U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

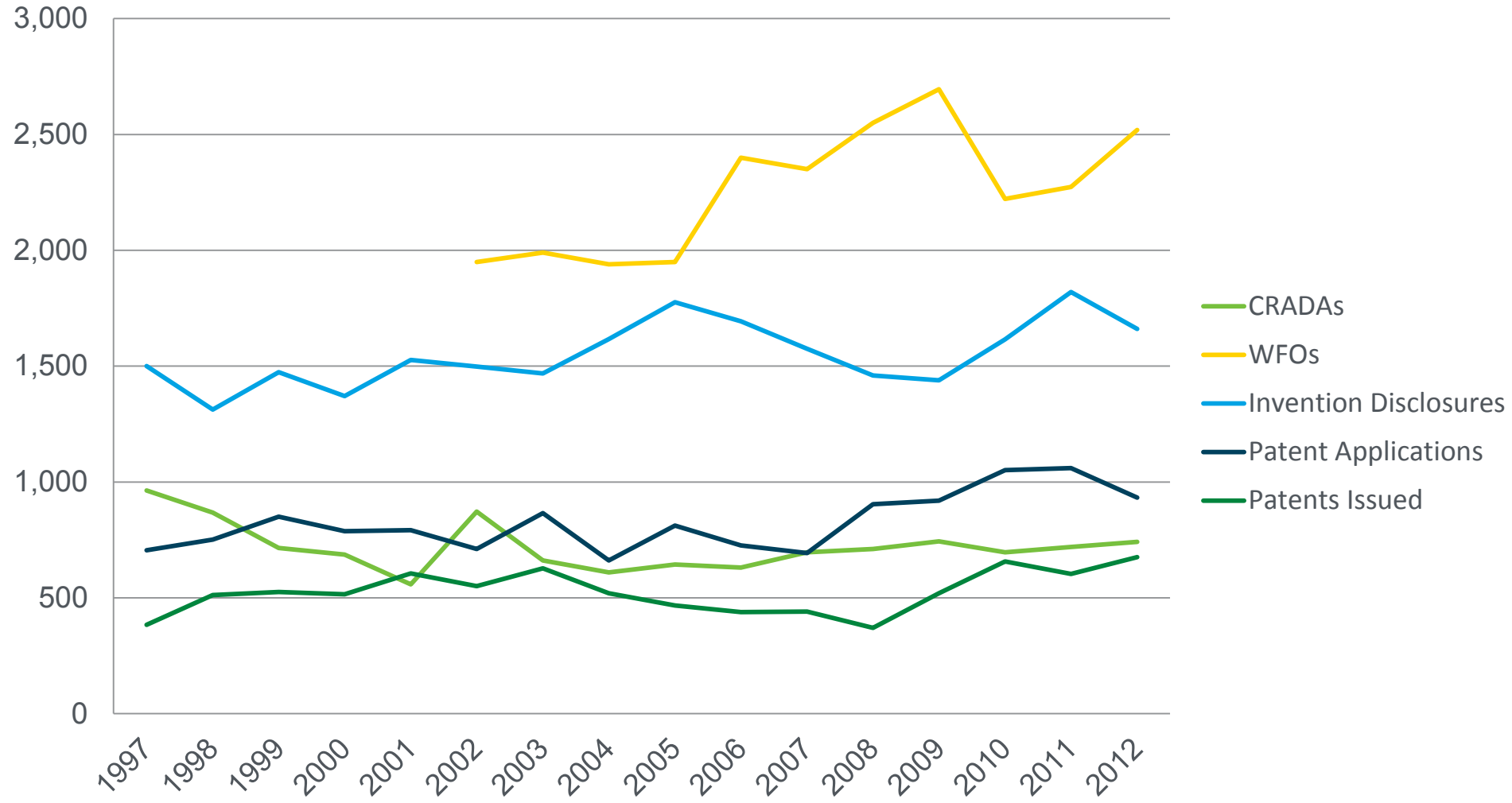
National Lab Impact Initiative

April 1, 2014

National Lab Commercialization Metrics

DOE Lab Tech Transfer: 1997-2012

Source: NIST 2011, DOE 2013



Select Reports on DOE Labs

- **1995** - Greater alliances with the industrial users of lab generated technology will be critical in the future (DOE Galvin Report)
- **2002** - DOE labs have substantially reduced CRADA partnerships and technical assistance to small businesses. (GAO)
- **2009** - It is difficult to assess tech transfer efforts at the labs because policies defining tech transfer are unclear. DOE and the national labs do not always agree on what constitutes tech transfer/commercialization. (GAO)
- **2011** - Most lab ORTA personnel can not provide a definition of what their success means to the lab or how to measure it. (Science and Technology Policy Institute)
- **2013** - Institutional biases against transferring market-relevant technology out of the labs and into the private sector reduce incentives for tech transfer (ITIF, CAP, Heritage)
- **2014** - DOE has room to improve the management of its tech transfer and commercialization (IG)

Past EERE & DOE Commercialization and Lab Engagement

- EERE Innovation Portal
- Solar Energy Technology Office: Bridging Research Interactions through collaborative Development Grants in Energy (BRIDGE)
- EERE Sponsored Hubs
- Entrepreneur in Residence Initiative
- Agreement for Technology Commercialization (ACT)
- Technology Commercialization Funding
- SBIR Technology Transfer

Stakeholder Engagement for Input

Clean Energy Manufacturing Initiative

- **CEMI Regional Summits**
