

## EFRC Fact Sheet

- **DOE Energy Frontier Research Centers (EFRCs)** The EFRCs are a means to enlist the talents and skills of the very best American scientists and engineers to address current fundamental scientific roadblocks to U.S. energy security (<http://www.sc.doe.gov/bes/EFRC.html> ).
- The EFRCs will address energy and science “grand challenges” in a broad range of research areas; these “grand challenges” have been defined through a series of more than one dozen technical workshops conducted by the U.S. Department of Energy’s (DOE) Office of Science over the past five years.
- Since 2003, the Basic Energy Sciences program within the Office of Science has organized numerous workshops (<http://www.sc.doe.gov/bes/reports/list.html>) in coordination with the Department’s technology offices to explore significant topics in energy production, conversion, storage, transmission, and waste mitigation. These workshop reports have engaged more than 1,500 participants from universities, DOE national laboratories, and industry, and have identified high priority research directions with promise to address the most critical knowledge and technology gaps.
- The 46 EFRCs, to be funded at \$2-5 million per year each for a planned initial five-year period, were selected from a pool of some 260 applications received in response to a Funding Opportunity Announcement (FOA) issued by the DOE Office of Science in 2008.
- Selection was based on a rigorous merit review process utilizing outside panels composed of scientific experts. This process is described in detail in the EFRC FOA.
- Thirty EFRCs are being funded at a total annual cost of \$100 million under the Fiscal Year (FY) 2009 Federal Budget. The Recovery Act provided a further \$277 million, enabling the Office of Science to establish an additional 16 EFRCs and forward-fund them for the full five-year period.
- In total, the EFRC initiative represents a planned DOE commitment of \$777 million over five years, with the \$400 million in out-year funding for the FY 2009 funded Centers subject to future appropriations.
- Of the 46 EFRCs selected, 31 are led by universities, 12 by DOE National Laboratories, two by nonprofit organizations, and one by a corporate research laboratory.
- There are 106 institutions, from 36 states plus the District of Columbia and 4 foreign countries, participating in the EFRC program.
- In all, they will involve nearly 700 senior investigators and employ, on a full- or part-time basis, an estimated 1100 researchers, including postdoctoral associates, graduate students, undergraduate students, and technical staff.
- Roughly a third of these will be supported by Recovery Act funding.
- EFRC researchers will take advantage of new capabilities in nanotechnology, high-intensity light sources, neutron scattering sources, supercomputing, and other advanced instrumentation, much of it developed with DOE Office of Science support over the past decade, in an effort to lay the scientific groundwork for fundamental advances in solar energy, biofuels, transportation, energy efficiency, electricity storage and transmission, clean coal and carbon capture and sequestration, and nuclear energy.

### EFRC Awards by Research Category and Institution

The 46 EFRC awards span the full range of energy research challenges described in the BES *Basic Research Needs* (BRN) series of workshop reports while also addressing one or more of the science grand challenges described in the BESAC report, *Directing Matter and Energy: Five Challenge for Science and the Imagination* (<http://www.sc.doe.gov/bes/reports/list.html>). Because many of the EFRCs address multiple energy challenges that are linked by common scientific themes, such as interfacial chemistry for solar energy conversion and electrical energy storage or rational design of materials for multiple potential energy applications, it is most appropriate to sort the EFRCs by the following taxonomy, with the appropriate BRN reports listed in parentheses:

**Renewable and Carbon-Neutral Energy** (Solar Energy Utilization, Advanced Nuclear Energy Systems, Biofuels, Geological Sequestration of CO<sub>2</sub>)

**Energy Efficiency** (Clean and Efficient Combustion, Solid State Lighting, Superconductivity)

**Energy Storage** (Hydrogen Research, Electrical Energy Storage)

**Crosscutting Science** (Catalysis, Materials under Extreme Environments, other)

In addition, the EFRCs span the full range of eligible institutions.

