



***Water Research & Development
funded by the SBIR/STTR Programs
at the Department of Energy***

Manny Oliver

Director, DOE SBIR/STTR Programs Office

U.S. EPA Water Technology Innovation Cluster Leaders Meeting

Pittsburgh, PA

April 27, 2015

U. S. Department of Energy Mission

- **The mission of the Department of Energy** is to ensure America's security and prosperity by addressing its energy, environmental, and nuclear challenges through transformative science and technology solutions.
 - **Goal 1:** Catalyze the timely, material, and efficient transformation of the nation's energy system and secure U.S. leadership in **clean energy** technologies.
 - **Goal 2:** Maintain a vibrant U.S. effort in **science and engineering** as a cornerstone of our economic prosperity, with clear leadership in strategic areas.
 - **Goal 3:** Enhance **nuclear security** through defense, nonproliferation, and environmental efforts.

Program Offices Participating in the DOE SBIR/STTR Programs

Electricity Delivery & Energy Reliability

Energy Efficiency & Renewable Energy

Fossil Energy

Nuclear Energy

Advanced Scientific Computing Research

Basic Energy Sciences

Biological & Environmental Research

Fusion Energy Sciences

High Energy Physics

Nuclear Physics

Defense Nuclear Nonproliferation

Environmental Management



Water-Related Topics

- SBIR/STTR Topic Development
 - DOE Program managers fund mission-aligned R&D at universities, DOE National Labs, and commercial entities
 - Based on their engagement with R&D leaders, they develop SBIR/STTR topics annually
 - Input on new and emerging R&D opportunities with commercial potential is welcomed
- Programs Sponsoring Water-Related Topics
 - Office of Science
 - Basic Energy Sciences
 - Office of Biological and Environmental Research
 - Office Energy Efficiency and Renewable Energy
 - Office of Fossil Energy



Recent Water Topics: FY2015 Phase I Release 1

- [FY 2015 Phase I Release 1 Topic document](#)
- 14. MEMBRANES AND MATERIALS FOR ENERGY EFFICIENCY
 - a. High Selectivity Membranes (including Desalination)
 - *“High performance membranes offer the potential to provide game-changing process energy advances. . . . In desalination, a rate increase of 2-3 orders of magnitude over reverse osmosis is projected for a system with not only controlled pore size but also engineered pore edge composition.”*
 - Questions – contact: David Forrest, david.forrest@hq.doe.gov
- 16. ADVANCED FOSSIL ENERGY SEPARATIONS AND ANALYSIS RESEARCH
 - b. Advanced Shale Gas Recovery Technologies for Horizontal Well Completion Optimization.
 - *“The objective is to increase the efficiency of resource recovery on a per well basis or reduce the volume of fresh water required to produce a unit volume of natural gas.”*
 - Questions – contact: Al Yost, albert.yost@netl.doe.gov



FY2015 Phase I Release 1 (cont.)

- 21. TECHNOLOGIES FOR CHARACTERIZING AND MONITORING COMPLEX SUBSURFACE SYSTEMS
 - a. Real-Time, In Situ Measurements of Hydrobiogeochemical and Microbial Processes in Complex Subsurface Systems
 - “. . . grant applications are sought to develop improved approaches for the autonomous and continuous sensing of key elements such as carbon, nitrogen, sulfur and phosphorus in situ; improved methods to measure and monitor dissolved oxygen, vertically resolved soil moisture distributions, and groundwater age.”
 - Questions – contact: David Lesmes, david.lesmes@science.doe.gov