  - Midwest Regional Summit – June 2013 in Toledo, OH with ~250 Business leaders, technologists, state and municipal policymakers, economic development organizations, and university leaders
- **"CEMI Day" Presentations**
  - 9 total with Applied Materials, Phillips Lighting, GE, Dow Corning, Dow, PPG, Corning, Alcoa
- **American Energy & Manufacturing Competitiveness (AEMC) Partnership**
  - **Regional Dialogues:** 4 Dialogues in 2013: Washington, DC; Toledo, OH; Niskayuna, NY; Santa Clara, CA with ~70 stakeholder participants from OEMs, SMEs, National Labs, Finance, Academia, Government
  - **National Summits:** December 2013 (with S-1 participation): 550+ CEOs, University Presidents, National Laboratory Directors, MOCs
  - **Subset of Recent 1:1 Discussions:** EERE and Council on Competitiveness with core AEMC partners: Lockheed Martin, GE, Alcoa, RPI, Deere, Applied Materials, several national labs

Technology-to-Market

- **Request for Information: Lab Tech Transfer**
  - (Sept 2013) received input from 9labs and dozens of incubators, universities, and private sector stakeholders.
- **Interviews with Tech Transfer Offices**
  - **(**June-Sept 2013): **i**nterviews with Laboratory Tech Transfer Offices, including NREL, LBNL, Argonne, LANL, Sandia, ORNL, and others.
- **OSTP Lab-to-Market (L2M) Summit**
  - **(**FY13-14): supported planning and collected input from a wide array of private sector stakeholders and federal agencies.
- **Early-Stage Venture Workshop**
  - (July 2013): received input on how to improve support for early-stage clean energy companies, including VCs, accelerators, labs,, and other commercialization experts.

National Laboratory Conversations

- **National Lab Roundtable**
  - July 2013, 1 day roundtable with senior leaders from seven national labs and private sector companies.

