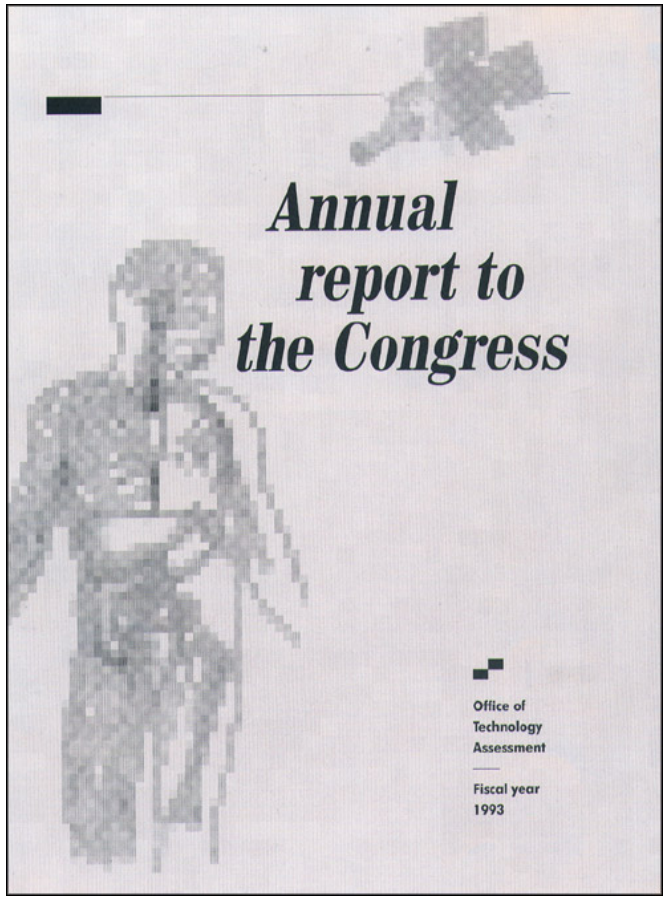
Annual Report to the Congress: Fiscal Year 1993

March 1994



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Statement from chairman, Edward M. Kennedy

It has been gratifying to witness the growth and development of the Office of Technology Assessment since its establishment in 1972. OTA has built a national reputation for its impartial and authoritative analysis of new developments in technology and related public policy issues, By analyzing how the latest scientific research can be applied to pressing economic, environmental, and social problems, and then suggesting policy options based on its findings, OTA performs an essential service for Congress and the country.

I commend the many men and women who have contributed to OTA'S remarkable success. They include the dedicated researchers who have contributed their expertise to hundreds of reports; the dependable administrative and support staff who have kept OTA operations running smoothly; the program managers and division directors whose foresight has kept OTA on the cutting edge of technology; the knowledgeable and skillful officers who handle OTA's congressional and public relations; the distinguished members of the Technology Assessment Advisory Council, who have provided wise counsel and advice; the Director Roger Herdman and his predecessors, whose gifted and energetic leadership has guided OTA toward the fulfillment of its mission.

More than ever, OTA's work is essential to intelligent policy decisions by Congress. The nation is in the midst of extraordinary

progress in technology. New developments in telecommunications and electronic networks are ushering in an information revolution that will be as significant as the industrial revolution of a century ago. We all know the need for fundamental restructuring in the nation's social services—especially in health care, welfare, education, job training, and crime prevention. We are working to find the best means to convert our industries from the defense orientation of the Cold War years to a civilian economy today. OTA has made essential contributions in all of these areas and many others. It has conducted important studies on electronic delivery of government services, the economic impacts of health reform, and defense conversion, to name just a few of the reports published by OTA in the past year. Studies such as these are providing Congress and the American people with indispensable tools for understanding the present and preparing for the future.

It is an honor to serve on OTA's board, and I applaud all those who have contributed so much to OTA's well-deserved success.

Senator Kennedy

Statement from vice chairman, Don Sundquist

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It has been my pleasure to serve as the Vice Chairman of the Technology Assessment Board during this Congress, after a number of years on the Board.

OTA has made some important transitions in the last year, not the least of which was Jack Gibbon's departure after many years as Director of OTA and, of course, Roger Herdman's becoming Director. I feel as though it has been a smooth transition, and we on the Board are looking forward to working with Roger in the future.

OTA has continued to give the Congress useful, nonpartisan advice on a wide range of topics: health care reform, environmental issues and the conversion of our economy in a post-Cold War environment. This is a unique institution that provides a lot of valuable analysis for Congress and policy makers generally.

I look forward to working with OTA in the second session of this Congress, and in the future.

Congressman Sundquist

Statement from TAAC chairman, Neil E. Harl

It has been my great pleasure to serve on the Technology Assessment Advisory Council and especially to assume the responsibilities of Chair of the Council in the past year.

OTA has remained a strong and important analytical organization. I am confident that OTA will continue to play a vital role in providing high quality information and analysis for the remainder of the decade and into the twenty-first century. The dramatic political happenings of recent time, the continuing economic and social pressures of the world, and the on-rush of technical and technological developments assure that OTA's unique niche will be an important one to the Congress and to the country generally. The shifting political, economic, legal and technological maelstrom creates an ever-changing relationship between technology and public policy. The dissolution of the former Soviet Union, the revolutions occurring in biology and information technology and the conversion of our domestic economy in a post-Cold War setting into an economy capable of sustained economic growth in an environmentally responsible manner are greatly increasing the need for sound advice on technolog, policy to the Congress. OTA has shown itself to be an objective, dependable source of advice and counsel and, I believe, will continue to be so.

I congratulate Roger Herdman on being appointed Director of OTA in the past year. I believe Roger will continue to provide the same valuable leadership that Jack Gibbons demonstrated during his tenure. The Council looks forward to working with Dr. Herdman in the future.

Neil E. Had

Statement from OTA director, Roger C. Herdman

Fiscal Year 1993 was a year of substantial change for OTA. In January 1993, OTA's Director for the last thirteen years was called to become Science Advisor to newly-elected President Clinton and was also appointed Director of the White House Office of Science and Technology Policy (OSTP). During the rest of 1993 a number of additional senior and administrative OTA staff also joined OSTP. Those staff departures along with the retirement of another assistant director resulted in the formation of a new top management team halfway through the fiscal year.

The change in management provided for more flexibility in responding to the legislative branch's priorities for resource economies. In doing so OTA's policy was to manage for the best value and to try to achieve expected levels of productivity with a less expensive process, primarily by reducing management overhead. In doing so a major effort has been made to preserve the working units of the agency, the project teams, and to make changes in organization and personnel through reassignment and attrition not through reductions in force. The response to the requirements of our appropriations has been made in a series of steps. These include reduction of OTA's research divisions from three to two with redistribution of the existing nine programs to the two new divisions. Also the support offices' management by a separate operations manager has been ended, and these offices are now distributed into the research divisions and the Congressional and Public Affairs office. This management change should improve the coordination of administrative and research functions. Further steps for the future have been the subject of major staff planning efforts and involve coalescing of the nine programs to six in response to continuing financial stringency

We are proud that during the time that all this activity has been going on, OTA was able to maintain the unique OTA process, which has served the agency and the Congress so well over the years, and to continue at traditional levels of productivity in generation of reports and information for congressional committees. The hallmarks of OTA's process remain: working on an agenda that flows from committee priorities and reflects, therefore, by definition important national issues; staff commitment to independent research, analysis and responsibility for the results with only focused reliance on contracting outside of OTA; careful search for and attraction of the best national experts and stakeholders as advisors for each assessment; reliance on advisors and the peer review process to monitor and ensure the quality of OTA work; and with the help of our Technology Assessment Board, a staff culture that assigns the highest priority to producing work that is nonpartisan, accurate and complete.

OTA spent considerable time preparing documentation and appearing before the Joint Committee on the Organization of Congress to explain and demonstrate how our work for the Congress is accomplished. Although there was some discussion in the Joint Committee directed at a consideration of duplicating some aspects of OTA's Technology Assessment Board for other congressional support agencies, the Committee did not propose any changes for OTA itself. At the same time, however, OTA took steps resulting from an internal analysis to provide greater standardization and uniform quality of reports. These steps included an agency-wide managing editor to provide continuous quality review and suggestions to project teams, a program to make available expert outside consultation on a periodic basis, and a rethinking of how prescriptive or conclusive OTA might or should be in reporting to Congress, among others.

