



CHANGING WHAT'S POSSIBLE

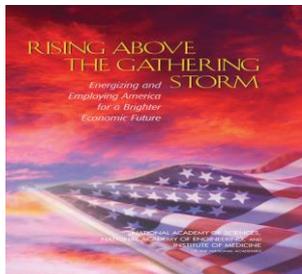


Eric A. Rohlfing  
Deputy Director for Technology

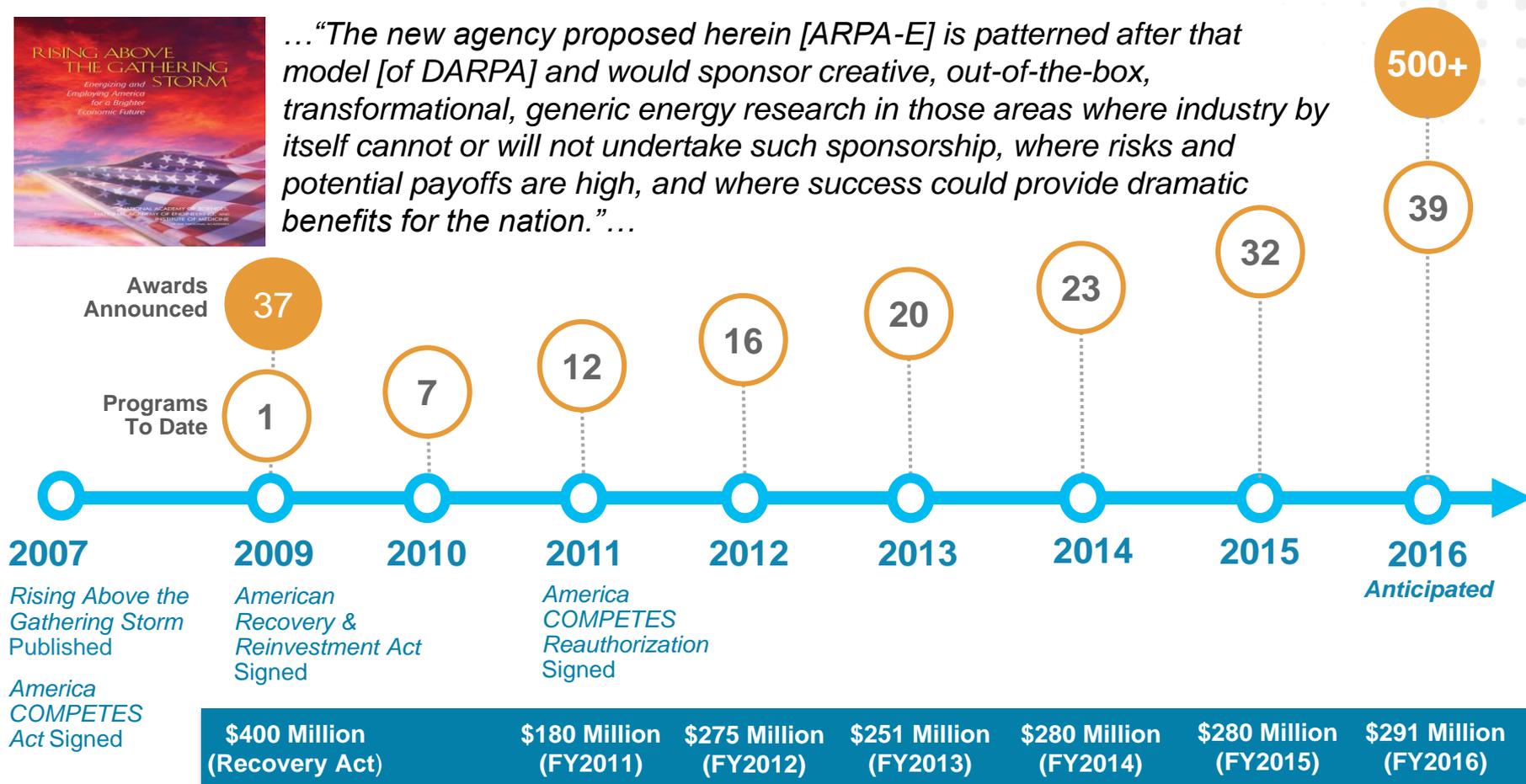
<http://www.arpa-e.energy.gov/>

# ARPA-E's History

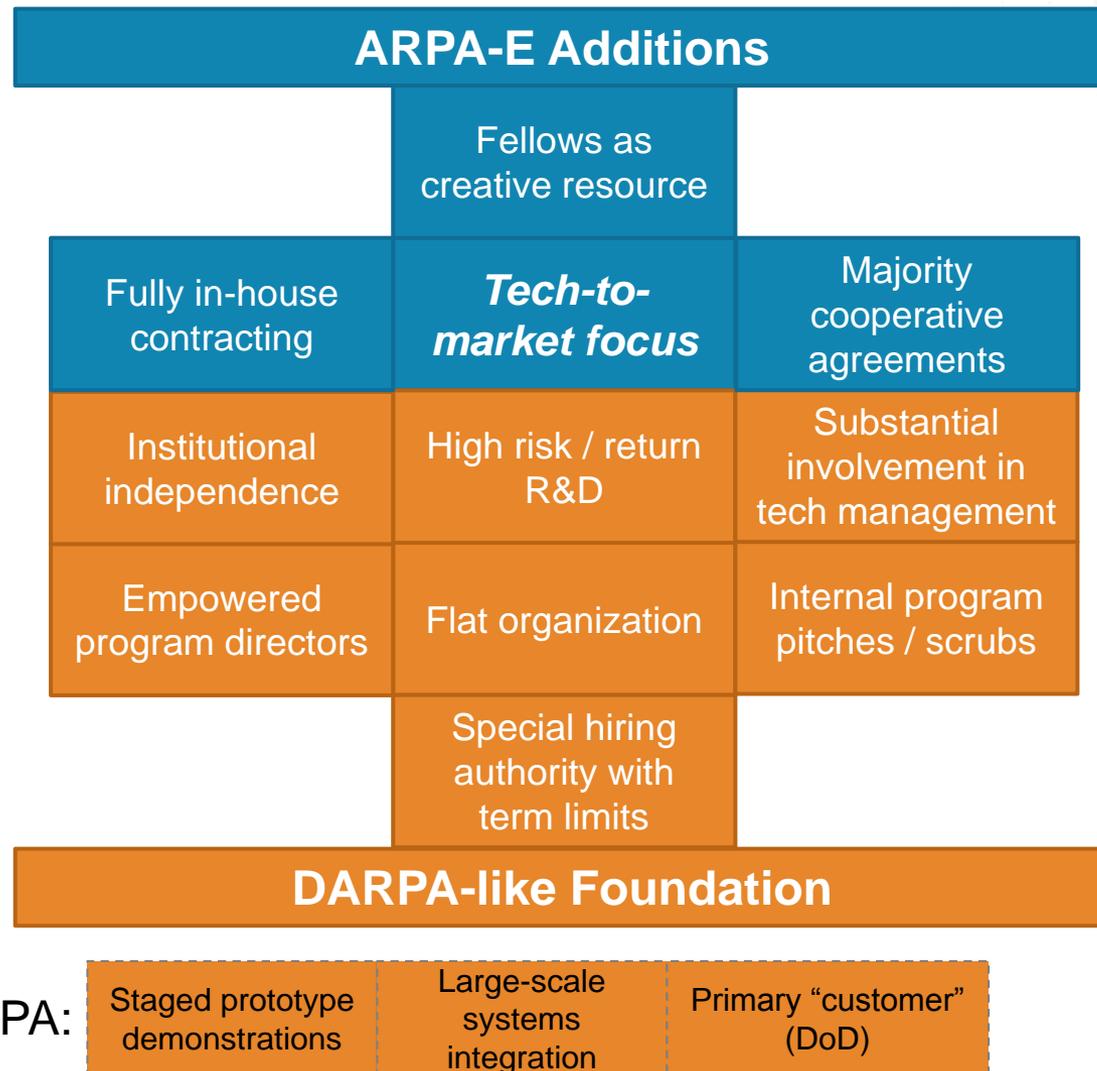
In 2007, The National Academies recommended Congress establish an Advanced Research Projects Agency within the U.S. Department of Energy\*



...“The new agency proposed herein [ARPA-E] is patterned after that model [of DARPA] and would sponsor creative, out-of-the-box, transformational, generic energy research in those areas where industry by itself cannot or will not undertake such sponsorship, where risks and potential payoffs are high, and where success could provide dramatic benefits for the nation.”...



