



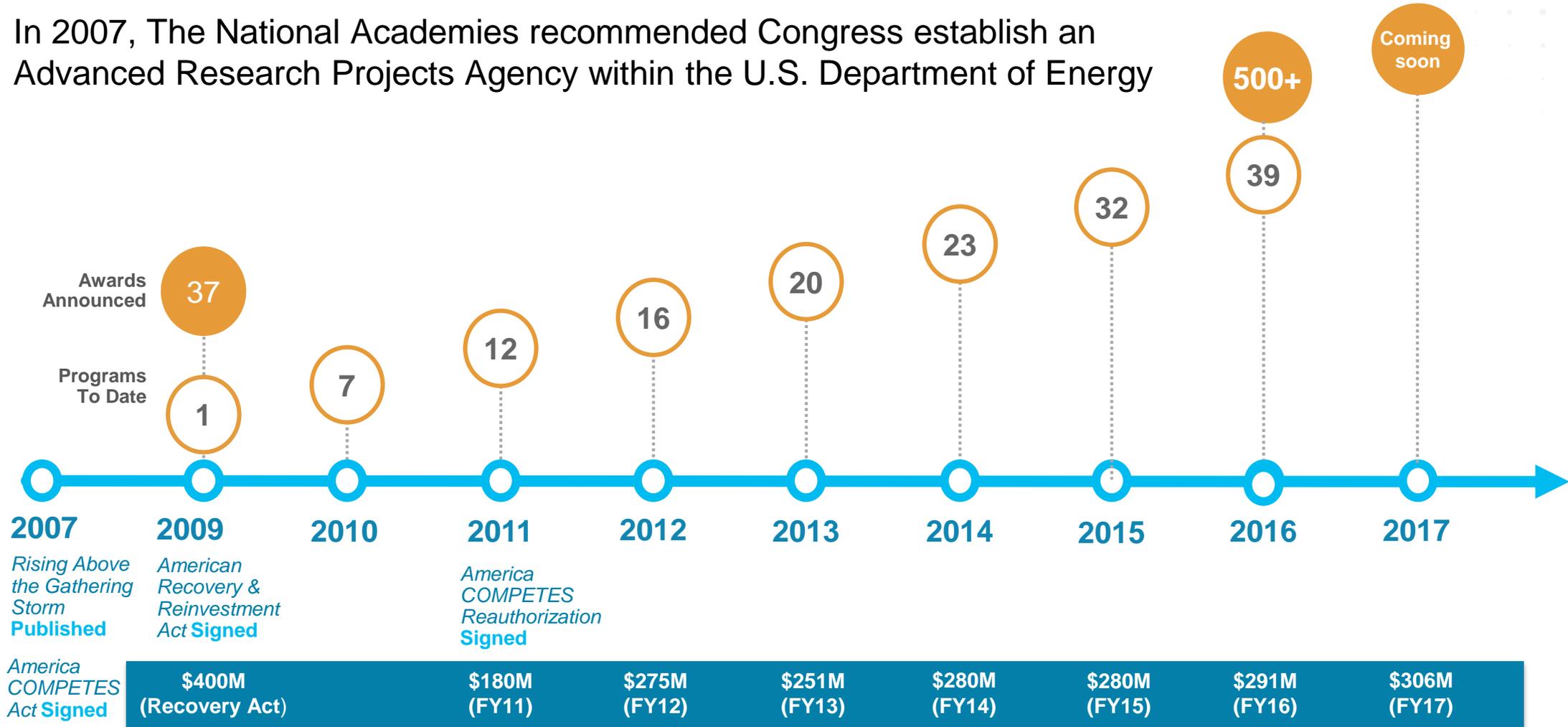
## Overview and Update on the Advanced Research Projects Agency-Energy (ARPA-E)

*Eric Rohlfiing*

*Deputy Director for Technology*

# History of ARPA-E

In 2007, The National Academies recommended Congress establish an Advanced Research Projects Agency within the U.S. Department of Energy



