TAPPING THE U.S HYDROPOWER POTENTIAL

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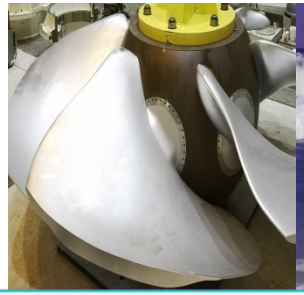
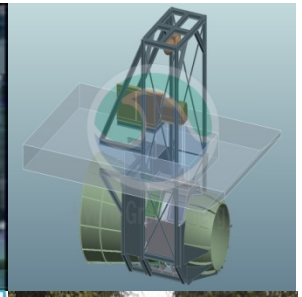
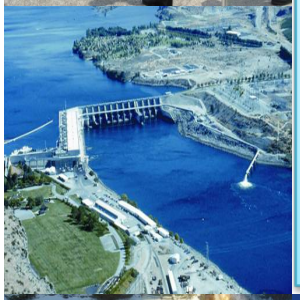
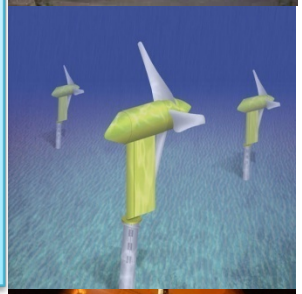
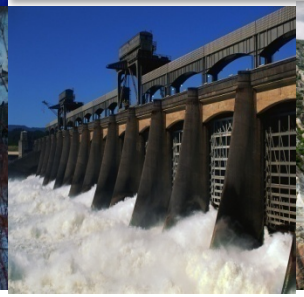
April 26, 2012
EESI Briefing

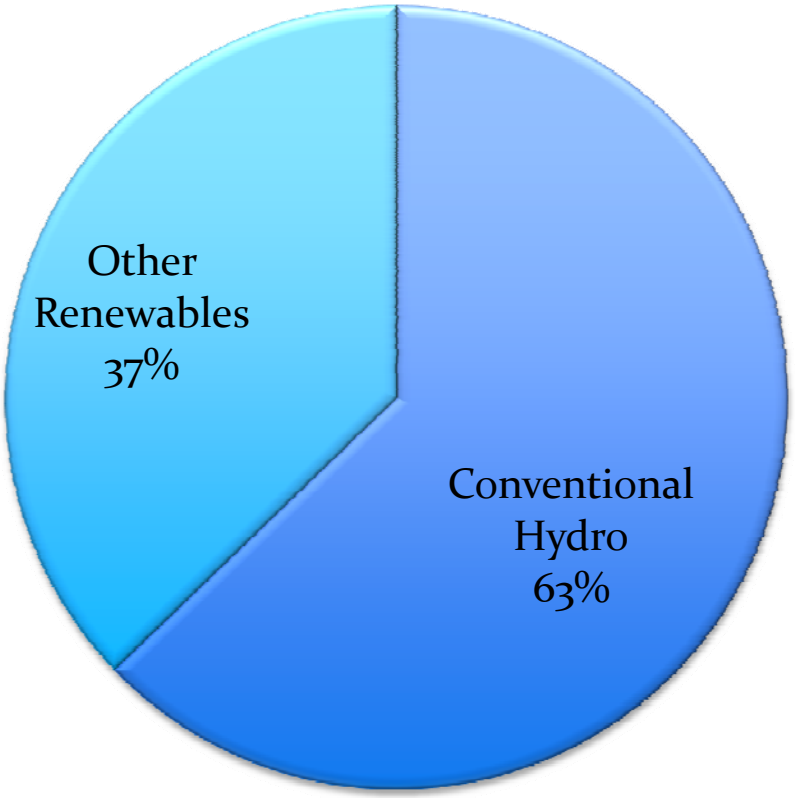



Vision

Double America's largest renewable energy resource – hydropower – in support of a sustainable and secure energy future.