FY 2015 Phase I Release 2

- [FY 2015 Phase I Release 2 Topic Document](#)
- 12. BIOENERGY
 - c. Solid-Liquid Separations for Algal Systems
 - *“Specifically it seeks commercial processing technologies that as a unit operation produces slurry with 20–30% solids from a dilute 0.5 grams/liter algal feed.”*
 - Questions – contact: Neil Rossmeissl, neil.rossmeissl@ee.doe.gov
- 15. GEOTHERMAL
 - b. TECHNOLOGY TRANSFER OPPORTUNITY: Enabling Geothermal Co-produced Applications by Employing Electromagnetic Manipulation of Magnetizable Oil
 - *Improving current oil/gas/water separation technologies has the potential to enable wider use of coproduced geothermal resources. GTO seeks to fund the further development and commercialization of the electromagnetic manipulation of magnetizable oil (U.S. Patent No. 8795519-Fermi National Accelerator Laboratory) to create a product that separates hydrocarbons from other produced fluids to enable geothermal coproduced applications. For example, the technology can be used as part of a water purification system or a mineral recovery system.*
 - Questions – contact: Josh Mengers, joshua.mengers@ee.doe.gov



FY 2015 Phase I Release 2 (cont.)

- 16. SOLAR

- c. Concentrating Solar Thermal Desalination

- *This subtopic seeks to identify and invest in concentrating solar thermal multi-stage flash distillation (MSF) and multi-effect distillation (MED) technologies that can meet and beat reverse osmosis (RO) desalination costs (~\$0.50/m³ fresh water) by reducing the levelized cost of solar thermal energy (in terms of \$/kWhth).*
 - Questions – contact: solar.sbir@ee.doe.gov



- 18. WATER

- a. Innovative Small, Low-head Hydropower Turbines

- *“Applications are sought for innovative small hydraulic turbine prototypes or integrated small hydropower turbine-generator unit prototypes that can generate from 50kW to 5MW power at heads less than 25 feet.”*
 - Questions – contact: Rajesh Dham, rajesh.dham@ee.doe.gov



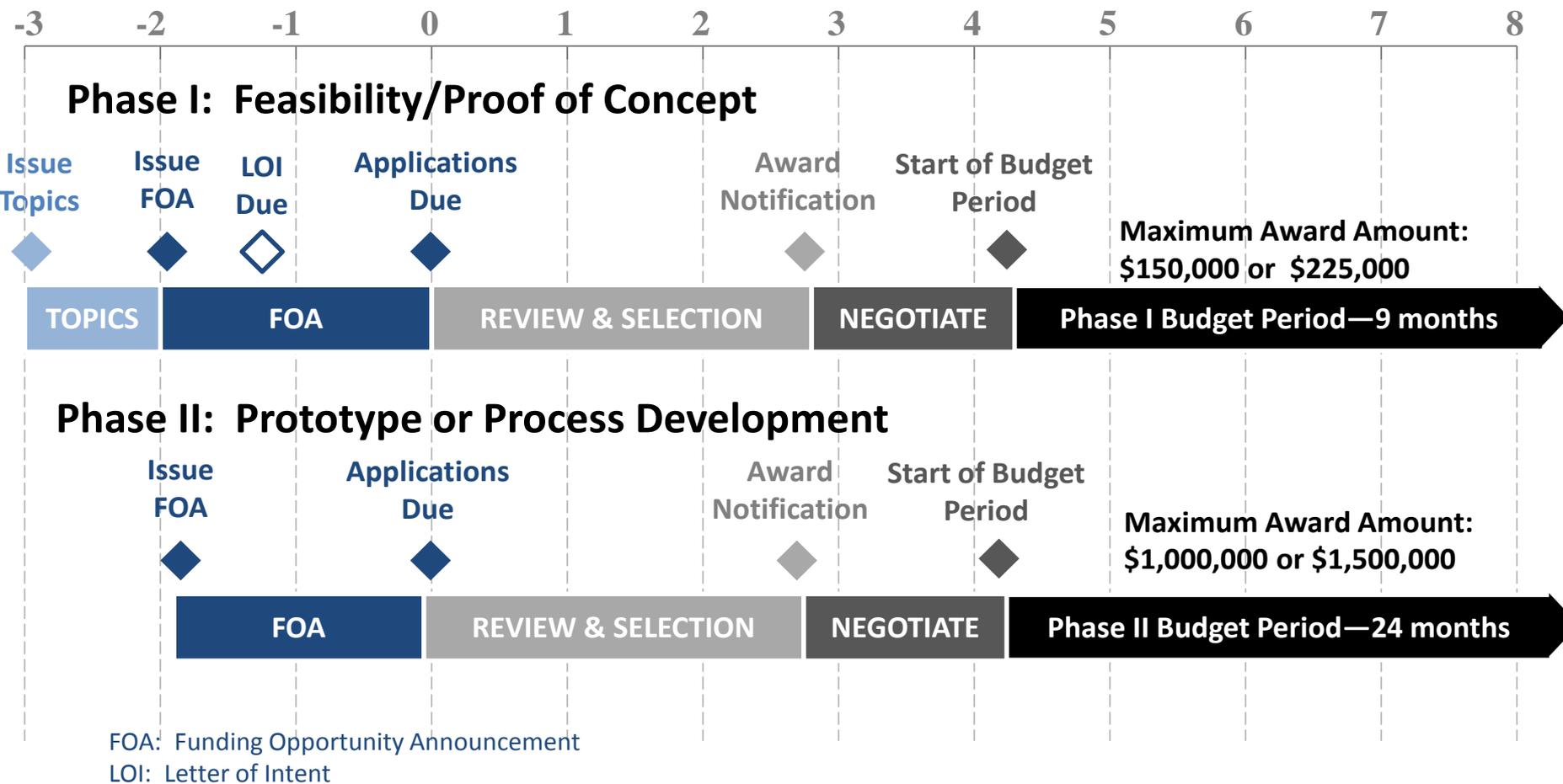
FY 2015 Phase I Release 2 (cont.)

