

Hydropower

The Controversy of Flowing Water

Excerpt from *Powering Our Future: An Energy Sourcebook for Sustainable Living*. The text was modified to fit the website.

Water is civilization's most precious natural resource: it is essential for the survival of life. Irrigation enables gardens to flourish in the desert, and, when harnessed for hydroelectricity, it can power civilization itself. Under the influence of gravity, the kinetic energy contained in a large, fast-moving river produces tremendous power. For millennia, humans have tapped this renewable source using simple mechanical devices. In the last century and a quarter, demand for electricity and other non-electrical purposes have resulted in the extensive construction of impoundment structures, particularly in the developed world. During the twentieth century, the United States led the world in dam construction. Former Secretary of the Interior, Bruce Babbitt, commented, "We have been building, on average, one large dam a day, every single day, since the Declaration of Independence." Today, the United States and most other industrialized nations have already developed the most suitable sites for hydropower and are questioning the ecological soundness and safety of the industry. As a result, new dam construction has virtually halted. Meanwhile, the growth of the hydropower industry has shifted overseas to developing nations, particularly in Asia. Currently, though the world seeks clean alternatives to fossil fuels, the future of hydropower in many geographical regions remains highly uncertain.

In the United States, roughly 80,000 megawatts (MW) of hydropower are produced annually. Additionally, the country generates 18,000 MW each year from pumped storage sites. In total, hydropower fulfills approximately 7 percent of the national electrical demand, varying slightly from year to year depending on precipitation. This energy source constitutes over 99 percent of renewable electricity generation in the United States. In total, the United States boasts more than 75,000 sizable dams, plus innumerable smaller ones. However, less than 3 percent of the dams, or just over 2,000 facilities, are utilized for electricity production. The remaining 97 percent of the nation's impoundment structures are used for a wide variety of purposes, including irrigation, flood control, recreation, public water reserves, and ponds to support livestock. In recent years, there has been a growing trend in the United States to dismantle dams. Between 1999 and 2002, 114 dams in the United States were removed with 57 more dismantling projects in progress. This shift is attributed to the diminishing reliability of aging dams, as well as to greater public awareness of their high ecological impacts. Still, these cases are few compared to the nation's tens of thousands of dams.

Today, hydropower is a distant leader in global electricity production from renewable resources and an important contributor in the global energy mix. In the face of global challenges, emission-free, renewable, and domestically producible electricity is becoming increasingly sought after. Hydropower offers these benefits and a number of other attractive features that are uncontested by other energy sources. Unfortunately, the advantages and disadvantages of dam building are a packaged deal. Some of the social and ecological impacts can be minimized using state-of-the-art technology and sound practices. But the impacts will never be eliminated. Humans and animal populations have paid a high ecological price for compromising the free-flow of natural river systems. Due to the fact that the impacts vary widely from one site to the next, it is essential that each dam undergo a thorough assessment that weighs the benefits against the inherent adverse impacts. Hydropower certainly has an important role in the energy mix today, and it will continue to be central in meeting global energy requirements for decades to come. However, we

cannot maintain healthy ecosystems while compromising the flow of rivers from tributary to ocean. Hydropower will remain highly controversial, and rightfully so, as the demand for power wages war against hydropower's detrimental ecological impacts.

Sources

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<http://www.hydro.org/hydrofacts/facts.asp>, accessed November 13, 2004. The National Hydropower Association is a nonprofit organization dedicated to educating and promoting hydropower as a viable, emission-free energy source for our future. This Web page is titled "Facts You Should Know About Hydropower."

<http://www.amrivers.org/57damsin16statestoberemovedin2003.html>, accessed November 13, 2004. This news article, titled "57 Dams in 16 States to be removed in 2003," was released on August 19, 2003 by American Rivers.