



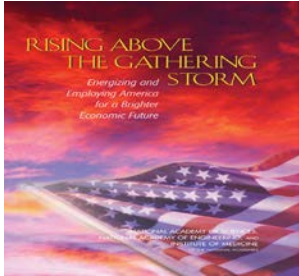
Advanced Research Projects Agency – Energy (ARPA-E)

Eric A. Rohlfing
Acting Director

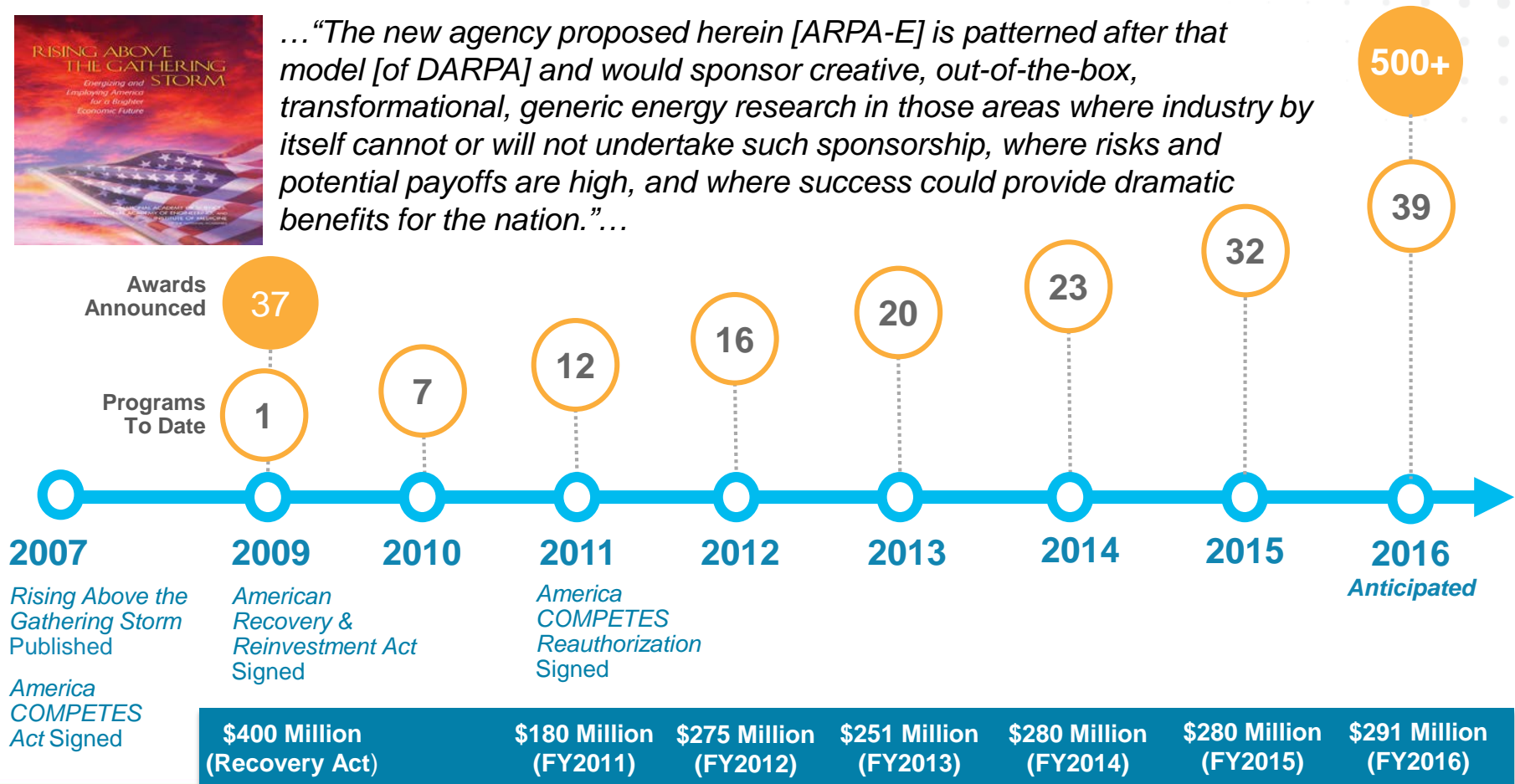
<http://www.arpa-e.energy.gov/>

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.”...