- 20. CLEAN COAL AND CARBON MANAGEMENT
 - b. Integrated Sensors for Water (Crosscutting Research)
 - *“Grant applications are sought for the development of an integrated water sensor package that is low-cost, rapidly-deployable, wireless, and self-powered while making and relaying in situ water measurements such as temperature, turbidity, flow, pH, and total dissolved solids (TDS.)”*
 - Questions – contact: Jessica Mullen, jessica.mullen@netl.doe.gov
 - j. Advanced Monitoring Technologies for Carbon Storage
 - *“Grant applications are sought for technologies involving field-based monitoring, verification and accounting (MVA) hardware that measure the potential impacts of CO₂ on groundwater and the soil in the unlikely event that CO₂ migrates out of the injection zone.”*
 - Questions – contact: Erik Albenze, erik.albenze@NETL.DOE.GOV



Application & Award Timelines

months



Sequential Phase II Awards



- Phase IIA: For projects requiring more time and funding than available with a single Phase II award to complete prototype or process development
- Phase IIB: For projects requiring additional R&D funding to transition an innovation towards commercialization



FY2016 SBIR/STTR Phase I Funding Opportunity Announcements

Phase I Release 1

- Office of Advanced Scientific Computing Research (ASCR)
- Office of Basic Energy Sciences (BES)
- Office of Biological and Environmental Research (BES)
- Office of Nuclear Physics (NP)

Phase I Release 2

- Office of Defense Nuclear Nonproliferation (NA)
- Office of Electricity Delivery and Energy Reliability (OE)
- Office of Energy Efficiency and Renewable Energy (EERE)
- Office of Fossil Energy (FE)
- Office of Fusion Energy Sciences (FES)
- Office of High Energy Physics (HEP)
- Office of Nuclear Energy (NE)



Schedule: FY 2016 Phase I, Releases 1&2

Phase I FOA Schedule	Release 1	Release 2
Topics Issued	July 20, 2015	November 2, 2015
Topic Webinars	Week of July 27, 2015	Week of November 9, 2015
Funding Opportunity Announcement Issued	August 17, 2015	November 30, 2015
FOA Webinar	August 21, 2015	December 4, 2015
Letters of Intent Due	September 8, 2015	December 21, 2015
Full Applications Due	October 19, 2015	February 9, 2016
Award Notification	early January 2016*	early May 2016*
Grant Start Date	late-February 2016*	early June 2016*