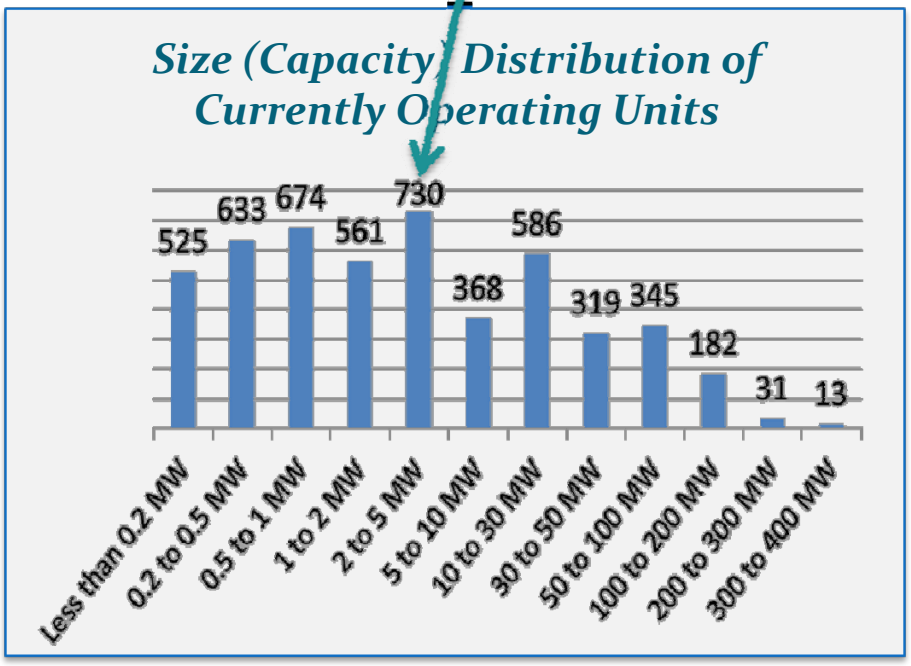
Hydropower is available – the largest source of U.S. renewable electricity generation making up nearly 8% of overall power generation in 2011.

U.S. Renewable Power Generation, 2011



Key Characteristics of the Hydro Fleet

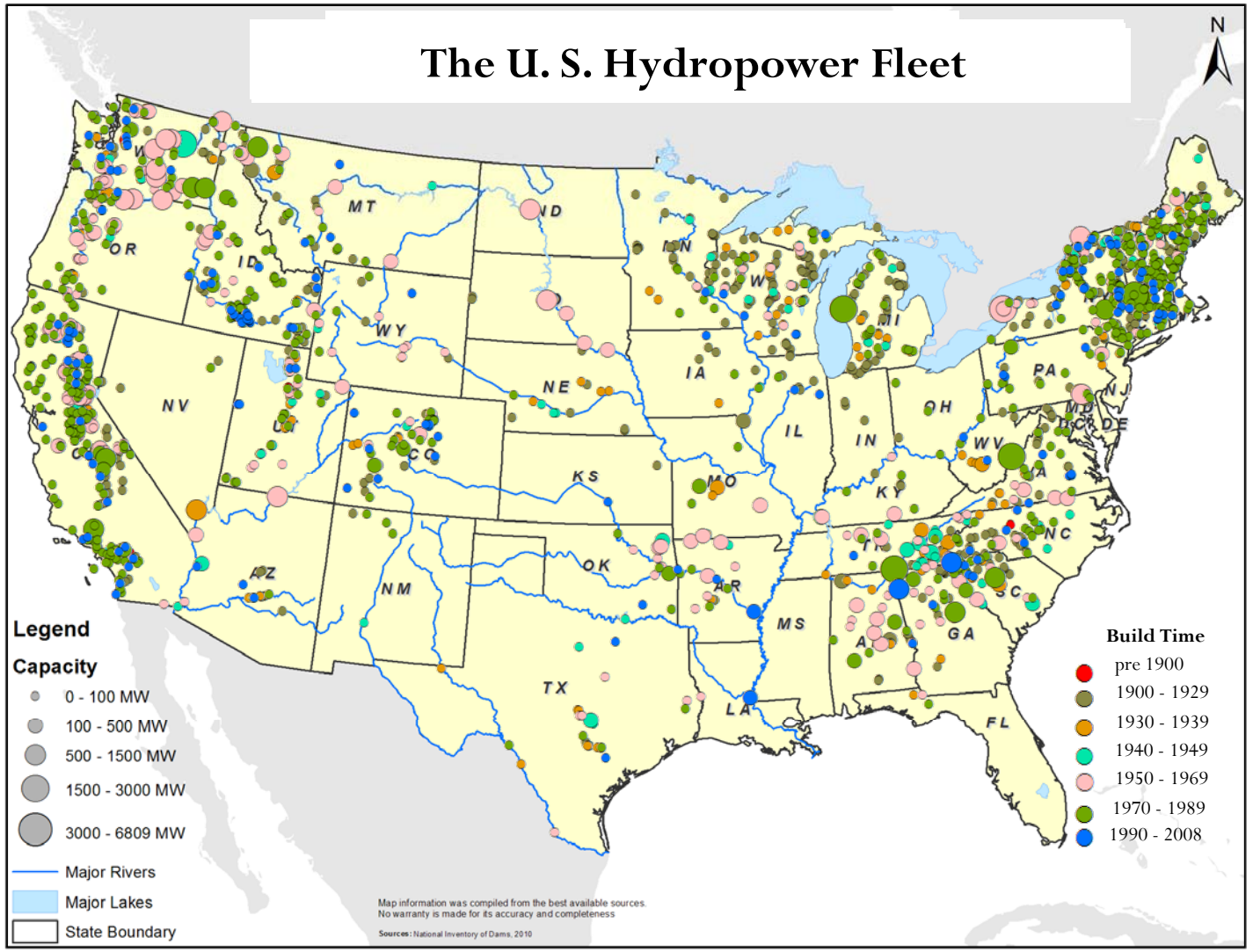
The majority of hydropower units are small.



