

Webinar Discussion on
**REGIONAL CLEAN ENERGY
TECHNOLOGY INNOVATION**

September 29, 2016



U.S. DEPARTMENT OF
ENERGY



Mission Innovation

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Mission Innovation

Within the larger international context for climate change:

- ❖ Commitment of US and 19 other world leaders to commit to a doubling (\$6.4 billion in FY 2016 to \$12.8 billion in FY 2021) of public investment in clean energy R&D over next 5 years (FY 2017 President's budget request is \$7.7 b for 12 agencies; of this, \$5.865b for DOE)
- ❖ The 20 countries represent 75% of the world's CO2 emissions from electricity, and more than 80 percent of the world's clean energy R&D investment
- ❖ Within DOE, new funding in FY 2017 for MI will be focused on early stage research and development

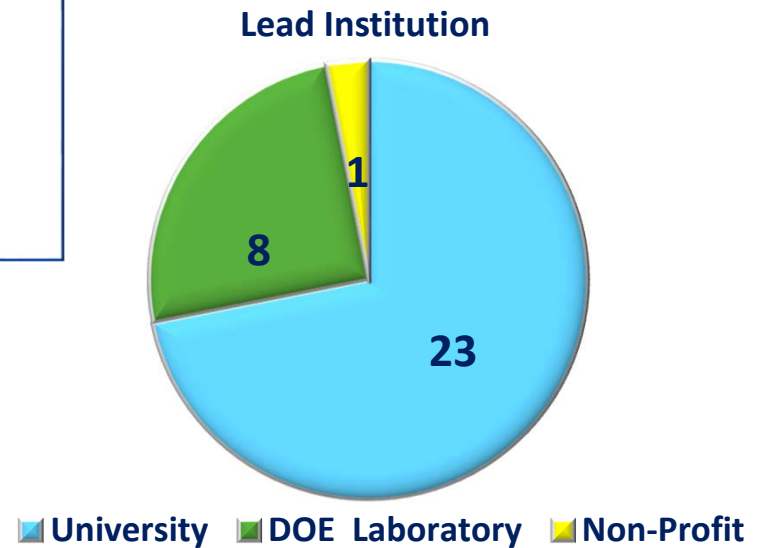
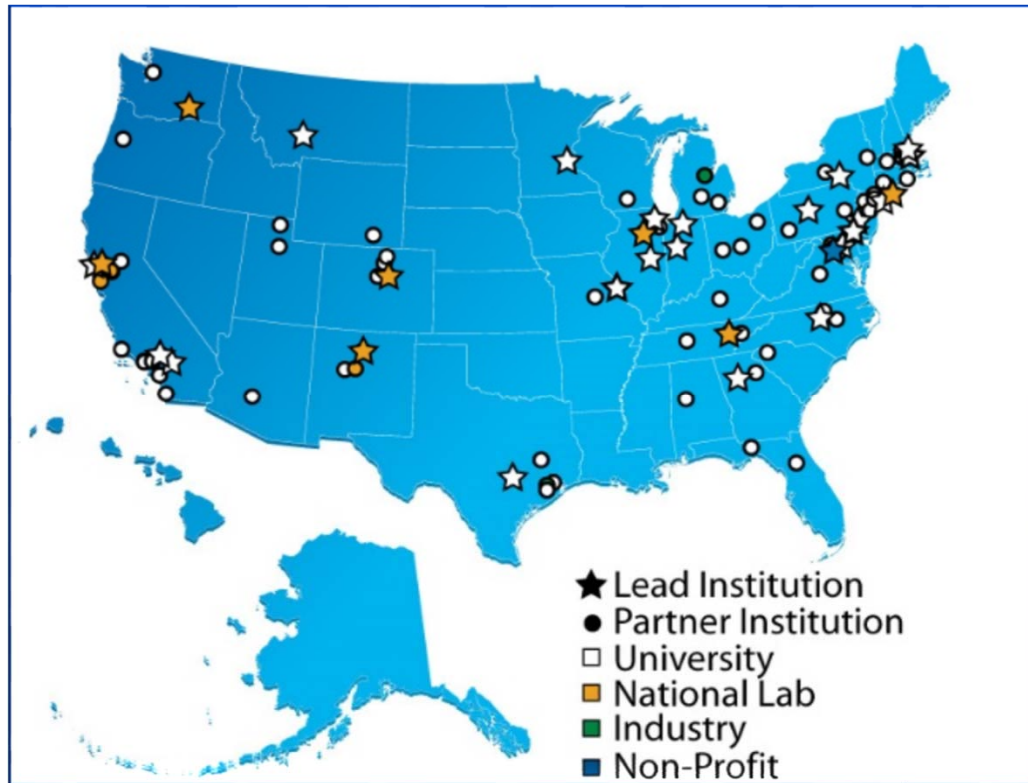


