

## DOCUMENT RESUME

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Ways to Strengthen Congressional Control of Energy Construction Projects Other Than Nuclear. EMD-77-25; B-178726. February 25, 1977. Released March 10, 1977. 3 pp. + enclosures (21 pp.).

Report to Sen. Henry M. Jackson, Chairman, Senate Committee on Energy and Natural Resources; Rep. Olin E. Teague, Chairman, House Committee on Science and Technology; by Robert F. Keller, Acting Comptroller General.

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The Energy Research and Development Administration's (ERDA) budgeting, accounting, and reporting procedures associated with construction-related activities for nonnuclear energy research and development projects were reviewed. The purpose of the review was to determine the extent to which existing legislative reporting requirements provide Congressional committees with information necessary for effective control over the funding of such projects. Of particular interest was ERDA's compliance with the reporting and specific authorization requirements of the Federal Nonnuclear Energy Research and Development Act of 1974.

Findings/Conclusions: These requirements are inadequate because they are vague and allow selective interpretation, thus limiting the ability of Congress to control nonnuclear energy projects. ERDA has not established any specific criteria for use in identifying the types of nonnuclear energy projects subject to the reporting or specific authorization requirements. The 1974 act is not clear about which type of projects must be reported or specifically authorized. Nowhere in the act are types of projects specifically defined. Recommendations: ERDA should develop legislation which would clarify the act on the types of projects requiring reports or specific authorizations. ERDA should develop and provide the authorization committees with its definitions of the various project phases together with an identification of the phase of each nonnuclear energy project meeting the minimum cost criteria for reports or specific authorization. (RRS)

00174

... to the General  
by the Office of the General



**REPORT OF THE  
COMPTROLLER GENERAL  
OF THE UNITED STATES**

**RELEASED**  
3/10/77

**Ways To Strengthen Congressional  
Control Of Energy Construction  
Projects Other Than Nuclear**

**Energy Research and Development Administration**

Two congressional committees asked GAO to determine the extent to which existing reporting and specific authorization requirements for nonnuclear energy projects enable the Congress to effectively control the funding of such projects.

In essence, GAO found that the existing legislative requirements are inadequate because they are vague and enable the Energy Research and Development Administration to interpret them selectively; thus, effectively limiting the ability of the Congress to control nonnuclear energy projects.

There were also other weaknesses related to the budgeting, accounting, and reporting for such projects which have similar impacts. GAO made several recommendations to enhance congressional oversight and control over them.



COMPTROLLER GENERAL OF THE UNITED STATES  
WASHINGTON, D.C. 20548

B-178726

To the Chairmen, Committee on Energy and Natural Resources, United States Senate, and Committee on Science and Technology, House of Representatives

In response to your joint request of October 26, 1976, and later discussions with the Committees' staffs, we reviewed the Energy Research and Development Administration's (ERDA) budgeting, accounting, and reporting associated with construction-related activities under nonnuclear energy research and development projects authorized by various legislation.

The Committees' principal interest was to determine the extent to which existing legislative reporting requirements are suitable for providing the Committees with information necessary for their effective control over the funding of such projects. The Committees were particularly interested in ERDA's compliance with the reporting and specific authorization requirements of the Federal Nonnuclear Energy Research and Development Act of 1974 (Public Law 93-577).

In essence, we found that these requirements are inadequate because they are vague and enable ERDA to selectively interpret them, thus effectively limiting the ability of the Congress to control nonnuclear energy projects. Our findings and recommendations to enhance congressional oversight and control over such projects are summarized below and set out in detail in enclosure I.

Under the Federal Nonnuclear Energy Research and Development Act of 1974, ERDA must seek specific authorization from the Committees for demonstration projects when the estimated Federal investment in construction costs exceeds \$50 million and must submit comprehensive reports to the Committees prior to starting demonstration projects when the Federal investment in construction costs is estimated at \$25 million to \$50 million. ERDA officials told us that they will submit reports on, or request specific authorization for projects pursuant to these requirements only if the projects meet ERDA's interpretation of the term "demonstration project." However, ERDA has not established any specific criteria for use in identifying the types of nonnuclear energy projects subject

to the reporting or specific authorization requirements, and was unable to provide us with its interpretation of the term. At our request, ERDA is currently developing its definitions of the various types of nonnuclear energy projects.

In our opinion, the Federal Nonnuclear Energy Research and Development Act of 1974 is not clear relative to which types of projects must be reported or specifically authorized. In some instances, the act appears to group both pilot plants and demonstration plants into a single class of projects; whereas, elsewhere in the act, these plants are discussed as if they were separate classes of projects. Also, nowhere in the act are these types of projects specifically defined. Accordingly, the use of terms such as "pilot plant" and "demonstration project" in setting out the reporting and specific authorization requirements is vague and subject to interpretation.

We are recommending that the Committees develop legislation which would clarify the act on the types of projects requiring reports or specific authorizations. To assist the Committees in their consideration of how broadly the reporting or specific authorization requirements should apply, we are also recommending that ERDA develop and provide the authorization Committees with its definitions of the various project phases together with an identification of the phase of each nonnuclear energy project meeting the minimum cost criteria for reports or specific authorization. This should include those projects which are currently operational, under construction, or planned, including those projects requested for authorization in the fiscal year 1978 budget submission.

