

## Section IV

# Assessment Activities

Since the preceding annual report, assessment activity has progressed in the six priority areas identified by OTA's Congressional Board: oceans, transportation, energy, materials, food, and health. Individual studies were designed to address the needs of Congressional committees as expressed in letters of request to OTA. Often the needs of several committees have been met within the scope of a single assessment addressing a number of related policy issues. In all activities, OTA staff worked closely with the staffs of the various Congressional committees to shape and time the performance of assessments to best converge with Congressional schedules. Frequently, information acquired from assessments in progress was adapted and made available to serve interim Congressional needs.

## OCEANS ASSESSMENTS

The OTA Oceans Assessment Program during the report year organized and began one extensive project, which formed an information base for four shorter-term activities. Data from two of the derivative studies were utilized in Congressional committee deliberations during the year. Planning was initiated for three additional assessments scheduled for fiscal year 1976. These projects address a variety of policy issues, most of them energy related, raised in assessment requests submitted by six Congressional committees concerned with ocean technologies and coastal zone management.

In February 1974, just prior to the close of the previous report year, the OTA Congressional Board designated oceans as a high priority area for assessment activities. Development of OTA's oceans project staff was begun and a nine member ad hoc advisory group was appointed, which included experts on legal, economic, environmental, geological, industrial and governmental aspects of offshore oil development. The panel included participants in recent studies of the subject sponsored by the National Science Foundation and the Council on Environmental Quality. (Members of the ad hoc panel are listed at the end of this subsection. )

During a three-day meeting, held in May 1974, the ad hoc panel reviewed procedures for the allocation of Federal resources which may be discovered in submerged lands beyond the three-mile limit. The panel also recommended that OTA assessments dealing with the Outer Continental Shelf should address the manner in which offshore-based energy facilities of various types may perform in a specific geographic region and the impacts they may have on the adjacent coastal area.

Incorporating the panel's guidance with the results of staff research and analysis—including reviews of information developed in previous Congressional hearings, monitoring of ongoing hearings, and first hand observation of North Sea oil staging and drilling sites by OTA's program manager—a proposal was developed for an assessment of new use demands on the coastal zone and offshore areas of New Jersey and Delaware. The project design was based on staff analyses that showed that the Baltimore Canyon Trough, lying off the New Jersey and Delaware coasts, would be an early target for a proposed program of accelerated offshore oil leasing. In addition, it addressed proposals for offshore siting of nuclear power plants and the possible development of deepwater ports for supertankers in the same coastal region.

An n-member project advisory panel, including representatives of the two affected State governments in addition to industrial, environmental,

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scientific, labor, and public-interest spokesmen, was appointed to assist OTA in the conduct of all phases of the assessment. (Panel members are listed at the end of this subsection.) The project team was additionally augmented by consultants, contractual arrangements, and by participants in post-doctoral fellowship programs sponsored by Stanford University and by the American Association for the Advancement of Science.

As the primary oceans assessment program progressed during the report year, the resources assembled by OTA—both personnel and collected information—were used as a basis for meeting related Congressional requests, several of which required responses within a short time span. Analyses by OTA's Oceans Assessment Program were published as a staff report by a Senate committee, and in another instance were utilized extensively in preparations and backgrounding for a Congressional oversight hearing.

***New usedemands on the coastal zone.***—In response to a request from the Senate Commerce Committee and the Senate National Ocean Policy Study, this regional assessment is examining the potential offshore and coastal zone impacts of the introduction of deepwater ports, floating nuclear power plants and oil exploration and production off the coasts of New Jersey and Delaware. Alternatives to those technologies also are being identified and evaluated. The 11-month study is scheduled for completion in the late fall of 1975. The two-State, coastal area selected for the study is densely populated, concentrated with industry and shoreline activity, and faces the imminent prospect of accelerated oil leasing activity in the Baltimore Canyon Trough region of the Atlantic Ocean, from 60 to 100 miles off its shores.

***Public participation program.***— A key element of the New Jersey-Delaware coastal zone assessment is the examination of public attitudes and, to the extent possible, the broadening of public understanding of the technologies under study and of the ways governmental decisions can alter their impacts. In a separate but related project, OTA public participation specialists are establishing contact with citizens and various interest groups within the two states to provide information about the assessment, its subject matter, the probabilities of potential impacts, and the public policy issues which stem from them.

***Analysis of accelerated OCS leasing plans.***— OTAoceans project personnel, at the request of the Senate Committee on Commerce, provided the basic information and analysis for a Senate National Ocean Policy Study preliminary report on Administration-announced plans for expanded leasing of OCS lands in 1975. The study, "An Analysis of the Department of the Interior's Proposed Acceleration of Development of Oil and Gas on the Outer Continental Shelf," was published in March 1975 by the Senate Commerce Committee for use in its hearings on that subject.

***Separation of exploration from production of OCS oil and gas.—***

In response to a joint request from the Senate Committee on Interior and Insular Affairs and the Senate Committee on Commerce, OTA assembled a task force to analyze the consequences both of existing leasing mechanisms and of alternative procedures that would separate offshore exploration for oil and gas from development and production. The objective was to examine the feasibility of obtaining more complete information about the extent and location of Outer Continental Shelf petroleum reserves, prior to the fixing of production commitments. Such information would be of use for State coastal zone planning, for Federal energy policy planning, and for calculating an equitable return from the leasing of public lands. The project, begun in February 1975, was completed in time to provide OTA briefings and an information base for a joint hearing held by the two requesting committees.

