Catalyzing Energy Breakthroughs for a Secure American Future

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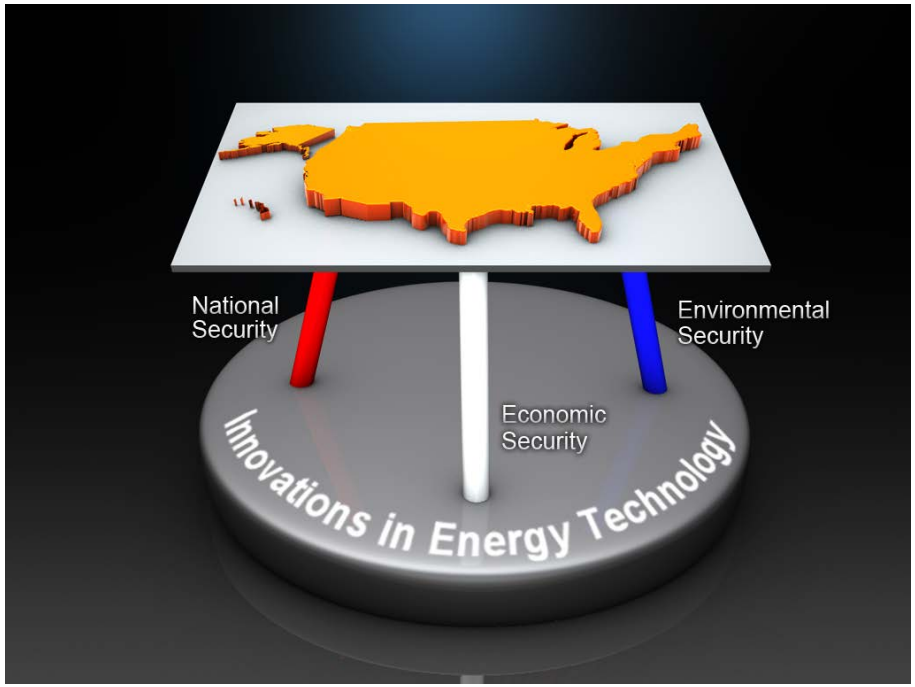
http://arpa-e.energy.gov/

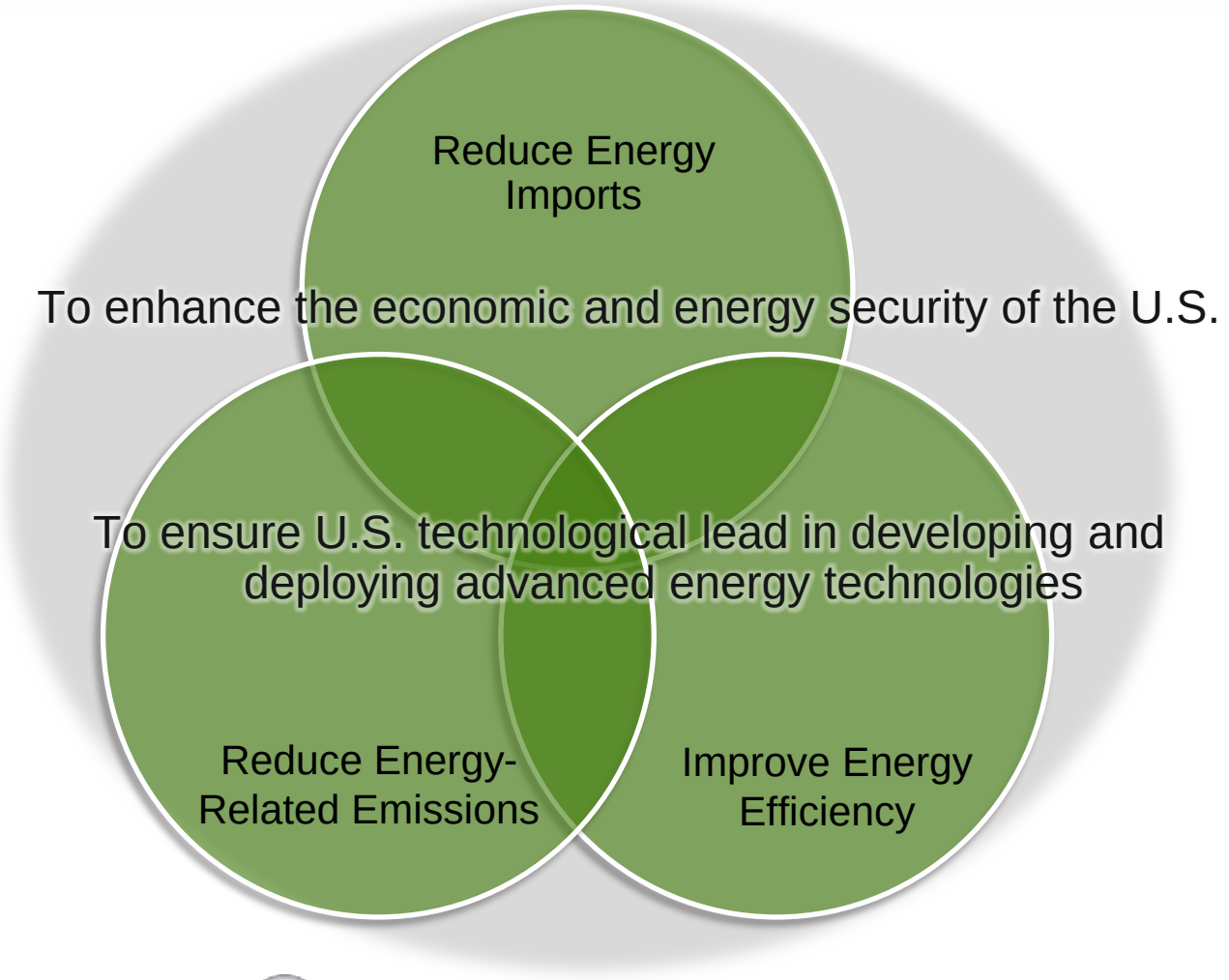
What is the Advanced Research Projects Agency – Energy (ARPA-E)?

