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General Accounting Office

Analysis Of The Energy Research And Development Budget Proposal Process

The fiscal year 1983 energy research and development budget is now with the Congress for its consideration. This budget was developed in 1981 by the Department of Energy (DOE) and was reviewed by the Office of Management and Budget (OMB).

In developing the budget, DOE and OMB did not set priorities among program areas by systematically applying planning and decisionmaking criteria. Rather, the judgment of individual program managers, energy policy reviewers, and budget decision-makers determined which projects were to be funded or cut. While such judgments are essential to the budget process, the support or basis for them is seldom well documented. Therefore, efforts to evaluate the appropriateness of proposed energy research and development projects' terminations and funding levels are hampered.



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NOVEMBER 5, 1982

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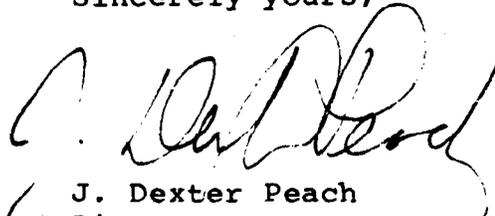
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Chairmen and Ranking Minority Members,
Selected Committees and Subcommittees

This report provides information on the energy research and development (R&D) budget proposal process. In view of the magnitude of the proposed changes for fiscal year 1983 and the continuing congressional interest in the energy R&D area, we reviewed the process underlying the administration's fiscal year 1983 energy R&D budget proposal. This report describes (1) how the fiscal year 1983 energy R&D budget was developed, (2) the roles played by the Department of Energy and Office of Management and Budget officials, and (3) factors that influenced decisions made on the budget.

We are sending copies of this report to the Director, Office of Management and Budget and the Secretary of Energy.

Sincerely yours,



J. Dexter Peach
Director

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**"LIST OF ADDRESSEES FOR GAO REPORT ENTITLED
ANALYSIS OF THE ENERGY RESEARCH AND DEVELOPMENT
BUDGET PROPOSAL PROCESS" (RCED-83-6)**

**The Honorable James A. McClure
Chairman, Committee on Energy and
Natural Resources
United States Senate**

**The Honorable Wendell H. Ford
Ranking Minority Member, Subcommittee
on Energy Research and Development
Committee on Energy and Natural
Resources
United States Senate**

**The Honorable J. Bennett Johnston
Ranking Minority Member, Subcommittee
on Energy Research and Development
Committee on Energy and Natural
Resources
United States Senate**

**The Honorable Dale L. Bumpers
Ranking Minority Member, Subcommittee
on Energy Research and Development
Committee on Energy and Natural
Resources
United States Senate**

**The Honorable Paul E. Tsongas
Ranking Minority Member, Subcommittee
on Energy Research and Development
Committee on Energy and Natural
Resources
United States Senate**

**The Honorable Don Fuqua
Chairman, Committee on Science and
Technology
House of Representatives**

**The Honorable Larry Winn, Jr.
Ranking Minority Member, Committee
on Science and Technology
House of Representatives**

**The Honorable Hamilton Fish, Jr.
Ranking Minority Member, Subcommittee
on Energy Development and Applications
Committee on Science and Technology
House of Representatives**

The Honorable Manuel Lujan, Jr.
Ranking Minority Member, Subcommittee
on Energy Research and Production
Committee on Science and Technology
House of Representatives

D I G E S T

The 1973-74 Arab oil embargo and the dramatic, unprecedented increases in oil prices throughout the 1970s prompted the Government to increase its support for research and development (R&D) on alternative energy technologies and also to broaden the Government's role in energy to support demonstration and commercialization of emerging technologies. The current administration has reversed this trend by adopting a philosophy primarily supporting "long-term, high-risk, high-payoff" energy R&D and relying on private industry to demonstrate the commercial viability of new energy concepts.

Under this new philosophy Federal funding for energy R&D has been reduced and further reductions are proposed. The reductions proposed by the administration are particularly significant in the areas of solar, conservation, and fossil R&D where Federal funding would be reduced from \$2.3 billion in fiscal year 1981 to about \$200 million proposed in fiscal year 1983.

In view of the magnitude of the proposed changes for fiscal year 1983 and the continuing congressional interest in the energy R&D area, GAO reviewed the process underlying the administration's fiscal year 1983 energy R&D budget proposal.

THE ENERGY R&D BUDGET
PROPOSAL PROCESS

The Department of Energy (DOE) began developing its fiscal year 1983 energy R&D budget proposal in March 1981. In February 1982, the DOE budget proposal, including its R&D component, was transmitted to the Congress. Final congressional action on the fiscal year 1983 budget is pending.

During the March 1981 through February 1982 time frame, the administration's thinking on economic, budget, and energy issues was

(GAO/RCED-83-6)

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still evolving, and the Congress was debating the significantly reduced fiscal year 1982 budget. In addition, during this time, many of the DOE Assistant Secretary positions were being filled on a temporary basis. It was against this uncertain backdrop that the fiscal year 1983 energy R&D budget was formulated, reviewed, revised, and ultimately finalized.

The key officials ranged from individual program managers through DOE Assistant Secretaries, the Deputy Secretary, and the Secretary; Office of Management and Budget (OMB) Examiners; the OMB Director; Presidential advisers; and the President himself. A myriad of decisions based on the individual and collective judgments influenced the final budget. Some decisions were predicated on broad energy policy directives (i.e., the continued funding of the Clinch River Breeder Reactor demonstration project); others reflected the overall criteria of Government support for "long-term, high-risk" R&D projects (i.e., support for basic or generic research at universities or national laboratories and developing new processes through the proof of concept stage); and others within DOE were driven by budgetary constraints (i.e., OMB required DOE to reduce its request by about \$3 billion). (See p. 4.)

As might be expected, as the budget was reviewed at higher levels of decisionmaking, technical judgments gradually gave way to broader energy and economic policy judgments. Also, some key decisions on the budget were made under severe time constraints. For example, DOE had about 10 days to accommodate a \$3-billion OMB-imposed funding cut. (See p. 7.)