# Built on DARPA foundation, but still evolving...



# Programs

**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

**OPEN Solicitations**



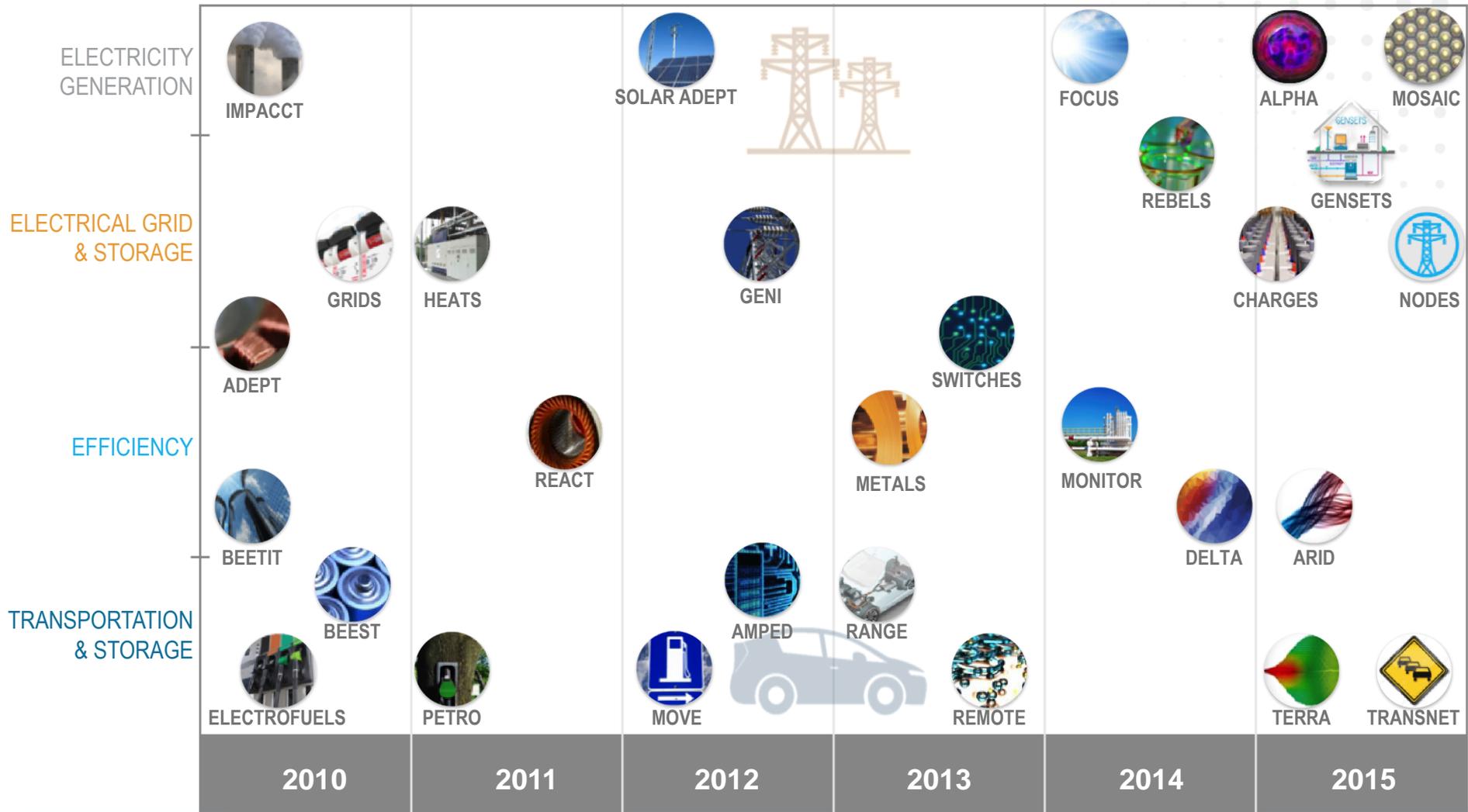
**Focused** programs prioritize R&D topics by their potential to make a significant difference in ARPA-E’s mission space.

