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Volume 2 of 4

Congressional Budget Request

Energy Supply Research and Development
Nuclear Waste Fund

Volume 2

FY 1988

U.S. Department of Energy
Assistant Secretary,
Management and Administration
Office of the Controller

January 1987

DEPARTMENT OF ENERGY

FISCAL YEAR 1988 CONGRESSIONAL BUDGET REQUEST

SUMMARY OF ESTIMATES BY APPROPRIATIONS

BUDGET AUTHORITY IN THOUSANDS OF DOLLARS

	FY 1986 Actual BA	FY 1987 Estimate BA	FY 1988 Request BA
Appropriations Before The Energy and Water Development Subcommittees:			
Energy Supply Research and Development	$ 1,701,351	$ 1,254,131	$ 1,914,710
Uranium Enrichment	1,549,015	1,210,400	1,070,000
General Science and Research	659,059	719,517	814,498
Atomic Energy Defense Activities	7,292,405	7,481,852	8,050,000
Departmental Administration	235,676	139,509	166,133
Alaska Power Administration	3,245	2,881	3,026
Bonneville Power Administration	404,329	327,659	205,800
Southeastern Power Administration	---	19,647	27,400
Southeastern - Continuing Fund	4,028	---	---
Southwestern Power Administration	29,180	25,337	16,648
Western Area Power Administration	195,842	240,309	295,515
Western Area Power Emergency Fund	147	225	---
Federal Energy Regulatory Commission	45,107	-3,465	-900
Nuclear Waste Fund	499,037	499,000	500,000
Geothermal Resources Development Fund	69	72	72
Subtotal, Appropriations Before the Energy and Water Development Subcommittees	$12,618,490	$11,917,074	$13,062,902

DEPARTMENT OF ENERGY

FISCAL YEAR 1988 CONGRESSIONAL BUDGET REQUEST

SUMMARY OF ESTIMATES BY APPROPRIATIONS

BUDGET AUTHORITY IN THOUSANDS OF DOLLAR

	FY 1986 Actual BA	FY 1987 Estimate BA	FY 1988 Request BA
Appropriations Before Interior and Related Agencies Subcommittees:			
Alternative Fuels Production	$ 2,775	$ ---	$ ---
Clean Coal Technology	---	---	50,000
Fossil Energy Research and Development	309,389	251,402	168,900
Naval Petroleum and Oil Shale Reserves	13,002	122,177	159,700
Energy Conservation	426,187	149,679	86,090
Energy Regulation	23,423	23,400	21,680
Emergency Preparedness	5,750	6,044	6,206
Strategic Petroleum Reserve	107,533	147,433	270,181
Energy Information Activities	57,724	60,301	61,599
Subtotal, Interior and Related Agencies Subcommittees	945,783	760,436	824,356
Subtotal, Energy and Water Development Subcommittees	12,618,490	11,917,074	13,062,902
Subtotal, Department of Energy	13,564,273	12,677,510	13,887,258
Permanent - Indefinite Appropriations:			
Payments to States	629	705	727
Total, Department of Energy	$13,564,902	$12,678,215	$13,887,985

DEPARTMENT OF ENERGY
FY 1988 CONGRESSIONAL STAFFING REQUEST
TOTAL WORK FORCE

	FY1986 FTE USAGE	FY1987 -FY86	FY1987 CONGR REQ	FY1988 -FY87	FY1988 CONGR REQ
ENERGY & WATER SUBCOMMITTEE					
HEADQUARTERS	4,663	170	4,833	47	4,880
FIELD	9,393	62	9,455	-4	9,451
SUBCOMMITTEE TOTAL	14,056	232	14,288	43	14,331
INTERIOR SUBCOMMITTEE					
HEADQUARTERS	1,254	-13	1,241	-104	1,137
FIELD	883	5	888	-143	745
SUBCOMMITTEE TOTAL	2,137	-8	2,129	-247	1,882
GRAND TOTAL	16,193	224	16,417	-204	16,213
ADJUSTMENT		-317	-317	54	-263
ADJUSTED TOTAL	16,193	-93	16,100	-150	15,950

