Purpose of Checklist: The State Environmental Policy Act (SEPA), in the Revised Code of Washington (RCW) Chapter 43.21C, requires all governmental agencies to consider the environmental impacts of a proposal before making decisions. An environmental impact statement (EIS) must be prepared for all proposals with probable significant adverse impacts on the environment. The purpose of this checklist is to provide information to help the District No.1 of Snohomish County's (the PUD) official and any other agencies with jurisdiction to identify impacts from a proposal (and to reduce or avoid impacts from the proposal, if it can be done) and to help the PUD decide whether an EIS is required.

A. BACKGROUND

1. Name of proposed project, if applicable:

   This is a non-project action, known as the draft 2025 Integrated Resource Plan (Draft 2025 IRP).

2. Name of applicant:

   Public Utility District No. 1 of Snohomish County (The PUD)

3. Address and phone number of applicant and contact person:

   Garrison Marr, Senior Manager Power Supply
   Public Utility District No. 1 of Snohomish County
   PO Box 1107, M/S E-4
   Everett, WA 98206-1107
   Telephone: 425-783-8268
   Email: gbmarr@snopud.com

   cc: John Haarlow, CEO/General Manager
   Jason Zyskowski, Chief Energy Resources Officer
   John Hoffman, Chief Customer Officer
   Public Utility District No. 1 of Snohomish County
   PO Box 1107
   Everett, WA 98206-1107

4. Date checklist prepared:

   October 13, 2025

5. Agency requesting checklist:

   Public Utility District No. 1 of Snohomish County (The PUD)

6. Proposed timing or schedule (including phasing, if applicable):

   The Draft 2025 IRP was presented to the PUD's Board of Commissioners (the "Board") during 5 public commission meetings with a walkthrough of the draft provided to the Board on October 21, 2025. The Board will continue to discuss the Draft 2025 IRP at one or more publicly noticed commission meetings. Adoption of a final 2025 IRP is required before the end of December 2025.

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.

   The Draft 2025 IRP is a non-project action. Pursuant to the RCW utilities such as the PUD prepare a comprehensive IRP every four years and/or a progress report every two years. The PUD anticipates that it will prepare and adopt future IRPs along that schedule with the Draft 2025 IRP being a comprehensive IRP with a new study scope, updated load forecast and new resource forecast.

   As required by statute, the Draft 2025 IRP establishes a long-term resource strategy describing the mix of supply side generating resources and demand side resources that will meet current and projected needs at the lowest reasonable cost and risk to the utility and its ratepayers, and a near-term action plan that describes actions to be taken by the utility to implement that plan.

   The activities described in the Draft 2025 IRP refer to future, programmatic activities in pursuit of additional data, study and evaluation of certain technologies.
   http://www.ecy.wa.gov/programs/sea/sepa/ChecklistGuidance.html

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

   The Draft 2025 IRP provides some generally available information about the general characteristics associated with the types of resources discussed within the document (see Section 5 Analytical Framework - Resource Options for the list of supply-

side and demand-side resources considered in the Draft 2025 IRP analysis). In addition, this checklist provides additional generally available and published information, including information identified in environmental documents by others. No other environmental information or documents are expected to be developed because the Draft 2025 IRP does not result in specific new construction activities.
http://www.ecy.wa.gov/programs/sea/sepa/ChecklistGuidance.html

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

N/A – This is a non-project action that does not contemplate the use of specific property.

10. List any government approvals or permits that will be needed for your proposal, if known.http://www.ecy.wa.gov/programs/sea/sepa/ChecklistGuidance.html

The Draft 2025 IRP was submitted to the Board for consideration and adoption. The final 2025 IRP will be submitted to the Washington State Department of Commerce (Commerce) pursuant to RCW 19.280.030 and 19.280.050 by December 31, 2025. Sections of the Draft 2025 IRP concerning the PUD's 10-year conservation potential estimate for the 2026 through 2035 period can be found in both the Executive Summary and Appendix A - Clean Energy Action Plan. The 10-year conservation potential estimate of 64.2 annual aMW for the 2026-2035 period, which demonstrates compliance with the Energy Independence Act, chapter 19.285 RCW and WAC 194-37-070(3). The PUD's 10-year conservation potential (64.2 annual aMW) was informed by the 2025 Draft IRP proposed Long Term Resource Strategy and demonstrates compliance with the Energy Independence Act, chapter 19.285 RCW and WAC 194-37-070(2). The PUD's 2026-2027 biennial conservation target is informed by the 10-year conservation potential and considered by the Board by December of 2025. After the 2026-2027 biennial conservation target is adopted by the Board it must be filed with Commerce by December 31, 2025.

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead

agencies may modify this form to include additional specific information on project description.)

The Draft 2025 IRP establishes a long-term resource strategy to meet projected utility needs and a near-term action plan that implements the long-term resource strategy. To achieve the lowest reasonable cost and low risk resource plan, a range of alternatives is considered. This requires a set of plans that are flexible for the utility and can adapt to changing circumstances without adverse financial impacts or other risks.

The Board has provided clear policy direction that the PUD will use integrated resource planning standards that:

a) *Consider the long-term costs and risks associated with greenhouse-gas-emitting generation sources and*
b) *Consider a diversity of resource options that provide the optimum balance of environmental and economic elements.*

The supply-side resources evaluated in the Draft 2025 IRP include Biodiesel, Geothermal, Run-of-River Small Hydro, Wind, Utility-scale Solar, collocated renewable plus storage, various energy storage types by dispatch duration, and non-emitting resources. Cost and planning assumptions for resources evaluated in the Draft 2025 IRP, are located in Section 5 – Supply-Side Resource Options.

For those resources identified in the various portfolios and in the long-term resource strategy, the Draft 2025 IRP does not consider specific projects, but rather only the general characteristics of the type of resource modeled in development of portfolios for each scenario. Therefore, the general characteristics of the types of resources discussed in the Draft 2025 IRP are described in Section D below.

The Draft 2025 IRP sets forth a number of possible or potential load and resource “futures” or scenarios, which represent a wide range of possible: regional economic factors, wholesale market energy prices, environmental factors, regulatory factors and uncertainties, customer electricity usage patterns, resource availability and costs, impacts of previously acquired conservation, and other factors.

