



U.S. DEPARTMENT OF
ENERGY

DOE R&D

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Overview

- \$6 billion per year.
- 6 Basic and 6 Applied Research Programs.
- Advanced Research Projects Agency - Energy (ARPA-E).
- Diverse R&D Portfolio = Meaning of DOE.
- Request for Proposals includes 254 techs.
- “Other” related techs.



High Energy Physics and Nuclear Physics

- <http://www.science.doe.gov/hep>.
- <http://www.sc.doe.gov/np>.
- Techs: Detectors and accelerators (including superconducting magnets and high current for industrial apps).
- <http://www.sc.doe.gov/np/nsac>.
- Techs: **Critically** needed medical isotopes production and separation.



Basic Energy Sciences (Chemists)

- <http://www.sc.doe.gov/bes>.
- 5 Nanoscience Centers
- 4 X-ray Sources and 2 Neutron sources.
- Techs: Membranes for industrial apps and batteries, Electric Vehicle energy storage, fission reactor materials.



Biological, Environmental Research, and Computing

- <http://www.sc.doe.gov/ober>.
- Techs: Climate measurements and modeling.
- <http://www.em.doe.gov>.
- Techs: Cleanups of nuclear weapons sites.
- <http://www.sc.doe.gov/ascr>.
- Techs: Hardware and software, including industrial apps.



Fossil, Fission, and Fusion Energy

- <http://www.fossil.energy.gov>.
- Techs: CO₂ capture, Fuels from CO₂, H₂ from coal, turbines.
- <http://www.ne.doe.gov>.
- Techs for advanced fuel cycles; e.g., safety and radwaste.
- <http://www.science.doe.gov/ofes>.
- Techs: Materials and diagnostics.



Electricity Delivery

- <http://www.oe.energy.gov>.
- Smart Grid.
- Hubless flywheels for energy storage; e.g., from renewable energy sources.



National Nuclear Security Administration

- <http://nnsa.energy.gov>.
- Defense Programs; i.e., safety and reliability of nuclear weapons.
- 10% of electricity.
- Non-proliferation techs: Nuclear Detonation Detection (e.g., optical, radionuclides, seismic) radmonitoring and Safeguards sensors (e.g., for IAEA).



Renewable Energy

- <http://www.eere.energy.gov>.
- R&D Roadmaps: click on “Plans” (twice), then subject, and then Multi-Year R&D Plan.
- Biomass: Cellulose ethanol.
- Geothermal: 10 kilometer deep Demo.
- Fuel Cells: 300 mile range.
- Solar: Photovoltaics (PVs) and Solar Thermal.



Renewable Energy

- Wind: More reliable large turbines and more cost-effective smaller turbines.
- Techs: Waste heat recovery, bioenergy, hydrogen/fuel cells, energy efficiency for manufacturing and buildings (e.g., solid state lighting), solar, water (e.g., ocean), wind (e.g., offshore).



ARPA-E

- <http://arpa-e.energy.gov>.
- DARPA like; i.e., App-driven basic and applied R&D; high tech risk.
- \$400 million ARRA and \$300 million per year requested, starting in FY11.
- Not supplement DOE.



ARPA-E Awards (examples)

- Algal butanol.
- Fuel from solar, carbon dioxide, and water.
- GigaWatt Photovoltaics.

- Superconducting Magnetic Energy Storage.
- Flywheel Energy Storage.



ARPA-E Awards (2 of 2)

- Permanent magnets for Electric Vehicles.
- Nanotech ultracapacitors for energy Storage.
- Nanotech for sequestration.
- Nanotech thermoelectrics for waste heat capture.



Small Business Innovation Research (SBIR)/Small Business Tech Transfer (STTR)

- \$167 million per year.
- SBIR: Tech transfers from small businesses.
- STTR: Small businesses assist tech transfers from universities and National Labs.
- **September** Requests For Proposals (RFP) – proposals due Nov 15th.
- Grants only (same as university grants).



General Info

- Phase I: \leq \$150K – Feasibility, \leq 9 months.
- Phase II: \leq \$1 million – R&D, 2 years.
- **Hybrid:** Buy products (like DoD) and fund research without buying (like NSF).
- Average about 2 proposals per company.
- Average nearly 2 awards per company.
- Not retain Data Rights for Government Use.



Peer Review Criteria

- 1. Scientific/Technical Approach**; e.g., unique ?, thoroughly presented ?
- 2. Ability to carry out Cost-Effectively**; e.g., staff qualifications, adequacy of equipment and facilities.
- 3. Impact** (equal weight, except $\frac{1}{2}$ weight for ARRAs); e.g., benefits, likelihood marketable.

Note: Evidence of Commercial Potential (Phase II Only)



Input to DOE

- Annual analysis of each specific tech (241 in FY10); ≥ 10 proposals, ≥ 2 fundable* (choices), ≥ 1 award.

*Top 2 levels of 7 level peer review.

- Can suggest techs to the Program Managers (71 listed in FY10 RFP) from all 12 DOE research Program Offices – **Incentive.**



Success Rates (3-Year Annual Average)

- Phase I: **20%** of proposals received a grant (excludes 20% declined for being non-responsive).
- Phase II: **50%** of proposals received a grant (must have DOE Phase I award).
- In FY09, Awards Made in **32** States.



FY09 Phase I

- 27% were First-time DOE Grantees.
- 43% of which were First-time DOE Applicants.
- 66 grants included universities and 37 included DOE National Labs.



Contact Info

- Web: www.science.doe.gov/sbir (**RFP** and **Abstracts**).
- Email: sbir-strt@science.doe.gov
- Phone: 301-903-1414.
- Technical Assistance Program (TAP):
<http://doecapreg.foresightst.com> and
www.t2plus.com.

(401) 273-4844 ext. 33.

Note: Some TAP without award/proposal.

We want you to succeed.