Only 3% of U.S. dams generate electricity – there is significant room for growth without building new infrastructure.

Hydropower is generated in every region and benefits every state, supporting up to 300,000 jobs around the U.S.

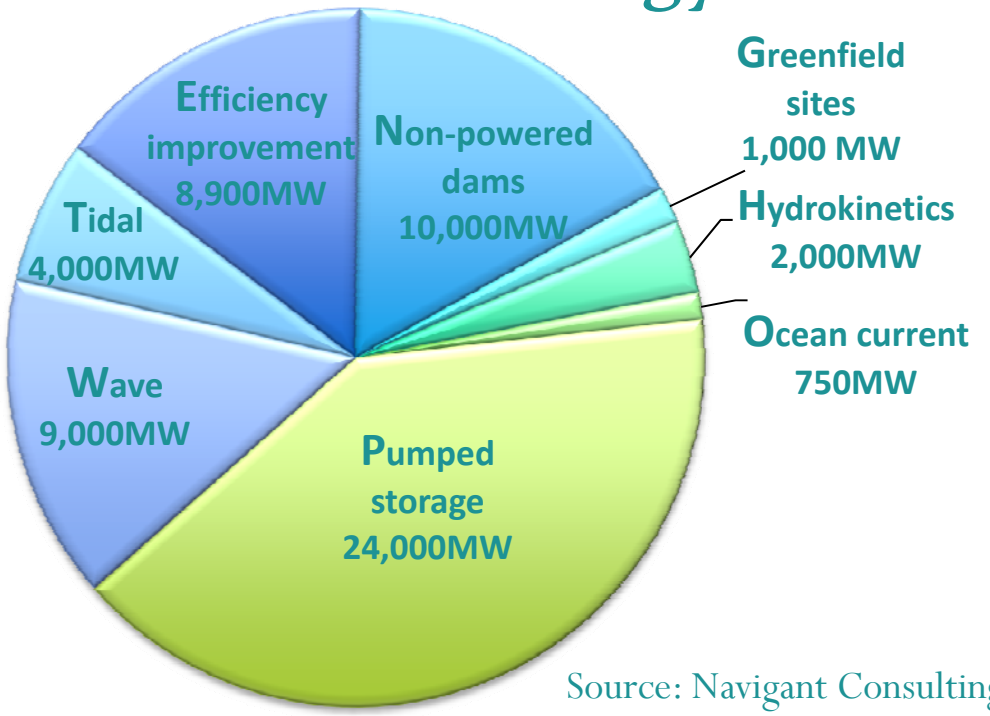
The Existing Foundation



Sources: ORNL, NID

Future Capacity

Hydro Capacity Growth by Technology



Source: Navigant Consulting

With the right policies in place, the U.S. could add 60,000 MW of new hydro capacity by 2025, the vast majority of which can be created without adding new dams.