OBSERVATIONS

In developing the budget, DOE and OMB did not set priorities among program areas by systematically applying planning and decision making criteria. The professional judgments of the individual program managers, energy policy reviewers, and budget decisionmakers determined which R&D projects were to be funded or cut. While such judgments are essential to the budget process, the support or basis for the judgments are seldom well documented. Therefore, efforts

to evaluate the appropriateness of proposed energy R&D project terminations and funding levels are hampered.

The trend toward long-term, high-risk, high-payoff R&D implies that Federal funds will be invested in energy concepts, technologies, and projects over longer periods of time before tangible energy contributions are discernible. Therefore, selecting the most promising energy R&D areas becomes more difficult and the need for criteria and priority systems even more important. Further, criteria and priority systems would not only assist in analyzing trade-offs among and within energy technologies but also provide a documented basis for justifying and evaluating budget decisions.

GAO recognizes that developing a criteria and priority system will not automatically produce a panacea where budget decisions are made and justified solely on the basis of an objective, quantifiable methodology. Policy considerations and budgetary constraints are inextricably, though loosely, linked and considered in negotiating trade-offs and analyzing options throughout the budget process. However, as GAO has stated before, energy R&D criteria and a priority system based on the technical and economic merits of the various energy concepts, technologies, and projects need to be established to provide the most effective use of limited funds. Also, it could result in better information being provided to the Congress in support of energy R&D budget requests. (See p. 11.)

AGENCY COMMENTS

DOE and OMB were given the opportunity to comment on this report. DOE declined to respond. OMB's response is appendix II.

OMB officials stated that this report provides a reasonably accurate description of the fiscal year 1983 budget process. However, they discussed two matters in the report which did not match their perception of the process.

The first matter concerns GAO's statement that budgetary constraints drove some of the funding decisions. OMB contends that this was not

the case. From OMB's perspective, the energy budget submitted to the Congress properly reflects the administration's policies, and even if overall funding levels were higher, DOE's R&D funding would not have changed. OMB stated that it was the application of broad policy directions, not budgetary constraints, that drove the sharp cuts.

GAO believes, while policy directions have had this effect, it is evident that budget constraints appear to have influenced DOE's decisions throughout the budget process. For example, in the early stages of the budget process, DOE program managers developed proposals designed to fit assigned target levels. To do so, affordability of potential projects was a primary consideration. In addition, budgetary constraints were prominently considered by DOE decisionmakers in September 1981, when OMB instructed DOE to reduce its budget by about \$3 billion.

OMB also expressed concern with the report's discussion of DOE's decision process. OMB stated that the process is the same as the type used generally throughout Government and industry. Basically, managers with limited funding are forced to exercise professional judgment in choosing among competing projects and requiring substantiating documentation for each judgment is unrealistic.

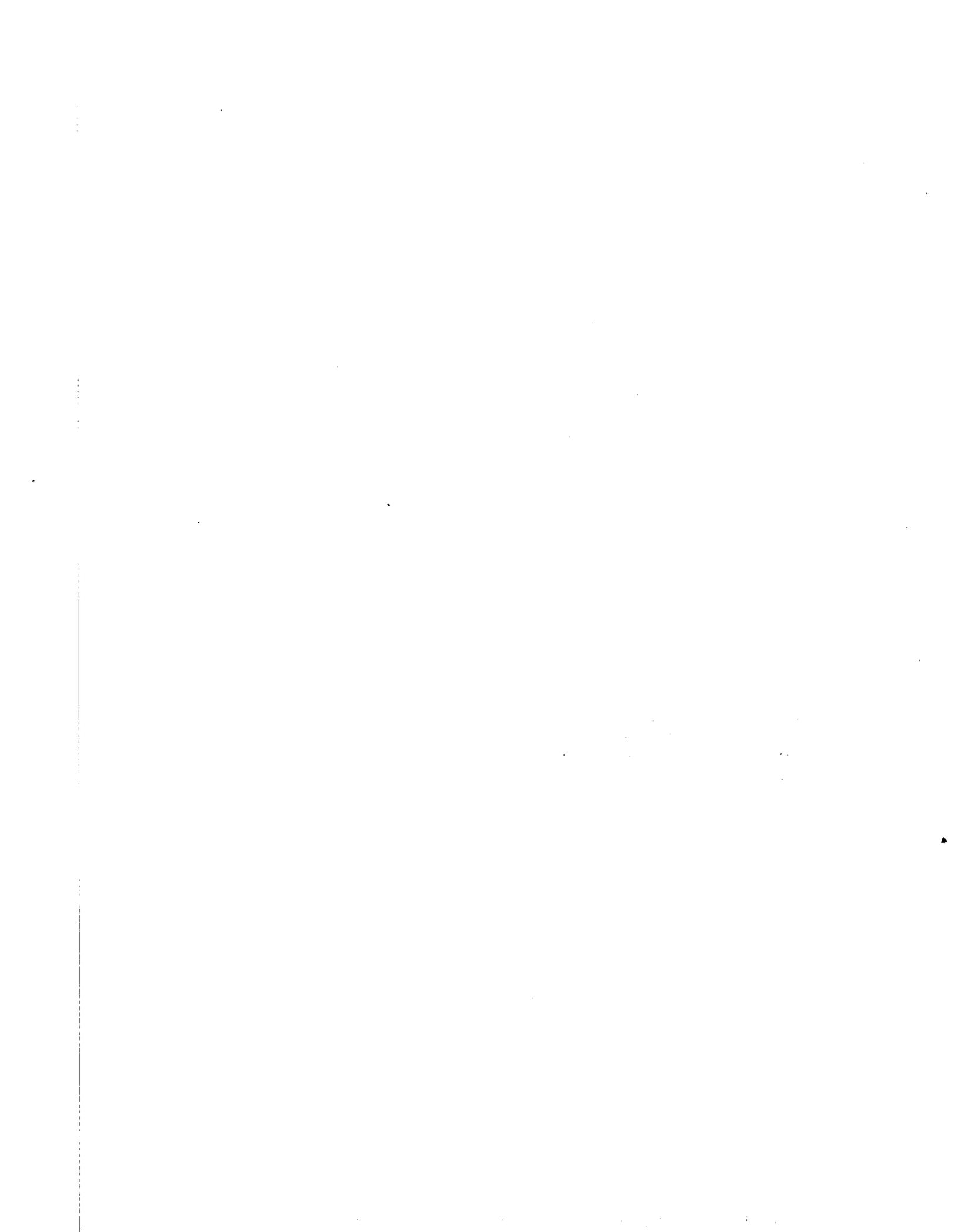
GAO recognizes that professional judgment is an essential part of the budget process. A criteria and priority system, however, could enhance this process. Such a system would provide a consistent basis for making decisions, as well as documentation of how and why key decisions were made. Also, by doing so the basis for decisions could be more visible, improve accountability, and provide better information to the Congress.

