CHANGING WHAT'S POSSIBLE

The ARPA-E Funding Process

ARPA-E Deputy Director for Technology
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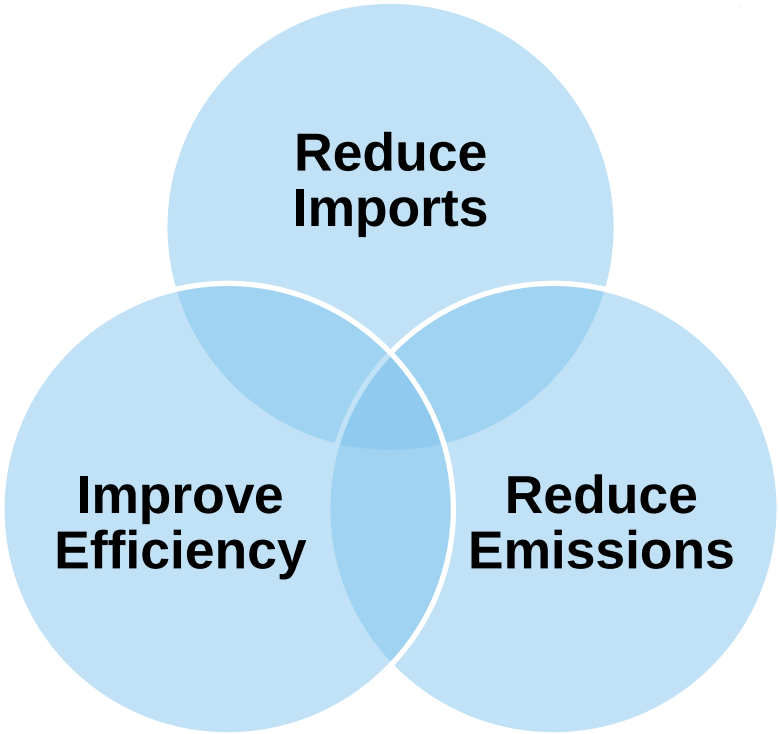
The ARPA-E Mission

Catalyze and support the development of transformational, high-impact energy technologies

Ensure America's

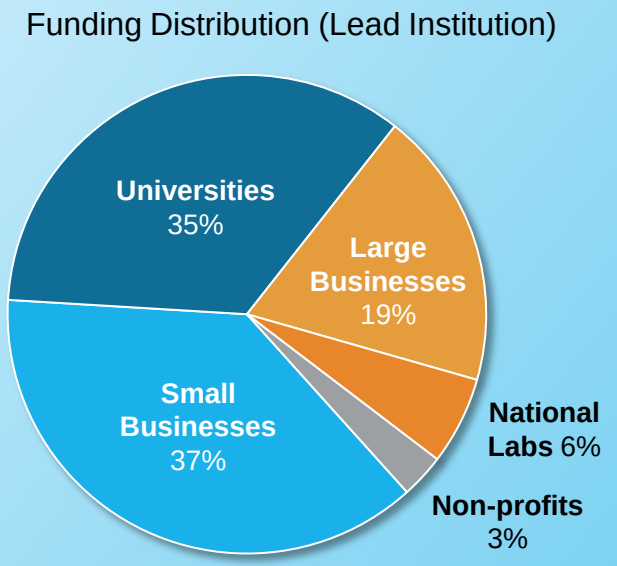
- National Security
- Economic Security
- Energy Security
- Technological Lead