With respect to achieving traditional levels of productivity during the year, OTA released 50 reports, full assessments or background papers—essentially the same number as in fiscal year 1992. And early in the fiscal year, in celebration of our 20th anniversary, OTA sponsored a "Forum on Technology and Governance in the 1990s." This Forum set the stage for OTA's future and focused sharply on five major areas of importance to the Congress and the Nation: international security, the environment, economic competitiveness, health care and education. Major presentations in these areas were made by Robert McNamara, Gro Brundtland, Laura Tyson, Arnold Relman and Derek Bok respectively, and these presentations were published by OTA in a monograph to recognize the event.

Our reports for the year covered the usual wide range of subject matter, and included a number which might be singled out as particularly of interest and use to Congress and the Nation. "Dismantling the Bomb and Managing the Nuclear Materials" capitalized to some extent on work OTA did looking into cleanup of DOE weapons production facilities. This study warned the Congress that a lot of work remained to be done to design and implement a plan to dismantle nuclear weapons and handle the resulting large quantities of radioactive materials and, in particular, to achieve the understanding and support of the public through a thoughtful and open process which involved as well as educated the public. At the same time OTA issued a study reviewing "Aging Nuclear Power

Plants" which should give the Congress a good sense of what to expect in terms of power plants going offline and some of the particular problems and challenges that lie ahead in managing this very difficult process with which the Nation has had relatively little experience.

OTA completed during 1993 a major study on "Adult Literacy and New Technologies" which raised the salience of this vital issue; OTA emphasized that the problem of illiteracy is of far greater magnitude than most appreciate. OTA's study defined the issue, conservatively estimated prevalence, and delved into implications for competitiveness and ways in which we might address, through new technologies, among others, the difficult task of remediation,

Fiscal year 1993 was the year that health care reform came into its own, and OTA was involved in a number of studies that would prove helpful to congressional committees in tackling the difficult issues in reform plans, Of particularly widespread interest was OTA's report, "An Inconsistent Picture" in which OTA looked at the economic projections made by a number of analysts and stakeholders for the various major categories of health core reform approaches. The enormous disparities from plan to plan and analysis to analysis in the expenditures, savings, and economic impacts on various sectors of American life proved to be of great interest and generated considerable debate, leading to a request for a follow-on study for delivery in mid-fiscal year 1994. OTA was asked to look at the assumptions that might explain the disparities and the documentation provided by authors of prelections that might allow observers to evaluate the methodology and reliability of those projections,

OTA also released "Multinationals and the National Interest: Playing by Different Rules" in 1993. This report was the first of two analyzing the objectives and policies of multinational corporations and the way they differ from the goals of the countries in which the corporations do business. The first report provided a wealth of descriptive detail and analysis. OTA looked at the treatment of home and foreign multinationals by various major trading partners, Japan, the European Community and the United States primarily, and the way the multinationals behave in various home and foreign environments. The treatment of foreign direct investment, the implications for trade, for technology transfer and the like were all described. The second report which will contain options for the Congress will appear in fiscal 1994 and together these reports should improve understanding of international trade and U.S. competitiveness.

Many other reports could be highlighted—our work on applications of information technologies, our very topical effort (in view of the major bioethical problems surfacing in early 1994) reviewing federal efforts in biomedical ethics, in the implications of global climate change and many, many more. Altogether OTA is proud of the accomplishments and the assistance to Congress achieved during 1993. We see complex issues continuing to come before the Congress and the American people—issues which will need thoughtful, careful analysis. We look forward to continuing to serve as a shared resource for the Senate and the House, the Majority and the Minority, to help frame issues, to help inform the debate, and to provide useful options for resolution of the **issues,**

Roger C. Herdman

About OTA's organization and operations

Created by the Technology Assessment Act of 1972 [86 Stat. 797], OTA is an agency of the legislative branch of the Federal Government (a copy of the Act is found on p. 52). OTA's primary function is to provide congressional committees with studies that identify the positive and negative consequences of policy alternatives affecting the uses of technology.

OTA assists Congress by identifying existing or probable impacts of technology; alternative technological methods and management programs for implementing specific actions (estimating and comparing the impacts of alternatives); and areas where additional research or data collection is required to provide support for assessments. OTA presents its completed analyses to the appropriate legislative authorities and, whenever possible, undertakes whatever additional related activities are necessary.

The Act provides for a bipartisan Technology Assessment Board, a director, and other employees and consultants necessary for the Office to conduct its work. The congressional board is made up of six Senators, appointed by the President pro tempore of the Senate, and six Representatives, appointed by the Speaker of the House, evenly divided by party. In 1993, Sen. Edward M. Kennedy (D-Massachusetts) and Rep. Don Sundquist (R-Tennessee) served as the Chairman and Vice Chairman, respectively, of the board. The two posts alternate between the Senate and the House with each Congress. The board members from each Chamber select their respective officer.

The congressional board sets the policies of the Office and is the sole and exclusive body governing OTA. The board appoints the director, who is OTA's chief executive officer and a nonvoting member of the board.

The Act also calls for a Technology Assessment Advisory

Council composed of 10 public members eminent in scientific and technological fields, the Comptroller General of the United States, and the Director of the Congressional Research Service of the Library of Congress. The advisory council advises the board and the director on such matters as the balance, comprehensiveness, and quality of OTA's work, and OTA's non-governmental resources.

Requests for OTA assessments may be initiated by:

- the chairman of any standing, special, select or joint committee of Congress, acting alone, at the request of the ranking minority member, or at the request of a majority of the committee members;
- the OTA board; or
- the OTA director, in consultation with the board.

The authorization of specific assessment projects and the allocation of funds for their performance are the responsibilities of the OTA board.

Toward the end of January 1993, new senior management had begun to be put in place at OTA. By the end of FY 1993, an entirely new top management team was confirmed, consisting of a new director and two new assistant directors. This reorganization was initiated with the departure of former director John H. Gibbons to assume the position of President Clinton's Science Advisor.

The analytical work of the Office is now organized into two divisions, each headed by an assistant director. They encompass assessments grouped in the areas of energy and materials; industry, technology, and employment; international security and commerce; science, education, and transportation; telecommunication and computing technologies; biological applications; food and renewable resources; health; and oceans and environment.

Administrative offices support the analytical work of the Office. These offices handle budget and finance, contracts, information services, personnel, telecommunications and information systems, building services, and publishing.

The Congressional and Public Affairs Office assists in coordinating OTA's work with various committees of the House and Senate, by initiating communications between OTA management and staff, and the Technology Assessment Board and the Technology Assessment Advisory Council. OTA publications are widely disseminated on Capitol Hill and are publicly available. The Information Center provides public access to the full collection of OTA publications, including an online index, and the Publications Distribution Office within information Marketing handles public dissemination of OTA publications. (General Information on OTA and availability of OTA publications is listed on the inside back cover.)

FY 1993 Activities

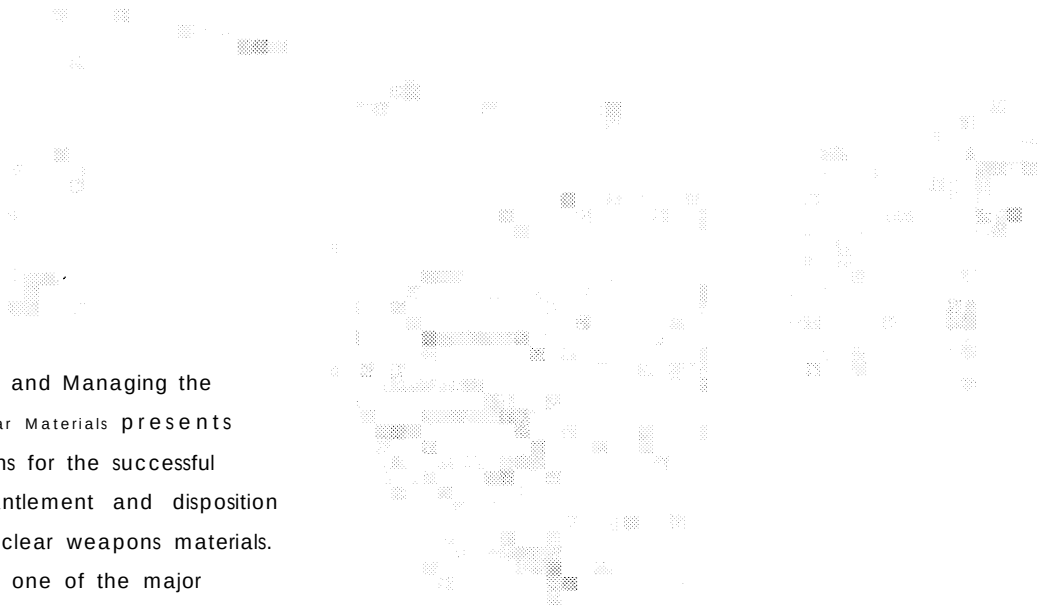
The prosperity and security of the Nation depend in no small part on how the U.S. Congress and others anticipate and respond to complex issues involving science and technology. OTA has an unequal led record in providing Congress with facts, figures, and nonpartisan analyses it can rely on in dealing with critical national issues involving science and technology. As we approach the 2 1st century, the United States and the world are undergoing momentous political, economic, socia1, and technological transformations that pose both new problems and new opportunities

for the nation's lawmakers. U.S. lawmakers seeking to cope with these transformations are likely to find that the guidance OTA can provide is more valuable than ever.

