

CATO HANDBOOK FOR CONGRESS

POLICY RECOMMENDATIONS FOR THE 108TH CONGRESS

CATO
INSTITUTE

Washington, D.C.

46. Department of Energy

Congress should

- eliminate the U.S. Department of Energy;
- transfer the National Nuclear Security Administration (NNSA), which is responsible for managing the DOE's nuclear-industrial complex, to the Department of Defense;
- renegotiate the DOE's nuclear weapons cleanup programs to reflect prioritization of containment and neutralization of risk rather than removal and return of sites to pristine conditions and transfer cleanup responsibilities to the NNSA;
- privatize all laboratories, except two of the three weapons laboratories, managed by the DOE;
- eliminate all research and development programs overseen by the DOE and replace them with a robust R&D tax credit;
- sell the assets held by the power marketing administrations to the highest bidders;
- sell the Strategic Petroleum Reserve; and
- spin off the Federal Energy Regulatory Commission, the Energy Information Administration, and the Office of Civilian Radioactive Waste Management (which is responsible for regulating the long-term disposal of high-level nuclear waste) as independent agencies within the executive branch.

The Department of Energy is a large department by any measure. It has a budget of \$21.3 billion per year. Approximately 115,000 workers are employed in 35 states at the DOE's national laboratories, cleanup sites, and other facilities. Notwithstanding its name, the DOE's primary role is that of caretaker of America's nuclear-industrial complex. Nearly three-quarters of the department's budget is devoted to nuclear weapons safety and nuclear cleanup activities.

The DOE is a 1970s' dinosaur that has outlived its usefulness. Energy production, distribution, and consumption are better directed by market forces than by government planners and bureaucrats. Likewise, weapons maintenance and related nuclear activities are better directed by Defense than by Energy personnel. There is no more reason for a department of energy than for a department of automobiles.

First, Eliminate the Department

Even if few of the actual functions of the DOE were eliminated, eliminating the department and transferring its programs to other agencies would be a worthwhile undertaking. Maintaining a cabinet-level energy department is risky because it provides a ready structure for the reintroduction of direct federal interventions in the energy market—a perfect command post from which some future “Energy Czar” could once again punish energy producers and consumers in the event of some temporary energy “emergency.” Elimination of the DOE would make it difficult for government to launch any future interventions in the energy marketplace.

Moreover, the DOE is demonstrably the most bureaucratically dysfunctional agency in government. Its inability to provide even the most basic security for our nuclear secrets is well-known. Its ability to protect workers and communities around its nuclear weapons facilities—such as those in Paducah, Kentucky—is seriously in doubt. Those problems, however, are simply well-publicized manifestations of a deeper problem: the department's inability to competently supervise the activities of the contractors who manage and operate its facilities and programs.

That failure is important because fully 90 percent of the department's budget is spent on contracts with third parties whose competence and integrity have been placed seriously in doubt by report after report and scandal after scandal. Despite repeated warnings by the U.S. General Accounting Office that the department's management and supervision of contractors have been ridiculously lax and grossly incompetent, the problems continue with no institutional remedy in sight.

There are two commonly marshaled rationales for the DOE: first, that the department is needed to discourage and ameliorate the occasional energy market dislocations that harm consumers and, second, that the department is needed to secure America's “energy independence” from OPEC. Both rationales are intellectually threadbare.

The occasional energy dislocations of the past two decades underscore the fact that the DOE is incapable of “smoothing out” the rough edges

of world oil markets. It is an economic fact of life that small changes in global oil supply or demand have very large effects on prices in the short term. That leads to large transfers of wealth from consumers to firms in times of supply decreases and from firms to consumers in times of supply increases. There is absolutely nothing that the DOE can do about that. When the federal government *has* tried to shelter consumers from short-term price spikes (primarily by imposing price controls, instituting rationing, and levying windfall profit taxes), energy markets have been even further distorted and consumer welfare has gone from bad to worse.

Other energy markets of concern—primarily gasoline markets and electricity markets—are largely beyond the reach of the DOE. Antitrust law polices the former, and the independent Federal Energy Regulatory Commission somewhat polices the latter (state public utility commissions take the lead regulatory role in electricity markets).