Funds R&D to translate science into breakthrough energy technologies:

- too risky for private sector funding
- if successful, would make today's technology obsolete
- potentially large commercial impact
- ensure U.S. technological lead in the world
- ensure national, economic, and environmental securities



ARPA-E's mission is to overcome the high-risk technological barriers in the development of energy technologies



(A) promoting revolutionary advances in fundamental sciences

(B) translating scientific discoveries into technological innovations

(C) accelerating transformational technological advances in areas that industry by itself is not likely to undertake

What makes ARPA-E unique from other programs?

GOAL: effecting revolutionary impact across the energy sector

STRUCTURE: distinct, nimble, flexible, “flat” org

DNA: high standard of excellence, aggressive, question assumptions, output oriented, constructive confrontation

FOCUS: high-risk/high-reward, at the forefront, addressing white space, creating new learning curves, translational stage projects at tech-push market-pull interface

APPROACH: promoting breakthrough technical advancement with consideration for eventual commercialization & market deployment

Photosynthetic Biofuels

Less than 1% efficient

Electrofuels

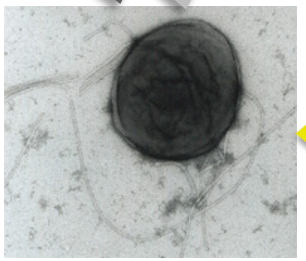
Sour

H_2S

H_2

Electricity

Non-photosynthetic microbes



Greater than 10X more efficient

PETRO: Plants Engineered To Replace Oil
Tobacco producing energy dense liquid biofuels

Today

80 GJ/ha-yr

Future

160 GJ/ha-yr @ $50/BOE

Algae

Tobacco

BERKELEY LAB

arpa·e

PETRO: Plants Engineered To Replace Oil
Pine trees produce natural liquid biofuels