Hydro Projects Waiting in Line

The FERC Pipeline Tops 82,000 MW across 644 projects

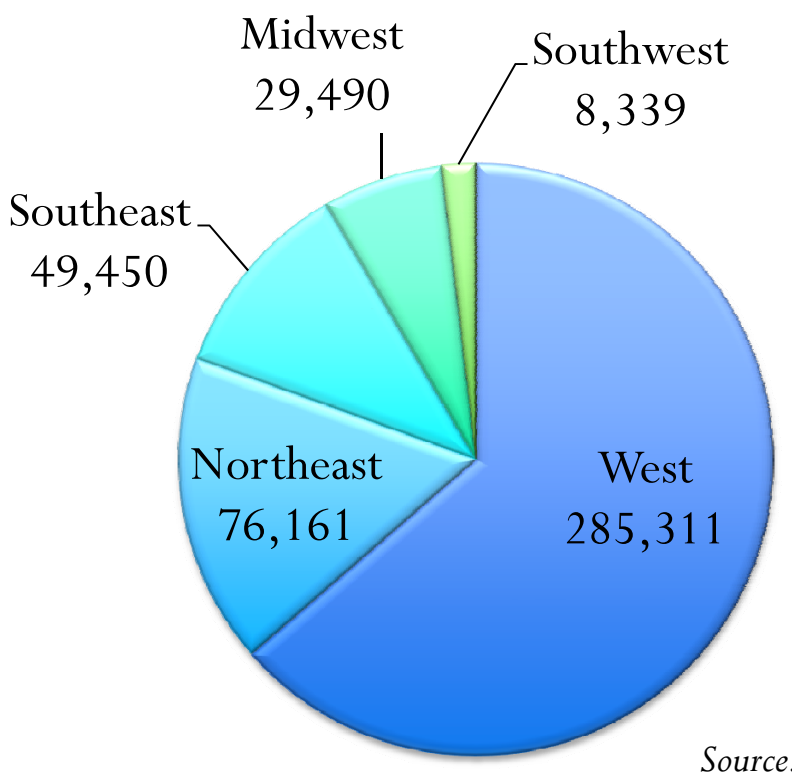
- **Applications/Exemptions Filed: 59 projects, 3000+ MW, 35 states**
- **Preliminary Permits Issued: 371 projects, 52,000+ MW, 47 states**
- **Preliminary Permits Pending: 214 projects, 26,000+ MW, 31 states**

