

National Hydropower Association

Trends in Hydropower



2015 NASEO Energy Policy Outlook Conference
February 4, 2015

Advancing the U.S. Hydro Industry

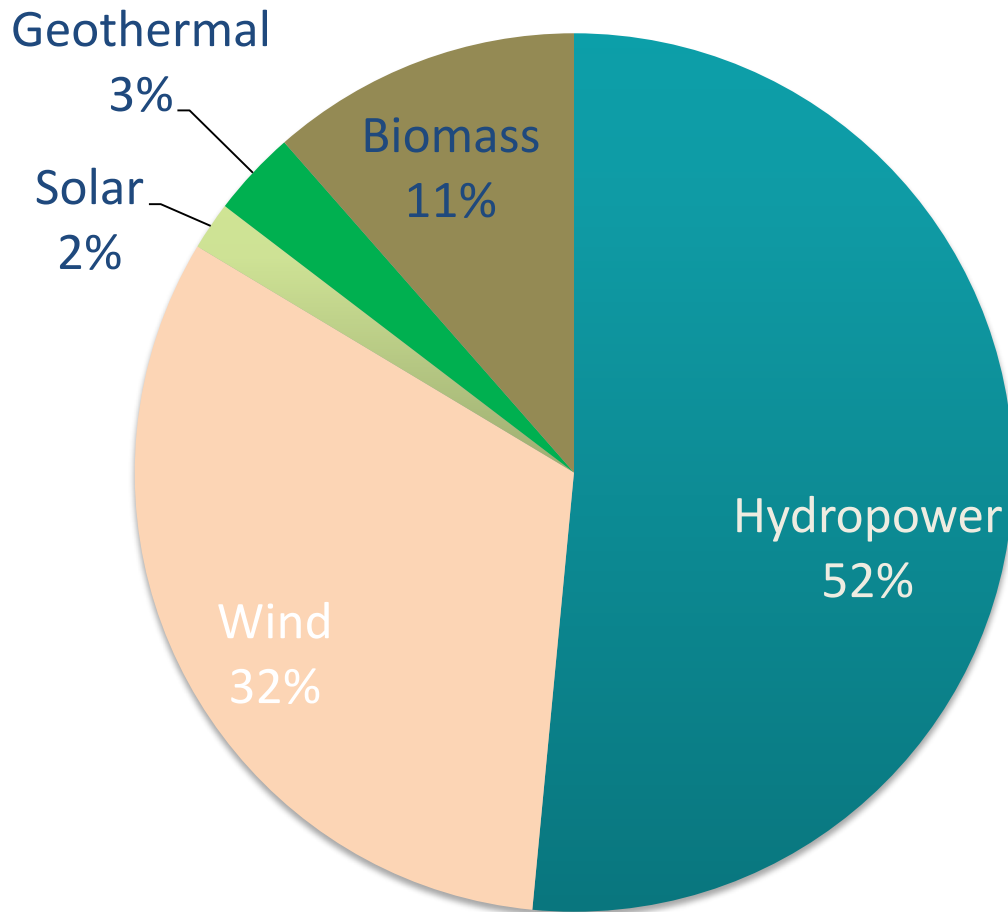
Vision

- **Double the contribution** of hydropower - America's largest, most trusted and flexible renewable energy resource – to drive economic development and help achieve a sustainable and secure clean energy future

Mission

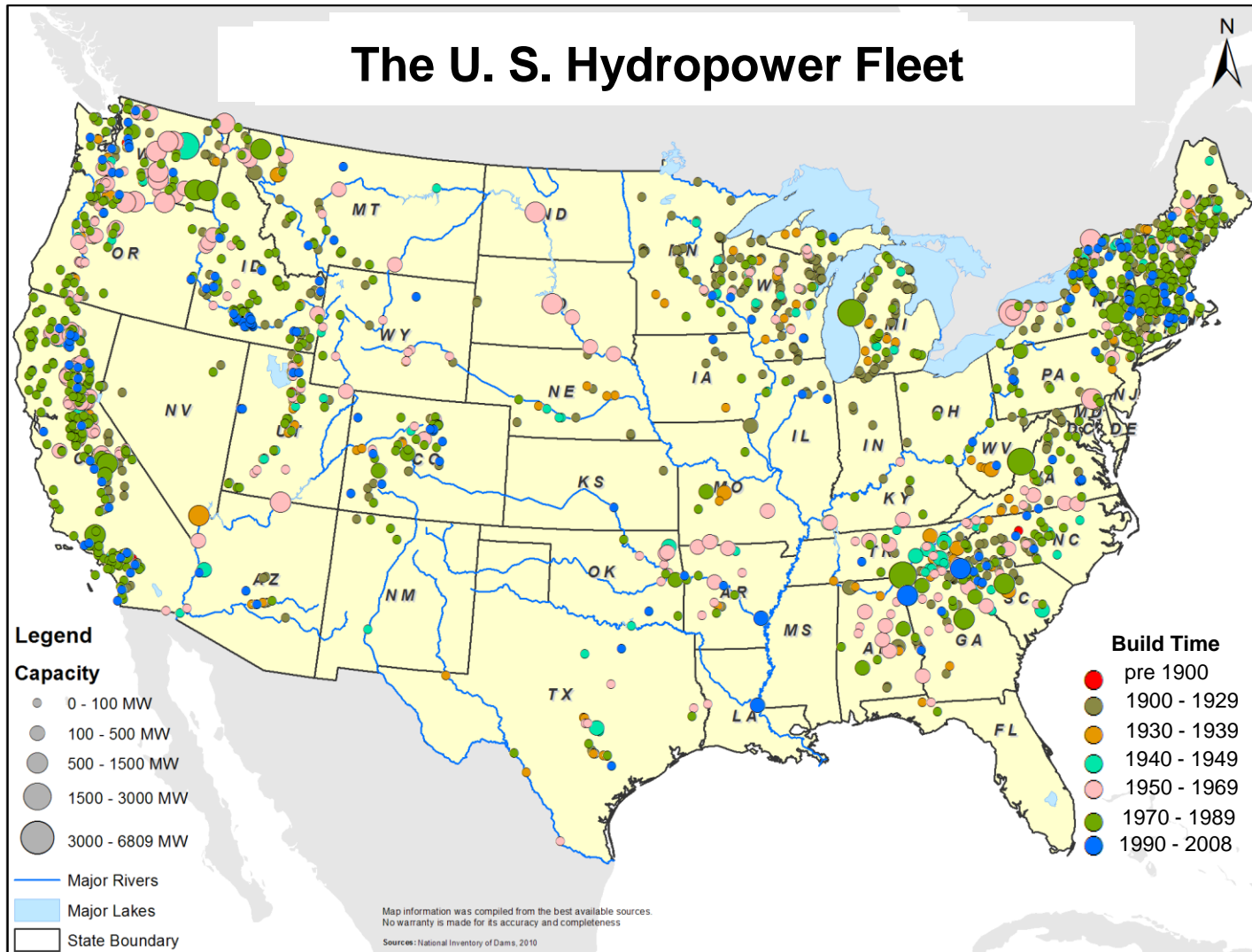
- **Champion the resurgence of hydropower, in all of its forms, as America's premier carbon-free renewable energy resource.**
- Focus on growth, operational excellence, streamlined licensing, environmental stewardship, and improved market recognition.

