



CHANGING WHAT'S POSSIBLE



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

ARPA-E

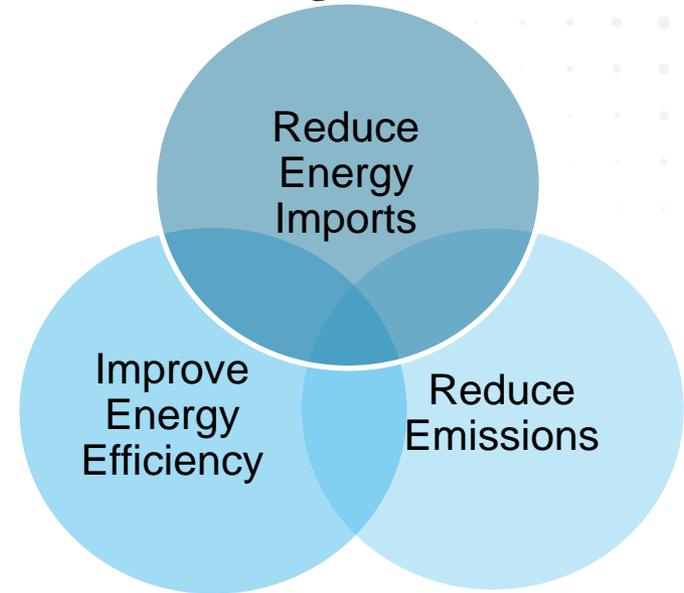
Mission: To overcome long-term and high-risk technological barriers in the development of energy technologies

Goals: Ensure America's

- Economic Security
- Energy Security
- Technological Lead in Advanced Energy Technologies

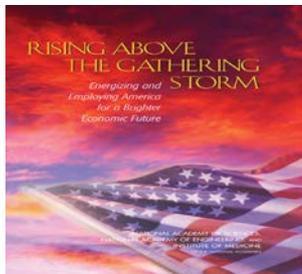
Means:

