
PPC White Paper – Value of the Lower Snake River Dams

Overview

The Public Power Council (PPC) is a trade association representing the interests of the non-profit, consumer owned utilities of the Pacific Northwest. PPC’s broad and diverse membership of electric utilities purchases much or all of their wholesale power and transmission from the Bonneville Power Administration (BPA). BPA serves as an economic engine of the Northwest. The rates BPA charges its utility customers have a large impact on the prosperity of individuals and the vitality of businesses in the region, while its environmental mitigation efforts help protect and enhance our region’s natural resources. BPA’s hydropower resources allow the Pacific Northwest to enjoy one of the lowest carbon-generating electric systems anywhere in the world.

PPC supports its member utilities and the communities that they serve through a rigorous focus on power supply economics and the scientific data supporting responsible and effective environmental stewardship. This fact-based, analytical approach is applied without preconceived conclusions. Northwest public power communities rely on their locally owned, non-profit utilities for an affordable, reliable, and environmentally responsible power supply. PPC members have no incentive or interest in supporting resources that do not further these goals and are less economic than available alternatives.

The four Lower Snake River Dams (LSRDs) have for many years been a source of controversy and litigation in the region. The recently concluded Columbia River System Operation (CRSO) Environmental Impact Statement (EIS) studied the environmental, biological, power supply, and socioeconomic impacts of the entire FCRPS. The CRSO EIS also specifically studied the impacts of removing or breaching the LSRDs. **The unambiguous conclusion of this comprehensive study was that the LSRDs play a critical role in the Northwest power system and economy and that their continued operation does not jeopardize the existence of endangered or threatened salmon species.**

Although the CRSO EIS is the most comprehensive and recent study of costs and benefits of the LSRDs, its conclusions are in line with those from studies by diverse entities and organizations. Considering the best information and analysis available from all sources, PPC reaches the following conclusions:

- **The LSRDs are among the lowest cost generating resources in the region.** The continued operation of these carbon free resources remains central to meeting the region’s carbon reduction goals while maintaining system reliability and affordable electricity rates.
- **Returns for fish that migrate in rivers across the west coast – both in dammed and undammed rivers – show that almost all stocks face persistent challenges to survival.** Indeed, juvenile survival through the FCRPS is comparable to undammed rivers, and removal of the LSRDs is not a clear path to recovery of endangered species or overall abundance of salmon. Structural and operational changes in place in the FCRPS have greatly improved in-river fish survival. More attention is needed on the common threat to these runs: ocean conditions and over-fishing.

- **“Solutions” that seek to transfer the economic consequences of changing LSRD operations to a subsection of the region are not sustainable.** Any collective effort to address regional resources must be based on equitable regional cost responsibility. Public power cannot continue to solely bear ever-increasing costs of mitigation efforts that extend well beyond the impact of hydropower operations.

Each of these conclusions is examined in further detail below.

Power Supply Economics of the Lower Snake River Dams

The four LSRD hydroelectric projects are a crucial component of BPA’s low cost, carbon-free power supply to public power and the Northwest as a whole. Every thorough study on this topic has shown uniformly that removal of the LSRDs would result in some combination of massive increases to regional power supply costs, increases in carbon emissions, impacts on other critical areas of the economy and increased risk of blackouts. In addition to the CRSO EIS, this includes work by PPC, the Northwest Power Planning and Conservation Council, the Northwest Power Pool and Public Generating Pool (via E3 consulting), Northwest Energy Coalition (via Energy Strategies consulting), Northwest River Partners (via EnergyGPS consulting), and BPA.

The power system value of the LSRDs comes through a combination of substantial carbon-free energy, operating reserves, and ramping capability to help prevent blackouts and integrate other renewable resources. The four projects produce an average of about 1,000 aMW of energy each year (about the average load of Seattle), well over 2,000 MW of sustained winter peaking capability, and one quarter of BPA’s total reserves holding capability for most of the year. The levelized incremental cost of this power is approximately \$12 per MWh, or about \$100 million per year. In contrast, based on the latest information from the Northwest Power and Conservation Council, the levelized costs of new wind and solar would be at least 2-3 times higher – and neither of these resources have the operational attributes of the LSRDs that support grid reliability, integration of other renewables, and load following capabilities.

Some dam removal advocates incorrectly cite operational costs of the LSRDs as reason for removal without accounting for the costs of replacement power. Given the accelerating pace of state-policy driven retirements of thermal resources, such as coal, and a paucity of additional cost-effective energy efficiency opportunities beyond what utilities are already pursuing, the capability of the LSRDs would need to be replaced in their entirety to avoid increasing the regional risk of blackouts in coming years at substantial cost and reliability risk.

The CRSO EIS analyzed the power system cost of LSRD replacement using regionally vetted analytical tools and cost assumptions. Replacing the output of the LSRDs with new carbon free resources would cost at least \$800 million annually with a portfolio of 3,306 MW of solar, 1,144 MW of wind, and 2,515 MW of storage products. For context, this would represent over \$9 billion in net present value over 25 years at an 8% cost of capital. This also assumes, with little or no certainty, that this unprecedented level of storage would be physically feasible to operate to provide grid reliability. Additionally, building these resources would have its own environmental impacts in terms of massive land usage, extraction of the underlying raw materials, transportation of components and industrial production.