During FY 1993, OTA completed 50 reports spanning the full range of science and technology issues facing the Congress. The following are examples of OTA projects that had a significant impact in areas that are of vital interest to the Congress:

- Getting the U.S. economy on o sound footing for the years ahead is clearly a high priority of the Congress. One of the challenges will be to find productive civilian uses for the resources that were formerly devoted to the Nation's defense. OTA's assessment of U.S. Technology and the Defense Conversion, which includes Defense Conversion; Redirecting R&D, concentrates on new opportunities in this area. Another OTA report, Adult Literacy and New Technologies: Tools for a Lifetime, focuses on how information technologies can help equip U.S. citizens with the skills needed to participate fully in the workplace. Multinationals and the National Interest discusses how to help ensure that multinational corporations such as IBM and AT&T work to support economic growth and high standards of living in the United States.
- Health care reform increasingly is coming to dominate the domestic policy agenda, and OTA can help U.S. lawmakers sort out some of the dilemmas that arise in the debate. An Inconsistent Picture: A Compilation of Analyses of Economic Impacts of Competing Approaches to Health Care Reform by Experts and Stakeholders, for example, points to some of the reasons for the wide range of differences in estimated economic impacts of approaches to health care reform. OTA's report Pharmaceutical R&D: Costs, Risks, and Rewards can help inform the development of sound Federal policies related to payment for prescription drugs.

  Another item high on the domestic policy agenda is "reinventing govern merit." At a time when demand is growing and budgets ore tighter, Federal, State and local governments face the challenge of delivering better services faster and at less cost. OTA's report Making Government Work: Electronic Delivery of Federal Services provides Congress with alternative strategies for improving the performance of government by using modern computer and telecommunication technologies.
- Dealing with environmental problems will be a continuing challenge for U.S. policymakers for the foreseeable future. Many scientists believe that as a result of $C0_2$ emissions from cars and other factors, the Earth's climate is likely to warm by several degrees during the next few decades. OTA's report Preporing for an Uncertain Climate discusses how U.S. policymakers can begin to plan for the possibility of global worming in the light of considerable uncertainties about when, where, and how much change will occur. Another OTA report, Dismantling the



Bomb and Managing the Nuclear Materials presents options for the successful dismantlement and disposition of nuclear weapons materials. This is one of the major environmental and public health challenges the country faces.

- Energy Efficiency Technologies for Central and Eastern Europe, part of OTA's assessment of Energy and Environmental Technology Transfer to Central and Eastern Europe, notes that transferring technology to improve the efficiency of energy use is one highly cost-effective way for the United States to encourage economic reform, democratization, and stability in the former communist countries of the Soviet bloc. Energy is used very wastefully in formerly centrally planned economies, and the **waste** limits economic development and contributes to local and global environmental degradation.
- The proliferation of chemical, biological, and nuclear weapons of mass destruction—especially in unstable regions of the world such as the Middle East, S. Asia, and Korea—is likely to pose a major security threat to the United States and other countries for many years to come. OTA's report Proliferation of Weapons of Mass Destruction: Assessing the Risks identifies a range of measures from which a coherent nonproliferation treaty might be constructed.

OTA's work in FY 1994 will continue to reflect the explicit needs of the committees of jurisdiction. OTA serves as a shared resource for Congress, providing nonpartisan analysis of scientific and technological issues—issues intrinsic to all important policy issues—in a cost-effective way.

Industry, commerce, and international security division

The Industry Commerce, and Internationall Security Division cornprise five research Programs: Energy and Materials; Industry, Technology and Employment; International Security and Commerce; Science, Education, and Transportation; and Telecommunication and Computing Technologies,

The Energy and Materials Program is responsible for assisting the Congress in understanding the role of technology in developing energy and materials resources and the consequences of these developments for society. The Program helps the Congress progress toward rational resource development such that economic growth is maintained, undesirable side effects are kept to a minimum, and the resource base is sustained for future generations. The Program covers those technologies that concern the extraction, delivery, and the use of energy and materials. The Program also analyzes world energy and materials markets and policies, especially the implications of U.S. imports and exports of energy and materials.

The Industry, Technology, and Employment Program examines how technology affects the ability of U.S. industry to contribute to a healthy national economy. This includes consideration of the competitiveness of U.S. industries in international markets; trade and economic development issues; the number and nature of employment opportunities in the U.S. economy; needs for worker education, training and retraining; and ways to ease adjustment in structural economic transitions. The ITE Program is concerned with the role of technology in examining the competitive position of both basic and new industries, with the development and dissemination of pre-competitive technologies, and with the quantity, nature, and quality of jobs in the U.S. economy.

The International Security and Commerce Program deals with the role of technology in national security, exploration and commercialization of space, and international technology transfer. The Program's work in national security focuses on assessment of the likely impacts of technological considerations on national security, including international stability, terrorism, diplomacy,

alliance relations, arms control, deterrence, and defense. Assessment of issues related to the notion's defense industrial and technology base is an increasing part of ISC'S work. The Program's work on space involves o broad range of issues, such as space transportation, international cooperation and competition in civilian space activities, and other areas in which technological progress, civilian exploration, commercial uses of space, and national security must all be reconciled.

The Science, Education, and Transportation Program includes efforts focusing on the Federal government's role in national transportation systems and policy; it includes a variety of efforts related to the Federal Government's role in maintaining the health of the U.S. scientific enterprise, especially allocation and decision methods available to the Congress to support and manage research and development; and, finally, the Program activities include a strong focus on the role of technology in enhancing learning in schools as well as in non-school educational systems.

The Telecommunication and Computing Technologies Program is concerned primarily with the changing role of telecommunica - tions and computing technologies in the nation's industry, com - merce, and government. The core responsibilities of the Program require monitoring the research and development of new information technologies and assessing the state-of-the-art in these areas as well as the pace and direction of basic research and development. The Program also studies telecommunications regulation, information policy, and applications of information technology in the public sector.

In FY 1993, the Industry, Commerce, and International Security Division published 17 assessment reports and 10 background papers.

U.S. Banks and International Telecommunications, October 1992
Requested by:
House Committee on Foreign Affalrs
Senate Committee on Finance

Industrial Energy Efficiency, April 1993
Requested by:
Senate Committee on
Governmental Affairs
Senate Committee on
Energy and Natural Resources
House Committee on
Energy and Commerce
House Committee on
Government Operations
House Committee on
Science, Space and Technology

Data Format Standards for Civilian Remote Sensing Satellites, May 1993
Requested by:
House Committee on
Science, Space and Technology
Senate Committee on
Commerce, Science, and Transportation

Access to Over-the-Road Buses for Persons with Disabilities, May 1993
Requested by
Mandated under Publlc Law 101-336

Advanced Network Technology, June 1993
Requested by:
House Committee on
Science, Space and Technology
Senate Committee on
Commerce, Science and Transportation

The 1992 World Administrative Radio Conference: Technology and Public Implications, June 1993
Requested by:
Senate Committee on
Commerce, Science and Transportation
House Committee on
Energy and Commerce

Defense Conversion: Redirecting R&D, June 1993
Requested by:
Senate Committee on Foreign Relations
Senate Committee on
Labor and Human Resources
Senate Committee on
Commerce, Science and Transportation
Senate Committee on
Labor and Human Resources
Senate Committee on Armed Services
House Committee on
Interior ond Insular Affairs
House Committee on
Government Operations

Energy Efficiency Technologies for Central and Eastern Europe, July 1993
Requested by:
Senate Committee on
Environment and Public Works
House Committee on Foreign Affairs
House Committee on
Energy and Commerce
Senate Committee on Foreign Relations