**U.S. Renewable Electricity Generation
2013**

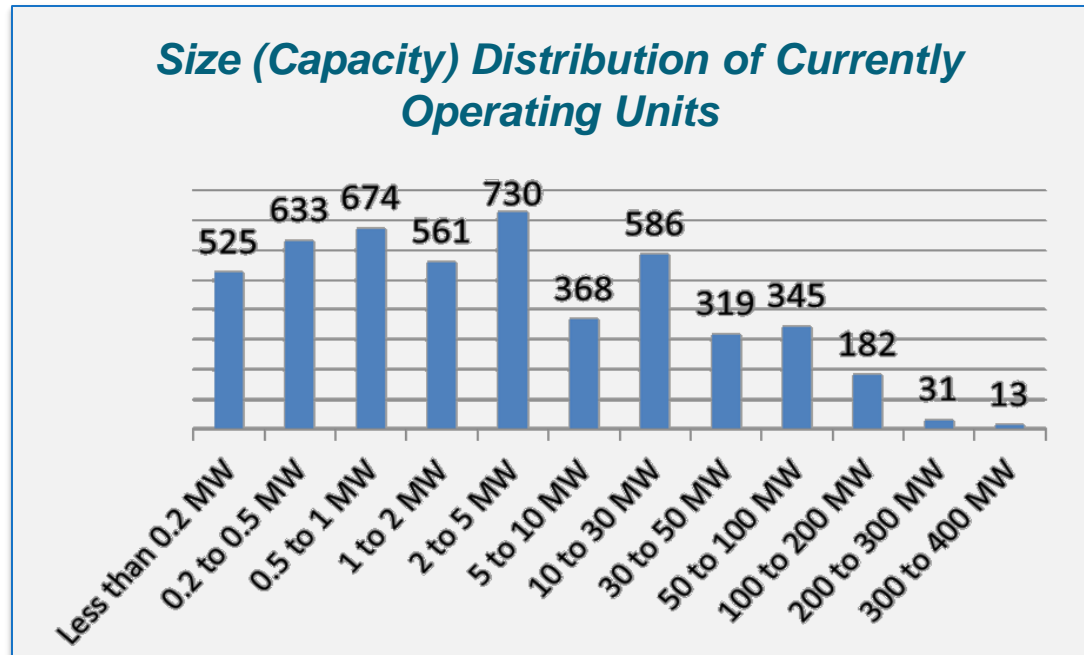


Hydropower Statistics

- America’s largest source of renewable electricity
- 7% of overall electricity generation and the majority of renewable electricity in 2013.
- Approximately **100 GW** of existing capacity, including **22 GW** of pumped storage.
- 50/50 generation split between public/private and federal (Army Corps & Reclamation).
- Additional benefits: flood control, irrigation, water supply, recreation.