**preliminary dates subject to change*



Topics

- Topics Document
 - DOE primarily uses focused topics
 - Issued 4 weeks prior to the Funding Opportunity Announcement
- Communication with DOE program managers
 - Open communication permitted
- Webinar
 - DOE program managers discuss their topics
 - Applicants submit questions in advance or during the webinar
 - Webinars are recorded and available from our website



U.S. Department of Energy

Small Business Innovation Research (SBIR) and
Small Business Technology Transfer (STTR) Programs

Topics

**FY 2015
Phase I
Release 2**

Version 4, November 7, 2014

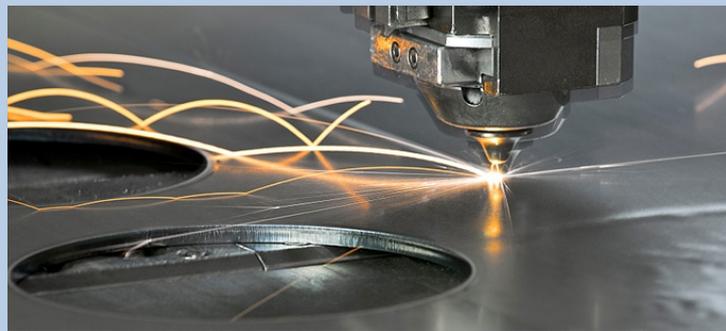
Participating DOE Research Programs

- Office of Defense Nuclear Nonproliferation
- Office of Electricity Delivery and Energy Reliability
- Office of Energy Efficiency and Renewable Energy
- Office of Fossil Energy
- Office of Fusion Energy Sciences
- Office of High Energy Physics
- Office of Nuclear Energy



DOE Topics & Commercialization

- DOE topics are drafted by program managers who are aware of the technology roadblocks but may not be aware of the commercialization challenges
- Small business applications are expected to address the commercialization challenges and ensure that there is a profitable business opportunity
 - Phase I & II Commercialization Plans
- DOE performs follow-up surveys to track commercialization outcomes of its SBIR/STTR awards



Important Elements of Your Application

- Project Narrative
 - Page and word limits
 - Phase I: 15 pages, 7,500 words
 - Phase II: 20 pages, 10,000 words
 - Fast-Track: 25 pages, 12,500 words
- Budget & Budget Justification
- Key Personnel
- Commercialization Plans
 - Phase I commercialization plan
 - An example can be found [here](#)
 - Phase II commercialization plan
- SBIR/STTR Information
- Data Management Plan

GRANTS.GOV® Grant Application Package

Buttons: Save & Submit, Save, Print, Cancel, Check Package for Errors

Opportunity Title: Small Business Innovation Research (SBIR) Small Business Chicago Service Center

Offering Agency: Chicago Service Center

CFDA Number: 49.104

CFDA Description: Office of Science Financial Assistance Program

Opportunity Number: SF-PCH-0000017

Competition ID: SF-PCH-0000017

Opportunity Open Date: 08/01/2011

Opportunity Close Date: 09/15/2011

Agency Contact: Paul Hebrion
E-mail: ahebr-at-science.doe.gov
Phone: 301-903-5707

I will be submitting applications on my behalf, and not on behalf of a company, state, local or tribal government, academia, or other type of organization.

* Application Filing Name: [Field]

Mandatory Documents

- Research & Related Budget
- Project/Performance Site Location(s)
- Research And Related Senior/Key Person Profile
- Research And Related Other Project Information
- SBIR/STTR Information

Buttons: Move Form to Complete, Move Form to Details, Open Form

Optional Documents

- Research & Related Subaward Budget (Total Fed +)
- Disclosure of Lobbying Activities (SF-LLL)