From FERC data, February 2012

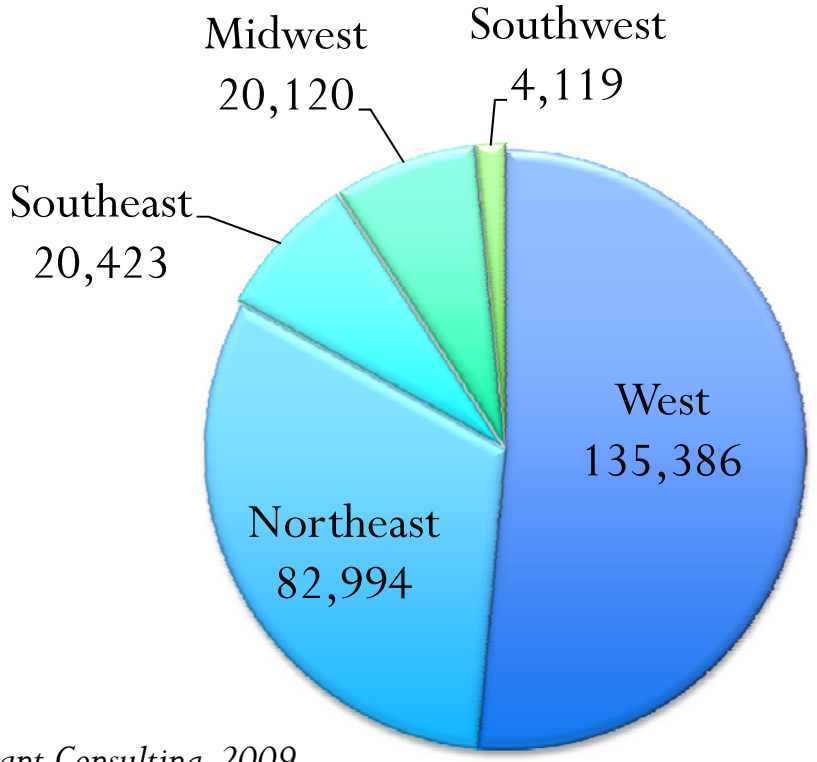
1.4 Million Potential Jobs

Cumulative Job Creation by 2025

Direct Jobs

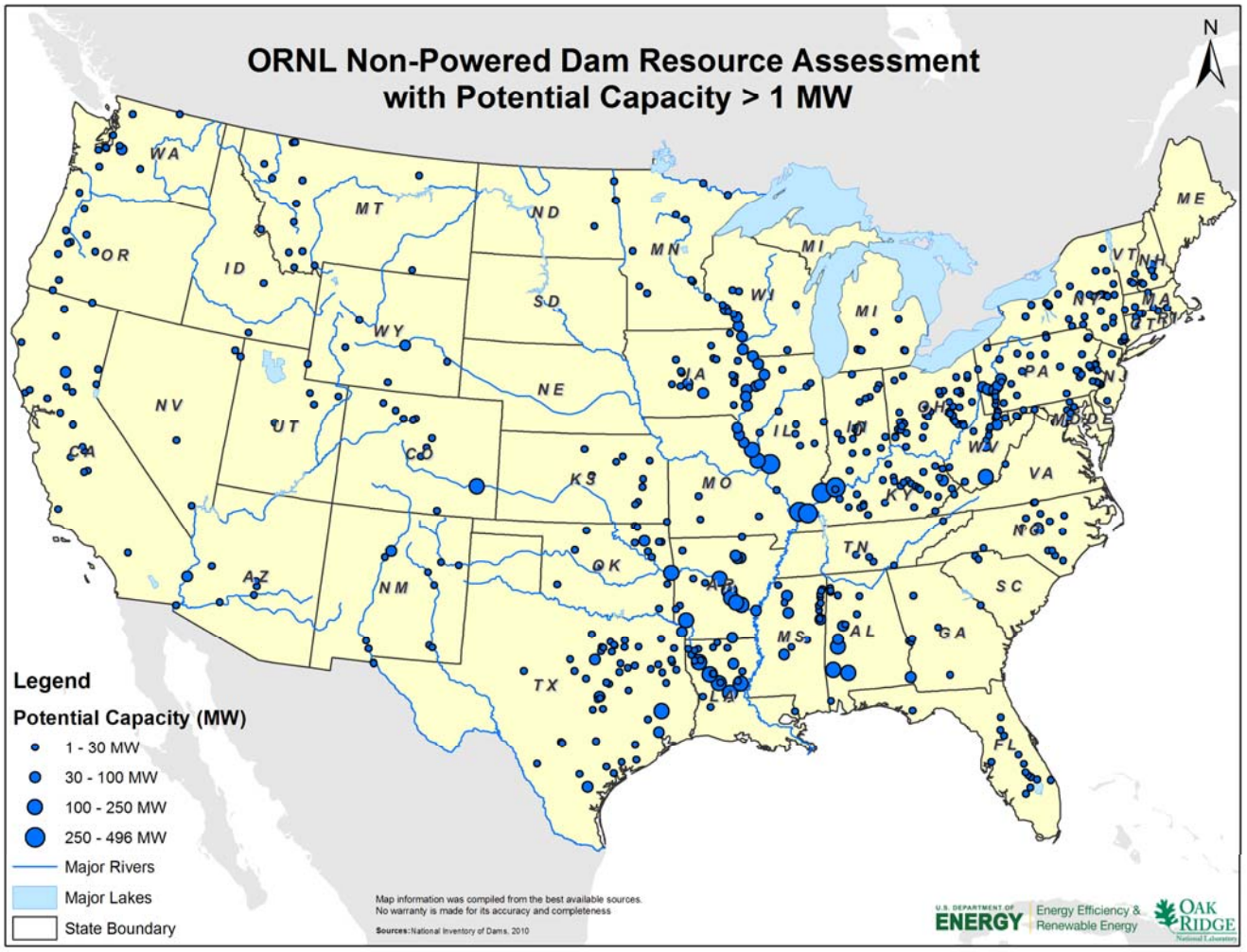


Indirect Jobs



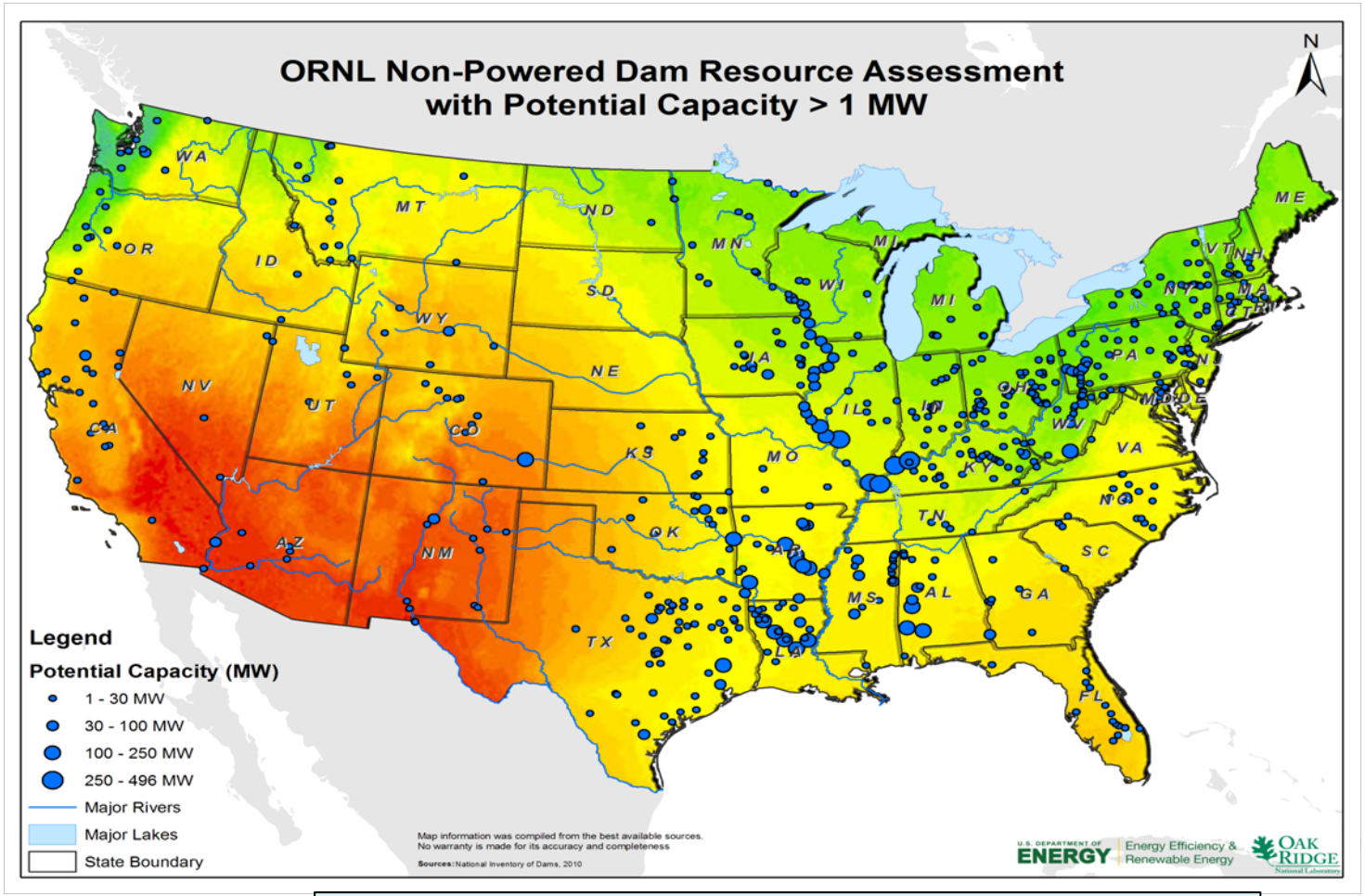
Source: Navigant Consulting, 2009

DOE/ORNL: Major Growth Opportunity



Source: ORNL

Non-Powered Dam Potential With Other Renewables



Sources: ORNL, NREL

Non-Powered Dam Potential exists in areas with less than ideal wind and solar resources

Hydropower supports the electric grid

- Hydropower is a flexible and reliable electricity source. Hydropower's ability to dispatch power immediately makes it an essential back-up during major electricity disruptions.