Who Goes There: Friend or Foe?, July 1993
Requested by:
House Committee on Armed Set-vices

Adult Literacy and New Technologies: Tools for a Lifetime, July 1993
Requested by:
House Committee on Education and Labor
Senate Committee on
Labor and Human Resources
Endorsed by:
Joint Economic Committee

The Future of Remote Sensing for Space: Civilian Satellite Systems and Applications, July 1993
Requested by:
House Committee on
Science, Space and Technology
Senate Committee on Commerce, Science and Transportation

The Chemical Weapons Convention: Effects on the U.S. Chemical Industry, August 1993
Requested by:
Senate Committee on Foreign Relations
Senate Committee on Governmental Affairs

Development Assistance, Export Promotion, and Environmental Technology, August 1993
Requested by:
House Committee on Foreign Affairs
House Committee on Energy and
Commerce
Senate Committee on Finance

Accessibility and Integrity of Networked Information Collections, August 1993

Aging Nuclear Power Plants: Managing Plant Life and Decommissioning, September 1993
Requested by
Senate Committee on Governmental Affairs
House Committee on
Energy and Commerce

Proliferation of Weapons of Mass Destruction: Assessing the Risks, September 1993
Requested by:
Senate Committee on Foreign Relations
Senate Committee on Governmental Affairs

Multinationals and the National Interest: Playing by Different Rules, September 1993
Requested by:
Senate Committee on
Commerce, Science and Transportation

U.S. 'Telecommunications Services in European Markets, September 1993
Requested by:
House Committee on Foreign Affairs
Senate Committee on Finance

Pulling Together for Productivity: A Union Management Initiative at U S West, Inc., September 1993
Requested by:
Senate Committee on
Commerce, Science and Transportation

Protecting Privacy in Computerized Medical Information, September 1993
Requested by:
Senate Committee on Governmental Affairs
House Committee on
Government Operations

Making Government Work: Electronic Delivery of Federal Services, September 1993
Requested by:
Senate Committee on Governmental Affairs

Contributions of DoE Weapons Labs ond NIST to Semiconductor Technology, September 1993
Requested by:
Hon. Ernest F. Hollings

Energy Efficiency: Challenges and Opportunities for Electric Utilities, September 1993
Requested by:
Senate Committee on Governmental Affairs
Senate Committee on
Energy and Natural Resources
House Committee on
Energy and Commerce
House Committee on
Science, Space and Technology
House Committee on Government
Operations

Aircraft Evacuation Testing: Research ond Technology Issues, September 1993
Requested by:
House Committee on
Science, Space and Technology

Potential Environmental Impacts of Bioenergy Crop Production, September 1993
Requested by:
House Committee on
Science, Space and Technolog,
House Committee on Energy and
Commerce

Biopolymers: Making Materials Nature's, Way, September 1993
Requested by:
Senate Committee on
Energy and Natural Resources

Information Systems Related to Technolog, Transfer: A Report on Federal Technology Transfer in the United States, September 1993

Health, life sciences, and the environment division

The Heollh, Life Sciences, and the Environment Division comprises four Programs: the Biological and Behavioral Sciences Program, the Food and Renewable Resources Program, the Health Program, and the Oceans and Environment/ Program.

The Biological and Behavioral Sciences Program assesses state-of-the-art technologies arising from progress in a wide range of scientific and technical disciplines. Typical studies explore actual and potential applications of results and techniques from biological and behavioral sciences, usually with an emphasis on ethical, legal, economic, and regulatory issues. Currently, the Program's activities center on (1) biotechnology and applications and implications of human molecular genetics, (2) neurological and behavioral sciences, and (3) Federal regulatory programs that involve use and understanding of biological tests and knowledge.

The scope of the Food and Renewable Resources Program includes all agriculture-related technologies used to provide society with food, fiber, and chemicals, and technologies that enhance or Jeopardize the ability to sustain in perpetuity the renewable resource bases that make such production possible. Agriculture itself is defined in the broad sense, including all crop and livestock production and forestry. Attention also is given to the impact that technology has had and is likely to have on how the agricultural system is organized, who controls it, and where it is heading. Further, the Program covers renewable resources that presently may not be considered or produced as crops, but that support agricultural production and are fundamental to human needs generally. Relevant international analyses on renewable resources and agriculture are included in certain Program studies.

The Health Program's charter is reflected in two primary types of efforts:

1) assessments of specific clinical and general health care technologies, and

2) studies of broader issues of health policy related to or with implications for technology.

In addition, it has certain statutory, methodology oversight responsibilities regarding Vietnam veterans health studies, and provides the staff work for the OTA Director's mandated responsibility to select and appoint members of the Prospective Payment Assessment Commission, the Physician Payment Review Commission, and the Advisory Panel on Alzheimer's Disease.

The Oceans and Environment Program has responsibility for all ocean-related questions, including ocean resources and maritime policy, and for large-scale environmental issues, such as climate modification and air, water, and land pollution. As a result of changing congressional interest, the Program has developed capability for analyzing the difficult questions in which the overriding concern lies with the environmental effects of decisions. The work of the Program usually falls under several categories: Federal services related to oceans and the environment, natural resources, pollution control, marine industry, and climate change.

In FY 1993, the Health, Life Sciences, and the Environment Division published 10 assessment reports and 13 background papers.

Genetic Tests and Health Insurance: Results of a Survey, October 1992
Requested by:
House Committee on
Science, Space and Technology
House Committee on
Energy and Commerce

Genetic Counseling and Cystic Fibrosis Carrier Screening: Results of a Survey, October 1992
Requested by:
House Committee on
Science, Space and Technology
House Committee on
Energy and Commerce

Federal and Private Roles in the Development and Revision of Alglucerase Therapy for Gaucher Disease, October 1992
Requested by:
House Committee on
Energy and Commerce

Science and Technology Issues in Coastal Ecotourism, October 1992
Requested by:
House Committee on
Merchant Marine and Fisheries

Coverage of Preventive Services: Provision of Selected Current Health Care Reform Proposals, October 1992
Requested by:
Senate Committee on
Labor and Human Resources

Hazards Ahead: Managing Cleanup Worker Health and Safety at the Nuclear Weapons Complex, February 1993
Requested by:
Senate Committee on Armed Services

Pharmaceutical R&D: Casts, Risks, and Rewards, February 1993
Requested by:
House Committee on
Energy and Commerce

Drug Labeling in Developing Countries, May 1993
Requested by:
Senate Committee on
Labor and Human Resources
House Committee on
Energy and Commerce

An Inconsistent Picture:
A Compilation of Analyses of Economic Impacts of Competing Approaches to Health Care Reform by Experts and Stakeholders, June 1993
Requested by:
Senate Committee on
Labor and Human Resources

Health Insurance:
The Hawaiian Experience, June 1993
Requested by:
Senate Committee on
Labor and Human Resources

Compilation of Abbreviations and Terms, September 1993

Water for Walker Lake, September 1993
Requested by:
Senator Harry Reid

Alternative Coca Reduction Strategies in the Andean Region, September 1993
Requested by:
Senate Committee on
Labor and Human Resources
Senate Committee on the Judiciary
House Select Committee on Narcotics
Abuse and Control

Dismantling the Bomb and Managing the Nuclear Materials, September 1993
Requested by:
Senate Committee on Governmental Affairs

OTA Assessment: The Department of Veterans Affairs Persian Gulf Veterans' Health Registry, September 1993
Requested by:
Mandated under Public Law 102-585

The Continuing Challenge of Tuberculosis, September 1993
Requested by.
House Committee on
Energy and Commerce
House Committee on Government
Operatlons

Harmful Non-Indigenous Species in the United States, September 1993
Requested by:
House Committee on Merchant Marine
and Flsheries
House Committee on Energy and
Commerce
Endorsed b,
Hon. Amo Houghton, TAB member

Benefit Design in Health Care Reform: Clinical Preventive Services, September 1993
Requested by:
Senate Committee on
Labor and Human Resources

Hip Fracture Outcomes in Feople Age 50 and Over: Mortality, Service Use, Expenditures, and Long-Term Functional Impairment, September 1993
Requested by:
Senate Special Committee on Aging

Impact of Legal Reforms on Medical Malpractice Costs, September 1993
Requested by
House Committee on Ways and Means
Senate Committee on
Labor and Human Resources
House Committee on Appropriations,
Subcommittee on Labor, Health and
Human Services
Senate Committee on Finance
House Committee on
Energy and Commerce

Biomedical Ethics in U.S. Public Policy, September 1993
Requested by
Senate Committee on Appropriations
Senate Committee on
Labor and Human Resources
Senate Commlttee on the Judiciary

The Biological Components of Substance Abuse and Addiction, September 1993
Requested by:
House Committee on
Government Operations
Senate Committee on Governmental Affairs
Senate Committee on
Labor and Human Resources

Benefit Design in Health Care Reform:
Patient Cost-Sharing, September 1993
Requested by:
Senate Committee on
Labor and Human Resources

OTA forum on technology and governance in the 1990s

Twenty years ago, Congress created the Office of Technology Assessment to demystify the roles of science and technology in governance—to make specialized information more accessible. For two decades, during which time the influence of technology has grown enormously, OTA has examined key socio-technical issues of our time, providing detailed information to congressional committees and other policy makers.