The other main objective of the DOE—the promotion of energy independence—is practically unachievable. Changes in oil supplies anywhere in the world affect oil prices everywhere in the world as long as oil is freely traded in markets. International oil shocks also spill over into domestic coal and natural gas markets. The United States would have to isolate its entire domestic energy market from the world energy market in order to eliminate the price effects of supply shocks elsewhere in the world—an economically prohibitive exercise.

In the event of a new energy crisis, Congress would be best advised to ensure energy supplies and fuel diversity by allowing markets to work unimpeded by bureaucratic second-guessing. The existence of an energy department presents too strong a temptation for intervention, which is widely acknowledged to have been disastrous in the past.

Reorganize the Nuclear-Industrial Complex

The DOE might be better named the “Department of Nuclear Weaponry and Science.”

Although stockpile maintenance and cleanup operations certainly need to be continued, the agency responsible for those activities hardly needs to be represented at the president’s cabinet table. There is no compelling reason for those activities to be under the administrative umbrella of an “energy” department, since “energy” has virtually nothing to do with either administrative function.

It makes administrative sense for those activities to be assumed by the Department of Defense. As the National Defense Research Institute of

the RAND Corporation recently pointed out, “It is questionable whether there remains any reason to continue the separation of nuclear responsibilities between DoD and DoE.” Likewise, a 1995 GAO survey of 37 academic experts and former DOE officials found overwhelming support for removing the DOE from the business of nuclear weapons development, stockpile maintenance, and arms control verification.

The newly constituted National Nuclear Security Administration—which has been charged by Congress with oversight of the nuclear-industrial complex managed by the DOE—should thus be spun off from the department and placed under the organizational auspices of the Department of Defense. The weapons-related activities of Los Alamos, Lawrence Livermore, and Sandia should be reduced to reflect post-Cold War realities, consolidated within two of those national laboratories, and placed under the direction of the NNSA.

Reform Federal Environmental Cleanup Programs

The DOE’s various cleanup programs—amounting to \$6 billion annually—are necessitated by the environmental mismanagement of the nuclear weapons complex. Federal nuclear weapons facilities, such as Rocky Flats, Colorado, and Hanford, Washington, are expected to take 30 years or more to clean up. Current cleanup standards negotiated by the DOE with state and local communities establish rigorous protocols, based on the federal Superfund statute, that are aimed at returning sites to near-pristine conditions. Estimates of the ultimate cost of such cleanups vary dramatically, but even the most conservative estimate of \$200 billion rivals the cost of the savings-and-loan bailout. Other estimates peg ultimate cleanup costs as high as \$1 trillion.

While cleaning up those sites is certainly a federal responsibility, the cleanup standards adopted by the DOE are unachievable as well as inordinately costly. Although that is widely understood within the scientific community, the point was perhaps best made in a report issued in 1995 by an advisory board appointed by the DOE to study the national laboratories:

Probably the most important reason behind the slow pace of assessment and cleanup is the low quality of science and technology that is being applied in the field. Many of the methods, such as “pump and treat” for contaminated groundwater remediation, cannot provide the claimed benefits. There is a lack of realization that many—and most experts believe most—existing remediation approaches are doomed to technical failure. Others would require unacceptable expenditures and much extended time to reach their stated objectives.

Current standards negotiated by the DOE for cleanup of nuclear sites are, even if desirable, untenable both economically and politically. Moving to a standard of risk neutralization allows far more sites to be cleaned up and correspondingly speedier health protection for the general public. Most environmental engineers believe that such a change in cleanup protocols on federal sites would cut total remediation costs by at least 50 percent.

If the NNSA is transferred to the Department of Defense, it makes sense to transfer cleanup operations there as well. RAND notes that “under the assumption that DOE continued to manage environmental cleanup, there would arise the issue of who was responsible for new environmental problems created by a DoD organization. It is not clear that bifurcating responsibility for nuclear waste cleanup—between old and new, or between that from weapons programs and that from other sources—would be prudent.” Accordingly, it makes sense to also give the NNSA this authority. The aforementioned GAO survey of energy experts likewise found an overwhelming consensus for transferring civilian nuclear disposal; nuclear weapons waste management and cleanup; and all matters of environmental, safety, and health oversight out of the DOE.