- 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

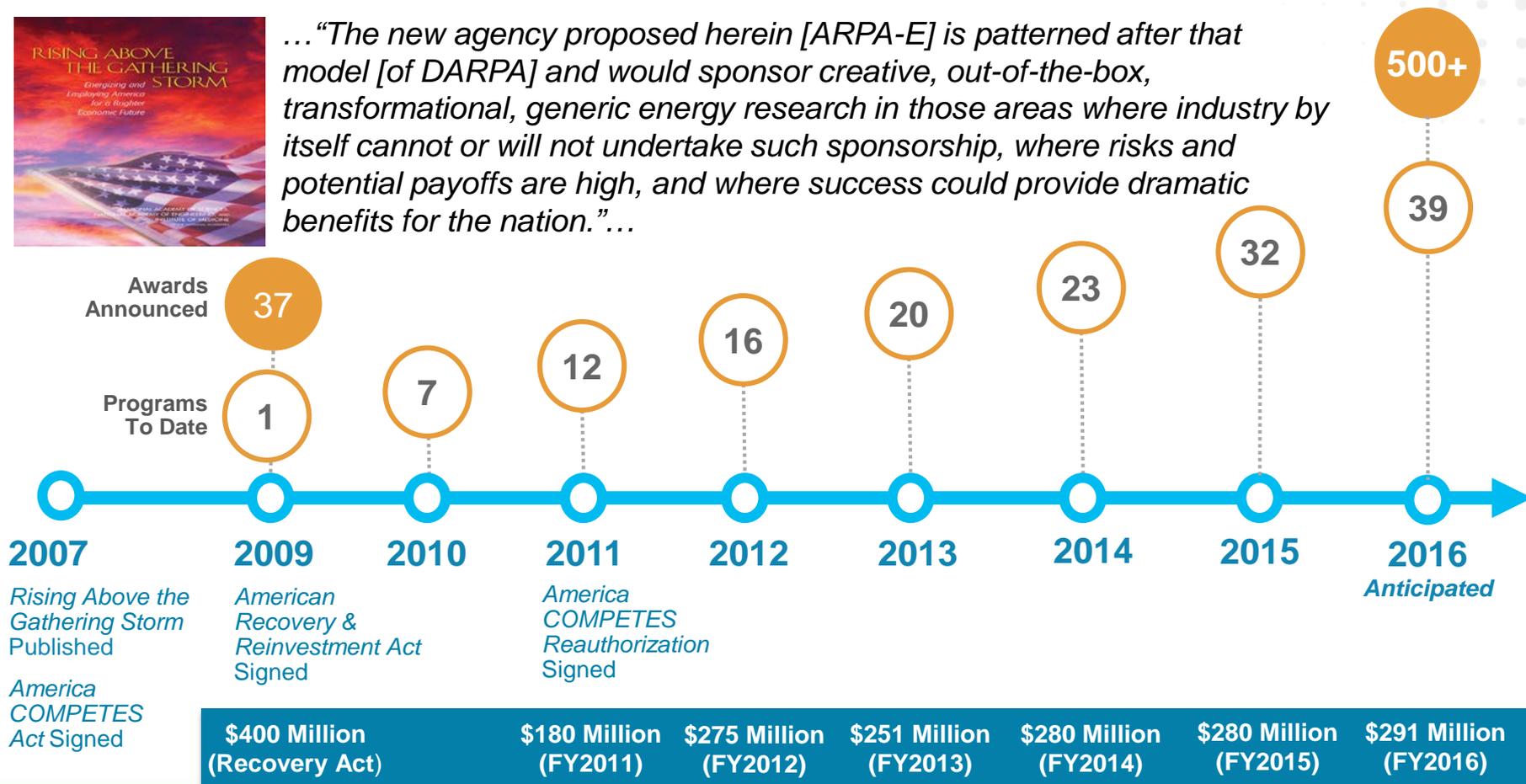


ARPA-E's History

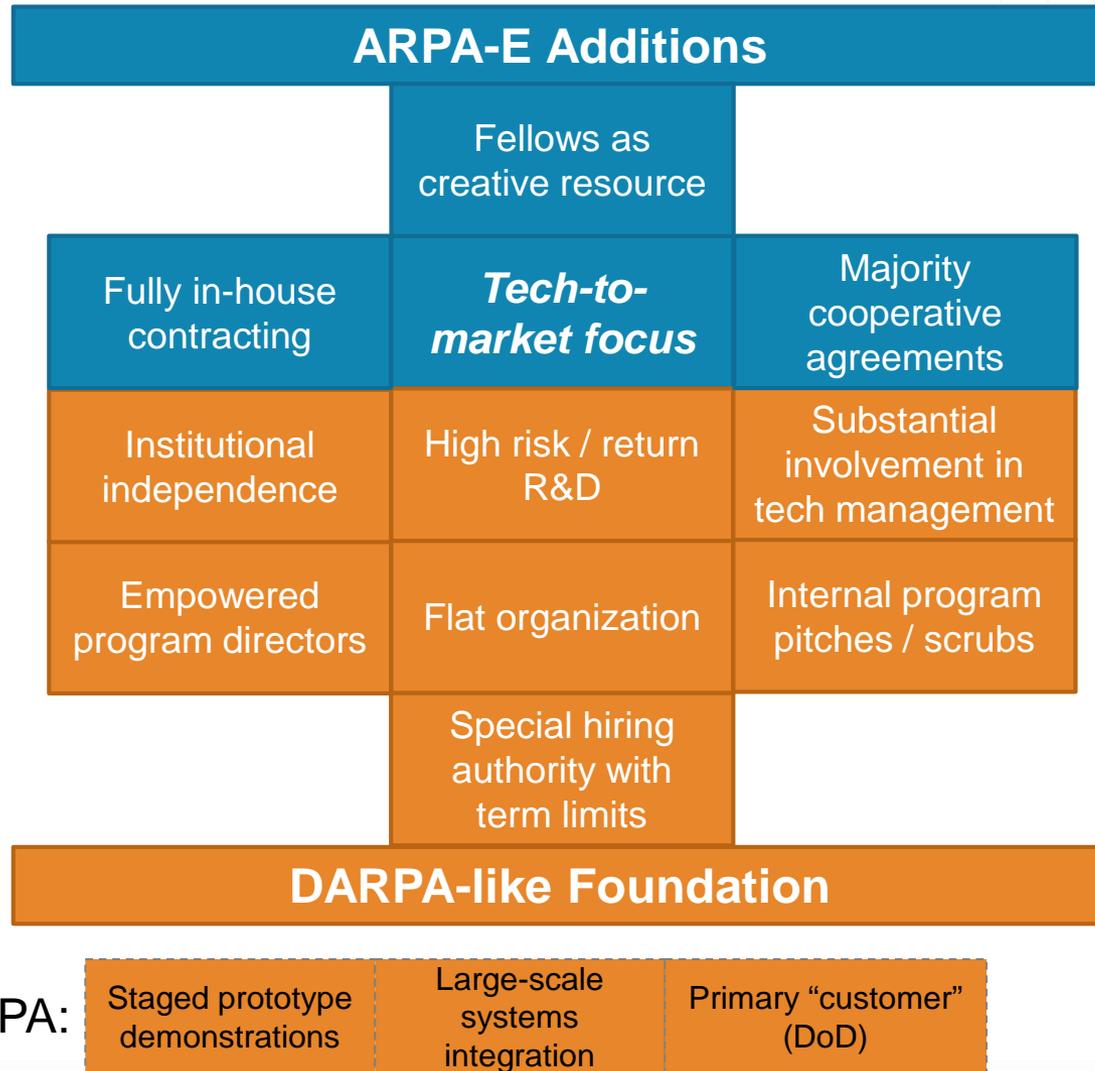
In 2007, The National Academies recommended Congress establish an Advanced Research Projects Agency within the U.S. Department of Energy*