Buttons: Move Form to Submit, Move Form to Details, Open Form

Instructions

- 1 Enter a name for the application in the Application Filing Name field.
 - This application can be completed in its entirety offline; however, you will need to login to the Grants.gov website during the submission process.
 - You can save your application at any time by clicking the "Save" button at the top of your screen.
 - The "Save & Submit" button will not be functional until all required data fields in the application are completed and you clicked on the "Check Package for Errors" button and confirmed all data required data fields are completed.
- 2 Open and complete all of the documents listed in the "Mandatory Documents" box. Complete the SF-424 form first.
 - It is recommended that the SF-424 form be the first form completed for the application package. Data entered on the SF-424 will populate data fields in other mandatory and optional forms and the user cannot enter data in these fields.
 - The forms listed in the "Mandatory Documents" box and "Optional Documents" may be pre-filled forms, such as SF-424, forms where a document needs to be attached, such as the Project Narrative or a combination of both. "Mandatory Documents" are required for this application. "Optional Documents" can be used to provide additional support for this application or may be required for specific types of grant activity. Reference the application package instructions for more information regarding "Optional Documents".
 - To open and complete a form, simply click on the form's name to select the form and then click on the "Open Form" button. This will move the document to the appropriate "Documents for Submission" box and the form will be automatically added to your application package. To view the form, scroll down the screen or select the form name and click on the "Open Form" button to begin completing the required data fields. To remove a form/document from the "Documents for Submission" box, click the document name to select it, and then click the "X" button. This will return the form/document to the "Mandatory Documents" or "Optional Documents" box.
 - All documents listed in the "Mandatory Documents" box must be moved to the "Mandatory Documents for Submission" box. When you open a required form, the fields which must be completed are highlighted in yellow with a red border. Optional fields and completed fields are displayed in white. If you enter invalid or incomplete information in a field, you will receive an error message.
- 3 Click the "Save & Submit" button to submit your application to Grants.gov.
 - Once you have properly completed all required documents and attached any required or optional documentation, save the completed application by clicking on the "Save" button.
 - Click on the "Check Package for Errors" button to ensure that you have completed all required data fields. Correct any errors or if none are found, save the application package.
 - The "Save & Submit" button will become active; click on the "Save & Submit" button to begin the application submission process.
 - You will be taken to the applicant login page to enter your Grants.gov username and password. Follow all onscreen instructions for submission.



Review and Selection of Applications

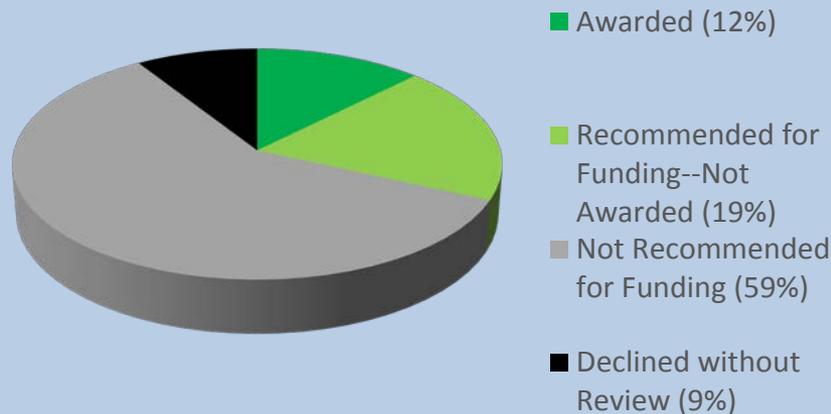
- DOE primarily uses external peer review to evaluate your applications
 - Typically at least 3 technical reviewers
 - 1 reviewer for the Phase II commercialization plan
- Review Criteria (equally weighted)
 - Strength of the Scientific/Technical Approach
 - Ability to Carry Out the Project in a Cost Effective Manner
 - Impact
- You will be notified of the decision on your application within 90 days of the application deadline
 - Reviewer comments will be made available to you. Use this feedback constructively to improve future applications



