



# HYDROPOWER: ESSENTIAL FOR A 24/7 CLEAN ENERGY GRID

PROVIDING RELIABLE, FLEXIBLE, ZERO-CARBON ELECTRICITY TO 30 MILLION  
U.S. HOMES AND BUSINESSES

## HYDROPOWER

**Proven Renewable Energy Resource:** Hydropower has provided the United States with reliable and affordable power for **over 100 years**. It is the largest source of renewable, dispatchable energy that contributes to system stabilization on par with natural gas and coal. In 2022, hydropower accounted for 28.7% of total renewable energy generation in the U.S. and roughly 6.2% of the nation's overall electricity generation.

**Essential for a Clean Energy Grid:** Hydropower generates energy on demand and can be ramped up and down to fill in energy gaps left by intermittent renewable sources, like wind and solar. Hydropower balances the power grid, allowing for greater integration of other variable renewable energy resources, and the flexibility presented in existing U.S. hydro facilities could help bring up to **137 GW of new wind and solar online by 2035**. Maintaining and expanding hydropower generation is critical to meeting our nation's clean energy targets.

**Significant Growth Potential:** Currently, only 3% of the 90,000 U.S. dams generate power. The Oak Ridge National Laboratory estimates an additional 12 GWs of electricity could be attained by adding generation to existing nonpowered dams, which is enough to power more than **9 million homes**.

**Promotes Grid Reliability:** Existing hydropower provides the U.S. with **40% of its "black start" capability**, meaning it can jumpstart the electric grid following a major outage or blackout. Extreme weather events are becoming more common, and hydropower facilities can quickly respond to grid changes to help the grid recover and come back online following a disruption. Hydropower provides other grid reliability services like spinning reserves, frequency control, inertia, and reactive power and voltage control.

## PUMPED STORAGE HYDROPOWER (PSH)

**Unparalleled Storage Capabilities:** Pumped storage hydropower (PSH) is the largest contributor to U.S. energy storage with an installed capacity of **21.9 GW** or roughly **93% of all utility-scale energy storage capacity**. Pumped storage hydro provides overnight and longer-term storage and can be combined with wind and solar plants to balance the grid during extreme weather or at peak demand.

**Grid Reliability and Security:** PSH provides flexible and fast responding energy storage, helps balance supply and demand on the grid, and serves as a stabilization tool for working with intermittent generation sources.

**Economic Benefits:** By creating jobs during construction and operation, PSH provides significant economic benefits, as well as **a stable source of revenue** for host communities through taxes and royalties.

**Durability and Reliability:** Pumped storage has a long lifespan, making it a durable and reliable energy storage solution. The oldest working pumped storage facility has been in service for nearly **120 years**.

**Cost Reduction:** Pumped storage **reduces the overall cost of electricity** by storing excess energy during periods of low demand, when value is lower, and releasing it during high demand periods, when electricity prices are higher.



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## MARINE ENERGY

**Robust Untapped Potential:** Marine Energy is a significant and valuable untapped renewable resource that has great potential to help decarbonize the U.S. energy portfolio. Examples include remote offshore power and “Blue Economy” markets, underserved remote coastal and islanded communities, and mainland grid-connection. NREL estimates marine energy in the fifty states to total **2,300 terawatt hours per year (56% of all U.S. electricity generated in 2021)**. Deployment of marine energy at this scale in the U.S. will increase localized economic development opportunities, create high-value jobs, and promote exports in clean energy manufacturing and related services.

**International Competition:** Marine Energy technologies are undergoing rapid innovation, with a number of systems at or nearing commercialization. However, the U.S. has fallen behind the leading global competitors in this emerging clean power sector. European companies receive significant public support and have several systems at the point of market entry and commercial scaling in grid-connected farms. Without increasing support for domestic private sector led innovation and early commercial activities, the U.S. will become an importer, not exporter, of these renewable energy systems.

## HOW CAN LAWMAKERS SUPPORT THE WATER POWER INDUSTRY?

**Streamline and Modernize the FERC Hydropower Licensing Process:** On average, relicensing a hydropower facility takes between **seven to ten years** to complete and can cost upwards of \$3.5 million. The current hydro licensing and relicensing process is bogged down with delays and costs related to bureaucratic reviews by numerous state and federal agencies. Nearly half of the non-federal fleet’s licenses expire by 2035, which puts 17 GW of energy is at risk -- enough to power **30 million U.S. homes and businesses**. The hydropower permitting process must be streamlined NOW to keep these critical sources of flexible, dispatchable, baseload energy online.

**Lawmakers should support S. 1521, the *Community and Hydropower Improvement Act* in the Senate and H.R. 4045, the *Hydropower Clean Energy Future Act* in the House.**

**Invest in the Existing Hydropower Fleet:** The U.S. hydropower fleet is aging; the average hydropower project is more than **60 years old**, and upgrading the existing fleet to comply with modern design standards will require significant investment. A lack of tax support leaves many asset owners unable to finance these upgrades and at risk of license surrender. To protect existing hydropower assets and in turn, our nation’s electric grid, we must equip the hydropower industry with the financial tools and support required to make necessary environmental upgrades at their facilities.

**Lawmakers should support the *Maintaining and Enhancing Hydroelectricity and River Restoration Act of 2023 - S. 2994 and H.R. 6653*, which creates a 30% investment tax credit to encourage environmental improvements and dam safety upgrades at existing hydropower facilities.**

**Implement a Marine Energy Commercialization Strategy:** Lawmakers should:

- Set deployment targets for marine energy, starting with 50 MW by 2025.
- Dramatically increase federal funding for private sector led technology advancement and testing along with university led foundational research and workforce development activities.
- Eliminate cost share requirements for marine energy as recommended by the U.S. Congress.
- Support the FY 2024 bipartisan authorization level of \$137 million for marine energy.