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.
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.
The U. S. Hydropower Fleet

Sources: ORNL, NID
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
With the right policies in place, the U.S. could add \textbf{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.

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

Source: ORNL
<table>
<thead>
<tr>
<th>State</th>
<th>Potential Capacity (MW)</th>
<th>State</th>
<th>Potential Capacity (MW)</th>
<th>State</th>
<th>Potential Capacity (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AL</td>
<td>922</td>
<td>ME</td>
<td>19</td>
<td>OH</td>
<td>288</td>
</tr>
<tr>
<td>AZ</td>
<td>80</td>
<td>MD</td>
<td>48</td>
<td>OK</td>
<td>339</td>
</tr>
<tr>
<td>AR</td>
<td>1136</td>
<td>MA</td>
<td>67</td>
<td>OR</td>
<td>116</td>
</tr>
<tr>
<td>CA</td>
<td>195</td>
<td>MI</td>
<td>48</td>
<td>PA</td>
<td>679</td>
</tr>
<tr>
<td>CO</td>
<td>172</td>
<td>MN</td>
<td>186</td>
<td>RI</td>
<td>13</td>
</tr>
<tr>
<td>CT</td>
<td>68</td>
<td>MS</td>
<td>271</td>
<td>SC</td>
<td>38</td>
</tr>
<tr>
<td>DE</td>
<td>3</td>
<td>MO</td>
<td>489</td>
<td>SD</td>
<td>12</td>
</tr>
<tr>
<td>FL</td>
<td>173</td>
<td>MT</td>
<td>88</td>
<td>TN</td>
<td>40</td>
</tr>
<tr>
<td>GA</td>
<td>144</td>
<td>NE</td>
<td>7</td>
<td>TX</td>
<td>658</td>
</tr>
<tr>
<td>ID</td>
<td>12</td>
<td>NV</td>
<td>16</td>
<td>UT</td>
<td>40</td>
</tr>
<tr>
<td>IL</td>
<td>1269</td>
<td>NH</td>
<td>63</td>
<td>VT</td>
<td>17</td>
</tr>
<tr>
<td>IN</td>
<td>454</td>
<td>NJ</td>
<td>33</td>
<td>VA</td>
<td>50</td>
</tr>
<tr>
<td>IA</td>
<td>427</td>
<td>NM</td>
<td>103</td>
<td>WA</td>
<td>85</td>
</tr>
<tr>
<td>KS</td>
<td>92</td>
<td>NY</td>
<td>295</td>
<td>WV</td>
<td>210</td>
</tr>
<tr>
<td>KY</td>
<td>1253</td>
<td>NC</td>
<td>167</td>
<td>WI</td>
<td>245</td>
</tr>
<tr>
<td>LA</td>
<td>857</td>
<td>ND</td>
<td>31</td>
<td>WY</td>
<td>45</td>
</tr>
</tbody>
</table>
DOE/ORNL: 65 GW in new stream reach development
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


<table>
<thead>
<tr>
<th>State</th>
<th>Capacity (MW)</th>
<th>State</th>
<th>Capacity (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CA</td>
<td>4,643</td>
<td>NJ</td>
<td>365</td>
</tr>
<tr>
<td>CO</td>
<td>336</td>
<td>NY</td>
<td>1,400</td>
</tr>
<tr>
<td>CT</td>
<td>31</td>
<td>OK</td>
<td>260</td>
</tr>
<tr>
<td>GA</td>
<td>1,120</td>
<td>PA</td>
<td>1,332</td>
</tr>
<tr>
<td>MA</td>
<td>1,746</td>
<td>SC</td>
<td>1,221</td>
</tr>
<tr>
<td>MI</td>
<td>1,658</td>
<td>SC/NC</td>
<td>1,065</td>
</tr>
<tr>
<td>MO</td>
<td>442</td>
<td>VA</td>
<td>2,722</td>
</tr>
<tr>
<td><strong>TOTAL CAPACITY</strong></td>
<td><strong>18,341 MW</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: FERC Staff, October 1, 2014
Issued Preliminary Permits for Pumped Storage Projects

Open-Loop
Capacity in MW
- 0 - 400
- 401 - 650
- 651 - 900
- 901 - 1150
- 1151 - 1400
- >1400

Closed-Loop
Capacity in MW
- 0 - 400
- 401 - 650
- 651 - 900
- 901 - 1150
- 1151 - 1400
- >1400

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

Source: FERC Staff, October 1, 2014

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

Maintain Existing U.S. Hydropower
- Favor: 81%
- Oppose: 19%
- Don’t Know/No Response: 0%

Expand Hydropower in the U.S.
- Favor: 75%
- Oppose: 25%
- Don’t Know/No Response: 0%
Contact

David Zayas
Senior Manager of Regulatory Affairs & Technical Services
202.750.8406
david@hydro.org

Visit us on the Web

www.hydro.org

NatlHydroAssoc

@NatlHydroAssoc

Questions?