National Laboratory Impact Initiative

Goal

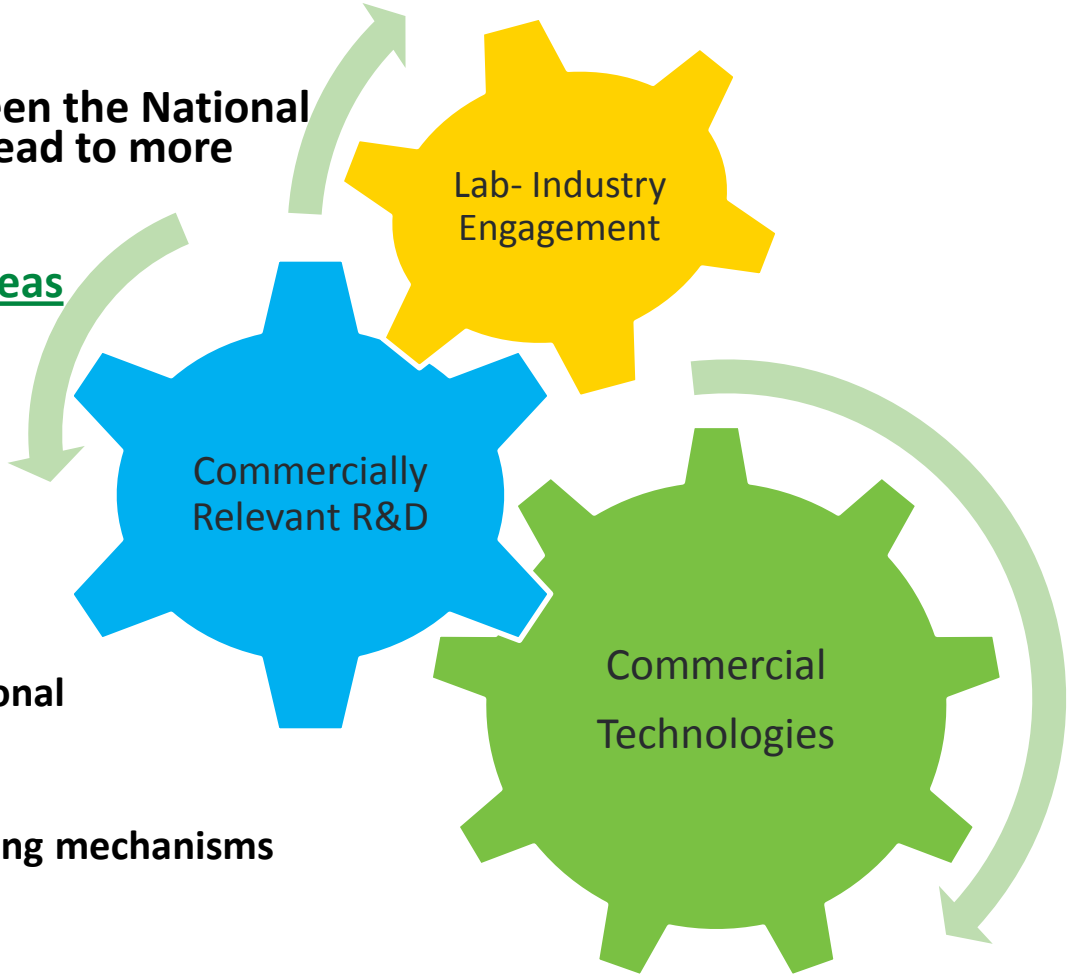
Increase intensity of industrially impactful research & engagement at the National Laboratories in the EERE mission space.

Assumption

Increased meaningful interactions between the National Laboratories and the private sector will lead to more Commercially Relevant R&D!

Pilot Fiscal Years 2014 & 2015 Priority Areas

1. **Identify and track success metrics**
2. **Identify barriers and potential solutions**
3. **Pilot new programs under discussion with labs and DOE offices to strengthen industry partnerships between the National Laboratories and the private sector**
4. **Re-orient existing EERE Laboratory funding mechanisms for success (AOP Impact Guidance)**
5. **Effectively communicate Lab-Industry successes**