The PUD contracted with Lighthouse Energy Consulting, to conduct a comprehensive assessment of energy efficiency potential ("Conservation Potential Assessment" or "CPA"), demand response potential ("Demand Response Potential Assessment" or "DRPA") and customer solar potential ("Solar Potential Assessment" or "SPA") in the PUD's service territory of Snohomish County and Camano Island. These studies considered available technologies, distribution system efficiencies and early-stage energy efficiency technologies, demand response and smart rates programs, and solar adoption curves, customer solar costs and incentivized potential that are likely to become available over the next 20 years. These reports included estimates of the achievable technical conservation potential, demand response potential and incentivized customer-owned solar available to the PUD. The Draft 2025 IRP then identified what level of conservation and demand response was economic for the range of scenarios while determining if an incentive for customer-owned solar would be cost-effective; the level of demand-side resources that were economic is outlined in Section 1, where a detailed description of the studies is located in Section 5 of the Draft 2025 IRP.

For supply side resources, the Draft 2025 IRP used a resource screening criteria that was based on objective and subjective criteria. The screening's objective criteria included costs, capacity factors, required secondary costs such as resource support services, cost of delivery, emissions factors as applicable, Renewable Energy Credit (REC) attributes, and project life. The screening's subjective criteria include non-quantifiable environmental considerations, location and deliverability relative to the PUD's service area, the dispatchability or flexibility, and the commercial availability of the resource type in the Pacific Northwest region.

Simultaneous with identifying the cost-effective conservation for each scenario, portfolio resources were identified that could meet shortfalls, if any, between the PUD's existing resources and the future demand, less the cost-effective conservation, identified in that scenario while minimizing the cost and ensuring compliance with clean energy regulations.

For each scenario PUD staff used an optimization model to develop

portfolios using lowest reasonable cost criterion and selected from demand and supply side resources that could satisfy the PUD's future energy needs and comply with applicable Board policies, regulations, and state laws. The details of the new resource additions proposed for each portfolio for the range of scenarios are outlined in Section 6 – Portfolio Development, of the Draft 2025 IRP.

The Draft 2025 IRP proposes a long-term resource strategy for consideration by the Board. The 2025 strategy is comprised of supply-side and demand-side resources to meet the PUD's future needs at the lowest reasonable cost while remaining flexible to changing conditions. Section 7 discusses the Long-Term Resource Strategy in detail.

The Long-Term Resource Strategy is nonbinding, and the PUD and the Board retain full discretion to add or delete potential resource types from the plan or adjust the quantities and timing of acquisition of resources, to adapt to changing circumstances. In addition, as stated in Sections 1, 6, and 7, since supply-side generating resource acquisition is dependent on load growth and regulatory needs, based on the scenario the PUD has many opportunities to re-evaluate its future resource need and revisit the Long-Term Resource Strategy as it gains more information about environmental and regulatory policies and learns more about resource availability and costs.

In accordance with RCW 19.280, the Draft 2025 IRP sets forth a proposed action plan (see Section 7 of the 2025 Draft IRP), which consists of a number of general strategies to ensure the PUD is well positioned to serve the electricity needs of its customers into the future, as follows:

1) Acquire 7.5aMW of cost-effective conservation by 2027

- The Draft 2025 IRP sets a biennial conservation target of 7.5 cumulative annual aMW for 2026-2027. Conservation remains a critical resource for meeting future load growth as it has in previous IRP cycles. The acquisition of conservation savings reduces the demand for electricity, delaying the need to acquire new resources and reducing the overall cost of energy and regulatory compliance for PUD customers.

2) **Develop cost-effective Demand Response & Smart Rates options, maximizing the regulatory and peak management value.**
   - The PUD Advanced Metering Infrastructure investment and the maturation of a variety of new customer-facing technologies allows for new options that could allow customers more control over their bills, and more tools for the PUD to work with customers to shape the PUD load profile into a more cost effective one. While the 2025 Draft IRP identifies a variety of programs that would be financially cost-effective for the PUD, PUD staff have identified that additional development work is needed to find the programs that provide the most value for customers and reduce PUD costs to the benefits of all customers. Development work should also consider PUD staff resources required to launch and sustain programs. The 2025 Draft IRP sets a 4-year target of 26.6 MW of peak reduction capability.
3) **Develop local PUD solar resources and explore programs for large (>50kW) customer-owned solar resources.**
   - The 2025 Draft IRP finds that local solar could have increased value due to the Bonneville Power Administration (BPA) Power and Transmission product changes, recent state regulatory changes, and new features of the Post-2028 BPA Power contract. There are two local solar elements found cost-effective in the 2025 Draft IRP: PUD-managed solar at larger (1-5MW) build sizes, and customer-owned solar at build sizes greater than 50kw. Accordingly, PUD staff should:
     - Develop a plan to deliver up to 10MW of cost-effective locally sited, PUD-managed solar projects, in increments not to exceed 5MW, by 2035. This plan should prioritize the regulatory value of these projects granted by WA State Bill 5445 and BPA's Post-2028 contract resource allotments.
     - Assess the feasibility of developing and managing an incentive program for larger customer-owned solar projects (> 50kW) in partnership with local stakeholders. Large size customer owned solar projects are an underdeveloped market segment which offers unique benefits and economies of scale. Developing programs or incentives for large scale customer solar projects creates opportunities for the PUD to lower costs and acquire environmental attributes while being responsive to customer feedback on expanding customer solar options. PUD staff should develop a framework to effectively deliver cost-effective large-scale customer

solar and ensure appropriate PUD staff resources and organizational capabilities can support the framework.