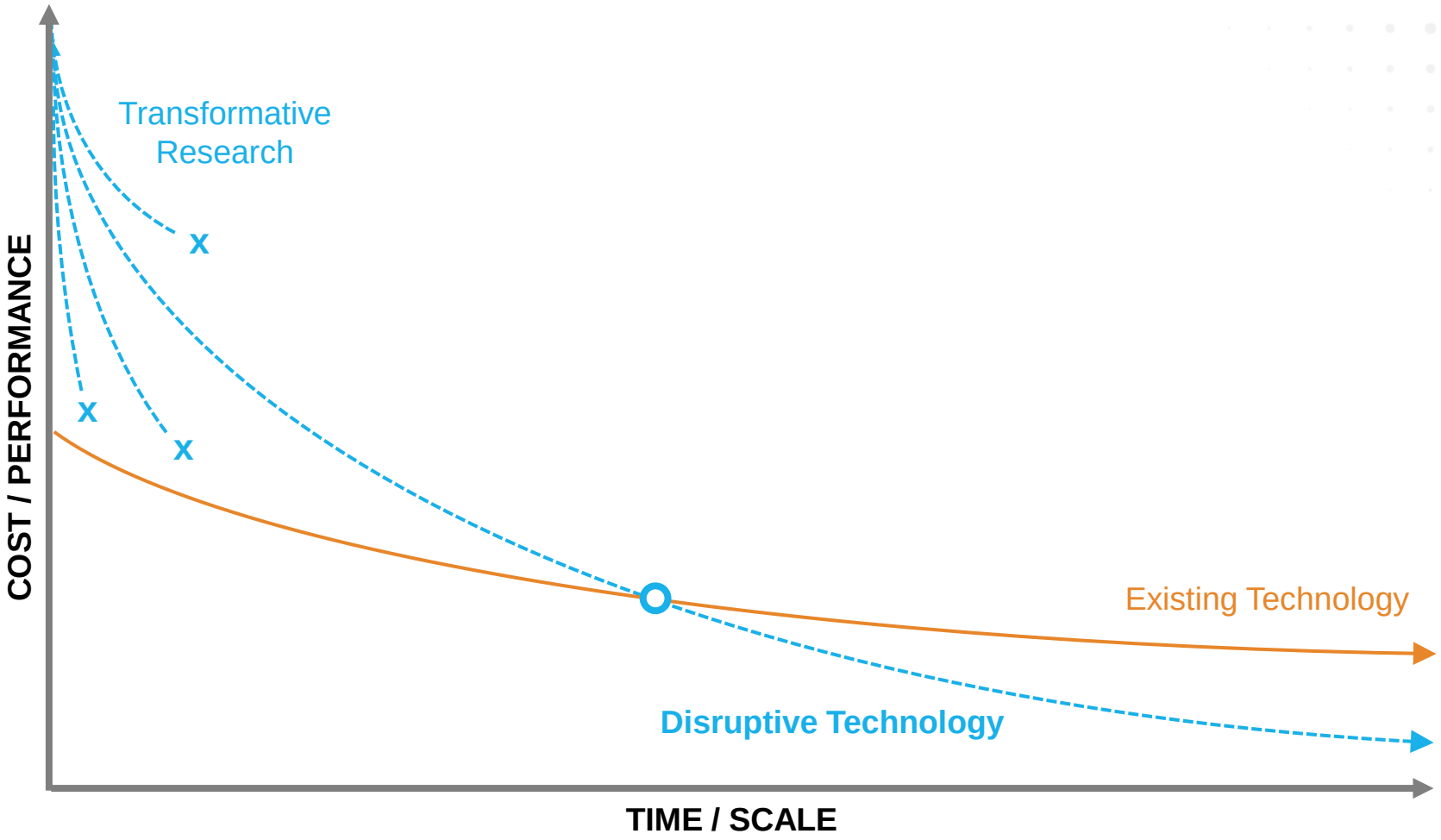
A Brief History of ARPA-E

- **2007**
  - *America COMPETES Act* signed, authorizing ARPA-E
- **2009**
  - *American Recovery & Reinvestment Act* signed, providing $400M to establish ARPA-E
- **2014**
  - Over $1B invested
  - 375 projects funded

Investing in America's Best and Brightest



Funding Disruptive Approaches to Innovation



ARPA-E Focused Programs

To date, ARPA-E has invested in 375 energy technology projects across 20 focused programs and 2 OPEN solicitations

