

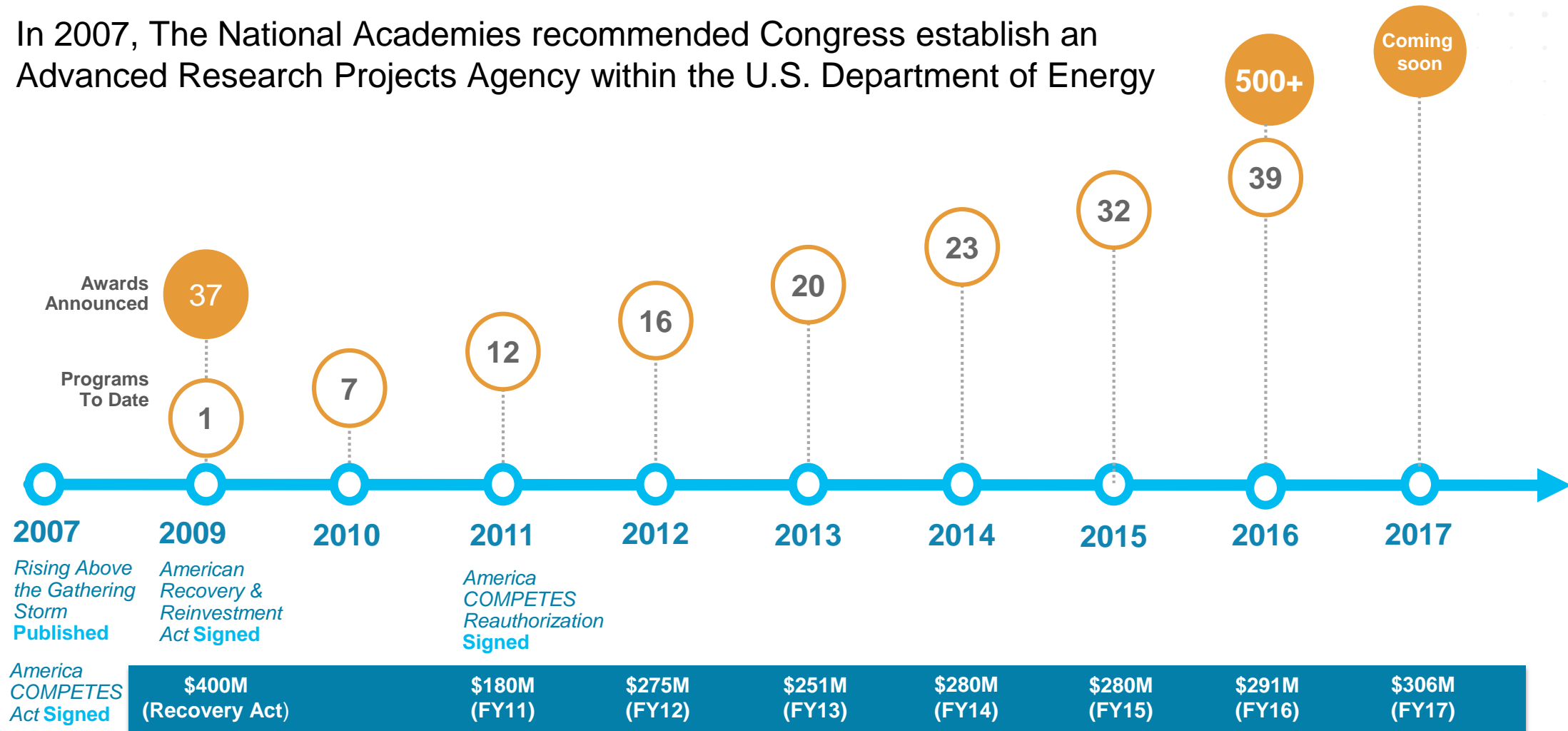


## Overview and Update on the Advanced Research Projects Agency-Energy (ARPA-E)

*Eric A. Rohlfiing*

# 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:

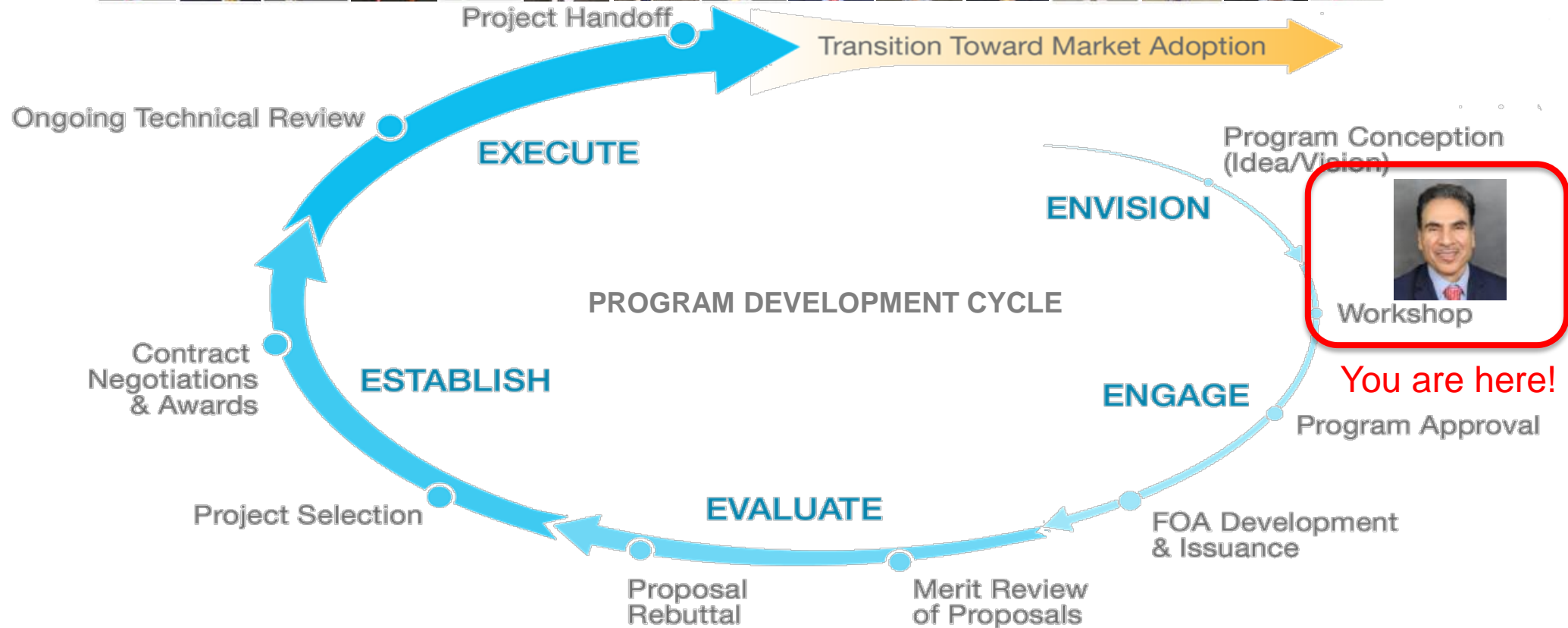
- ▶ Identify and promote revolutionary advances in fundamental and applied sciences
- ▶ Translate scientific discoveries and cutting-edge inventions into technological innovations
- ▶ Accelerate transformational technological advances in areas that industry by itself is not likely to undertake because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



