U.S. DEPARTMENT OF ENERGY

Introduction to ARPA-E

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Advanced Research Projects Agency - Energy
U.S. Department of Energy

2012 Emerging Ideas Workshops
March 26-30, Washington DC

History of ARPA-E

2006
Rising Above the Gathering Storm
(National Academies)

2007
America COMPETES Act

2009
American Recovery & Reinvestment Act
($400M)

2011
FY2011 Budget
($180M)

2012
FY2012 Budget
($275M)

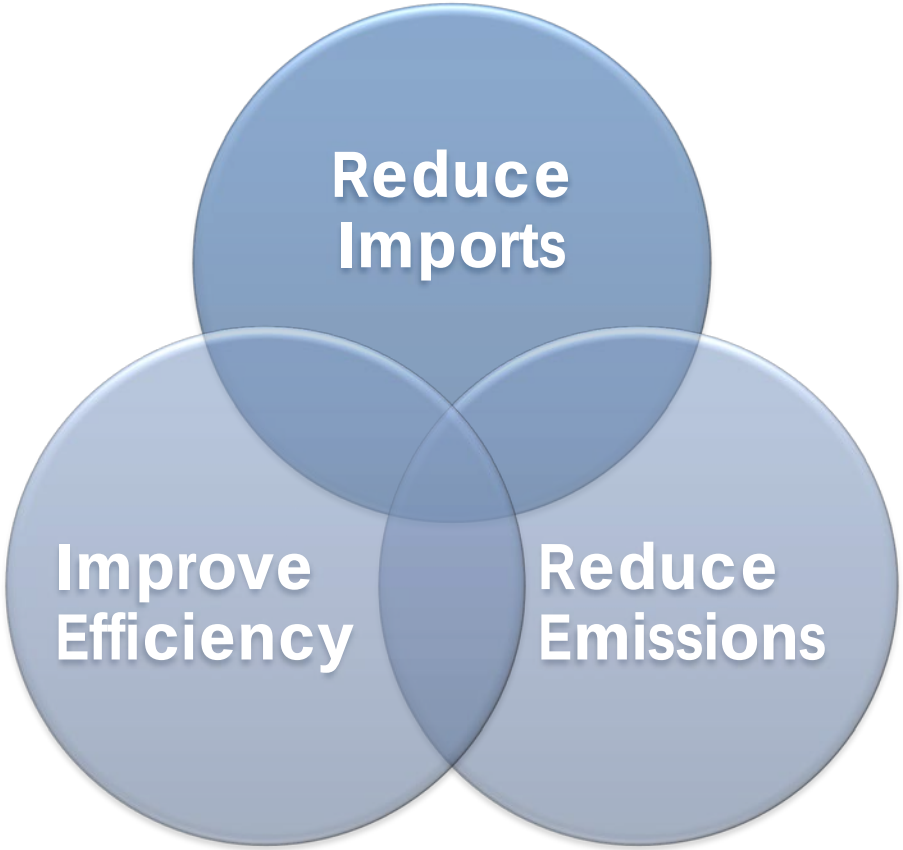
Arun Majumdar
1st Director

The ARPA-E Mission