In addition, we are recommending that the Committees adopt more stringent funding controls over those nonnuclear energy construction projects which are, or will be, funded by operating expense appropriations. Some alternative controls, each with a different degree of impact on ERDA's funding flexibility, are identified in the enclosure.

In order to correct other problems noted during our review, we are recommending that the Administrator, ERDA:

- Budget and account for test facilities and projects involving facilities and major equipment having potential for continued industrial use, as capital projects.

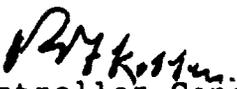
- Separately budget for the detailed design costs of large, complex operating expense projects in a manner similar to certain capital projects.
- Specify to the appropriate congressional committees ERDA's criteria for determining those types of projects for which expanded information will be provided in the budget submission and consistently apply that criteria.
- Direct that projects with substantial Federal support of construction costs funded from operating expense appropriations be included in the reports periodically provided to various congressional committees on the status of projects funded by plant and capital equipment appropriations.

As you know, section 236 of the Legislative Reorganization Act of 1970 requires the head of a Federal agency to submit a written statement on actions taken on our recommendations to the House and Senate Committees on Government Operations not later than 60 days after the date of the report, and to the House and Senate Committees on Appropriations with the agency's first request for appropriations made more than 60 days after the date of the report.

Copies of this report will be sent to ERDA so that the requirements of section 236 can be set in motion.

Our review was conducted at ERDA headquarters in Washington, D.C., and Germantown, Maryland. We discussed the matters reviewed with ERDA officials; however, due to our commitment to report to the Committees, their specific comments on our conclusions and recommendations were not available in time to be considered in the preparation of this report.

Sincerely yours,

  
Comptroller General  
of the United States

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ENCLOSURES

ENCLOSURES

GAO'S COMMENTS ON BUDGETING,  
ACCOUNTING, AND REPORTING FOR  
NONNUCLEAR ENERGY CONSTRUCTION  
PROJECTS

Energy Research and Development  
Administration

OPPORTUNITIES TO ENHANCE CONGRESSIONAL  
OVERSIGHT AND CONTROL OF ERDA'S  
NONNUCLEAR ENERGY CONSTRUCTION PROJECTS

In a joint request dated October 26, 1976, from the Chairmen, Senate Committee on Interior and Insular Affairs (now the Committee on Energy and Natural Resources) and the House Committee on Science and Technology, and during subsequent discussions with the Committees' staffs, we were asked to examine:

- ERDA's compliance with various legislative requirements for authorizing nonnuclear energy research and development projects, especially those for demonstration projects under the Federal Nonnuclear Energy Research and Development Act of 1974 (Public Law 93-577);
- ERDA's budgeting and accounting procedures for such projects; and
- the extent to which information on these projects is being provided to the Committees.

ERDA conducts its nonnuclear energy research and development program under the general authority granted to it by the Energy Reorganization Act of 1974 (Public Law 93-438). Although this act created ERDA, it did not contain provisions for authorizing specific project activities. Such activities, which in many cases result in substantial Federal investment in facilities constructed under projects to research and demonstrate new energy technologies, are authorized under various other legislative requirements.

Under the Federal Nonnuclear Energy Research and Development Act of 1974, ERDA is authorized to establish research, development, and demonstration projects in various nonnuclear energy technologies. Section 8 of the act requires ERDA to (1) seek specific authorization of any demonstration project where the estimated Federal investment in construction costs exceeds \$50 million and (2) provide a comprehensive report to appropriate congressional committees before funds are expended on any demonstration project where the Federal investment in construction costs is estimated at \$25 million to \$50 million.

ERDA's annual authorization acts cover the construction and acquisition of projects funded from plant and capital equipment appropriations (capital projects), as well as

research, test, or experimental projects funded from operating expense appropriations (operating expense projects). Under section 314 of its fiscal year 1976 authorization act (Public Law 94-187), ERDA can use its fossil energy operating expense appropriations for constructing facilities at locations other than ERDA installations. If the estimated construction cost of such a project exceeds \$250,000, ERDA is required to report its nature, purpose, location, and estimated cost to the authorization Committees before using operating expense appropriations. An identical provision was agreed to by the House and Senate conferees in considering ERDA's fiscal year 1977 authorization, which was not enacted during the 94th Congress.

Under section 105 of the Geothermal Energy Research, Development, and Demonstration Act of 1974 (Public Law 93-410) and section 7 of the Solar Energy Research, Development, and Demonstration Act of 1974 (Public Law 93-473), specific authorization of a demonstration project is required where the estimated Federal investment in construction and cost of operations exceeds \$10 million and \$20 million, respectively. The programs authorized by these acts were incorporated into those authorized by the Federal Nonnuclear Energy Research and Development Act of 1974.