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

**Focused Solicitations**



# Focused Program Portfolio



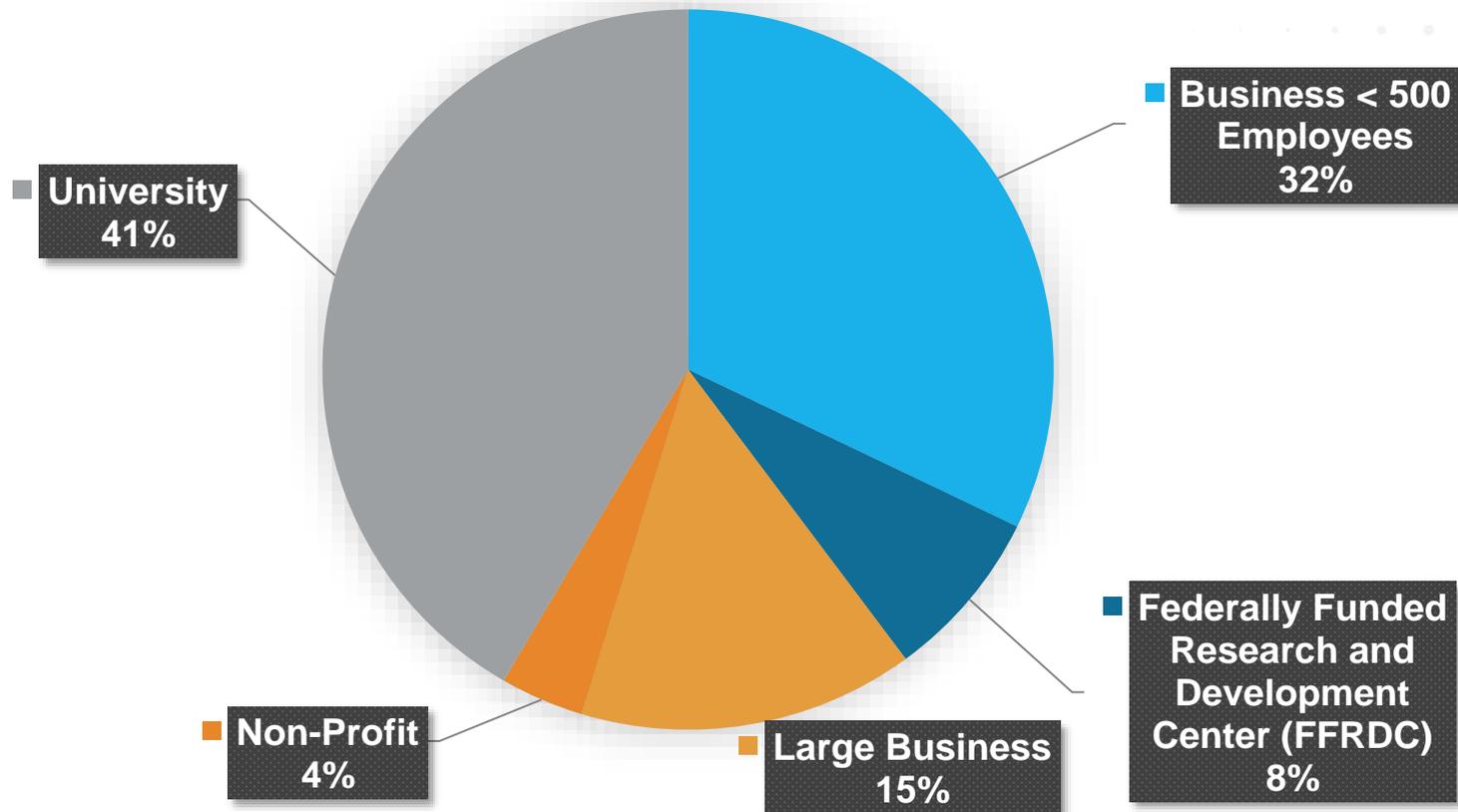
**OPEN 2009**  
36 projects

**OPEN 2012**  
66 projects

**OPEN 2015**  
41 projects



# ARPA-E Project Portfolio by Lead Organization

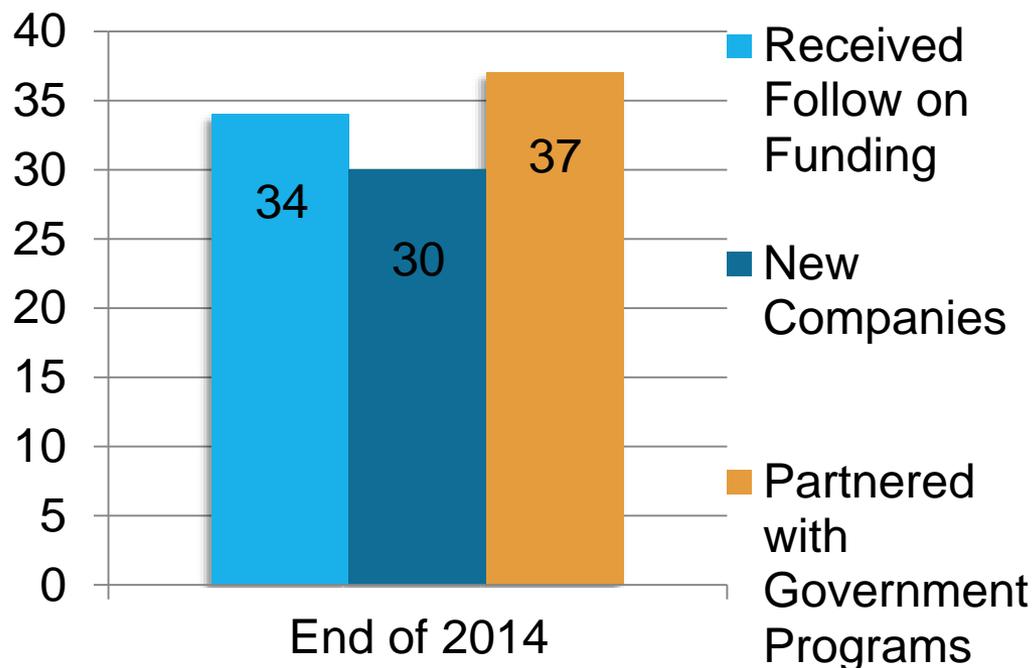


ARPA-E supports multi-institutional teams with substantial involvement from the private sector:  
74% of projects involve more than one institution  
79% of projects include the private sector, as leads or partners

