National Hydropower Association

An Overview of Hydropower

NHA Finance Summit
June 3, 2013

"Hydro's back... hydro's way back!"

NHA: Looking to the Future

Vision

- Double America's largest renewable energy resource – hydropower – in support of a sustainable and secure clean energy future. – Another **100,000 MWs**

Mission

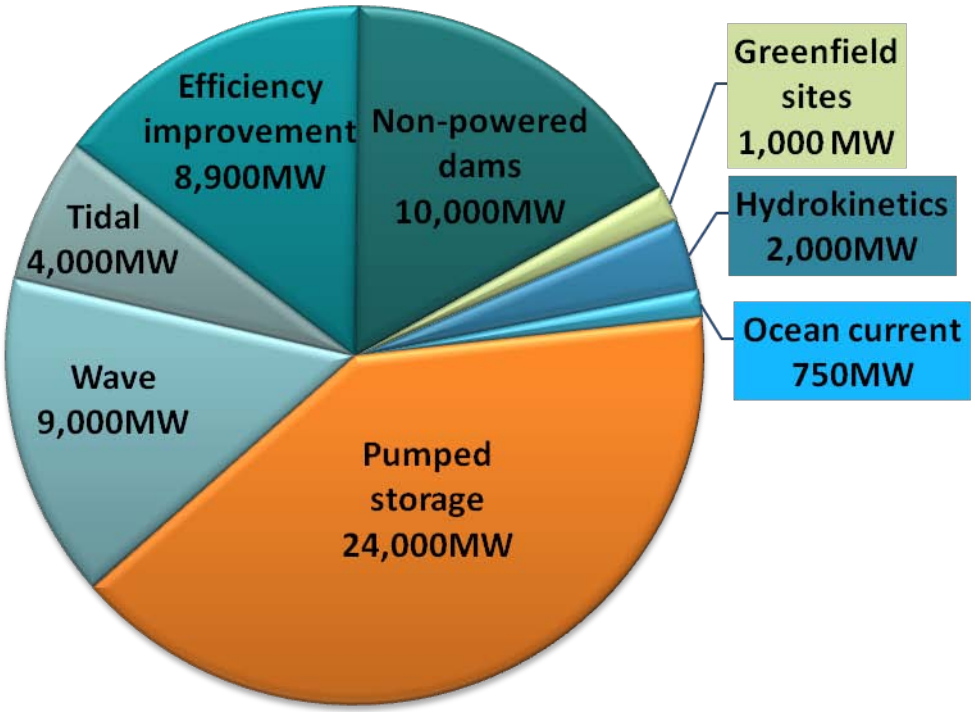
- Champion hydropower, in all of its forms, as America's premier clean and renewable energy resource.
- Focus on growth, operational excellence and environmental stewardship.

Future availability

With the right policies in place, **the U.S. could add 60,000 MW** of new hydro capacity by 2030, 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

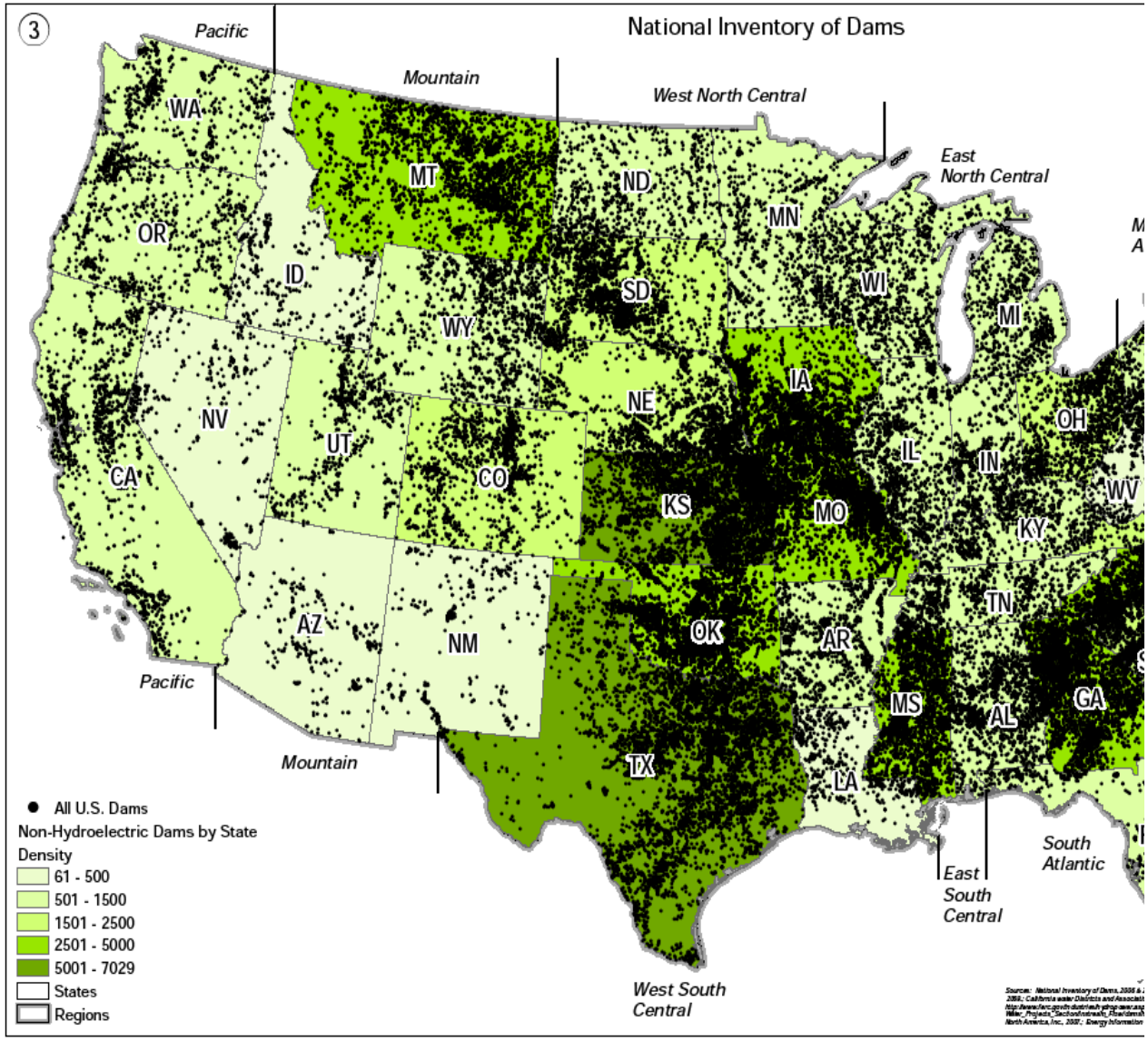
Prime Development Opportunities on Existing Infrastructure

