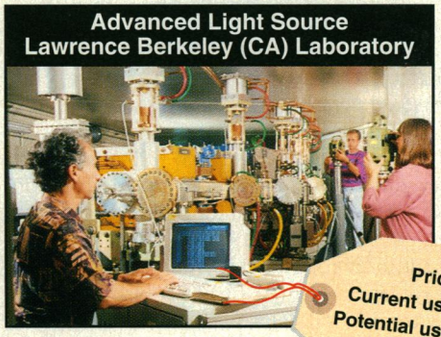
1996 SCIENCE BUDGET

White House Ponders Increase for DOE Labs

With its lights out and its doors shut, the Intense Pulsed Neutron Source (IPNS) at Argonne National Laboratory in Illinois, the most powerful U.S. source of neutrons, sits idle for almost two-thirds of the year. Despite a long waiting list of researchers eager to use the 23-year-old facility to study liquid and solid structures, lab managers can't afford the additional $4 million to keep it operating for another 12 weeks, to its full 32-week capacity.



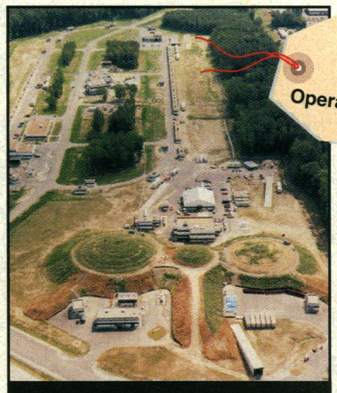
Advanced Light Source
Lawrence Berkeley (CA) Laboratory

Price: $146 million
Current use: 3000 hours/year
Potential use: 5000 hours/year
Extra cost: $2 million

And that's just one example of what's happening at the large labs run by the Department of Energy (DOE). From Brookhaven National Laboratory on Long Island to the Stanford Linear Accelerator Center on the California coast, the DOE's multibillion-dollar investment in light sources, accelerators, reactors, and other research facilities is chronically underused because of a lack of operating money.

Things could get worse, too, because each new machine that comes on line increases the pressure on DOE's shrinking research budget. Next year, for example, the department will need to find an additional $161 million to begin operating two state-of-the-art facilities: the $551-million Continuous Electron Beam Accelerator Facility (CEBAF) in Newport News, Virginia, and the $811-million Advanced Photon Source at Argonne. And an even bigger project—the $2.9-billion Advanced Neutron Source proposed for Oak Ridge National Laboratory—is waiting for its first construction dollars (see box).

Awareness of this pinch has finally reached the White House, where a rescue plan is being drawn up. Administration officials are considering an initiative that would pump as much as $200 million into energy research facilities. The money, which would be included in the 1996 budget that President Clinton will propose to Congress in February, would go to extend operating schedules for such facilities as Argonne's IPNS. The logic behind the initiative is that tight budgets require the government to make sure it's getting the most out of existing stock. "It's ridiculous," says one senior administration manager. "We're building DOE facilities, and we can't operate the ones we have."



Continuous Electron Beam Accelerator Facility
Newport News, VA

1995 start-up
Price: $551 million
Operating cost: $71 million/year

This high-level concern delights lab managers, who have been lobbying Congress and the Administration for relief from budgets that have remained roughly stagnant in the past 5 years. But it poses a challenge for Energy Department officials who don't want to abandon the drive for new projects. Martha Krebs, DOE's assistant secretary for energy research, backs the initiative but argues that it is not directly linked to the fate of proposed facilities such as the ANS. At the same time, however, she admits the department "faces constant or declining budgets, and we're struggling to meet very difficult numbers."

Making a list. The first inkling of the potential new spending came in a 23 Sep-

Neutron Source Fights for Its Life

The current budget squeeze on the Department of Energy (DOE) has put some big projects in jeopardy—even those with friends in high places. Take the proposed Advanced Neutron Source (ANS) at Oak Ridge National Laboratory in Tennessee. Vice President Al Gore enthusiastically supports it. U.S. physicists applaud it. DOE officials have spent $100 million planning it. Nevertheless, says the director of one DOE laboratory, who insisted on anonymity, "it's really twisting in the wind."