4) **Perform due diligence on regional renewable energy projects, and prepare for potential procurement activity**
   - 200 MW of new renewables are identified in Years 3-10 of the Resource Strategy for clean energy regulation compliance and load growth. Renewable resources take time to develop and to prepare for potential renewable additions, PUD staff will start due diligence activities now, making flexible procurement plans. Due diligence activities include but aren't limited to: evaluating the potential to access existing projects, monitoring regional Request for Proposals (RFP) and announced contracts for best practices and price points, evaluating transmission needs, talking with regional peers to identify partnership opportunities, and procurement activities like Requests for Information (RFI) and RFP.
5) **Perform additional analysis on Above-High-Water-Mark load service options**
   - The PUD will choose a Tier 2 election strategy in 2026 for above-high-water-mark service. At the time of the Draft 2025 IRP, BPA has provided limited information on the contents of the Long-Term Tier 2 product option, and the 2026 BPA Resource Program was not completed. PUD staff expect additional information before the Tier 2 election deadline and anticipate performing additional analysis to ensure that the PUD makes an appropriate election and makes any needed adjustments to resource planning in response to that election. PUD staff will provide the results of the analysis to the Board with a recommendation to inform Board decision-making.
6) **Ensure compliance with clean energy mandates**
   - The PUD is committed to meeting or exceeding clean energy and carbon regulatory requirements, and the PUD's portfolio is well-positioned to do so. The Draft 2025 IRP forecasts a need to acquire RECs in the near-term to augment portfolio resources and meet Renewable Portfolio Standards. PUD staff will:
     - Continue to develop its REC procurement framework to mitigate risks and employ lowest cost strategies.
     - Implement the Clean Energy Implementation Plan and Clean Energy Action Plan contained in the Draft 2025 IRP per the Clean Energy Transformation Act statute.

7) Perform due diligence on local battery energy storage

- PUD staff should continue to perform due diligence on utility-scale local battery projects including quantifying cost savings via in-house development, quantifying local transmission and distribution system value, and considering the strategic value of reducing regional transmission system risks while working with local stakeholders. The results of the due diligence process should inform a comprehensive strategy for local energy storage.

8) Explore partnerships with local fusion energy companies

- Snohomish County is home to a developing fusion energy sector and the PUD is well positioned to further relationships with local fusion energy developers. The PUD will appropriately support local fusion companies and continue to follow advances in this sector.

9) Continue to engage in regional transmission policy and planning efforts to ensure sufficient transmission capacity to serve load

- Regional transmission availability and reliability is a topic of sector-wide concern and PUD staff should continue to be at the table on behalf of PUD customers to advocate for projects and policy that reduce risks and follow sound business principles.

10) Continue to engage in Organized Markets development.

- Various regional discussions on Regional Transmission Organizations (RTO), Day Ahead Markets, and other market structures can present new risks and opportunities for the PUD. To adequately plan and influence market formation and design, PUD staff should continue to participate in relevant discussions, evaluations, and exploratory efforts to mitigate risks and develop new opportunities for the PUD on behalf of its customers. Specifically, PUD staff should continue advocacy to ensure hydropower is appropriately valued, that the economic opportunities and risks of planned dispatchable resources are accounted for, and regulatory compliance is facilitated.

11) Demonstrate regional leadership on power, transmission and policy issues.

- Regional issues require the active engagement by subject matter experts to guide policymaking that could have significant implications for risks, costs, and opportunities for PUD ratepayers. Accordingly, PUD staff should:

- Continue to engage in local, state and federal policymaking for energy-related issues. Analysis in the Draft 2025 IRP has found that state regulatory compliance obligations drive resource builds and that alternative regulatory compliance structures can produce cost savings for PUD customers. PUD staff should continue to be engaged with local, state and federal policymaking that can help meet clean energy and carbon goals at the lowest reasonable cost to ratepayers.
- Continue to advocate for sound business principles and sound policy in BPA proceedings to achieve low and stable cost trajectories of BPA Power and Transmission products. BPA continues to be an integral part of the PUD's long-term power supply and keeping BPA's costs low and stable is a critical method of mitigating cost pressures on our customers. Collaborative efforts with BPA to ensure sound business practices and sensible policy objectives are followed and met will ensure BPA's long-term financial sustainability and stewardship of the regions unique resources.

12) Continue to build and enhance community engagement on long-term planning

- PUD staff should continue to develop and enhance community engagement efforts in the development of long-term plans. This customer-centric approach will help ensure that planning efforts meet the needs of customers and incorporate the feedback from customers.

13) Continue to advance the PUD's long-term planning tools to capture more risks, opportunities and scenario-planning tools with the goal of achieving lowest reasonable costs for customers.

- PUD staff should continue to work cross-functionally to capture the potential of local resources to defer infrastructure needs and costs on the T&D system. Systematically capturing such opportunities within Resource planning and T&D System planning efforts has the potential to identify cost-saving investments across PUD business lines. Specifically, PUD staff should:
  i. Develop and solicit an RFP for a new Demand Side Services support contract to deliver updated Conservation Potential Assessment, Demand Response Potential Assessment, and Solar Potential Assessment studies based on PUD staff recommendations.

- Continue to advance the Load-Following Optimization Model for the Draft 2025 IRP, incorporating more tools to capture risks, opportunities, and deeper scenario analysis.

14) Develop a strategy and framework to manage new large load requests

- PUD staff should work collaboratively across departments to develop a strategic framework for managing new large load requests. The increasing volume of these requests presents significant implications for the PUD and warrants further analysis before service commitments are made. A comprehensive framework is needed to guide the evaluation and processing of future large load requests.

As with the Long-Term Resource Strategy, this list represents non-project actions, the general characteristics are discussed in Section D of this checklist, as appropriate.
http://www.ecy.wa.gov/programs/sea/sepa/ChecklistGuidance.html

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

The Draft 2025 IRP is a non-project action that does not involve specific locations or projects. There are several reasons why no specific projects are identified or analyzed in this document. First, the primary purpose of identifying types of projects is to set out general characteristics of resources for purposes of comparing them to other types of resources. For example, wind or solar compared to biodiesel or small hydro. Second, in the context of the integrated resource planning process, each of the resource types of the resource portfolios for each future scenario could be met by any of that resource type, not necessarily a specific project. Each resource is generic and not project specific. Finally, if a particular project were to be pursued, it would entail a separate, project-specific level of environmental review.
http://www.ecy.wa.gov/programs/sea/sepa/ChecklistGuidance.html

B. ENVIRONMENTAL ELEMENTS

Since the Draft 2025 IRP is a non-project action without designated locations or projects, PUD staff has determined that omitting the questions in Part B of the checklist is appropriate, as they do not contribute meaningfully to the analysis.

Instead, the typical characteristics and impacts associated with the types of resources included in the Draft 2025 IRP are described in Part D of this checklist.