- Grid support services include: Frequency Control | Regulation | Load Following | Spinning Reserve |Supplemental Reserve

"[During the blackout,] one relatively large island remained in operation serving about 5,700 MW of demand, mostly in western New York, anchored by the Niagara and St. Lawrence hydro plants."
— US-Canada Power System Outage Task Force report, 2005

Hydropower is an affordable, scalable form of energy storage.

Hydropower pumped storage is one of the few large-scale, affordable means of storing and deploying electricity.

- Absorbs excess generation at times of low demand, and releases it during peak demand periods.
- An excellent partner for intermittent renewable electricity sources.

The U.S. has more than 20GW of pumped storage capacity today, with facilities in every region of the country. Developers have proposed an additional 31GW.

Hydropower is clean and sustainable

- The hydropower industry is committed to better understanding and mitigating the potential impacts of projects.

- Hundreds of millions of dollars are invested each year in environmental enhancements at hydro facilities.

- **Using hydropower avoided approximately 196 million metric tons of U.S. carbon pollution in 2009 – equal to emissions from approximately 38 million cars.**

Policy Priorities

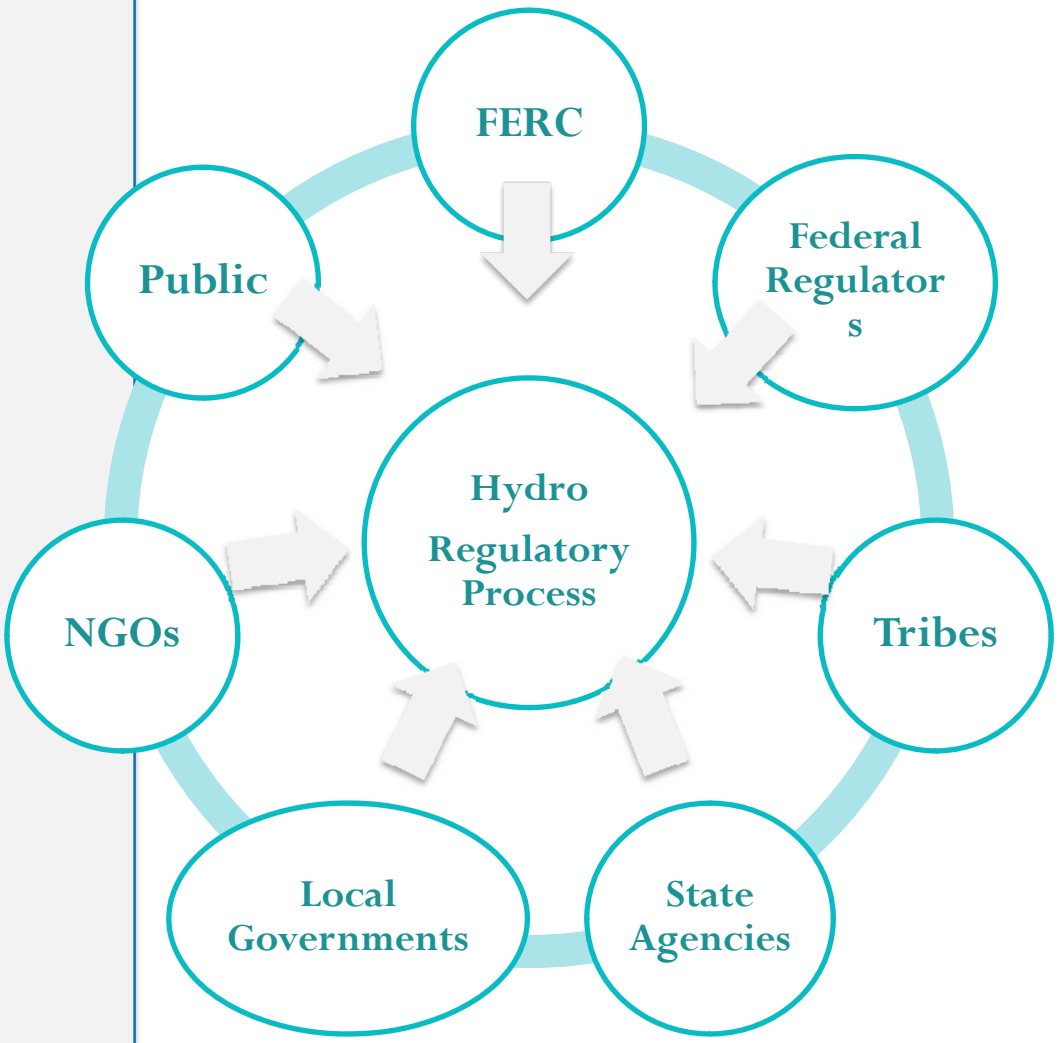
NHA supports the goal to substantially increase the amount of **America's electricity from clean and renewable energy** – a goal achievable only with a significant role for hydropower.