On January 27, 1993, in celebration of OTA's twentieth anniversary, the Technology Assessment Board hosted a one-day Forum on Technology and Governance in the 1990s for members of Congress and key congressional staff. The Forum was designed to address several goals:

- To raise congressional and public awareness of the most critical issues faced by our nation and the world.
- To equip policy makers with an improved understanding of how best to deal with these issues.
- To show how technology is woven into socio-economic, domestic, and international policies, and to demonstrate the need to adapt our policies, methods of governance, and institutional mechanisms to this reality.

Five topics were chosen, selected on the basis of national and/or global urgency, likely continued importance to the legislative agenda, and the centrality of technology in creating or solving the problem: international security; sustaining the global environment; U.S. economic competitiveness; health care; and public education. Distinguished speakers were invited to address the topics—

The Forum Proceedings are available from the OTA Publications Distribution Office, Office of Technology Assessment, U.S. Congress, Washington, DC 20510-8025, (202) 224-8996.

outlining the problems, the reasons for their urgency, and alternatives for resolution. The following is the list of papers presented:

A New World Order and Its Implications for Arms Reductions
Robert S. McNamara
Former U.S. Secretary of Defense
Former President, The World Bank

■ .Sustaining the Global Environment
Gro Harlem Brundtland
Prime Minister of Norway
Chair of the World Commission on Environment and Development

■ Economic Competitiveness in the U.S.
Laura D'Andrea Tyson,
Chair of the Council of Economic Advisors

■ Medical Care Reform: Building a Viable System
Arnold S. Relman
Professor of Medicine and of Social Medicine, Harvard School of Medicine
Editor-in-Chief Emeritus New England Journal of Medicine

■ Rethinking Public Education in the U.S.
Derek Bok
President Emeritus, Harvard University

OTA wishes to acknowledge the generous financial support of the Carnegie Corporation of New York and Corning International, without whom the Forum could not have taken place, In addition, OTA thanks the members of the Technology Assessment Board and the Technology Assessment Advisory Council for their ongoing cooperation and support.

Work in progress at year-end

More than 41 proejects were in progress during fiscal year 1993. In addition, 14 new studies were u nder ta ken.

This section lists the titles of assessments underway or in press, as of September 30, 1993. For a full description of these projects, please refer to the current "Assessment Activities, " OTA-PC -105. This pamphlet is available from OTA by calling the Publications Distribution Office at (202) 224-8996.

Industry, Commerce, and International Security Division

Energy and Materials Program

- U.S. energy efficiency: past trends and future opportunities
- Renewable energy technology: research development and commercial prospects
- Energy and environmental technology transfer to Central and Eastern Europe

Industry Technology, and Employment Program

- American industry and the environment: implications for trade and U.S. competitiveness
- Multinational corporations and U.S. technology base
- Commercialization of emerging technologies
- Technology, jobs and productivity in the service economy

International Security and Commerce Program

- Defense modeling and simulation
- Proliferation of weapons of mass destruction

- Earth observation systems
- Assessing the potential integration of defense and civilian technology and manufacturing

Science, Education, and Transpodation *Program*

- Teachers and technology Federal aviation research and technology
- Vocational education assessment instruments

Telecommunication and Computing Technologies Program

- Information security and privacy in network environments
- Social Security Administration's information technology automation program
- Information technology and the health care system
- The Electronic enterprise: opportunities for American business and industry

Health, Life Sciences, and the Environment Division

Biological and Behavioral Sciences Program

- Research on health risk assessment
- Technologies for understanding the root causes of substance abuse and addiction
- OSHA'S selection of control technologies and assessments of their impacts and costs
- The human genome project and patenting human DNA sequences

Food and Renewable Resources Program

- Agriculture, trade and the environment
- Aquiculture: food and renewable resources from U.S. waters
- Biological pest control
- Science and technology, renewable resources and international development

Health Program

- Assessing the assumptions behind health reform prejections
- Regulator-y and health assessments of dietary supplements
- Setting the stage for studying Persian Gulf veterans' health
- Monitoring of mandated veteran studies
- Federal response to AIDS: congressional issues
- Health professions training: roles of Titles Vll and Vlll
- Technology, insurance, and the health care system
- Defensive medicine and the use of medical technology
- International differences in health technology, services and economics
- Policy issues in the prevention and treatment of osteoporosis
- Prospects for health technology assessment
- Appointment of the Prospective Payment Assessment Commission and the Physician Payment Review Commission

Oceans and Environment Program

- Systems at risk from climate change
- New approaches to environmental regulation

Technology assessment advisory council

The Technology Assessment Advisory Council (TAAC) was established by OTA's statute, and members are appointed by OTA's Congressional Technology Assessment Board (TAB). The Council advises TAB and the Director on issues and other matters related to science, technology, and technology assessment.

Neil E. Harl, Chairman
Dr. Harl is the Charles F. Curtiss Distinguished Professor of Economics at Iowa State University, where he has served on the faculty since 1964.

James Hunt, Vice Chairman
Dr. Hunt is Distinguished Professor, Health Sciences Center, at the University of Tennessee in Memphis. He previously served as Chancellor of the Health Science Center and as the Dean of Medicine for the University. Prior to joining the University, he served as Chairman of the Department of Medicine at the Mayo Clinic.

Lewis M. Branscomb
Dr. Branscomb is the Albert Pratt Public Service Professor at Harvard's John F. Kennedy School of Government. He is a former executive of International Business Machines. Prior to joining IBM, he was the Director of the National Bureau of Standards.

Herbert D. (Ted) Dean
Mr. Doan is a Partner with Doan Associates. He was Chairman and Founder of Doan Resources Corporation. He served as President of the Dow Chemical Company for nine years.

Joshuca Lederberg
Dr. Lederberg was President of Rockefeller University, New York. He is the former Chairman of the Department of Genetics at

Stanford University School of Medicine. He is a member of the National Academy of Sciences and is a Nobel Laureate in Physiology and Medicine.

Max Lennon

Dr. Lennon is President of Clemson University. He previously served on the faculties of Ohio State University, (Vice-President for Agricultural Administration and Executive Dean for Agriculture, Home Economics and Natural Resources), University of Missouri, and Texas Tech University.

Thomas J. Perkins

Mr. Perkins is the General Partner of Kleiner & Perkins in San Francisco. He held a number of positions with Hewlett Packard Company, most recently as Assistant Manager, Corporate Research Laboratories. He also served as Vice President, Marketing with Optics Technology, Inc. and as an Electrical Engineer with Sperry Corporation.

Chase N. Peterson

Dr. Peterson is President Emeritus of the University of Utah. He practiced medicine at the Salt Lake Clinic and taught at the LDS Hospital and University of Utah Medical School until his appointment as Dean of Admissions and Financial Aids at Harvard College. There he also served as Vice President for Alumni Affairs and Development. Dr. Peterson returned to the University of Utah in 1978 as Vice President for Health Sciences, and has served as University President since 1983.

John F. M. Sims

Dr. Sims is Vice President for Marketing for Usibelli Coal Mine, Inc. He previously served as Director of the Office of Mineral Development with the Alaska Department of Commerce and Economic Development. Dr. Sims also taught Geological Engineering at the University of Alaska-Fairbanks.

Marina v.N. Whitman

Dr. Whitman is a Professor at the Institute of Public Policy Studies at the University of Michigan. Previously she sewed as the Vice President and Group Executive for Public Affairs Staff Group at General Motors Corporation. She also served as Vice President and Chief Economist at General Motors. Prior to joining General Motors she taught at the University of Pittsburgh.

Statutory Members

Charles A. Bowsher

Mr. Bowsher is Comptroller General of the United States and Director of the U. S. General Accounting Office.

Joseph E. Ross

Mr. Ross is Director of the Congressional Research Service, U. S. Library of Congress.