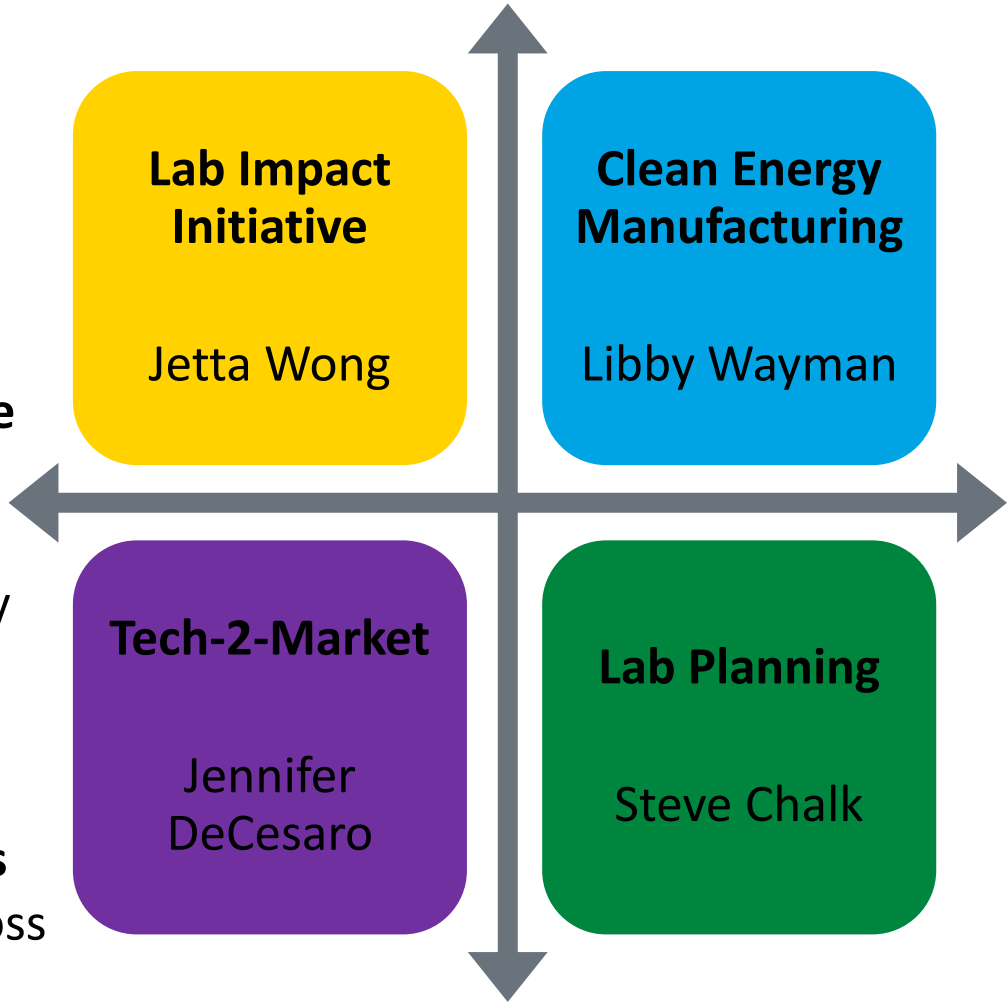
Lab Impact Initiative Approach

Approach

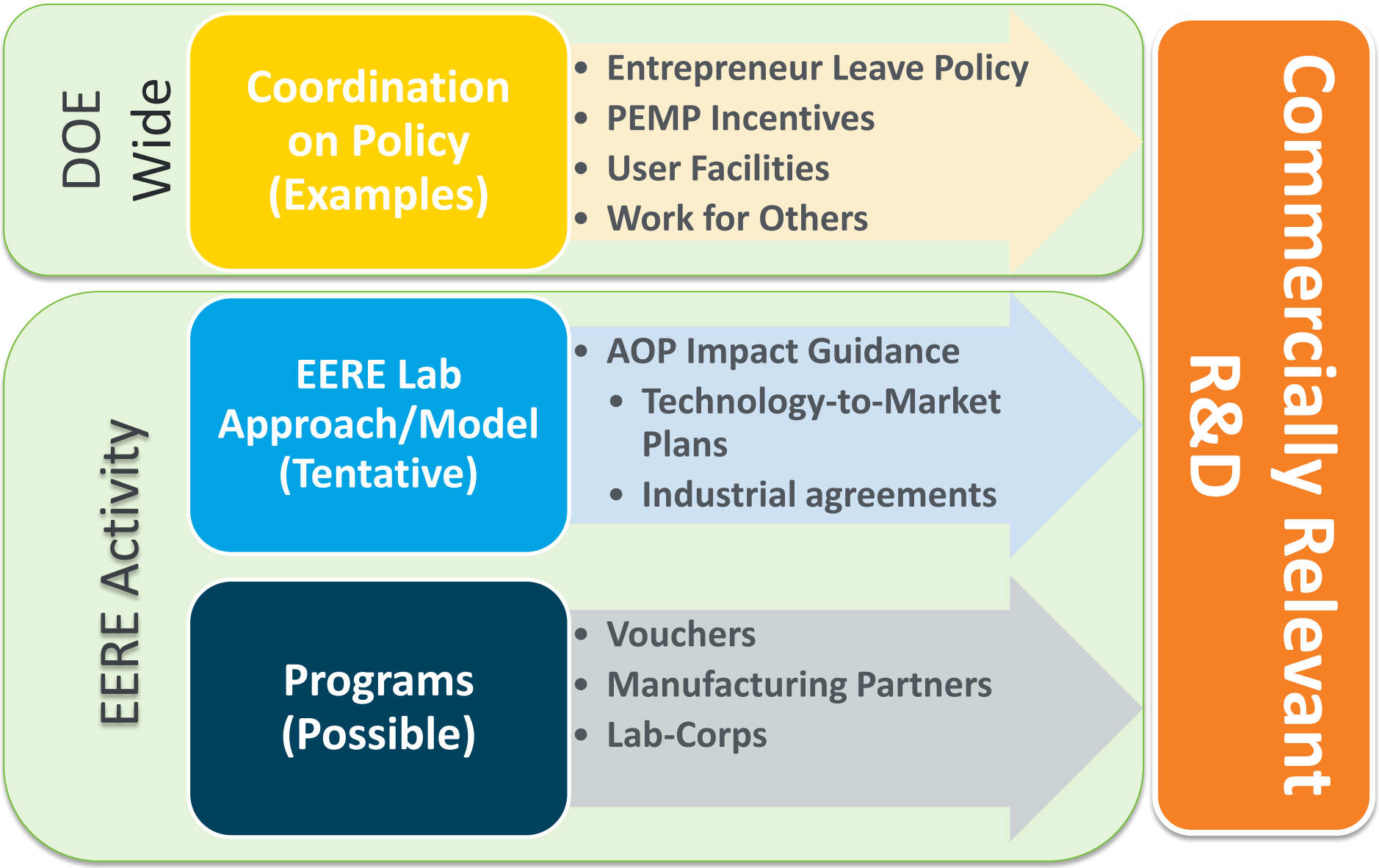
Develop and implement a coordinated strategy of uniform policies and programs aimed at accelerating the commercial impact of our National Labs.

Coordination

- Build off of EERE **Technology-to-Market** expertise.
- Enhance opportunities for **Clean Energy Manufacturing Initiative** Partners to engage with Labs.
- Leverage work and tools developed by the **Lab Planning** team to identify priorities and areas of opportunity.
- Identify **Best Practices of EERE Offices** and elevate and coordinate them across EERE.



Coordination of Multiple Components



EERE Laboratory Funding ~$800 Million Annually

Impact Guidance: A tool kit to increase commercially relevant R&D at National Laboratories

Uniform EERE Policies to Engage Industry

- Merit/Peer Review
- Technology to Market Plans
- Requirements to work with Industry

Support for EERE Best Practices focused on Stronger Connections to Industry and R&D Serving EERE Stakeholder Needs

1. Technology Evolution Resources
2. Mechanisms for Market Context
3. Ease and Cost of Business Assistance
4. Awareness of Lab Capabilities Activities: Human Capital & Facilities
5. Entrepreneurship and Human Capital Development Strategies