# ARPA-E Mission

**Mission:** To overcome long-term and high-risk technological barriers in the development of energy technologies



## Means:

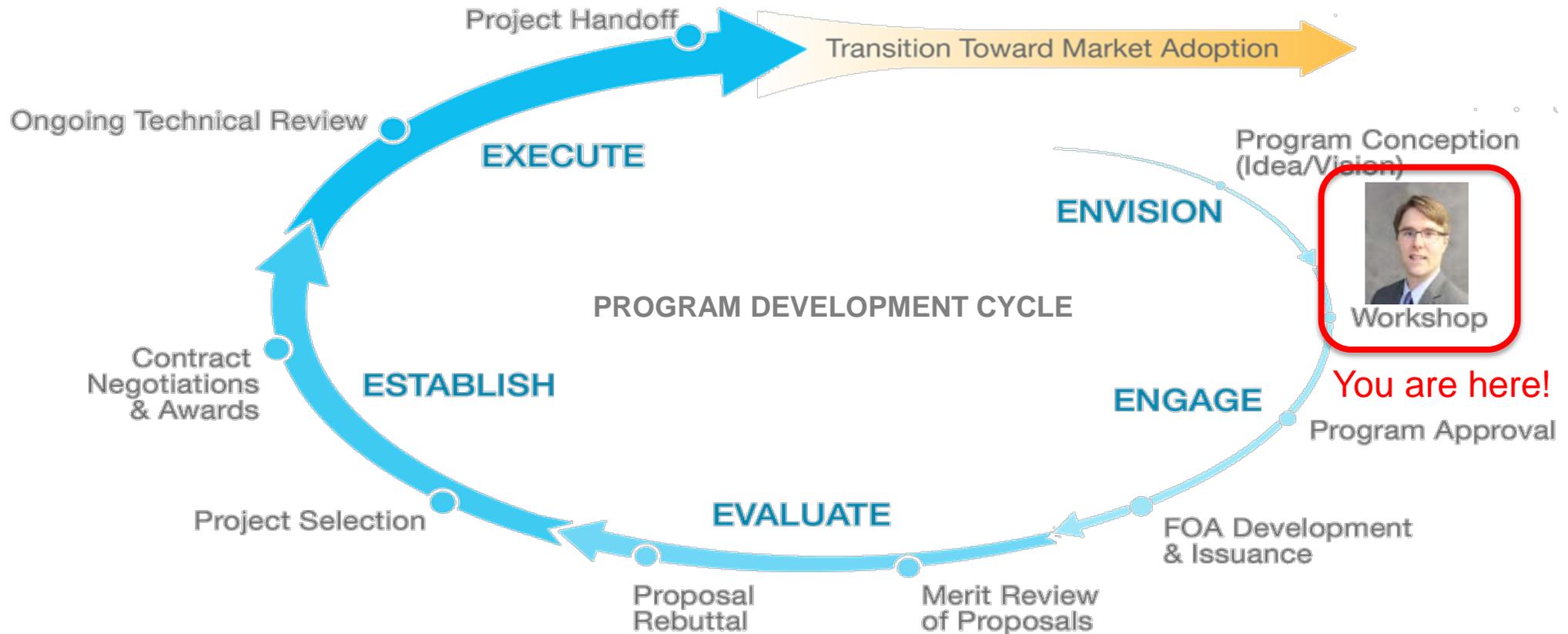
- ▶ Identify and promote revolutionary advances in fundamental and applied sciences
- ▶ Translate scientific discoveries and cutting-edge inventions into technological innovations
- ▶ Accelerate transformational technological advances in areas that industry by itself is not likely to undertake because of technical and financial uncertainty

# Built on DARPA foundation, but with key differences...



# Developing ARPA-E Focused Programs

## ARPA-E Program Directors



# ARPA-E Program Framing Questions



# ARPA-E Program Types

**Focused** programs prioritize R&D topics by their potential to make a significant difference in ARPA-E's mission space.

- Size of the potential impact
- Technical opportunities for transformation
- Portfolio of projects with different approaches



**OPEN** programs support the development of potentially disruptive new technologies across the full spectrum of energy applications.