DEPARTMENT OF ENERGY
FY 1988 CONGRESSIONAL STAFFING REQUEST
TOTAL WORK FORCE

	FY1986 FTE USAGE	FY1987 -FY86	FY1987 CONGR REQ	FY1988 -FY87	FY1988 CONGR REQ
10:ENERGY SUPPLY RESEARCH AND DEV	918	8	926	0	926
HEADQUARTERS	635	4	639	0	639
FIELD	283	4	287	0	287
15:URANIUM ENRICHMENT	65	2	67	0	67
HEADQUARTERS	54	2	56	0	56
FIELD	11	0	11	0	11
20:GENERAL SCIENCE AND RESEARCH	38	1	39	0	39
HEADQUARTERS	38	1	39	0	39
25:ATOMIC ENERGY DEFENSE ACTIVITI	2,710	142	2,860	30	2,890
HEADQUARTERS	491	52	543	19	562
FIELD	2,227	90	2,317	11	2,328
30:DEPARTMENTAL ADMINISTRATION	3,273	77	3,350	20	3,370
HEADQUARTERS	1,493	46	1,739	5	1,744
FIELD	1,580	31	1,611	15	1,626
34:ALASKA POWER ADMINISTRATION	36	2	38	-3	35
FIELD	36	2	38	-3	35
36:BONNEVILLE POWER ADMIN	3,491	-41	3,430	-50	3,380
FIELD	3,491	-41	3,430	-50	3,380
38:SOUTHEASTERN POWER ADMIN	38	2	40	0	40
FIELD	38	2	40	0	40
42:SOUTHWESTERN POWER ADMIN	193	-7	186	0	186
FIELD	193	-7	186	0	186
46:WAPA - POWER MARKETING	1,176	-16	1,160	0	1,160
FIELD	1,176	-16	1,160	0	1,160
50:WAPA - COLORADO RIVER BASIN	219	0	219	0	219
FIELD	219	0	219	0	219
52:FEDERAL ENERGY REGULATORY COMM	1,597	62	1,659	0	1,659
HEADQUARTERS	1,597	62	1,659	0	1,659
54:NUCLEAR WASTE FUND	291	20	311	44	355
HEADQUARTERS	154	3	157	23	180
FIELD	137	17	154	23	177
56:GEOTHERMAL RESOURCES DEV FUND	1	0	1	0	1
HEADQUARTERS	1	0	1	0	1
65:FOSSIL ENERGY RESEARCH AND DEV	706	-3	703	-113	590
HEADQUARTERS	141	-3	138	0	138
FIELD	565	0	565	-113	452
70:NAVAL PETROL & OIL SHALE RES	99	-4	95	0	95
HEADQUARTERS	20	2	22	0	22
FIELD	79	-6	73	0	73
75:ENERGY CONSERVATION	322	30	352	-109	243
HEADQUARTERS	201	26	227	-84	143
FIELD	121	4	125	-25	100
80:EMERGENCY PREPAREDNESS	64	7	71	0	71
HEADQUARTERS	64	7	71	0	71
81:ECONOMIC REGULATION	348	-53	295	-20	275
HEADQUARTERS	348	-53	295	-20	275
85:STRATEGIC PETROLEUM RESERVE	152	-5	147	-5	142
HEADQUARTERS	34	-12	22	0	22
FIELD	118	7	125	-5	120
90:ENERGY INFORMATION ACTIVITIES	446	20	466	0	466
HEADQUARTERS	446	20	466	0	466
94:ADVANCES FOR CO-OP WORK	2	0	2	0	2
FIELD	2	0	2	0	2
GRAND TOTAL	16,193	274	16,417	-204	16,213
ADJUSTMENT		-317	-317	54	-263
ADJUSTED TOTAL	16,193	-93	16,100	-150	15,950

ENERGY SUPPLY, RESEARCH AND DEVELOPMENT ACTIVITIES

(Including Transfer of Funds)