OTA staff as of September 1993

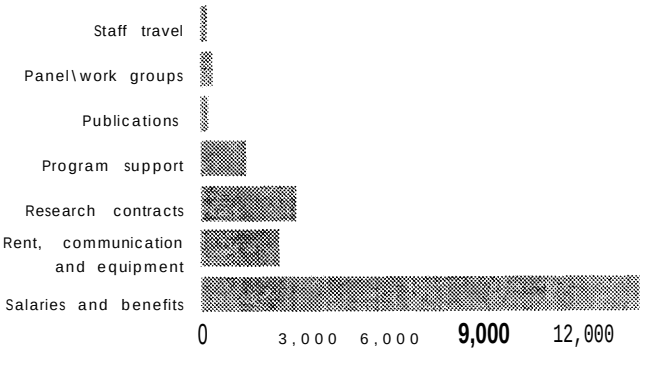
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FISCAL YEAR 1993 BREAKDOWN (IN THOUSANDS)



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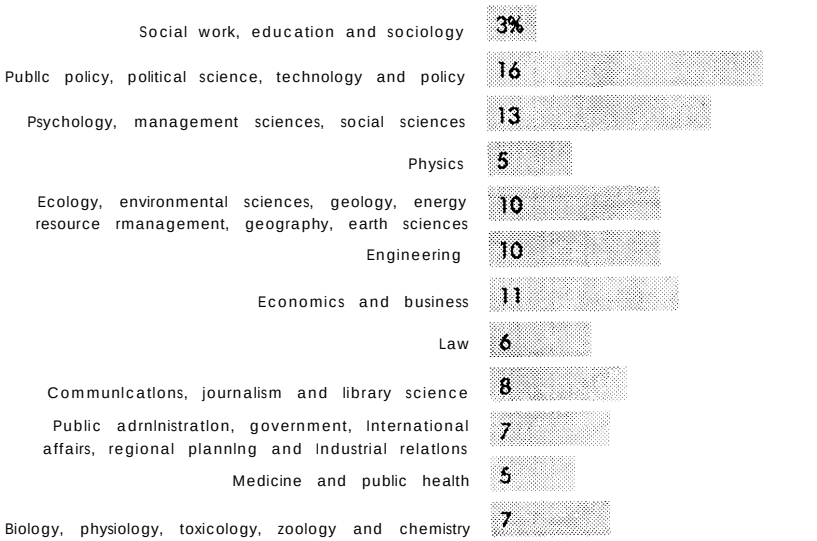
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OTA awards and fellowship programs

The Distinguished Service Award is given to those individuals who have made notable outstanding contributions to OTA and the accomplishment of OTA's mission. Nominations are made by all OTA staff, and employees in all job categories are eligible. A rotating Employee Recognition Committee selects the recipients. The following OTA staff were honored with the Distinguished Service Award for 1993:

- Pidge Chapman, Division Administrator, Industry, Commerce, and International Security Division
- Mary Lou Higgs, Manager, Publishing Services
- Vincent McCall, Systems Technician, Telecommunications and Information Systems

OTA Reports Recognized as Notable

In May 1993, the American Library Association's Government Documents Round Table announced their list of Notable Government Documents for 1992. Of the 20 Federal government documents recognized, four were OTA reports:

- After the Cold War: Living with Lower *Defense* Spending, Industry, Technology and Employment Program, Kitty Gillman, Project Director
- Biological Rhythms: Implications for the Worker, Biological and Behavioral Sciences Program, David Liskowsky, Project Director
- Testing in American Schools: Asking the Right *Questions,* Science, Education, and Transportation Program, Michael Feuer, Project Director
- U.S. Dairy *Industry at a Cross*roads: Biotechnology and Policy Choices, Food and Renewable Resources Program, Mike Phillips, Project Director

The Government Documents Round Table selects those documents they consider to be the best of the government information sources produced in the previous year. These documents "expand

our knowledge, enhance the quality of life, and/or contribute to an understanding of governmerit. "

Blue Pencil Awards

The National Association of Government Communicators conducts the Blue Pencil Competition as an annual recognition of outstanding government communications projects and producers. Entries are judged on writing, editorial content, layout and design, achievement of purpose and cost effectiveness. This year three OTA reports were recognized in the competition:

- Cystic Fibrosis and DNA Tests: Implications of Carrier Screening, Biological and Behavioral Sciences Program, Robyn Nishimi, Project Director, First Place, Books for a Technical Audience Category
- Testing in American Schools: Asking the Right *Questions,* Science, Education, and Transportation Program, Michael Feuer, Project Director, Second Place, Books for General Audience Category
- *Evaluation* of the Oregon Medicaid Proposal, Health Program, Elaine Power, Project Director, Honorable Mention, Books for a Technical Audience Category

The Morris K. Udall Fellowship Program

The Udall Fellowship Program is awarded to up to six individuals each year for a one-year appointment at OTA. It was established in 1991 by the Technology Assessment Board in honor of Morris K. Udall, retired congressman from Arizona who served 30 years in the House of Representatives and 18 years on the Technology Assessment Board. Qualified candidates must demonstrate exceptional ability in areas needed in OTA's work, such as the physical or biological sciences, engineering, law, economics, environmental and social sciences, and public policy. Candidates must have significant experience in technical fields or management or have completed research at the doctoral level.

Fellows, 1992-93

- Lucian Hughes, Industry, Technology and Employment Program
- Thomas Vischi, Biological Applications Program

Fellows, 1993-94

- Dean Cheng, International Security and Commerce Program
- Betsy Gunn, Oceans and Environment Program
- Lois Joellenbeck, Oceans and Environment Program

Congressional Fellowship in Health Policy

The Milbank Memorial Fund and OTA established the Congressional Fellowship in Health Policy in 1992 to be served at OTA beginning in September 1992. The program seeks candidates with substantial training and experience in research and strong interest in health policy. The fellowship provides an opportunity for an individual of proven ability and considerable promise to work with OTA researchers to assist Congress in its deliberations of science and technology issues affecting our Nation's health policy and to gain a better understanding of the ways in which Congress establishes national Policy related to these issues.

The Fund and OTA invited applications from individuals who have demonstrated ability in research on issues of health policy. Applicants should have doctorates in the social sciences or related areas or have terminal scientific or professional degrees and considerable training in research using the policy sciences

Fellow, 1992-93

- Sean Tunis, Health Program

Fellow, 1993-94

- Gerard Fergerson, Biological and Behavioral Sciences Program

Advisors and *panel members**

Energy and Materials Program

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The Alliance to Save Energy

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Strategic Performance Management

WORKSHOP ON ENVIRONMENTAL IMPACTS OF BIOENERGY CROP PRODUCTION

WORKSHOP ON SOCIAL COSTS OF ENERGY USE

Industry, Technology, and Employment Program

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WORKSHOP ON EOS AND USGCRP

WORKSHOP ON FORMATS, MEDIA AND STANDARDS FOR CIVILIAN REMOTELY SENSED DATA

WORKSHOP ON FUTURE OF REMOTELY SENSED DATA

WORKSHOP ON FUTURE OF REMOTE SENSING FROM SPACE

WORKSHOP ON REMOTE SENSING DATA: MANAGEMENT/ DISTRIBUTION, AND ANALYSIS

WORKSHOP ON POTENTIAL MILITARY USES OF CIVILIAN SATELLITES

WORKSHOP ON SHIPBUILDING

WORKSHOP ON FUTURE TRENDS IN GLOBAL SECURITY

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WORKSHOP ON THE ELECTRONIC ENTERPRISE: LABOR MANAGEMENT

WORKSHOP ON THE ELECTRONIC ENTERPRISE: NEW OPPORTUNITIES FOR AMERICAN BUSINESS AND INDUSTRY

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WORKSHOP ON THE AMERICANS WITH DISABILITIES ACT, MENTAL ILLNESS AND EMPLOYMENT

WORKSHOP ON BIOMEDICAL ETHICS IN U.S. PUBLIC POLICY

WORKSHOP ON COMMUNITY-BASED DRUG PREVENTION

WORKSHOP ON DRUG AVAILABILITY

WORKSHOP ON INTERNATIONAL RESEARCH IMPLICATIONS OF DNA PATENTS

WORKSHOP ON FEDERAL SUPPORT OF RISK ASSESSMENT: STRUCTURE AND ORGANIZATION

WORKSHOP ON LEGAL ISSUES IN PATENTING HUMAN DNA

WORKSHOP ON ROLE OF RECREATIONAL, CULTURAL, AND OTHER COMMUNITY ACTIVITIES AND SETTINGS IN PREVENTING DRUG ABUSE AMONG YOUTH

WORKSHOP ON UNDERSTANDING THE ROLE OF GENETIC FACETS IN MENTAL ILLNESS

Food and Renewable Resources Program

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WORKSHOP ON AQUACULTURE FUTURES

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WORKSHOP ON LINKING MEDICAL EVIDENCE WITH CLINICAL PRACTICE: PROGRESS AND BARRIERS

WORKSHOP FOR PEOPLE WITH DISABILITIES

WORKSHOP ON PERSIAN GULF WAR VETERANS' HEALTH

WORKSHOP ON POLICY ISSUES IN THE CONTROL OF TUBERCULOSIS

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WORKSHOP ON SYSTEMS AT RISK FROM CLIMATE CHANGE

WORKSHOP ON PLUTONIUM STORAGE

Office of technology assessment act

#

Public Law 92-484
92d Congress, H.R. 10243
October 13, 1972
An Act

To establish an Office of Technology Assessment for the Congress as an aid in the identification and consideration of existing and probable impacts of technological application; to amend the National Science Foundation Act of 1950; and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Technology Assessment Act of 1972."