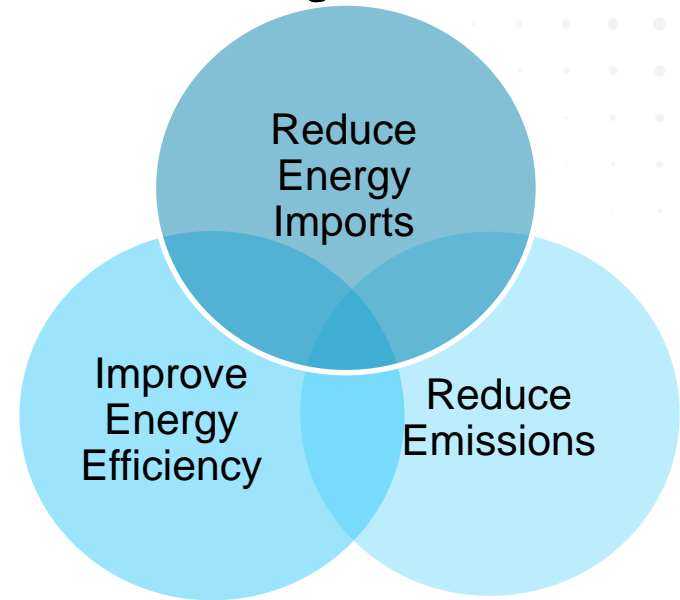


ARPA-E Mission, Goals, & Means

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

Goals: Ensure America's

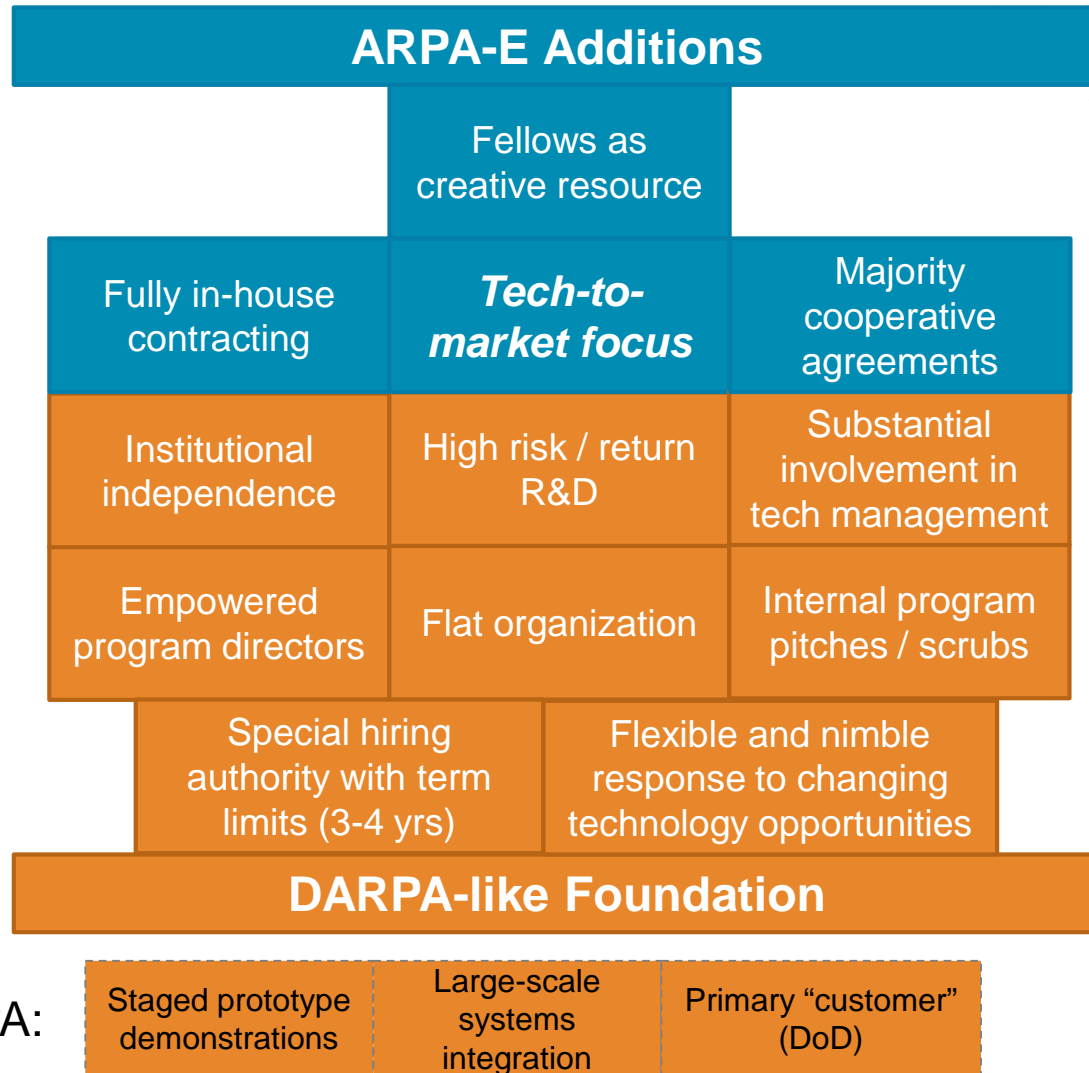
- ▶ Economic Security
- ▶ Energy Security
- ▶ Technological Lead in Advanced Energy Technologies