At issue is whether President Clinton will include construction funds for the $2.9-billion reactor in his 1996 budget that goes to Congress in February. On one side are Gore, former senator from Tennessee, and John Gibbons, director of the White House Office of Science and Technology Policy and a former physicist at Oak Ridge, along with retiring Representative Marilyn Lloyd (D–TN), chair of the energy subcommittee of the House Science, Space, and Technology Committee. Lined up against them are skeptics in Congress and the Office of Management and Budget, which oversees the president's budget planning, and some DOE officials. The department did not ask for construction funding in its budget submission to OMB, according to Administration sources.

ANS supporters say the facility, which they hope to begin operating in 2003, is vital to keep U.S. scientists apace with Europe and Japan. Detractors acknowledge the project's scientific value but criticize its cost and the possibility that its fuel, highly enriched uranium, could be diverted for use in a nuclear weapon. In particular, Gore's staff is nervous about having the vice president—an outspoken figure on environmental and nonproliferation issues—support a project that many environmental and arms-control groups oppose.

ANS is also threatened by what one neutron physicist calls "death by a thousand paper cuts." That's the tendency for Congress to avoid making a decision on a big project, delaying construction but continuing to fund design studies, as happened last year. "The clear signal from Congress is that they're not ready" for the ANS, says Martha Krebs, assistant DOE secretary for energy research. In addition, Energy Secretary Hazel O'Leary is worried about the downstream construction costs of ANS, estimated at $500 million a year, "and so am I," says Krebs.

In the meantime, ANS supporters are hoping to make the project more attractive by broadening its scope and lowering its cost. Under one option, ANS would be converted into a cheaper research reactor, using low-grade uranium, that can also produce tritium to renew the nation's stockpile of nuclear weapons. The hope is that a smaller price tag, a more politically acceptable fuel, and multiple uses might be a winning political combination.

–A.L.

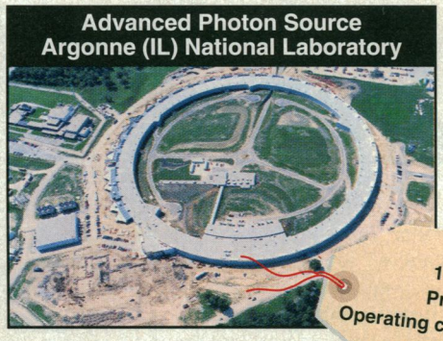
tember letter to lab directors from Krebs and two White House officials. It asked the directors to fill out a questionnaire on ways to boost efficiencies at a minimum cost. "Important DOE facilities, assets that represent an enormous investment for the taxpayer, often are not fully utilized," the letter noted. The directors recommended a total of $100 million to $200 million in additional operating funds for 1996 spread across dozens of facilities, Krebs said.

Adding a few million here and there to existing facilities may not seem like a big deal to a department with a $17.7-billion budget. But lab managers say that, in fact, small increases could result in big scientific payoffs. "A little bit of money can get you a lot," says Nicholas Samios, director of Brookhaven National Laboratory in Upton, New York. "For a few million dollars we can increase our [overall] efficiency by 50%." The reason for that staggering boost in efficiency is that it's very expensive to leave a big research facility unused. A highly trained staff must be paid even if the machine is idle, and the complex machinery requires expensive maintenance whether it's running or not.

The pinch isn't only being felt at older facilities. The new $146-million Advanced Light Source (ALS) at Lawrence Berkeley National Laboratory in California, which produces soft x-rays for research in electronics, materials, and pharmaceuticals, operates at only three-fifths capacity, says Brian Kincaid, who runs the facility. In addition, this year an $800,000 drop in the budget forced him to lay off 10 people. However, he says a $2-million boost in ALS's $22-million budget would let him run ALS for a full 5000 hours next year.