In cases where reporting requirements apply, a waiting period of either 30 or 60 days is required to allow the Committees to consider the projects and, if warranted, to object to any of them.

During our review we noted that certain of the legislative reporting and authorization requirements are inadequate because they are vague and enable ERDA to selectively interpret them. This limits the degree to which ERDA provides information to the Congress on nonnuclear energy projects, thereby impacting on the extent to which the Congress can exercise its oversight and control over such projects. There were also other weaknesses related to ERDA's accounting, budgeting, and reporting for nonnuclear energy construction projects which have similar impacts, and several opportunities were identified to enhance the Committees' oversight and control by:

- Clarifying the Federal Nonnuclear Energy Research and Development Act of 1974.
- Tightening ERDA's budgeting and accounting criteria for certain construction projects.
- Improving ERDA's initial project cost estimates.

--Having ERDA provide better information to the Congress on operating expense projects.

We also identified a number of alternative means by which the Committees can further increase their control over the funding of nonnuclear energy construction projects.

NEED TO CLARIFY THE FEDERAL NONNUCLEAR ENERGY RESEARCH AND DEVELOPMENT ACT OF 1974

There is a need to clarify the specific types of projects subject to the reporting or specific authorization requirements of section 8 of the Federal Nonnuclear Energy Research and Development Act of 1974. Although the term "demonstration project" is used, the act does not provide a precise definition of what the term encompasses. Also, the various uses of the term "pilot" and "demonstration" in section 8 are ambiguous. Section 8(d)(2) apparently distinguishes between demonstration and pilot plants by requiring that project proposals include both a description of prior pilot plant operating experience and a preliminary design of the demonstration plant. However, section 8(a)(1) links demonstration plants to pilot plants by specifying that the Administrator of ERDA is authorized to

"\* \* \* provide Federal assistance for or participation in demonstration projects (including pilot plants demonstrating technological advances and field demonstrations of new methods and procedures, and demonstration of prototype commercial applications for the exploration, development, production, transportation, conversion, and utilization of energy resources) \* \* \*"

As mentioned previously, the act requires that demonstration projects requiring more than \$50 million in Federal support of construction costs be specifically authorized and that reports be submitted to the authorization committees on such projects requiring \$25 million to \$50 million in Federal support of construction costs. We identified a number of large projects involving the construction of facilities for use as part of ERDA's nonnuclear energy research and development program (see enclosure II). Several of the projects which exceed \$50 million in estimated Federal costs of construction were not requested for specific authorization. Also, ERDA has not submitted comprehensive reports to the authorization committees for a number of projects where the estimated Federal investment in construction costs ranges from \$25 million to \$50 million.

We found that projects were not reported or specifically authorized under the section 8 requirements because ERDA did not consider them to be "demonstration projects." ERDA officials told us that they categorize projects into various phases, such as process development unit, pilot plant, demonstration plant, and commercial demonstration plant. Consequently, since the Federal Nonnuclear Energy Research and Development Act of 1974 does not provide a precise definition of the kinds of projects subject to the section 8 requirements, ERDA officials believe they can interpret the requirements in line with their own understanding of the term "demonstration project."

Specific criteria which identifies the characteristics of the various project phases are needed to determine the types of projects requiring reports or specific authorizations under section 8. However, ERDA has not established such criteria and was unable to provide us with its interpretation of the term "demonstration project."

In a November 30, 1976, letter to ERDA's Controller, we requested definitions of the various project phases, including the demonstration phase. As of mid-February 1977 we had not received a reply. In following up on our request with ERDA officials, we were told that there were no internally consistent definitions of project phases for use by all nonnuclear energy programs. However, in response to our letter, ERDA is now developing such definitions.

In our opinion, the language of the Federal Nonnuclear Energy Research and Development Act of 1974 should be clarified to identify the types of projects which must be reported or specifically authorized. In order to consider how broadly the section 8 requirements should apply, the authorization Committees should have information on ERDA's definitions of the various project phases and an identification of the phase of each nonnuclear energy project meeting the minimum cost criteria of section 8. We believe that ERDA should develop and provide its definitions of the various project phases to the authorization Committees together with an identification of the phase for each nonnuclear energy project meeting the minimum cost criteria of section 8. This should include those projects which are currently operational, under construction, or planned, including those projects requested for authorization in the fiscal year 1978 budget submission.

ERDA'S BUDGETING AND ACCOUNTING  
CRITERIA FOR CERTAIN CONSTRUCTION  
PROJECTS SHOULD BE TIGHTENED

ERDA needs to tighten its criteria for determining whether construction projects should be funded by operating expense appropriations or plant and capital equipment appropriations. We found that in applying the criteria, ERDA had funded, or planned to fund, a number of large construction projects as operating expense projects. We believe that some of these projects should have been treated as capital assets and funded under ERDA's plant and capital equipment appropriations. These are test facilities and certain other projects involving facilities and major equipment having potential for continued industrial use.