...“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



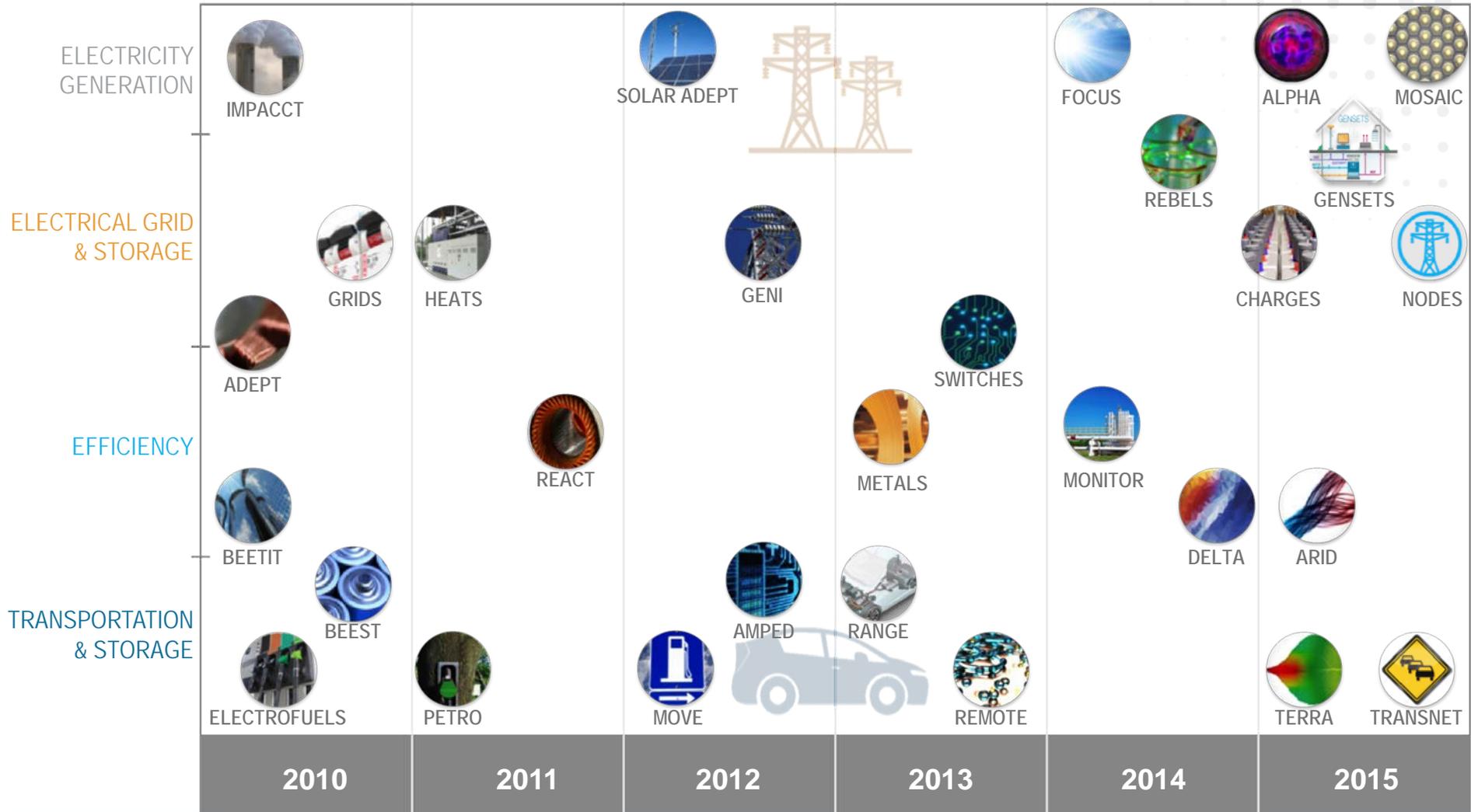
Focused programs prioritize R&D topics by their potential to make a significant difference in ARPA-E’s mission space.