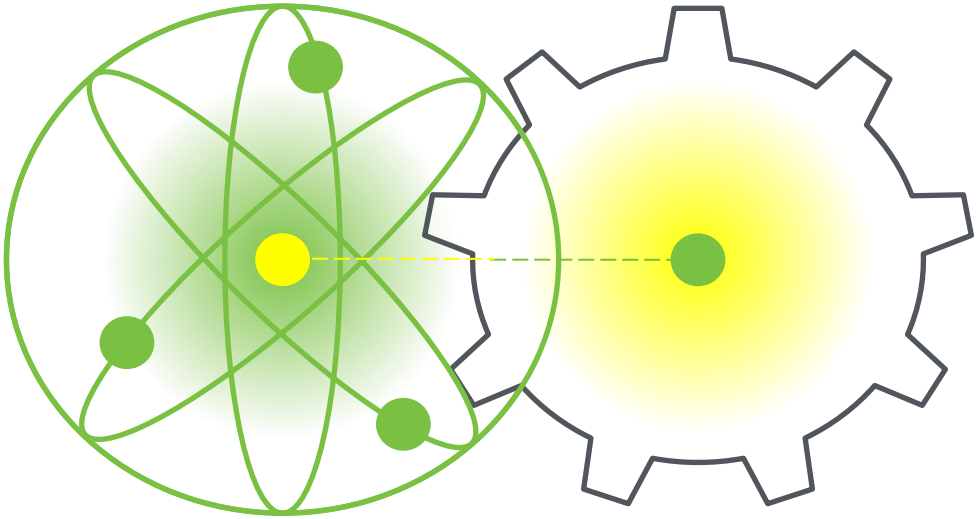
Possible “National Lab Manufacturing Partners” Program”

Pilot: The “Lab-Manufacturing Partners” program will build on and extend existing National Lab efforts. EERE will support exchanges of “embedded” researchers from Labs to industry and vice-versa. Focus around specific problem/oppty.

Motivation: Two of EERE top priorities

- Increasing U.S. clean energy manufacturing competitiveness
- Increase commercially relevant research at the National Laboratories in the EERE mission space

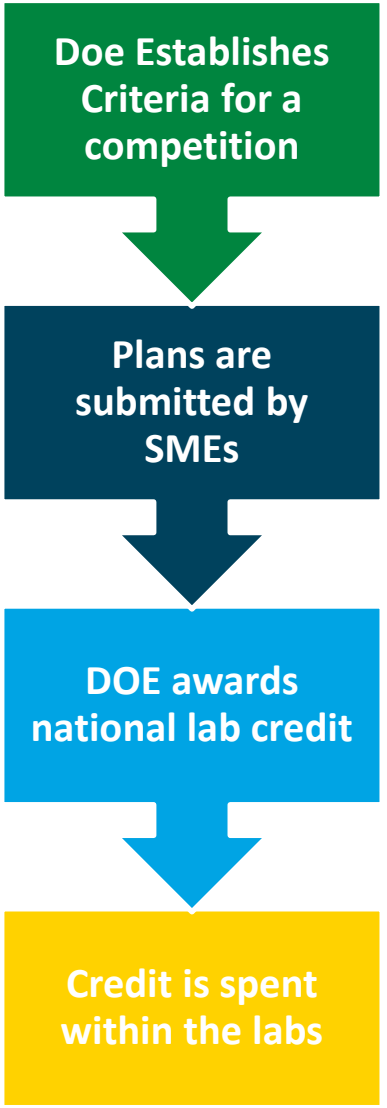
Goals: Catalyze strong Lab-Industry relationships that result in significant growth in high-impact Lab-Industry research agreements



Possible Voucher Program for Small Business

Leverage national laboratory capabilities for economic development by establishing a laboratory voucher program for small business