***Oil tankers.—***This in-house study was begun in December 1974 in response to a request from the Senate Committee on Commerce and as an outgrowth of the coastal zone assessment. Preliminary information from this project was utilized by the Commerce Committee in its preparations for oversight hearings on the supertanker issue, held in late January 1975.

The final project report is intended as a basic background document, or primer, compiling available information about all aspects of tanker operations and identifying alternative approaches to policy issues raised by this technology. Entitled "Oil Transportation by Tankers-An Analysis of Marine Pollution and Safety Measures," the report was formally transmitted to the Senate Commerce Committee.

***Energy facilities siting.—***This study planned for initiation in fiscal year 1976 is being designed as the first increment of a developing OTA assessment program dealing with the subject of national growth policy. The proposed first-stage assessment would focus on the growth policy implications of the demand for energy facilities (e.g., powerplants, refineries, petrochemical plants, fuel extraction facilities, etc. ) and the factors associated with their siting, particularly within coastal zone areas. **The study responds to requests from the House Committee on Interior and Insular Affairs and the Senate Committee on Commerce. The staged approach to this area of assessment was recommended by the OTA Advisory Council.**

**Fisheries.-**Planning for this proposed fiscal year 1976 assessment was begun in response to requests from the House Committee on Merchant Marine and Fisheries and the Senate Committee on Commerce. The study would examine present and future impacts of technology on the U.S. fishing industry. In particular, it would examine the risks, benefits, and resource management problems that would occur if U.S. fishing rights are extended from the current 12-mile limit to a proposed 200-mile limit.

***Liquefied natural gas costal facilities and transportation.-***In response to interest expressed by the Senate Commerce Committee on behalf of the National Ocean Policy Study, OTA has made plans to examine the national need for, and the projected impacts of, the construction and operation of port and terminal systems for the marine transportation of liquefied

natural gas (LNG). The project, proposed for the 1976 fiscal year, would assess the risks and benefits of LNG tanker operations in coastal waterways and harbors.

### Ad Hoc Oceans Advisory Panel

Dr. DON E. KASH, <i>Chairman</i> . . . .	Director, Science and Public Policy Programs, University of Oklahoma.
Dr. RAY BRANNON . . . . .	Research Scientist, Exxon Production Research.
Mr. HENRY COULTER . . . . .	Assistant Director for Environmental Conservation, U.S. Geological Survey.
Mr. CHARLES EDDY . . . . .	Counsel, Ford Foundation Energy Policy Project.
Mrs. BARBARA HELLER . . . . .	Environmental Policy Center.
Mr. ROBERT KNECHT . . . . .	Director, Office of Coastal Zone Management, National Oceanic and Atmospheric Administration.
Dr. WALTER J. MEAD . . . . .	Professor, University of California at Santa Barbara.
Dr. LYLE ST. AMANT . . . . .	Assistant Director, Louisiana Wildlife and Fisheries Commission.
Mr. MARVIN SINGER . . . . .	Council for Environmental Quality.

### Coastal Zone Assessment Advisory Panel

Dr. RICHARD SULLIVAN, <i>Chairman</i> . . . . .	Center for Environmental Studies, Princeton University.
Mr. DAVID J. BARDIN . . . . .	Commissioner of Environmental Protection, State of New Jersey.
Mr. E. C. BROUN, Jr. . . . .	Vice President, Petroleum and Minerals Group, Dresser Industries, Inc.
Dr. FRANCIS T. CHRISTY, Jr. . . . .	Director, Program of International Studies of Fishery Arrangements for the Future.
Mr. JOHN DANIELLO . . . . .	Secretary of Community Affairs and Economic Development, State of Delaware.
Dr. JOHN MARK DEAN . . . . .	Associate Professor of Marine Science and Biology, University of South Carolina.
Mr. RICHARD M. ECKERT . . . . .	Vice President, Engineering and Construction, Public Service Electric & Gas Co. (New Jersey).
Dr. DON E. KASH, . . . . .	Director, Science and Public Policy Programs, University of Oklahoma.
Dr. H. W. MENARD . . . . .	Scripps Institute of Oceanography, University of California.
Mr. CHARLES C. MOLLARD . . . . .	National Coordinator, Inland Boatmen's Union of the Seafarers International Union, AFL-CIO.
Dr. JAMES SULLIVAN . . . . .	Director, Center for Science in the Public Interest.

## TRANSPORTATION ASSESSMENTS

Assessment activity in the field of transportation issues advanced during the report year in response to a half-dozen Congressional requests dealing with the subjects of urban mass transit, automobile safety, and the nation's railroads. The OTA Transportation Program staff began work on five projects, completed one of them, and initiated planning for an additional study. The work undertaken in this area addresses various policy issues grouped around the common theme of a perceived need for safer, less costly, and more energy-efficient means of meeting national transportation needs.

