

Hydropower: The Power of Moving Water

Current Drivers for Hydropower Development in the Northwest

By: Jeffrey A. Leahey, Esq.



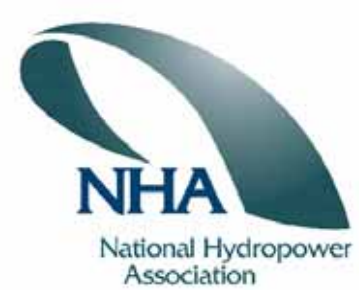
Policy Drivers

- Continued Growth in Electricity Demand
- Need for Domestic Energy Security
- Climate Change
- New Incentives for Hydropower

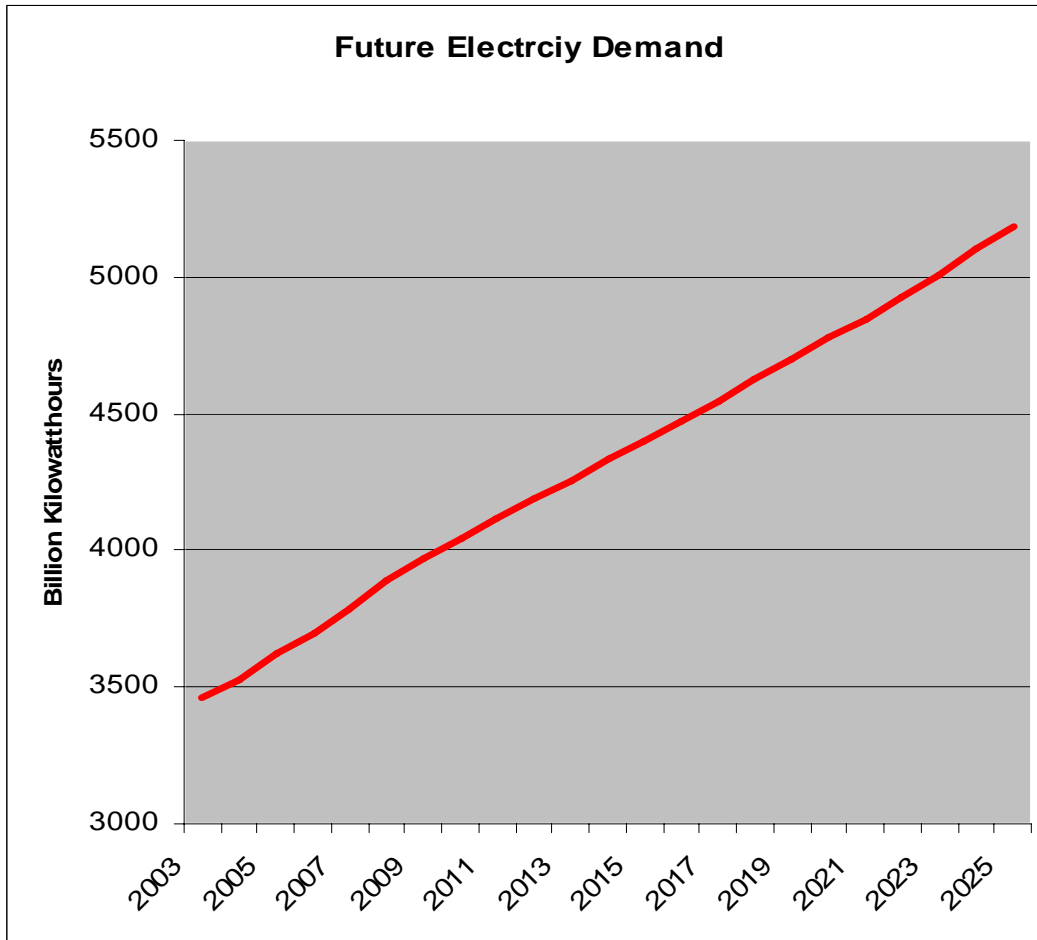
PTC and CREBs

Renewable Portfolio Standards

Carbon Strategies



Electricity Demand



The U.S. Electric Power Sector and Climate Change Mitigation. Pew Center on Global Climate Change. June 2005