- Complement focused programs
- Support innovative “one off” projects
- Provide a “snapshot” of energy R&D



# ARPA-E Program Portfolio



# ARPA-E Current & Planned FOAs

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- ▶ **Innovative Natural-gas Technologies for Efficiency Gain in Reliable and Affordable Thermochemical Electricity-Generation (INTEGRATE)**
  - Develop natural gas-fueled distributed electric generation systems that offer fuel to electric power conversion efficiencies in excess of 70%.
- ▶ **Modeling Enhanced Innovations Trailblazing Nuclear Energy Reinvigoration (MEITNER)**
  - Advance innovative concepts for advanced (non-LWR) nuclear power plants that can achieve commercial viability by taking an integrated, system-level, safety-through-design approach.
- ▶ **OPEN 2018**
  - Coming soon.....teaming partner list currently posted on ARPA-E funding portal (<https://arpa-e-foa.energy.gov/> )

# Tech to Market: Preparing Teams for Success



## Scope

Support creation of highly innovative, commercially-relevant programs



## Manage

Manage project teams' T2M efforts through T2M plans and jointly developed milestones



## Advise

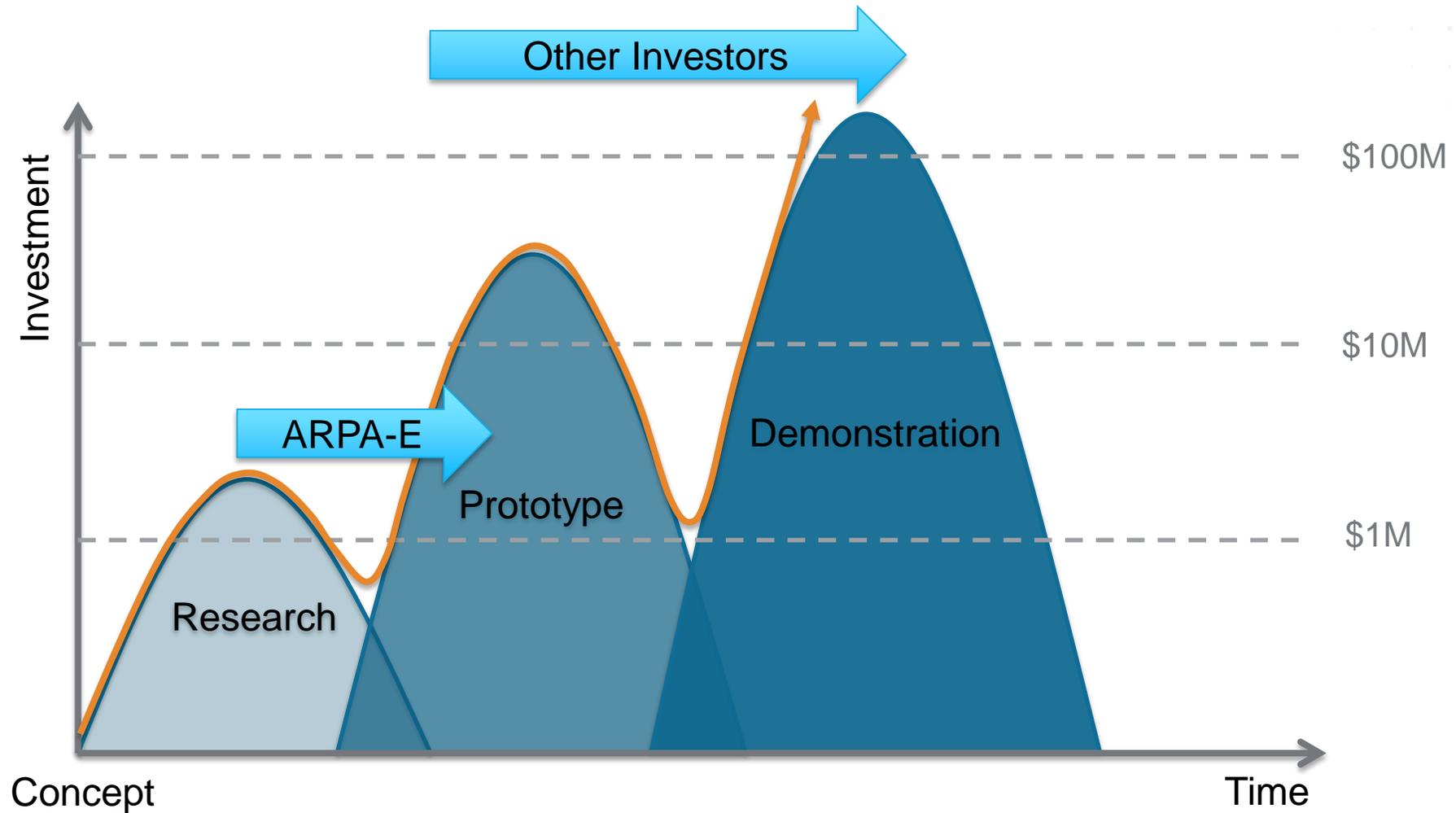
Support project teams with skills & knowledge to align technology with market needs