In developing responses to these requests, the OTA staff has worked closely with public groups and industry sources, as well as with executive branch transportation officials. Members of the project management staff have personally visited various of the activities subject to analysis and review during the performance of assessments. Continuous guidance and assistance has been provided by an urban mass transit advisory panel comprised of 11 members chosen to reflect the concerns of labor, management, engineers, public interest groups, planners, and architects. (A list of the panel members appears at the end of this subsection.) In addition, valuable contributions have been made through consultants, contractual arrangements, special project panels and participants in workshop discussions.

The work of the OTA Transportation Assessment Program, and the progress of each assessment, was closely coordinated with interested Congressional committee members and staffs, as well as with other legislative branch information agencies. The Congressional Research Service of the Library of Congress provided assistance for an OTA study of automated guideway transit systems, and information developed in that project was, in turn, shared with staff members of the General Accounting Office conducting a review of an aspect of that subject. Additionally, OTA has provided summaries of its findings in the area of automated train control equipment to two General Accounting Office divisions involved in studies of metropolitan mass transportation systems. At the end of the report year, information inputs from OTA transportation assessments had been scheduled for inclusion in five upcoming Congressional hearings.

***Automatic train control.***—***This*** assessment, requested by the Senate Appropriations Committee, addresses questions about the cost, safety, and efficiency of the uses of automation in rail rapid transit systems. The study will examine and evaluate the experiences of major domestic transit systems now existing or being planned, during the phases of design, development,

procurement, testing, and operation. The objective is to ascertain how social, economic, and technological variables affect system safety, security, reliability, performance, and costs.

The assessment is being performed by a multidisciplinary team with experience in train control, human factors, and systems and reliability engineering. Eighteen site visits have been made to transit properties, specialty transit installations, and manufacturers of signaling and automatic train control equipment. Work commenced in July 1974 and is scheduled to be completed in the autumn of 1975.

**Community planning for mass transit.**—*Upon the* advice of OTA consultants and staff, and with the concurrence of the Senate Appropriations Committee staff, this project was separated from the automatic train control study because of its need for a differing mix of expertise. This study is concerned with the processes by which communities have planned, selected (or rejected), and developed new or modernized urban rail transit systems in conjunction with other modes such as bus and personal rapid transit. Nine metropolitan study sites form the base for this study. These are: Atlanta, Baltimore, Boston, Denver, District of Columbia, Los Angeles, Minneapolis-St. Paul, San Francisco, and Seattle.

Work on this study began in July 1974. Concern over the impacts of the energy crisis and the unstable economic situation caused the Senate Appropriations Committee to request that the assessment of community planning be expanded in December 1974 to include these critical aspects. The purpose of the modification is to place public transit within the framework of national concern over energy and the economy and to analyze the potential impacts of these issues upon transit as well as the potential of transit for conserving energy or stimulating economic activity. The overall project is scheduled for completion in the autumn of 1975.

**Automated guideway transit.**—*Because* communities have shown increasing interest in smaller, more flexible forms of automated mass transportation (such as the installation at Morgantown, W. Va., and airport “people mover” systems), the Senate Appropriations Committee requested an additional assessment focused on these high technology systems. Systems involved in this study are characterized by a capacity to transport small numbers of passengers (from two to four in small units; up to 50 in large ones) with very brief “headways”, or spacing between vehicles.

This OTA project was carried out with assistance from a team of consultants and by five panels, formed to address the following subject areas: U.S. experience, foreign experience, technology, economics, and public acceptance. Work on the assessment commenced in December 1974, and was completed in time to provide the basis for OTA testimony at a Committee hearing scheduled shortly after the end of the report year.

**Automobile collision data.**—The National Highway Traffic Safety Administration is charged with setting standards for automobiles to en-

hance occupant safety. To set standards properly, a data base relating fatalities and injuries to the forces generated in crashes is needed. The Administration has proposed collecting improved data through the use of devices (crash recorders) placed in automobiles which would record collision forces and other data if a crash occurred.

During a House-Senate Conference Committee discussion of transportation appropriations it was suggested that OTA evaluate the proposed crash recorder program. The House Appropriations Committee transmitted the request, which was approved by OTA's Congressional Board. With assistance from a contractor, OTA commenced work on this assessment in December 1974, and issued a final report used during Congressional hearings held in March 1975.

***Railroad services and*** technologies.-Planning was initiated by the OTA Transportation Program staff in response to two requests received during the report year. In January 1974, the Senate Commerce Committee requested an assessment of railroad technologies, including the need for upgrading roadbeds and rights-of-way. In February 1975, a request was initiated through a member of the Technology Assessment Board, calling for an OTA review of the U.S. Railway Association's proposal for reorganization of the Northeastern railroads. The OTA staff commenced work on this project during the spring of 1975.

## Urban Mass Transit Advisory Committee

Mr. GEORGE KRAMBLES, <b><i>Chairman.</i></b>	General Operations Manager, Chicago Transit Authority.
Mr. WALTER J. BIERWAGEN. . . . .	Member, General Executive Board, Amalgamated Transit Union.
Mr. ROBERT A. BURCO. . . . .	President, Public Policy Research Associates.
Mrs. JEANNE J. FOX. . . . .	Senior Research Associate, Joint Center for Political Studies.
Dr. LAWRENCE A. GOLDMUNTZ, . .	President, Economics and Science Planning.
Dr. DORN C. MCGRATH. . . . .	Professor of Urban Planning, George Washington University.
Dr. BERNARD M. OLIVER. . . . .	Vice President for Research and Development, Hewlett-Packard Corporation.
Mr. SIMON REICH. . . . .	Train Control Consultant, Gibbs & Hill.
Mr. FREDERICK P. SALVUCCI. . . . .	Secretary, Executive Office of Transportation and Construction, Commonwealth of Massachusetts.
Dr. THOMAS C. SUTHERLAND, Jr.	Assistant Dean, School of Architecture and Urban Planning, Princeton University.
Dr. STEWART F. TAYLOR. . . . .	Director, Transportation Systems, Sanders & Thomas, Inc.