Overcome high-risk technological barriers to development of energy technologies

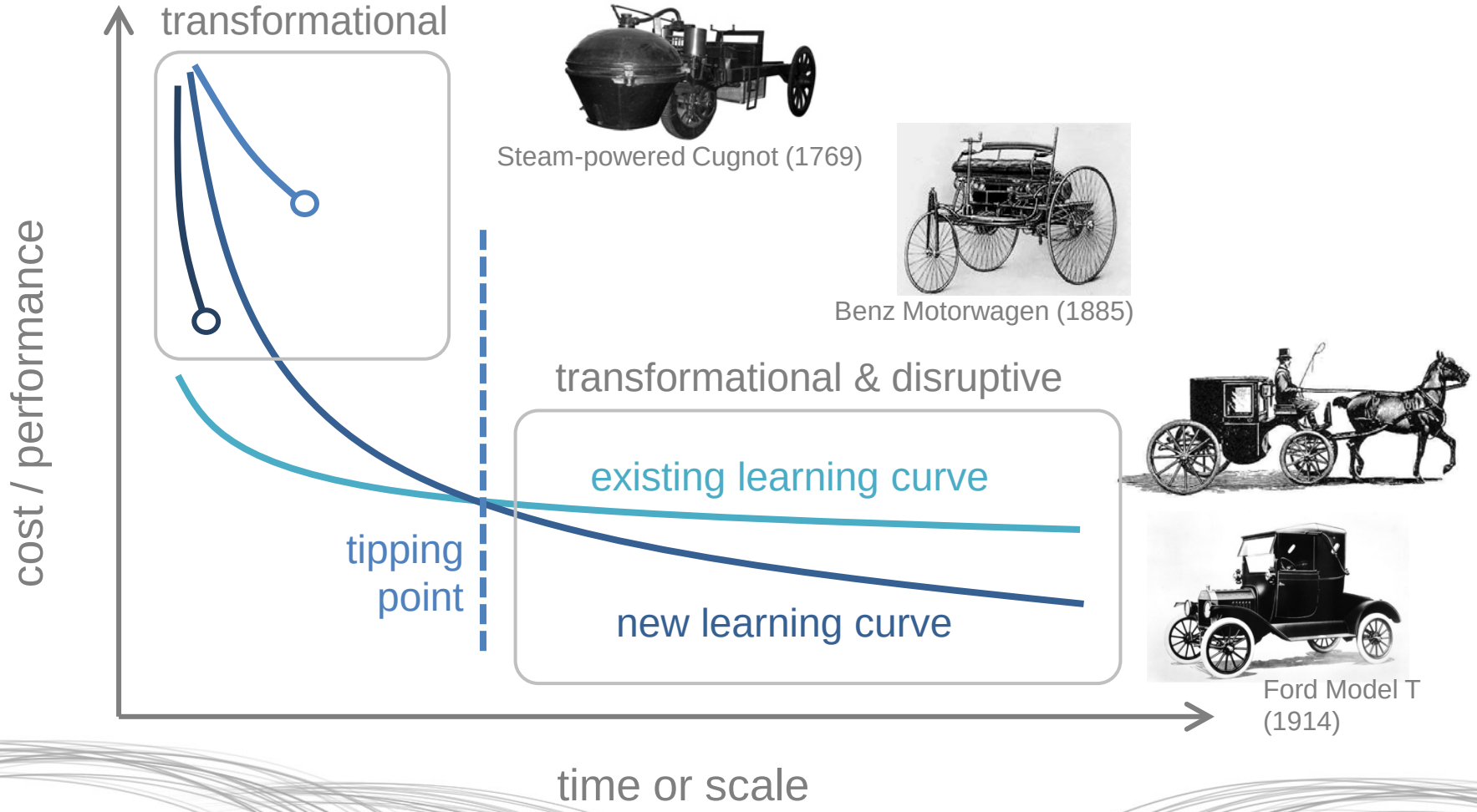
Ensure America's

- National security
- Economic security
- Energy security
- Technological lead



The ARPA-E Approach

Transformational & disruptive technologies that lead to new learning curves



The ARPA-E Approach

- We fund solutions
  - that lead to new learning curves
  - to create new markets
  - to displace old technologies
  - too risky for the private sector

- We do not fund
  - specific technologies
  - science for science-sake
  - incremental advances