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ABBREVIATIONS

DOE	Department of Energy
GAO	General Accounting Office
OMB	Office of Management and Budget
R&D	Research and Development



CHAPTER 1

INTRODUCTION

In the 1960s, Federal support for energy-related research and development (R&D) programs concentrated on nuclear energy. By fiscal year 1969, Government support for energy R&D amounted to about \$361 million, with nuclear fission R&D accounting for about \$277 million or approximately 77 percent. The 1973-74 Arab oil embargo and the dramatic and unprecedented increases in oil prices through the 1970s changed this thinking and prompted the Government not only to increase its support for R&D on alternative energy technologies but also to broaden the Government's role in energy to support demonstration and commercialization of emerging technologies.

As a result, the energy R&D budget increased nearly eightfold between 1973 and 1981. Energy funding in 1973 totaled \$622 million, with nuclear fission receiving \$356 million or 57 percent. By fiscal year 1981 energy funding had reached about \$4.7 billion, with nuclear fission accounting for about \$1 billion or 21 percent. Support for other technologies had grown to the point that fossil received \$994 million, solar received \$552 million, and fusion received \$394 million.

In January 1981, the current administration, which has a different philosophy of the Government's role in energy, took office. The Reagan administration proposed an energy program which would significantly alter the previous administration's program and several of the congressional mandates contained in earlier legislation. It believes that the Government's energy program should be limited to performing only long-term, high-risk, and high-payoff R&D which industry cannot be expected to undertake. It is predicated on the assumption that as a technology moves closer to demonstration and commercialization, the Government's role should be curtailed with industry providing financial support. Thus, the free marketplace is expected to supply the capital investments required to support the demonstration and commercial introduction of new and alternative energy technologies into the economy. The administration believes that the marketplace can achieve this introduction more efficiently and effectively than the Government, especially if energy prices are allowed to reflect their true replacement costs.

The administration's reformulation of policies affecting energy is part of the President's Comprehensive Program for Economic Recovery. This program includes elimination of excessive Federal spending and taxes, regulatory relief, and a sound monetary policy.

Federal energy R&D funding has been reduced, and further reductions are proposed. The administration's fiscal year 1983 energy R&D budget request amounts to about \$2.3 billion, which is approximately \$2.4 billion less than the fiscal year 1981 level.

The proposed reductions are particularly significant in the areas of solar, conservation, and fossil R&D where Federal funding would be reduced from \$2.3 billion in fiscal year 1981 to about \$200 million in fiscal year 1983.

OBJECTIVES, SCOPE, AND METHODOLOGY

Although the proposed fiscal year 1983 energy R&D budget represents a continuation of the fundamental reorientation, of the Federal role in energy that was initiated in last year's budget process, last year's budget was not entirely accepted by the Congress and many energy R&D programs were funded at levels higher than requested by the administration. Further, changes appear likely on the administration's fiscal year 1983 budget request as evidenced by the June 22, 1982, fiscal year 1983 budget resolution. For example, the budget resolution, if followed, would raise fossil energy funding for fiscal year 1983 from \$106.9 million to \$400 million and conservation from \$22 million to \$387 million.

In view of the magnitude of the proposed changes for fiscal year 1983 and the continuing congressional interest in the area of energy R&D, we reviewed the process underlying the fiscal year 1983 energy R&D budget proposal. We addressed three major questions: (1) how was the fiscal year 1983 budget developed? (2) what role did the various Department of Energy (DOE) and Office of Management and Budget (OMB) officials play in the budget process? and (3) what criteria or factors influenced the decisions made on the budget?

This work covers the energy R&D budget process on a broader scale than our earlier reports. In these reports, which were oriented towards particular technologies, we recommended that specific definitions be developed for long-term, high-risk, high-payoff programs and that they be consistently applied to funding current and future R&D projects. ^{1/} For this report, we examined the R&D budget process across technologies.

To obtain a representative understanding of the budget formulation and review process, we concentrated on tracing the budgets of four DOE organizations--Fossil Energy, Conservation and Renewable Energy, Nuclear Energy, and the Office of Energy Research. We selected these organizations because, when taken together, they are responsible for all the energy R&D performed by DOE.

^{1/}"Fossil Energy Research, Development, and Demonstration: Opportunities for Change," EMD-78-57, Sept. 18, 1978, and "Analysis of Federal Funding for Electric Utility R&D Projects," EMD-81-145, Sept. 28, 1981.

In tracing the budget process:

--We met with and obtained available documentation from DOE officials at the program level, or the level where the individual research projects are directly managed. Among other things, we sought their views on the guidance or criteria they received on how to develop their budget inputs, and the extent to which they actually had input to the process.

--We met with officials representing various Assistant Secretaries to obtain available documentation and to get their perspective on the process, including the adequacy of guidance received from the DOE Controller's office and from OMB, and the control they actually had over which projects were funded and at what levels.

--We met with officials of DOE's Controller's office for information and any available documentation on the agency's overall budget process and its contacts with OMB.