How do we advance clean energy R&D?

- **A fully stocked portfolio of energy R&D based on a solid foundation of fundamental science and computing**
- **Innovative research collaborations**
- **What interdisciplinary research modes are appropriate for MI research?**



Energy Frontier Research Centers



Energy Innovation Hubs

Energy Innovation Hubs

EERE: Critical Materials Institute (AMES)

Explores ways to address challenges in critical materials, including mineral processing, manufacture, substitution, efficient use, and end-of-life recycling.

EERE: Energy-Water Nexus Desalination Hub (TBD)

Will serve as a center of research focused on developing integrated technological system solutions and enabling technologies for de-energizing, de-carbonizing, and reducing the cost of desalination to provide clean and safe water.

NE: Modeling and Simulation of Nuclear Reactors (ORNL)

Creates a "virtual" version of an existing operating Pressurized Water Reactor, a modeling and simulation tool known as the Virtual Environment for Reactors Analysis (VERA) that is being used to create a better understanding of performance and safety issues with these reactors.

SC: Batteries and Energy Storage Hub (ANL)

Focuses on discovery of new energy storage chemistries through the development of an atomic-level understanding of reaction pathways and development of universal design rules for electrolyte function.

SC: Fuels from Sunlight Hub (LBNL)

Creates transformative advances in the development of artificial photosynthetic systems for converting sunlight, water, and carbon dioxide into a range of commercially useful fuels.

Advanced Manufacturing Initiative

GOAL

Reduce by 50% in 10 years the life-cycle energy consumption of manufactured goods by targeting the production and use of advanced manufacturing technologies

Develop and Demonstrate:

- Energy-efficient processing and materials technologies for manufacturers and spur investment.
- Manufacturing processes that reduce energy intensity and improve production.
- Materials technologies improving products to use less energy throughout their lifecycles.
- Technical assistance activities promoting advanced technologies and better energy management.

- **Oak Ridge Manufacturing Demonstration Facility**
- **Critical Materials Hub**
- **America Makes**
- **Power America**
- **Institute for Advanced Composites**



Advanced Research Projects Agency – Energy (ARPA-E) Unique Role to Complement DOE Applied Energy R&D

- Focus on early stage technologies
- Potential for meaningful advancement from concept to laboratory-scale prototype with a modest investment over a defined time period
- Project leads include companies, universities, national labs
- 475 projects from 29 focused and open solicitations, 35 new companies, 45 private sector follow on investments, 60 projects with follow on government funding for further development



MI Portfolio: New Cross-cutting Initiatives Proposed in FY 17 Budget

Regional Clean Energy Innovation Partnerships

- Establish regionally-based innovation partnerships focused on regional innovation capabilities, resources, markets, needs and opportunities (\$110M)
- Two principal issues: design of a partnership and establishment of regional boundaries