The ARPA-E Team

2009

Eric Toone

2009

Dave Danielson

2010

Rajeev Ram

2010

Mark Johnson

2010

Jonathan Burbaum

2010

Ravi Prasher

2011

Dane Boysen

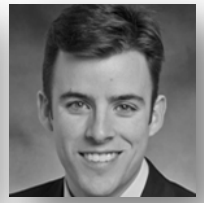
2011

Karma Sawyer

2010

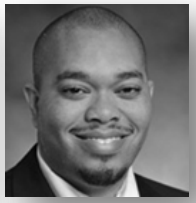
Nick Cizek

2010



Robert Conrado

2011



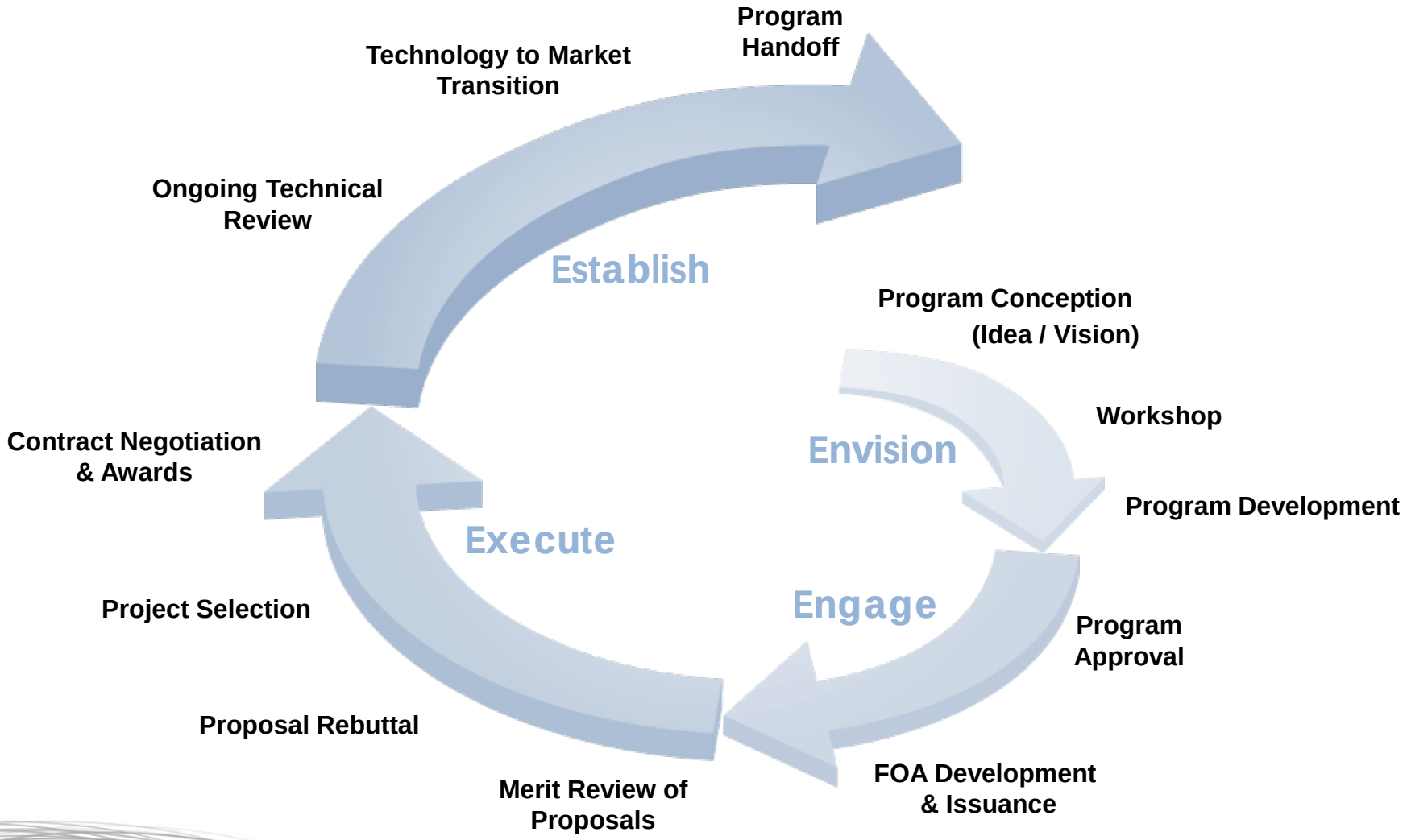
Asegun Henry

2012

Tim Heidel

The ARPA-E Process

Concept-to-Contracts: 6-8 months



What makes an ARPA-E program?