## Partnerships

Engage third-party investors and partners to support technology development towards the market

# Energy Technology “Mountains of Opportunity”



# ARPA-E Impact Indicators

Since 2009 ARPA-E has provided \$1.5 billion in R&D funding to more than 580 projects.



74 projects have attracted more than \$1.8 billion in private-sector follow-on funding



208 patents issued by U.S. Patent and Trademark Office



56 projects have formed new companies



1,328 peer-reviewed journal articles from ARPA-E projects



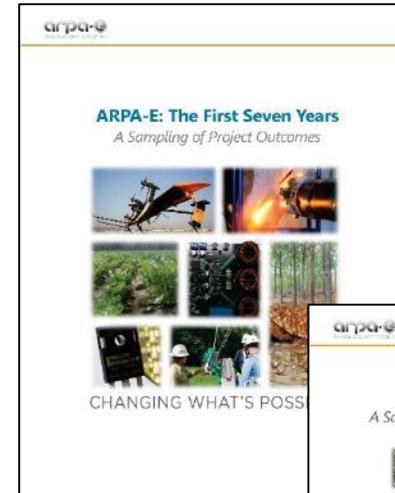
68 projects have partnered with other government agencies to further development



1,493 reported subject invention disclosures

# Assessing ARPA-E's Impact

ARPA-E's Impact Assessments evaluate the technical and commercial advancements of a sampling of projects.



*Download Volume I & II on ARPA-E's Website*

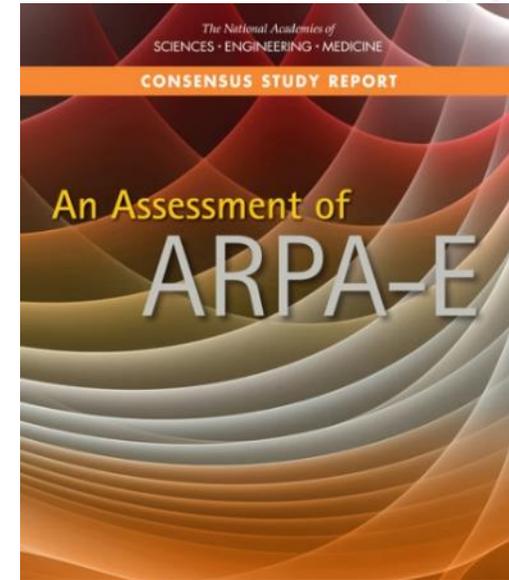
# National Academies of Science Assessment

## Overview:

- ▶ NAS launched in 2015 a congressionally mandated study of ARPA-E and its progress in achieving its statutory mission and goals
- ▶ The final report issued in June 2017 included 18 findings and 14 recommendations

## Key Conclusions:

- ▶ Active project management organizational model is effective
- ▶ ARPA-E has funded research that no other funder was supporting at the time
- ▶ Agency has successfully focused on high risk, potentially transformational technologies and overlooked “off-roadmap” opportunities



*“There are clear indicators that ARPA-E is making progress toward achieving its statutory mission and goals...ARPA-E has the ability to make significant contributions to energy R&D that likely would not take place absent the agency’s activities.” - NAS Assessment*

