

Office of Science Summary

Program and Financing (in millions of dollars)

| Identification code 89-0222-0-1-251 | 2007 Actual | 2008 est. | 2009 est. | 2009 2008 |
|--|----------------|--------------|--------------|--------------|
| Obligations by program activity: | | | | |
| 00.01 High energy physics..... | 733 | 688 | 805 | +17.0% |
| 00.03 Nuclear physics..... | 413 | 433 | 510 | +4.8% |
| 00.05 Biological and environmental research..... | 480 | 500 | 568 | +13.6% |
| 00.06 Basic energy sciences | 1,223 | 1,270 | 1,568 | +23.5% |
| 00.07 Advanced scientific computing research | 276 | 351 | 369 | +5.1% |
| 00.09 Science laboratory infrastructure | 37 | 65 | 110 | +69.2% |
| 00.11 Program direction | 166 | 178 | 204 | +14.6% |
| 00.14 Fusion energy sciences | 312 | 287 | 493 | +71.7% |
| 00.15 Safeguard and securities | 70 | 70 | 81 | +15.7% |
| 00.17 Workforce development for teachers & scientists..... | 8 | 8 | 14 | +75.0% |
| 00.18 Small business innovation research | 112 | | | |
| 00.19 Small business technology transfer | 14 | | | |
| 00.20 Direct program activity | | 123 | | |
| 10.00 Total new obligations | 3,844 | 3,973 | 4,722 | +18.9% |

Fusion Energy Science Summary

Fusion Energy Sciences.—The fusion energy sciences program advances plasma science, fusion science, and fusion technology in order to establish the knowledge base necessary for fusion to become an economically and environmentally attractive energy source. The program is conducting a broad range of research dealing with the many scientific issues it faces with the eventual goal of developing a predictive capability for plasma performance, including burning plasmas; demonstrating enhanced fundamental understanding of magnetic confinement through research on magnetic confinement configuration optimization; and developing the fundamental understanding of high energy density laboratory plasmas.

The budget includes \$214 million for the U.S. contributions to ITER project, an international burning plasma physics experiment being built in France in collaboration with the European Union (EU), Japan, Russia, Korea, China, and India. The EU is providing approximately 45% of the cost of building the facility, while the remaining parties will each provide approximately 9%. ITER is an essential next step toward eventually developing fusion as a commercially viable energy source. The budget also provides for support of basic research in plasma science in partnership with the National Science Foundation, investigation of innovative confinement concepts, and continued operation of the DIII-D, Alcator C-Mod, and the National Spherical Torus Experiment facilities to develop a fuller understanding of the physics of magnetically confined plasma and to identify approaches that may improve the economical and environmental attractiveness of fusion in the long run. Fabrication of the National Compact Stellarator Experiment will continue at Princeton Plasma Physics Laboratory in collaboration with Oak Ridge National Laboratory. Theory, modeling, and evolving computational methods using high performance computing and enabling technologies research will also be conducted in support of the science experiments.

| Budgets (\$M) | FY 2008 Estimated | FY 2009 President's Proposal |
|---------------------------------|-------------------|------------------------------|
| Domestic Fusion Program | 276.4 | 279 |
| US ITER Activities | 10.6 | 214 |
| Total US Fusion Energy Sciences | 287 | 493 |