Privatize the National Laboratories

The DOE maintains 9 multiprogram laboratories (which account for 70 percent of the department’s total laboratory budget and 80 percent of all laboratory personnel) and 13 program-dedicated laboratories, all but 4 of which are managed and operated for the department by various university and corporate contractors. Because those laboratories have a total annual operating budget of about \$10 billion and a combined payroll of approximately 60,000 people, the taxpayers’ “investment” in those laboratories has been truly staggering.

The national laboratories today are no longer focused exclusively on weapons programming; they have branched out to include environmental, commercial, and various other research activities now that the Cold War is over.

More than 30 reports and audits over the last several decades—including those of seven internal advisory groups—have warned that the laboratories’ missions are unfocused and questionable, that the DOE micromanages the laboratories, and that the laboratories do not operate in an integrated manner. Still, the GAO reported in September 1998 that the department had refused to implement most of the recommendations made in those audits and reports and that the actions that had been undertaken by the department were of dubious value.

Perhaps the most compelling recent analysis of the national laboratories is the February 1995 Galvin Report, the product of a corporate-academic task force appointed by the secretary of energy, that trumpeted “critical finding” as “so much more fundamental than we anticipated that we could not in good conscience ignore it. The principle behind that finding is: government ownership and operation of these laboratories does not work well.” The prescription?

The principal organizational recommendation of this Task Force is that the laboratories be as close to corporatized as is imaginable. We are convinced that simply fine-tuning a policy or a mission, a project, or certain administrative functions will produce minimal benefits at best.

Accordingly, Congress should float, for purchase by any interested party, stock in each separate laboratory save for two of the three main weapons laboratories (Lawrence Livermore, Sandia, and Los Alamos). If there is insufficient commercial interest in any particular facility, the federal government should turn operation of that facility over to the management agent currently under contract to the federal government. That agent would then retain full ownership rights to the laboratory and be free to operate it as it wished, contracting with public and private entities in the free market, or close it down. The federal government would retain full liability for past environmental contamination at all the privatized laboratories and would be responsible—through the NNSA—for remedying any environmental contamination that threatened public health.

Eliminate Energy Research and Development

The DOE spends \$7 billion annually on research and development. About half of that sum is spent on basic scientific research. The emphasis on R&D is so great at the DOE that, in its 2001 budget request to Congress (titled “Strength through Science”), the department straightforwardly declared that “DoE is a Science Agency.”

Over the past four decades, the federal government has poured nearly \$100 billion into nondefense nuclear science and energy R&D, 70 percent of which since the mid-1980s has been devoted to applied energy R&D. Clearly, federal energy R&D expenditures have not been trivial.

There are two primary justifications for federally supported energy R&D. The main justification is that R&D is a “public good.” No firm that discovers new technologies or production practices can fully exclude other firms from appropriating those discoveries for their own commercial

benefit. Private firms will thus underinvest in R&D and supplemental government investment is necessary to improve overall economic efficiency. The second justification is mercantilist: other nations subsidize the R&D programs of their domestic industries, and, if the United States did not do likewise, it would competitively disadvantage firms headquartered in the United States.

While the former argument is almost certainly true to some extent, it's worth noting that the United States became the richest nation in the world long before there was any significant American leadership in science and technology. Most federal programs to promote science and technology, moreover, were initiated after World War II. Subsequently, U.S. economic growth has been among the lowest of the major nations.

The historical and cross-national record reveals a strong relationship between real expenditures for R&D and the level of national output—but little relationship with the rate of economic growth. This record is more consistent with the hypothesis that R&D is an income-elastic consumption good, something that rich people and rich nations do, rather than an investment that will increase future economic growth.

The mercantilist justification is even weaker. The international character of science is such that discoveries made in one nation are available to scientists in all. The existence of the free rider problem at the international level suggests that the relative competitive position of an economy may not be improved by funding R&D. As noted by the late Harry Johnson, an economist at the University of Chicago, a position of leadership in basic science

might benefit a nation almost exclusively in terms of intangible national prestige of scientific accomplishment, the concrete benefits of the application of scientific findings being reaped mainly by other nations. In that case, the expenditure of public money on the support of basic scientific research would serve mainly to save other countries the cost of basic research and enable them to concentrate on development and application.