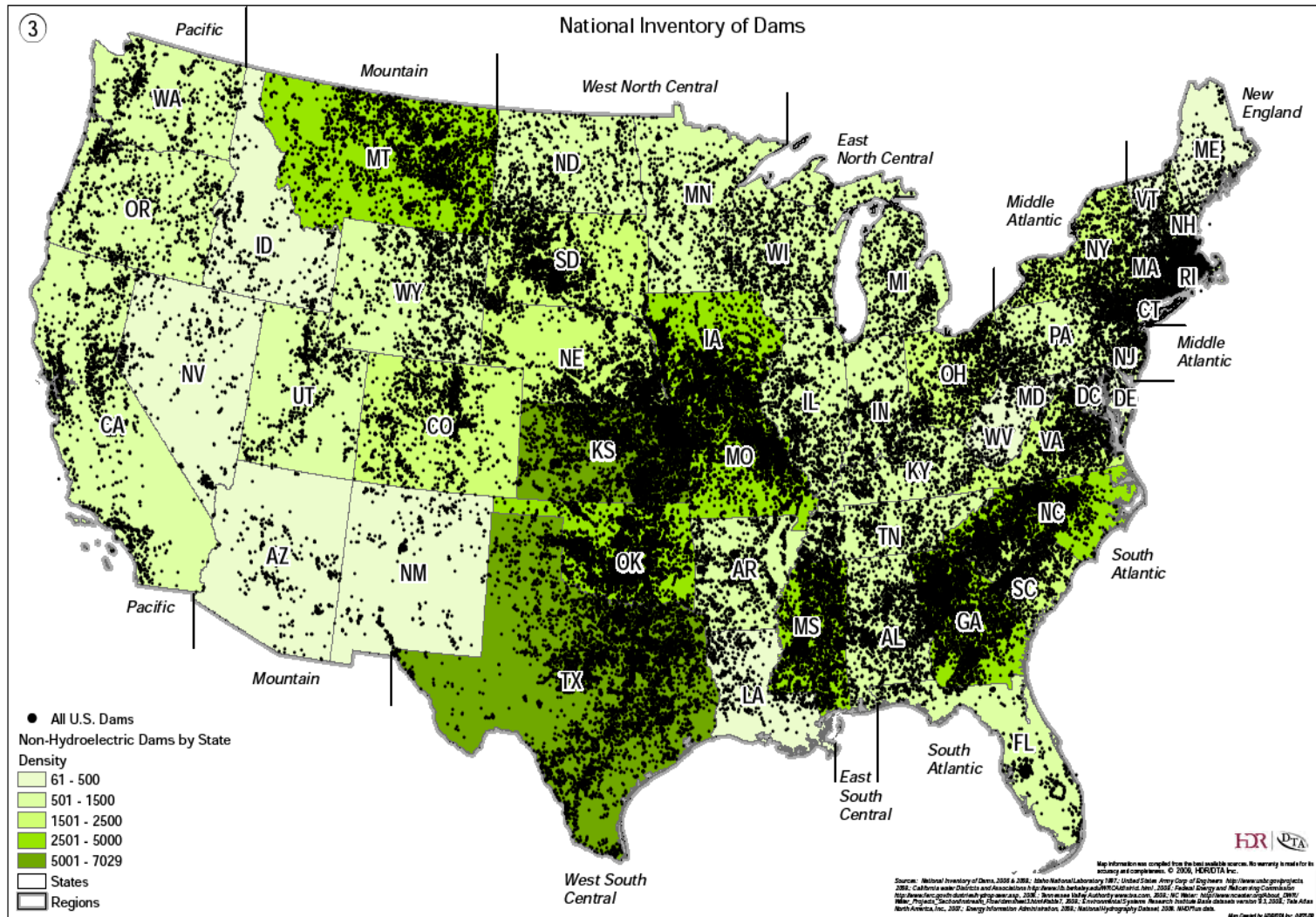


Key Characteristics of the Hydro Fleet



Hydropower is generated in every region of the country and benefits every state, employing up to 300,000 workers around the U.S.

Only 3% of the 80,000 dams across the U.S. generate electricity



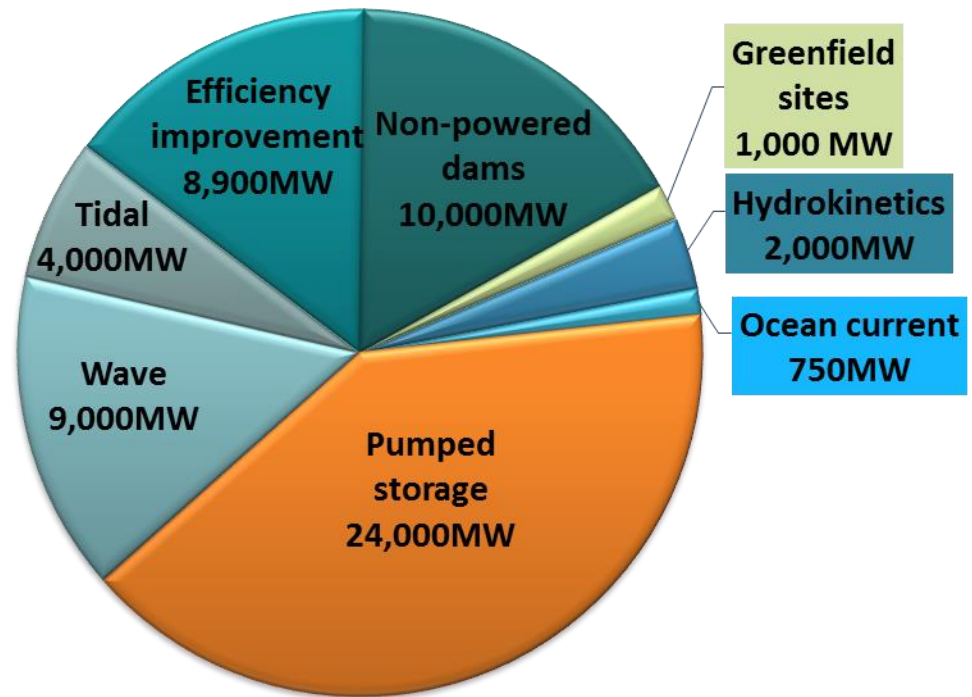
Source: USACE, ORNL

Future availability

With the right policies in place, the U.S. could add 60,000 MW of new hydro capacity by 2025, much of which can be created by maximizing existing infrastructure or with low-impact projects.

There are also some greenfield project opportunities.