The blame game. When it comes to assigning responsibility for DOE's current fix, the fingers quickly start pointing. Krebs points hers at previous Administrations, which she says did not foresee the current funding squeeze. In response, Allan Bromley, dean of engineering at Yale University and former science adviser to President Bush, says no one could have anticipated the pressures on today's federal budget. "It wasn't at all clear when many of these projects started in the Reagan years that the funding would not be available," he says. "There was an unfortunate tendency to minimize operations costs," he adds, an attitude he says the Bush Administration tried to change. Another surprise was the end of the Cold War, which pulled the rug out from under DOE's justification for much of its research.

Laboratory managers point their fingers at DOE officials. "DOE should have taken this problem in hand and tried to fix the situation," complains Hermann Grunder, who directs CEBAF. "At the moment, all we have is pious words." Some of the lab managers think the White House interest is an implicit criticism of DOE management. "It's embarrassing to have the White House tell you to increase your budget request," says one lab manager, who requested anonymity.



Finger pointing is, of course, a political pastime in Washington, but regardless of whose fault it is, the problem of finding money for existing facilities while continuing to look for new scientific frontiers isn't going to disappear soon. And that inescapable reality is forcing lab officials to consider radical ways to tap nonfederal sources of funding.

For example, industrial users currently pay for time to conduct experiments on Berkeley's Advanced Photon Source. But David Moncton, who runs the facility, thinks his lab—for a fee—could instead provide industry with data. "Industry would rather have the data than the beam time anyway," he says.

But federal regulations make it difficult for labs to sell their services to industry. And Krebs says it is "unrealistic" to expect industry to fill the funding gap, in part because many DOE facilities are best suited for fundamental research with few short-term applications.

Of course, any White House or DOE initiative must win the support of Congress. And while there is sympathy for the plight of the labs on Capitol Hill, there is also doubt that DOE can distinguish between a mature program that is worth continuing and one that has outlived its scientific usefulness. "To these labs, there is no such thing as an obsolescent and inefficient facility," says one Senate aide. "We have got to shut some down to make room for new things." Krebs agrees the department must look carefully at its facilities—there are two panels reviewing the DOE labs—but points out that those results will not be ready in time to influence the 1996 budget request.

In the meantime, lab managers and Administration officials say the White House initiative puts Krebs in the difficult position of arguing for more funding for basic research at the same time DOE must tackle a multibillion-dollar environmental cleanup problem and increase its applied research activities, all within a shrinking budget. Some doubt she can succeed. "She is not strong enough to win the battle," predicts one administrator, while another says that "the real problem is that [Energy Secretary Hazel] O'Leary doesn't care." Still, DOE lab directors are hoping Krebs and the White House will prevail, and that a little more money will enable them to throw a lot more light on some important research questions.

–Andrew Lawler

PLANT BIOTECHNOLOGY

Lay U.K. Panel Savors Debate

LONDON—Scientists and academic institutions talk a lot about involving the public in science. But the results often amount to little more than talk. Recently, however, one funding body here—Britain's Biotechnology and Biological Sciences Research Council (BBSRC)—offered 16 members of the lay public a crash course in a controversial subject involving science—plant genetic engineering—in which they got to question the experts and then write their own report.

The 16-member panel, chosen from 350 applicants, came away with generally positive feelings about plant biotechnology. Fourteen of them, for example, said they would be willing to eat a genetically engineered tomato, which is not on sale in Britain. But they also had some sharp criticisms of the way genetically engineered products are developed and labeled. The results of this exercise suggest that the public, at least in Britain, is willing and able to grapple with the complex legal, economic, environmental, and social aspects of biotechnology research that most observers expect to change the face of agriculture in the 21st century.

"Before this conference, I didn't believe I had a right to an opinion," said Sheila Martin, a retired teacher from Paisley, Scotland, who was a member of the panel comprising the first U.K. National Consensus Conference on Plant Biotechnology, which issued a preliminary report* last week to close a 3-day conference at Regent's College. "Now I have one or two." That knowledge wasn't obtained overnight, however. "We've lived, slept, and breathed biotechnology for a few months," said panelist Berry Baker, a marketing consultant from Caterham, Surrey.

What Martin, Baker, and others were asked to do is immerse themselves in an im-

* Lay Panel Final Report on the UK National Consensus Conference available (end of November) from Imelda Topping, Science Museum, Exhibition Road, London, UK SW7 2DD.