--We met with officials at OMB to get their perspective on the development of the DOE energy research budget, and for information on the role they played.

Our review was performed in accordance with generally accepted government audit standards.

CHAPTER 2

THE ENERGY R&D BUDGET PROCESS

The fiscal year 1983 budget process for energy R&D began in March 1981, went through a series of reviews and changes, and ultimately resulted in DOE's budget submission to the Congress in February 1982. During this period, the administration's thinking on economic, budget, and energy issues was still evolving, and the fiscal year 1982 budget was being debated by the Congress. In addition, during this time, many of the DOE Assistant Secretary positions were being filled on a temporary basis. It was against this uncertain backdrop that the fiscal year 1983 energy R&D budget was formulated, reviewed, revised, negotiated, and ultimately finalized. The key officials ranged from individual program managers through DOE Assistant Secretaries, the Deputy Secretary, and the Secretary; OMB Examiners; the OMB Director; Presidential advisers; and the President himself. A myriad of decisions based on the individual and collective judgments influenced the final budget. Some of their decisions were predicated on broad energy policy directives (i.e., the continued funding of the Clinch River Breeder Reactor demonstration project); others reflected the overall criteria of Government support for "long-term, high-risk" R&D projects (i.e., support for basic or generic research at universities or national laboratories and developing new processes through the proof of concept stage); others within DOE were driven by budgetary constraints (i.e., DOE was directed by OMB to reduce funding by about \$3 billion); and still others by the professional and technical judgment of individual researchers and program managers.

As might be expected, as the budget was reviewed at high levels of decisionmaking, technical judgments gradually gave way to broader energy and economic policy judgments. Also, some key decisions on the budget were made under severe time constraints.

BUDGET PROCESS BEGAN BY ADDRESSING MAJOR ISSUES

The fiscal year 1983 budget process began in March 1981, when DOE initiated a planning effort directed at addressing potential major issues facing the agency. This effort was to provide input to the DOE organizations for use in developing their budget requests. The issues were prepared by the affected DOE organizations and submitted to a DOE Executive Committee chaired by the Acting Under Secretary. It was the Committee's responsibility to decide on how these issues should be resolved for purposes of formulating the DOE budget.

Twenty-seven issues that were of broad concern to DOE and could have major funding or policy implications were ultimately identified for the process. Examples included the following.

--Should DOE try to determine the engineering feasibility of magnetic fusion energy during the next decade?

--Should the rate of growth of the basic energy sciences program be increased annually by an additional 4 percent for the next 5 years to meet the Nation's long-term energy needs?

--Should there be separate coal mining research and development programs in DOE and the Department of the Interior?

--Should the Clinch River Breeder Reactor be licensed?

In developing DOE positions on these issues, the Committee considered the information presented by the various DOE organizations in both the memoranda and meetings held on the questions. The appropriate Assistant Secretaries were informed on June 26, 1981, of the Committee's decision on the resolution of the issues.

PROGRAM OFFICIALS PREPARE
BUDGET TO MEET TARGET FIGURES

In May 1981, during the same time frame that the Executive Committee was considering the 27 issues, the DOE offices began developing their fiscal year 1983 budget submissions based on guidance by the DOE Office of Controller. This office provided each Assistant Secretary or comparable office instructions on budget form and content as well as target figures for their program. These were internal figures that were based on the continuation of the fiscal year 1982 programs. The offices were given instructions by the DOE Office of Controller that they could shift funds among their programs as long as the totals remained at their target levels.

Each office had to develop programs for three levels

--the target level, which represented a continuation of the fiscal year 1982 program;

--the decrement level, which was 10 percent lower than the target figure; and

--the incremental level, which was the target level plus any additional amounts resulting from having a Secretarial issue resolved in favor of their program or resulting from repricing issues, such as escalation.

The organizations we examined--nuclear energy, fossil energy, energy research, and conservation and renewable energy--basically followed the same procedures in developing their budget requests. When the organizations received their target figures, they passed them on to the program officials. The figures were broken down to the program level (e.g., in fossil energy they were broken down to coal liquefaction, coal gasification, fuel cells, etc.). However, the program level numbers could and did change. This

was accomplished by officials at the program level requesting more funding from higher levels in their organizations (Assistant Secretary level). The Assistant Secretaries (or Director in the Office of Energy Research) reviewed and made decisions on the arguments for additional funding. If an activity was granted a funding increase, other programs had to be reduced since the totals for the organization could not exceed their predetermined target levels.

In examining the basis for decisions on what projects to include or exclude, we found that DOE did not set priorities among program areas by systematically applying planning and decisionmaking criteria. Such criteria should include the (1) contribution that each technology can make in meeting the Nation's energy goals; (2) total cost and timing of commercializing the technology; and (3) incremental cost of producing energy from the technology. They could be used as a basis to allocate limited resources among different energy technologies and among alternative approaches within each. The criteria should be supported by comparative studies and ranked or weighed accordingly to importance in meeting program goals.

However, in lieu of such criteria, the professional judgments of program officials determined which projects were to be cut or funded. Although the support or basis for such judgments did not leave a well documented audit trail, we found that they could be influenced by a combination of factors such as the cost, benefits, technical risk, and available funding. While such factors are relevant, we found no evidence that they were systematically or uniformly considered. Further, the relative weight or importance of each factor is unclear. Other factors that played a role in some of the decisionmaking processes were program balance, out-year funding implications, and the administration's energy policy.

The fossil energy, energy research, and the conservation and renewable energy programs budgets were to be developed consistent with the administration's philosophy of funding long-term, high-risk, high-payoff R&D. Budget officials in the Assistant Secretaries' offices for these programs told us that this philosophy was considered among other factors, in determining what was to be included in their programs. However, they stated that the long-term, high-risk, high-payoff philosophy also had been used during the fiscal year 1982 budget and most of the activities which did not fit this philosophy had been eliminated then.