Hydro Capacity Growth by Technology



Navigant Consulting Study, 2009

DOE/ORNL: 12 GW at over 54,000 sites

8 GW in top 100 sites

81 of top 100 sites are dams owned by the U.S. Army Corps of Engineers

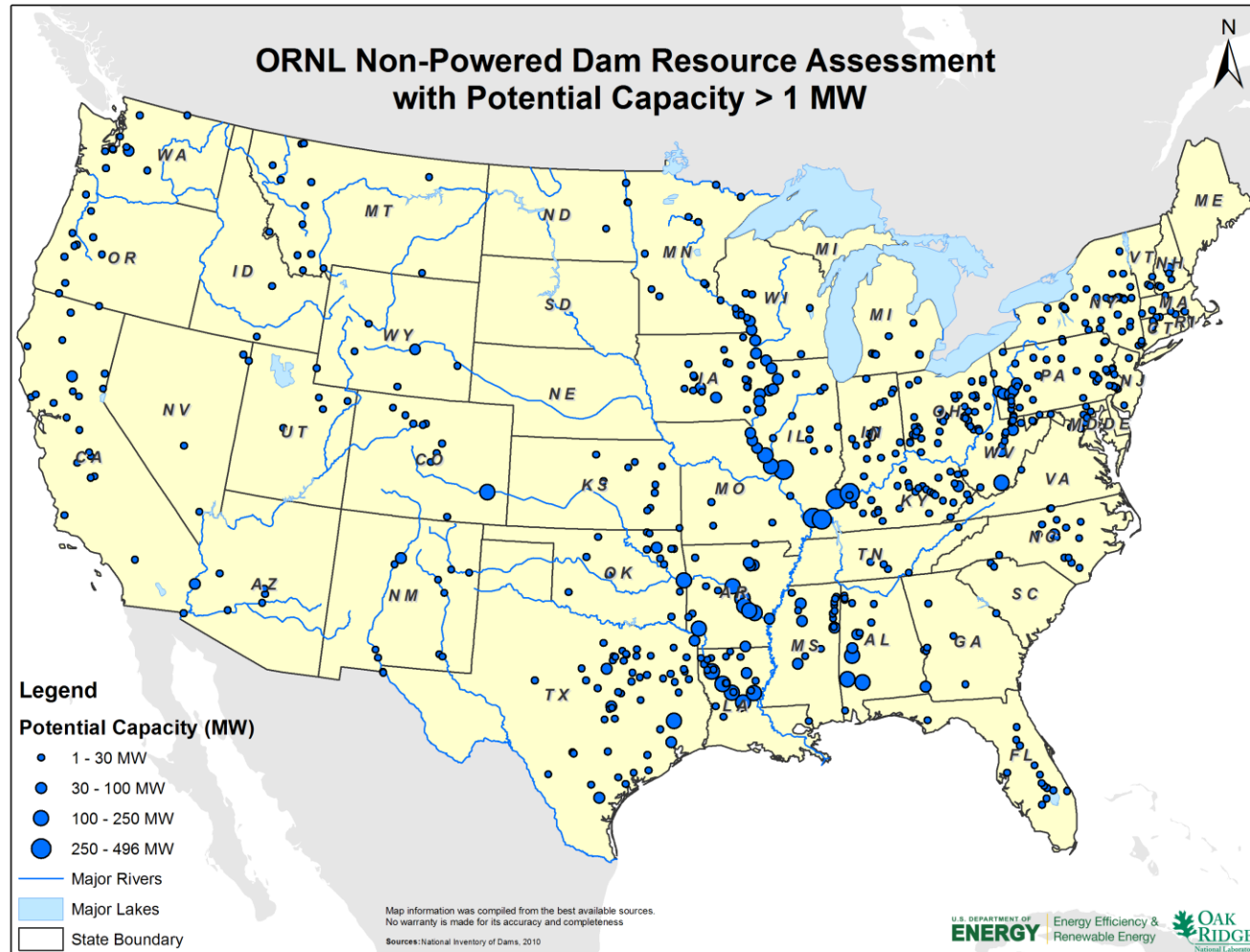
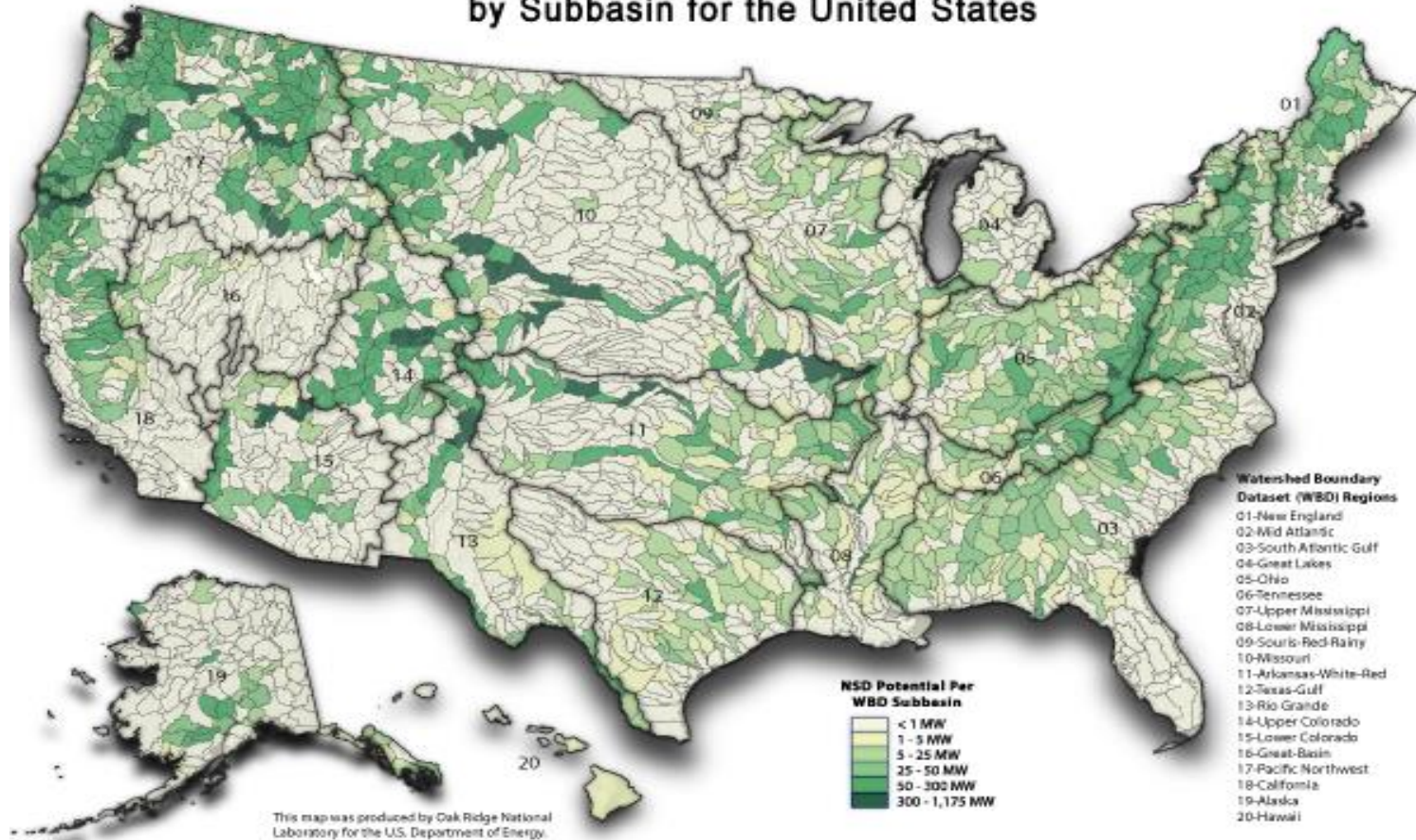