By requesting construction projects to be funded by operating expense appropriations, ERDA's program divisions appear to have greater assurance that such projects will be funded and greater flexibility in using the funds provided. For example:

- The budget impact of nonnuclear energy projects seems less significant when viewed as part of a \$4-5 billion operating expense appropriation request rather than a plant and capital equipment appropriation request of about \$1 billion.
- Operating expense projects are less visible in the budget submission.
- ERDA's program divisions have gotten a greater portion of their requests for operating expense appropriations approved as part of the budget submission to the Congress than their requests for plant and capital equipment appropriations.
- ERDA has greater flexibility in using its operating expense appropriations as compared to its plant and capital equipment appropriations.

In determining whether a project should be funded by operating expense or plant and capital equipment appropriations, ERDA has adopted criteria established by its predecessor, the Atomic Energy Commission. This criteria is contained in ERDA's accounting manual and, in part, provides that research and development activities are considered to be operating expenses for funding purposes. The manual states that such activities:

"\* \* \* include all work up to the time when the ideas or conceptual design for the project \* \* \* are ready for preliminary design work \* \* \*."

The manual states that construction activities should be funded under plant and capital equipment appropriations and notes that such activities:

"\* \* \* include the design and engineering for a specific project \* \* \*; the procurement, fabrication, erection, and installation of all materials and equipment \* \* \* comprising the project; the preparation of operating manuals; and the preoperational testing of the components in the project."

Generally, facilities and major equipment are considered to be capital items and are budgeted for funding by plant and capital equipment appropriations.

However, ERDA's criteria provides an exception which permits facilities related to experimental projects to be budgeted, accounted for, and reported on as operating activities and not as capital projects. In this regard, the criteria states that to qualify as an experimental project, the facility must be related to a specific investigation; that is, it cannot be multipurpose. In addition, an experimental project must have an operating life of less than 3 years in order to be funded as an operating expense project. If an experimental project's operating life is expected to be 3 years or more, it is to be funded as a capital project.

Test facilities should be funded as capital projects

During our review, we noted instances where ERDA's criteria for experimental projects were apparently being violated. Projects with an expected operating life longer than 3 years and with multiple experimental objectives were being funded by operating expense appropriations. For example, the Geothermal Component Test Facility, with a total estimated Federal cost of \$48 million, is to be used by industry, university and government laboratories, and private individuals to test processes, prototype components, and proprietary concepts. Similarly, the Hot Brine Test Facility, with a total estimated Federal cost of from \$36 million to \$41 million, will test components and materials for geothermal equipment

and processes. ERDA program officials told us that these facilities may operate for as long as 13 and 11 years, respectively.

ERDA accounting officials told us that decisions on whether projects were to be funded as capital or operating expense projects, were based on balanced judgments of various factors, such as the nature and purpose of the facilities, useful operating life of the project, and potential for ERDA's continued use of the facilities. An ERDA budget official claimed that it was not clear that these test facilities were multipurpose. However, since they are for testing various materials, components, equipment, concepts, and processes, they do not, in our opinion, meet the specific investigation criterion. This budget official further noted that the operating life of the facilities could exceed 3 years since the life-of-project criterion had to be balanced with the project's experimental objective in deciding how it should be funded. However, as we previously noted, the length-of-life criterion is applied to determine how an experimental project should be funded. There are no exceptions to treating test facilities as capital projects when they are expected to operate for 3 years or more.

In contrast to the operating expense funding of non-nuclear test facilities, we noted that a number of test facilities appear as capital projects under ERDA's nuclear program. These projects include the Plant Component Test Facility at Oak Ridge, Tennessee, and the proposed Plant Component Test Facilities to be built at the Liquid Metal Engineering Center in California.

We believe ERDA should sufficiently tighten its criteria to avoid similar misinterpretations in the future. We believe that because of the nature and purpose of test facilities and their potential for having useful lives of greater than 3 years, all such facilities should be treated as capital assets and funded accordingly. This would make such facilities more visible in the ERDA budget and would provide congressional committees with a better opportunity to assess the reasonableness of the facilities' objectives and required funding.

Facilities and equipment with potential industrial use should be funded as capital projects

ERDA's criteria does not recognize the potential for continued industrial use of near-commercial or commercial size equipment.

Interestingly, ERDA's criteria notes that

"\* \* \* where it is expected that the experiment will become a productive facility even though primarily constructed for experimental purposes, it shall be treated as a construction project for budgeting and accounting purposes."

ERDA budget officials told us, however, that "productive facility" means productive only for ERDA's purposes under its continuing ownership. Therefore, projects using near-commercial or commercial size equipment can be budgeted and accounted for as operating expense projects, because the probability that their successful operation would trigger continued use by industry does not have to be considered. For example, ERDA budget officials told us that the 50 Megawatt Geothermal Demonstration Plant for generating electricity from a geothermal source hopefully will continue to be operated by industry after ERDA withdraws from the project at the end of the demonstration period. However, as far as ERDA is concerned, the project is properly requested in the fiscal year 1978 budget as an operating expense project.

ERDA accounting officials emphasized that if a project's scope changes so that it was no longer an experimental project, the value of the facility and its equipment could be capitalized even though they were funded by operating expense appropriations. However, the decision to capitalize may not be made until long after the costs of the facility and equipment were funded. Consequently, the costs may not be readily ascertainable.