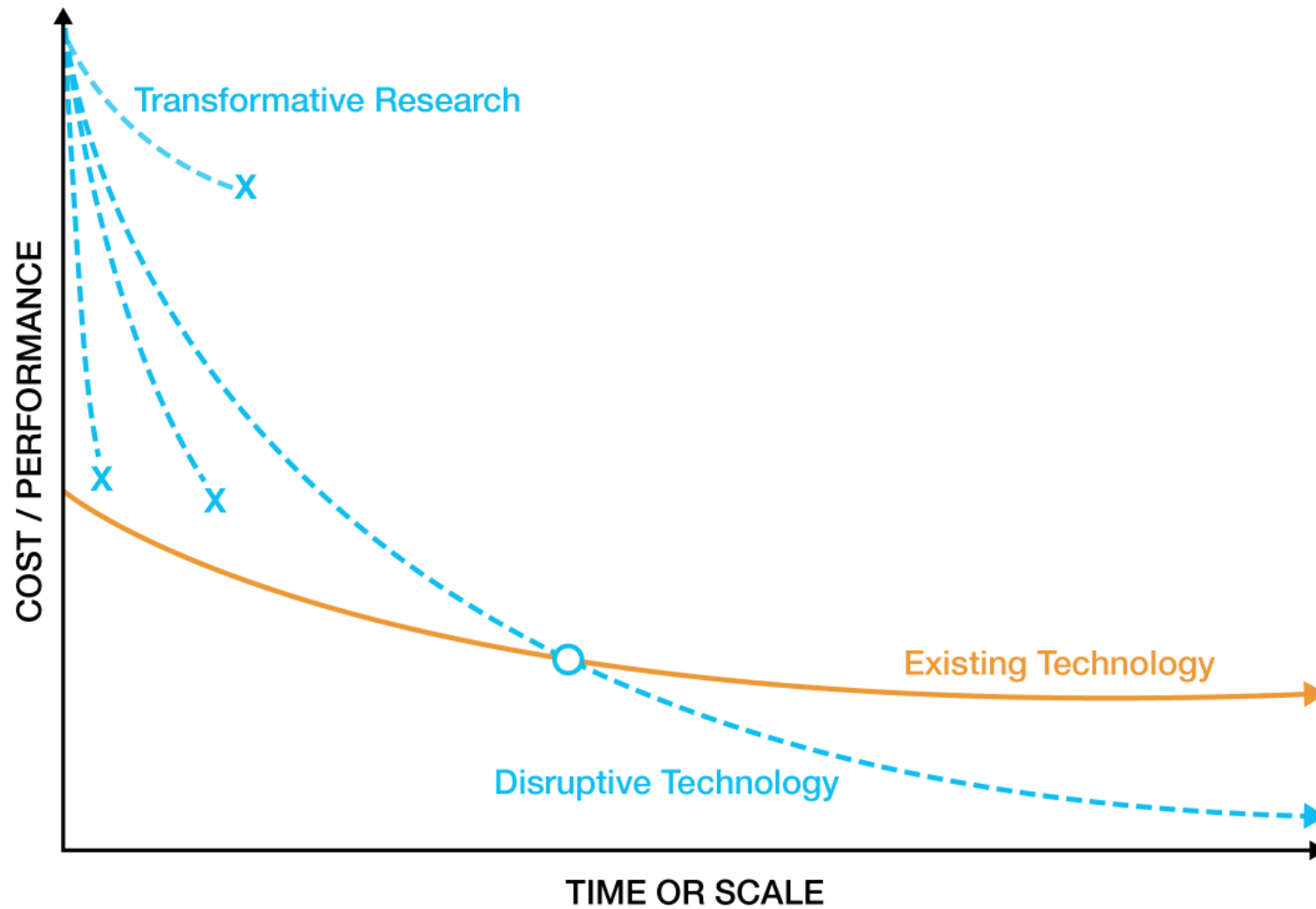


If it works...

