(dollars in thousands)

inorganic/organic components in engineered assemblies with unprecedented efficiencies for the conversion of solar photons to fuels and chemicals. Within this activity, there are increases for direct solar conversion to fuels research ($+5,129,000) and for the development of new tools, techniques and mid-scale instrumentation to measure forces, atomic configuration, and physical and chemical properties with ultrahigh sensitivity to further advance nanoscale science ($+1,500,000). Additional funding is provided for research related to the hydrogen economy ($+2,425,000).

- **Experimental Program to Stimulate Competitive Research (EPSCoR)** **7,643** **7,280** **8,000**

This activity supports basic research spanning the complete range of activities within the Department in states that have historically received relatively less Federal research funding. The EPSCoR states are Alabama, Alaska, Arkansas, Delaware, Hawaii, Idaho, Kansas, Kentucky, Louisiana, Maine, Mississippi, Montana, Nebraska, New Hampshire, Nevada, New Mexico, North Dakota, Oklahoma, Rhode Island, South Carolina, South Dakota, Tennessee, Vermont, West Virginia, Wyoming, the Commonwealth of Puerto Rico, and the U.S. Virgin Islands. The work supported by the EPSCoR program includes research in materials sciences, chemical sciences, biological and environmental sciences, high energy, and nuclear physics, fusion energy sciences, fossil energy sciences, and energy efficiency and renewable energy sciences. In FY 2007, funding is increased for EPSCoR research activities ($+720,000). The following table shows EPSCoR distribution of funds by state.

EPSCoR Distribution of Funds by State

Alabama	695	685	258
Alaska	—	—	—
Arkansas	145	135	139
Delaware	—	—	—
Hawaii	—	—	—
Idaho	476	375	375
Kansas	626	135	—
Kentucky	224	—	—
Louisiana	660	462	375
Maine	—	—	—
Mississippi	667	132	—
Montana	375	455	133
Nebraska	120	265	269
New Hampshire[a]	—	—	—
Nevada	—	90	105
New Mexico	135	135	—
North Dakota	406	273	—
Oklahoma	485	350	350
Rhode Island[a]	—	—	—

[a] Becomes eligible in FY 2006.

	(dollars in thousands)		
	FY 2005	FY 2006	FY 2007
Puerto Rico	375	375	—
South Carolina	716	660	525
South Dakota	125	125	—
Tennessee	—	140	140
Vermont	705	—	—
U.S. Virgin Islands	—	—	—
West Virgina	315	225	135
Wyoming	270	140	140
Technical Support	123	60	110
Other[a]	—	2,063	4,946

- **Electron-beam Microcharacterization** **7,614** **7,945** **7,945**

  This activity, which was previously budgeted in Structure and Composition of Materials, supports three electron-beam microcharacterization user centers: the Electron Microscopy Center for Materials Research at Argonne National Laboratory, the National Center for Electron Microscopy at Lawrence Berkeley National Laboratory, and the Shared Research Equipment Program at Oak Ridge National Laboratory. These centers contain a variety of highly specialized instruments to provide information on the structure, chemical composition, and properties of materials from the atomic level on up, using direct imaging, diffraction, spectroscopy, and other techniques based primarily on electron scattering.

  Atomic arrangements, local bonding, defects, interfaces and boundaries, chemical segregation and gradients, phase separation, and surface phenomena are all aspects of the nanoscale and atomic structure of materials, which ultimately controls the mechanical, thermal, electrical, optical, magnetic, and many other properties and behaviors. Understanding and control of materials at this level is critical to developing materials for and understanding principles of photovoltaic energy conversion, hydrogen production, storage, and utilization, catalysis, corrosion, response of materials in high-temperature, radioactive, or other extreme environments, and many other situations that have direct bearing on energy, environmental, and security issues.

  Electron probes are ideal for investigating such structure because of their strong interactions with atomic nuclei and bound electrons, allowing signal collection from small numbers of atoms—or, in certain cases, just one. Furthermore, the use of these charged particles allows electromagnetic control and lensing of electron beams resulting in spatial resolution that can approach single atomic separations or better.

  Capital equipment is provided for instruments such as scanning, transmission, and scanning transmission electron microscopes, atom probes and related field ion instruments, related surface characterization apparatus and scanning probe microscopes, and auxiliary tools such as spectrometers, detectors, and advanced sample preparation equipment.

  In FY 2007, user operations, scientific research of the staff, and development of new instruments or techniques will continue to be supported at the electron beam microcharacterization user facilities.

[a] Uncommitted funds in FY 2006 and FY 2007 will be competed among all EPSCoR states.