

state & society

DOE boosts physics budget 9%, despite last-minute cuts

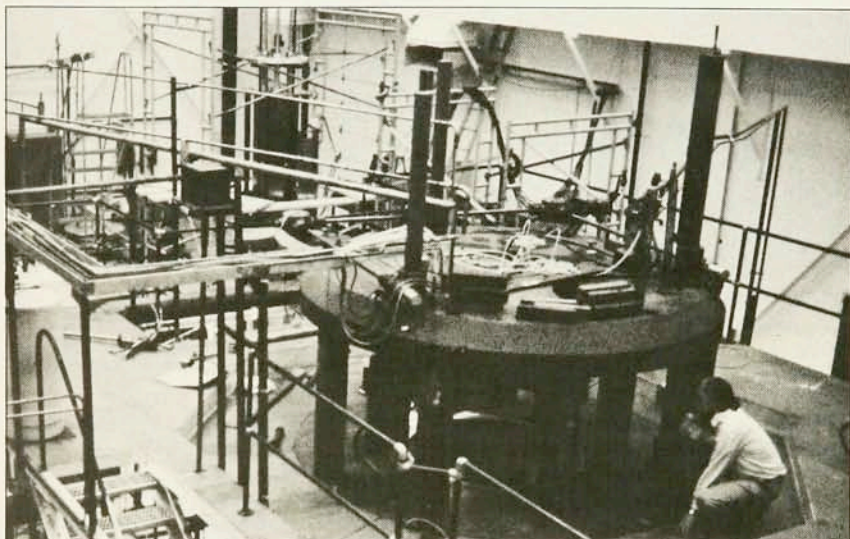
In an effort to combat inflation, President Carter has submitted to Congress a revised budget for Fiscal Year 1981 that is \$15 billion less than the version he sent to Congress in January. The Department of Energy's budget was cut \$492 million, but only \$26 million of these cuts were made in physics-related research programs. The proposed budget for physics-related research, excluding fusion research, is 9% higher than what DOE expects to spend this year.

High-energy physics. The FY 1981 request for high-energy physics, up 9% before inflation takes its toll, reflects the final year of funding for the Energy Saver project and the initiation of the Tevatron colliding-beam project, both at Fermilab. The Fermilab upgrade has gone by a variety of names in the past, including Energy Doubler/Saver. The Energy Saver will provide a ring of superconducting magnets within the existing accelerator tunnel and the support systems necessary for the ring to deliver 500-GeV primary protons to three external experimental areas and protons at about 800 GeV to an internal target.

Tevatron, a two-phase project, will ultimately allow proton-antiproton collisions at reaction energies up to 2000 GeV and fixed-target experiments at energies up to 1000 GeV. Tevatron I, which will begin in 1981 with a budget of \$2 million, will provide the colliding-beam capability; it is scheduled for completion in 1983 at a total cost of \$39.5 million. Tevatron II will add beam extraction equipment and upgrade the experimental areas to allow fixed-target operation at the full 1000 GeV.

The budget also includes \$41 million for the continuation of construction of the 400 GeV $\times$ 400 GeV Intersecting Storage Accelerator (Isabelle) at Brookhaven National Laboratory. This budget is \$4 million less than what Carter proposed spending in January, but Edward Friedman, director of energy research, told PHYSICS TODAY that work on Isabelle has been delayed slightly anyway because of difficulties in the fabrication of the superconducting coils; so the cut will not have much of an effect on the overall construction schedule.

Nuclear physics. An overall increase of 5.7% is being requested for nuclear physics,



Superconducting magnet of the National Superconducting Cyclotron now under construction at Michigan State University. The ten-foot diameter, 100-ton magnet is shown here raised out of its normal operating position during an inspection by Henry Blosser, who is director of the facility.

almost 5% less than what was asked for in January. The budget originally included \$4 million to begin construction of the Argonne Tandem/Linac Accelerator System (ATLAS) at Argonne National Laboratory. This program is to be delayed until 1982, however, because of the budget reductions.

Although there will be no new major construction projects in nuclear physics in 1981, construction of the National Superconducting Cyclotron Laboratory at Michigan State University (MSU II) will continue with a budget of \$8.9 million. The new superconducting cyclotron will be arranged to provide a second stage of acceleration for beams from the present superconducting cyclotron, MSU I. The coupled cyclotron system will produce energies of 200 MeV per nucleon for projectiles lighter than calcium and a decreasing energy per nucleon for heavier projectiles, to a value of about 20 MeV per nucleon for uranium.

Construction of MSU II may have to proceed at a slower pace, however. The subcommittee on energy research and production of the House Science and Technology Committee has proposed stretching out the construction schedule

to liberate \$5 million for use elsewhere in the DOE budget.

Solid-state physics. The two big projects in solid-state physics in the 1981 budget are the National Synchrotron Light Source at Brookhaven National Laboratory and the Intense Pulsed Neutron Source I at Argonne National Laboratory. Both of these will go into operation for the first time in 1981. DOE is also discussing with Los Alamos the possibility of using the LAMPF accelerator and the proton storage ring, to be installed there for weapons research, to produce neutrons for neutron-scattering experiments.