Transportation Energy Technologies


BEEST


Electrofuels


RANGE


PETRO


MOVE


REMOTE

Stationary Energy Technologies


Solar ADEPT

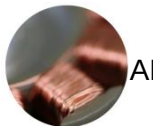

GRIDS


IMPACCT


FOCUS


BEETIT


GENI


ADEPT


REBELS

Transportation and Stationary Technologies

HEATS


AMPED


REACT

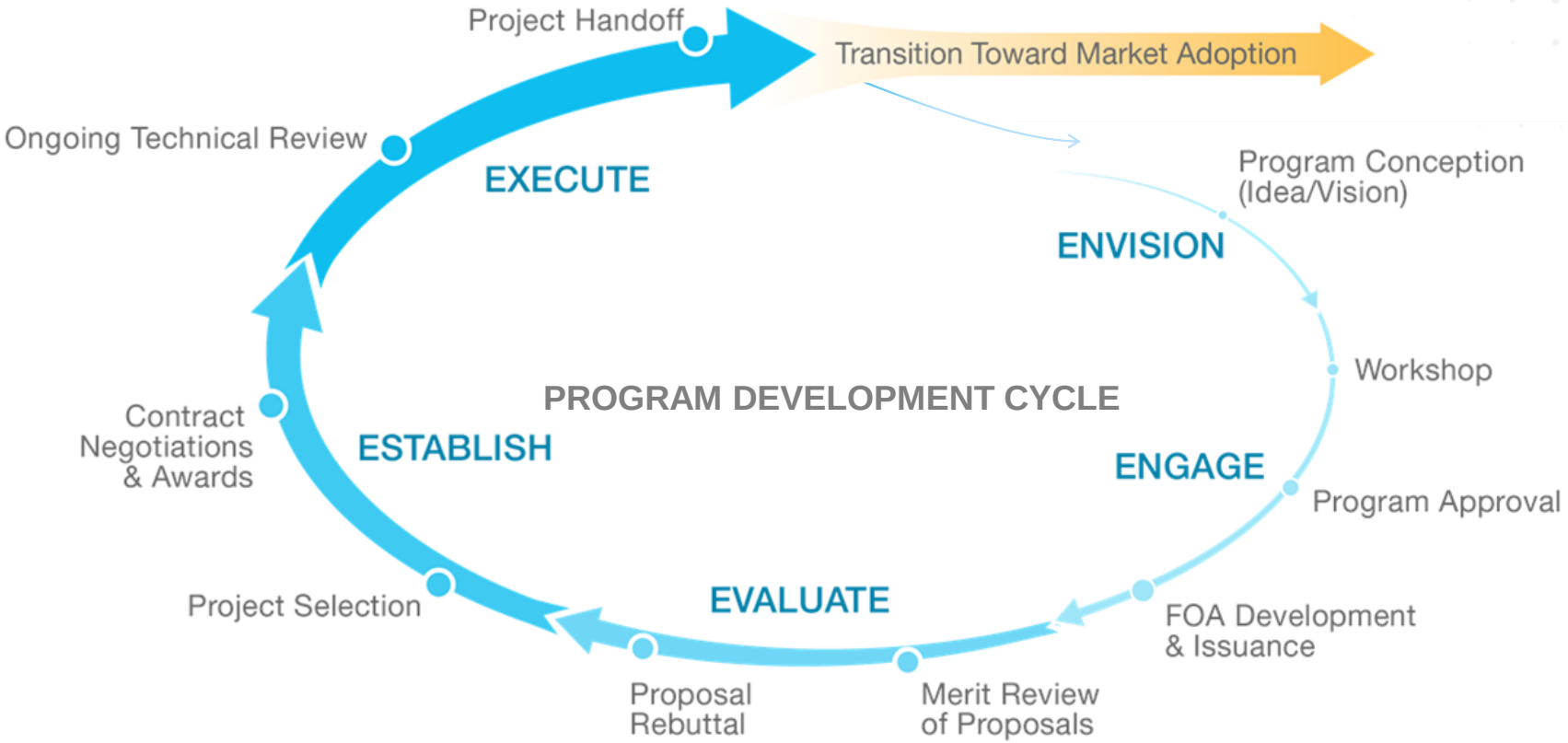

SBIR/STTR


METALS

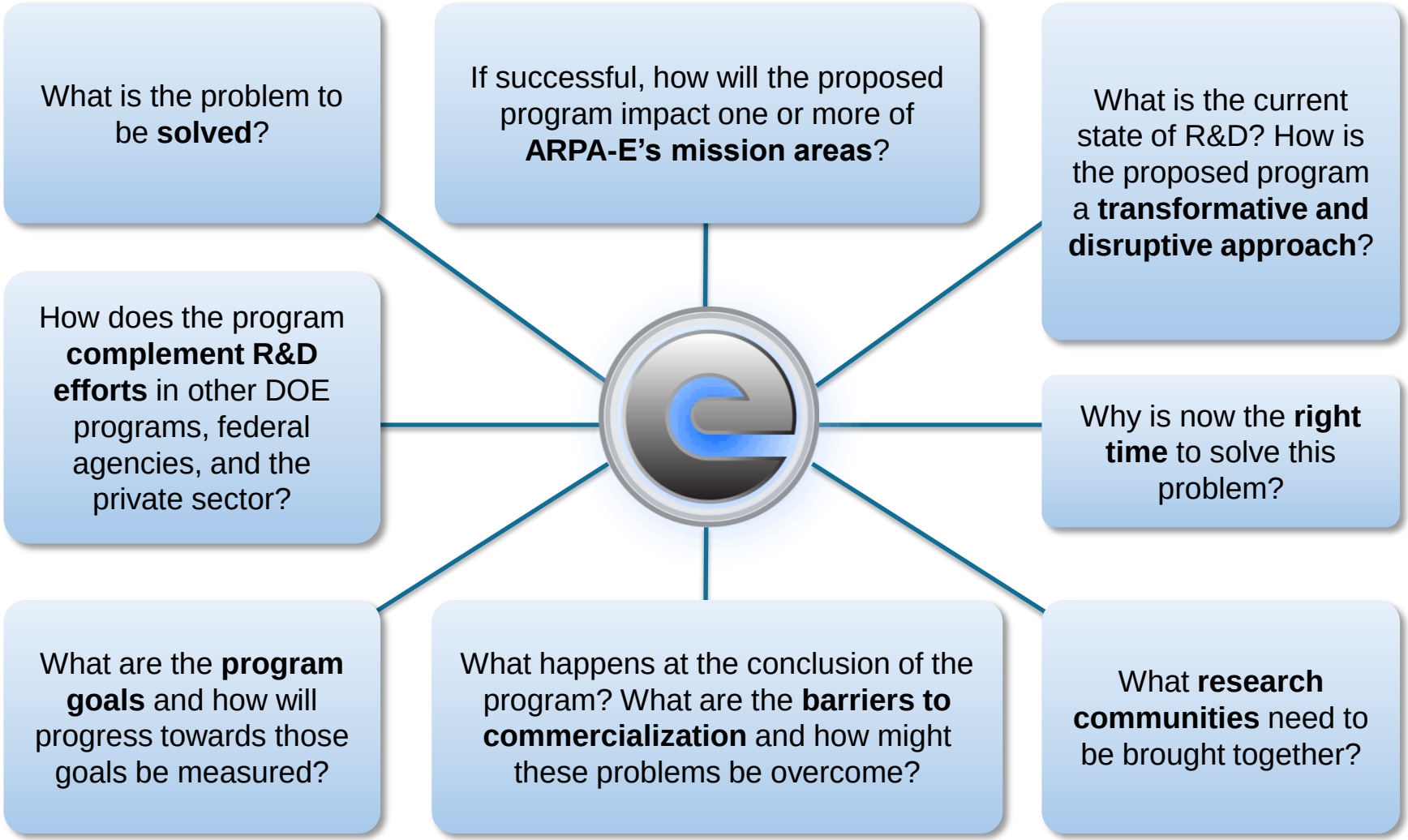

SWITCHES

Developing ARPA-E Programs