We believe ERDA's application of the "productive facility" criterion is too narrow. In our opinion, facilities and associated major equipment which reasonably can be expected to have continued use should be funded as capital projects, without regard to the identity of the ultimate operator of such facilities.

#### THE INITIAL COST ESTIMATES FOR PROJECTS COULD BE IMPROVED

ERDA needs to improve its initial cost estimates by using advanced planning and design funds to support the early construction-related architectural and engineering costs of large, complex operating expense projects. This would provide the authorization Committees with better cost estimates for their use in deciding whether operating expense projects should be funded.

The total estimated cost of a capital project includes all costs of architectural and engineering design, construction, installation, and land acquisition. The total estimated cost does not include the research and development preceding, or the operating costs following, construction. However, in ERDA's budget submission these costs are usually identified along with other related costs. The total estimated cost of an operating expense project includes all of these costs.

In seeking initial authorization for capital or operating expense projects, ERDA provides construction cost estimates which are often based on sketchy information. This is due to a number of factors, including the timing of project proposals in relation to the budget cycle, the requirements of authorizing legislation, and ERDA's criteria applicable to budgeting for construction projects. For example, ERDA officials told us that reports on or requests for specific authorization of demonstration projects should be submitted as soon as a firm decision is made to construct a facility; that is, before funds are obligated for facility design. At such an early date, the project cost estimates provided to the Congress are preliminary and are not based on a definitive engineering evaluation of an approved project design. At the time preliminary estimates are made, such crucial matters as the location and size of the facility and the specific technology to be used may not have been decided. Obviously with such vital unknowns the preliminary cost estimates can best be characterized as "educated guesses."

ERDA requests that the Congress initially authorize and fund projects regardless of how definitive the available construction cost estimates are. Once a project is started, there may be a natural reluctance to terminate it because of the investment already made, even when the project experiences substantial cost growth.

Substantial increases in cost estimates often result when detailed cost estimates, based on engineering studies, are prepared. For example, ERDA's budget request for the Component Development and Integration Facility project was initially based on a preliminary construction cost estimate of \$20 million. The project is intended to test and evaluate magnetohydrodynamic components for the purpose of improving the technology and providing the basis for a pilot plant. It was initiated with fiscal year 1976 supplemental budget funds. While still in fiscal year 1976, the estimate rose sharply to \$31.5 million partly based on an engineering study of a more exact (but still incomplete) facility description. The construction estimate has since grown further to \$37 million.

On the Combined Cycle Test Facility (Powerton) project, ERDA had included preliminary cost estimates in a report to the authorization Committees in April 1976, as follows:

<u>-----Cost estimates-----</u>			
	<u>ERDA's</u> <u>share</u>	<u>Others'</u> <u>share</u>	<u>Total</u>
<u>------(millions)-----</u>			
Engineering design and supervision	\$14.6	\$ 7.4	\$ 22.0
Construction, including supervision	22.9	22.9	45.8
Operations	<u>24.7</u>	<u>12.4</u>	<u>37.1</u>
Total	<u>\$62.2</u>	<u>\$42.7</u>	<u>\$104.9</u>

ERDA's construction-related costs were estimated at \$37.5 million. The report did not indicate what the vital unknowns or constraints were which would impact significantly on the reliability of the project construction cost estimate. The estimate was merely labeled "preliminary."

A definitive estimate prepared in June 1976 by an engineering firm showed the following:

<u>-----Cost estimates-----</u>			
	<u>ERDA's</u> <u>share</u>	<u>Others'</u> <u>share</u>	<u>Total</u>
<u>------(millions)-----</u>			
Engineering design and supervision	\$ 15.0	\$ 8.0	\$ 23.0
Construction, including supervision	61.3	30.6	91.9
Operations	<u>39.7</u>	<u>12.4</u>	<u>52.1</u>
Total	<u>\$116.0</u>	<u>\$51.0</u>	<u>\$167.0</u>

In comparison to the preliminary cost estimates, ERDA's estimated financial commitment grew substantially to \$76.3 million for construction-related costs. Most of this growth was due to an increase in the project's total estimated construction-related costs from \$67.8 million to \$114.9 million.

ERDA believes that its cost estimates for large, complex construction projects could be more reliable if it could perform sufficient engineering and design work on project feasibility, scope, and cost. For fiscal years 1977 and 1978, ERDA requested \$7.2 million and \$10.0 million, respectively, to support advanced construction planning and design work on a few large, complex construction projects. However, ERDA officials told us that such authorization requests are meant to support future capital projects, not operating expense projects.

ERDA COULD PROVIDE BETTER  
INFORMATION TO THE CONGRESS  
ON OPERATING EXPENSE PROJECTS

ERDA believes it has kept, and claims it will continue to keep, the appropriate congressional committees fully informed about energy facility construction and other research and development projects, regardless of whether such projects are funded out of operating expense or plant and capital equipment appropriations. ERDA provides extensive information on capital projects and has begun with the fiscal year 1978 budget submission to provide the Congress with expanded information on certain operating expense projects.