Hydropower Potential

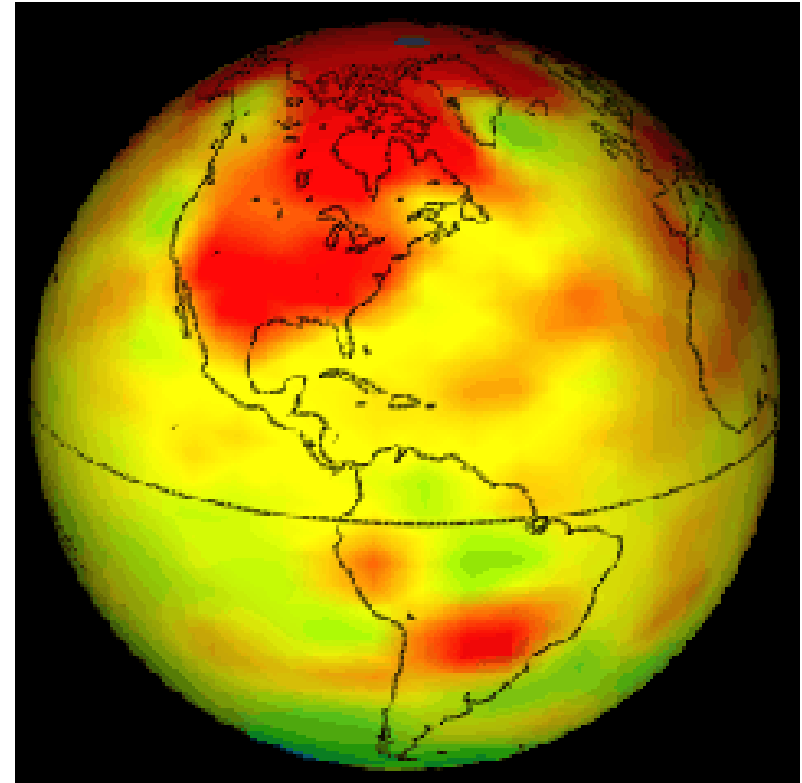
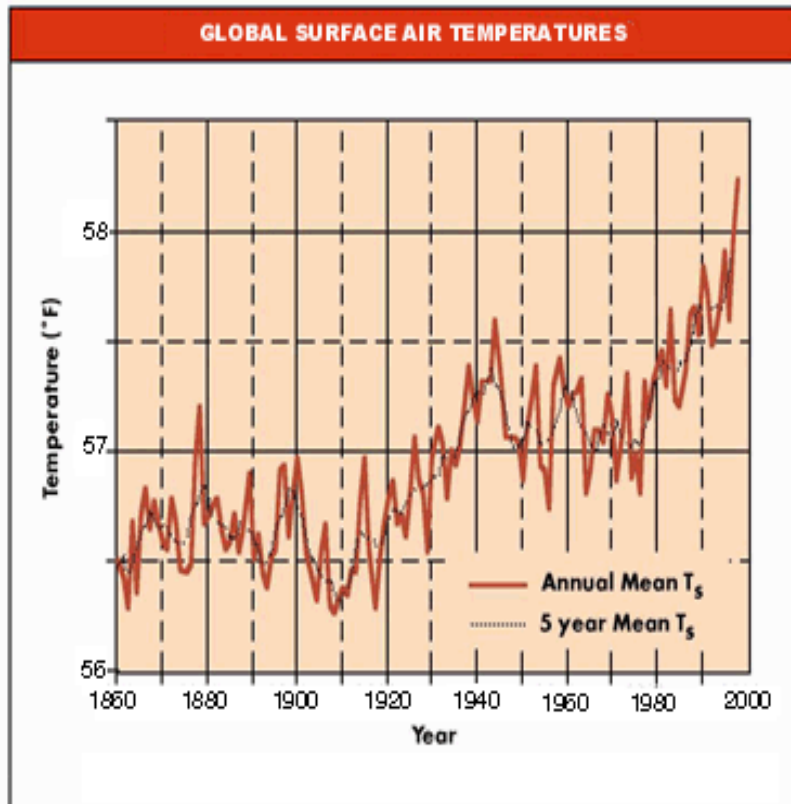
Technology	2006 Existing Capacity MW	Potential Additional Capacity MW	Projected Capacity By 2010 MW	Projected Capacity By 2015 MW	Projected Capacity By 2025 MW
Conventional Hydro	75,000	62,300			
<i>Conventional Hydro Potential Realized</i>			525	2,350	10,000
Hydrokinetic	Demos	12,500 ¹			
<i>Hydrokinetic Potential Realized</i>			115	330	3,000 ²
Ocean Energy	Demos	10-20,000			
<i>Ocean Energy Potential Realized</i>			84	1,000 ³	10,000
Total	~75,000	90,100⁴			
<i>Cumulative Waterpower Realized</i>			724	3,680	23,000