Nuclear fission. The 1981 budget for nuclear fission represents a shift in emphasis to strengthen short-term research on light-water reactors. The gas-cooled breeder reactor program will be "brought to an orderly conclusion" in 1981, the gas-cooled thermal reactor will be phased out and the Clinch River Breeder Reactor would be abandoned under the Carter budget.

Earlier this year Carter was criticized for his postponement of fast-breeder reactor development by the 66-nation conference on International Fuel Cycle Evaluation. This is not the first time

Carter has tried to persuade Congress to drop the Clinch River Breeder Reactor, and Congressional moves to restore the program to the budget have gained strength from this latest international show of support for the breeder.

Research on light-water reactor safety is emphasized in the 1981 budget, as is isotope separation and waste management. The FY 1981 commercial nuclear waste budget of \$289 million includes funds for the President's recently announced nuclear waste management policy, which would provide a permanent repository for radioactive waste by the mid-1990's. The budget provides for further expansion of research begun in 1980 of non-salt geologic media for potential terminal isolation of nuclear waste. Carter has terminated, however, the Waste Isolation Pilot Plant near Carlsbad, New Mexico, which was to have housed defense nuclear wastes in a salt bed. The defense wastes intended for that facility will be placed instead in the first commercial waste-disposal facility. The Carlsbad site will be considered along with other sites for the first licensed facility.

Other programs. Carter has labeled conservation the highest priority in the DOE budget, claiming that energy savings of up to 50% are possible over the next 30 years. 1981 will be the first year in which the budget devoted to conservation activities surpasses \$1 billion.

Fossil-energy programs also exceed the billion-dollar mark for the first time in the 1981 budget request. \$1.1 billion will be spent in 1981 on research, development and commercialization of domestic resources of coal, oil and unconventional natural gas. Included in the budget is \$175 million for a Solvent Refined Coal plant at Newman, Kentucky, \$190 million for the SRC II plant at Morgantown, West Virginia, and \$55 million for a High-BTU Synthetic Pipeline Gas plant. Construction funds for these three demonstration facilities constitute 40% of the FY 1981 request for coal research and development.

Although an increase of 29% was originally planned for solar applications, only a 7% increase is allowed under the President's revised budget, and solar technology will increase even less—a mere 2%.

The President's budget amendment

DOE physics-related research

(in millions of dollars)

	FY 1980 (current plan)	FY 1981 (estimate)
High-energy physics		
Fermilab	67.8	75.0
Brookhaven	38.9	43.2
Argonne	9.8	7.5
SLAC	49.2	57.8
Berkeley	11.5	12.0
General R&D	41.8	45.9
Capital equipment	36.0	39.0
Construction	69.5	73.6
Program direction	0.6	0.9
Total high-energy physics	325	355
Nuclear physics		
Medium-energy physics	41.7	45.5
Heavy-ion physics	33.6	36.0
Nuclear theory	6.1	7.0
Construction	14.8	13.3
Other capital equipment	8.2	9.4
Program direction	0.2	0.3
Total nuclear physics	105	111
Basic energy sciences		
Nuclear sciences		
Nuclear research	12.0	13.3
Nuclear data measurements	4.9	5.2
Nuclear data compilation and evaluation	2.4	2.6
Heavy-element chemistry	3.4	3.7
Isotope preparation	8.0	8.6
Capital equipment	1.3	1.4
Total nuclear sciences	32.0	34.8
Materials sciences (including solid-state physics)	97.0	98.0
Chemical sciences	65.0	72.3
Engineering, mathematical and geosciences	21.3	28.7
Advanced energy projects	5.2	7.5
Biological energy research	6.3	8.7
Other capital equipment	0.1	0.1
Program direction	2.3	2.4
Total basic energy sciences	229	252

also killed a new \$3-million program to establish goal-oriented university research centers around the country. The centers were to have conducted research that fell between DOE's basic and applied research categories.

What will happen to this now quite lean budget on Congressional Hill remains to be seen, but all indications so far reveal that members of Congress are willing to go at least as far as the President in tightening the fiscal reins. —MEJ

Budget for fusion also rises 9%

The combined budgets for magnetic and inertial-confinement fusion would go up 9% between 1980 and 1981 under the President's proposed budget for the Department of Energy. The additional money will be used to increase support of concepts beyond the tokamak and to deepen our understanding of the physics issues of inertial confinement.

Magnetic fusion. The FY 1981 budget for magnetically confined fusion is \$396 million, 11% higher than the 1980 level, but 2% lower than the level announced in January. For several months a storm has been brewing over the most appropriate pace for the magnetic fusion energy program. The House subcommittee on en-

ergy research and production, under the chairmanship of Mike McCormack (D-Wash.), has been arguing that the time is ripe for a fast-paced fusion development program that would have as its goal an on-line electric power demonstration plant before the year 2000, at least ten years earlier than the current DOE schedule would permit.

McCormack has publicly asked the President to declare the development of magnetic fusion energy a major national priority and establish as a national goal the construction of a magnetic fusion electric generation demonstration plant before the end of the century. To accomplish this goal, he is calling for an in-

Deutch leaves DOE

John Deutch, who joined DOE in 1977 as director of the Office of Energy Research and who was named Under Secretary of Energy last year, has resigned from the Department. Deutch has returned to MIT, where he was a professor of chemistry before joining DOE. He told us that he will also continue to assist the Carter presidential campaign on energy matters.