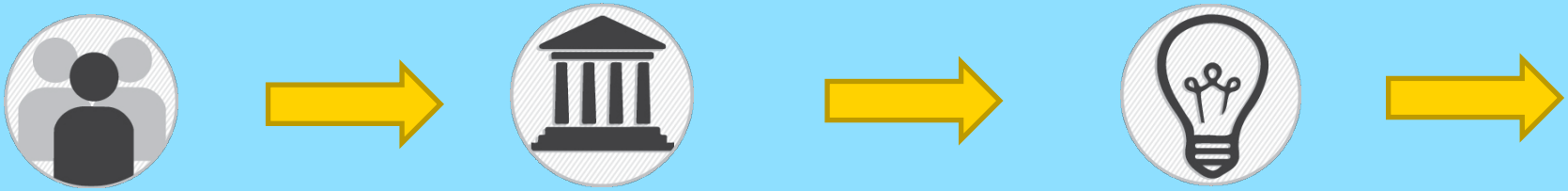
- Provides access to expertise, competencies, and equipment at all DOE national laboratories
- Selection through business plan competition
- Would not replace existing industrial or small business assistance programs



Possible Lab-Corps: Adapting the NSF i-Corps Model to DOE Labs

Lab-Corps Summary: A new pilot program to empower National Lab teams to identify market applications and create business models for commercializing high-impact technologies, building on the validated NSF I-Corps model.

Program Structure & Process:



1. Lab Team Selection

- Includes a PI, Entrepreneurial Lead, and Industry Mentor
- Teams receive $100k over six months

2. Experiential Training

- Full-contact, experiential training based on customized curriculum and direct market exposure
- Training provided by new, customized Lab-Corps Node

3. Commercialization Plan

- Teams develop a business model and/or commercialization plan, presenting at a final session
- Teams reach Go/No-Go decision: startup, license, CRADA, or other

EERE Pilot for DOE-Wide Scalability

- Utilizing and Learning from i-Corps: Lab-Corps will begin as a pilot in FY 2014 by utilizing the existing I-Corps infrastructure, allowing DOE and labs to learn from the existing I-Corps model.
- Building Custom Infrastructure: During the pilot, EERE will develop a Lab-Corps node and curriculum customized for National Labs, with the node located at one lab but serving all labs.
- Designing for Scalability: The pilot program will be funded and managed by EERE; the model itself will be designed with the potential to scale across DOE in future years.

Industry Consortium Ideas?