## ENERGY ASSESSMENTS

During the report year, the OTA Energy Assessment Program undertook two Congressionally requested projects, while mapping plans for forthcoming programs to help Congress address national energy problems within the context of a comprehensive analysis of the country's overall energy status. OTA work contributed directly to Congressional review of the fiscal year 1976 budget of the new Energy Research and Development Administration (ERDA). Activities in the energy area were initiated in accordance with priorities set by the Technology Assessment Board and in response to needs expressed by four Congressional committees.

The development of OTA's assessment capabilities in the energy field has been greatly augmented by support from the scientific community, including skilled staff recruited through Congressional fellowship programs supported by professional societies. Outside expertise, supplied through consultants and through task forces and advisory panels, also has contributed to the depth and the breadth of OTA energy studies. An OTA assessment in the area of solar energy is being performed with the assistance of an interdisciplinary team assembled under contractual agreement. Mutually supportive relationships have been established between energy projects at OTA and those at the General Accounting Office and Congressional Research Service.

In order to furnish a timely and independent response to the Congressional request for assistance in reviewing the policy implications of the proposed ERDA budget, OTA utilized a variety of informational resources available in the energy field, including valuable background data generated in the Office's ongoing solar energy assessment. Because of differences in executive and legislative branch scheduling priorities, there was a period of only two weeks from the time the ERDA budget figures were released to the time the House of Representatives began its authorization hearings. Utilizing an ad hoc advisory panel and a working task force of consultants, OTA prepared an item-by-item analysis of important issues raised in the budget. Each issue analysis included pro and con arguments, lists of questions to be asked of Administration witnesses, and a brief background discussion of the issue. Participants in the review also personally briefed committee members and staff prior to, and during the course of, the hearings.

***Solar energy.***— OTA solarenergy assessment deals with several possible means of producing electricity using the sun's energy. It specifically is addressed to the question of the on-site production of electricity, suitable for dispersed sites with populations of 100,000 or less and where use can be made of waste heat.

The study, requested by the Senate Committee on Aeronautical and Space Sciences, was begun in June 1974 and is to be completed by fall, 1975. The design of this assessment also responds to energy issues raised in a request from the House Committee on Science and Technology. In addition, its results should be pertinent to Congressional oversight of recently passed legislation to finance projects demonstrating solar heating and cooling technologies.

The OTA assessment focuses on two technological processes; the direct conversion of solar energy to electrical energy using the photo-voltaic cell, and the use of sun-heated fluids to drive electric generators. Either process can provide additional-or leftover-energy to heat or cool buildings.

The assessment also addresses many general energy policy issues in its coverage of the cost and availability of alternative energy sources and the discussion of policy implications of solar energy, such as impacts on balance of trade, pollution, or capital requirements. Results from this assessment project will therefore be applicable to other OTA energy assessments. The OTA solar energy project staff has been actively assisted in all aspects of its work by a diversified panel of experts. (The 13 advisory panel members are listed at the end of this subsection. )

***ERDA budget review.***— OTA assistance in analyzing the ERDA budget request was initially sought by the House Science and Technology Committee, and the results later were made available to the Senate Committee on Interior and Insular Affairs and the Joint Committee on Atomic Energy. This work product was jointly published by the three committees.

OTA's ERDA budget analysis served as a prelude to the forthcoming examination of ERDA's comprehensive plans and programs which, by law, must be submitted to the Congress by June 30, 1975. During the brief time available for the budget analysis, the OTA staff was assisted by a task group of 14 consultants and specialists under the guidance of a seven-member ad hoc advisory panel. (Members of the Ad Hoc Energy Panel and the Energy Task Group are listed at the end of this section. ) .

***Energy priorities.***—The OTA staff has begun plans for a study to develop a comprehensive overview of the Nation's current and near-future energy status. An analysis of major recent energy studies will be undertaken to clarify the assumptions that were made and to establish the points of agreement, disagreement, and uncertainty. The objective of this planned activity is to provide the Congress a common base of information which will be useful in formulating legislative solutions to energy problems. This project was planned for fiscal year 1976 in response to requests received from the House Science and Technology Committee and the Senate Committee on Interior and Insular Affairs.

## Ad Hoc Energy Panel

<b>Dr. MILTON KATZ, <i>Chairman</i>.</b> . . .	Professor, Harvard Law School.
<b>Dr. EUGENE G. FUBINI</b> . . . . .	Private energy consultant, Washington, D.C.
<b>Dr. JACK B. HOWARD</b> . . .	Department of Chemical Engineering, Massachusetts Institute of Technology.
<b>Dr. WILLIAM H. MIERNYK</b> . . .	Director, Regional Research Institute, West Virginia University.
<b>Mr. LELAND F. SILLIN, Jr.</b> . . . .	Chairman and President, Northeast Utilities.
<b>Dr. ROBERT S. COLOW</b> . . . .	Center for Environmental Studies, Princeton University.
<b>Dr. WILLIAM E. ZEITER</b> . . . . .	Lawyer, Morgan, Lewis & Bockius.