# Why Work at ARPA-E?



## CONTRIBUTE TO A BETTER ENERGY FUTURE

Work towards creating a more efficient, more secure energy future



## WORK IN DIVERSE TECH AREAS

Work with a diversity of energy issues and explore new fields



## JOIN OUR INNOVATIVE STARTUP-LIKE CULTURE

ARPA-E is a fast-paced, action-oriented Agency



## COLLABORATE WITH OTHER EXPERTS

Work with experts from different disciplines who are devoted to creating a better energy future

*If you are interested in applying or learning more, please email [arpa-e-jobs@hq.doe.gov](mailto:arpa-e-jobs@hq.doe.gov).*

# Program Directors Drive Technical Innovation

PROGRAM DEVELOPMENT



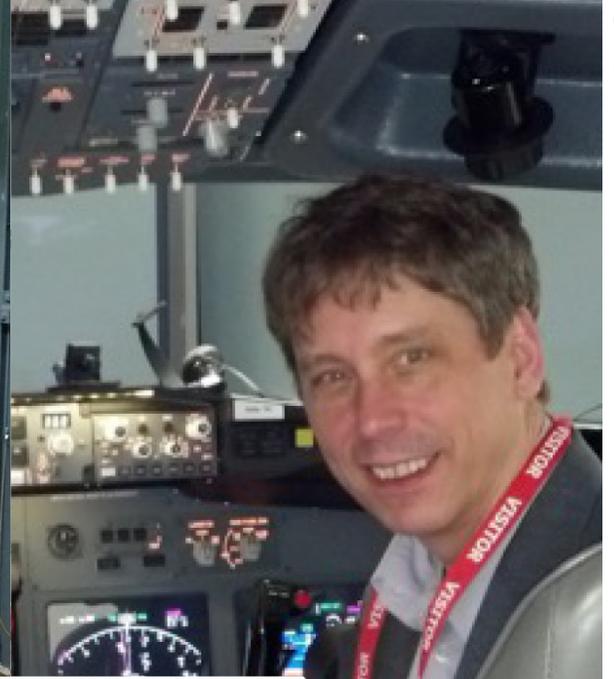