Means:

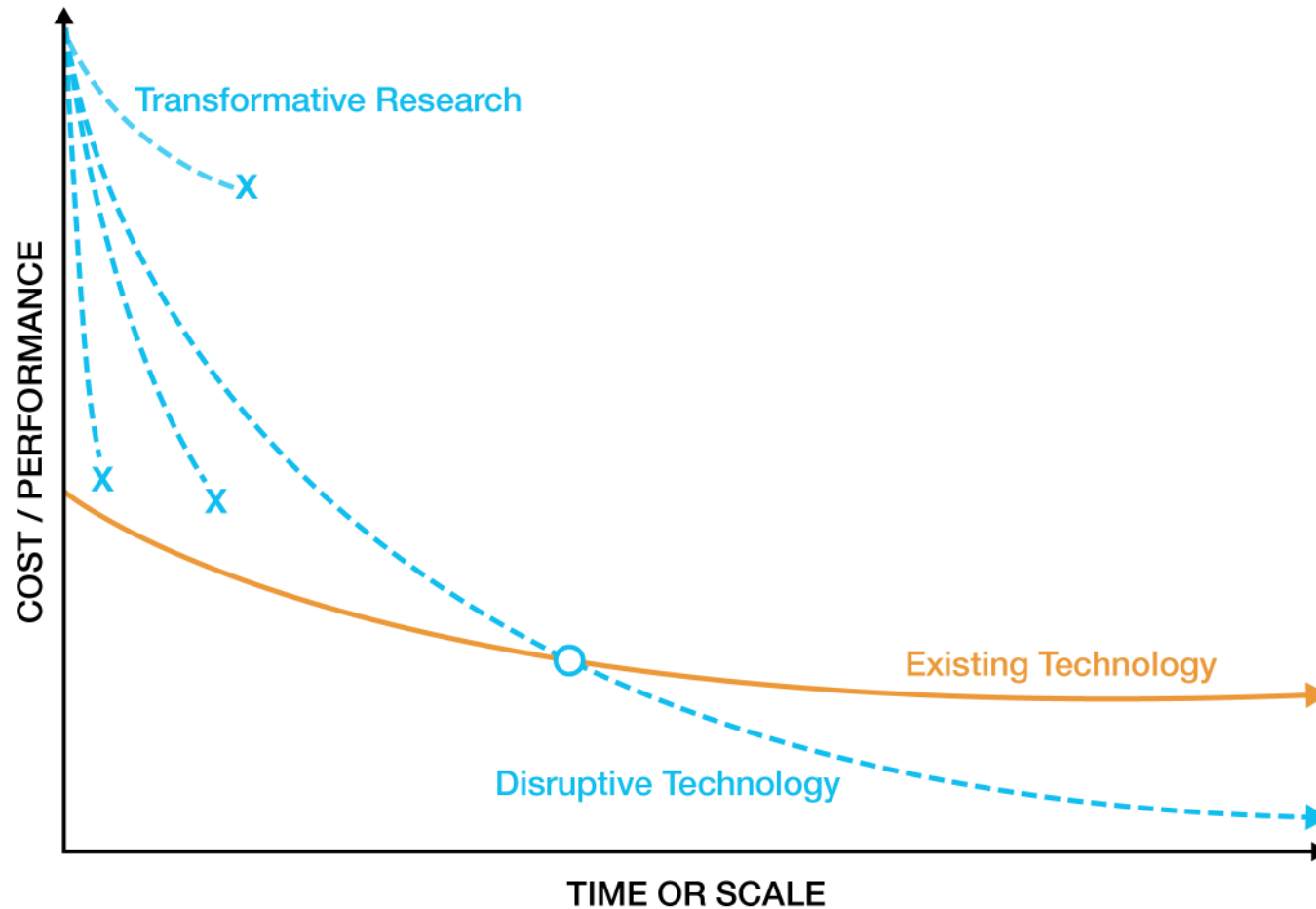
- Identify and promote revolutionary advances in fundamental and applied sciences
- Translate scientific discoveries and cutting-edge inventions into technological innovations
- Accelerate transformational technological advances in areas that industry by itself is not likely to undertake because of technical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

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



Unique to DARPA:

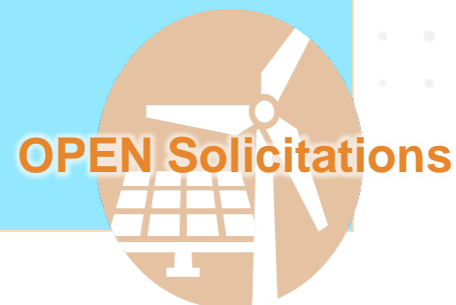
Creating New Learning Curves



ARPA-E Program Types

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



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

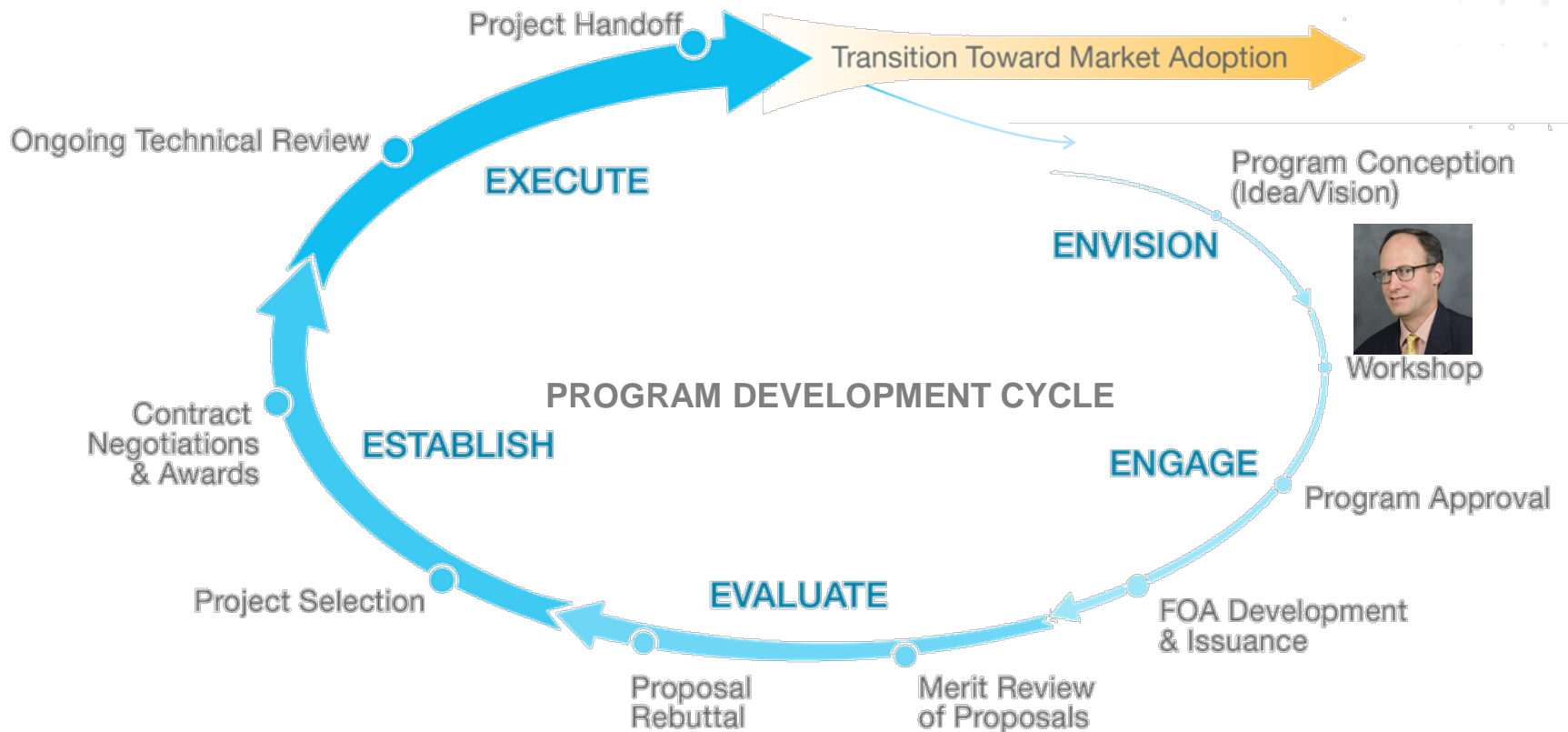
- Size of the potential impact
- Technical opportunities for transformation
- Portfolio of projects with different approaches