## Energy Task Group

<b>Dr. MICHAEL DEVINE</b> . . . . .	Professor, Science and Public Policies Program, University of Oklahoma.
<b>Dr. DAVID HUETTNER</b> . . . . .	Professor, Science and Public Policies Program, University of Oklahoma.
<b>Dr. JACK GIBBONS</b> . . . . .	Director, Environmental Center, University of Tennessee.
<b>Dr. DON KASH</b> . . . . .	Director, Science and Public Policies Program, University of Oklahoma.
<b>Dr. FRED KRUGER</b> . . . . .	Professor, Economic Geology, Stanford University.
<b>Mr. JOHN MOODY</b> . . . . .	Private Energy Consultant, New York City.
<b>Dr. FREDERICK H. MORSE</b> . . . . .	Mechanical Engineering Department, University of Maryland.
<b>Mr. M. HARRY PERRY</b> . . . . .	Private Energy Consultant, Washington, D.C.
<b>Dr. DAVID ROSE</b> . . . . .	Nuclear Engineering Department, Massachusetts Institute of Technology.
<b>Dr. ROBERT D. TOLLISON</b> . . . . .	Chairman, Department of Economics, Texas A & M University.
<b>Dr. FRANK VON HIPPLE</b> . . . . .	Professor, Princeton University.
<b>Dr. RICHARD WERTHAMER</b> . . . . .	Bell Telephone Laboratories, Murray Hill, N.J.
<b>Dr. JAMES L. WHITTENBERGER</b> . . . . .	Professor, School of Health, Harvard University.
<b>Dr. HERBERT WOODSON</b> . . . . .	Chairman, Department of Electrical Engineering, University of Texas.

## Solar Advisory Panel

Dr. JERRY GREY, <i>Chairman</i> . . . . .	Research and Engineering Consultant.
Mr. WILLIAM W. CAUDILL . . . . .	Architect, Partner, Caudill, Rowlett & Scott.
Mr. JOHN J. GUNTHER . . . . .	Executive Director, U.S. Conference of Mayors.
Dr. KLAUS P. HEISS . . . . .	President, ECON, Inc.
Mr. MORTON HOPPENFELD . . . . .	Director of Planning, Greater Hartford Process.
Mr. CHARLES LUTMAN . . . . .	Principal Project Manager, Ralph M. Parson, Inc.
Dr. JAMES J. MACKENZIE . . . . .	Massachusetts Audubon Society.
Mr. PAUL MAYCOCK . . . . .	Manager, Product Planning, Consumer Products Division, Texas Instruments.
Dr. MARJORIE MEINEL . . . . .	Professor, University of Arizona.
Dr. L. T. PAPAY . . . . .	Director of Research and Development, Southern California Edison Company.
Dr. PAUL RAPPAPORT . . . . .	Director, Process and Applied Material, RCA-David Sarnoff Research Center.
Mr. FLOYD E. SMITH . . . . .	President, International Association of Machinists.
Dr. E. M. SPARR OW . . . . .	Professor, University of Minnesota.

## MATERIALS ASSESSMENTS

The OTA Materials Assessment Program, during the report year, began two major projects and completed preparations for a third. Planning was initiated for two additional assessments scheduled for fiscal year 1976. These activities address a range of policy questions raised in five Congressional requests for assessments of possible steps to assure adequate national supplies of basic materials resources and commodities, including fuels.

In preparing its response to these requests, OTA developed the materials assessment program in stages. First, a review of the history of national materials policy and legislative actions was prepared for OTA by the Congressional Research Service of the Library of Congress. Included was a broad program prospectus with suggested topics for both long-range and short-range assessments.

Next, concurrent with recruitment of in-house project management staff, a 19-member Materials Advisory Committee was appointed to provide a broad range of outside expertise. (Members of this committee are listed at the end of this subsection.) Staff development in the materials area was augmented by the special assignment to OTA of a senior physicist and division chief from the National Bureau of Standards, and through the availability of a Congressional Science and Engineering Fellow sponsored by the American Association for the Advancement of Science.

Additional planning information was supplied by a survey, conducted at OTA'S request by the Federation of Materials Societies, an association of professional and technical societies representing over 500,000 scientists and engineers. This survey addressed the adequacy, completeness and accessibility of information about supply and demand of key materials and resources.

These inputs were reviewed by the Materials Advisory Committee and by the OTA Advisory Council, and ten candidate topics for assessment were listed in priority order by the committee. The materials project staff, working in co-ordination with the requesting Congressional interests, developed plans for the performance of five assessments, including the four topics assigned highest priority by the advisory committee. This work program subsequently was authorized by the OTA Congressional Board.

**Materials information system.**— In response to the request of the House Science and Technology Committee, this assessment is evaluating existing and potential systems for compiling data about the location, use and disposal of basic industrial commodities. The goal is to identify ways to provide Congressional decisionmakers earlier and more complete information about supplies and potential shortages of materials both raw and processed, which are critical to the economy of the United States.