Table 4. Summary of NPD Assessment by State Totaling 12 GW of Potential (P.25)

State	Potential Capacity (MW)	State	Potential Capacity (MW)	State	Potential Capacity (MW)
AL	922	ME	19	OH	288
AZ	80	MD	48	OK	339
AR	1136	MA	67	OR	116
CA	195	MI	48	PA	679
CO	172	MN	186	RI	13
CT	68	MS	271	SC	38
DE	3	MO	489	SD	12
FL	173	MT	88	TN	40
GA	144	NE	7	TX	658
ID	12	NV	16	UT	40
IL	1269	NH	63	VT	17
IN	454	NJ	33	VA	50
IA	427	NM	103	WA	85
KS	92	NY	295	WV	210
KY	1253	NC	167	WI	245
LA	857	ND	31	WY	45

DOE/ORNL: 65 GW in new stream reach development

New Stream-reach Development (NSD) Potential by Subbasin for the United States



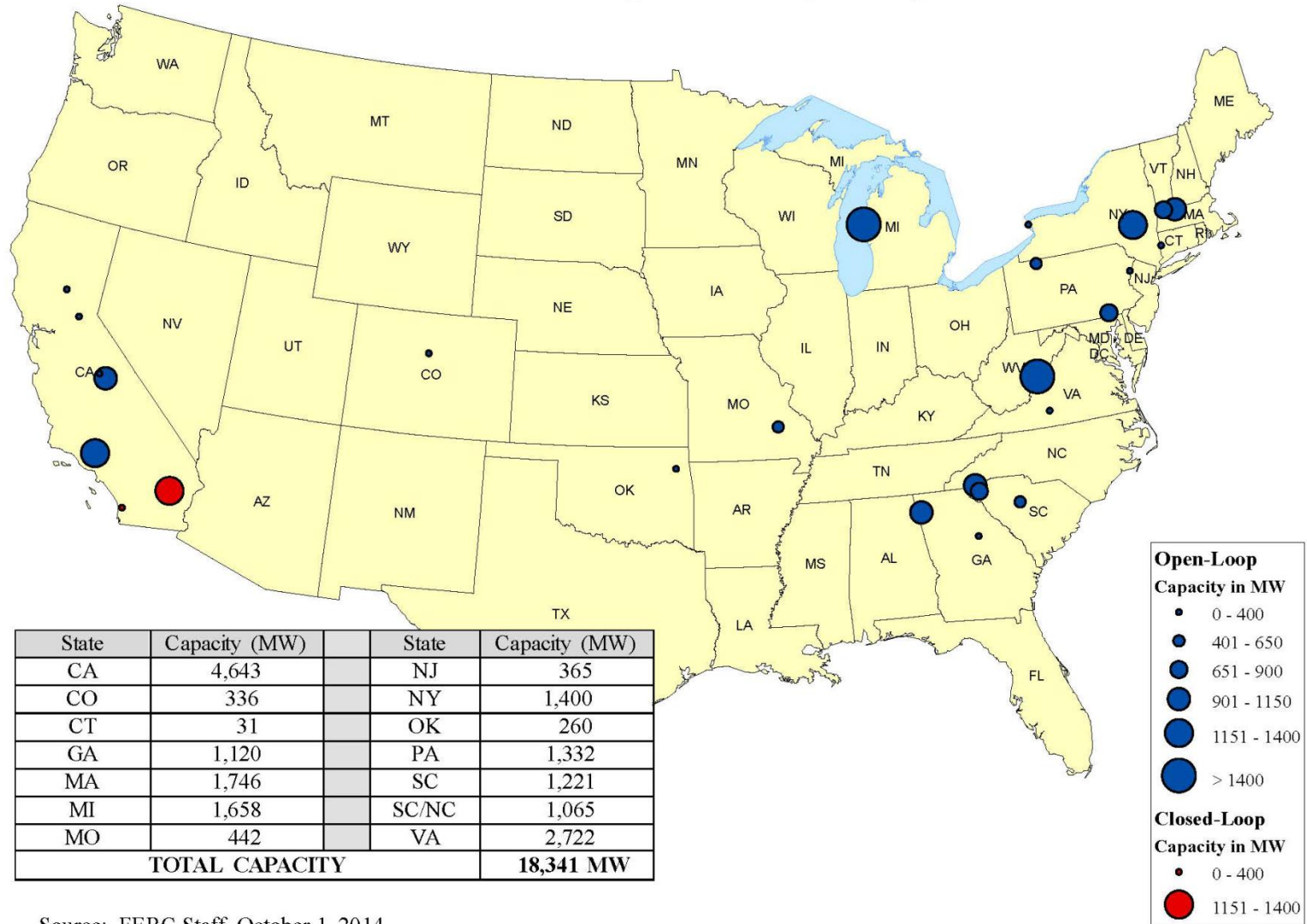
Hydro Projects In Line

**The FERC
pipeline tops
37,508 MW
across 306
projects**

- **Pending Licenses/Relicenses/
Exemptions: 34 projects, 1,724 MW, 21
states**
- **Preliminary Permits Issued: 233
projects, 35,158 MW, 41 states**
- **Preliminary Permits Pending: 19
projects, 626 MW, 8 states**