Our work showed, however, that ERDA was not consistent in its selection of projects for which expanded information was provided. In addition, ERDA was not consistent in reporting on construction projects once they had been authorized. Although the status of capital projects was extensively reported to the Congress, there was no similar reporting for operating expense projects.

Information provided to the  
Congress on capital projects

Information is provided routinely to the Congress on capital projects in two ways. First, the budget describes projects proposed for authorization and previously authorized projects requiring appropriations. Information provided relates mainly to detailed construction cost estimates. For projects proposed for authorization, ERDA submits construction project data sheets which provide more detailed information on each project's time schedule, cost, purpose, justification, and scope. ERDA officials told us that their general rule on capital projects is to provide information on the research and development, annual operating, and other related costs to provide the Congress with a complete picture of the total costs for such projects.

The second source of information on capital projects is the status report on construction projects which is sent twice yearly to various congressional committees. This report shows time schedule and cost estimates, both original and revised, and the estimated degree of completion for projects.

Information provided to the Congress  
on operating expense projects

Once operating expense projects are authorized, ERDA does not make periodic external reports on their status, even though it requires that such projects be subject to the same construction cost controls as capital projects. Because operating expense projects are managed by ERDA in a manner similar to capital projects, their status could be reported in a manner similar to capital projects. We believe that once projects are authorized, their status should be periodically reported to congressional committees in the same way the status of capital projects are reported.

Prior to fiscal year 1978, operating expense projects were not highlighted or extensively described in ERDA's budget submissions. In its fiscal year 1978 budget submission, ERDA provided significantly more information on nonnuclear energy operating expense projects. This information generally included brief descriptions of the projects, including their objectives, locations (if known), and total estimated construction and operating costs. ERDA budget officials stated that the expanded information was provided on all such projects estimated to require \$5 million or more in Federal support of facility construction costs. However, we identified some projects which appeared to meet this criteria but did not receive detailed treatment in the budget, as follows:

<u>Project</u>	<u>Estimated Federal commitment to construction</u>
	(millions)
4.8 MW Fuel Cell Demonstration	\$ 10.2
Early Ocean Test Platform	12.2
Geothermal Component Test Facility	25.1
Hot Brine Test Facility	19-24
Geothermal Loop Experimental Test Facility	5.2

According to ERDA budget officials, the fuel cell project should have received detailed reporting in the fiscal year 1978 budget submission but it was inadvertently overlooked. They

also indicated that ERDA had not yet decided to proceed with the ocean test platform; therefore, it was not shown in detail. However, according to the fiscal year 1978 budget submission, refitting of a barge to serve as the ocean platform was to start in fiscal year 1977 and fiscal year 1978 funds were being requested to continue the refitting. Consequently, ERDA appears to have made a firm decision to carry out the project.

With respect to the geothermal and hot brine facilities, ERDA officials stated that their construction would be completed by fiscal year 1978 and only operating funds would be needed. Therefore, they stated there was no need to provide expanded information on these facilities in the fiscal year 1978 budget submission. However, we noted that expanded information was provided on fossil energy projects which are also scheduled to be operating in fiscal year 1978. In addition, we noted that fiscal year 1978 funds are being requested to begin construction on the Hot Brine Test Facility.

Thus, ERDA has been inconsistent in applying its criteria for providing expanded information on nonnuclear energy construction projects. We believe in order to better achieve its objective of keeping the Congress fully informed about operating expense projects, ERDA needs to specify its criteria for selecting projects on which expanded information is to be provided and consistently apply that criteria.

#### Satisfying authorization act reporting requirements

Our review of ERDA's compliance with the reporting requirements under section 314 of its fiscal year 1976 authorization act showed that it initially did not provide sufficient information on most of the projects requiring reports. In this regard, section 314 required ERDA to submit such reports to the authorization committees on any fossil energy project involving the expenditure of operating expense appropriations in excess of \$250,000 for constructing facilities at locations other than its installations. The reports were required to be submitted at least 30 days prior to starting such projects. The information required in the reports included the nature, purpose, location, and estimated cost of each project.

In initially carrying out this reporting requirement, ERDA submitted an April 1976 letter to various congressional committees which listed its fossil energy projects on a schedule. The schedule provided the name and location (if known) of each proposed project, the estimated total value of the contract, estimated obligations for the current fiscal year, planned contract award date, and the procurement status

of the project. The schedule, however, did not contain information on the purpose and scope of any of the projects and, in some cases, project location had not been determined at the time the schedule was prepared.

On a few projects with a potentially large Federal investment, ERDA submitted detailed reports to the authorization committees. These reports contained information similar to that in project data sheets plus information on the estimated cost of the Government's future commitment to support project operating costs, the Government's rights in property and equipment, and the projects' environmental impact and safety features.