Hydropower's Security Benefits

- **Domestic Source of Reliable Energy**
 - **Dependability** – reduces reliance on foreign energy sources in unstable regions of the world.
 - **Flexibility** – can respond quickly to changes in electricity demand.
 - **Reliability** – hydropower's unique characteristics help ensure grid stability.
- **Example** – August 14, 2003 Blackout – millions in the eastern U.S. and Canada lose power. Hydropower projects in upstate NY and several other states continue to run. Blackstart capability allowed some plants to generate power almost immediately. Grid stability re-initiated.

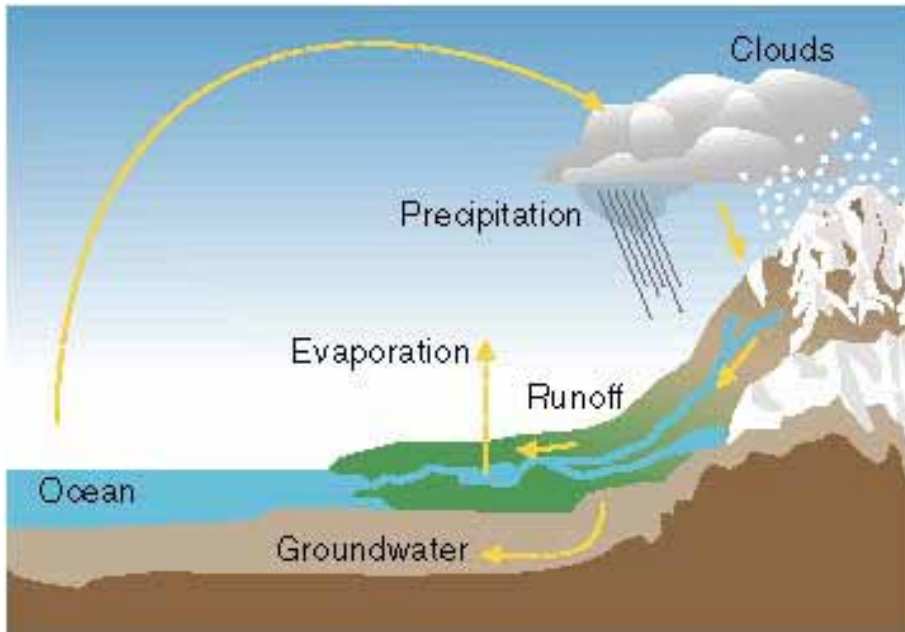
Climate Change





Hydro's Climate Benefits

Hydrological Cycle

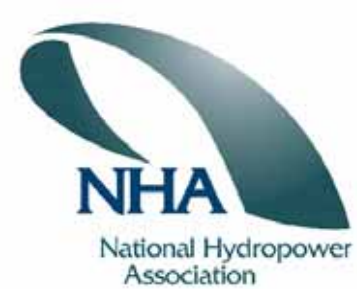


Yes, it's renewable!

Avoided Air Emissions

More than 160 million tons of carbon emissions were avoided in the United States in 2004 when 268 million megawatt-hours of hydropower were generated.

Yes, it's clean!



New Incentives

- **Section 45 Production Tax Credit**

Ten year tax credit.

Price is 0.9 cents per Kwh.

Energy must be placed in service prior to January 1, 2009.

“Incremental hydropower” – new energy at existing facilities through additions of capacity and efficiency improvements.