*will it matter?*

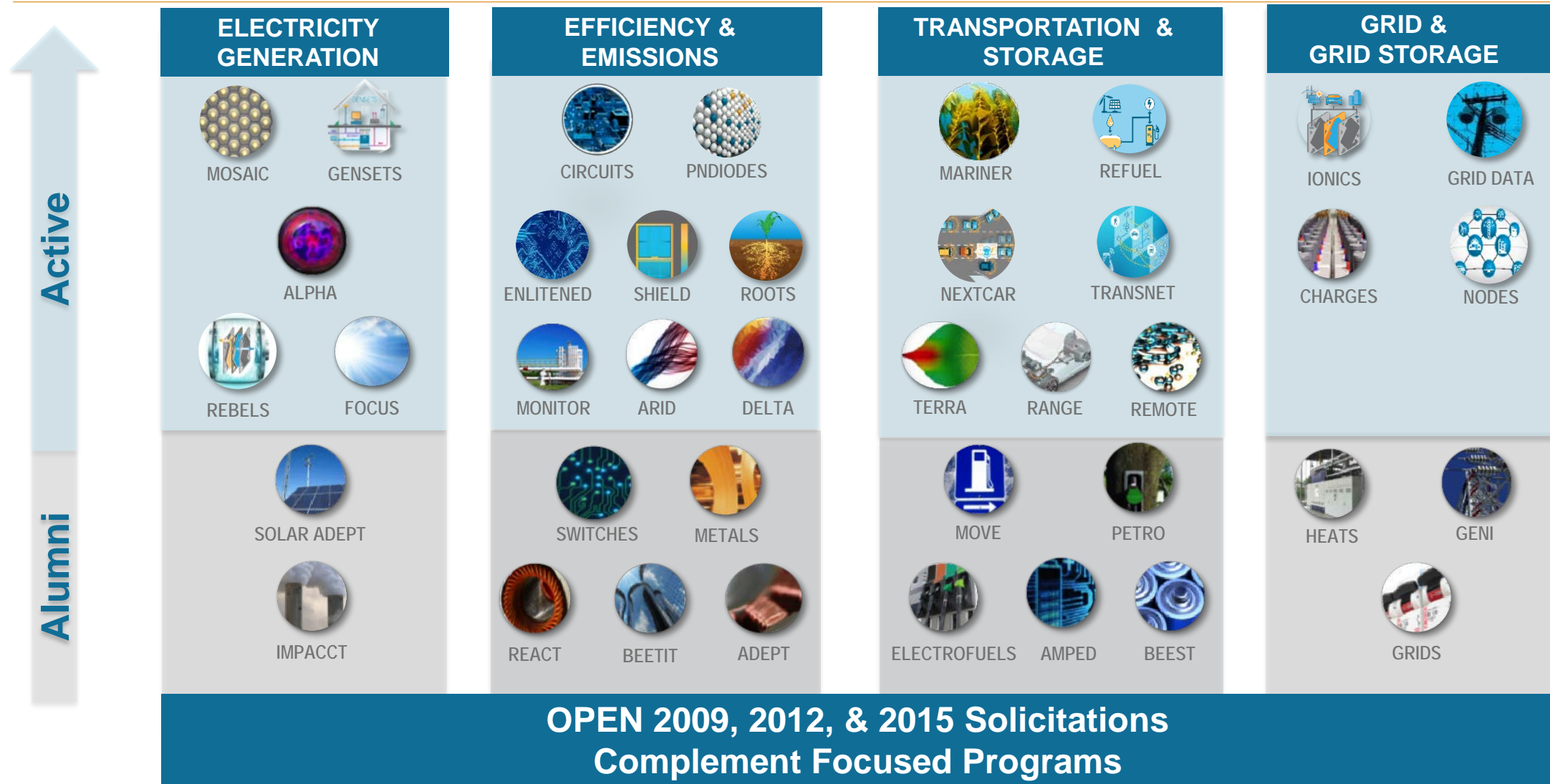


# Creating New Learning Curves





# Focused Program Portfolio



# ARPA-E Current & Pending FOAs

- ▶ **Saving Energy Nationwide in Structures with Occupancy Recognition (SENSOR)**
  - Dramatically reduce the amount of energy used for heating and cooling