Fact Sheet

January 2019

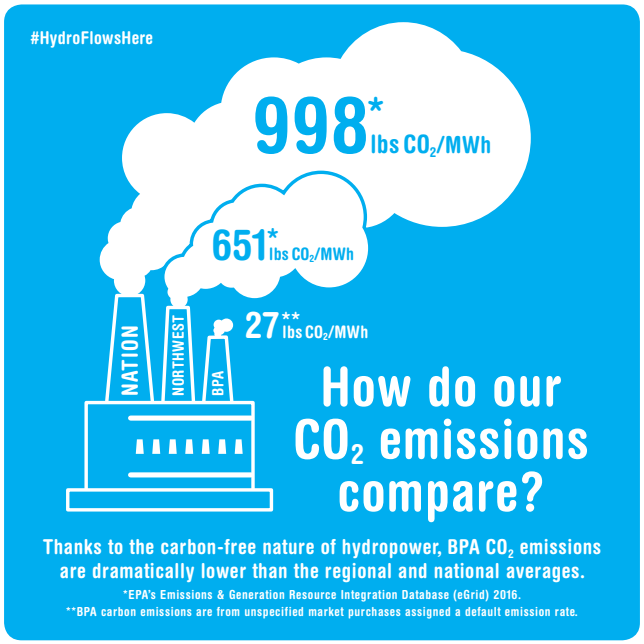
The carbon-free footprint of BPA's hydropower supply

The Columbia River produces more hydropower than any other river in North America. BPA plays a unique role in the sale and distribution of this renewable resource, giving its customers access to 22,000 MW of flexible, reliable, carbon-free hydropower across 15,000 miles of transmission lines.

As a nonprofit wholesale power marketer and transmission provider, BPA sells its products and services to Northwest utilities at the cost of production. The power BPA sells is produced by 31 federally-owned hydroelectric dams that are operated by the U.S. Army Corps of Engineers and Bureau of Reclamation. BPA also markets the output of the 1,200 MW Columbia Generating Station, a nuclear plant in Washington that is owned and operated by Energy Northwest.

The federal dams in the Columbia River Basin and the Columbia Generating Station produce enough carbon-free power to meet nearly 30 percent of the Northwest's electricity needs.

While the federal dams and Columbia Generating Station produce carbon-free power, a small amount of carbon emissions is associated with the federal system. This is because BPA sometimes purchases power on the open market, and that power has a certain amount of carbon emissions attributed to it. BPA uses these purchases to balance resources and meet its customers' demands beyond what the federal system can provide. But even with these market purchases, the emissions associated with BPA's system are significantly lower than the regional average.



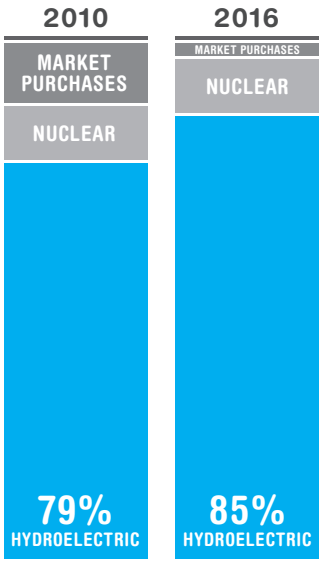
Where does the carbon in BPA's resource mix come from?

The power BPA purchases on the wholesale market cannot be attributed to a specific resource. These unspecified market purchases, which are assigned a default emissions factor, make up about 3 to 12 percent of BPA's total annual power supply. The difference from year to year is largely due to the significant streamflow variability in the Columbia River Basin.

BPA typically purchases more power in the market during years when there is less water. Other factors that

contribute to BPA's market purchases include the availability of the Columbia Generating Station and whether it experiences an extended outage, and fish operations that are designed to help endangered fish migrate to the ocean. These operations call for spilling water past dams instead of sending it through turbines, which reduces generation.

The power BPA sells is not attributed to individual resources. The entire federal system, including market purchases, is treated as a single source. Therefore, the federal system is collectively assigned an annual emissions factor, which is measured as pounds or metric tons of carbon dioxide per megawatt-hour.



BPA RESOURCE MIX

Between 3 and 12 percent of BPA's annual fuel mix comes from market purchases, depending on the water year and other factors. 2010 was a low water year, while 2016 was a higher-than-average water year.

Maximizing the value of the region's carbon-free assets

BPA is taking steps to ensure its long-term commercial success by addressing industry challenges that could affect its ability to remain a cost-effective power supplier. BPA's strategy includes improving its competitive position by reducing costs, while also maximizing revenues from sales of surplus federal power. To do this, BPA is focused on new market opportunities for clean capacity resources.

The West Coast states are setting ambitious carbon reduction goals and aggressively pursuing energy policies that put a price on carbon. The Northwest's existing hydropower resources can play an essential role in meeting these goals most cost-effectively while maintaining safe, reliable service. Policies that put a price on carbon could increase the value of BPA's surplus sales because of an increased premium for low-carbon power.

For example, California's existing cap-and-trade program has created value for low-carbon generation. Demand for BPA's low-carbon power has resulted in surplus sales to California at a premium over other wholesale market prices. The premium BPA earns from these surplus sales is used to offset its costs, thereby lowering power rates for the agency's principal customer base, which is made up primarily of Northwest public utilities.

WHAT ABOUT OTHER GREENHOUSE GASES ASSOCIATED WITH THE FEDERAL SYSTEM?

Sulfur hexafluoride: SF_6 is a greenhouse gas commonly used as an insulator in high-voltage electrical equipment, including in BPA's transmission system. Since 1999, BPA has led the nation as a charter partner in the Environmental Protection Agency's SF_6 Emission Reduction Partnership for Electric Power Systems. BPA's 2017 emissions rate — the ratio of SF_6 emissions relative to total amount of SF_6 contained in electrical equipment — was 0.53 percent. That is well below even the EPA partnership's latest reported average of 1.9 percent.

Methane: The conversion of water into power does not produce methane, but some research has shown that reservoirs can emit methane under certain conditions, particularly in tropical climates where there is a lot of plant growth and algae — conditions not found in the Federal Columbia River Power System. Both the U.S Army Corps of Engineers and the Northwest Power and Conservation Council concluded that the reservoirs in the Columbia and Snake rivers do not emit a measurable level of methane.

CARBON PRICING PROGRAMS AND BPA

Carbon pricing programs, such as California's cap-and-trade program, require participants to purchase carbon allowances for power that they either generate in California or import into California. If BPA were to import power into California, the requirement to purchase allowances would apply due to the emissions factor that is assigned to the federal system as a whole (arising from the small amount of market purchases BPA makes). However, carbon allowances are considered a state tax by the U.S. Department of Energy, BPA and other federal agencies. Federal agencies cannot pay state taxes unless Congress specifically authorizes it. Therefore, BPA currently cannot purchase these carbon allowances. As an alternative, BPA uses third-party arrangements to sell to entities who take BPA's power into the California market and who pay for the carbon allowances. But these arrangements are costly, inefficient and raise complications. BPA is exploring options for future participation in markets that put a price on carbon.