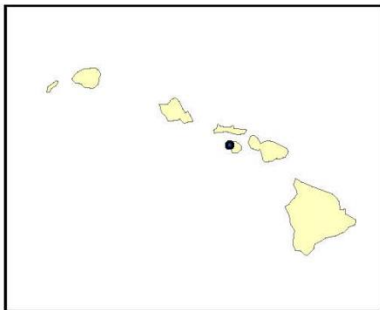
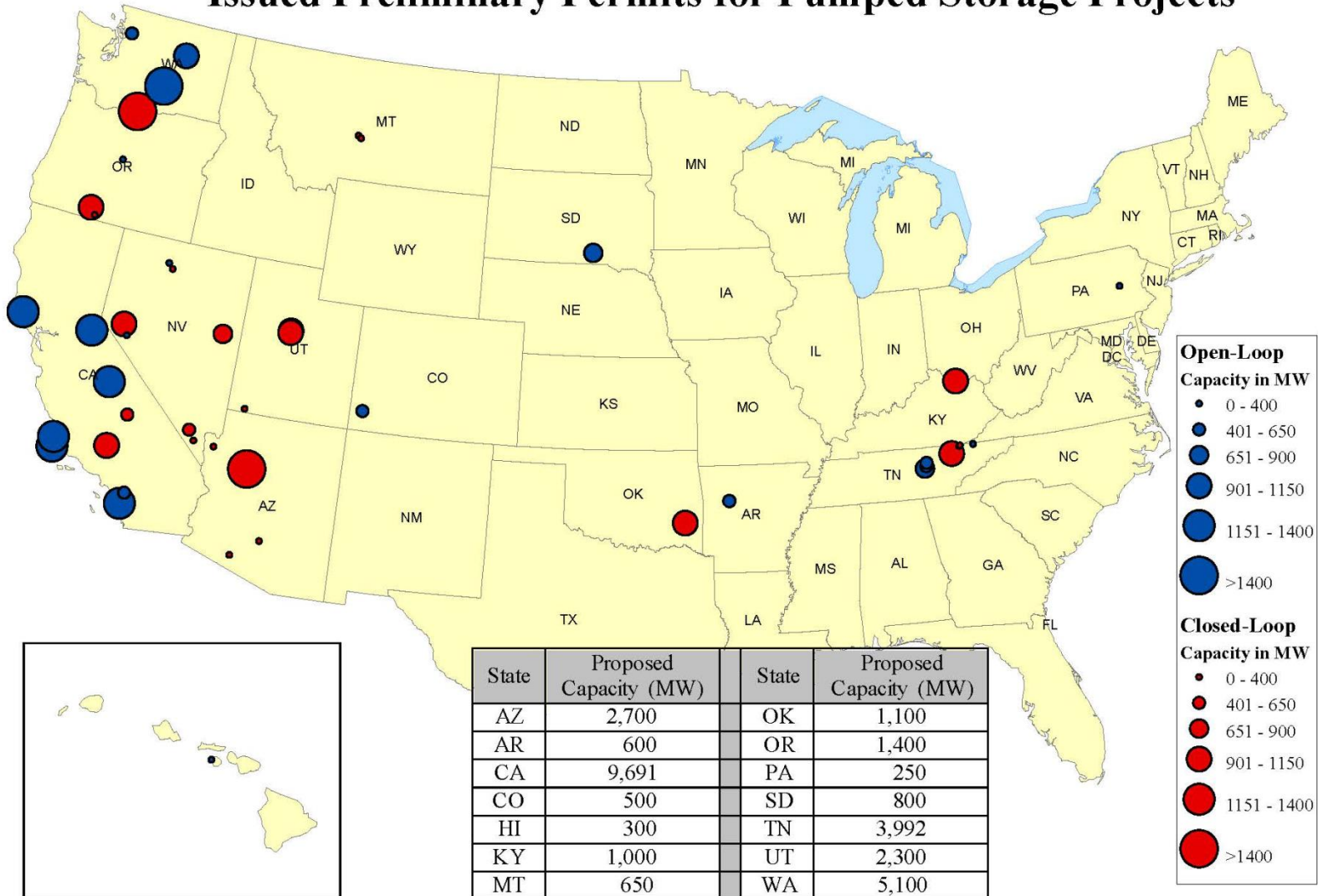
*2014 FERC data

Licensed Pumped Storage Projects



Source: FERC Staff, October 1, 2014

Issued Preliminary Permits for Pumped Storage Projects



State	Proposed Capacity (MW)	State	Proposed Capacity (MW)
AZ	2,700	OK	1,100
AR	600	OR	1,400
CA	9,691	PA	250
CO	500	SD	800
HI	300	TN	3,992
KY	1,000	UT	2,300
MT	650	WA	5,100
NV	3,650		
TOTAL CAPACITY		34,033 MW	

Note: Preliminary determination of open- vs. closed-loop classification based on preliminary permit application.

Federal Legislative Success for Hydro

Hydro bills/ provisions signed into law in 113th Congress

- The Hydropower Regulatory Efficiency Act of 2013
- Bureau of Reclamation Small Conduit Hydropower Development and Rural Jobs Act
- The Water Resources Reform and Development Act (WRDDA)
- Bureau of Reclamation Conduit Hydropower Development Equity and Jobs Act



What this process meant for hydro

- 1) Demonstrated overwhelming bipartisan support for hydropower as a renewable energy resource.
- 2) Demonstrated NGO support for increasing hydropower capacity.
- 3) Hydro policy development can be moved on its own. Is not a controversial issue.
- 4) Busting the myth that hydropower is a tapped out resource. Many growth opportunities – non-powered dams, pumped storage, small hydro, conduits – all across the country.

Great PR for Hydro

The Washington Post

“Congress finally found an energy source everyone likes - hydropower”

THE DENVER POST

“Congress gives hydropower a boost”

The New York Times

“Congress Passes First Significant Energy Legislation Since 2009”

platts

With broader energy bill stalled, US Senate passes hydropower bills

Roll Call

THE NEWSPAPER OF CAPITOL HILL SINCE 1955

Two Hydropower Bills Cleared for President's Signature

DOE & NHA Partnership on Hydropower Vision



“Hydropower can double its contributions by the year 2030. **We have to pick up the covers off of this hidden renewable that’s right in front of our eyes** and continues to have significant potential.”

