get total annual value of building resilience benefits for the energy-efficiency measure

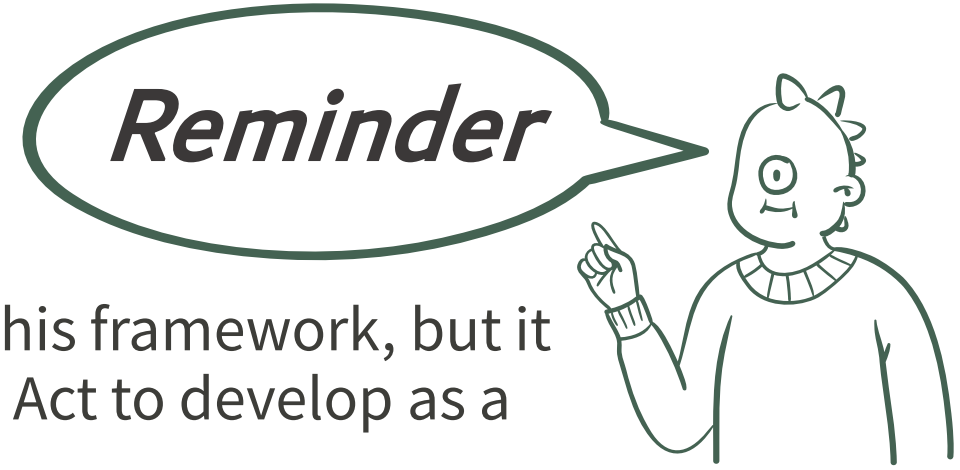
Energy Inefficient

We recognize that rooftop solar or distributed batteries would also help a home ride out a resiliency event, and will apply a comparable value to those resources as well

Environmental Methodology

A reminder/recap

Environmental Methodology



- The environmental methodology is included in this framework, but it is a separate process that we are required by the Act to develop as a part of any new power plan
- It is a *methodology* for considering *quantifiable* resource costs and benefits, and is just one, very confined, piece of how the environment is considered in the power plan
- It is required and defined by the Act, so in the next few slides we're going to look at the text of the Act to help us understand what the environmental methodology is and is not