ARPA-E Program Directors



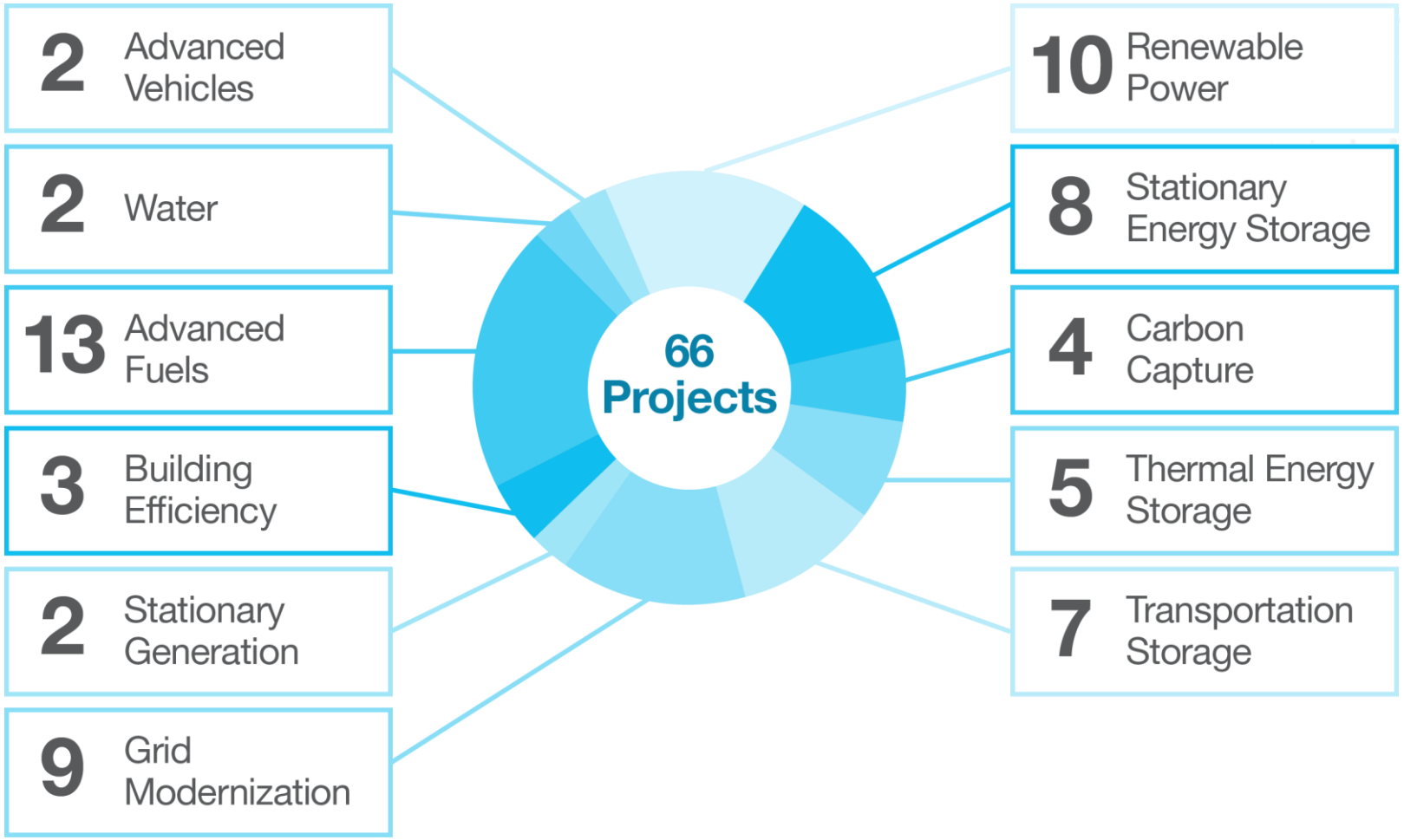
ARPA-E Program Framing Questions



If it works…

will it matter?

OPEN 2012: 66 Projects, 24 States, 11 Areas



Next OPEN FOA in FY 2015 following appropriation

Creating a Successful ARPA-E Project

The ability to make an **IMPACT**

The potential to **TRANSFORM** our energy future

A **BRIDGE** from science to breakthrough technology

A **TEAM** of best-in-class experts

Top 5 Tips for Writing a Competitive Proposal

1. Read the Funding Opportunity Announcement (FOA)
2. Demonstrate impact
3. Describe the technology
4. Compare to state of art
5. Identify challenges and solutions

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- Motivation for the program
- Program objectives
- Technical categories of interest
- Technical performance targets

Read the FOA!
Then read it <u>again</u>, *carefully*.