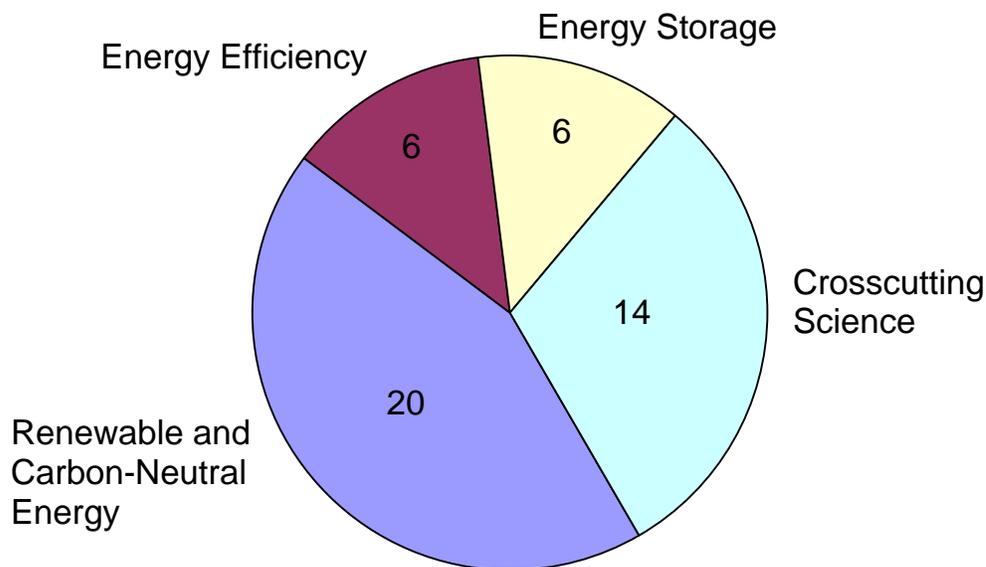


Figure 1. Distribution of EFRC awards by research category.

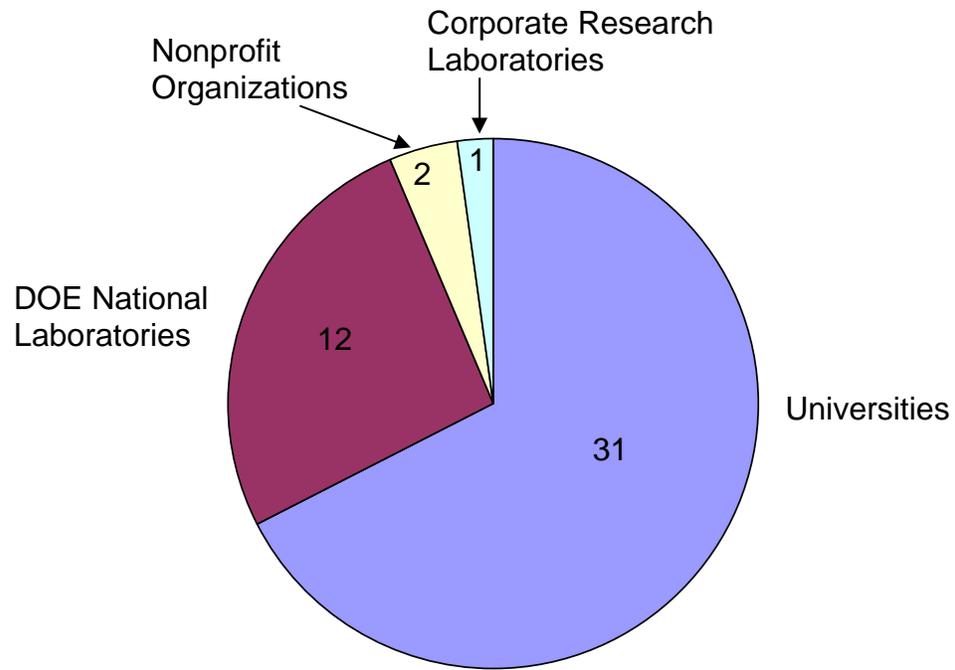


Figure 2. Distribution of EFRC awards by lead institution type.