In the nuclear energy area, the President's October 8, 1981, policy statement on nuclear energy had an influence on decisions. This statement directs that

--priority attention be given to recommending improvements in the nuclear regulatory and licensing process with the objective of shortening the licensing time to 6 years from 8 years;

- Government agencies proceed with the demonstration of breeder reactor technology, including the completion of the Clinch River Breeder Reactor;
- the indefinite ban be lifted on commercial reprocessing activities; and
- work proceed swiftly toward deployment of means of storing and disposing of commercial high-level radioactive wastes.

DOE'S INTERNAL BUDGET REVIEW

The budget requests for the three funding levels were to be submitted to the Under Secretary by June 15, 1981. These budget requests were reviewed and meetings were held on each one. By memorandum dated July 24, 1981, the Acting Under Secretary informed the Assistant Secretaries or comparable officers of the results of DOE's internal budget review. The memoranda stated, in part, that

"Decisions on the budget were based on information presented in your budget request and provided during the hearing, Congressional action on the FY [fiscal year] 1982 budget which has occurred to date, and preliminary discussions with OMB on the revised Target level anticipated for DOE programs. Although final OMB guidance has not yet been received, discussions with the OMB staff indicate that the Department can anticipate a revised Target level about sixteen percent below targets used to develop the Internal Review Budget submission."

The memoranda also provided each organization with three new target figures which took into account the anticipated OMB reduction and guidance on the funding level for individual programs. The funding levels could be appealed to the Deputy Secretary up until July 28, 1981, just 4 days after the date of the memoranda.

Because of the short time available, decisions on whether to appeal any items had to be made quickly by the various Assistant Secretaries. The Assistant Secretaries made the appeal decisions based on their own program knowledge and on discussions with the program level officials.

The Deputy Secretary made the final decision on the appeals after considering the new information presented from the organizations. Their budget targets would be adjusted based on the decisions made. After the appeal process was complete, each office was in position to develop its budget submissions for the three new program levels.

BUDGET REVISED TO MEET
OMB FIGURES

DOE submitted its budget to OMB on September 15, 1981. This budget was based on what DOE considered a continuation of the fiscal year 1982 budget, but modified by the agency's internal review process. OMB had not at that point provided DOE their official target figures. In prior years, OMB provided the agencies with funding targets in June to coincide with the internal review. OMB officials stated that they were unable to provide the target figures for fiscal year 1983 because they were too involved in getting the fiscal year 1982 budget through the Congress.

On September 25, 1981, OMB provided DOE an overall figure of \$11.1 billion in outlays for fiscal year 1983. This was about \$3 billion lower than the budget DOE developed for its official request. In anticipation of being funded below the Department request level, the Secretary scheduled a series of internal meetings with the Assistant Secretaries to discuss their respective programs in late September. The OMB figures were received during this process. Based on these meetings with the Assistant Secretaries, the Secretary decided on how the reductions were to be handled. An amended budget, taking the reductions into account, was submitted to OMB on October 5, 1981, 10 days from the time OMB provided the DOE target figure.

OMB'S REVIEW OF THE BUDGET

From October 5, 1981, to November 20, 1981, OMB had the DOE budget for review. OMB Budget Examiners were given portions of the energy budget and it was the Examiners' responsibility to review and recommend changes to it. In doing so, Examiners could obtain a presentation from DOE officials on their programs, contact outside sources for input, and rely on their own knowledge and expertise in the program area.

In examining the energy budget, OMB officials stated that they took into consideration the administration's intention to

- reduce the size and scope of Government,
- reduce the Federal budget to improve the economy, and
- emphasize defense needs.

From this perspective it was clear, according to OMB officials, that the Government should be less involved in energy and that the energy budget should be reduced. It was their opinion that the Government had been excessively concerned with limiting oil imports, and that past administrations were attempting to reduce the imports at any cost by forcing accelerated development of alternative energy technologies.

With this as a backdrop, OMB factored in the policy of funding only long-term, high-risk, high-payoff R&D which was unlikely to be undertaken by industry and the President's Nuclear Policy Statement in making their changes to the DOE budget. This meant that basic and general science R&D received support since these activities by their very nature, according to OMB, fit the general administration's philosophy of funding long-term, high-risk, and potentially high-payoff activities which industry generally would not consider doing. Nuclear energy received continued high funding because of a different criterium, the presidential Nuclear Policy Statement. That statement expressed support for continued Federal nuclear activities including specific support for the construction of the Clinch River Breeder Reactor. By contrast to this nuclear policy criterium, OMB officials proposed reduced funding for the technology areas of fossil and renewable and conservation because many of these activities, in their view, fall outside the "long-term, high-risk, high-payoff" criteria and that industry will or should be responsible for their funding.

In reducing the non-nuclear activities, OMB developed guidelines which further refined the long-term, high-risk, high-payoff policy as it applied to non-nuclear programs. The Budget Examiners were to make decisions on the fossil, solar, conservation, and geothermal programs by applying these guidelines in reviewing and recommending funding changes to DOE programs. The guidelines were the following.

- "Generic and technology base R&D (e.g. materials research, instrumentation, catalysis) would be retained. Long-term R&D to accelerate the development of advanced technologies (e.g. high temperature turbines) would not be funded.
- "Operation of existing Government experimental facilities with unique capabilities (e.g. coal combustion research facilities at Pittsburgh) would be continued in support of the generic and technology base R&D or basic research.
- "Environmental research would be maintained to assist the Government in carrying out its regulatory responsibilities particularly in fossil energy.
- "Resource assessment activities which could eventually support leasing (e.g. geopressured methane) would be retained.
- "Operation of Government-funded pilot plants or technology test facilities would continue only where continued operation would result in net revenues returned to the Government (e.g. Mobil M-Gasoline plant), or where the costs of termination exceed the project completion costs. Under this guideline, for example,

support for the operation of the Barstow, California Solar Thermal Pilot Plant (to come on line this spring) would not be provided in 1983.