– Dr. **Ernest Moniz**, Secretary of Energy

A new vision for U.S. hydropower

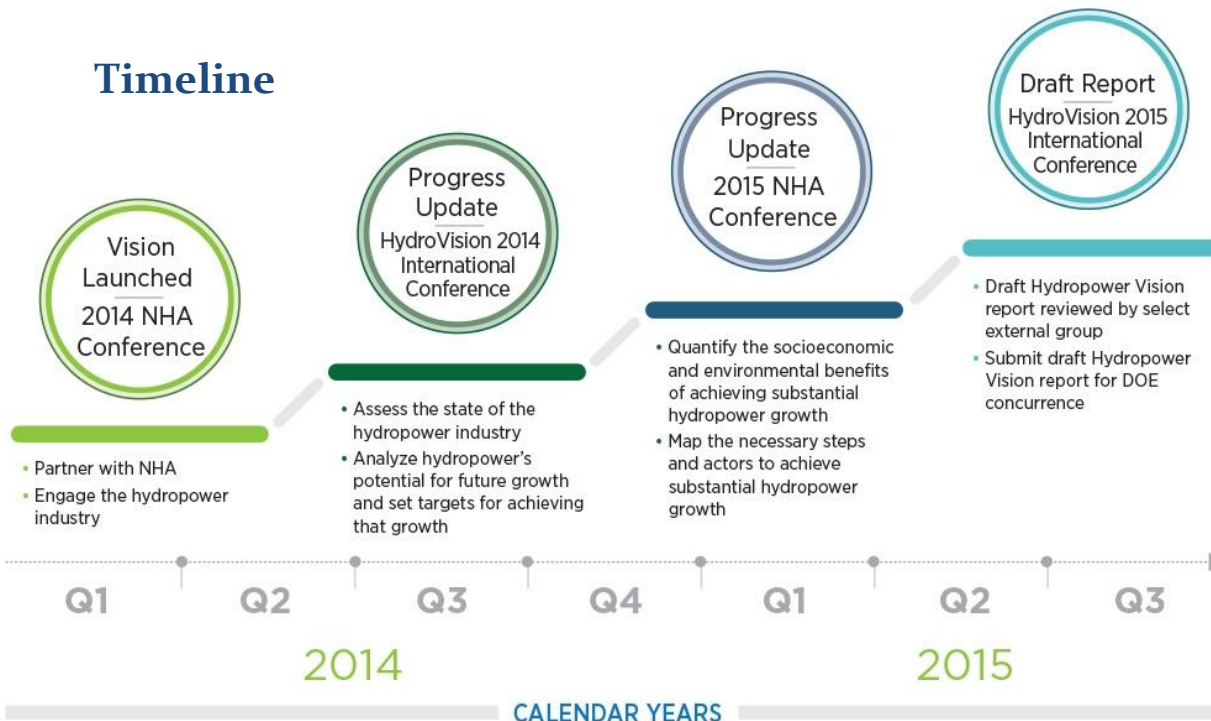
Objectives

- Lead the development of a **cohesive long-term vision** for the benefit of the broad U.S. hydro community
- Analyze a range of **aggressive, but attainable industry growth scenarios**
- Provide **best available information** to address stakeholder interests
- Provide **objective and relevant information** for use by policy and decision makers

Product

- Close examination of the **current state** of the industry
- Discussion of the **costs and benefits to the nation** arising from additional hydro
- **A road map** addressing the challenges to achieving higher levels of hydropower within a sustainable national energy mix

Timeline



What States are doing

Including hydropower in state Renewable Energy Standards and other clean/renewable programs and initiatives.

Providing developers with tax incentives or low-interest loan programs to assist projects

Better coordinating state wildlife and water quality staff participation in the federal licensing process.

Investigating ways to speed up state permit and other decision-making processes.

State Hydro Initiatives & Activities

Colorado – Passed hydro legislation, and signed MOU w/ FERC to streamline and simplify the authorization of small scale hydro projects (mainly conduits).

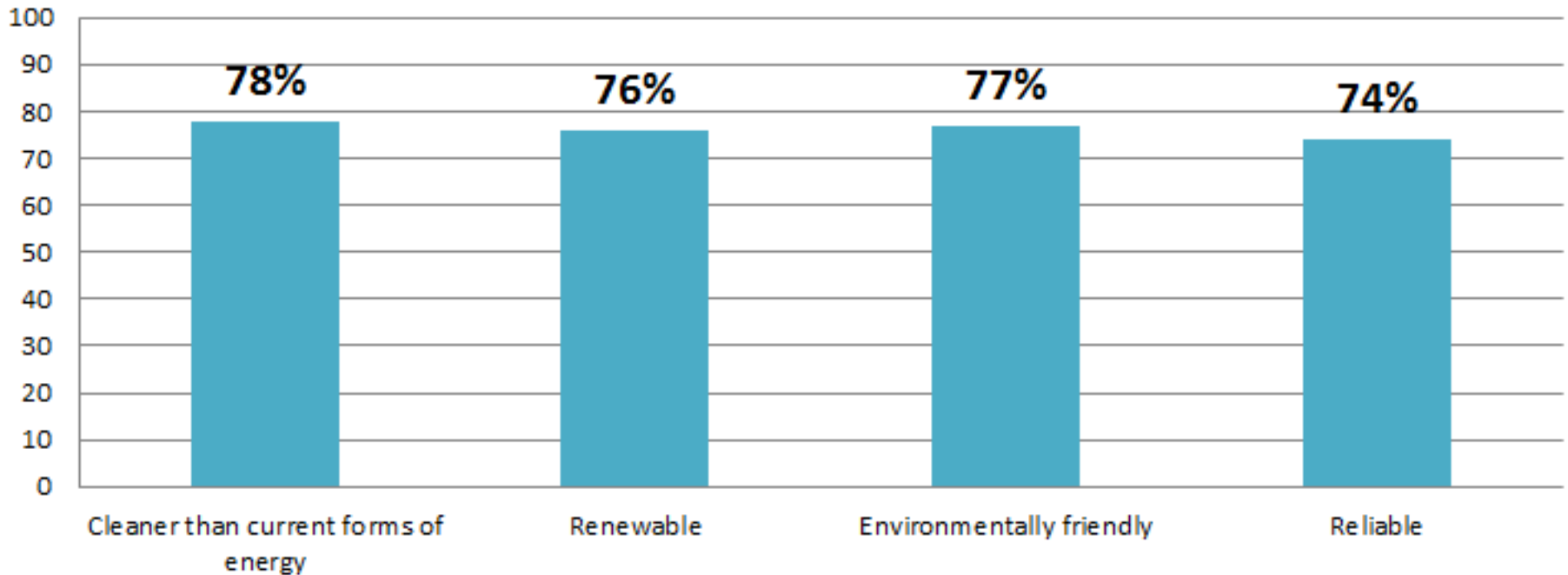
California – Signed MOU w/ FERC on coordinating the pre-application activities for non-federal hydro project proposals.