FINDINGS AND DECLARATION OF PURPOSE

SEC, 2. The Congress hereby finds and declares that:

(a) As technology continues to change and expand rapidly, its applications are—
1. large and growing in scale; and
2. increasingly extensive, pervasive, and critical in their impact, beneficial and adverse, on the natural and social environment.

(b) Therefore, it is essential that, to the fullest extent possible, the consequences of technological applications be anticipated, understood, and considered in determination of public policy on existing and emerging national problems.

(c) The Congress further finds that:
1. the Federal agencies presentl, responsible directly to the Congress are not designed to provide the legislative branch with adequate and timely information, independently developed, relating to the potential impact of technological applications, and
2. the present mechanisms of the Congress do not and are not designed to provide the legislative branch with such information.

(d) Accordingly, it is necessary for the Congress to-
1. equip itself with new and effective means for securing competent, unbiased information concerning the physical, biological, economic, social, and political effects of such applications; and
2. utilize this information, whenever appropriate, as one factor in the legislative assessment of matters pending before the Congress, particularly in those instances where the Federal Government may be called upon to consider support for, or management or regulation of, technological applications.

ESTABLISHMENT OF THE OFFICE OF TECHNOLOGY ASSESSMENT

SEC. 3. (a) In accordance with the findings and declaration of purpose in section 2, there is hereby created the Office of Technology Assessment (hereinafter referred to as the "Office") which shall be within and responsible to the legislative branch of the Government.

(b) The Off Ice shell consist of o Technology Assessment Board (hereinafter referred to as the "Board") which shall formulate and promulgate the policies of the Off Ice, and o Director who shall carry out such pollicies and administer the operations of the Off Ice.

(c) The basic function of the Off Ice shall be to provide early indicotions of the probable beneficial and adverse impacts of the opplicatlons of technolog, and to develop other coordinate Information which may assist the Congress In carrying out such function, the Off Ice shall:

1 identify existing or probable Impacts of technology or technological programs;

2 where possible, ascertain cause and -effect relatilonships;

3 Identify alternative technological methods of Implementing specific programs,

4 Identify alternative programs for achievlng requisite goals;

5. make estimates and comparisons of the Impacts of alternative methods and programs;

6. present findings of completed analyses to the appropriote legislatlve outhorities,

7. Identify areas where additional research or data Collection IS required to provide adequate support for the assessments and estimates described In paragraph (1) through (5) of this subsection; and

8. under-take such additional associated activities os the appropriate authorities specified under subsection (d) may direct

(d) Assessment activities undertaken by the Office may be initiated upon the request of

1 the chairman of any standing, special, or select committee of either House of the Congress, or of any joint committee of the Congress, acting for himself or at the request of the ranking minority member or a majority of the committee members;

2. the Board; or

3. the Director, in consultation with the Board

(e) Assessments mode b, the Off Ice, includlng information, surveys, studies, reports, and findings related thereto, shall be made available to the initiating committee or other appropriate committees of the Congress. In addition, any such Information, surveys, studies, reports, and findings produced by the Office may be made available to the public except where—

1. to do so would violate security statutes; or

2. the Board considers it necessary or advisable to withhold such information in accordance with one or more of the numbered paragraphs in section 552(b) of title 5, United States Code.

TECHNOLOGY ASSESSMENT BOARD

SEC. 4. (o) The Board shell consist of thirteen members as follows

1. SIX Members of the Senate, oppointed by the President pro tempore of the Senate, three from the majority party and three from the mlnority party;

2. SIX Members of the House of Representatives appointed by the Speaker of the House of Representatives, three from the majority party and three from the mlnority party; and

3. the Director, who shall not be a voting member.

(b) Vacancies in the membership of the Board shall not affect the power of the remaining members to execute the functions of the Board and shall be filled in the same manner os in the case of the original appointment

(c) The Board shell select a chairman and a vice chairmon from among its members at the beginning of each Congress, The vice chairmon shall act in the place and stead of the chairman in the absence of the chairman The chairmanship and the vice chairman - ship shalll alternate between the Senate and the House of Representatives with each Congress, The chairman during each even-numbered Congress shell be selected by the Members of the House of Representatives on the Board from among their number. The vice chairmen during each Congress shall be chosen in the same manner from that House of Congress other than the House of Congress of which the chairman IS a Member.

(d) The Board is authorlzed to sit and act at such places and times during the sessions, recesses, and adjourned periods of Congress, and upon a vote of a majority of its members, to require by subpoena or otherwise the attendance of such witnesses and the production of such books, papers, and documents, to administer such oaths and affirmations, to take such testimony, to procure such printing and binding, and to make such expenditures, as it deems advisable, The Board may make such rules respecting its organization and procedures as it deems necessary, except that no recommendation shell be reported from the Board unless a majority of the Board assent. Subpoenas may be issued over the signature of the chairman of the Board or of any voting member designated b, him or by the Board, and may be served by such person or persons as may be designated by such chairman or member The chalrman of the Board or any voting member thereof may administer oaths or affirmations to witnesses,

DIRECTOR AND DEPUTY DIRECTOR

SEC. 5. (a) The Director of the Office of Technology Assessment shall be appointed by the Board and shall serve for a term of six years unless sooner removed by the Board. He shall receive basic pay at the rate provided for level III of the Executive Schedule under section 5314 of title 5, United States Code

(b) In addition to the powers and duties vested in him by this Act, the Director shall exercise such powers and duties as may be delegated to him by the Board.

(c) The Director may appoint with the approval of the Board, a Deputy Director who shall perform such functions as the Director may prescribe and who shall be Acting Director during the absence or incapacity of the Director or in the event of a vacancy in the office of Director. The Deputy Director shall receive basic pay at the rate provided for level IV of the Executive Schedule under section 5315 of title 5, United States Code,

(d) Neither the Director nor the Deputy Director shell engage in any other business, vocation, or employment than that of serving as such Director or Deputy Director, as the case may be; nor shall the Director or Deputy Director, except with the approval of the Board, hold any office in, or act in any capacity for, any organization, agency, or institution with which the Office makes any contract or other arrangement under this Act.

AUTHORITY OF THE OFFICE

SEC. 6. (a) The Office shall have the authority, within the limits of available appropriations, to do all things necessary to carry out the provisions of this Act, including, but without being limited to, the authority to-

1 make full use of competent personnel and organizations outside the Office, public or private, and form special ad hoc task forces or make other arrangements when appropriate;

2 enter into contracts or other arrangements as may be necessary for the conduct of the work of the Office with any agency or instrumentality of the United States, with any State, territory, or possession or any political subdivision thereof, or with any person, firm, association, corporation, or educational institution, with or without reimbursement, without performance or other bonds, and without regard to section 3709 of the Revised Statutes (41 U.S.C. 5);

3 make advance, progress, and other payments which relate to technology assessment without regard to the provisions of section 3648 of the Revised Statutes (31 U.S.C. 529);

4 accept and utilize the services of voluntary and uncompensated personnel necessary for the conduct of the work of the Office and provide transportation and subsistence as authorized by section 5703 of title 5, United States Code, for persons serving without compensation;

5 acquire by purchase, lease, loan, or gift, and hold and dispose of by sale, lease, or loan, real and personal property of all kinds necessary for or resulting from the exercise of authority granted by this Act; and

6 prescribe such rules and regulations as it deems necessary governing the operation and organization of the Office.