Regardless of the theoretical debate, there is little evidence to suggest that the tens of billions of dollars poured into energy R&D have ever produced more net economic benefits than costs or that the energy economy today would be any different absent such R&D expenditures.

Perhaps the most serious examination of federal R&D programs—conducted for the Brookings Institution by economists Linda Cohen of the University of California at Irvine and Roger Noll of Stanford University—found that energy R&D has been an abject failure and a pork barrel for

political gain. MIT's Thomas Lee, Ben Ball Jr., and Richard Tabors likewise observe that "the experience of the 1970s and 1980s taught us that if a technology is commercially viable, then government support is not needed; and if a technology is not commercially viable, no amount of government support will make it so."

Even the Galvin Report concluded that the DOE's laboratories—where most of the department's R&D takes place—"are not now, nor will they become, cornucopias of relevant technology for a broad range of industries."

Those conclusions were reached by Cato's chairman Bill Niskanen, who found in a regression analysis that a \$100 increase in real federal R&D outlays per employee (which would increase current federal outlays by about \$17 billion) might increase the annual productivity rate by about one-quarter of a percentage point within five years. All the near-term effects of R&D outlays on productivity growth, however, appear related entirely to defense R&D. Civilian and space R&D outlays appear to have no effect on near-term productivity growth. The long-term effects may be greater but cannot be ascertained from the statistical sample of 1956–95 used by Niskanen.

The reason that energy R&D has such a disappointing track record is that politicians and bureaucrats are charged with deciding which industries, technologies, and projects to support on the basis of political, not economic or scientific, considerations. As former senator William Proxmire once remarked: "Money will go where the political power is. Anyone who thinks government funds will be allocated to firms according to merit has not lived or served in Washington very long." Eric Reichl, former director of the Synthetic Fuel Corporation and long-time member of the DOE's Energy Research Advisory Board, agrees: "The more R&D dollars are available, the more of them will go to some marginal ideas. The high-merit ideas will always find support, even from—or particularly from—private industry. In general, then, government R&D dollars will tend to flow to marginal ideas. Exceptions always exist, but they are just that, exceptions."

Federal energy R&D expenditures should be immediately eliminated. The argument that they have provided a net social benefit to the economy is simply dogma masquerading as fact. The GAO audit of a recent DOE report of its R&D "Success Stories," for instance, revealed "basic math errors, problems in supporting economic analyses, and unsupported links between the benefits cited and DoE's role or the technology. These prob-

lems make DoE's estimates of the benefits of these cases questionable." In fact, no cost/benefit analysis of any kind has ever been produced to justify past or present DOE R&D programming.

The case for government support of civilian R&D is that the return to the economy is higher than the return to the firm, not that the government has better information on what R&D has the highest return. Government-sponsored R&D programs may increase the total level of investment, but allocation of the incremental expenditure is constrained by lack of information and is unduly influenced by vocal user and supplier interests.

Science policy would probably make a larger contribution to economic growth by merely augmenting private R&D expenditures, leaving the allocation decisions entirely to private organizations. The most effective instrument for supporting civilian R&D, then, is probably a tax credit for private R&D expenditures.

Unlike the present credit, however, an ideal credit would

- apply to total R&D expenditures by a firm, not merely to the increment above some base period, and
- be refundable to avoid a bias against start-up firms with no near-term tax liability.

Similarly, the most effective instrument to support basic research in universities would be a grant to match funds raised from private sources. University-based scientists would make their case to private firms rather than to some government-appointed peer-review committee.

Failing that, Congress should transfer DOE's R&D programs to the National Science Foundation. Energy programs would then compete with nonenergy programs for financial support.