It may be possible to replace the output of the LSRDs at lower cost than wind, solar and storage, but this would require using thermal resources, most likely in the form of new natural gas generation. While potentially lowering the cost of replacement, this would unnecessarily increase regional greenhouse gas emissions and run counter to state environmental policy. The lowest cost thermal replacement portfolio would still have a net cost of hundreds of millions of dollars annually relative to the continued operation of the LSRDs.

Given these facts, dam removal advocates arguing that there is a net economic benefit to removing the LSRDs have relied on misinformation or “non-use benefits” derived from faulty application of unscientific and contentious “stated preference” polling analysis. Under this type of analysis, residents are asked to state a dollar value that they would pay for an outcome, such as a “free flowing” Lower Snake River which is then imputed to the entire population of the region. This type of analysis is, at best, highly controversial economically and no study has applied it to the LSRDs with anything approaching accepted best practices.

LSRDs and Willamette Valley projects: A contrast built on fundamental differences

PPC is not dogmatic in analyzing the value of FCRPS resources. For example, the economics of the Willamette Valley hydropower system are in clear contrast to the LSRDs. The total Willamette system produces only about 184 aMW in an average year, less than 4% of the FCRPS, and does not provide within-hour operational flexibility. The long-term levelized cost of generation for the Willamette system was projected in 2019 at about \$31 per MWh, with certain projects much higher than this average and likely to increase further as a result of additional costs or operational changes. While the LSRDs substantially contribute to system reliability and keep rates low, many Willamette Valley projects add upward pressure to rates. For this reason, PPC has strongly advocated for reexamination of cost allocations between the authorized uses of the projects and a study of deauthorization of commercial power production at the highest cost Willamette Valley projects of Cougar, Detroit and Big Cliff.

Fish and Wildlife Implications

Public power is committed to scientific, cost-effective mitigation for the impacts of the operations of the federal hydro system. From a financial perspective, costs related to fish and wildlife mitigation typically comprise a quarter or more of BPA’s power rates. Today, public power funds nearly 70 percent of the agency’s overall costs and 80 percent of its power costs. Without stable funding from Northwest consumer-owned utilities, there will be uncertainty for essential Northwest programs, including the world’s largest fish and wildlife mitigation program. This investment has yielded tangible results both in terms of juvenile survival and adult salmon returns.

Although there are impacts to fish and wildlife from the hydro system, removal of the LSRDs is not a clear path to recovery for endangered species or overall abundance of salmon. The LSRDs are built to facilitate fish passage and actually achieve spring juvenile survival at 96% and summer migrating fish survival at 93%, meeting or exceeding performance standards. Academic studies have shown that fish survival through the federal hydro system is comparable to undammed rivers such as the Peace River in British Columbia. The LSRDs also affect only 4 of 13 ESA listed salmon species and impound a relatively

limited amount of historic habitat. The operation of the LSRDs also has little if any impact on orca populations. NOAA fisheries finds in the 2020 Biological Opinion that continued operation of the LSRDs does not adversely affect Southern Resident Killer Whales (SRKW) “because increased prey availability through CRS-funded hatchery production more than offsets any negative effects on SRKW prey base caused by the proposed hydrosystem operations and maintenance.”

The federal hydro system, including the LSRDs, ultimately affect a relatively small portion of the salmon lifecycle. Leaving commercial and sport salmon harvest aside, the dominant factor in adult salmon returns and abundance is ocean conditions. Unfortunately, climate change is creating an increasingly hostile ocean environment for West coast salmon. New research shows climate change driving equally precipitous declines in salmon populations across the entire West coast for both dammed and undammed rivers. Our best hope of reversing the decline in ocean conditions is to reduce carbon emissions. Removing 1,000 aMW of carbon-free power seems at odds with this conclusion, particularly with increasing pushes to electrify significant additional areas of the economy such as transportation.

Solutions Going Forward

Sustainable solutions to salmon recovery must take a comprehensive approach that considers all the factors affecting stocks. While hydropower is one factor, other factors such as harvest, habitat and hatchery conditions – also known as “The All-H” approach to salmon recovery – must be addressed. Impacts from predation must be managed and ocean conditions better understood. The best available evidence and science shows that the LSRDs are not a substantially limiting factor in salmon recovery or abundance.

The incredible power supply value that the LSRDs provide through low cost, carbon free energy, flexibility, and the capability to integrate other renewables must be fully considered in regional discourse going forward. The flexible capacity that the LSRDs provide will only increase in demand and value as state and federal legislation, policies and economic or societal factors drive the further retirement of fossil-fueled base load resources and replace them with intermittent renewable generation. The LSRDs are a key part of reliable and affordable grid operations and cannot be replaced at low cost by intermittent renewable resources. The value of capacity and reliability of the power produced by these hydropower projects must be properly accounted for. Further, the economic, environmental and air quality value of the LSRDs is not limited to power supply and includes navigation, transportation, and water supply benefits – additional aspects that were also carefully evaluated in the federal government’s EIS process.

Public power remains committed to mitigating its fair share of the impacts of operating the LSRDs on fish and wildlife. Over many years, this has included substantial investments at the hydro projects themselves as well as funding of numerous off-site improvements to habitat throughout the region. Mitigation must be grounded in science, cost effective, and have a clear nexus with hydro system operations. As well, public power cannot solely bear ever-increasing costs of mitigation efforts that extend well beyond the impact of the hydropower system to provide broader social and environmental benefits.

PPC welcomes discussion going forward that advances collaborative solutions and shares costs on the basis of the broad regional benefits provided. Not only is it appropriate to equitably align cost responsibility with public benefits but doing so also recognizes the region's shared stake in both fish recovery and the financial health of BPA.