Application & Award Statistics for FY 2014

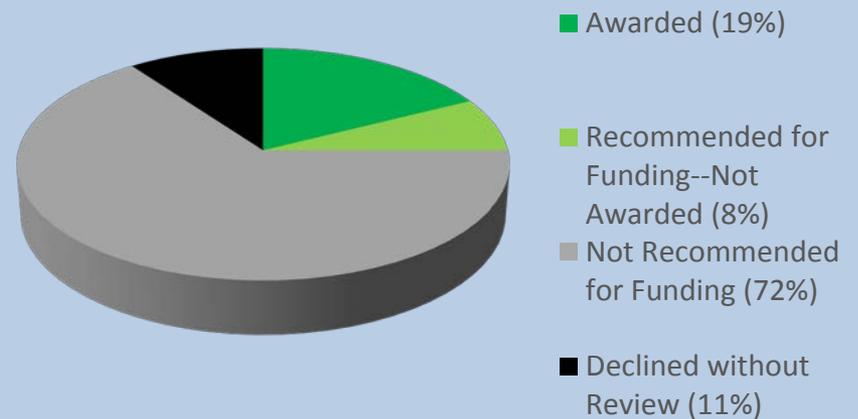
- Phase I

- 1618 applications
- 201 awards



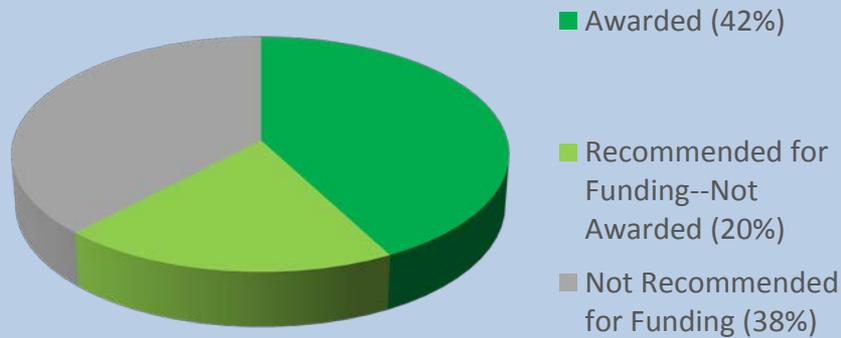
- Fast-Track

- 72 applications
- 14 awards

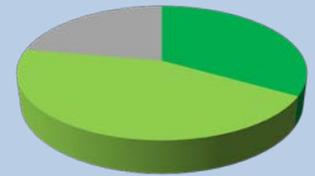


Application & Award Statistics for FY 2014

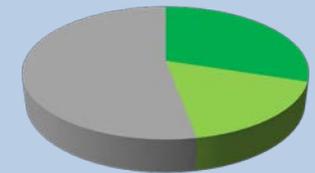
- Phase II
 - 279 applications
 - 118 awards