residential buildings (by 30%) via user-transparent sensor systems
- ▶ **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.

# 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

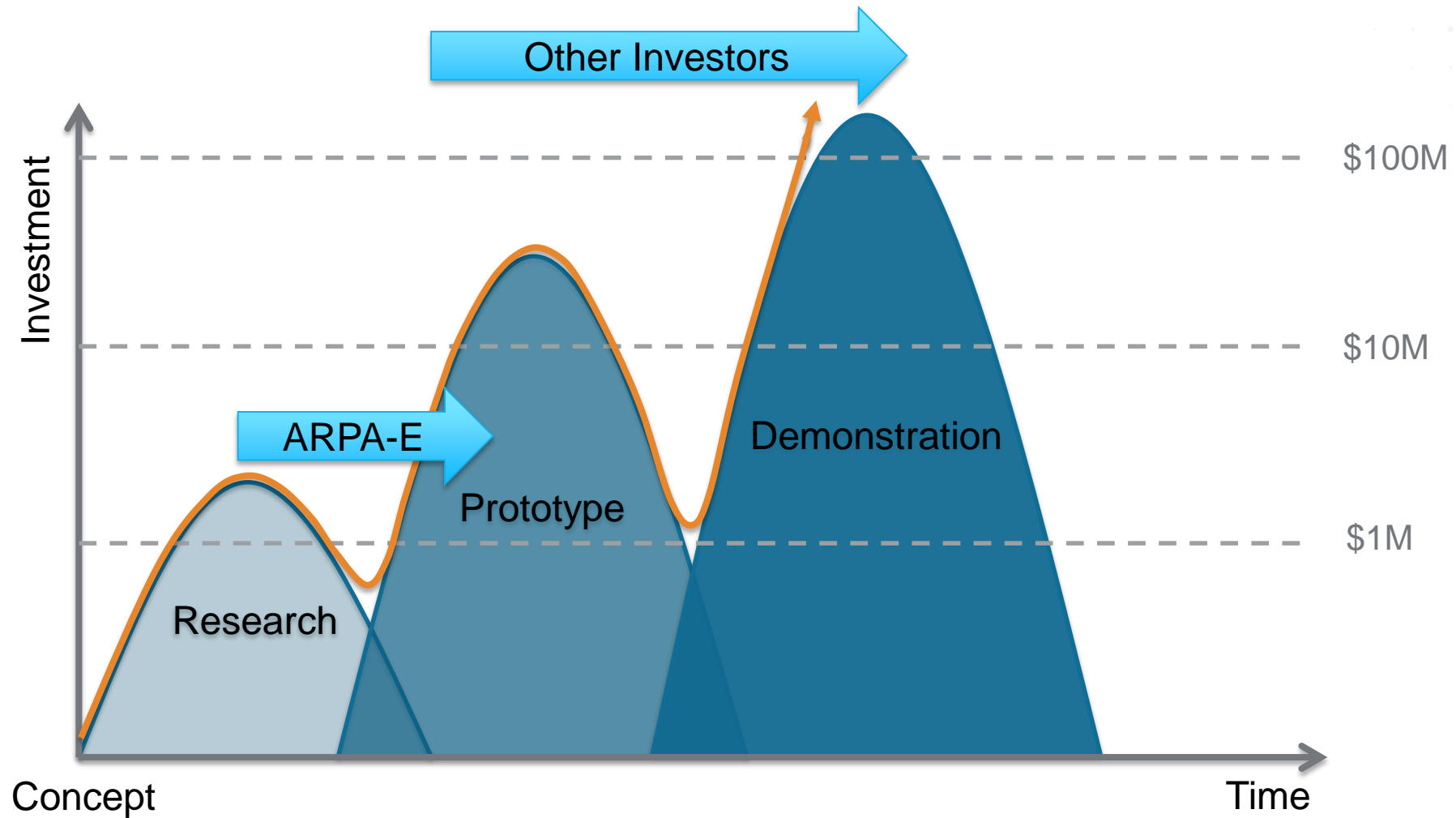
Support project teams with skills & knowledge to align technology with market needs



