

## The Department of Energy in the FY 2002 Budget

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### HIGHLIGHTS

- For FY 2002, the Department of Energy's (DOE) total budget, mostly funded by the Energy and Water Development appropriations bill, would fall 2.5 percent to \$19.2 billion under the President's request.
- Overall, DOE's R&D budget would decline 4.5 percent to \$7.4 billion, eroding almost half the gain its portfolio achieved last year (see Table II-11).
- Consistent with the Administration's plan to focus energy policy on expanded oil, gas and coal supplies, mostly by conventional means, the Department's FY 2002 request slashes R&D spending on virtually all energy technologies, with cuts ranging from 25 to 50 percent. However, the Department would commit \$150 million to a Clean Coal Power Initiative by transferring funds from other fossil fuel accounts.
- The Administration's emphasis on increasing energy supply, even at the cost of climate impact, is also reflected in the 28 percent cut it proposes for Energy Conservation R&D.
- The Secretary of Energy managed to keep DOE's Office of Science relatively protected from the sharp knives of budget cutters, and its proposed R&D budget of \$2.9 billion represents a loss of only 0.8 percent. The physical sciences portion of the

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account would receive \$2.3 billion, maintaining DOE as the prime supporter of research in that area.

- Last year DOE turned a spotlight on its premier research portfolio, subtitled its FY 2001 budget request *Strength Through Science*. This year, the Department leads with National Security, keeping pace with the Administration's naming of defense as one of its highest priorities. The National Nuclear Security Administration (NNSA), which manages most of the Atomic Defense activities, would see its R&D programs climb 2.6 percent to \$3.4 billion. Construction funding for the National Ignition Facility, which last year came under heavy fire for alleged mismanagement and technology blunders, would receive a hefty 24.2 percent boost to \$245 million.
- The Administration has promised to revisit U.S. needs for energy technology R&D once Vice President Cheney's energy policy task force has made its recommendations. It is widely believed that Department will request higher funding for selected energy supply areas, while keeping the overall bottom line fixed and leaving proposed spending on defense programs unchanged. In this scenario, the Office of Science might come under renewed pressure for reductions.

## **INTRODUCTION**

The Department of Energy is one of the principal supporters of federal R&D. Although it ranks fourth in total R&D, behind the Department of Defense (DOD), the National Institutes of Health (NIH) and the National Aeronautics and Space Administration (NASA), it ranks first in physical science research, first in support of R&D facilities, and second in mathematics and computer science research. (See Table II-11 for details of R&D in the DOE budget.)

Traditionally, about half of DOE's R&D budget is allocated to federally funded research and development centers (FFRDCs), including multipurpose, specialized civilian and national weapons laboratories. These centers, long regarded as jewels in the nation's R&D enterprise, contain many large facilities, such as synchrotron light sources, neutron

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reactors, specialized accelerators and super computers, which are used by scientists and engineers in universities, industry and other federal research agencies.

The FFRDCs also provide excellent opportunities for interdisciplinary activities. Today, for example, biomedical researchers constitute more than 40 percent of the users of the synchrotron-radiation facilities, developed and maintained by accelerator physicists, optical scientists, vacuum engineers and computer scientists. Last year DOE entered into an agreement with NIH to fund jointly the upgrade of the Stanford Synchrotron Radiation Laboratory.

Particle accelerators at the FFRDCs remain the focus of American high-energy physics, a research field that pushes the envelope of technology to its limits. The World Wide Web, for example, traces its origin to the international community of high-energy physicists, who developed the information technology to enable them to transmit graphics and data.

### **POLITICAL ENVIRONMENT**

Despite its prestigious scientific record, DOE has been a perennial target of congressional animus for a decade or more. Labeling it a dysfunctional bureaucracy with an ill-defined mission and criticizing it for breaching its own rules on national security, conservative members of Congress repeatedly have called for the Department's demise. Its current Secretary, Spencer Abraham, was one of its harshest critics less than two years ago when he was a member of the Senate.

The DOE's Capitol Hill difficulties stem partially from its unnatural birth. The Department traces its origin to 1946, when Congress established the Atomic Energy Commission (AEC) to oversee the nation's embryonic nuclear weapons and civilian nuclear reactor programs. In 1974, responding to the national energy crisis, Congress consolidated energy R&D programs housed throughout the federal government and combined them with the non-regulatory activities of the AEC to create the Energy Research and Development Administration (ERDA). In 1977, when ERDA achieved Cabinet status, it was renamed the Department of Energy.

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The Department has been saddled with the bureaucratic layers that accompanied its transplanted components. On the few occasions when the Department has made serious attempts to eliminate administrative redundancy, members of Congress have intervened to preserve DOE jobs in their own districts. The Department has also been stymied in its attempt to save costs by renegotiating some of the tripartite agreements among the federal, state and local governments involving nuclear waste cleanup. Frequently lost in the accusatory rhetoric are the successes of DOE's stellar scientific portfolio.