- 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



Measuring ARPA-E's Success

Since 2009 ARPA-E has invested approximately \$1.3 billion across more than 475 projects through 30 focused programs and three open funding solicitations.

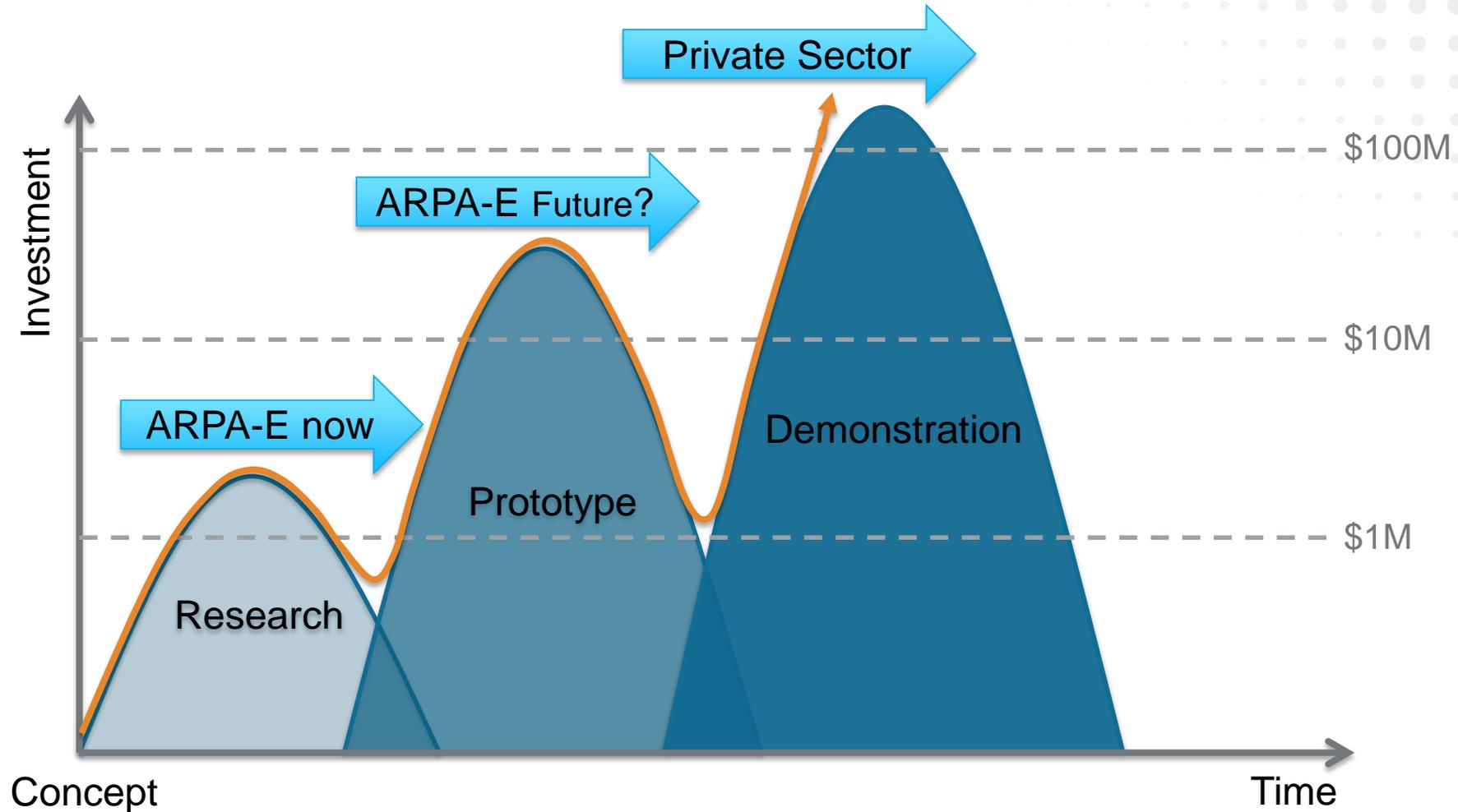
As of Dec 31, 2015, ARPA-E had a total of 206 alumni projects that had received a total of \$535 million in funding.