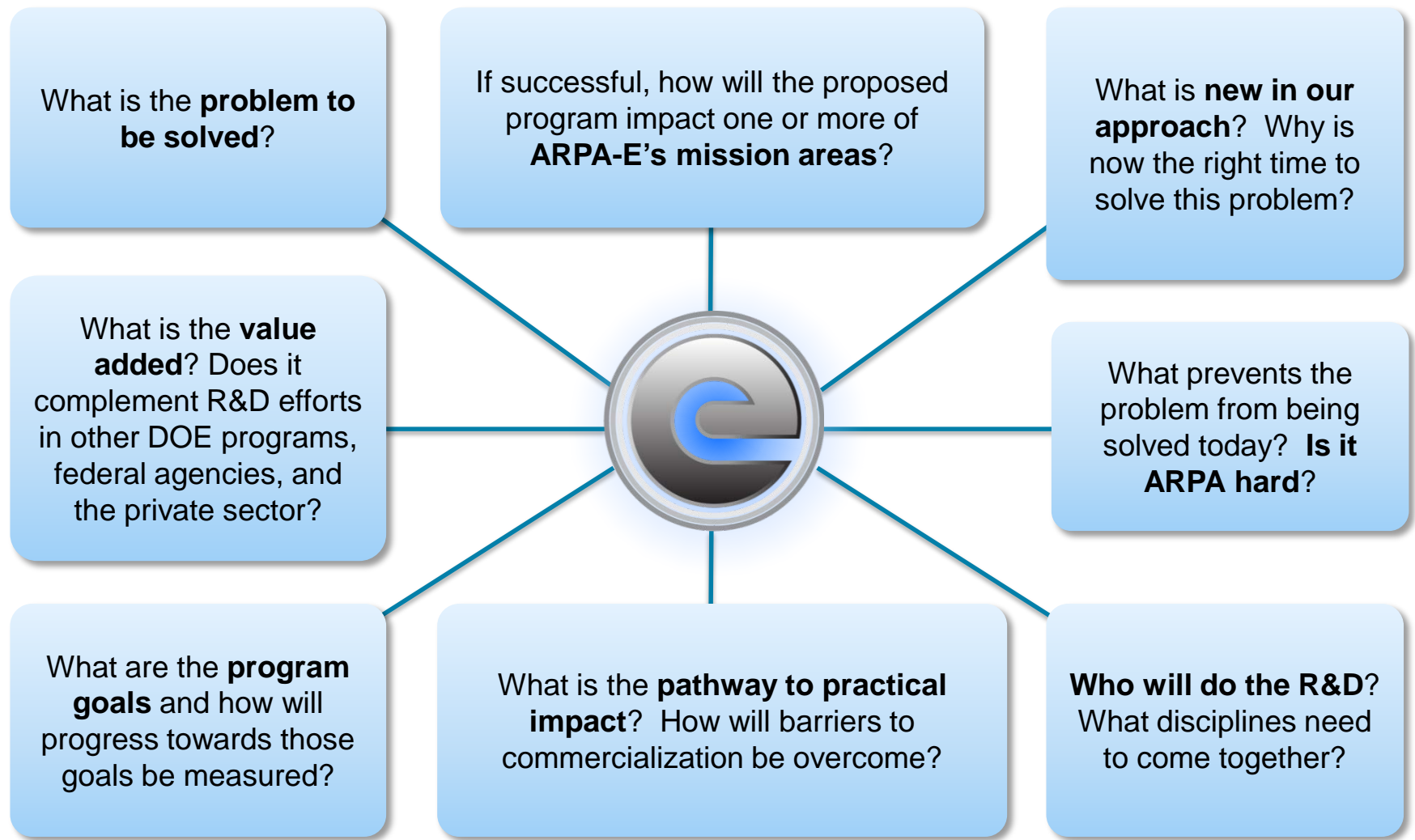
Developing ARPA-E Focused Programs



ARPA-E Program Directors



ARPA-E Program Framing Questions

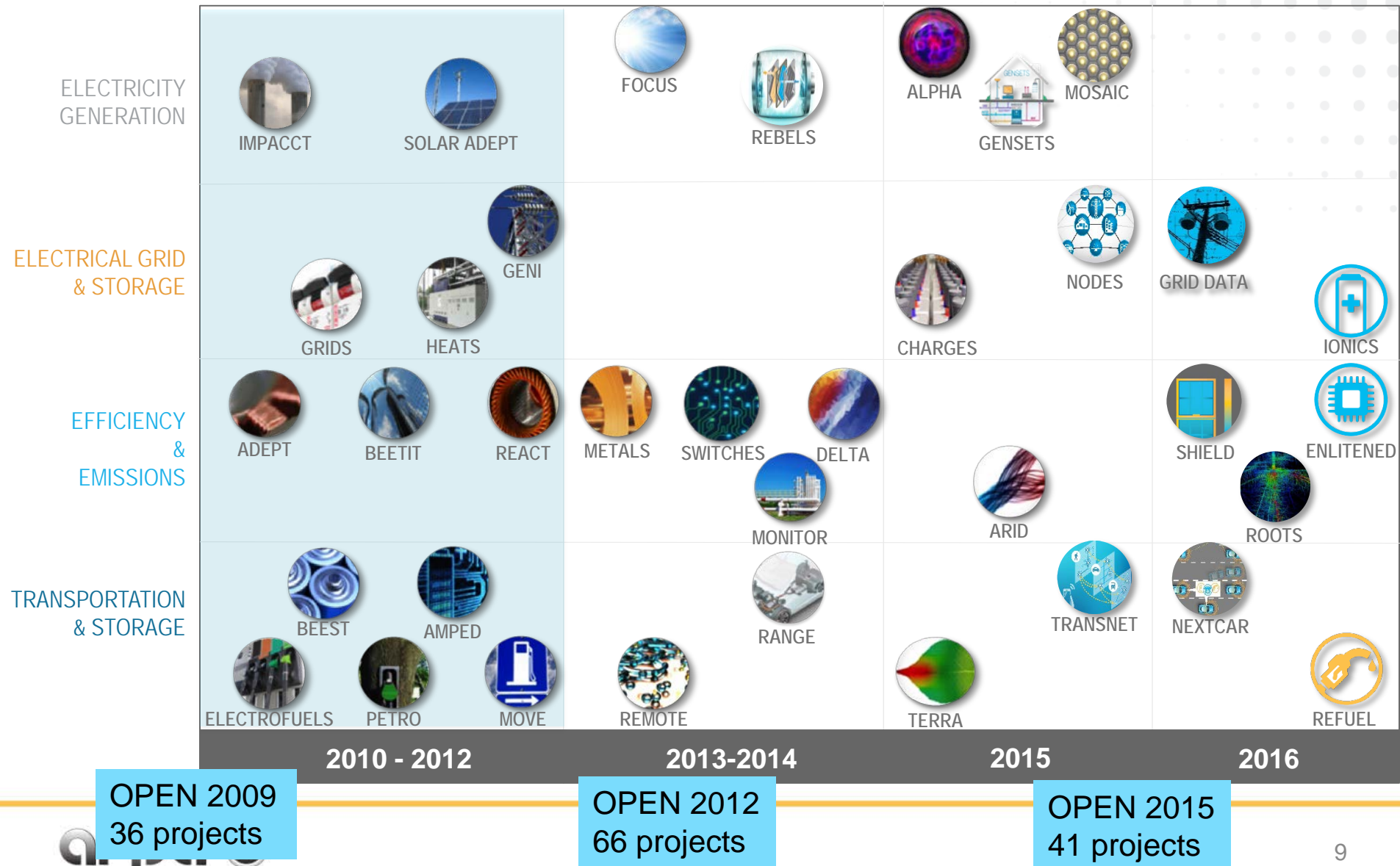




If it works...

will it matter?

ARPA-E Program and Project Examples