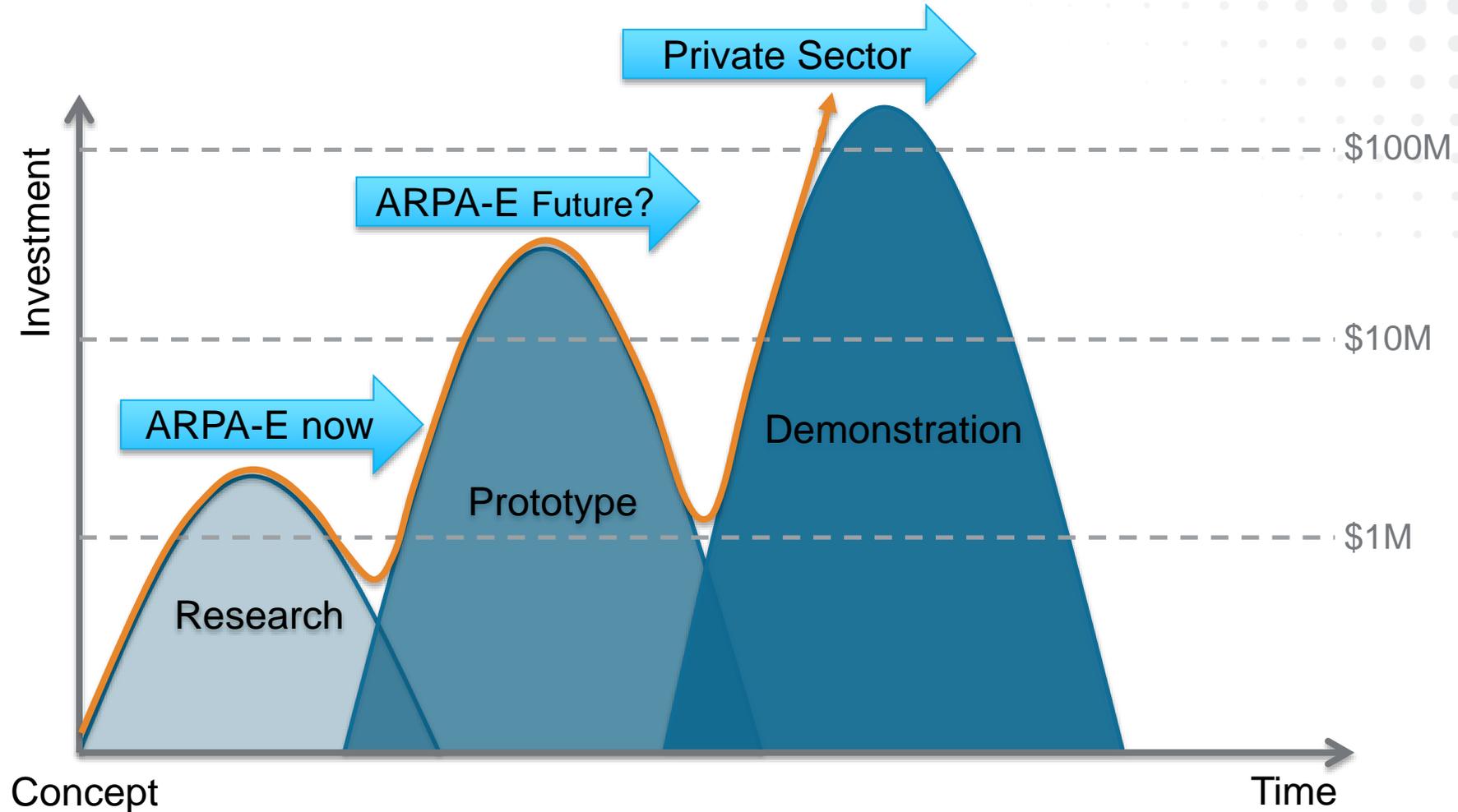
# Measuring the transition to the market

Since 2009 ARPA-E has invested approximately \$1.1 billion in more than 400 projects through 23 focused programs and two OPEN solicitations.