Today

80 GJ/ha-yr

Future

160 GJ/ha-yr @ $50/BOE

BEEST: Batteries for Electrical Energy Storage for Transportation

BEEST Targets

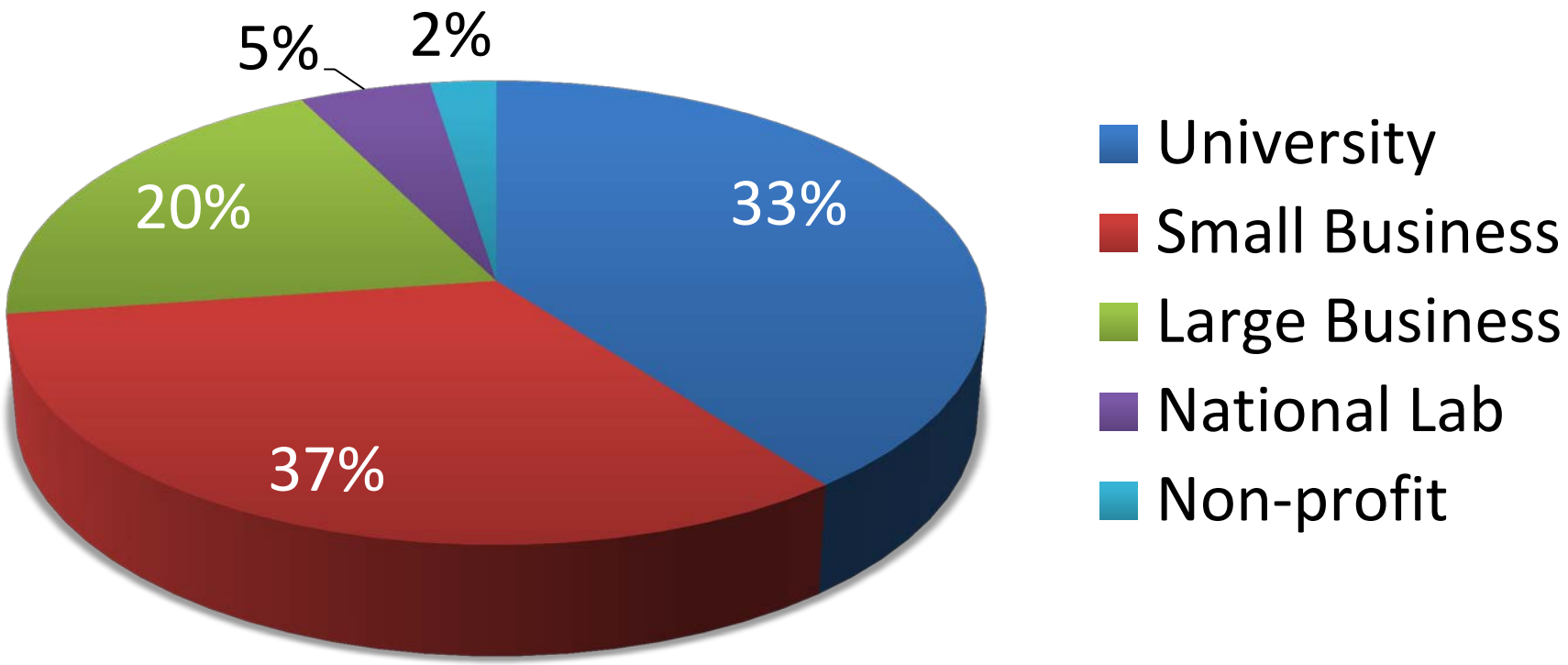
twice the energy density + one-third the cost

BEEST Competition

All Electron Battery
Lithium-Oxygen
Lithium-Ion, Flow Battery
Lithium-Sulfur
Metal-Air
Magnesium-Ion

Chicago to St. Louis on a single charge …for only $7!

We identify the opportunity and create the competition. The market will pick the winners.



Note – Data only for FOAs 1-3

ARPA-E has projects from one open and 11 focused programs which have been created within the last two years

Transportation

Electrofuels

BEEST

PETRO

End-Use Efficiency

HEATS

BEETIT

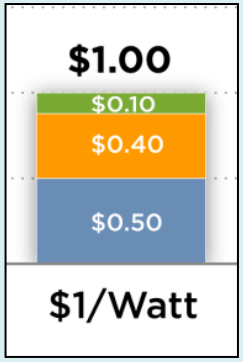
Stationary Power

IMPACCT

ADEPT

GRIDS

Solar ADEPT



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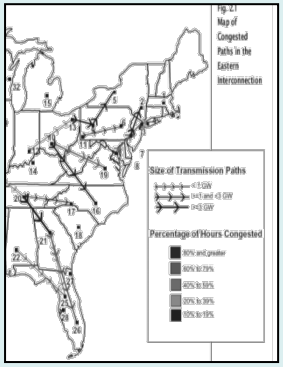

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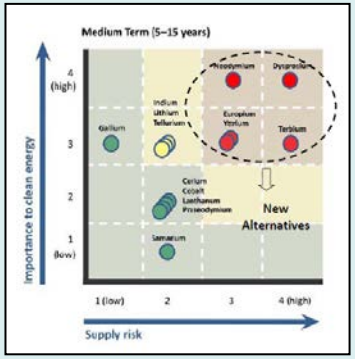

Thank you

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