National Laboratory Small Business Partnerships

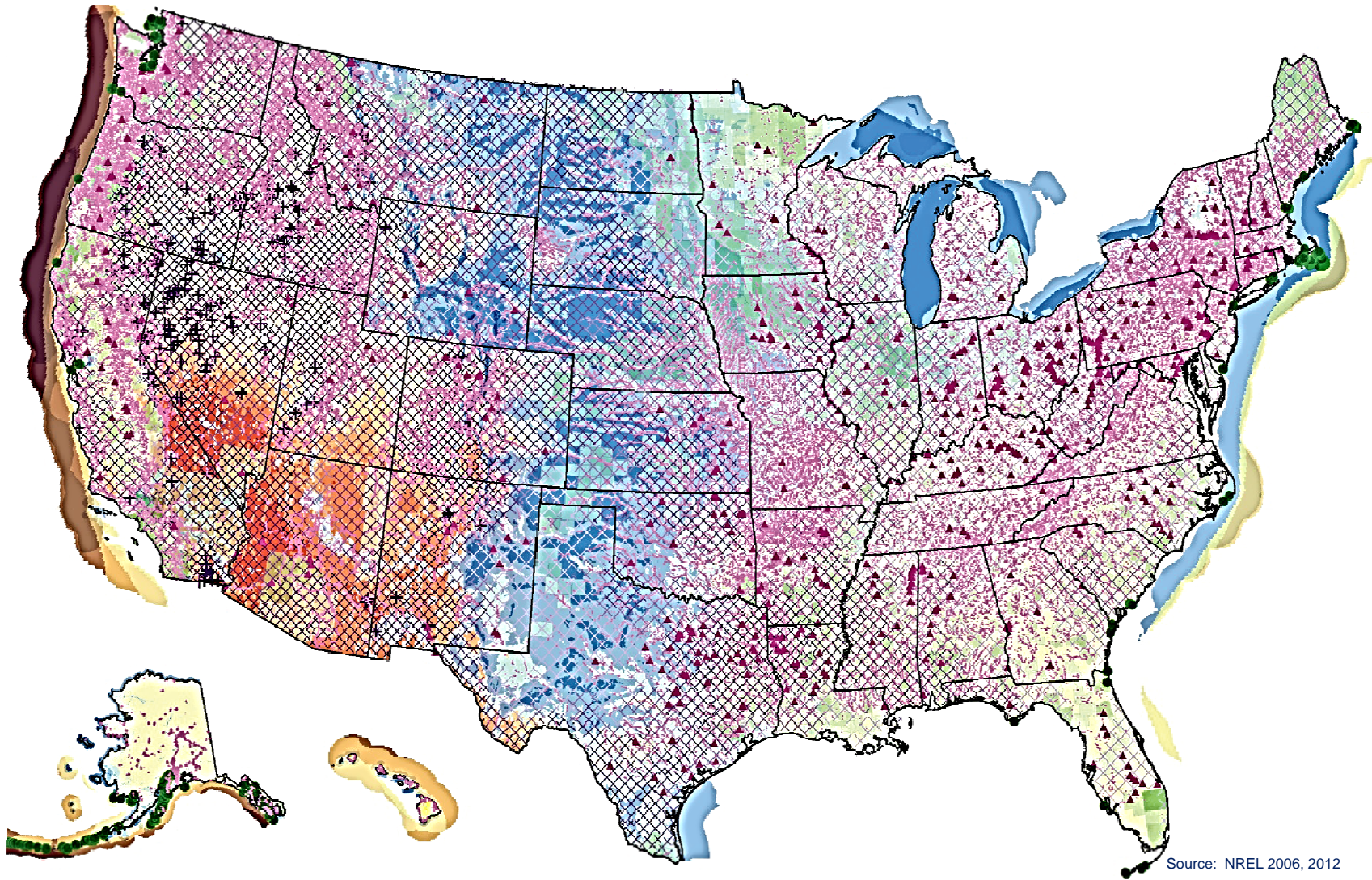
- Expansion of EERE small business voucher pilot program

National Laboratory Energy Technology Innovation Accelerators

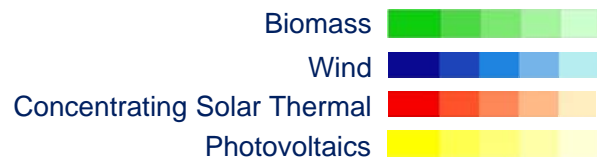
- Provide clean energy entrepreneurs with seed funding, technical support, and access to lab researchers and capabilities; modeled after LBNL Cyclotron Road Partnership