Privatize the Power Marketing Administrations

The DOE sells about 19 percent of the nation's annual power production. The facilities that generate that power are mostly dams: Hoover, Grand Coulee, and 129 other smaller dams operated by the Army Corps of Engineers and the Bureau of Reclamation. The DOE's remaining power marketing administrations (PMAs)—the agencies that deliver public power wholesale (with the exception of the Bonneville Power Administration, which also sells power retail) to publicly owned utilities and rural power cooperatives—are, together, as large as major private power companies.

The PMAs were originally justified on two premises: first, that monopoly electricity corporations would not find enough profit in electrifying

rural America and thus government must step in and provide the power and, second, that government could provide power to consumers at less cost than could private companies because it could do so “at cost” without worrying about capital costs or profit margins.

The first premise is now irrelevant. Rural America is thoroughly electrified and will remain so with or without the PMAs. Moreover, 60 percent of rural America is already served by investor-owned utilities.

The second premise—that federal power would be cheap—was a socialist chimera. Public electricity generation has proven to be far more costly than private generation.

All of the PMAs should be privatized by asset divestiture and sold to the highest bidders by an asset privatization working group under the management of the Department of the Treasury. The divested assets should include the right to market power produced at federal facilities (without any price constraint) and the generation equipment associated with energy production at those facilities (owned primarily by the Army Corps of Engineers and the Bureau of Reclamation). The privatization plan should grandfather in existing operating conditions at hydroelectric generating facilities, including minimum flows from the dams, and provide a “preference” to current customers that would relieve them from current contract requirements if they so desired. Sale of the four PMAs proposed by the Clinton administration in 1995 (but, alas, proposed no longer) was estimated to bring in between \$3.4 billion and \$9 billion to the federal treasury. Bonneville was likely to bring in approximately \$9 billion.

Although there might not be a market for the largest federal dams, such as Hoover and Grand Coulee (although that remains to be seen), there are more than 100 smaller dams that would find ready buyers. More than 2,000 hydropower facilities are owned by the private sector (compared to 172 facilities owned by the public), and 56 percent of the nation’s hydropower is generated by private companies. Those facilities are not necessarily small generators. The Conowingo Dam, a 500-megawatt facility on Maryland’s Susquehanna River, and the Brownlee Dam, a 585-megawatt facility on the Snake River, are both owned by nonfederal power companies.

Sale of federally owned dams would also allow environmentalists and the recreational industry the option of buying and retiring those dams in the interest of riparian protection and, indirectly, the health of various fisheries. There is little merit to the idea that the federal government knows a priori the highest and best economic use for riparian resources. It may

well be that society values the environmental benefits of untamed waterways more than it values the low-cost electricity that those waterways provide. If that is the case, the public should be afforded the opportunity to make those preferences known through the marketplace.

Most retail consumers of public power would experience no rate increases under privatization (assuming, that is, that environmentalists do not win bids to own privatized hydroelectric facilities). The reason is that, even though public power is sold to intermediary wholesale purchasers at from 1 to 3 cents per kilowatt-hour, those wholesalers (rural electric cooperatives and municipal utilities) typically resell that power to their customers at market rates—6 to 8 cents per kilowatt-hour. In other words, the retail customers of public power do not receive the public subsidy; the rural electric cooperatives and municipal utilities do.

Sell the Strategic Petroleum Reserve

The federal government maintains a 583-million-barrel Strategic Petroleum Reserve (SPR) of unrefined, generally high-sulfur crude oil in five caverns in Texas and Louisiana. The mission of the SPR, according to the DOE, is “to reduce U.S. vulnerability to economic, national security, and foreign policy consequences of petroleum supply disruptions.” As the oil price spikes of 2000 clearly demonstrated, however, no petroleum reserve—no matter how large—can insulate the United States from the effects of international supply disruptions.

The military rationale for the SPR is dubious. Joshua Gotbaum, former assistant secretary for economic security at the Department of Defense, testified before the Senate in 1995 that the military could fight two major regional wars nearly simultaneously while using only one-eighth of America’s current domestic oil production. And short of a seamless naval embargo, no oil boycott could prevent the United States from purchasing oil in the international marketplace. As noted by MIT economist Morris Adelman: “The danger is of a production cutback, not an ‘embargo.’ The world oil market is one big ocean, connected to every bay and inlet. For that reason the ‘embargo’ of 1973–74 was a sham. Diversion was not even necessary, it was simply a swap of customers and suppliers between Arab and non-Arab sources.”