Retrofitting non-powered dams

- 12,000 MWs identified by DOE
- Equivalent to capacity of 12 nuclear facilities

Capacity Additions & Efficiency Improvements

- Over 110 projects PTC certified by FERC
- Average 10 percent increase in generation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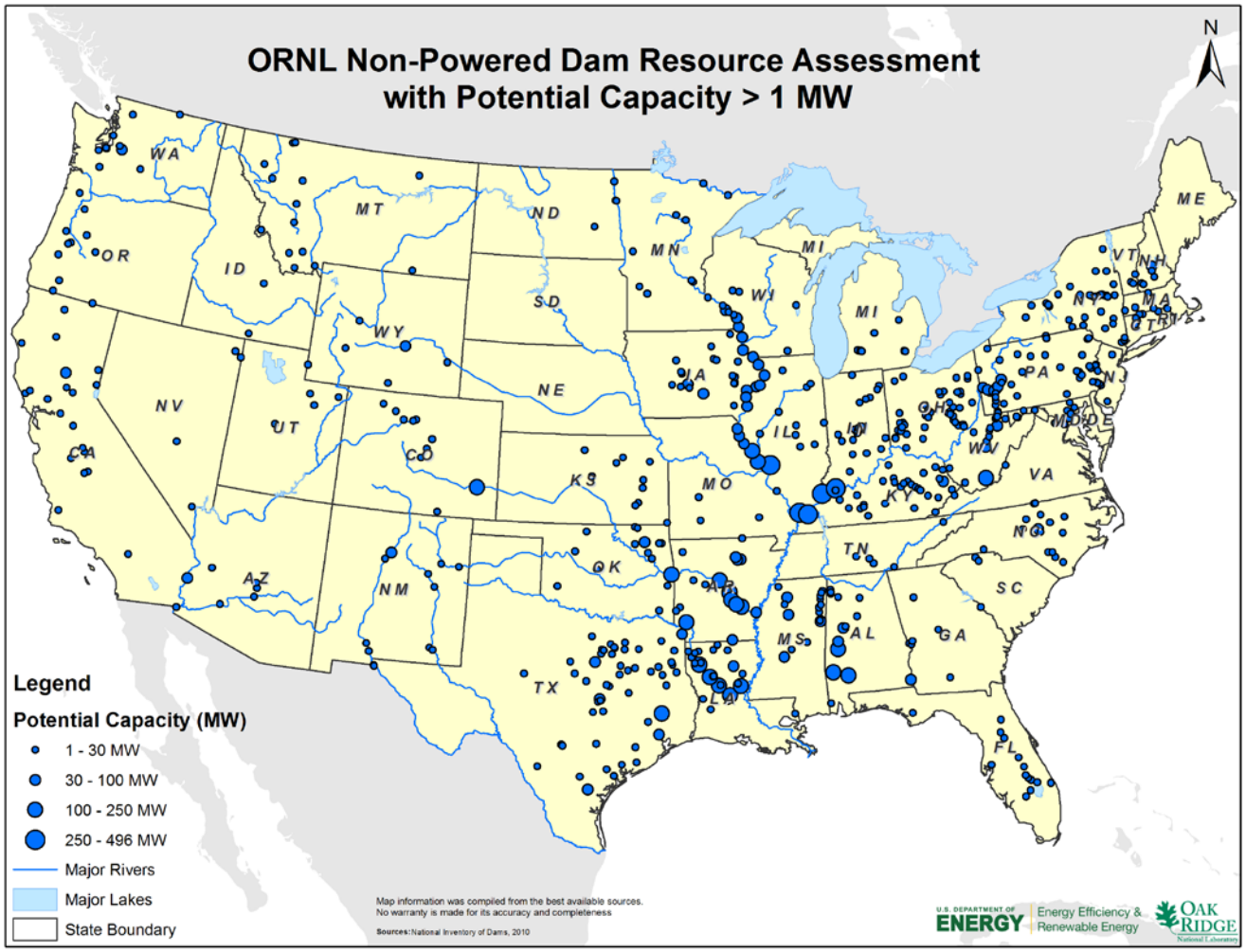
National Inventory of Dams
Pacific
Mountain
West North Central
East North Central
West South Central
East South Central
South Atlantic
WA
OR
CA
ID
NV
MT
WY
UT
AZ
CO
NM
ND
SD
NE
KS
OK
TX
MN
IA
MO
AR
LA
WI
IL
MS
MI
IN
KY
TN
AL
OH
WV
GA
All U.S. Dams
Non-Hydroelectric Dams by State
Density
61 - 500
501 - 1500
1501 - 2500
2501 - 5000
5001 - 7029
States
Regions