For all alumni and current projects:

- ▶ Follow-on Funding
 - 45 projects have attracted more than \$1.25 billion from the private sector
- ▶ Partnerships with other government agencies
 - 60 government projects
- ▶ New company formation
 - 36 new companies formed



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
Total	280	291	500	+209

The ARPA-E Trust proposes a total of \$1.85 billion in mandatory funds over five years and defines a path toward a \$1B/year agency

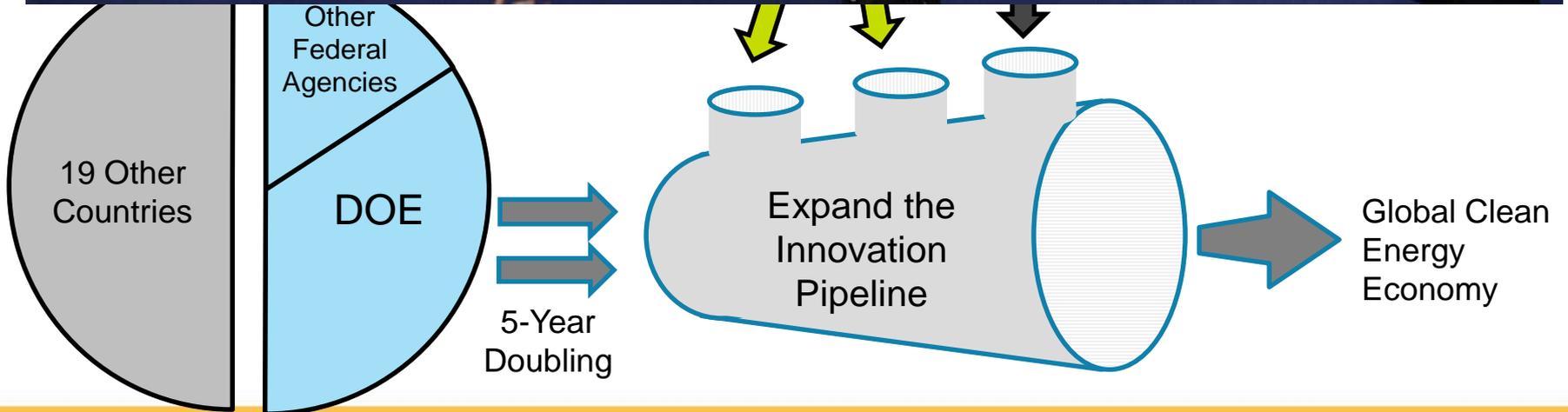
Appropriations Request (\$350 M in FY17)