## 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



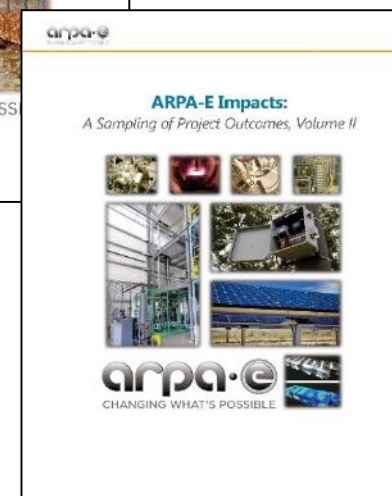
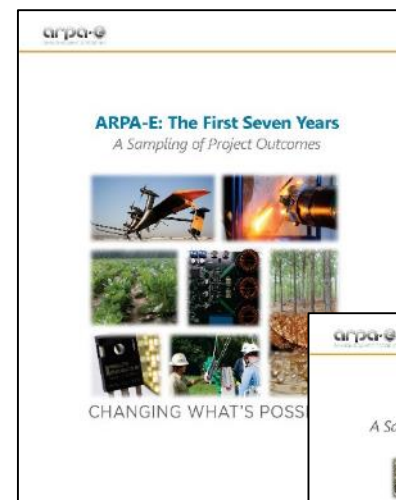
68 projects have partnered with other government agencies to further development



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*

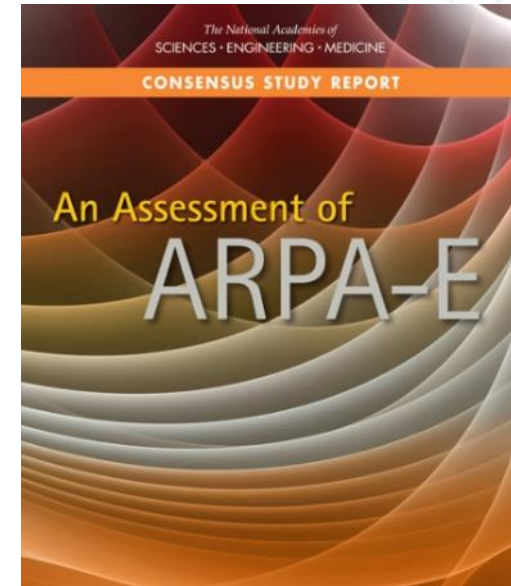
# National Academies of Science Assessment

## 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).*

# Influence a Mission that Matters

Electricity  
Generation



Transportation



Grid



Energy  
Efficiency



Storage



Enhance Technological Lead in Advanced Energy Technologies

Ensure U.S. Energy and Economic Security

Develop Clean, Efficient, Reliable Energy Systems



U.S. DEPARTMENT OF  
**ENERGY**

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