Oregon and Washington – Signed MOUs to coordinate state review of hydro projects using emerging marine and hydrokinetic technologies.

Other Actions: Alaska, Maine, Massachusetts, Rhode Island, Wyoming, and Vermont all have all passed laws or have created administrative or legislative workgroups to examine ways to grow their hydro resources. Governors' Energy Offices are also taking the lead.

Telling Hydro's Story: Public Support for Hydropower

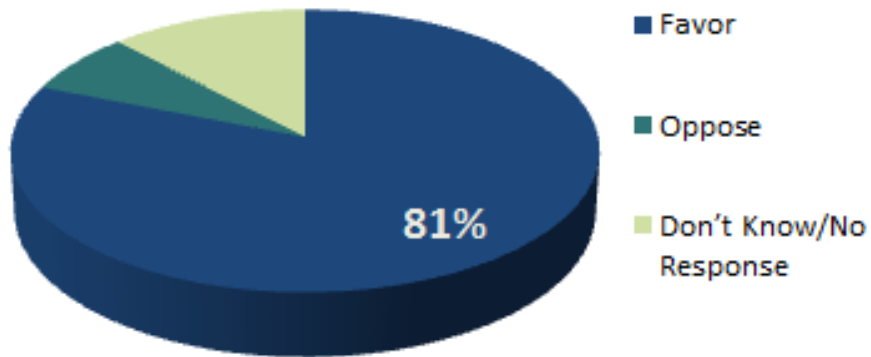
Hydropower is...



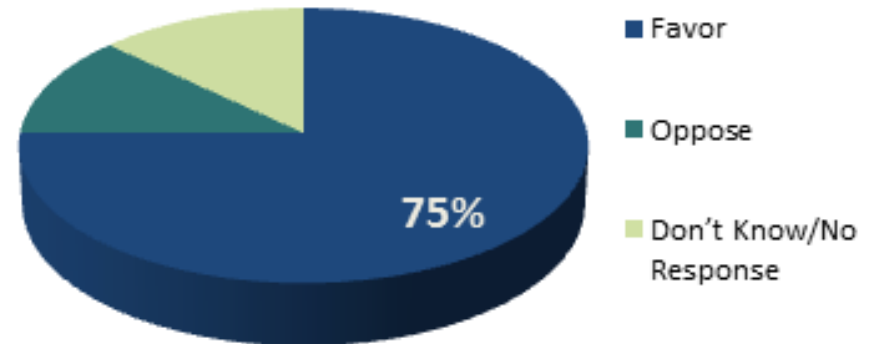
The January 2014 survey was conducted by Princeton Survey Research Associates International (PSRAI).

Poll Results

Maintain Existing U.S. Hydropower



Expand Hydropower in the U.S.



Contact

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Visit us on the Web

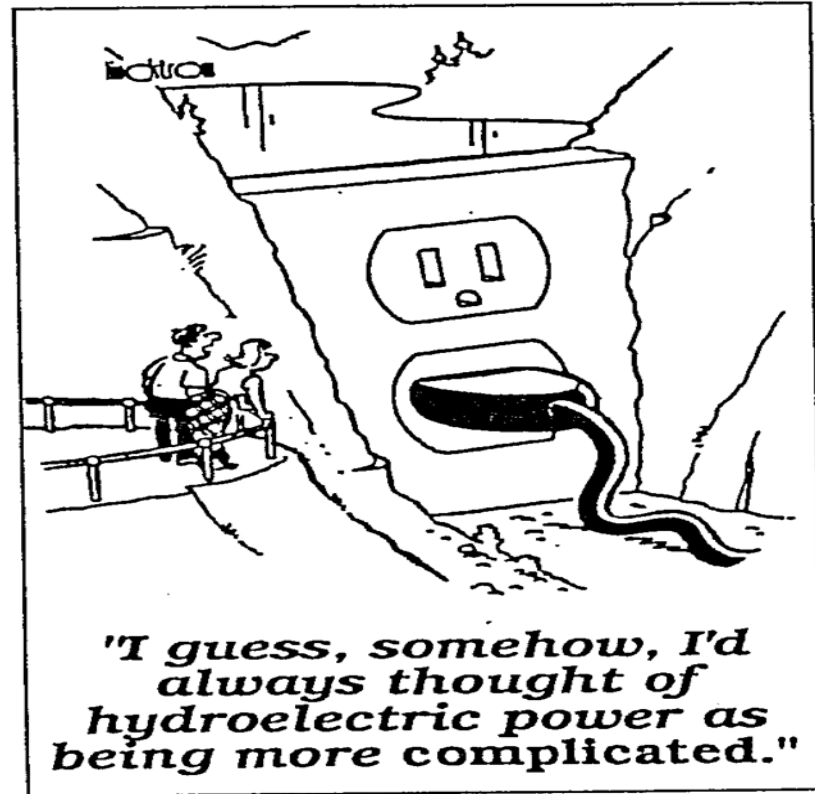
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Questions?