

WATER POWER TECHNOLOGIES OFFICE

# OPPORTUNITIES TO STRENGTHEN THE U.S. HYDROPOWER SUPPLY CHAIN

Hydropower makes up about 27% of U.S. utility-scale renewable electricity generation and is an important contributor to achieving the nation's clean energy goals. A robust domestic supply chain is critical to support new construction and upgrades, refurbishments, and relicensing activities at existing hydropower facilities.

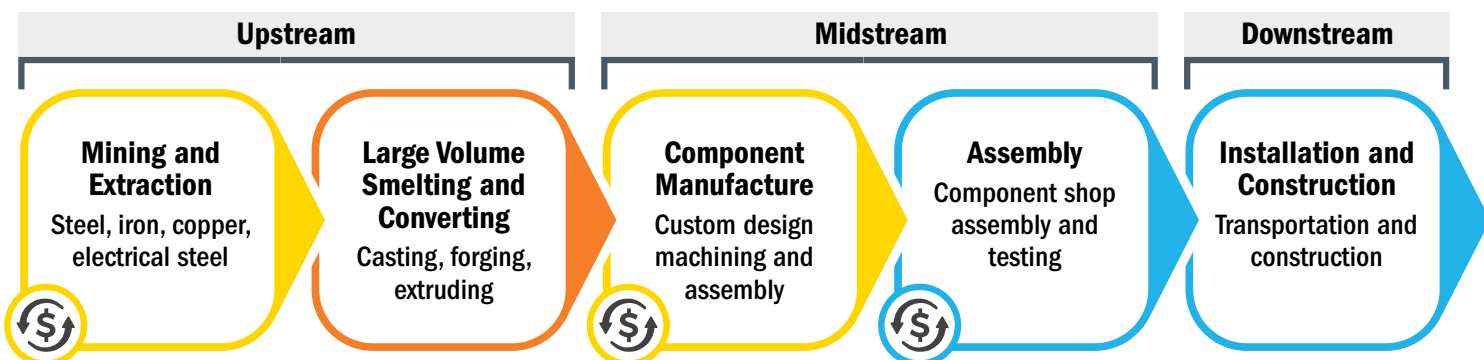


Photo from Krysta Rasmussen, 2023 Make a Splash Contest

Drawing on feedback from stakeholders across the hydropower sector, the U.S. Department of Energy's Water Power Technologies Office (WPTO) developed the Hydropower Supply Chain Gap Analysis. This report identifies five major gaps in the domestic hydropower supply chain and makes actionable recommendations to address those gaps.

## The U.S. hydropower supply chain is divided into three sectors: upstream, midstream, and downstream.

The Hydropower Supply Chain Gap Analysis focuses on areas within the upstream and midstream sectors that have some and limited domestic capabilities.



■ Limited domestic capability   
 ■ Some domestic capability   
 ■ Domestic capability   
 Cost-effective foreign competition

## GAPS IN THE HYDROPOWER SUPPLY CHAIN



**Unpredictable and variable demand signals for materials and components.** In general, hydropower systems have exceptionally long lives (e.g., 30–50 years), so replacements and refurbishment schedules have cycles that span years or decades.



**Severely limited or nonexistent domestic suppliers for materials and components.** Only one or two domestic suppliers—or in some cases, none—exist for materials and components.



**Federal contracting procedures and domestic content laws.** There are several procurement regulations and/or general practices that inhibit the development of the domestic hydropower supply chain.



**Foreign competition, foreign subsidies, and ineffective trade policies.** Discussions with companies in the hydropower industry highlighted inequitable competition from foreign companies and ineffective trade policies as issues in the hydropower supply chain.



**Shortage of skilled workers.** Hydropower manufacturing and upstream support industries suffer from a lack of expertise in the workforce. As these industries have been offshored over the last 40 years, skilled workers have retired or moved to other industries.

## RECOMMENDATIONS TO ADDRESS THE GAPS



**Lead with the federal fleet to prime the development of an aggregated, consistent demand signal.** Nearly 50% of the domestic hydropower fleet is federally owned. The potential demand signal from new federal facilities and refurbishments can be significant.



**Increase awareness of the domestic supply chain by developing databases of domestic manufacturing and installations.** Developing tools to predict demand is another way that WPTO can help both the federal and private fleets. A database of domestic suppliers along the hydropower supply chain and a tool that visualizes data (e.g., size and turbine type) on individual hydropower generation units are already in development.



**Work with other low-carbon technologies and industries to create a significant, steady, and predictable demand signal for common materials.** Many of the components and materials used for hydropower systems (e.g., transformers and electrical steel) are also used in other clean energy technologies, such as wind energy.



**Continue workforce development efforts.** Expanding academic and experiential-type programs like internship/fellowship/apprenticeship opportunities, job fairs, primary and secondary school competitions, collegiate competitions, and programs that place veterans and other unique workforce segments can increase awareness of hydropower and its opportunities.



Photo from Joshua Bauer, 2023 Make a Splash Contest

Hydropower  
Supply Chain Gap  
Analysis Report

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