What it will take:

- A **more efficient regulatory process**
- Economic incentives to **support project development**
- A **national clean and renewable electricity standard**
- **Research and development**

The Regulatory Process

Hydropower development involves a **comprehensive but sometimes redundant regulatory approval process** that needs better coordination and cooperation between participants.



Making the regulatory process more efficient includes:

- Facilitating private hydropower development on Army Corps of Engineers and Bureau of Reclamation Facilities.

- An expedited licensing process for hydropower development at non-powered dams and closed loop pumped storage projects, that takes no more than two years.

- Support for small hydro and conduit power developers, so that the regulatory process provides assistance and is not a disincentive to project development.

Economic Incentives

Fund and extend incentives to provide long-term certainty

- Extension of production and investment tax credits (PTC, ITC) through 2018
- Additional funding for clean renewable energy bonds (CREBs)
- Additional funding for RE equipment manufacturers ITC

Provide parity to hydropower resources

- Equalize the PTC rate for hydropower and MHK
- New ITC and CREBs eligibility for pumped storage

Federal RES or CES Program

Previous RES proposals recognized only certain hydropower resources as renewable.

A Clean Energy Standard is a different policy paradigm than the RES. As such, the treatment and recognition of hydro must be re-evaluated. That includes:

- **existing hydropower generation**
- **pumped storage generation, existing and new, which will be necessary to integrate additional variable resources**
- **projects involving new dam infrastructure**

R&D Support

Federal and State programs support technology innovation, improved operations and other advancements

NHA advocates for R&D support for all sectors of the waterpower industry – conventional hydropower, pumped storage and marine and hydrokinetics

U.S. Hydropower Supply Chain Snapshot

National Hydropower Association Annual Conference
April 16, 2012

Available | Reliable | Affordable | Sustainable

NHA
National Hydropower Association

U.S. Hydropower Supply Chain Snapshot

Available | Reliable | Affordable | Sustainable

NHA National Hydropower Association

Snapshot Methodology

- Sampling of NHA's approximately 200 members
  - Project developers
  - Generators
  - Major suppliers
- 30 Members provided supplier lists under confidentiality agreements
- Data consolidated to provide snapshot of industry's supply chain

Highlight

- Nearly 2,000 small, medium and large companies across the country

- Equal distribution in U.S. South, Midwest, Northwest, and West
  - 400-550 companies in each region
  - Significant presence in South, Rust Belt

NHA National Hydropower Association

Hydro in the Rust Belt

More than 500 hydro supply chain companies

NHA National Hydropower Association

Hydro in the South

Nearly 500 hydro supply chain companies

Available | Reliable | Affordable | Sustainable

NHA National Hydropower Association

The Diversity of the Hydro Industry

- Construction companies & manufacturers in OH
- Machine parts manufacturers in AL
- Gear manufacturers in WA
- Engineering firms in MA
- Pump manufacturers in CA
- Hydraulic specialists in PA

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Questions?