- "In cases where facility operating funds have not been provided in the 1983 budget, DOE should consider limited operation of these facilities in 1983 using prior year funds while the Department arranges for its orderly transfer to the private sector on closing. Deferrals are to be submitted, if necessary.
- "To the extent possible, the Department should re-orient the 1982 program towards the policy outlined above while bringing activities no longer consistent with this policy to a logical conclusion."

Based on the Examiners' recommendations, which were forwarded through OMB for review, changes were made to the DOE energy programs. On November 20, 1981, DOE was informed of the budget changes (referred to as the passback). As can be seen in the following table, the changes were significant.

Energy Research Budget

	DOE request prior to <u>OMB review</u>	DOE budget request after OMB passback <u>and appeal</u>	<u>Change</u>
	—————(in millions)—————		(percent)
Fossil	\$ 305.2	\$ 106.9	- 65
Nuclear Fission	1,140.4	830.2	- 27
Conservation/ Renewable	152.1	103.8	- 32
Basic and General Sciences (note a)	<u>1,235.4</u>	<u>1,328.0</u>	<u>+ 07</u>
Total	<u>\$2,833.1</u>	<u>\$2,368.9</u>	<u>- 16</u>

a/Includes DOE accounts for General Sciences, Fusion, and Basic Energy Sciences.

DOE APPEALED OMB'S PASSBACK

After DOE received the passback, the Secretary met with his Deputy and Assistant Secretaries to discuss its implications and reviewed memoranda from them on items they wished to appeal. The Assistant Secretaries had previously obtained input from their program managers in determining which items to appeal. As a result, the Secretary of Energy, in a November 24, 1981, letter

to the OMB Director, responded formally to the OMB decisions by appealing 23 items departmentwide totaling \$991 million. Six hundred million dollars of this appeal was for energy programs. Appendix I shows a summary of the appeal items and their final outcome.

In his letter, the Secretary expressed concern over the basis for a number of the cuts, stating, in part,

"I am transmitting to you appeals for a total of \$.6 billion for our Energy programs. There are several areas of major concern including severe cuts in the Nuclear and Fossil program areas and the change in policy proposed for Fossil, Solar, Conservation and Geothermal programs. The policy change would redefine the Federal role in support of non-Nuclear energy technologies and would require some significant revisions to the policies this Administration has supported before the Congress and the public. The proposed revisions would limit Federal involvement to only the most basic, generic kinds of research, would eliminate environmental work which is essential to achieving feasibility of new technologies, and would discontinue work necessary to complete proof-of-concept activities which are essential if activities are to be turned over and accepted by private industry * * *. I want these proposed policy changes reconsidered so that we can stick to our objective of funding only long-term, high-risk but potentially high-payoff research and development through the proof-of-concept stage."

In order to resolve disputes, OMB established, for the first time, a three-level appeal process. The first level was to have DOE present its appeals and accompanying rationale to OMB officials within 48 hours. In this instance, conflicting schedules prevented the Secretary of Energy and the OMB Director from discussing the appeals within the 48-hour time frame. As a result, the appeals went to the second level.

The second level of appeal was the Budget Review Committee which consisted of the OMB Director and two top assistants to the President. DOE was represented by the Secretary and his Assistant Secretary for Management and Administration. Because of the number of appeals involved, the Budget Review Committee's staff chose 10 of the 23 items for its review and sent the remainder back for OMB to settle with DOE, with the stipulation that any appeals that were not resolved between OMB and DOE would come back to the Committee. Those appeals were resolved between OMB and DOE. Regarding the 10 items under review by the Committee, 2 were resolved--Terminal Isolation R&D and Barnwell--and the remaining 8 were appealed to the third and final level which was the President. The President resolved the final items as indicated in appendix I.

OBSERVATIONS

OMB and DOE have a different perspective on the extent to which budget decisions were driven by policy considerations as opposed to budget constraints. From OMB's perspective, the energy budget submitted to the Congress properly reflects the administration's policies and, even if overall energy funding levels were higher, DOE R&D funding would not have changed. In contrast, budget constraints appear to have significantly influenced DOE program decisions. The affordability of potential projects was a primary consideration of DOE program managers in the early stages of the budget process when they were developing proposals to fit three assigned target levels. Budget constraints remained a primary consideration of DOE decisionmakers in responding to OMB-imposed cuts throughout the budget process.

Criteria for setting priorities among program areas have not been established. The professional judgments of the individual program managers, energy policy reviewers, and budget decisionmakers played dominant roles in determining which R&D projects were to be funded or cut. While such judgments are essential to the budget process, the support or basis for the judgments are seldom well documented. Therefore, efforts to evaluate the appropriateness of proposed energy R&D project terminations and funding levels are hampered.

In commenting on a draft of this report, OMB stated that the budget decision process is generally the same throughout the Government and industry. Basically, managers use professional judgment to select among competing projects, and most managers would be crippled by a requirement to supply substantiating documentation each time they exercised their judgment. We recognize that professional judgment is essential to the budget process. However, the development of criteria and priority systems would not only assist in analyzing trade-offs among and within energy technologies but also provide a documented basis for justifying and evaluating budget decisions. As stated in a prior report, establishing R&D priorities will provide the most effective use of limited funds. ^{1/}

The trend toward long-term, high-risk, R&D implies that Federal funds will be invested in energy concepts, technologies, and projects over longer periods of time before tangible energy contributions are discernible. Therefore, selecting the most promising energy R&D areas becomes even more difficult and the need for criteria and priority systems even more important.

^{1/}"Analysis of Federal Funding for Electric Utility R&D Projects," EMD-81-145, Sept. 28, 1981.

We have recommended improvements to the DOE budget process in past reports. For example, GAO recommended that specific definitions be developed for long-term, high-risk, high-payoff programs and that they be consistently applied to funding current and future R&D projects. DOE has not adopted our recommendations. Rather, it believes that the project selection process for R&D demands a strong degree of flexibility and that the choice of projects should be left to R&D program managers who have the technical perspective to make the necessary judgments concerning the projects potential benefits and are capable of determining the appropriateness of Federal funding. DOE views our recommendations as an "across-the-board textbook approach" which they believe cannot be substituted for professional judgment.