For expenses of the Department of Energy activities including the purchase, construction and acquisition of plant and capital equipment and other expenses incidental thereto necessary for energy supply, research and development activities, and other activities in carrying out the purposes of the Department of Energy Organization Act (Public Law 95-91), including the acquisition or condemnation of any real property or any facility or for plant or facility acquisition, construction, or expansion; purchase of passenger motor vehicles (not to exceed [18] 21 for replacement only), [$1,347,048,000,] $1,909,710,000, to remain available until expended; [in addition $684,158,000 shall be derived by transfer from Uranium Supply and Enrichment Activities provided in prior years and shall be available until expended; and of which $84,100,000 which shall be available only for the Center for New Industrial Materials; the Center for New Industrial Materials; the Center for Nuclear Imaging Research; the Energy Research Complex; Saint Christopher's Hospital for Children - Energy Demonstration Project; Center for Excellence in Education - Energy Utilization Performance Project; the Institute of Nuclear Medicine; the Advanced Science Center; the Center for Science and Engineering; and funds provided for byproducts utilization activities shall be available only for the following regional projects: Florida Department of Agriculture and Consumer Services; Hawaii Department of Planning and Economic Development; Iowa State University; Oklahoma, Red-Ark Develoment Authority; Washington, Port of Pasco; State of Alaska.] (Energy and Water Development Appropriations Act, 1987 as included in Public Laws 99-500 and 99-591, section 101(e),) and in addition, as authorities by section 201 of Public Law 95-238 and notwithstanding 31 U.S.C. 3302, revenues received as user fees for use of the Liquified Gaseous Fuels Spill Test Facility in Fiscal Year 1988 shall be retained and used to provide toxic and flammable spill test facilities and activities.

Explanation of Change

Deletes Language contained in Public Laws 99-500 and 99-591 which had specific application to fiscal year 1987.

Proposed Language provides fees from non-Federal users of the Liquified Gaseous Fuels Spill Test Facility in Nevada to be received into the account as reimbursable expenses to be retained and used to operate, manage and maintain the facility.

DEPARTMENT OF ENERGY

FISCAL YEAR 1988 CONGRESSIONAL BUDGET REQUEST

SUMMARY OF ESTIMATES BY APPROPRIATION BY MAJOR ACTIVITY

ENERGY SUPPLY RESEARCH AND DEVELOPMENT

BUDGET AUTHORITY IN THOUSANDS OF DOLLARS

	FY 1986 Actual	FY 1987 Estimate	FY 1988 Request
Solar Energy	$ 143,464	$ 123,532	$ 71,175
Cooperative Venture R&D Pools	---	---	5,000
Geothermal	26,495	20,830	15,935
Hydropower	481	450	---
Electric Energy Systems	11,387	11,276	6,500
Energy Storage Systems	17,142	16,589	7,500
Nuclear Energy R&D	372,037	327,474	334,170
Remedial Action & Waste Technology	229,915	276,870	251,500
Civilian Waste R&D	15,991	6,500	5,000
Environmental, Safety and Health	44,004	62,014	70,000
Biological and Environmental Research	178,000	193,992	217,500
Liquified Gaseous Spill Test Facility	1,732	2,000	500
Magnetic Fusion	361,480	345,313	345,600
Basic Energy Sciences	419,850	525,450	479,075
Energy Research Analysis	2,567	2,000	3,700

DEPARTMENT OF ENERGY

FISCAL YEAR 1988 CONGRESSIONAL BUDGET REQUEST

SUMMARY OF ESTIMATES BY APPROPRIATION BY MAJOR ACTIVITY

ENERGY SUPPLY RESEARCH AND DEVELOPMENT (CONTINUED)

BUDGET AUTHORITY IN THOUSANDS OF DOLLARS

	FY 1986 Actual	FY 1987 Estimate	FY 1988 Request
University Research Instrumentation.	6,176	5,000	5,000
University Research Support	10,168	15,775	13,400
Advisory and Oversight Program Direction	2,674	2,490	3,200
Multi-Program Laboratories 'Facilities Support	39,908	56,695	56,600
Small Business Innovation Research Program	29,137	---	---
In-House Energy Management	11,715	16,500	18,880
Strategic Facilities Utilization Program	---	---	2,175
Technical Information and Management	12,407	14,698	14,000
Policy and Management	3,497	3,874	4,300
Subtotal, Energy Supply R&D ...	1,940,227	2,029,322	1,930,710
Less Use of Prior Year Balances and Other Adjustment	-238,876	-775,191	-16,000
Total, Energy Supply R&D.....	$1,701,351	$1,254,131	$1,914,710

OVERVIEW

Energy Research Analysis

The Office of Program Analysis manages the Energy Research Analysis Program to fulfill one of the responsibilities of the Director of the Office of Energy Research. The Department of Energy Organization Act (Public Law 95-91) states "It shall be the duty and responsibility of the Director--[Office of Energy Research] 1) to advise the Secretary with respect to the physical research program... (and) 2) to monitor the Department's energy research and development programs in order to advise the Secretary with respect to any undesirable duplication or gaps in such programs;...." Accordingly, the Office of Program Analysis (OPA) assesses research projects and programs in order to judge the significance of these efforts and to identify undesirable duplications and gaps.