C. SIGNATURE

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: Garrison marr

Name of signee Garrison B. Marr

Position and Agency/Organization Senior Manager Power Supply, Snohomish PUD

Date Submitted: October 13, 2025

Part D – Supplemental Sheet for Non-project Actions

1. How would the proposal be likely to increase discharge to water; emissions to air; production, storage, or release of toxic or hazardous substances; or production of noise?

Typical Construction Activities and Common Operational Impacts

There is the potential for a similar set of construction related impacts with many different types of power generation facilities and associated infrastructure that would be common to the generation resources described in this analysis, including but not limited to: clearing, grading, vegetation removal, excavation, operating heavy equipment that compacts soil, drilling or blasting, construction of access roads, and installation of utilities.

In addition, common impacts associated with operation of many types of facilities include road maintenance, additional impervious surface, occasional additional vehicle traffic to and from the site, vegetation management and tree trimming, and the use and operation of electric transmission and distribution equipment, such as transformers, circuit breakers, poles and wires.

Operation of equipment and construction activity could lead to release of hazardous fluid (fuel and hydraulic oils, etc.) to ground or surface water.

Clearing and grading can expose soil and lead to erosion, or turbidity.

Noise could be produced during construction activities, from operation of equipment, drilling or blasting activities.

There would be temporary emissions from the exhaust of construction equipment, including Carbon Monoxide (CO), Carbon Dioxide (CO2), sulfur oxides (SOx), particulates, oxides of nitrogen (NOx) and volatile organic hydrocarbons (VOCs). Exposed soil and heavy mobile equipment could generate fugitive dust emissions.

There is equipment used in the operation of the facilities, powerhouse and switchyard that contains potentially hazardous materials, such as batteries (acids) and, circuit breakers (SF6 gas).

Many construction-related impacts in this category are likely to be temporary and mitigated by the use of the use of Storm water Pollution Prevention Plans (SWPPPs), Spill Prevention, Containment, and Countermeasures Plans (SPCCs), Temporary Erosion and Sediment Control Best Management Practices (BMPs), water quality BMPs, and by compliance with noise ordinances, clearing and grading ordinances, water quality-related permits. In addition, temporary impacts can be mitigated in part by appropriate siting for energy projects, scheduling construction during the dry season, ensuring proper disposal of spoils and waste products.

In operations, mitigation can include the use of SWPPPs, SPCCs and BMPs, NPDES industrial permits, relevant air quality permits, and good maintenance of vehicles and equipment. The Draft 2025 IRP assumes that any new resource or plant would acquire all necessary air quality, siting and other operating permits, and meet all local, state and federal environmental standards.

Use of resources described in the Draft 2025 IRP may include release of greenhouse gases, including annual CO2 output, known SF6 releases from any sources, and other greenhouse gases from ongoing operations. Currently, the PUD is below the 25,000 metric ton threshold.

Small Run-of-River Hydro

Hydroelectric power is a renewable energy derived from the generation of electric power from the flow of water, from a reasonable height of fall, called the head, through a penstock into a turbine. For purposes of this analysis, conventional hydro technology is assumed, with a capacity of approximately 7.5 MW or less. PUD small hydro facilities are assumed to be primarily run-of-river projects, which

divert a portion of the water to a pressurized pipeline that delivers it to a turbine downstream for energy production. In addition, this analysis assumes projects consistent with PUD criteria. These criteria include: 1) located to the extent possible outside of sensitive areas such as designated wilderness lands, 2) in the upper reaches of creeks above anadromous fish populations, and 3) in or near the PUD's service area to reduce the need for new transmission lines and to minimize line losses and environmental impacts.

Operation of small hydro projects can typically alter the timing and rate of water flow in the streams or rivers on which they operate. Changing flow rate of water can affect water quality, including turbidity and temperature.

Air emissions are negligible because no fuels are burned, however if a large amount of vegetation is growing along the riverbed and not removed prior to when a dam or weir is built, it can decay in the impoundment or lake that is created, causing buildup and release of methane, a powerful greenhouse gas.

Protection, mitigation, and enhancement measures (PM&Es) for construction and/or operational impacts associated with small hydro are addressed in the FERC license and other permits required for a project. These PM&Es can often be in excess of the impacts; thereby, providing a net benefit.

Geothermal

Geothermal is a renewable energy derived from the natural heat in the earth's crust. As groundwater is heated, geothermal energy may be produced in the form of hot water and steam. Steam from the geothermal reservoirs is used to spin turbine generators and produce electric energy. The geothermal water is then returned down an injection well into the geothermal reservoir to maintain pressure, sustain the reservoir, and eventually reheated. For purposes of this analysis, conventional binary cycle technology is assumed, in which the geothermal liquid is brought to the surface through wells, passed through a heat exchanger, and the cooled geothermal liquid is re-injected to the reservoir.

Emissions associated with generating electricity from geothermal technology are negligible because no fuels are combusted. (EPA: Non-

hydroelectric Renewable Energy/Clean Energy). Geothermal steam can also contain hydrogen sulfide gas, which has a rotten egg smell, but usually it is below the level that most people would be able to detect.

Geothermal plants using binary technology with air-cooling use minimal fresh water, but may affect groundwater if large amounts of steam are extracted before being reinjected.

Depending on the geothermal site, groundwater may contain solids that must be filtered before steam is sent to the turbines. Byproducts of filtering would be appropriately disposed of depending on their composition, and may go back into the well, may be disposed of in a landfill, or may be alternately disposed of as appropriate.

Wind

For wind projects, a renewable energy derived from wind, electricity is generated when air flows through a wind turbine, producing mechanical or electrical power. The wind turbine is typically mounted on top of tubular steel tower supporting a nacelle (the housing for an enclosed generator that is connected by a gearbox to the rotor) and a three-bladed rotor. Cables carry the generated electricity down the tower to a ground level base panel, then to a pad-mounted transformer located adjacent to the tower that steps up voltage, then to a power collection system that connects groups of wind turbines to a project substation. The substation equipment steps up voltage and feeds it to the transmission line to the regional grid. Modern wind turbines are large structures that range from 240 to 350 feet in height. Wind projects of 100 MW typically encompass a total project area of several thousand acres or more, though the permanent facilities only utilize 5 to 10% of the total acreage.