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

Hydro Projects In Line

The FERC pipeline tops 81,000 MW across 564 projects

- **Pending Licenses/Relicenses/ Exemptions: 113 projects, 15,000+ MW, 36 states**
- **Preliminary Permits Issued: 382 projects, 62,000+ MW, 47 states**
- **Preliminary Permits Pending: 69 projects, 4400+ MW, 22 states**

Challenges to Growth

Long development lead times

- Permitting and licensing can take over 5 years, followed by construction.
- Incentives generally extended on short-term basis.
- Numerous stakeholder involvement can add to time and cost
- Hard to attract investment

Large up-front capital investment required

- In addition to licensing costs, study costs, projects can require significant up front capital. (New pumped storage projects - $1-2 billion).
- Projects economic over long-term, but have high immediate start-up costs.

Uncertainty re: support, incentives, and regulatory policy

- Financial community concerned that incentives for hydro may not be renewed before project comes online.
- Affects both utilities and small developers abilities to pursue projects (conventional and new).

2013 Policy Priorities

Legislative and Regulatory Action Items

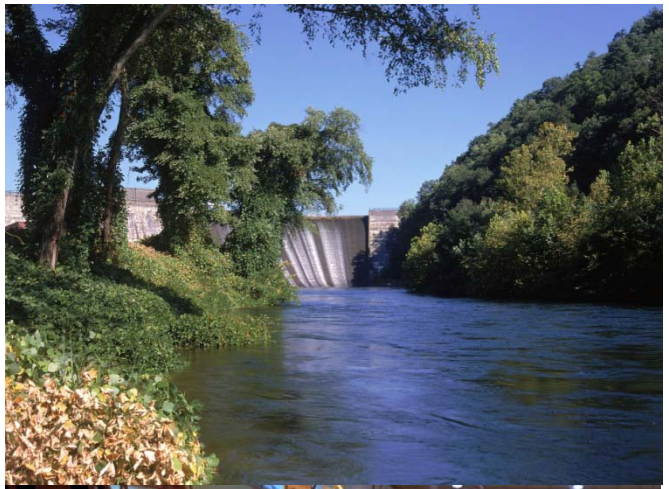
Enact the current hydropower regulatory efficiency bills	Enact reforms to the Corps approval process for non-federal development on Corps dams	Develop and enact proposals to address outstanding licensing issues for existing and new projects	Examine new incentive options and market policies to provide value for hydro's benefits and fully realize its growth potential	Engage FERC on the 2-year pilot licensing process for building on non-powered dams and closed-loop pumped storage	Respond to upcoming agency regulatory proposals and remain engaged on compliance issues of importance to existing hydro owners

Progress on regulatory efficiencies – 2012 House vote

2013 House vote even better! 422-0

Exciting Future Ahead -- Growth & More Growth!

- Politically Safe. Strong bipartisan support. Only energy resource that Congress can agree on!
- Is clean and helps to reduce CO_2; Environmental community has developed a new perspective in support of hydro growth.
- New policies are furthering hydro growth through reforms and considerations in incentive policies.
- Its electric benefits – baseload, load following and grid integration -- make it more important than ever!



"Hydro's back…hydro's way back!"

And that's a win/win for all of us!