THOUGHT LEADERSHIP



HANDS ON MANAGEMENT

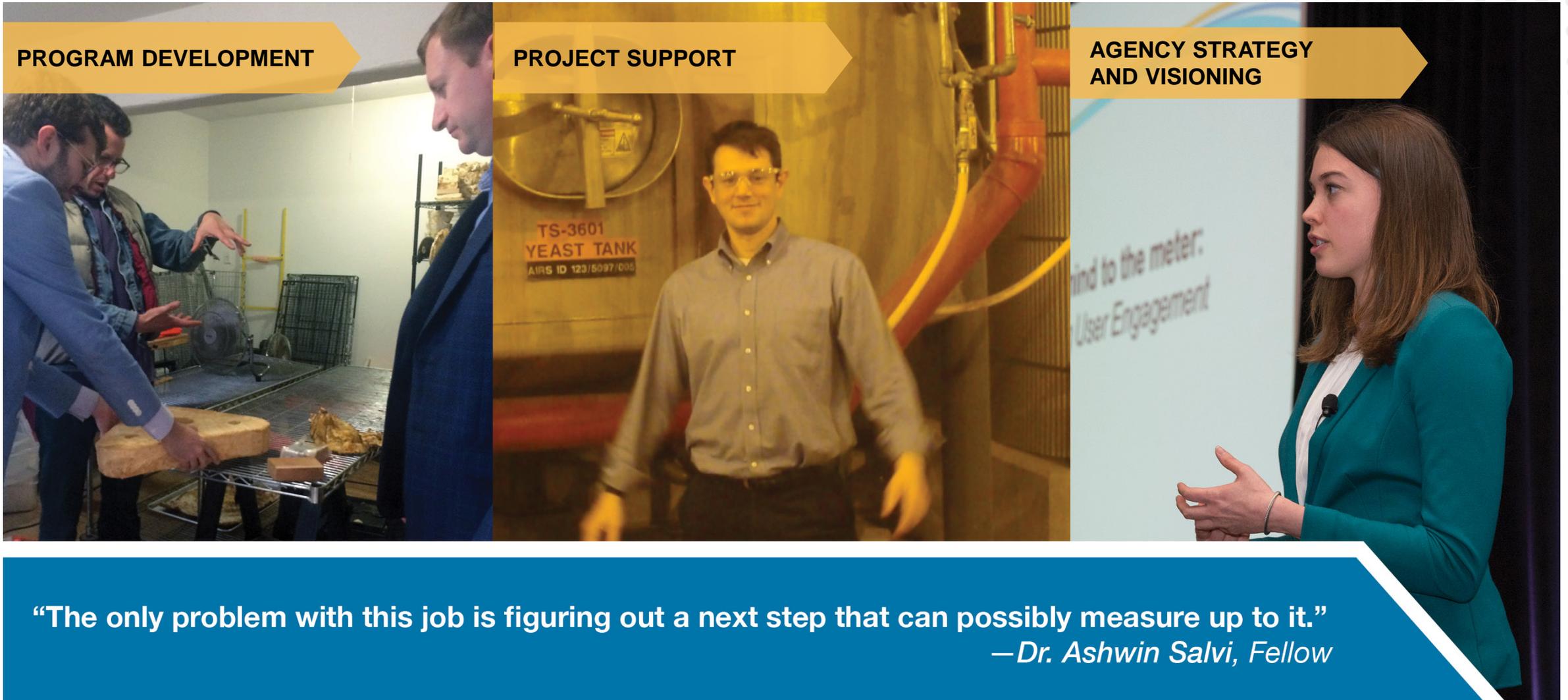


COMMUNITY BUILDING



**“The CEO of my company asked if he hadn’t given me a big enough sandbox to play in. I told him ARPA-E offered me a beach.” —Joe Cornelius, ARPA-E Program Director**

# Fellows Are Early-Career Innovators

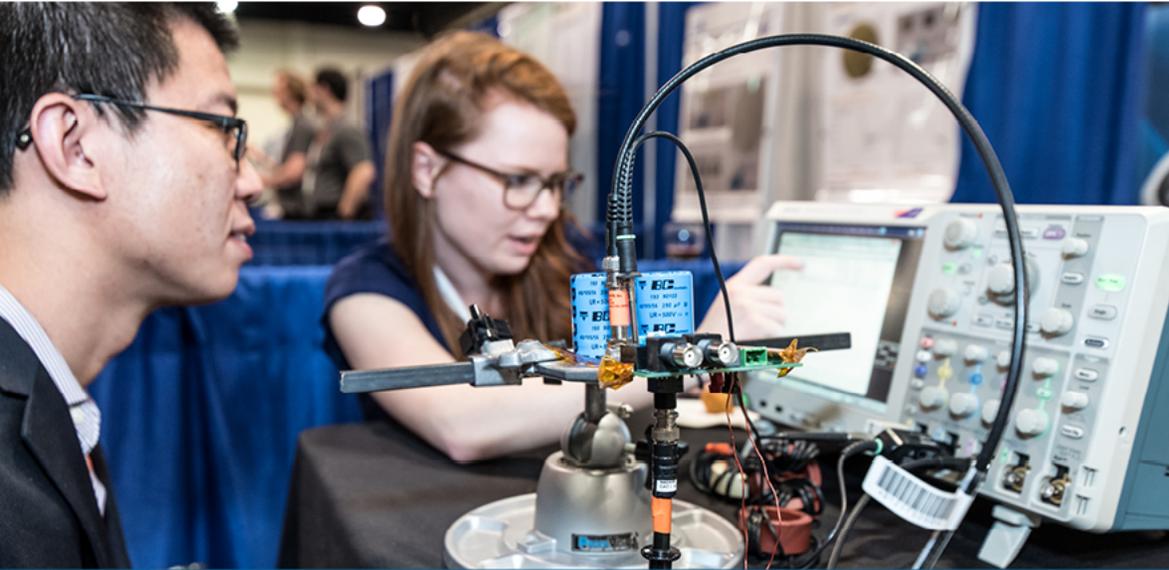


PROGRAM DEVELOPMENT

PROJECT SUPPORT

AGENCY STRATEGY AND VISIONING

**“The only problem with this job is figuring out a next step that can possibly measure up to it.”**  
—*Dr. Ashwin Salvi, Fellow*



2018 SUMMIT  
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Gaylord Convention Center,  
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