Emissions associated with generating electricity from wind technology are negligible because no fuels are combusted. (EPA: Non-hydroelectric Renewable Energy/Clean Energy) Wind project impacts are almost entirely dependent on siting considerations, and careful choice in appropriate site selection and project design in the early project stages would ensure impacts from these projects are avoided and minimized. There is a potential for noise impact/disturbance to humans and migrating birds associated with the rotating blades.

Biodiesel

For purposes of this analysis, a biodiesel facility produces electricity by directly combusting biodiesel a renewable fuel made from vegetable byproducts, used cooking fat or animal fats. The heat from combustion turns water into steam, which drives a turbine. The analysis assumes that the biodiesel plant will be a peaking facility, only running for short periods of time to supply peak energy needs.

Biodiesel generation releases more NOx than traditional diesel, a small amount of sulfur dioxide, and CO2, however these values are more commonly associated with vehicular usage. The amounts emitted depend on the type of biodiesel that is burned and the type of generator used.

Fuel handling in biodiesel plants is regulated to prevent releases to surface waters or ground waters.

Solar – Utility-Scale

Solar energy is a renewable energy derived from the sun, and generated by two basic technology alternatives, solar thermal and photovoltaic (PV). Only PV is assumed herein. PV devices use a semiconductor device, called solar cells, to convert light from the sun to electricity. Energy from the sunlight displaces electrons from their normal atomic orbits, a grid structure on the surface of the semiconductor collects these electrons and makes them available to be used in an external circuit. The semiconductor material can be crystalline or thin film. Crystalline cells are usually made from silicon, thin film can be amorphous silicon, copper indium diselenide, or cadmium telluride. For utility-scale solar, PV cells are connected as a module, modules are combined to make solar panels, and solar panels are grouped into arrays. The amount and timing of solar power production depends upon the location of the generation source. A utility scale solar project of 5 megawatts with fixed mount panels would require approximately 50 acres of land.

Emissions associated with generating electricity from solar technologies are negligible because no fuels are combusted. (EPA: Non-hydroelectric Renewable Energy/Clean Energy)

Proper operation of the solar facility requires regular cleaning of the panels, which uses small amounts of water.

Depending upon the location, solar facilities may use large amounts of dust suppressants because dust can affect panel performance. These suppressants may contain brines and salts, organic non-petroleum products, and other constituents.

Pumped Storage Hydro

Pumped Storage Hydroelectric Storage or Pumped Hydro, is a mature energy storage technology. Electric energy is converted to potential energy and stored in the form of water at an upper elevation. Pumping the water uphill for temporary storage refills or recharges the reservoir so that during periods of high electricity demand, the stored water can be re-released through the turbines and converted back to electricity like a conventional hydropower station.

New pumped hydro likely faces similar environmental siting issues as small hydro projects, including mitigation for effects on the upper and/or lower reservoirs, particularly if they do not already exist. Pumped hydro in its generating electricity mode has no direct emissions; however, the utility may not be able to identify emissions associated with the energy required to refill or recharge the reservoir through its pumping operations.

Battery Storage

Energy storage with batteries is a modular and flexible resource considered in the Draft 2025 IRP. In the most basic sense, a Lithium-Ion battery refers to a battery where the negative electrode (anode) and positive electrode (cathode) materials serve as a host for the lithium ion. Ions move from the anode to cathode during discharge, and reverse direction during charging. An electrolyte composed of an organic solvent and dissolved lithium salt provides the media for lithium ion transport. A variety of safety mechanisms are typically included in the design of battery systems, such as current interruption devices, fire suppression, and temperature alarms.

Batteries are generally sited at locations that already contain utility infrastructure such as at generation sites or substations. This mitigates the impacts on surrounding areas. Battery storage as an energy storage technology is a net energy consumer. It takes more energy to recharge the battery than the battery can generate. Energy storage projects are assumed to have no direct emissions, but the

utility may not be able to identify if there are emissions associated with the energy required to recharge the battery.

Local land use and construction permitting typically requires that containment be installed to prevent the release of hazardous substances from utility scale batteries and requires consultation with local fire authorities to ensure an adequate fire response plan is in place.

Simple Cycle Combustion Turbine

Simple Cycle Combustion Turbines (SCCTs) are a mature fossil fuel generation technology used in the power industry as a seasonal load and peak matching resource. SCCTs were modeled as price proxies for larger-scale dispatchable capacity resources. For power generation applications, investment costs for this peaking resource are cheaper than combined cycle combustion turbine plants but they operate less efficiently. SCCTs can be scaled to generate small or large amounts of power. These plants are typically designed and permitted to combust natural gas, distillate or a combination of the two to generate electricity.

In the Draft 2025 IRP, PUD staff modeled the cost and operating characteristics associated with dispatching a SCCT no more than 10% of the hours in a year, fueled by natural gas with distillate as the emergency backup fuel source. The combustion of natural gas produces carbon dioxide and nitrogen oxides, and the associated emissions are based on the efficiency of the plant since the carbon content of natural gas is fairly uniform at 117 lbs/MMbtu.

Combined Cycle Turbine

Combined Cycle Turbines (CCTs) are a mature fossil fuel generation technology used in the power industry to supply base load needs, operating similarly to other thermal resources. CCTs were modeled as price proxies for larger-scale dispatchable baseload resources. For power generation applications, investment costs for CCT’s are higher than simple cycle combustion turbine plants but they operate more efficiently for more hours in a year.

In the Draft 2025 IRP, PUD staff modeled the cost and operating characteristics associated with a CCT dispatched 95% of the hours in a year, fueled by natural gas with distillate as the emergency backup

fuel source. The combustion of natural gas produces carbon dioxide and nitrogen oxides, and the associated emissions are based on the efficiency of the plant since the carbon content of natural gas is the same 117 lbs/MMbtu.

Neither SCCT or CCT were considered for the long-term resource strategy but were used as a cost baseline against other resource options.