- 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

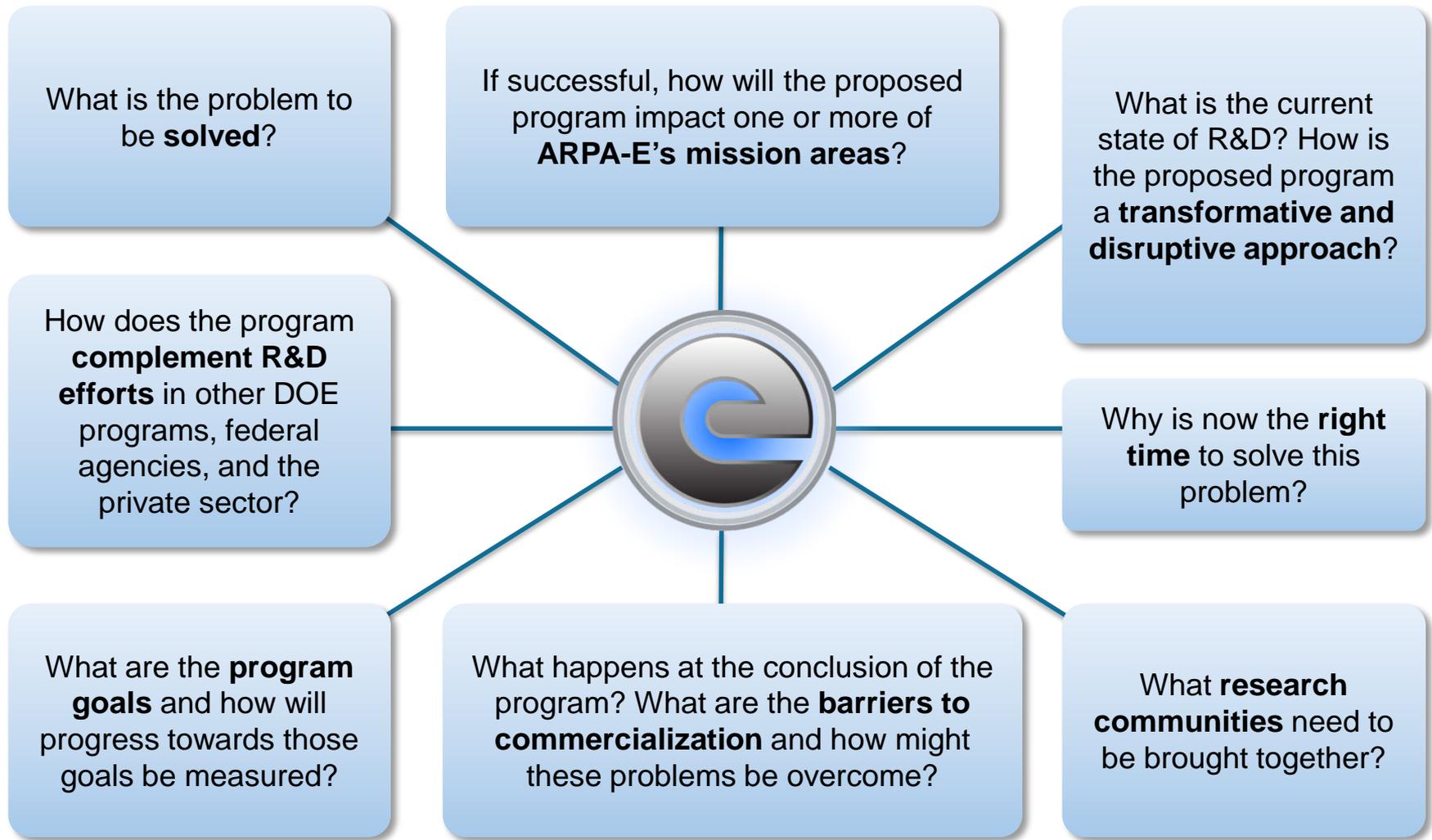
ARPA-E Trust (\$1.85 B over 5 Years)