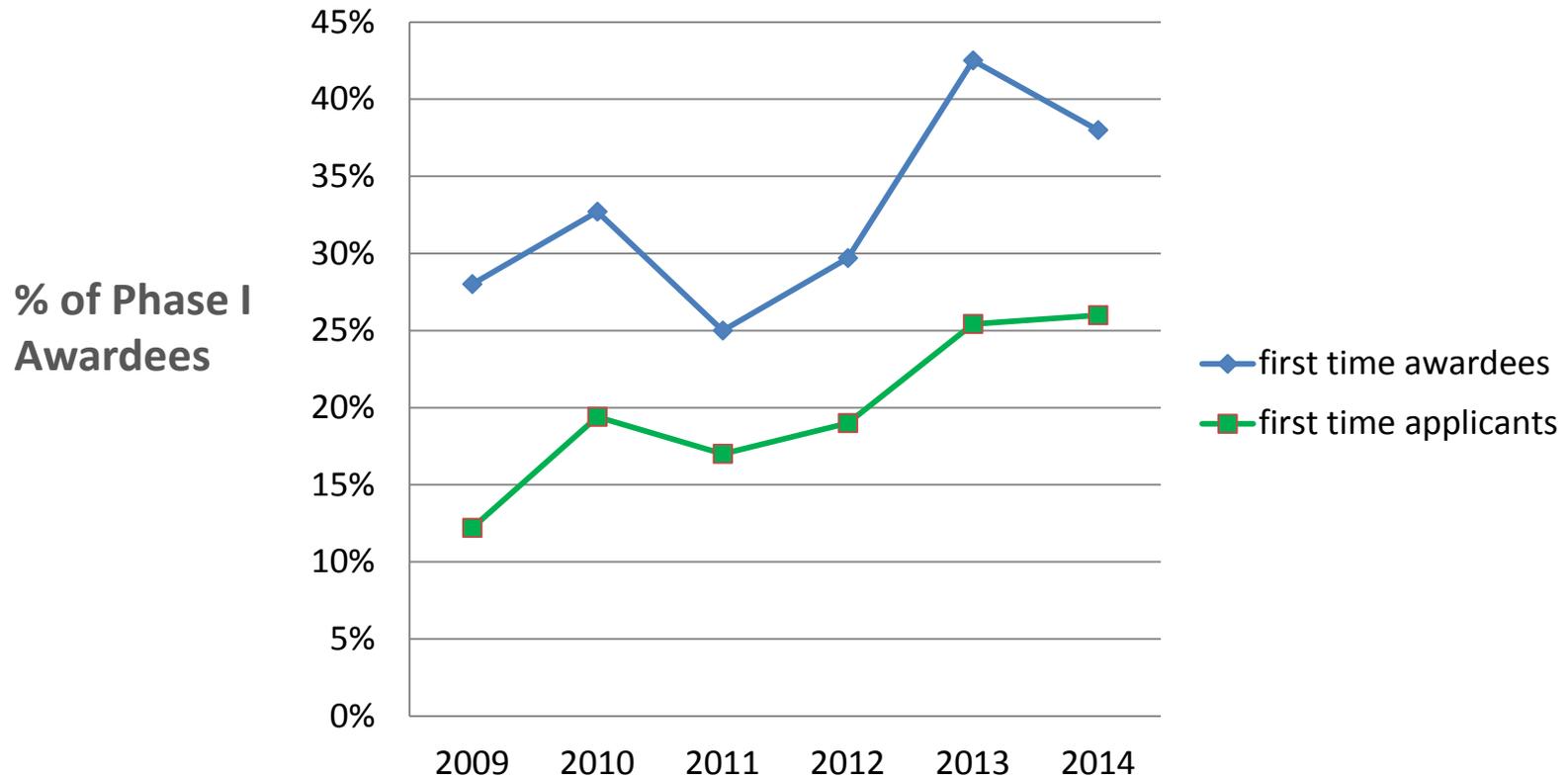
- Phase IIA
 - 9 applications
 - 3 awards



- Phase IIB
 - 70 applications
 - 21 awards



Phase I Awardees: First Time Winners & Applicants



New for FY 2015: Phase 0 Assistance Program

- Goal
 - increase the number of responsive, high quality proposals submitted to the DOE within targeted states with historically low SBIR/STTR applications to the DOE, and amongst women- and minority-owned businesses nationally.
- Services
 - Letter of Intent (LOI) writing assistance
 - Phase I proposal preparation, review and submission assistance
 - Small business development training and mentoring
 - Communication and market research assistance
 - Technology advice and consultation
 - Indirect rate and financial information
- Cost
 - This program is entirely funded by the DOE; there is no cost to participants.
- Website: [Dawnbreaker DOE Phase Link](#)
- DOE's Under Represented States
 - AK, DC, GA, HI, IA, ID, IN, KS, LA, ME, MN, MS, MT, NC, ND, NE, NY, OK, PA, PR, RI, SC, SD, WA, WI



Questions?

Contact information:

- DOE SBIR/STTR Operations: 301-903-5707
- DOE SBIR/STTR Email: [SBIR & STTR DOE Link](#)

Our Website:

- DOE SBIR/STTR Website: [DOE Science and Energy SBIR Link](#)

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