This year, DOE may get a more sympathetic hearing on Capitol Hill. First, the Secretary of Energy is counted by GOP conservatives as "one of their own." Second, as gas prices soar and California-style rolling blackouts threaten to engulf the rest of the nation, Congress is becoming increasingly engaged in the energy issue, which has largely lain dormant since the Carter years. Third, economists of all stripes have embraced the idea that economic growth is powered by the kinds of technological innovation that emanate from DOE's scientific research portfolio.

Even if Congress finds these arguments persuasive, however, the DOE R&D budget will have to clear serious hurdles. Most significantly, the largest part of its allocation must pass through the Energy and Water Development Appropriations Subcommittee, where it must compete with appropriators' pet water projects. If the Subcommittee operates under the stringent caps on discretionary spending established by the White House in its budget proposal, the DOE budget may experience an even rougher road than the Administration intends in its budget submission.

Still, DOE will have its champions on Capitol Hill. Republican Senator Pete V. Domenici, whose home state of New Mexico depends upon the economic stimulus of two of the Department's three weapons labs, Los Alamos and Sandia, has long been DOE's principal R&D patron. From his perch as chairman of both the Senate Budget Committee and Energy and Water Appropriations Subcommittee chairman, Domenici has had more to say about DOE's allocations than any other member of Congress. This year, fellow Republican Bill Frist of Tennessee and fellow New Mexican Jeff Bingaman, a Democrat, will join him in trying to build a bipartisan Senate consensus for DOE's science activities.

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Changes in House committee chairmanships should improve DOE's budget reception on the other side of Capitol Hill this year, as well. Moderate New York Republican Sherwood Boehlert has taken over the chairmanship of the House Science Committee from conservative budget hawk F. James Sensenbrenner (R-WI), who, according to staff reports, repeatedly urged appropriators to rein in DOE's science budgets and often achieved considerable success. By contrast, Boehlert, a Northeastern environmentalist, is expected to speak out strongly in favor of DOE's science and energy technology portfolio. Physicist Vern Ehlers (R-MI), who has assumed the chairmanship of the Environment, Technology and Standards Subcommittee, will certainly be a strong ally.

### **FUNDING REQUEST AND PRIORITIES**

**Overview:** Last year, in an opinion piece in *The Hill*, then-Secretary of Energy Bill Richardson stated, "The Department of Energy is at its heart a science agency." The message resonated well. Touting its role as the dominant federal player in the physical sciences and building on economic analyses that tied economic growth to technology originating from that portion of the scientific sector, the Department parlayed its research message to Congress into an 11.0 percent increase for the Office of Science and a 22.8 percent increase for Energy Supply R&D.

This year, with its fiscal hands tied by major tax cuts, a 4-percent discretionary spending cap and large increases for defense and education, DOE is approaching congressional appropriators with a significantly more restrained message. The Department would seek increases only for programs that meet the test of the greatest immediacy. Leading the list is Atomic Defense R&D.

According to DOE's Budget Highlights, "The FY 2002 request refocuses priorities to meet critical National Security needs." Prime among them, according to the Highlights, is protection for the operational readiness of the nuclear weapons stockpile. The Department's request reflects this redirection, with increases approaching 25 percent for both Stockpile R&D and the National Ignition Facility's construction budget.

Apart from Defense, the only beneficiary of major new R&D spending would be the Clean Coal Power Initiative, subsumed under the Fossil

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Energy account. Identified as a new initiative—about the only one featured in the Department’s request this year—the program would provide “\$150 million in federal matching funds for innovations in coal fired technology” for R&D and demonstration projects. This, the Department has noted, reflects a presidential commitment to expanding the use of conventional fossil fuel supplies.

**Energy Supply:** Virtually every part of the Energy Supply portfolio would take a major hit. R&D in Renewable Energy Resources would drop 30.8 percent, with Geothermal, Hydrogen, Hydropower, Solar and Wind Energy all chopped in half. Only Biomass would be spared a massive cut, probably as a political concession to farm state conservatives. It would fall slightly more than 5 percent. The balance of the Energy Supply R&D budget is devoted to Nuclear Energy, which has won Senator Domenici’s backing in recent years. This year, however, the Department would trim R&D in the account by 29.4 percent to \$57 million (see Table II-11).

**Science:** The Science account’s largest R&D program, Basic Energy Sciences (BES), would receive a 1.3 percent boost in its R&D to \$997 million, principally to cover the increased costs for building the Spallation Neutron Source (SNS), consistent with its planned construction profile. Total spending for the SNS, comprising construction and R&D, would reach \$291 million. Among the other BES activities, Materials Sciences, Engineering and Geosciences, and Energy Biosciences would all decline about 2 percent, and Chemical Sciences would edge up by 1 percent.