- 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

Mission Innovation and the Breakthrough Energy Coalition



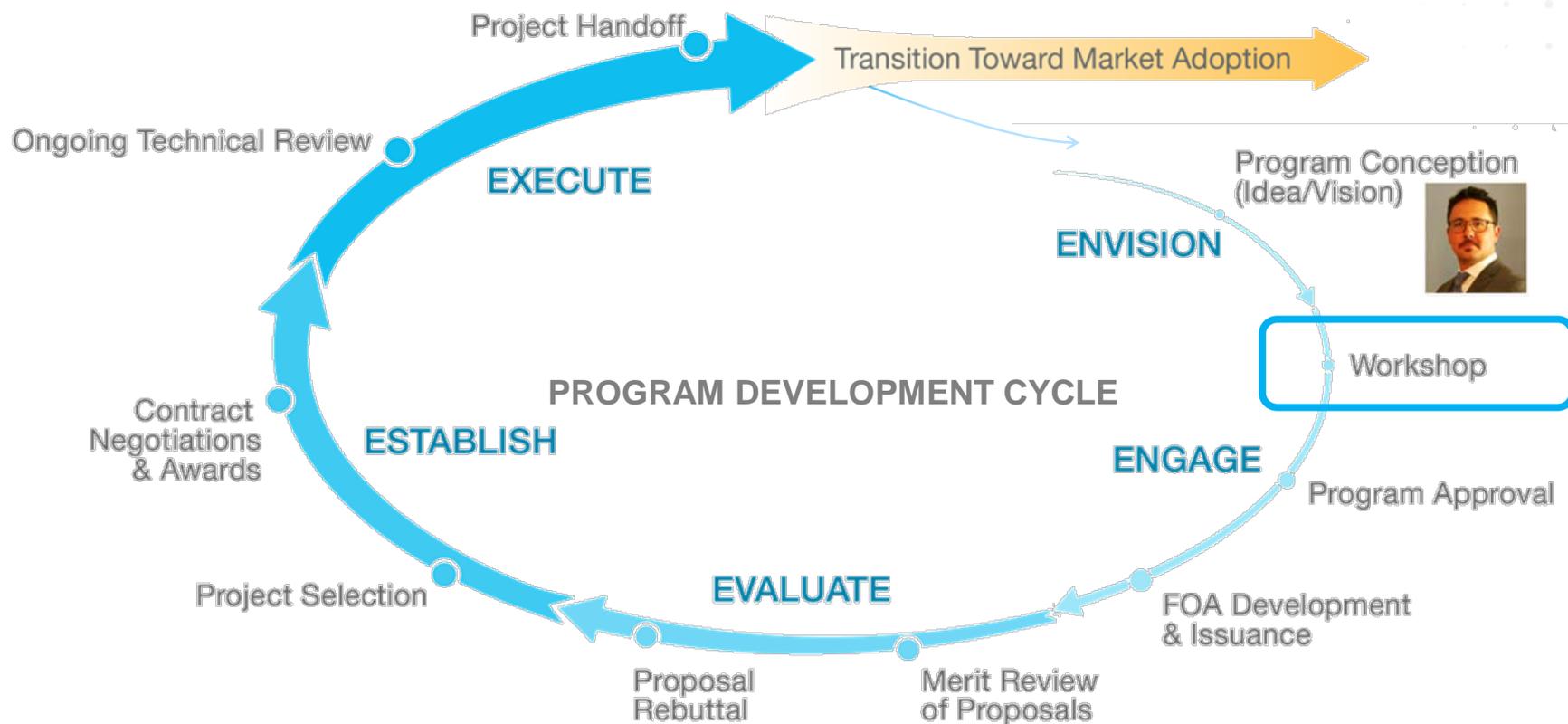
ARPA-E Program Framing Questions



Developing ARPA-E Focused Programs



ARPA-E Program Directors



Program Directors

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

The ARPA-E Fellowship program is a unique, technical opportunity with a two-year term

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***



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