We recognize that developing a criteria and priority system will not automatically produce a panacea where budget decisions are made and justified solely on the basis of an objective, quantifiable methodology. Policy considerations and budgetary constraints are inextricably, though loosely, linked and considered in negotiating trade-offs and analyzing options throughout the budget process. However, as noted in an earlier report, ^{1/} an energy R&D criteria and priority system based on the technical and economic merits of the various energy concepts, technologies, and projects could improve the application of energy and economic policy considerations and the information provided to the Congress in support of energy R&D budget requests.

AGENCY COMMENTS

DOE and OMB were given the opportunity to comment on this study. DOE declined to respond. OMB's response is appendix II.

OMB stated that the study provides a reasonably accurate description of the fiscal year 1983 budget process. However, OMB discussed two matters in the report which did not match its perception of the process.

The first matter concerns our statement that budgetary constraints drove some of the funding decisions. OMB contends that this was not the case. From OMB's perspective, the energy budget submitted to the Congress properly reflects the President's policies, and even if overall funding levels were higher, DOE's R&D funding would not have changed. OMB stated that it was the application of broad policy directions, not budgetary constraints that drove the sharp cuts.

While policy directions may have had this effect, it is evident that budget constraints appear to have influenced DOE program

^{1/}"Fossil Energy Research, Development, and Demonstration: Opportunities for Change," EMD-78-57, Sept. 18, 1978.

decisions. For example, in the early stages of the budget process, DOE program managers developed proposals designed to fit assigned target levels. To do so, affordability of potential projects was a primary consideration. In addition, budgetary constraints were prominently considered by DOE decisionmakers in September 1981, when OMB instructed DOE to reduce its budget by about \$3 billion. We changed the text to more clearly state that, from DOE's perspective, budgetary constraints drove some of their decisions.

OMB also expressed concern with the report's discussion of DOE's decision process. OMB stated that the process is the same as the type used generally throughout Government and industry. Basically, managers with limited funding are forced to exercise professional judgment in choosing among competing projects and requiring substantiating documentation for each judgment is unrealistic.

While we recognize that professional judgment is essential to the budget process, a criteria and priority system could enhance this process. Such a system would provide a degree of documentation which would facilitate an understanding of how and why key decisions were made and permit better accountability. By doing so, the basis for decisions could be more visible and, as a result, better information could be provided to the Congress.

Summary of DCE Fiscal Year 1983 Appeals

	<u>Amount appealed</u>	<u>Amount reinstated</u>
- - -(in millions)- - -		
<u>Appeals to OME</u>		
Defense	<u>\$ 99.0</u>	<u>\$ 49.0</u>
Inertial Confinement Fusion	37.0	--
Weapons Production and Support Facilities	35.0	30.0
Verification and Control	2.0	--
Richland Storage Tanks	19.0	19.0
Nuclear Materials Security and Safeguards	6.0	--
Nuclear	<u>139.0</u>	<u>13.0</u>
Light Water Reactor Safety	6.0	--
Plutonium Conversion	5.0	--
Uranium Enrichment Revenue	109.0	--
Advanced Isotope Separation	15.0	10.0
Uranium Resource Assessment	5.0	3.0
Environment	<u>12.0</u>	<u>5.0</u>
Power Marketing	<u>9.0</u>	<u>9.0</u>
Energy Information Administration	<u>5.0</u>	<u>2.5</u>
Subtotals	\$264.0	\$ 78.5
<u>Appeals to Budget Review Board/President</u>		
Defense	<u>180.0</u>	<u>108.0</u>
Defense Waste Processing Facility	37.0	10.0
Waste Isolation Pilot Plant	98.0	98.0
Naval Reactors Fuel Facility	45.0	--
Nuclear	<u>193.0</u>	<u>18.0</u>
Terminal Isolation R&D	110.0	--
Waste Treatment and Storage Technology	8.0	8.0
Large Development Plant	65.0	--
Barnwell	10.9	10.0
Fossil Energy	<u>198.0</u>	--
Departmental Administration	<u>156.0</u>	--
Manpower (note a) (2,000 FTE appealed; 220 FTE reinstated)	a/	<u>10.0</u>
Subtotals	<u>727.0</u>	<u>136.0</u>
Totals	<u>\$991.0</u>	<u>\$214.5</u>

a/Manpower funds were included in other appeal items (e.g., Departmental Administration). FTE means full-time equivalent employees.

Source: DOE.



EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF MANAGEMENT AND BUDGET
WASHINGTON, D.C. 20503

AUG 20 1982

Mr. Morton A. Myers
Director, Program Analysis
Division
United States General
Accounting Office
Washington, D.C. 20548

Dear Mr. Myers:

Thank you for your July 20, 1982, letter sending for our review and comment the draft GAO report: EMD-82-109, entitled "The Energy Research and Development Budget Proposal Process."

My staff has examined the report and advises me that it provides a reasonably accurate description of the budget process as it took place last fall. But I wish to call to your attention two significant perceptions in the report which do not match our own.

First, the report states on p. ii and p. 4 that "Some [budget] decisions were predicated on broad policy directions... and others were driven by budgetary constraints (i.e. sharp reductions for solar and fossil R&D)." Brackets and underlining added.

In fact, the sharp cuts in funds for solar and fossil R&D, and for energy conservation R&D as well, were predicated on broad policy directions. Programs that were eliminated or severely curtailed in the President's 1983 budget were those characterized by nearer-term objectives (e.g., demonstrations of passive solar technology), or low technical risk (e.g., bottoming-cycles for trucks), or low potential pay off (e.g., magnetohydrodynamics and ocean thermal energy) compared with competing projects. The stated characteristics of these programs represent criteria in the Administration's R&D policy by which we decide that a particular program or project is not appropriate for Federal funding. It is therefore incorrect to say that these programs were cut due to budget constraints. Even if the overall R&D funding level had been higher, the President's budget for the Department of Energy still would have reflected these program reductions as a matter of R&D policy.