High-Energy Physics, the second largest Science program at \$706 million, would receive an increase of 0.6 percent for its R&D. Principally to allow the newly completed CDF and D-Zero detectors at Fermilab and the BaBar detector at the Stanford Linear Accelerator Center (SLAC) to be utilized effectively, the Department would add \$25.4 million to the FermiLab budget and \$5.6 million to SLAC budget. However, to accommodate these increases, the Department would scale back university research by 5.0 percent to \$105.3 million and decrease U.S. funding for the international Large Hadron Collider project in Geneva, Switzerland by \$10.0 million.

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Nuclear Physics would be flat funded at \$355 million. That would precipitate a 25 percent reduction in operating time at Brookhaven's Relativistic Heavy Ion Collider and a 4.1 percent reduction in heavy ion university research. Operating schedules at the Thomas Jefferson and MIT Bates Medium-Energy accelerators would be affected minimally. (For more information on the physics programs, see Chapter 13.)

Fusion Energy Sciences, scheduled for a \$10 million cut in DOE's original FY 2002 plan, would see a restoration of its R&D to the FY 2001 level of \$245 million in a revised request. The program would continue to fund three major machines: DIII-D at General Atomics, Alcator C-Mod at MIT, and the National Spherical Tokamak Experiment at Princeton.

The Advanced Scientific Computing Research (ASCR) program is focused on developing computational and networking tools to allow scientists to model, simulate and predict complex phenomena. The Department's request trims 1.6 percent from this program.

Biological and Environmental Research (BER), the third largest Science program at \$442 million, would see its R&D decline by 8.2 percent, largely reflecting the completion of last year's congressionally directed projects, which totaled \$43.0 million. The Department would focus more of its resources on the Genomes to Life program, more than doubling that funding to \$19.5 million. The Human Genome program, which DOE originated well before it was on NIH's radar screen, would rise by 2.1 percent to \$88.2 million.

**Fossil Energy and Energy Conservation:** These are the only two R&D programs within DOE that receive their funding through the Interior and Related Agencies Appropriations Bill. Apart from the \$150 million Clean Coal Power Initiative, all Fossil Energy activities would see major reductions, most receiving cuts of 50 percent or more. Only Carbon Sequestration R&D would break the trend with a 10.3 percent increase to \$20.7 million. On the other side of the ledger, the Department would reduce R&D in Energy Conservation by 28.3 percent, consistent with the Administration's contentious assertion that conservation cannot address the nation's energy problems in any significant way (see Table II-11).

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**Atomic Energy Defense Activities – National Nuclear Security Administration (NNSA):** Defense represents the largest portion of the DOE R&D portfolio and, this year, its primary focus. Maintaining the nuclear stockpile as a safe, secure and reliable weapons system has been a major challenge for DOE, since the U.S. ceased testing nuclear weapons more than a decade ago. To meet the challenge, DOE has developed the Stockpile Stewardship program within its Weapons Activities account, the largest component of its Defense R&D portfolio. Congressional support for this program should remain relatively strong, and the Department's requested increase of 3.9 percent for R&D in Weapons Activities will probably be a floor rather than a ceiling.

The Advanced Simulation and Computing program, formerly the Accelerated Strategic Computing Initiative (ASCI), provides three-dimensional simulations of nuclear weapons behavior, which would be tested against controlled fusion experiments allowed under the terms of Comprehensive Test Ban Treaty (CTBT). The experiments would be carried out using two facilities currently under construction: the National Ignition Facility (NIF) and the Dual-Axis Radiographic Hydrodynamic Test Facility. When completed, NIF, according to DOE, "will provide a means to study primary [fission] boosting, assess secondary [fusion] performance, and validate new physics models and codes while pursuing its goal to demonstrate thermonuclear ignition in the laboratory." The recently completed DAHRT facility is intended to validate the implosion performance of primaries. Construction of NIF, with a planned completion date at the end of FY 2008, would receive an allocation of \$245 million in FY 2002.

The Department also has responsibility for several other weapons R&D areas. These include two small ones, Nuclear Safeguards & Security and Intelligence, and one large one, Environmental Management (EM). Consistent with the Administration's plan to trim the \$6 billion EM program by 5.7 percent overall, the R&D component of EM would drop 25.3 percent to \$131 million.

**Radioactive Waste Management:** The Department has responsibility for managing and disposing of the nation's spent nuclear fuel and high-level radioactive waste, both civilian and military. The proposed 29.9 percent drop reflects continuing reduced needs for further R&D.