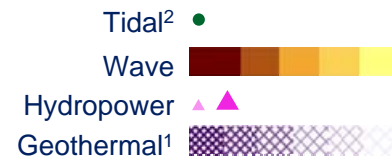
Mapping of U.S. Renewable Resources



Source: NREL 2006, 2012



Resource
Dark =
Higher
Light =
Lower

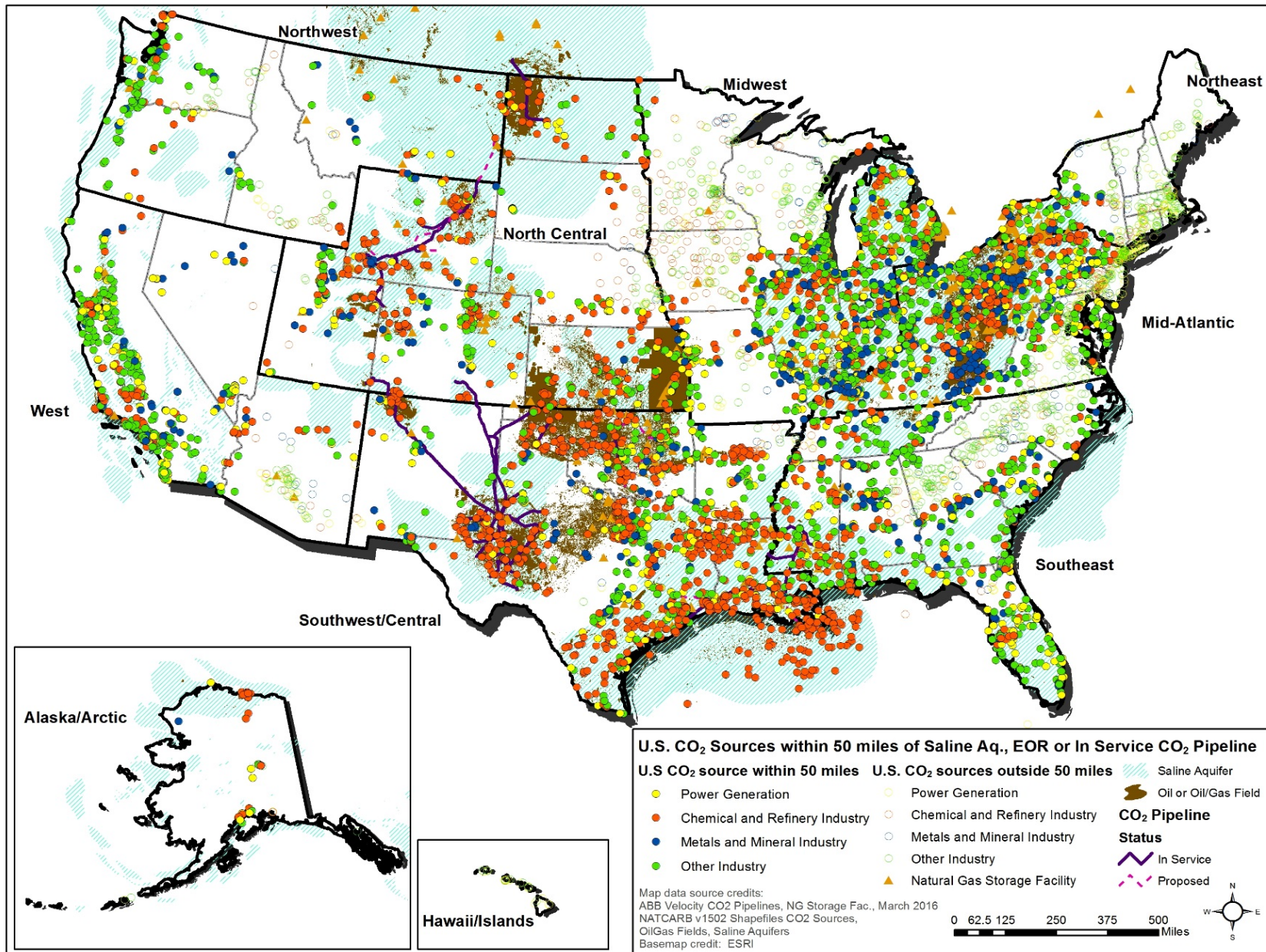


¹ Does not include Alaska or Hawaii

² Does not include Hawaii



Regional CO₂ Sources with Access to Sequestration Options or Associated Infrastructure





Kevin Knobloch

Chief of Staff, Office of the Secretary

Mission Innovation Website
www.energy.gov/mission-innovation

THE END