Currently Active FOAs

Power electronics:

PNDIODES: Selective area doping of III Nitrides (GaN); supplement to SWITCHES program

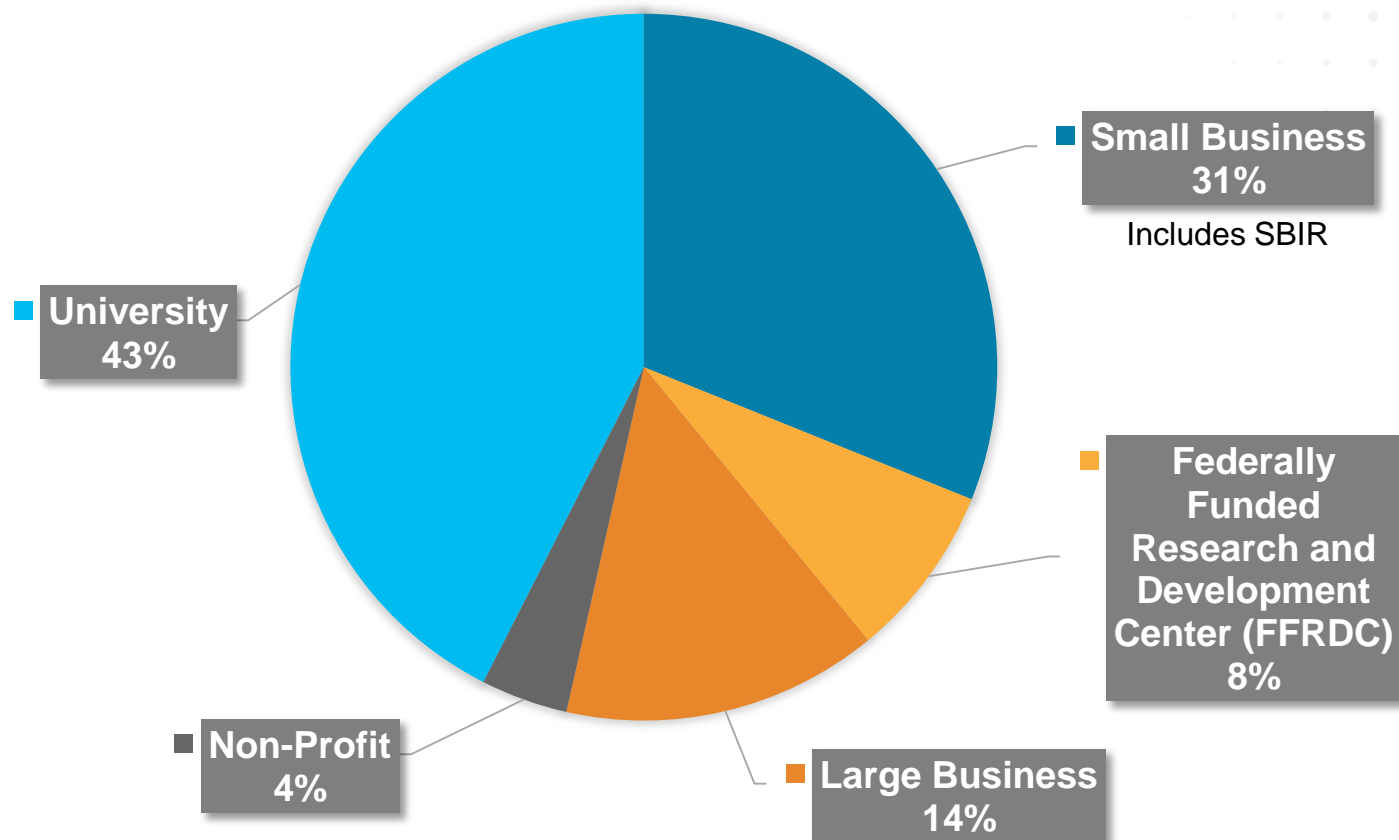
CIRCUITS: Advanced circuit topologies to take full advantage of WGB devices; broad application space