Demand Response and Smart Rates Programs

The Draft 2025 IRP used the results of the 2025 Demand Response Potential Assessment conducted by Lighthouse Energy Consulting that identified demand response and smart rates programs' potential by products and levelized cost to inform the demand side resource options evaluated in the Draft 2025 IRP analysis. Product/Program types and potential included:

1. Electric Vehicle (EV) charging
2. Various seasonal residential water heating
3. Various seasonal residential and/or commercial space heating
4. Industrial demand curtailment
5. Various seasonal residential, commercial, and/or industrial Time-of-Use (TOU) rates
6. Various seasonal residential, commercial, and/or industrial Critical Peak Pricing (CPP) rates
7. Utility based demand voltage programs
8. Customer-owned energy storage programs

Conservation Measures

Conservation resources include a wide range of methods to reduce energy use by customers. Conservation measures are typically grouped into programs based upon target customer groups, delivery methods, and funding sources. Conservation programs offer incentives, technical assistance, and/or loans to incent building to more efficient standards than are required by energy codes and appliance

standards.

Typical residential energy efficiency measures include wall, floor and ceiling insulation, windows, lighting, refrigerators, freezers, clothes washers, and ductless heat pumps.

Typical commercial measures include lighting, HVAC systems, refrigeration, building envelope (doors, windows, insulation, etc.), equipment, and appliances.

Conservation in the industrial sector focuses on increasing the efficiency of energy use in industrial processes and systems, and can include motors, pumps, heating, cooling, fluid handling, ventilation, lighting, controls, and space and material heating.

Energy efficiency measures such as insulation, windows, weather stripping and caulking can reduce air circulation and may reduce indoor air quality without proper ventilation consideration and implementation.

Compact fluorescent lightbulbs (CFLs) are historically considered an energy efficient lightbulb, but contain hazardous materials such as mercury, and must be properly disposed of. This is not an issue with modern light emitting diodes (LEDs), which are also significantly more energy efficient than CFLs.

Transmission

New or upgraded transmission facilities may be required to deliver electricity from new generation facilities to the PUD service area, or to improve the reliability, redundancy or otherwise increase the capacity of the system in a manner that could reduce or defer the need for new generation facilities. The PUD contracts for firm transmission with the Bonneville Power Administration to deliver energy from generating resources or the wholesale energy market and does not intend to construct any new transmission. Transmission lines are suspended on either lattice steel towers or wood or steel single-pole structures. Designs vary, but often towers can be over 100’ high. Transmission lines require access roads for construction and maintenance, and transmission line corridors must be kept clear of vegetation that could contact the lines and cause outages. The clearance distances are set by national standards and vary with the

voltage and design of the transmission system. Vegetation removal can be managed through physical removal or with herbicides, or a combination. The PUD has vegetation management standards that minimize the use of herbicides and pesticides.

Vegetation removal can have impacts on soil.

The scientific agencies that have considered health and safety impacts associated with electromagnetic fields have concluded that the extensive body of research shows that EMF from electric power transmission and substation equipment are not an established cause of any long-term adverse health effects (Seattle City Light, 2012 IRP). The PUD continues to monitor research into EMF, and PUD staff responds to concerns with information and assistance when requested by customers.

2. How would the proposal be likely to affect plants, animals, fish, or marine life?

Typical Construction Activities and Common Operational Impacts
Removing plants, soil, and disrupting biological, physical and chemical functions can reduce productivity and displace habitat at the locally affected site. Habitat for animals could be disturbed by vegetation removal and plant construction.

Aquatic habitat can be degraded by runoff, dust, and exposure to contaminants through spills and by loss of adjacent vegetation, which provides filtering, nutrient uptake and output, and temperature mitigation functions.

Many streams, rivers and waterbodies in the state contain important habitat for anadromous fish and other aquatic species protected under the Endangered Species Act and state laws, and many forested areas contain habitat for terrestrial species protected under the ESA and the Migratory Bird Treaty Act.

Many construction-related impacts in this category are likely to be temporary, but some are unavoidable. These impacts can be mitigated by careful project siting, use of careful design and planning and use of best management practices. Best management practices used in PUD projects would include: avoiding or minimizing work in critical areas

and buffers, conducting construction during dry season, use of in-water windows for work, establishing buffers, covering and stabilizing exposed soil areas, compliance with federal, state and local permits, including consultation under the ESA and preparation of biological opinions, and providing mitigation for impacted or lost habitat.

Increases in carbon emissions as a result of use of coal or other fossil fuel based generation can lead to a number of other impacts associated with climate change, including more severe weather events, changes in ocean and waterbody chemistry and temperatures.

In operations, mitigation can include the use of SWPPPs, SPCCs and BMPs, NPDES permits and air quality permits, and best management practices for maintenance. The Draft 2025 IRP assumes that any new resource or plant would acquire all necessary air quality, siting and other operating permits, and meet all state and federal environmental standards.

Small Hydro and Pumped Hydro

Depending on the type of project, small hydro and pumped hydro facilities can affect fish populations. Impacts are almost entirely dependent on siting considerations, and careful choice in appropriate site selection and project design in the early project stages, as recommended by the fish and wildlife agencies, would ensure impacts from these projects are avoided and minimized. As such, these impacts are typically addressed in the planning and licensing of such projects, and include consultation with state and federal agencies to determine the appropriate PM&E conditions. PM&Es could include requirements to: develop habitat improvements; purchase, protect and enhance land; add river channel improvements; and other requirements designed using the latest scientific information to protect specific species and habitats.

Geothermal

Typical construction and operational impacts.

Wind

Wind facilities can result in collision hazards for birds and bats, electrocution hazards, and potential interference with migratory behavior; however, the impacts can vary widely. U.S. Fish & Wildlife

Service in 2012 issued "Final Land-Based Wind Guidelines" to address siting, construction, operation and decommissioning of wind farms, to mitigate impacts. Washington Department Fish & Wildlife issued similar guidance in 2009.

Wind project impacts are almost entirely dependent on siting considerations, and careful choice in appropriate site selection and project design in the early project stages, as recommended by the guidance documents above, would ensure impacts from these projects are avoided and minimized.

Biodiesel
Typical construction and operational impacts.

Solar – Utility-Scale
Solar could require removal of vegetation from a large area. Roads associated with power plants have the potential to fragment habitat and displace local populations.

Depending upon the location of a potential resource, there may be protected desert species affected as well.