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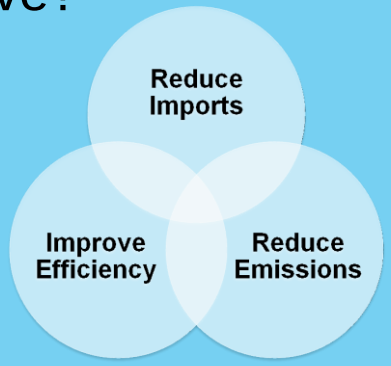
- How does it impact ARPA-E mission areas?
- What problem are you trying to solve?



Your first question should not be "will it work?"

"If it works, **will it matter**?"

Dos and *Don'ts* of Demonstrating Impact

Hydrogel-based super biodegradable diapers

- Exposing diaper to UV light activates ability to fully dissolve in water in 30 s vs. 300 y biodegradation of conventional diapers
- Will save ~18 billion diapers a year from entering US landfills

Carbon-reducing biocatalyst for human waste

- Novel carbon reducing bio-catalyst reduces human waste to pure carbon and water $(CH_2)_n + n/2O_2 = nC(s) + nH_2O$
- Technology acts as carbon sink using human waste, potentially reducing carbon dioxide emissions by more than 1 Giga-tonne per year

Does not address an ARPA-E mission

Addresses an ARPA-E mission area

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- How does it work? Describe with absolutely no jargon.
- What's new in your approach?
- Why do you think it will be successful?

Dos and *Don'ts* of Describing Technology

Flexible, energy efficient time travel

- 10x more efficient time travel to any date and place in the history of the universe
- Leverages novel proprietary technology from Doc and McFly Industries, Inc.
- Validated at proof-of-concept scale by D&M Industry advisors, including several Nobel laureates

- Next generation flux capacitor based on proprietary hafnium alloy is the key enabling technology
- Capacitor placement within metallic vehicle body perturbs the flux dispersal field, allowing smooth passage through the space-time continuum (see references 3-8)
- Time travel requires 1.21 Gigawatt-hours of electrical power, with allows for 10x efficiency gain as validated via the mass/energy balance outlined in Table 3

Too vague, no content

Backs up claims, gives specifics

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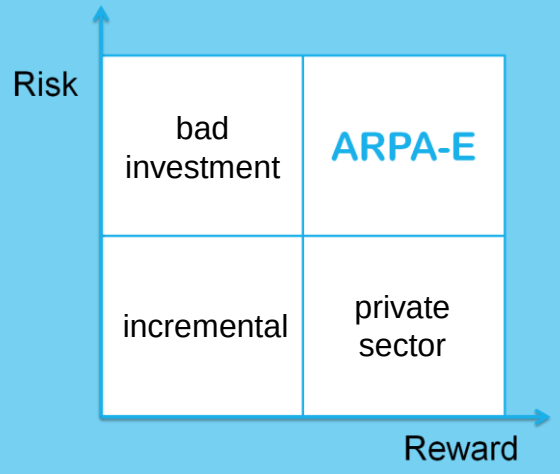
4. **Compare to state of art**
5. Identify challenges and solutions

- How is it done today?
- Why are today's solutions insufficient?
- How does your solution represent a dramatic improvement?



Top 5 Tips for Writing a Competitive Proposal

1. Read the Funding Opportunity Announcement (FOA)
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3. Describe technology
4. Compare to state of art
5. **Identify challenges and solutions**

- What is the challenge to developing your specific technology? Why is it hard?
- What approaches will you take to overcoming these challenges?

Why should we fund you?

