ARPA-E: Changing What’s Possible
2013 ASEE Engineering Research Council (ERC) Annual Conference
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March 4, 2013
Evolution of ARPA-E

- **2007**: RISING ABOVE THE GATHERING STORM PUBLISHED
- **2007**: AMERICA COMPETES ACT SIGNED
- **2009**: AMERICAN RECOVERY & REINVESTMENT ACT $400M Appropriated
- **2011**: FY2011 BUDGET $180M Appropriated
- **2012**: FY2012 BUDGET $275M Appropriated
ARPA-E Mission

Catalyze the development of transformational, high-impact energy technologies

Reduce Energy-Related Emissions
Reduce Energy Imports
Improve Energy Efficiency

Ensure the U.S. maintains a lead in the development and deployment of advanced technologies
Creating New Learning Curves

New Learning Curves

Current Learning Curve
What Makes an ARPA-E Project?

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

**TRANSFORM**
- Challenges what is possible
- Disrupts existing learning curves
- Leaps beyond today’s technologies

**BRIDGE**
- Translates science into breakthrough technology
- Not researched or funded elsewhere
- Catalyzes new interest and investment

**TEAM**
- Comprised of best-in-class people
- Cross-disciplinary skill sets
- Translation oriented
Technology Acceleration Model

Program Development Cycle

ENVISION
- Program Conception (Idea/Vision)
- Workshop
- Program Approval

EXECUTE
- Project Handoff
- Transition Toward Market Adoption

ESTABLISH
- Contract Negotiations & Awards
- Project Selection

EVALUATE
- Proposal Rebuttal
- Merit Review of Proposals

ENGAGE
- FOA Development & Issuance
Measuring ARPA-E’s Success

MOVING TECHNOLOGY TOWARD MARKET
- Partnerships with Other Government Agencies
- Licensing/Acquisition by an Established Firm
- Licensing/Acquisition Resulting in a Spinoff
- Private-Sector Funding
- Growth of Existing Company (e.g., Organic Growth)

BREAKTHROUGH ACHIEVEMENTS
- Patents
- Publications

OPERATIONAL EXCELLENCE
- Expedited program development and project selection
- Aggressive performance metrics
Breakdown of ARPA-E’s project leads

**Federal Funding (million $)**

- Universities: $189.7M (37%)
- Small Businesses: $191.4M (37%)
- Large/Med Businesses: $95.1M (18%)
- National Labs/FFRDCs: $27.3M (5%)
- Non-Profits: $11.2M (2%)

**Frequency**

- Universities: 86 (41%)
- Small Businesses: 60 (29%)
- Large/Med Businesses: 33 (16%)
- National Labs/FFRDCs: 27 (13%)
- Non-Profits: 4 (2%)

Data above includes all ARPA-E projects contracted as of the end of FY 2012, with the exception of AMPED and SBIR/STTR which were excluded due to data availability issue.
OPEN 2012: 66 Projects, 24 States, 11 Areas

- 2 Advanced Vehicles
- 2 Water
- 13 Advanced Fuels
- 3 Building Efficiency
- 2 Stationary Generation
- 9 Grid Modernization
- 10 Renewable Power
- 8 Stationary Energy Storage
- 4 Carbon Capture
- 5 Thermal Energy Storage
- 7 Transportation Storage
Focused Programs

TRANSPORTATION ENERGY TECHNOLOGIES
- BEEST
- Electrofuels
- PETRO
- MOVE

HEATS
REACT
AMPED
SBIR/STTR

STATIONARY ENERGY TECHNOLOGIES
- BEET-IT
- IMPACCT
- GRIDS
- Solar ADEPT
- GENI
- ADEPT
Photosynthetic Biofuels

Less than 1% efficient
**Electrofuels**

- **Non-photosynthetic microbes**
- **Electricity**
- **H₂S**
- **H₂**
- **CO₂**

Greater than 10X more efficient
Plants Engineered To Replace Oil (PETRO)

Non-food crops that directly replace transportation fuels

Photosynthetic plants
Insightful Keynotes
Unparalleled Showcase and Networking
Compelling Discussions

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