ERDA budget officials told us that the expanded information on individual projects included in the budget beginning with the fiscal year 1978 request is expected to satisfy some of the requirements for section 314 reporting and similar requirements in future authorization acts relative to fossil energy projects. They also pointed out that the additional details on specific projects provided in each fiscal year's fossil energy program plan supporting the budget help to further satisfy the reporting requirements. The program plan describes the various fossil energy technologies, discusses the status of projects using each technology, illustrates the performance schedule, and shows the total estimated Federal budget authority for each fiscal year through the year covered by the report.

Accordingly, the authorization act reporting requirements are being met for those projects on which expanded information is provided in the ERDA budget submission and related support. ERDA budget officials further stated that separate reports would have to be prepared for those fossil energy projects on which sufficient information is not provided in the budget submission and related support. Such separate reports, therefore, would have to discuss the nature, purpose, location, and estimated cost of each project.

#### OTHER ALTERNATIVES FOR INCREASING CONGRESSIONAL CONTROL OVER THE FUNDING OF OPERATING EXPENSE PROJECTS

Once funds are authorized and appropriated for operating expense activities, there is no funding ceiling on individual projects. ERDA can increase the funding for an operating expense project without seeking congressional review and approval, provided its use of operating expense appropriations is within the scope of that appropriation and does not violate any specific legislative provisions or reprogramming criteria.

The extent to which ERDA can increase the funding of an operating expense project substantially beyond what it had indicated it needed in the budget is subject to certain constraints. As one congressional committee pointed out in its report on an appropriation bill:

"In a strictly legal sense \* \* \* [the Agency] could utilize the funds appropriated for whatever programs were included under the individual appropriation accounts, but the relationship with the Congress demands that the detailed justifications which are presented in support of budget requests be followed. To do otherwise would cause Congress to lose confidence in the requests made and probably result in reduced appropriations or line item appropriation bills."

One means of accommodating both an agency's desire for flexibility and Congress' desire for control, is the development of reprogramming procedures under which congressional committees are kept informed of certain departures from budget justifications. These procedures vary from agency to agency both in the degree of formality and the extent of committee input. In some cases, the agency is only required to notify committees of reprogramming actions already taken. However, certain reprogramming action may be subject to prior committee approval.

Reprogramming requirements can be stated in legislation. For example, ERDA's fiscal year 1976 authorization act prohibited any increase in existing nonnuclear energy programs or addition of new programs without a report to, and prior approval of, the authorization committees. In addition, certain nonnuclear energy programs and subprograms could not be reduced by more than 10 percent. The legislative reprogramming requirements did not specifically relate to projects.

In addition to the legislative reprogramming requirements described above, ERDA needs congressional approval for any reprogramming action which results in increases in program areas previously cut by the Congress, or involves new items estimated to cost \$500,000 in the current fiscal year or \$3 million over a 3-year period. ERDA budget officials told us that they would use their discretion in determining whether any lesser change should trigger a reprogramming notification or approval. ERDA can, therefore, apply more operating expense appropriations to specific projects than indicated in its budget submission without notifying or

seeking approval of any congressional committee, except where the action meets certain legislative or ERDA reprogramming criteria.

Consequently, the Committees should consider alternative ways of further controlling the level of funding ERDA can apply to individual nonnuclear energy projects. Some of the alternatives, each with a different degree of impact on ERDA's flexibility, would be to:

- Authorize operating expense projects on a line item basis.
- Specify an allowable limit (percentage or dollar increase) to the additional operating expense funding of projects beyond which ERDA could not fund projects without congressional review and reauthorization.
- Specify reprogramming criteria for ERDA to follow in notifying the authorization committees of increases in a project's funding over what had been indicated in the budget submission.

### CONCLUSIONS

There is a need to clarify the specific types of projects subject to the reporting or specific authorization requirements of section 8 of the Federal Nonnuclear Energy Research and Development Act of 1974. In order to consider how broadly these requirements should apply, ERDA should provide the authorization committees with certain information. The information should include the definitions of the various project phases and an identification of the phase of each nonnuclear energy project meeting the minimum cost criteria of section 8. This would pertain to those projects which are currently operational, under construction, or planned, including those projects requested for authorization in the fiscal year 1978 budget submission.

ERDA's criteria for deciding whether to budget, account, and report activities as research and development expenses or capital construction projects should be tightened to eliminate the operating expense funding for projects using near-commercial or commercial size equipment where the facilities and major equipment have a potential continued industrial use. Such facilities and major equipment should be initially budgeted and accounted for as capital assets. In addition,

ERDA's criteria should be revised to prohibit the operating expense funding of test facilities.

Information on the estimated construction costs provided to the Congress by ERDA in seeking authorization of nonnuclear energy projects is not generally based on an engineering estimate made of a set plant design. ERDA should improve the quality of its construction cost estimates by budgeting separately for architectural-engineering services on large, complex operating expense projects similar to the way it does for large, complex capital projects.

The information provided by ERDA in its budget submission on a variety of nonnuclear energy projects has increased substantially. For many projects, the descriptions in the budget submission and the related fossil energy program plan provide sufficient information to satisfy the reporting requirements of the authorization act. However, ERDA should specify and consistently apply its criteria for selecting projects on which expanded information will be provided.