FACES: Replacing travel for communication with digital human representation

MARINER: Advancing marine cultivation of macroalgae as biofeedstocks for fuel and chemicals

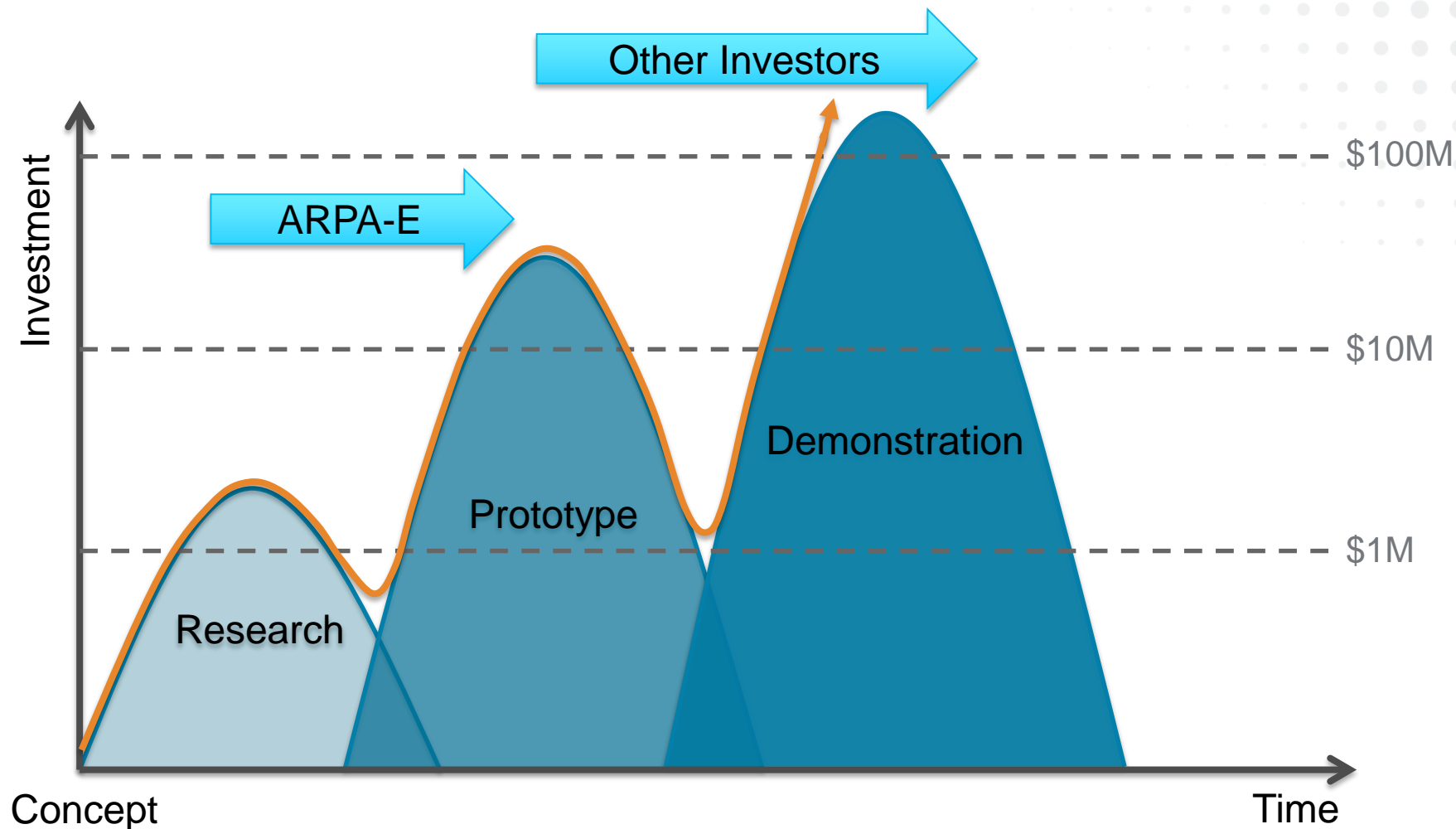
SENSOR: Occupancy, people counting, and CO₂ sensing for optimal HVAC and ventilation efficiency in residential and commercial applications

