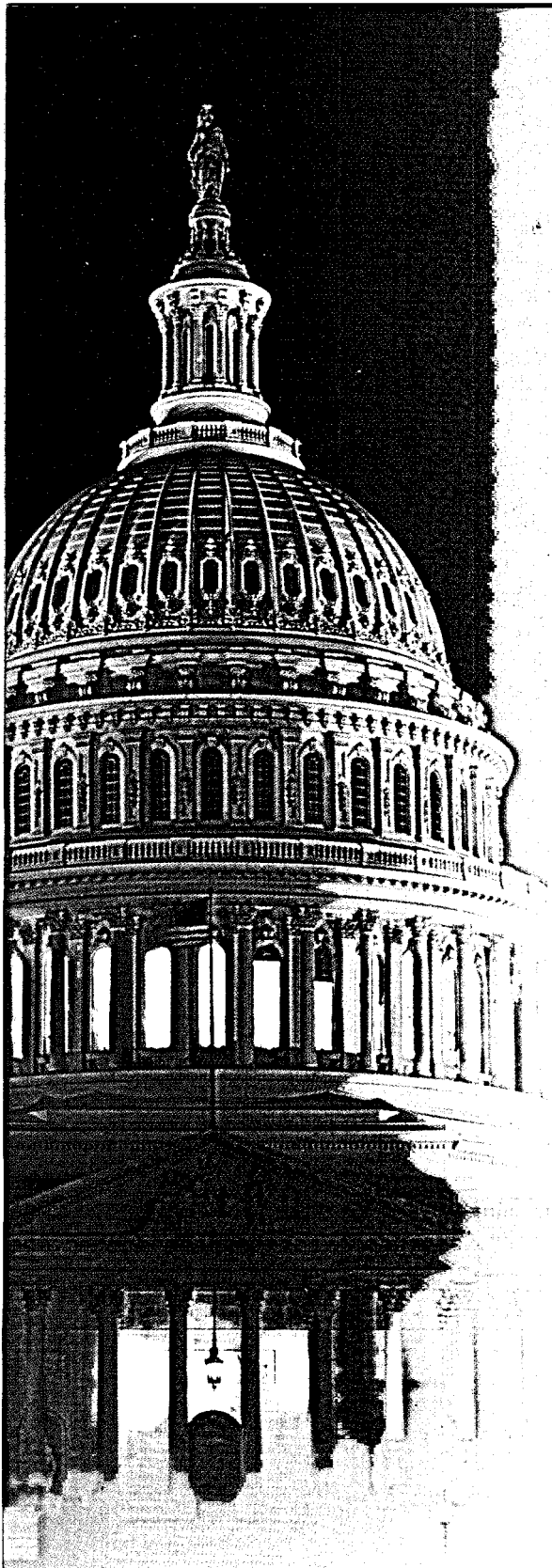

GOVERNMENT POLICIES

Aiding America's Science Agenda

ORNL research has provided important information to federal science and technology policy makers, shaping the debate and sometimes the wording of various laws, regulations, and other policies. For example, Laboratory studies since the 1960s have resulted in several regulatory criteria that have improved the safety of nuclear power plant operations. (See "Nuclear Safety" on p. 6.)

In 1974 when Alvin Weinberg, former ORNL director, headed a federal energy office that advised the Federal Energy Administration, he recommended developing technologies that use energy efficiently and studying long-term climatological effects of energy production. These recommendations were buttressed by the results of ongoing ORNL research led by Jack Gibbons, Roger Carlsmith, and Eric Hirst (who developed tools to improve energy efficiency in buildings and power delivery systems) and Jerry Olson (who studied how plants incorporate carbon dioxide from the atmosphere and return it when they die, as part of the global carbon cycle).

"ORNL has had a significant impact on the way Americans think about energy and ways to use it cleanly and efficiently," says Tom Wilbanks, an ORNL corporate fellow who has provided assistance on energy and environmental problem solving to people in 40 nations on 4 continents. This sea change in the nation's energy policy making began in the 1960s when Weinberg had a vision that ORNL could become the nation's environmental research and development laboratory. As one expression of this vision, a National Science Foundation Environmental Program was established at ORNL under the leadership of David Rose of the Massachusetts Institute of Technology, with Gibbons as his assistant director. Gibbons later served as director of the Office of Technology for the U.S. Congress and as science adviser to President Bill Clinton.

Carlsmith, Hirst, and other ORNL staff were instrumental in convincing U.S. policy makers and business leaders that energy efficiency improvements need not mean reductions in energy services. Industry leaders, in fact, began to see that energy efficiency could be good business. Firms such as Honeywell and Johnson Controls began marketing devices to monitor energy use, while the Department of Energy established national appliance efficiency standards. ORNL studies led by David Greene and others also influenced the development of policies promoting transportation energy efficiency.

ORNL also played a prominent role in cultivating the art and science of environmental impact analysis, helping to shape implementation of the National Environmental Policy Act of 1969. In addition, ORNL influenced the emergence of national environmental standards in the 1970s. Research led by Chuck Coutant concerning the effects on fish and other aquatic life of heated water discharged from power plant cooling systems was reflected in a section in the Clean Water Act of 1970 and the Environmental Protection Agency's implementation document, which remains the basic guideline for evaluating thermal-discharge effects.

Provisions of the Clean Air Act Amendments of 1990 that restrict industrial emissions of sulfur and nitrogen oxides reflect the findings of ORNL acid rain research for the National Acid Precipitation Assessment Program. Research results from ORNL also provided the technical basis for advice to DOE and EPA on setting regulations concerning safe disposal of pollutants in compliance with the Resource Conservation and Recovery Act. Studies by Steve Lindberg and others led to federal recommendations for controls of mercury emissions from sources such as coal-fired power plants.

More recently, ORNL staff members have addressed national needs for energy security, global environmental management, and competitiveness in international energy markets. Paul Leiby showed the substantial value of filling DOE's Strategic Petroleum Reserve to its capacity of 700 million barrels of oil, contributing to a recent Bush Administration decision to expand the reserve.

Related in part to conclusions of DOE national laboratory groups co-led by Marilyn Brown, who identified energy-efficient and low-carbon technologies that could slow the buildup of climate-altering atmospheric carbon dioxide, Wilbanks recently assisted DOE in preparing a strategic plan for the Clean Energy Technology Exports section of the U.S. Senate's 2002 energy bill. Further ORNL studies of strategies for U.S. energy independence by 2030 are under way.