There are three types of independent technical assessments performed by OPA on research programs throughout the Department. First, OPA staff performs comprehensive project-by-project evaluations of major programs using outside experts from industry, academia and the National Laboratories. These peer reviews provide judgments on the quality of the research and its impact. DOE Principal Officers responsible for energy R&D recognize that without this program less technically competitive projects would be awarded. Second, technical assessments provide independent views on the directions that future R&D in specific areas should take to be more productive and relevant to DOE missions. Research assessments are performed by contractors and OPA staff drawing on the world's leading experts in the specific fields being addressed. Tasks by the Foreign Applied Sciences Assessment Center (FASAC) and JASON's are included in these assessments. In addition, the Energy Research Advisory Board (ERAB) funded by this office addresses questions posed directly by the Secretary or the Director, Office of Energy Research, and provides views based upon their expertise. Third, OPA investigates the accomplishments of programs by determining specific advances in science or marketable products that arise from the program's R&D. Accounts of scientific developments are prepared in lay English to communicate the program's accomplishments to the general public.

A project has been initiated that will result in a report in FY 1988 on the accomplishments, over the last 30 years, of the Department's High Energy Physics program. The FY 1988 request would also allow a report to be initiated on the accomplishments of the Advanced Research and Technology program under Fossil Energy. In addition, in-depth technical peer reviews will be prepared on two major research programs, Advanced Process Technology (APT/FE) and Small Business Innovation Research (SBIR). Three research needs assessments are planned, Coal Liquefaction, Mixed-Wastes and Materials by Design. A new class of peer reviews will be performed in FY 1988 with

the review of the exploratory R&D programs at each of the National Laboratories for which the Office of Energy Research (ER) has oversight responsibility--Lawrence Berkeley Laboratory, Argonne National Laboratory, Oak Ridge National Laboratory, Brookhaven National Laboratory, and Pacific Northwest Laboratory.

OPA also has the responsibility within DOE for providing financial support for management of the National Acid Precipitation Assessment Program (NAPAP) created by the Acid Precipitation Act of 1980 (P.L. 96-294). OPA is also charged with providing funds under NAPAP for summarizing and synthesizing the state of the science in acid rain research and producing assessment reports useful for policymakers. In FY 1988 an increase in funds is needed for the studies that must be initiated to support the preparation of the Second Interim Assessment which will synthesize the results of $300 million worth of Federal acid rain research. In the absence of adequate support, decisionmakers will not have an updated assessment of acid rain research in 1988, and the preparation of the NAPAP's Final Assessment at the end of the mandated major 10 year research program by 1990 will be severely impaired.

DEPARTMENT OF ENERGY
FY 1988 CONGRESSIONAL BUDGET REQUEST
ENERGY SUPPLY RESEARCH AND DEVELOPMENT
(dollars in thousands)

LEAD TABLE

Energy Research Analysis

Activity	FY 1986 Actual	FY 1987 Appropriation	FY 1988 Base	FY 1988 Request	% Change from FY 1987 Approp.
Energy Research Analysis....	$ 2,567	$ 2,000	$ 2,000	$ 3,700	+85
Total.....	2,567	2,000	2,000	3,700	+85
Operating Expenses.....	(2,567) a/ b/	(2,000)	(2,000)	(3,700)	+85
Total Program.....	($ 2,567)	($ 2,000)	($ 2,000)	($ 3,700)	+85

Authorization: Section 209, P.L. 95-91.

a/ Total has been reduced by $31,000 which has been transferred to SBIR program.
b/ Total has been reduced by $102,000 in accordance with P.L. 99-177, the Balanced Budget and Emergency Deficit Control Act of 1985 (Gramm/Rudman/Hollings).