34 ARPA-E projects have attracted more than \$850 million in private-sector follow-on funding.



# Energy Technology “Mountains of Opportunity”



# ARPA-E FY 2017 Budget Request

(\$ millions)	FY 2015 Enacted	FY 2016 Enacted	FY 2017 Request	FY 17 vs FY 16 Delta
ARPA-E Annual Appropriation	280	291	350	+59
ARPA-E Energy Trust (Mandatory)	-	-	150	+150
<b>Total</b>	<b>280</b>	<b>291</b>	<b>500</b>	<b>+209</b>

In addition to the \$350 M request in FY 2017, the budget includes a new proposal, the “ARPA-E Trust,” which provides a total of \$1.85 billion in mandatory funds over five years (\$150 M in FY 2017, \$250 M in FY 2018, \$350 M in FY2019, \$450 M in FY 2020, and \$650 M in FY 2021)

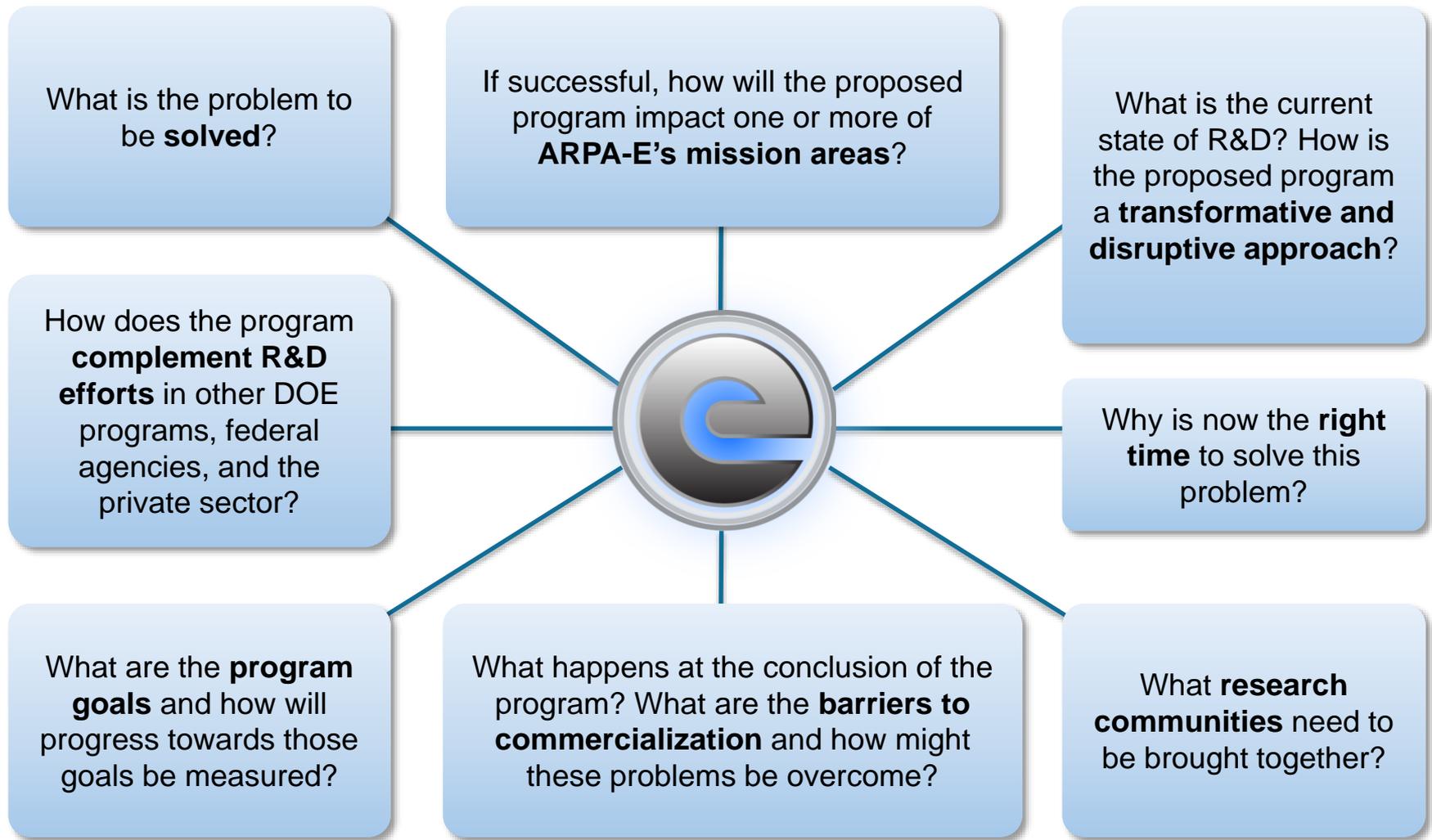
## Appropriations Request (\$350 M in FY17)

- Core activities – dynamic portfolio of early stage innovation programs, with strong focus on developing commercial potential
- Release FOAs for 7 - 8 focused programs
- Continue a stand-alone SBIR/STTR program
- Continue IDEAS, a small rolling open FOA
- Commercial readiness support for highly successful projects