Provide **key insight/unique approach** to solve a problem where others failed

Final Remark on Pedigrees

- It doesn't matter **who** you are…
  - Nobel prize winner or
  - Founder of a tiny startup company
- We only care about the **quality of the idea**

If you're really good, let it show through

in the **quality of your proposal.**

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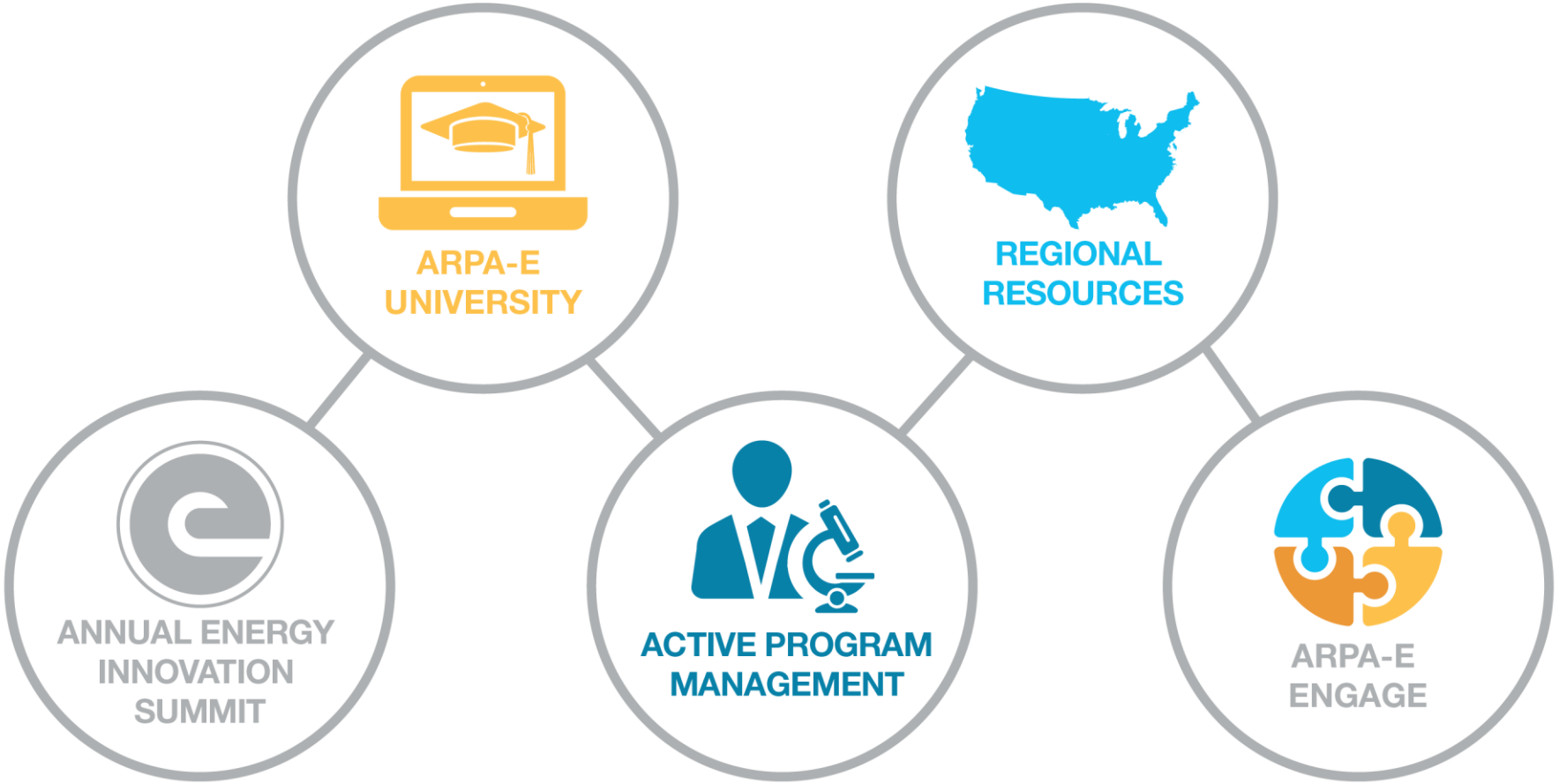
Concept Papers and Full Applications

- Concept Papers (4 pages)
  - Summarize concept succinctly
  - Describe innovation/impact, proposed work, and team organization/capabilities
- Full Applications (30 pages for technical section)
  - Detailed description of proposed technology, work plan, and budget
  - Detailed justification of how proposed technology will meet FOA technical targets

Use templates provided by ARPA-E

ARPA-E Resources



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