During the report year, the OTA assessment team, assisted by a contractor, completed a preliminary report which analyzed alternative institu-

tional structures for a national materials information system. Pertinent information from this report was made available to the four Congressional members of the National Commission on Supplies and Shortages. The final assessment report is expected to be completed by the end of 1975.

***National stockpiling policies.***—Initiated in response to the informational needs expressed by the House Committee on Science and Technology, this assessment is examining the contribution that a national stockpile of basic commodities (excluding food) might provide to avoid future economic dislocations and interruptions in supplies.

Among the policy alternatives being evaluated are differing objectives and effects of possible new systems for a national program to buy, hold, upgrade, and sell various materials. The primary focus of the OTA stockpiling policy assessment will define a broader set of purposes, beyond current defense-related programs, which might be served by a well-defined national program. The development of such a program of stockpiling would be an important factor in the formulation of over-all national and international policies for materials and commodity management and conservation, and international trade.

This assessment is scheduled for completion in the fall of 1975.

***Constraints and incentives affecting domestic mineral accessibility.***—This assessment, initiated by a member of the OTA Board, addresses questions raised in requests submitted by the House Committee on Interior and Insular Affairs and the House Committee on Science and Technology. The project will examine the consequences of modifying and restructuring constraints and incentives that significantly affect the accessibility of fuel and mineral resources located on Federal lands.

In order to define the problem, a range of estimates will be made of national mineral requirements and availability in the period from 1975 to 2000 and beyond, including import dependence and other alternatives to increasing the domestic production of essential minerals.

The most important constraints and incentives affecting domestic mineral accessibility on public lands will be identified and one or more appropriate sets of legislative options and implementing administrative measures will be defined and assessed. Included in the assessment will be an analysis of the major social, environmental and economic impacts, which would result from not expanding domestic production of essential minerals, as well as legislative options for developing a balanced national land-use and mining policy which will meet national security and economic needs with due regard for environmental and social values.

Plans for this project were formulated during the project year, and it is scheduled to be completed early in 1976.

***Materials recycling.***—Requested by the House Committee on Science and Technology and the Senate Committee on Commerce, this planned assessment will examine the barriers to achieving substantial recovery of reusable materials from urban refuse using the best current technology.

Present plans for this assessment consist of two parts: (1) the identification of the institutional, economic and technical barriers to achieving substantial resources recovery from urban refuse, and (2) an assessment of the legislative options for the removal of the barriers identified in part 1 and the consequences of the adoption of these options.

**Conservation of materials through reduced wastage.**— This assessment was planned in response to a request from the Senate Committee on Commerce. It calls for an examination by OTA of alternative approaches to the reduction of materials wastage. Areas of potential waste reduction include (1) employing technology to reduce degradation processes (e.g., corrosion, wear, fracture), (2) designing for longer life in service, and (3) more effective industrial processing.

## Materials Advisory Committee

Dr. JAMES BOYD, <i>Chairman</i> . . . . .	President, Materials Associates.
Dr. EARL H. BEISTLINE . . . . .	Dean, College of Earth Sciences and Mineral Industry, University of Alaska.
Dr. SEYMOUR L. BLUM . . . . .	Director, Advanced Program Development, The MITRE Corporation.
Dr. LLOYD M. COOKE, . . . . .	Corporate Director, University Relations, Union Carbide Corporation.
Mr. FRANK FERNBACH . . . . .	Economist, United Steelworkers of America.
Dr. EDWIN A. GEE . . . . .	Vice President, and Director, and member of Executive Committee, E. I. Dupont de Nemours & Co., Inc.
Dr. BRUCE HANNAY, . . . . .	Vice President, Research, Bell Laboratories.
Dr. BRUCE HANNON, . . . . .	Center for Advanced Computation, University of Illinois (Urbana).
Dr. WILLIAM J. HARRIS, Jr, . . . . .	Vice President, Association of American Railroads.
Dr. JULIUS HARWOOD . . . . .	Assistant Director, Materials Science, Ford Motor Company.
Mr. HARRY H. HERMAN, Jr. . . . .	Consulting Engineer.
Dr. JAMES A. KENT . . . . .	Dean, College of Engineering, Michigan Technological University.
Dr. HANS H. LANDSBERG . . . . .	Director, Energy and Minerals Program, Resources for the Future.
Dr. ELBURT OSBORN, . . . . .	Distinguished Professor, Carnegie Institution of Washington Geophysical Laboratory.
Dr. R. TALBOT PACE . . . . .	Research Associate, Resources for the Future.
Mr. N. E. PROMISEL . . . . .	Director Emeritus, National Materials Advisory Board.
Dr. LOIS SHARPE . . . . .	Environmental Coordinator, League of Women Voter Education Fund.
Mr. GEORGE A. WATSON . . . . .	Executive Director, Ferroalloys Association.
Dr. J. H. WESTBROOK . . . . .	Manager, Materials Information System, General Electric Company.

## FOOD ASSESSMENTS

The OTA Food Assessment Program, during the report year, addressed itself to the problem of improving the quality of agricultural and nutritional information, both domestic and international, which forms the basis for Congressional policy decisions in a broad spectrum of food-related areas. This project was initiated by OTA's Congressional Board with the endorsement of the Senate Committee on Agriculture and Forestry. The OTA food assessment staff also completed preliminary plans for follow-on studies, scheduled for fiscal year 1976.

