

Executive Summary
U.S. Hydropower: Climate Solution and Conservation Challenge

Stanford University Uncommon Dialogue
October 13, 2020

The “*Joint Statement of Collaboration on U.S. Hydropower: Climate Solution and Conservation Challenge*” (Joint Statement), represents an important step to help address climate change by both advancing the renewable energy and storage benefits of hydropower and the environmental and economic benefits of healthy rivers.

The *Joint Statement* is the result of a two-and-a-half-year dialogue, co-convened by Stanford University’s Woods Institute for the Environment, through its Uncommon Dialogue process, Stanford’s Steyer-Taylor Center for Energy Policy and Finance, and the Energy Futures Initiative, to bring together the U.S. hydropower industry and the environmental and river conservation communities. The parties, listed on page three of this executive summary, are motivated by two urgent challenges. To rapidly and substantially decarbonize the nation’s electricity system, the parties recognize the role that U.S. hydropower plays as an important renewable energy resource and for integrating variable solar and wind power into the U.S. electric grid. At the same time, our nation’s waterways, and the biodiversity and ecosystem services they sustain, are vulnerable to the compounding factors of a changing climate, habitat loss, and alteration of river processes. Our shared task is to chart hydropower’s role in a clean energy future in a way that also supports healthy rivers.

There are more than 90,000 existing dams throughout the country, of which about 2,500 have hydropower facilities for electricity generation. In the next decade, close to 30 percent of U.S. hydropower projects will come up for relicensing. As such, the parties focused on three potential opportunities:

- *Rehabilitating* both powered and non-powered dams to improve safety, increase climate resilience, and mitigate environmental impacts;
- *Retrofitting* powered dams and adding generation at non-powered dams to increase renewable generation; developing pumped storage capacity at existing dams; and enhancing dam and reservoir operations for water supply, fish passage, flood mitigation, and grid integration of solar and wind; and
- *Removing* dams that no longer provide benefits to society, have safety issues that cannot be cost-effectively mitigated, or have adverse environmental impacts that cannot be effectively addressed.

The potential development of new “closed loop” pumped storage to increase capacity to store renewable energy, including variable solar and wind, was also a focus of the dialogue. Closed

loop pumped storage systems do not involve construction of a new dam on a river, but they may have other impacts that need to be avoided, minimized or mitigated, including to surface and ground water.

The parties found inspiration in the precedent-setting 2004 agreement involving Maine's Penobscot River where the Penobscot Nation, the hydropower industry, environmentalists, and state and federal agencies agreed on a "basin-scale" project to remove multiple dams, while retrofitting and rehabilitating other dams to increase their hydropower capacity, improve fish passage and advance dam safety. After project completion in 2016, total hydropower generation increased, more than 2,000 miles of river habitat had improved access for the endangered Atlantic salmon and other species of sea-run fish, and the Penobscot River again helps support the realization of treaty rights and other aspects of tribal culture for the Penobscot Nation.

Driven by the urgent need to address the twin challenges of climate change and river conservation, the parties have identified seven areas for joint collaboration, detailed in the Joint Statement:

1. Accelerate Development of Hydropower Technologies and Practices to Improve Generation Efficiency, Environmental Performance, and Solar and Wind Integration
2. Advocate for Improved U.S. Dam Safety
3. Increase Basin-Scale Decision-Making and Access to River-Related Data
4. Improve the Measurement, Valuation of and Compensation for Hydropower Flexibility and Reliability Services and Support for Enhanced Environmental Performance
5. Advance Effective River Restoration through Improved Off-Site Mitigation Strategies
6. Improve Federal Hydropower Licensing, Relicensing, and License Surrender Processes
7. Advocate for Increased Funding for U.S. Dam Rehabilitation, Retrofits and Removals

Over the next 60 days, the parties have agreed to invite other key stakeholders, including tribal governments and state officials, to join the collaboration, and to address implementation priorities, decision-making, timetables, and resources.

In sum, the parties agree that maximizing hydropower's climate and other benefits, while also mitigating the environmental impact of dams and supporting environmental restoration, will be advanced through a collaborative effort focused on the specific actions developed in this dialogue. The parties commit themselves to seizing these critical and timely opportunities

Parties to the Joint Statement of Collaboration

American Rivers



National Hydropower Association



World Wildlife Fund



Eagle Creek Renewables



Union of Concerned Scientists



Low Impact Hydropower Institute



Great River Hydro



Rye Development



American Whitewater



Hydropower Reform Coalition



Natel Energy



Hydropower Foundation



Conveners of the Joint Statement of Collaboration

Stanford Woods Institute for the Environment



Energy Futures Initiative



Steyer-Taylor Center for Energy Policy and Finance