Battery Storage
Typical construction and operational impacts.

Simple Cycle Combustion Turbine
Typical construction and operational impacts.

Transmission
Transmission corridors require removal of vegetation within the corridor, and maintenance of clearances for lines. Transmission lines can result in bird collisions and electrocution.

3. How would the proposal be likely to deplete energy or natural resources?

Typical Construction Activities and Common Operational Impacts
Construction activities consume gas and other fuels for construction equipment, vehicles, and operations.

Any new construction requiring development in forested or rural lands could fragment habitat, increase road travel to the site, and otherwise locally impact the pattern of land use and temporal human activities locally. These impacts sometimes open the door to future development by providing access (via new roads) and basic services where these may have not been available, or were unapparent previously. Natural resources such as forest plant communities, water quality, and wildlife habitat can be impacted through fragmentation, increased weed intrusion, water runoff issues related to roads, etc. These impacts are especially apparent cumulatively as these changes happen over time, and project impacts may not rise to significant levels individually but can cause changes over time that may be significant in scope and impact.

Careful site selection, taking any long-term cumulative impacts into account, and energy siting policies that encourage urban or co-located energy facilities over new facilities in rural or otherwise undeveloped areas would mitigate some of these impacts. For example, policies that encourage facilities such as biomass, to the extent they are economically feasible, would minimize some of the impacts associated with new energy development.

Conservation measures, demand response programs and smart rate programs exemplify the kind of developments that avoid and mitigate additional energy or natural resource impacts that would be caused by more traditional power plant siting.

Small Hydro, Pumped Hydro, and Geothermal

Generating electricity from renewable energy sources reduces the use of other forms of energy such as fossil fuel and may reduce impacts on energy and natural resources.

Wind

Generating electricity from renewable energy sources reduce the use of other forms of energy such as fossil fuel, and may reduce impacts on energy and natural resources.

On the other hand, because wind is an intermittent resource with a great deal of volatility, it requires additional energy generation, or reserves in order to mitigate the volatility of energy production.

Biodiesel
Biodiesel plants use existing diesel turbines with renewable biofuels for peaking needs. These plants require large amount of biofuel to supply peaking capabilities, however, the assumption is that feedstock is from byproducts of cooking or farming and is not a dedicated crop.

Energy would be consumed in transporting and processing fuels, but these have relatively low impacts when compared with other forms of generation, taking into account avoided waste streams and the potential for co-location with other utility infrastructure or lower impact siting.

Solar – Utility Scale
Generating electricity from renewable energy sources reduce the use of other forms of energy such as fossil fuel, and may reduce impacts on energy and natural resources.

Pumped Storage Hydro and Battery Storage
Unlike conventional resources, energy storage resources are net energy consumers. It takes more energy to fill the project than the project will be able to generate. The utility may not always be able to identify the source of the energy used to charge the battery.

Simple Cycle Combustion Turbine
Reciprocating engines and simple cycle combustion turbines are designed and permitted to burn natural gas, distillate oil, or a combination of the two to generate electricity.

Demand Response and Smart Rates Programs
Shifting energy consumption from one period to another period or reducing energy consumption during periods of peak demand can reduce the use of other forms of energy such as fossil fuel, may reduce emissions and impacts on energy and natural resources.

Conservation Measures
Reducing energy consumption through the use of conservation reduces the use of other forms of energy such as fossil fuel, and may reduce emissions and impacts on energy and natural resources.

4. How would the proposal be likely to use or affect environmentally sensitive areas or areas designated (or eligible or under study) for governmental protection; such as parks, wilderness, wild and scenic rivers, threatened or endangered species habitat, historic or cultural sites, wetlands, flood plains, or prime farmlands?

Typical Construction Activities and Common Operational Impacts
Clearing, grading, excavation, access road construction and other construction activities could result in disturbances to sensitive areas such as wetlands, streams and buffer areas, as well as surface and subsurface disturbances to soil and geologic formations.

Power plants are generally not considered aesthetically pleasing and can be perceived as creating a negative aesthetic impact. Any new construction requiring development may have the potential to create impacts to environmentally sensitive areas, wetlands, floodplains or historic or cultural resource sites. Additionally, most surface waters in Washington are subject to Critical Areas codes that include floodplains protections, protections for adjacent wetlands, and protection for agricultural areas designated under the Growth Management Act rules. Each of these designations and regulations have associated requirements that would be considered in combination as part of the planning process for any specific project.

Careful site selection, taking any long-term cumulative impacts into account, and energy siting policies that encourage urban or co-located energy facilities over new facilities in rural or otherwise undeveloped areas would mitigate some of these impacts. For example, policies that encourage facilities such as biomass, to the extent they are economically feasible, would minimize some of the impacts associated with new energy development.

The Draft 2025 IRP assumes that any new or additional plant would acquire all necessary air quality, siting, and other operating and construction related permits.

Many construction-related impacts are likely to be temporary and mitigated by the use of Storm water Pollution Prevention Plans, SPCCs, Temporary Erosion and Sediment Control BMPs, water quality BMPs, and by obtaining and complying with applicable permits,

including critical areas permits, clearing and grading permits, NPDES and Waste Discharge Permits, Hydraulic Project Approvals, Section 404 permits and 401 Water quality certifications. Additional impacts can be mitigated by scheduling construction during the dry season or in water work windows.

Small Hydro and Pumped Storage Hydro

Several rivers in the State of Washington are listed on the State's list of Scenic Rivers pursuant to Chapter 79A.55 RCW, that may limit the development of small hydro resources. There is a federal listing of designated Wild and Scenic Rivers that prohibits development.

Where small hydro projects or pumped storage hydro projects are licensed, the licensing and permitting processes typically require conditions, as appropriate, to preserve, mitigate, restore or create recreational, cultural, historic, or aesthetic resources.

Geothermal

Geothermal plants can only be located where the resource is located. It is possible that the most likely location for geothermal resources could be in close proximity to areas such as Forest Service lands, National Parks, or Wilderness lands. These designations might prohibit or restrict development of the geothermal resource.

Wind

Impacts to environmentally sensitive areas are highly dependent upon where the project would be located. Given the size of the turbines and the amount of land needed for a wind generation facility, there likely would be impacts to aesthetic resources, and the turbines can be seen from great distances.