An important role in the development and execution of the OTA Food Assessment Program was played by an advisory committee comprised of 13 leading experts representing a broad range of agricultural and nutritional concerns, ranging from food production and processing to distribution and consumer protection. (A listing of the members of the OTA Food Advisory Committee appears at the end of this subsection. ) Additional assistance to the OTA project management staff was provided through the temporary assignment of skilled professionals from the Agency for International Development, the U.S. Department of Agriculture, and from the Congressional fellowship program of the American Association for the Advancement of Science. Through contractual arrangements, the OTA food team also utilized agricultural experts at Michigan State University and two private research firms. The overall direction and performance of the initial assessment, however, remained primarily an in-house function.

***Agricultural information systems.***— The initial OTA food assessment project is being performed primarily for the Senate Committee on Agriculture and Forestry. However, it relates to concerns raised by four other Congressional committees; House Agriculture, House Foreign Affairs, Senate Foreign Relations, and Senate Select Nutrition and Human Needs. The final assessment report is scheduled for completion in the fall of 1975.

Assessment efforts have been focused on information requirements dealing with key factors such as grain production and demand, import resource requirements, and domestic food consumption patterns and nutrition. The study was designed to identify and explain the relevant data-collecting and data-processing institutions-how they function, how they use technology, how they coordinate with one another, and where gaps, bottle-

necks, redundancies, and deficiencies exist-and to suggest policy options which might lead to improved availability of pertinent information.

The assessment includes a survey of organizations in the executive and legislative branches of the Government, as well as in the private sector, which are generators and/or users of agricultural information. The study was designed to determine whether policy directives or other legal or administrative structures exist, through which the exchange or coordination of information between such organizations can be enhanced.

During the conduct of the study, the OTA food assessment staff contributed preliminary findings and information for use in Congressional hearings and processes. Extensive meetings were held with staff of the Senate Agriculture and Forestry Committee to define issues, select witnesses and prepare questions for hearings on the Food for Peace program held over several days during February 1975. Similarly, OTA provided information and assistance in preparation for hearings set for April 1975 by the Senate Subcommittee on Foreign Agriculture Policy. Earlier during the assessment, the OTA staff assisted the Congress in its preparations for the World Food Conference, held in Rome in November 1974.

OTA also provided general background information for the U.S. Congressional delegation, which was incorporated in a comprehensive briefing book and other analytical documents, including a preliminary report on a worldwide food, agricultural, and nutrition information system. Many of the OTA analyses were reflected in final resolutions of the World Food Conference that were submitted to the United Nations General Assembly and approved.

***Follow-on studies.***— The Food Advisory Committee and OTA staff also began planning efforts to identify future study needs relating to subsystems in the agricultural-food-nutrition system. Such studies would build upon results of the initial assessment when it becomes final. Plans also were drawn to define the appropriate role in an information system of data on world grain production, and distribution; utilization of key resources (land, water, fertilizer, herbicides, pesticides) ; and national nutrition components, preferences, and attitudes. These projects were proposed by the Senate Committee on Agriculture and Forestry.

***Agricultural waste conversion.***— Planning was begun by OTA staff, during the report year, for a possible OTA assessment on agricultural waste conversion, requested by the Senate Select Committee on Nutrition and Human Needs. This proposed study would address such questions as the potential for using agricultural wastes for animal feed, and the extent to which protein substance now used to feed livestock might be more efficiently used if made directly available for human consumption.

## Food Advisory Committee

Dr. CLIFTON R. WHARTON, Jr., <i>Chairman.</i>	President, Michigan State University.
Dr. MARTIN E. ABEL . . . . .	Professor of Agricultural and Applied Economics, Director, Economic Development Center, University of Minnesota.
Dr. W. D. BUDDEMEIER . . . . .	Director of International Agricultural Programs, College of Agriculture, University of Illinois.
Dr. DAVID CALL . . . . .	Director of Cooperative Extension, Cornell University.
Dr. D. GALE JOHNSON . . . . .	Vice President and Dean of Faculty, University of Chicago.
Dr. CHESTER O. McCORKLE, Jr. . . . .	Executive Vice President, University of California.
Dr. MAX MILNER . . . . .	Coordinator, NSF/MIT Protein Resources Study, Department of Nutrition and Food Science, Massachusetts Institute of Technology.
Dr. ROBERT O. NESHEIM . . . . .	Vice President, Research and Development, Quaker Oats Company.
Mrs. ESTHER PETERSON . . . . .	Vice President, Consumer Programs, Giant Food Inc.
Dr. ROGER REVELLE . . . . .	Director, Center for Population Studies, Richard Saltonstall Professor of Population Policy, Harvard University.
Mr. LEON SCHACHTER . . . . .	International Vice President, Amalgamated Meat Cutters and Butcher Workmen of North America.
Mr. LAUREN SOTH . . . . .	Editor of the Editorial Page, Des Moines Register and Tribune.
Dr. E. T. YORK, Jr. . . . .	Chancellor Designate, State University System, University of Florida.