Consequently, we recommend deleting the underlined part of the sentence quoted above.

See GAO note, p. 17.

Second, in a paragraph which confuses us, appearing on p. ii. and p. 12, the report seems to say:

- The Department of Energy has no decision process for R&D programs.
- The Department has a decision process and it is essential. It involves the professional judgment of managers.
- But this process does not leave a well-documented audit trail. Therefore it should be changed.

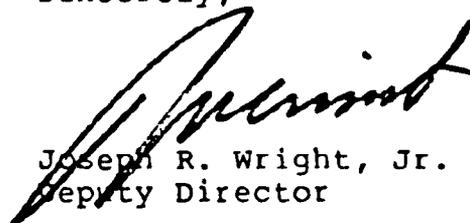
Our view is that the Department of Energy does indeed have an R&D program decision process, and that it is the same as the type used generally throughout the Government and industry. Basically, managers with limited funding are forced to exercise their professional judgment and to choose among projects under their control. The process is then repeated at higher levels of management, and that is how a program takes shape. Most managers would be crippled by a requirement to supply substantiating documentation each time they exercised their judgment. But that seems to be what the report suggests. If a decision process for complex scientific activities works, it would seem unfair to criticize it because it does not happen to lend itself very well to the usual kind of auditing with which accountants and investigators may be most comfortable.

We therefore recommend deleting the specified paragraph on each of pages iii and 16, and the paragraph following also. The second paragraph continues to imply that DOE has no system for setting priorities.

Should you have questions about our views as outlined above, it would be appropriate for our staff to discuss the issues further with yours, with a view to resolving any differences before GAO publishes the report. Please feel free to call Hugh Loweth (395-3404), Deputy Associate Director for Energy and Science, to arrange a meeting.

We very much appreciate this opportunity to comment.

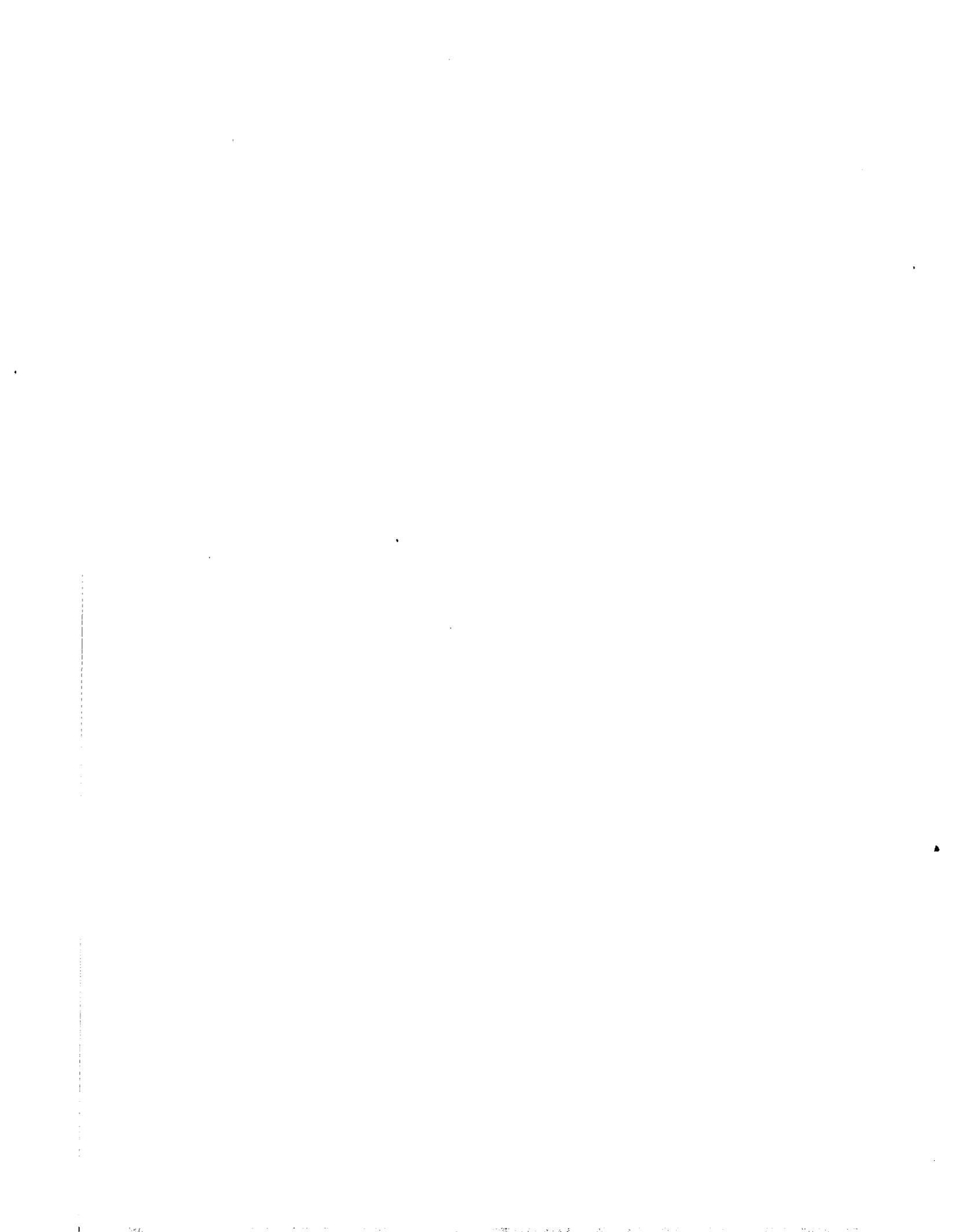
Sincerely,



Joseph R. Wright, Jr.
Deputy Director

GAO note: Page references in this appendix have been changed to correspond to page numbers in this final report.

(001935)



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