1. Impact

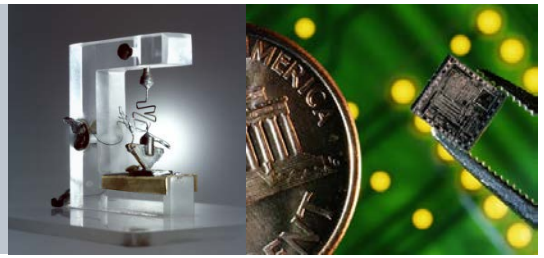
- High impact on ARPA-E mission areas
- Credible path to market
- Large commercial application

2. Transform

- Challenges what is possible
- Disrupts existing learning curves
- Leaps beyond today's technologies

3. Bridge

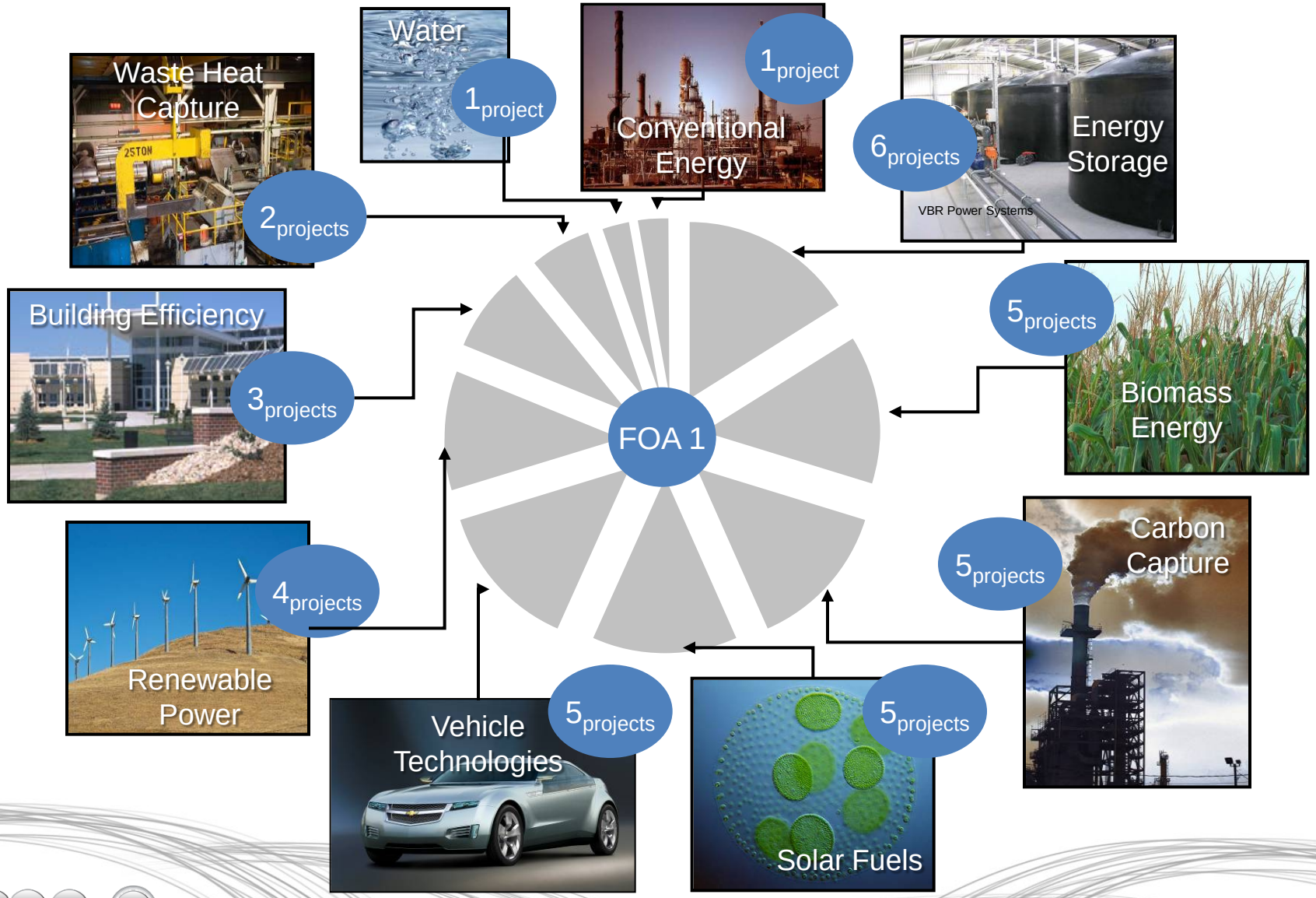
- Translate science into breakthrough technology
- Not researched or funded elsewhere
- Catalyzes new interest and investment