“Qualified hydropower” – “run-of-river” hydropower at existing FERC-licensed non-hydropower dams.



New Incentives continued...

- **Clean Renewable Energy Bonds**
- **A CREB is a special “tax credit bond” that offers non-taxpaying entities the equivalent of an interest-free loan for financing qualified energy projects.**
- **The CREB issuer does not pay interest to the bondholder. Instead the bondholder receives a tax credit from the federal government.**
- **Renewable energy generation projects that qualify for the PTC generally qualify for CREB financing.**
- **CREBs program extended to December 31, 2008 with \$1.2 billion of funding.**



PTC and CREBs Numbers

PTC – PacifiCorp was the first licensee to be certified. Since then FERC has certified a handful of other applications. Handful of pending applications.

CREBs – 14 hydro applications were approved. For the governmental entities, funding requests had to be under \$3.2 million, for co-ops the request had to be under \$30 million.



New Incentives continued...

NW RPS Programs

- **WA – 15% by 2020 for utilities with more than 25,000 customers. Incremental hydropower, ocean and tidal resources qualify.**
- **OR – None. Proposed program – 25% by 2025. Wave and tidal included. “Disagreement about nearly all aspects of what type of limits on hydropower to include.”**
- **CA – 20% by 2010. Small hydropower of 30 MW or less, ocean wave, ocean thermal and tidal current resources qualify.**
- **ID – None. No bills filed in 2007 legislative session.**
- **MT – 15% by 2015. Hydropower projects 10 MW or less that do not require a new appropriation, diversion, or impoundment of water, qualify.**



New Incentives continued...

- **Carbon Strategies**

- **Cap and Trade – Program that caps (or limits) the total amount of greenhouse gas (GHG) emissions to meet a specific environmental target. GHG emissions are allocated to individual companies. The total number of emission permits (or allowances) allocated adds up to the total emissions cap for the region. This may be lowered over time to achieve reductions.**
- **Emissions trading – Is part of a Cap-and-Trade Program and allows companies to meet their allocations by buying credits from other companies that emit less than their allocations (or do not emit at all).**
- **Examples – Northeast Regional Greenhouse Gas Initiative (RGGI); California (AB 32 of 2006)**



Senate Greenhouse Gas Cap-And-Trade Proposals in the 110th Congress

Sponsor and Near Term GHG Caps

Bingaman - Discussion draft as evaluated by EIA on 1/11/2007
2.6%/year reduction in emissions intensity from 2012-2021.

Feinstein-Carper - S.317 Introduced on 1/17/2007
2006 level in 2011. 2001 level in 2015, 1%/year reduction from 2016-2019.

Kerry-Snowe - Introduced on 2/1/2007.
2010 level in 2010.

McCain-Lieberman - S.280 Introduced on 1/12/2007.
2004 level in 2012.

Sanders-Boxer - S.309 Introduced on 1/15/2007.
2010 level in 2010. 2%/year reduction from 2010-2020.



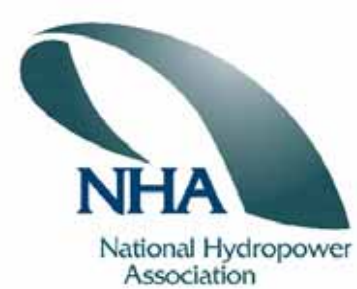
NHA's Advocacy Work on Incentives

- **PTC** – long term extension; increase credit rate to that of the other renewables; inclusion of the ocean, tidal and instream technologies.
- **CREBs** – program extension and additional funding.
- **RPS** – equitable treatment of hydropower; inclusion as a renewable resource.
- **Carbon Strategies** – recognition of hydropower's clean air benefits; ensure cap and trade programs provide allocations for renewables, including hydropower.



NHA's Advocacy Work on R&D

- DOE Program Terminated – No funding proposed for FY 2008. Funding unlikely for FY 2007.
- NHA is working to restore funding for the program to support the continued development of the “next generation” of hydropower equipment – both traditional and the new technologies.
- To assist us, NHA has created the Ocean, Tidal and New Technologies Council to provide the Association the needed information, advice and expertise regarding these resources.



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