FAA requirements may also necessitate safety lighting, which has additional aesthetic impacts.

These impacts would be addressed during the planning and siting process.

Biodiesel

The Draft 2025 IRP assumes that biodiesel engines would be sited at locations that already contain utility infrastructure such as at generation sites or substations. To the extent that a biodiesel

project expanded the infrastructure on a given site, the impacts would be those generally described as common above.

Solar – Utility Scale
Given the size of the facility, a utility-scale solar plant can substantially change the visual quality of the setting.

Battery Storage
The Draft 2025 IRP assumes that battery storage would be sited at locations that already contain utility infrastructure such as at generation sites or substations. To the extent that a battery storage project expanded the infrastructure on a given site, the impacts would be those generally described as common above.

Simple Cycle Combustion Turbine
Impacts to environmentally sensitive areas are highly dependent upon where the project would be located. Power plants are generally not considered aesthetically pleasing and can be perceived as creating a negative aesthetic impact. These impacts would be addressed during the planning and siting process.

Transmission
Due to vegetation clearing, or access road operation and maintenance, transmission facilities may have impacts to sensitive areas such as wetlands, streams, buffer areas, that are generally mitigated through the permitting process with federal or state agencies.

5. **How would the proposal be likely to affect land and shoreline use, including whether it would allow or encourage land or shoreline uses incompatible with existing plans?**

Typical Construction Activities and Common Operational Impacts
Depending upon the type of project, construction activities might require temporary changes to shoreline or land uses for staging areas.

All local jurisdictions (and the states) have planning laws that regulate where various land uses may be developed, including a process for administering the siting of essential public facilities.

Construction of generation plants often requires long-term

displacement of existing land uses, the impact is highly dependent on project location, size and type of facility, the amount of land it displaces, and the character of the surrounding area.

Small Hydro and Pumped Storage Hydro

Because they are typically located on streams or rivers, small hydro and pumped storage hydro projects typically have unavoidable impacts to shorelines and shoreline buffers. However, impacts are commonly addressed during the licensing and permitting process for such facilities. A consistency determination with the Coastal Zone Management Act is a part of the licensing process. Additionally, public access enhancements to waterways are considered during the licensing process.

Geothermal

Geothermal resources are more likely to be found in natural areas and forests, and the industrial nature of a plant might contrast with its surroundings.

Geothermal energy production generally uses less total land in comparison to other types of energy facilities.

Wind

Development of a large wind project requires temporary displacement of a large quantity of land, but after construction the amount used is primarily turbine foundations, access roads, substations and maintenance facilities.
Much of the land can continue to be used for farming without much impact to farming operations.

Biodiesel

The Draft 2025 IRP assumes that biodiesel engines would be sited at locations that already contain utility infrastructure, such as generation sites or substations. To the extent that adding new generation to such a location increases its footprint, the impacts are consistent with those described as common above. Development of a biodiesel project may require temporary displacement of land, but after construction the amount used is primarily building foundations, access roads, substations, fuel storage and maintenance facilities. Since biodiesel engine projects can to be co-located with existing generation or transmission infrastructure much of the land can remain

unaffected.

Solar – Utility Scale
Utility-scale solar requires large amounts of land that would be precluded from other uses.

Battery Storage
The Draft 2025 IRP assumes that battery storage would be sited at locations that already contain utility infrastructure, such as generation sites or substations. To the extent that adding battery storage to such a location increases its footprint, the impacts are consistent with those described as common above. Development of a battery storage project may require temporary displacement of land, but after construction the amount used is primarily building foundations, access roads, substations and maintenance facilities. Since battery storage projects tend to be co-located with existing generation or transmission infrastructure much of the land can remain unaffected.

Simple Cycle Combustion Turbine
Development of a simple cycle combustion turbine project may require temporary displacement of land, but after construction the amount used is primarily building foundations, access roads, substations and maintenance facilities. Impacts are commonly addressed during the licensing and permitting process for such facilities.

Transmission
Transmission lines require wider rights of way than distribution lines. Often land uses can continue after construction of transmission lines through agricultural or rural areas, so the displacement is temporary. Where transmission lines go through forest lands or built-up environments, they displace existing land uses.

6. How would the proposal be likely to increase demands on transportation or public services and utilities?

Typical Construction Activities and Common Operational Impacts
Construction activities could lead to temporary increases in utilization of roads and bridges for construction equipment and vehicles, or material handling trucks.

Common operational impacts could include minor to moderate use of additional utilities such as power, water, wastewater and waste disposal. The impacts are minor compared to other types of development as the facilities are not typically used to house full time personnel, and require periodic site visits for maintenance and repair activities.

Wind and Utility Scale Solar

Because these plants require a great deal of land, and must be located in areas with an adequate supply of wind or sunshine, plants would likely be located in Eastern Oregon or Washington, and require long transmission lines for operation. The PUD contracts for firm transmission with the Bonneville Power Administration to deliver energy from generating resources or the wholesale energy market and does not intend to construct any new transmission.

Simple Cycle Combustion Turbine

These plants are usually located close to existing gas pipelines and transmission lines. However, depending on the location they may require long transmission lines or pipelines for operation. The PUD contracts for firm transmission with the Bonneville Power Administration to deliver energy from generating resources or the wholesale energy market and does not intend to construct any new transmission.

Battery Storage

The Draft 2025 IRP assumes that battery systems are co-located with substations or other utility infrastructure sites. They may require quick access to emergency services and special restrictions for entry and use, similar to the way substations are managed. While a minor impact, large battery arrays have special emergency services considerations to protect human and environmental health in the event of a disaster or error that could cause a spill release of battery contents (acids, electrolyte components). Continuing to carefully plan the siting & design of these systems will help ensure that they are in places with appropriate access to emergency services, meet state and local standards for siting of power infrastructure, and are constructed to contain spills and avoid public exposure to potentially harmful components through isolation within a substation fence or other protective barrier.

7. Identify, if possible, whether the proposal may conflict with local, state, or federal laws or requirements for the protection of the environment.

Potential projects developed for supply-side resources are anticipated to obtain all applicable federal, state and local permits and to undergo appropriate environmental review. Accordingly, no possible conflicts have been identified.