(b) Contractors and other parties entering into contracts and other arrangements under this section which involve costs to the Government shall maintain such books and related records as will facilitate an effective audit in such detail and in such manner as shall be prescribed by the Office, and such books and records (and related documents and papers) shall be available to the Off Ice and the Comptroller General of the United States, or any of their duly authorized representatives, for the purpose of audit and examination.

(c) The Office, in carrying out the provisions of this Act, shall not, itself, operate any laboratories, pilot plants, or test facilities,

(d) The Office is authorized to secure directly from any executive department or agency information, suggestions, estimates, statistics, and technical assistance for the purpose of carrying out its functions under this Act Each such executive department or agency shall furnish the Information, suggestions, estimates, statistics, and technical assistance directly to the Office upon its request.

(e) On request of the Office, the head of any executive department or agency may detail, with or without reimbursement, any of its personnel to assist the Office in carrying out its functions under this Act.

(f) The Director shall, in accordance with such policies as the Board shall prescribe, appoint and fix the compensation of such personnel as may be necessary to carry out the provisions of this Act

ESTABLISHMENT OF THE TECHNOLOGY ASSESSMENT ADVISORY COUNCIL

SEC 7 (a) The Off Ice shall establish a Technolog, Assessment Advisory Council (hereinafter referred to as the "Council") The Council shall be composed of the following twelve members

1 ten members from the public, to be appointed by the Board, who shall be persons eminent in one or more fields of the physical, biological, or social sciences or engineering or experienced in the administration of technological activities, or who may be judged qualified on the basis of contributions made to educational or public activities;

2 the Comptroller General; and

3 the Director of the Congressional Research Service of the Library of Congress

(b) The Council, upon request b, the Board, shall--

1 review and make recommendations to the Board on activities undertaken by the Office or on the initiation thereof in accordance with section 3(d);

2 review and make recommendations to the Board on the filndings of any assessrnent made by or for the Off Ice, and

3 undertake such additional related tasks as the Board may direct

(c) The Council, by majority vote, shall elect from its members appointed under subsection (a) (1) of this section a Chairmon and a Vice Chairman, who shall serve for such time and under such conditions as the Council may prescribe In the absence of the Chairrnan, or in the event of his incapacity, the Vice Chairman shall act as Chairman

(d) The term of office of each member of the Council appointed under subsection (a)(1) shall be four years except that any such member appointed to fill a vacanc, occurring prior to the expiration of the term for which his predecessor was appointed shall be appointed far the remainder of such term. No person shall be appointed a member of the Council under subsection (a) (1) more than twice. Terms of the members appointed under subsection (a)(1) shall be staggered so as to establish a rotating membership according to such method as the Board may devise.

(e) 1. The members of the Council other than those appointed under subsection (a)(1) shall receive no pay for their services as members of the Council, but shall be allowed necessary travel expenses (or, in the alternative, mileage for use of privately owned vehicles and per diem in lieu of subsistence at not to exceed the rate prescribed in sections 5702 and 5704 of title 5, United States Code), and other necessaryV expenses incurred by them in the performance of duties vested in the Council, without regard to the provisions of subchapter 1 of chapter 57 and section 5731 of title 5, United States Code, and regulations promulgated thereunder.

(2) The members of the Council appointed under subsection (a)(l) shall receive compensation for each day engaged in the actual performance of duties vested in the Council at rates of pay not in excess of the daily equivalent of the highest rate of basic pay set forth in the General Schedule of section 5332(a) of title 5, United States Code, and in addition shall be reimbursed far travel, subsistence, and other necessary expenses in the manner provided for other members of the Council under paragraph (1) of this subsection.

UTILIZATION OF THE LIBRARY OF CONGRESS

SEC. 8. (a) To carry out the objectives of this Act, the Librarian of Congress IS authorized to make available to the Off Ice such services and assistance of the Congressional Research Service as m a, be appropriate and feasible.

(b) Such services and assistance made available to the Off Ice shall include, but not be limited to, all of the services and assistance which the Congressional Research Service is otherwise authorized to provide to the Congress.

(c) Nothing in this section shall alter or modify any services or responsiblities, other than those performed for the Off Ice, which the Congressional Research Service under law performs for or an behalf of the Congress. The Librarian is, however, authorized to establish within the Cangressional Research Service such additional divisions, groups, or other organizational entities as may be necessary to carry out the purpose of this Act

(d) Services and assistance made available to the Office by the Congressional Research Service in accordance with this section may be provided with or without reimbursement from funds of the Off Ice, as agreed upon by the Board and the Librarian of Congress.

UTILIZATION OF THE GENERAL ACCOUNTING OFFICE

SEC, 9. (a) Financial and administrative services (Including those related to budgeting, accounting, financial reporting, personnel, and procurement) and such other services as may be appropriate shall be provided the Office b, the General Accounting Office.

(b) Such services and assistance to the Office shall include, but not be limited to, all of the services and assistance which the General Accounting Office is otherwise authorized to provide to the Congress.

(c) Nothing in this section shall alter or modif, an, services or responsibilities, other than those performed for the Office, which the General Accounting Office under law performs for or on behalf of the Congress.

(d) Services and assistance made available to the Office b, the General Accounting Off Ice in accordance with this section may be provided with or without reimbursement from funds of the Office, as agreed upon by the Board and the Comptroller General.

COORDINATION WITH **THE NATIONAL SCIENCE FOUNDATION**

SEC 10. (a) The Office shall maintain a continuing liaison with the National Science Foundation with respect to-

1. grants and contracts formulated or activated b, the Foundation which are for purposes of technolog, assessment; and
2. the promotion of coordination in areas of technolog, assessment, and the avoidance of unnecessary duplication or overlappin, of research activities in the development of technology assessment techniques and programs.

(b) Section 3(b) of the National Science Foundation Act of 1950, as amended (42 U.S.C. 1862(b)), is amended to read as follows:

"(b) The Foundation is authorized to initiate and support specific scientific activities in connection with matters relating to international cooperation, national security, and the effects of scientific applications upon society by making contracts or other arrangements (including grants, loans, and other forms of assistance) for the conduct of such activities, When initiated or supported pursuant to requests made by any other Federal department or agency, including the Office of Technology Assessment, such activities shall be financed whenever feasible from funds transferred to the Foundation b, the requesting official as provided in section 14(g), and any such activities shall be unclassified and shall be identified by the Foundation as being undertaken at the request of the appropriate official. "

ANNUAL REPORT

SEC, 11, The Office shall submit to the Congress an annual report which shall include, but not be limited to, an evaluation of technology assessment techniques and identification, insofar as ma, be feasible, of technological areas and programs requiring future analysis, Such report shall be submitted not later than March 15 of each year.

APPROPRIATIONS

SEC. 12. (a) To enable the Office to carry out its powers and duties, there is hereby authorized to be appropriated to the Office, out of any money in the Treasury not otherwise appropriated, not to exceed $5,000,000 in the aggregate for the two fiscal years ending June 30, 1973, and June 30, 1974, and thereafter such sums as may be necessary.

(b) Appropriations made pursuant to the authority provided in subsection (a) shall remain available for obligation, for expenditure, or for obligation and expenditure for such period or periods as may be specified in the Act making such appropriations,

Approved October 13, 1972.

LEGISLATIVE HISTORY

HOUSE REPORTS

No. 92-469 (Comm. on Science and Astronautics) and

No. 92-1436 (Comm. of Conference),

SENATE REPORT

No. 92-1123 (Comm. on Rules ond Administration).

CONGRESSIONAL RECORD,

Vol. 118 (1 972):

Feb. 8, considered and passed House,

Sept. 14, considered and passed Senate, amended.

Sept. 22, Senate agreed to conference report.

Oct. 4, House agreed to conference report.

Technology Assessment Board of the 103d Congress

EDWARD M. KENNEDY, Massachusetts, *Chairman*
DON SUNDQUIST, Tennessee, Vice Chairman

SENATE

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MICHAEL G. OXLEY, Ohio

ROGER C, HERDMAN
(Nonvoting)

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Iowa State University
Ames, Iowa

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Policy Program, Harvard University
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JOSHUA LEDERBERG
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JOSEPH E. ROSS
Director, Congressional Research Service
The Library of Congress
Washington, DC

JOHN F.M. SIMS
Vice President, Marketing
Usibelli Coal Mine, Inc.
Fairbanks, Alaska

MARINA v N. WHITMAN
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University of Michigan
Ann Arbor, Michigan