Reports on operating expense projects with substantial Federal support of construction costs should be included in the reports on the status of capital projects periodically furnished to various congressional committees.

Since ERDA treats a number of large nonnuclear energy projects as experimental projects and funds their construction-related activities with operating expense appropriations, the authorization Committees should consider alternative mechanisms to enhance their control over the funding for such projects.

#### RECOMMENDATIONS TO THE ADMINISTRATOR, ERDA

We recommend that the Administrator of ERDA:

- Develop and provide the authorization Committees with definitions of the various project phases and an identification of the phase of nonnuclear energy projects meeting the section 8 cost criteria which are currently operational, under construction, or planned, including those projects requested for authorization in the fiscal year 1978 budget submission.
- Budget and account for test facilities and projects involving facilities and major equipment having potential for continued industrial use, as capital projects.

- Budget separately for the detailed design costs of large, complex operating expense projects under the operating expense appropriations, in a manner similar to certain capital projects.
- Specify to the appropriate congressional committees the criteria for determining those types of operating expense projects for which expanded information will be provided in the budget submission and consistently apply that criteria.
- Direct that operating expense projects with substantial Federal support of construction costs be included in the reports periodically provided to various congressional committees on the status of capital projects.

RECOMMENDATIONS TO THE  
AUTHORIZATION COMMITTEES

We recommend that the authorization Committees, upon reviewing the definitions and related information to be provided by ERDA,

- develop legislation which would clarify the Federal Nonnuclear Energy Research and Development Act of 1974 to describe the section 8 projects requiring reports or specific authorizations; and
- adopt more stringent controls over ERDA's funding of each nonnuclear energy construction project in line with the alternatives previously discussed in the report.

NONNUCLEAR ENERGY PROJECTSPLANNED OR UNDERWAY WITH TOTAL ESTIMATEDFEDERAL COMMITMENT OF \$25 MILLION OR MORE (note a)

<u>Program/project title</u>	<u>Estimated Federal commitment</u>		<u>Current status</u>
	<u>Total</u>	<u>Construction</u>	
	----- (millions) -----		
Fossil energy:			
Cresap Test Facility	\$ 88.3	\$ 38.5	Under construction
Synthoil Process Development Unit	87.1	27.0	Under construction
H-Coal Pilot Plant	142.6	89.7	Under construction
Combined Cycle Test Facility (Powerton)	116.0	64.6	Under design-- construction to begin early 1977
Synthane Pilot Plant	89.2	22.0	Operational
Steam Iron Pilot Plant	29.0	14.0	Construction completed
Hygas Pilot Plant	38.5	12.0	Operational
CO2 Acceptor Pilot Plant	37.7	9.3	Operational
Bi-Gas Pilot Plant	103.0	40.0	Operational
Solvent Refined Coal Pilot Plant	164.4	32.0	Operational
Combined Cycle Test Facility (Woodbridge)	45.0	20.6	Under design
Fluidized-Bed Boiler, 30 MW Pilot Plant	42.6	24.5	Completing construction
Donor Solvent Extraction Power Plant	121.2	54.5	Planning
Clean Boiler Fuel Demonstration	254.0	178.0	Under design; delayed

<u>Program/project title</u>	<u>Estimated Federal commitment</u>		<u>Current status</u>
	<u>Total</u>	<u>Construction</u>	
----- (millions) -----			
High-Btu Demonstrations: (note b)			
Plant 1	c/\$361.5	\$220.0	Contract negotiation
Plant 2	310.0	246.0	Contract negotiation
Low-Btu Demonstration:			
Industrial Hydrogen from	d/205.3	150.0	Contract negotiation
Coal Facility	87.0	47.0	Contract negotiation
Component Development and Integration Facility	e/46.1	37.0	Under construction
Atmospheric Fluidized-Bed Demonstration	219.0	162.0	Planning
Solar energy:			
5 MW Solar Thermal Test Facility	f/31.4	21.2	Under construction
10 MW Central Receiver Solar Thermal Pilot Plant	g/132.0	110.0	Under design
Early Ocean Test Platform	25.3	12.2	Under design and construction
Geothermal:			
50 MW Demonstration Plant	h/65-75	50-60	Planning
Component Test Facility	48.0	25.1	Operation to begin early 1977
Hot Brine Test Facility	36-41	19-24	Begin construction in 1978
Conservation:			
4.8 MW Fuel Cell Demonstration	33.0	10.2	Completing design, construction to begin soon

- a/This listing does not include all nonnuclear energy projects which have been identified for possible future development. Such technologies are now in early stages of development and future planning and developing of additional project stages is currently contemplated.
- b/Only one demonstration plant currently authorized.
- c/Does not include \$24 million in other annual funding requirements.
- d/Does not include \$3.4 million in other annual funding requirements.
- e/Does not include \$7-9 million in annual operating costs.
- f/Does not include \$4.8 million in other annual funding requirements.
- g/Cost will be reduced by utility contributions; does not include \$5.1 million in other annual funding requirements.
- h/Assumes 50-50 cost sharing.