Quantifying Environmental Costs & Benefits

- 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

Due Consideration

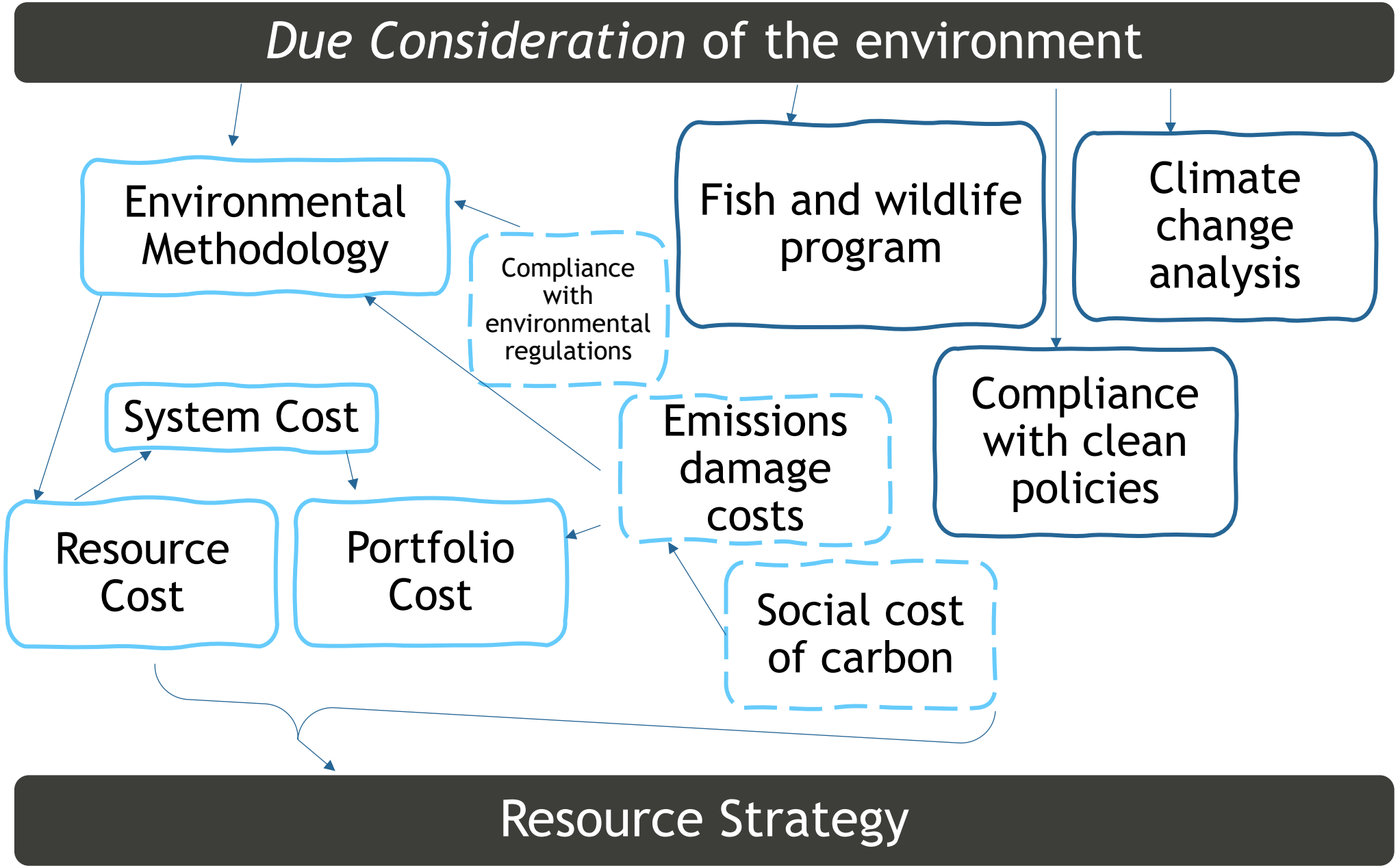
- A different section of the Act (Section 4(e)(2)) calls on the Council, in developing the new resource strategy for the plan, to give "due consideration" for environmental quality, fish and wildlife matters, compatibility with the existing system, and other criteria the Council may set forth.
- This 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

→ → → →

A visualization of the many ways the Plan can and does incorporate environmental considerations when producing the resource strategy

→ → → →



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, if possible to quantify
3. Costs of compliance with proposed environmental regulations
4. Quantifiable environmental benefits

This is the primary way environmental costs are quantified

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 consideration which we will walk through in more detail in the following slides

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

2. Environmental effects beyond regulatory controls, if possible to quantify

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*
  - *i.e. a* coal plant emits certain levels of particulates, SO2 etc. beyond the strict emission limits place on them. Or wind turbines still kill birds despite regulatory requirements to reduce mortalities
  - 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.
- Unregulated—Environmental effects that are not currently under regulation
  - *i.e.* Power plants emit greenhouse gases that have not been subject to comprehensive emissions control. Those emissions contribute to climate change which causes damages to things like ag production, human health, property damage etc. which we have attempted to capture in a dollar value by incorporating the SCC into our planning
  - The SCC was included in the total system cost for the first time in the 2021PP
  - The Council will include a SCC in the 9th Plan but the details still need to be worked out.

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

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

Advisory Committee Perspective

What did we hear from stakeholders?