DEPARTMENT OF ENERGY
FY 1988 CONGRESSIONAL BUDGET REQUEST
ENERGY SUPPLY RESEARCH AND DEVELOPMENT
(dollars in thousands)

SUMMARY OF CHANGES

Energy Research Analysis

FY 1987 Approriation enacted	$ 2,000
- Assessments deferred from FY 1987 and new class of reviews of five National Laboratory Exploratory Funds R&D	+1,100
- Synthesis of NAPAP Acid Rain Research, Government-wide	+600
FY 1988 Congressional Budget Request	$ 3,700

DEPARTMENT OF ENERGY
FY 1988 CONGRESSIONAL BUDGET REQUEST
ENERGY SUPPLY RESEARCH AND DEVELOPMENT
(dollars in thousands)

KEY ACTIVITY SUMMARY

ENERGY RESEARCH ANALYSIS

I. Preface: Energy Research Analysis

The Office of Program Analysis manages the Energy Research Analysis program to fulfill one of the responsibilities of the Director, Office of Energy Research. The Department of Energy's Organization Act (Public Law 95-91) states "It shall be the duty and responsibility of the Director--(Office of Energy Research) 1) to advise the Secretary with respect to the physical research program . . . (and) 2) to monitor the Department's energy research and development programs in order to advise the Secretary with respect to any undesirable duplication or gaps in such programs;. . . ." Accordingly, the Office of Program Analysis assesses research projects and programs in order to judge the significance of these efforts and to identify undesirable duplications and gaps.

II. A. Summary Table

Program Activity	FY 1986	FY 1987	FY 1988	% Change
Program Technology Assessment.....	$1,990	$1,450	$2,550	+ 76
Acid Rain Support.....	577	550	1,150	+109
Total, Energy Research Analysis....	$2,567	$2,000	$3,700	+ 85

II. B. Major Laboratory and Facility Funding

Argonne National Laboratory.....	$ 465	$ 89	$ 210	+135
Brookhaven National Laboratory.....	306	255	300	+ 18
Oak Ridge National Laboratory.....	776	110	800	+627
Pacific Northwest Laboratory.....	40	325	420	+ 29
Total.....	$1,587	$ 779	$1,730	+122

III. Activity Descriptions

Program Activity	FY 1986	FY 1987	FY 1988
Program Technology Assessment	Prepared technical assessments of Wind Energy Turbodynamics, Nonhighway Transportation, Accomplishments of the Seed Money Program of ORNL and the Magnetic Fusion Energy Program, as well as a compilation of all DOE Geosciences related research. Support ERAB, JASON, and FASAC.	Perform technical assessments of Coal Gasfication, peer review of the Advanced Research and Technology Development (AR&TD/FE) program, and accomplishments of the Basic Energy Sciences (BES) program. Support ERAB, JASON, and FASAC.	Perform technical assessments of Coal Liquefaction, Mixed Wastes and Materials by Design. Prepare Program Accomplishments of High Energy Physics (ER) and AR&TD (FE), conduct Peer Reviews of Advanced Process Technology (APT/FE) and Small Business Innovation Research (ER). Fact finding surveys of the Exploratory Funds R&D (ER). Support ERAB, JASON, FASAC.
	$1,990	$1,450	$2,550

III. Activity Descriptions

Program Activity	FY 1986	FY 1987	FY 1988
Acid Rain Support	Provide DOE share of support for NAPAP management and technical staff under P.L. 96-294. Perform technical assessment of the results of the research program conducted by national laboratories, et. al., and coordinated by the interagency National Acid Precipitation Assessment Program (NAPAP). Drafted First Interim Assessment for 1986. Begin Second Interim National Assessment Report (due 1988).	Provide DOE share of support for NAPAP management and technical staff under P.L. 96-294. Conclude first interim assessment. Assess interim results of major research projects, including the National Stream Survey, the Mountain-Cloud Network; and the National Trends Network.	Provide DOE share of NAPA management and technical staff under P.L. 96-294. Begin assessments for 1988 and 1990 concluding the 10-year NAPAP program. Assess the results of the validation of the Regional Atmospheric Deposition Model, the Direct-Delayed Response Program and the materials research program. Synthesize the results of over $300 million worth of Federal acid rain research funded through FY 1987 for use by decisionmakers.
	$ 577	$ 550	$1,150
Total Energy Research Analysis	$2,567	$2,000	$3,700