The idea that the government should buy oil when it is cheap and store it for future use when prices are high seems reasonable at first glance, but the maintenance of a federal reserve discourages private firms from maintaining stockpiles. That’s because it’s very costly to store oil over

time. Private stockpiles make economic sense only if they can be sold at very high prices (which are necessary to recoup storage costs), but the threat that the federal government may flood the market during times of shortage makes firms far less certain that domestic prices would ever stay high enough to ensure a profit on stockpiled oil. In fact, a back-of-the-envelope calculation suggests that—after adjusting for inflation and figuring in the costs of storage and maintenance—the oil in the SPR has cost the treasury at least \$60 a barrel. Yet no serious energy economist expects oil prices to ever equal the price of putting a barrel of oil in the SPR. If one thinks of the SPR as the functional equivalent of an insurance policy, then the premium on the policy exceeds the benefits of the policy.

Although hedging against the risk of supply disruption and temporary shortages may make sense, the maintenance of a physical stockpile is only one way—and a very expensive way—of doing so. Futures markets (for instance, the oil futures market on the New York Mercantile Exchange) provide an alternative to stockpiles by enabling consumers to lock in purchase prices for as long as six years into the future.

Selling the SPR would bring \$16 billion in revenue to the treasury.

Conclusion

The remainder of the DOE's responsibilities could be easily parceled out to independent or semi-independent agencies. The Federal Energy Regulatory Commission and the Energy Information Administration—although nominally within the DOE management structure—are nearly autonomous now and could be made officially so. The DOE's Office of Civilian Radioactive Waste Management, which is responsible for regulating the long-term storage of high-level nuclear waste, could be transformed into an independent agency or placed under the authority of the Department of the Interior.

The views expressed here may be rare in Washington, but they are orthodox among serious economists. As noted by Richard Gordon, professor of mineral economics at Pennsylvania State University and recipient of the International Association of Energy Economists' Outstanding Contributions Award, "The dominant theme of academic writings is that governments have done more harm than good in energy," a view "almost universally supported by academic energy economists, whatever their political outlook."

Eliminating the Department of Energy and most of its nondefense functions would save taxpayers at least \$10 billion annually and tens of

billions more through the privatization of federal assets. Such a step would eliminate what is perhaps the largest slice of corporate welfare in the budget and improve the overall efficiency of the economy—which is burdened, not helped, by federal intervention in the energy market.

Suggested Readings

- Adelman, M. A. *The Genie Out of the Bottle: World Oil since 1970*. Cambridge, Mass.: MIT Press, 1996.
- Block, Michael, and John Shadegg. “Lights Out on Federal Power: Privatization for the 21st Century.” Washington: Progress and Freedom Foundation, October 1996.
- Bradley, Robert L. Jr. *Oil, Gas, and Government: The U.S. Experience*. Lanham, Md.: Rowman & Littlefield, 1996.
- Lee, Thomas, Ben Ball Jr., and Richard Tabors. *Energy Aftermath*. Boston: Harvard Business School Press, 1990.
- Niskanen, William A. “R&D and Economic Growth—Cautionary Thoughts.” In *Science for the 21st Century*. Edited by Claude Barfeld. Washington: AEI Press, 1997.
- Robinson, Colin. “Energy Economists and Economic Liberalism.” *Energy Journal* 21, no. 2 (2000).
- Stelzer, Irwin. *The Department of Energy: An Agency That Cannot Be Reinvented*. Washington: American Enterprise Institute Studies in Policy Reform, 1996.
- Taylor, Jerry, and Peter VanDoren. “Evaluating the Case for Renewable Energy: Is Government Support Warranted?” Cato Institute Policy Analysis no. 422, January 10, 2002.
- VanDoren, Peter. *Politics, Markets, and Congressional Policy Choices*. Ann Arbor: University of Michigan Press, 1991.
- Wirl, Franz. *The Economics of Conservation Programs*. Boston: Kluwer, 1997.

—Prepared by Jerry Taylor