Advisory Committee Discussion

- *Presented this framework and methodology at a joint advisory committee in November*
  - *This meeting was focused, like this presentation, on methodology. Any specific resource cost decisions will go back to their respective AC for further discussion as needed*
- *Response was broadly supportive of the approach with no substantive issues raised. However, the topics of additional discussion raised fell into a few categories described on the next slide*

The Generating Resource AC, Demand Response AC, & Conservation Resource AC were all represented at the joint committee meeting

The RTF Policy Advisory Committee has also seen and weighed in on the framework prior to this presentation

Advisory Committee Feedback

Topic Raised	Staff Response
Public Health • *Resiliency* • *Particulates*	Public health is not specifically a goal of the Power Act, although there is sometimes a connection (e.g. particulates) that also have environmental impacts The Council wrestled with this both the Seventh and 2021 Power Plan and determined there is a lack of appropriate data for all resources, and therefore these are better to deal with qualitatively
Distributed Resources • *Microgrids* • *Load center resources*	DERs like rooftop solar and BTM batteries will be included in our modeling as a resource to be compared against other resources more completely than they have in past plans The Council quantifies values (e.g. T&D deferral values) and models the system impacts where feasible, but there are some limitations in data and modeling capabilities
Wildfires	Staff are exploring how to account for the operational risk of wildfires in the ninth power plan. This will be discussed more at the January Council meeting
Permitting Costs	Permitting cost will be discussed with the GRAC as a component of the capital costs of a resource
Social Cost of Carbon	The SCC is required by some jurisdictions in the region and therefore will need some treatment in the plan. Staff is doing some testing on the SCC and will bring back a proposed approach for members to consider at an upcoming meeting (likely February.)
Tax Credits	At the RTF PAC the question of tax credits being treated as transfer payments was raised (ie all tax credits, federal and state should be considered transfer payments and therefore not accounted for). Staff maintains that due to the misalignment between the rate-base and the tax-base this would be an inaccurate treatment

Questions/Comments?

Annika Roberts, Resource Policy Analyst: aroberts@nwcouncil.org

Additional Slides

Potential Resource Cost Consideration	Within the Power Act's definition of "system cost"?	Can the cost be quantified within the Council's Power Plan?
Capital/incremental cost	Yes	Yes
Operations and maintenance costs	Yes	Yes
Fuel cost (production)	Yes	Yes
Fuel cost (end-use)	Yes	Yes
Transmission (existing, new)	Yes	Yes
Transmission and distribution (deferral)	Yes	Yes
Administrative costs	Yes	Yes
Tax credits (Federal)*	Yes	Yes
Tax credits (State)*	Yes	Yes
Regional preference adder	Yes	Yes
Building Resiliency*	Yes	Yes
Water use (volume, end-use)	Yes	Yes
Generation deferral	Yes	Yes
Economic development	No	n/a
Public Health	No	n/a
Safety	No	n/a
Security	No	n/a
Comfort	No	n/a
Aesthetics	No	n/a
Satisfaction/pride	No	n/a
Business	No	n/a
Insurance premiums	No	n/a

Potential Resource Cost Consideration	Within the Power Act's definition of "system cost"?	Can the cost be quantified within the Council's Power Plan?	Explanation
Reliability	Yes	Partially	*Reliability isn't perfectly distinct and separate from adequacy in the modeling. Captures the transfer of power from certain places, but are unable to capture everything.*
Ancillary services	Yes	Partially	*Some, not all, ancillary services are accounted for (balancing reserves & contingency reserves)*
Greenhouse Gas Emissions	Yes	Partially	*Some, not all, green house gases are accounted for (CO2e)(where we have data)*
Particulates and non-carbon emissions	Yes	Partially	*The cost of compliance for new and existing resources is incorporated into the total resource cost. Beyond compliance costs particulates/additional emission costs are not captured. Rationale is captured in the Environmental Methodology.*
Decommissioning/end-of-lifecycle, including disposal of hazardous waste	Yes	Partially	*If information is available decommissioning/ end of life costs are incorporated into resource costs, but data is fairly incomplete*
Impacts on land, water, and air	Yes	No	*Captured qualitatively but not able to quantify consistently with current available data*
Bulk Power System Resiliency*	Yes	No	*Reliability and adequacy on the bulk power system scale are considered in a long term planning context. However, an evaluation of resiliency improvements for recovery following an operational contingency or emergency measures are not included as they are difficult to predict and/or quantify.*