ARPA-E Project Portfolio by Lead Organization



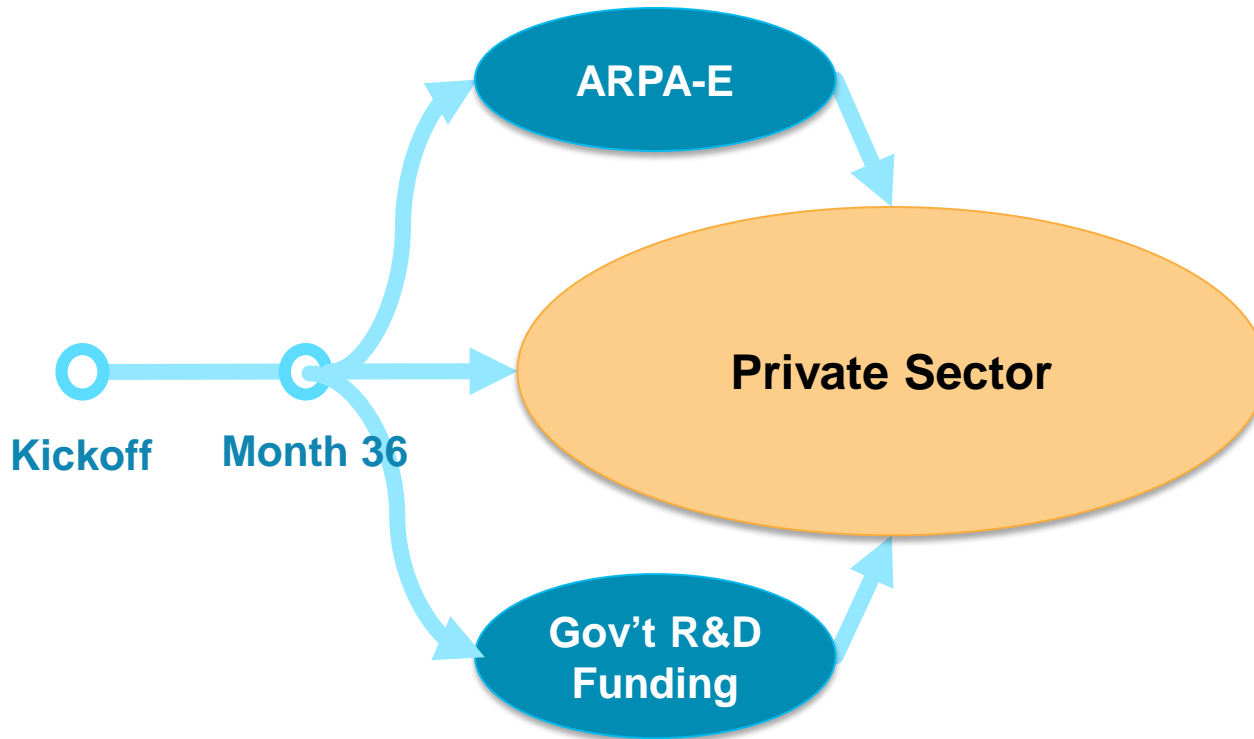
ARPA-E supports multi-institutional teams with substantial involvement from the private sector:
76% of projects involve more than one institution
75% of projects include the private sector, as leads or partners

Energy Technology “Mountains of Opportunity”



Technology to Market (T2M)

- ▶ What happens at the end of an ARPA-E project?



Why month 37 matters so much

- **Return on the public dollar** – publishing is great, but we're here to move a market
- **Team Momentum** – Teams have clear view on what's required next
- **Thought leadership** – Validate that we've hit upon an idea that really matters

T2M Approach



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



Finance

Engage third-party financiers to support continuity of technology development towards the market

Measuring ARPA-E's Success

Since 2009 ARPA-E has invested approximately \$1.3 billion across over 500 projects, through 32 focused programs and 3 open funding solicitations.

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



Want to work at ARPA-E? There may be a role for you!



Program Director

- Program development
- Active project management
- Thought leadership
- Explore new technical areas

Technology-to-Market Advisor

- Business development
- Technical marketing
- Techno-economic analyses
- Stakeholder outreach

Fellow

- Independent energy technology development
- Program Director support
- Organizational support



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