4. Team

- Best-in-class people
- Cross-disciplinary skill sets
- Translation oriented

First Open FOA -10 Technology Areas



Currently 11 Focused Programs

Transportation

Electrofuels

BEEST

PETRO

End-Use Efficiency

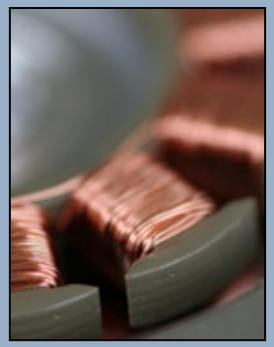
HEATS

BEETIT

Stationary Power

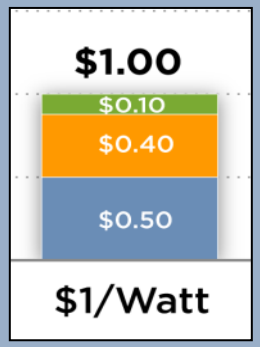
IMPACCT

ADEPT

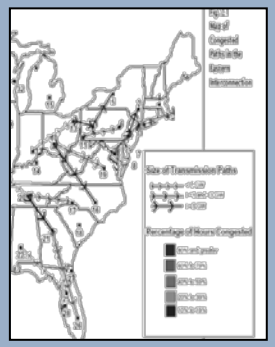


GRIDS

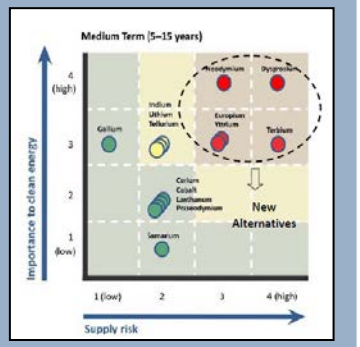
Solar ADEPT



GENI



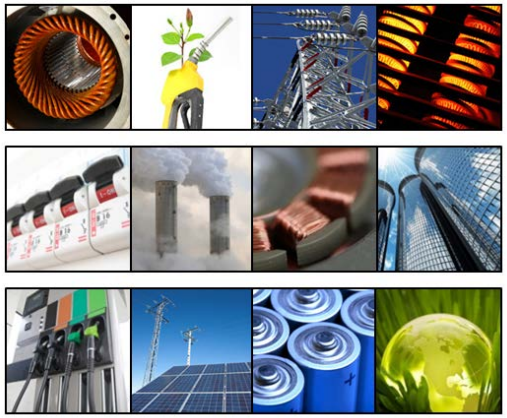
REACT



2012 Emerging Ideas Workshops

Day	Emerging Ideas Workshop	Location
Mar 26	**PHOTON** High-efficiency, high-concentration PV	**L'Enfant Plaza**
Mar 27	**TOPHAT** High-temperature topping cycles	**Virginia Square**
Mar 27	**MICROBES** New bioreactors for algae and Electrofuels	**L'Enfant Plaza**
Mar 28	**RACE** Fast charging of EV batteries	**L'Enfant Plaza**
Mar 28	**ICEPOP** No or Low-Water Power Plant Cooling	**L'Enfant Plaza**
Mar 29	**SNIFFER** Remote methane detection	**L'Enfant Plaza**
Mar 30	**PROPHET** Advanced forecasting of wind/solar	**Virginia Square**

Distinction: Emerging Ideas Workshops vs. Typical ARPA-E Workshops/FOAs



Typical Workshop/FOA

- Thematically related topics
- Workshops: 50-100 people
- Each with individual program
- Program funding is $30-40 million
- Consists of 10-20 projects

Emerging Ideas Workshops

- Funding amount/mechanism undetermined
- Workshops: 10-40 people
- Ideas across areas compete with each other
- Best topics may go into a combined solicitation
- Best proposals of any topic are selected
- Topics may lead to a larger future program

2012 Funding Information

Funding Opportunity Announcement (FOA)

- Methane Opportunities for Vehicular Energy (**MOVE**) – **closed March 26**
- Open FOA Opportunity Announcement (**OPEN FOA**)

Announcement of Teaming Partner List

- Advanced Management and Protection of Energy-storage Devices (**AMPED**)

Request for Information (RFI)

- Electrofuels Phase II