A FACT SHEET

CONSIDERING ALL OPTIONS, INCLUDING A CLEAN, AFFORDABLE, RENEWABLE ENERGY SOLUTION, FOR THE LOWER SNAKE RIVER

HOW WE CAN RESTORE SALMON WHILE MEETING OUR ENERGY NEEDS WITH RELIABLE, CLEAN and RENEWABLE, CARBON-FREE ELECTRICITY

Everyone agrees that we would like to restore wild salmon and meet energy needs with reliable, clean and renewable, carbon-free electricity. But, before asking whether four lower Snake River dams should be removed or operations changed in order to achieve these goals, we need to understand the options that are available to us.

So far, we have not been given that opportunity.

Last May a federal court ruled that options that would replace hydropower from the four dams with clean, affordable energy from other renewable and clean energy sources have not been adequately considered. This brochure describes why they should be and the steps that BPA and the U.S. Army Corps of Engineers must take if we are to make a fair and informed choice.

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for a clean and affordable energy future

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November 2016

POWER SYSTEM COSTS & BENEFITS OF A CLEAN AND RENEWABLE RESOURCE SOLUTION

The dams' power output

*The 4 dams **produce 1,040 average megawatts** (aMW) of electricity*

- Enough to power a city the size of Seattle
- 1,040 aMW represents only 4% of the Northwest's regional load
- The dams' "firm power" – the amount that can be counted on during drought -- is just 567 aMW
- In November-February, when demand for electricity is greatest, the dams can produce only about 463 aMW of firm power due to low winter water levels
- The dams help keep the electric grid in balance by holding back power production when wind and solar are producing and increasing power when they are not.

The dams' operating costs

*As the dams age the cost to maintain them could rise to as high as **$269 million a year***

- In 2002 the U. S. Army Corps of Engineers estimated the cost of maintaining the dams at $56 million per year, but a recent independent assessment by a former Corps engineer estimated the cost over the long term at $269 million, nearly five times as much.
- The revised analysis includes the cost of rehabilitating the dams' 24 total turbines, operation & maintenance, navigation and dredging, and costs related to fish passage facilities
- The larger figure was validated when the Corps started rehabilitating the dams' 24 turbines. The Corps originally said they could be rehabilitated for $380 million (about $16 million each), but by the time the work started, the cost for just the first three had doubled to $97 million (almost $33 million each).

Replacing hydropower with clean and renewable resources

*All of the dams' power can be replaced with clean and renewable power resulting in **no added carbon emissions***

- Future power supplies will feature a portfolio of resources to meet the energy and capacity needs of Northwest customers. Energy efficiency, solar, wind, energy storage, demand response, smart grid technology, and purchases of power from across the West can be integrated to reliably deliver clean and affordable electricity.
- The important function of providing flexible power production when the region needs it and balancing the grid can also be met by the portfolio solution. Hydropower from the lower Snake system isn't the only way.

*One power replacement scenario that provides **reliable, clean, affordable electricity***

- 463 aMW, or 45% of the dams' firm power, can be replaced with utility-scale solar
- The remaining 55% can be replaced by market purchases of energy that also provide ready capacity to adapt to periods of peak use, and include increasing amounts of renewable energy

The cost difference to the average customer

$1.03/year

AVOIDING ANOTHER RUSH TO JUDGMENT

A federal judge rejected the agency plan because it failed to adequately consider viable alternatives, including dam removal and power replacement options. Any complete assessment must:

1. Make realistic assumptions about dam operating costs and capital investments to keep them running

Detailed current and future cost estimates for operating, maintaining, and upgrading the lower Snake River dams have not been made publicly available. The U.S. Army Corps of Engineers last estimated the annual cost to maintain the dams in 2002 when it put the figure at $56 million[1]. A more realistic and up-to-date estimate by a retired former Corps engineer is $269 million[2], nearly five times as great. The figure was recently validated when the Corps started rehabilitating the dams' 24 turbines. The Corps originally said that all 24 could be rehabilitated for $380 million (about $16 million each), but by the time actual work started, the cost for just the first three had doubled to $97 million (almost $33 million each).[3]

2. Consider a portfolio of renewable and clean energy resources from throughout the West to replace the hydropower

Current statements from federal agencies assert that, if the lower Snake River dams are removed or operations modified, replacement power will have to come from natural gas-fired power plants. But, this conclusion isn't based on a full assessment of replacement options. In fact, the best solution probably won't rely on any single source. Solar and wind can be combined as part of a portfolio of clean and renewable resources that also includes increased energy efficiency, demand response, energy storage, clean energy purchases from other suppliers in the West, and smart grid technology. If we explore different configurations and implementation schedules, we can take advantage of fast-declining costs for solar and wind as well as emerging markets and smart grid technologies throughout the West to produce a grid that's reliable, clean and affordable.

3. Compare apples to apples

Common metrics should be used when comparing power replacement options to continuation of the same level of hydropower output from the dams. To date, this has not been done. Assessments should also take into account seasonality and the fact that the dams produce the most power in the spring when all hydro is at its peak and demand for power is low, and produce the least in the fall and winter when we need flexible, clean energy the most. Meanwhile, solar resources are widely available in the summer and Montana wind peaks in winter.

4. Gather and share the necessary data for a thorough analysis

BPA and the Corps of Engineers either don't have or have so far refused to share all the data that are essential to conducting a thorough assessment of dam operations and of clean and renewable energy alternatives. Without transparency, no assessment can be credible.

Unless BPA and the other federal agencies adopt these four practices, they will have failed yet again to provide Northwest residents with the information necessary to make an informed decision about the best path forward to restore salmon and provides us with clean, reliable, and affordable energy.

[1]US Army Corps of Engineers, Lower Snake River Juvenile Salmon Migration Feasibility Report (http://www.nww.usace.army.mil/Library/2002LSRStudy.aspx), 2002

[2]Waddell, Jim; The Cost of Keeping the Lower Snake River Dams: A Reevaluation of the Lower Snake River Feasibility Report, http://www.nwenergy.org/data/Cost-LSR-Dams-1-1-2015F1.pdf, 2015

[3]Weiss, Steven; Restoring Wild Salmon: Power System Costs and Benefits of Lower Snake River Dam Removal, http://www.nwenergy.org/data/Restoring-salmon.pdf, 2015