## ARPA-E Trust (\$1.85 B in Mandatory funds over 5 Years)

- Complement core activities
- New activities to integrate advances from core program into innovative technology systems, accelerating large impacts on the energy system
- Create investable opportunities by reducing technical risk of early stage innovations

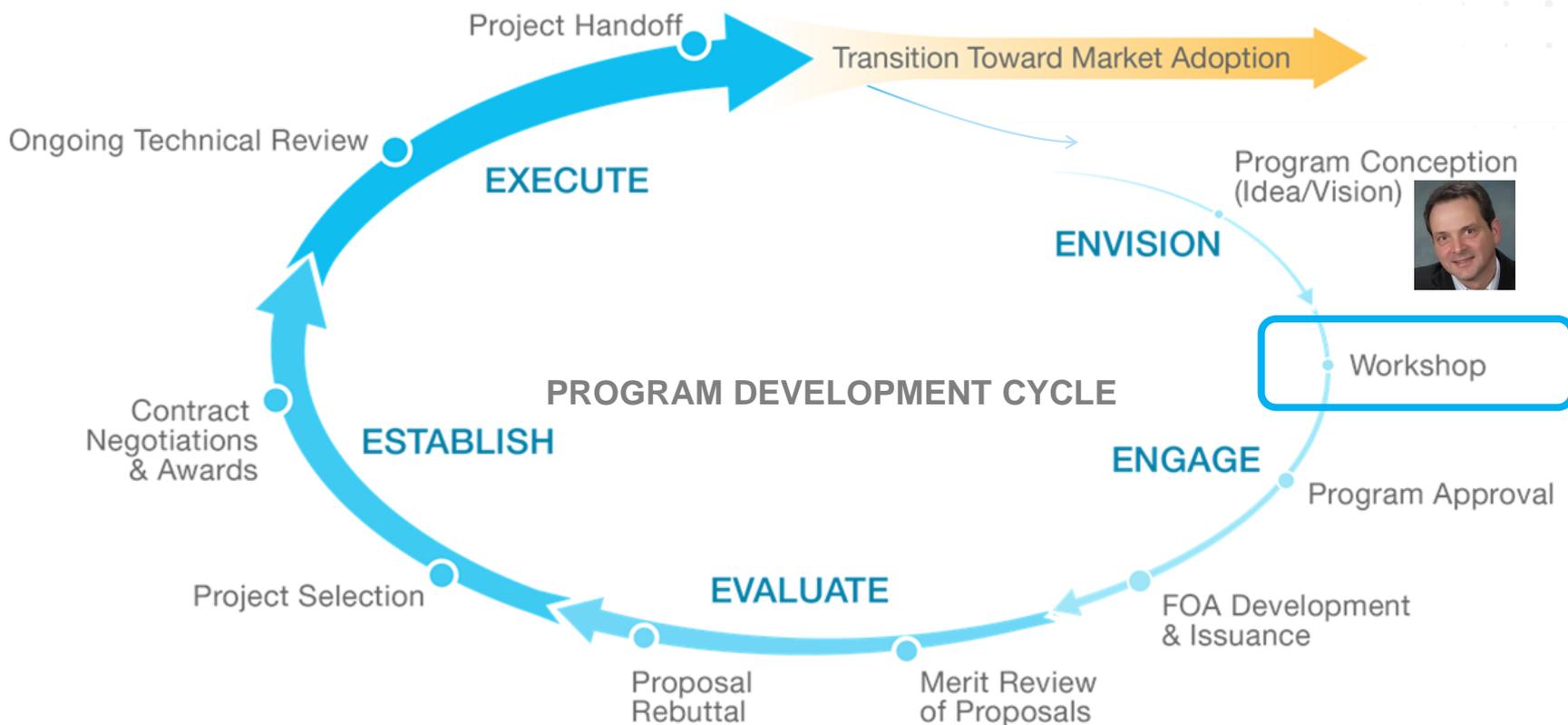
# ARPA-E Program Framing Questions



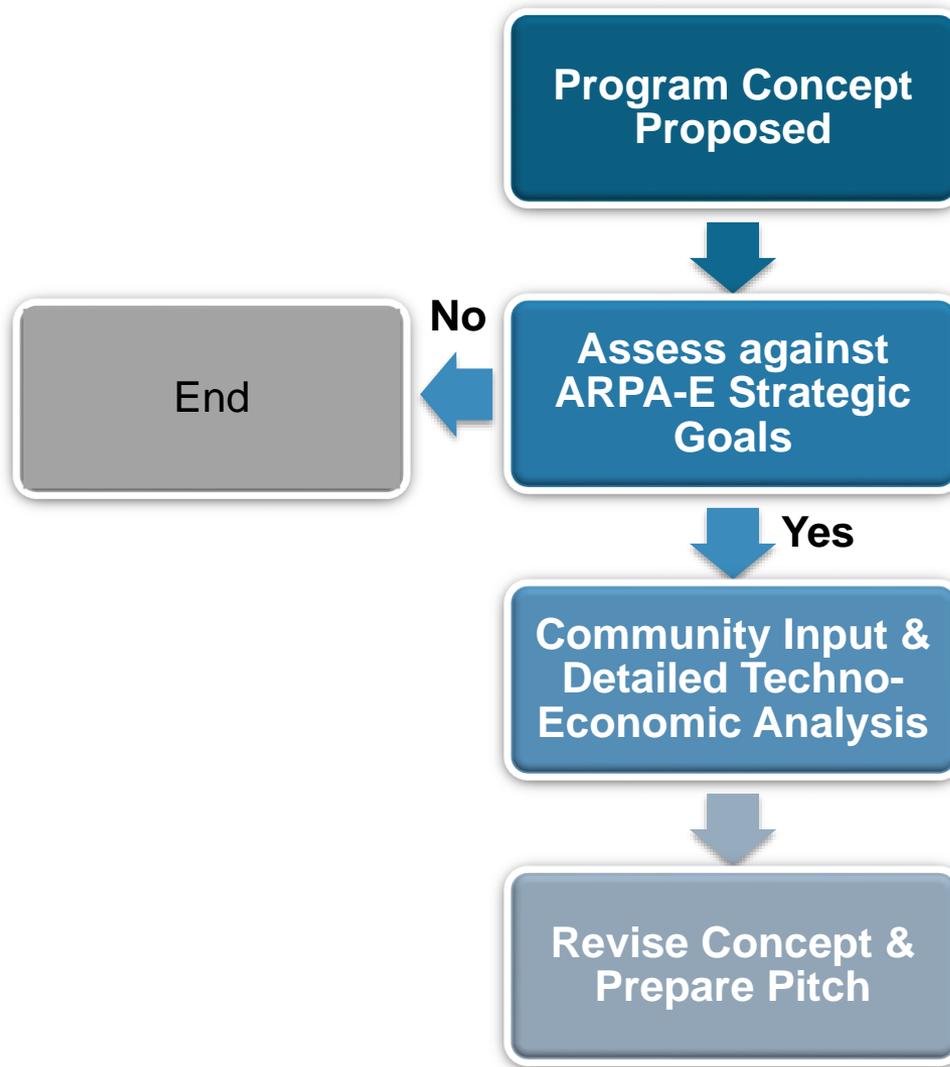
# Developing ARPA-E Focused Programs



ARPA-E Program Directors



# Program Development: Concept to FOA



## External Engagement (representative examples):

- ▶ Discussions with other DOE offices or other agencies
- ▶ Site visits (academia, industry)
- ▶ Attendance at conferences
- ▶ Webinars
- ▶ Workshop planning meeting
- ▶ **Workshop (mandatory)**
- ▶ Funded external study (ARID, NODES)
- ▶ Requests for Information (RFIs)

# Program Directors

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*ARPA-E is continually recruiting new Program Directors, who serve 3-year terms*

## ROLES & RESPONSIBILITIES

### Program development

- ▶ Perform technical deep dive soliciting input from multiple stakeholders in the R&D community
- ▶ Present & defend program concept in climate of constructive criticism

### Active project management

- ▶ Actively manage portfolio projects from merit reviews through project completion
- ▶ Extensive “hands-on” work with awardees

### Thought leadership

- ▶ Represent ARPA-E as a thought leader in the program area

## ATTRIBUTES

- ▶ R&D experience; intellectual integrity, flexibility, and courage; technical breadth; commitment to energy; communication skills; leadership; and team management
- ▶ ***A passion to change our energy future***

# Fellows

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*ARPA-E also hires Fellows, who serve 2-year terms*

## ROLES & RESPONSIBILITIES

### Identification of high-impact energy technologies

- ▶ Perform technical and economic analyses to identify high-impact energy technologies.
- ▶ Publish original research papers and reviews.

### Program director support

- ▶ Help develop future programs through technical analysis, discussions, and workshops.
- ▶ Assist with management of current projects, including site visits.

### Organizational support

- ▶ Review proposals for funding opportunities.
- ▶ Contribute to the strategic direction and vision of the agency.

## ATTRIBUTES

- ▶ Ph.D. in science or engineering; strong analytical and communication skills; ability to work independently and across disciplines; leadership.
- ▶ ***A passion to change our energy future***



U.S. DEPARTMENT OF  
**ENERGY**

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Join us at our 2016 Summit

February 29 – March 2, 2016

Gaylord National Convention Center  
just outside Washington, DC.