NAMII

CASL

NABC
National Advanced
Biofuels Consortium

BESC
BioEnergy Science Center

Hydrogen Storage Engineering
CENTER OF EXCELLENCE

NAABB
National Alliance For Advanced Biofuels and Bio-products

jbei
Joint BioEnergy Institute

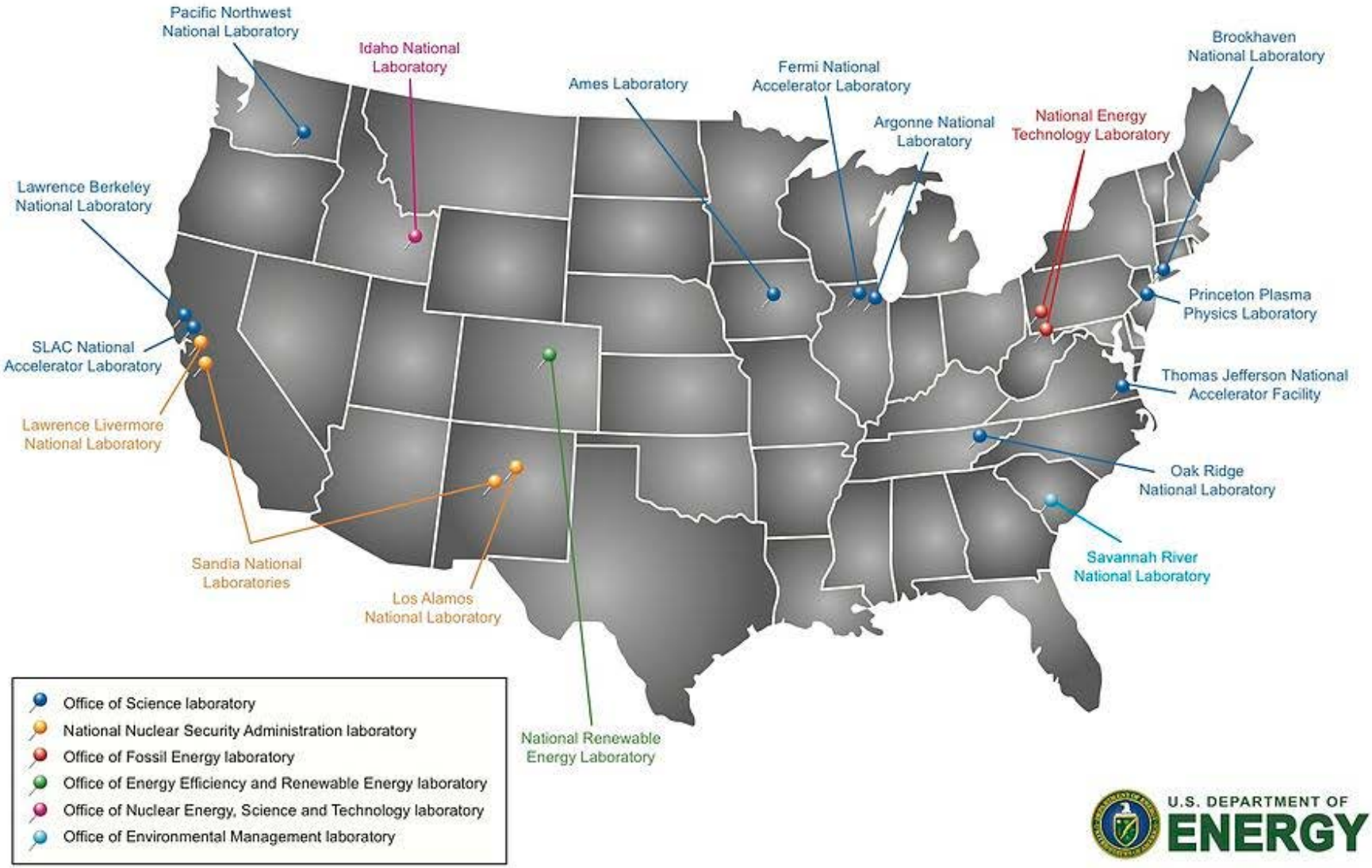
CMI
Critical Materials Institute
AN ENERGY INNOVATION HUB

Connecting with the National Laboratories

- **DOE National Labs have a wealth of resources to help industry develop new products and services that will contribute to energy independence, enhance our national security, protect our environment, and increase our economic prosperity.**

- ***Guide to Doing Business with DOE National Laboratories***
  - **Cooperative Research and Development Agreement (CRADA)**
  - **Work for Others (WFO) Agreement**
  - **Agreements for Commercializing Technology (ACT)**
  - **Technical Assistance (TA) Agreement**
  - **User Agreement**
  - **Technology Licensing Agreement**
  - **Material Transfer Agreement (MTA)**
  - **Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR)**

Department of Energy National Laboratories



Connect with a DOE National Lab today!

National Lab Impact Initiative

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DOE National Labs

- Ames Laboratory, Ames, Iowa
- Argonne National Laboratory, Argonne, Illinois
- Brookhaven National Laboratory, Upton, New York
- Fermi National Accelerator Laboratory, Batavia, Illinois
- Lawrence Berkeley National Laboratory, California
- Oak Ridge National Laboratory, Tennessee

DOE National Labs

- Pacific Northwest National Laboratory, Washington
- Princeton Plasma Physics Laboratory, New Jersey
- SLAC National Accelerator Laboratory, California
- Thomas Jefferson National Accelerator Facility, Virginia
- Sandia National Laboratory, California and New Mexico
- Los Alamos National Laboratory, New Mexico
- Lawrence Livermore National Laboratory, California
- National Renewable Energy Laboratory, Colorado
- Idaho National Laboratory, Idaho
- National Energy Technology Laboratory, Pennsylvania
- Savannah River National Laboratory, Georgia