## HEALTH ASSESSMENTS

OTA's Health Assessment Program produced the first report transmitted by the Office to the Congress. The study dealt with a long-standing health policy issue—the equivalence of the therapeutic effects achieved by different brands of the same prescription drug product. During the report year, the program management staff in this area also conducted extensive negotiations with Congressional committee staffs interested in future OTA health assessments. Preliminary discussions covered a range of proposed fiscal year 1976 projects dealing with fifteen health and medical care issues enumerated in request letters from four Congressional committees.

In the planning and development of OTA's health program, the project staff has been able to utilize the talents of leading professionals in the fields of medicine, pharmacy and public health policy. Dr. Frederick C. Robbins, a Nobel Laureate in medicine and a member of the OTA Advisory Council, served as a member of the panel which performed the first OTA assessment and has been closely involved in planning for future studies.

***Drug bioequivalence.***—***This*** study was performed at the request of the Senate Committee on Labor and Public Welfare and was completed in July 1974. The project grew out of subcommittee hearings on drug safety, drug costs, prescription practices and Federal regulatory functions. In late 1973, the Secretary of Health, Education, and Welfare testified about proposed changes in Federal drug purchasing policy, under which reimbursements for drugs used in the Medicare and Medicaid programs would be made at the price of the least expensive chemically equivalent product available. In a subsequent hearing in February 1974, representatives of the pharmaceutical industry testified that, in terms of quality and therapeutic equivalence, there can be significant differences among chemically equivalent drugs.

In view of the substantial difference of opinion presented before the Senate committee, an agreement was reached to delay the proposed new drug reimbursement regulations pending completion of an OTA study of the underlying technological issues. OTA staff worked closely with the requesting committee to define the issues to be addressed and the charge for the study. Project leaders and committee staff also cooperatively selected a panel with broad experience in medicine, pharmacology, and biostatistics to carry out this task. (The panelists are listed at the end of this subsection. )

The OTA charge to the study panel was: Evaluate the extent to which technology-short of trials in man-can determine whether drug products

that meet the same official standards of chemical composition, but which are produced at different times or by differing processes (although otherwise are the same), can be expected to produce comparable therapeutic effects. The OTA panel limited its examination to the degree to which such differences can be predicted on the basis of bioavailability—that is, the extent and rate of absorption of active ingredients over time. They also sought to determine whether differences in bioavailability noted in man correlate well with results achieved in laboratory tests.

The panel's report was forwarded to the Senate Committee on Labor and Public Welfare and to the House Committee on Interstate and Foreign Commerce in July 1974. Upon receipt of the report, a new subcommittee hearing was promptly scheduled in the Senate to hear additional testimony from drug manufacture, from the Department of Health, Education, and Welfare, and from members of the OTA Drug Bioequivalence Study Panel. Subcommittee staff subsequently began consideration of amendments to incorporate panel recommendations into pending legislation.

**Medical malpractice.**—At the request of the House Ways and Means Committee, planning was begun for a proposed assessment of the extent to which applications or misapplications of medical technology cause injuries which result in medical malpractice lawsuits. The study would seek to identify and analyze alternative ways of reducing the incidence of such technology-related injuries. Also to be examined would be the cost and appropriateness of so-called “defensive” applications of medical technology instituted for the sole purpose of seeking to avoid malpractice litigation.

**Medical technologies.**—The many uses of technologies in the health care field, ranging from research and disease prevention to diagnosis and treatment, raise a great many questions as to effectiveness, appropriateness, cost, and risk to patients involved. In response to a request from the Senate Labor and Public Welfare Committee, the OTA staff has begun preliminary planning within this broad area to identify specific issues for technology assessment which involve significant public policy questions and alternatives.

**Hospital outpatient services.**—The Senate Finance Committee has requested that OTA conduct an assessment of the technologies related to hospital outpatient departments. Preliminary plans for such a study call for the development of information concerning various types of medical technologies employed in outpatient departments, the utilization and costs of such technologies, and possible methods for decentralizing or dispersing certain services in order to reduce costs and improve efficiency.

**Medical records and health information.**—The Senate Committee on Labor and Public Welfare has asked OTA to consider an assessment dealing with the collection, storage, and transfer of medical and health information. Such a study would consider the recordkeeping requirements of various state and Federal medical programs, the potential costs and benefits of com-

puterized information systems, and the need to safeguard the privacy of patients involved.

***Adverse drug reactions***— The House Ways and Means Committee has requested that OTA develop data on the extent of adverse drug reactions, to survey and evaluate existing methods for reporting and disseminating information of such occurrences, to examine the problems of collation and exchange of this information, and to make recommendations on the role of utilization review as it pertains to adverse drug reactions. Preliminary OTA plans call for a review of previous studies in this area in order to determine the need for additional research.

## Drug Bioequivalence Study Panel

Dr. ROBERT W. BERLINER, <i>Chairman.</i>	Dean, School of Medicine, Yale University.
Dr. LEIGHTON E. CLUFF.	Chairman, Department of Medicine, University of Florida.
Dr. JAMES T. DOLUISIO.	Dean, College of Pharmacy, University of Texas at Austin.
Dr. KENNETH L. MELMON.	Chief, Division of Clinical Pharmacology, University of California at San Francisco.
Dr. ALEXANDER S. NADAS.	Chief, Cardiology Department, Children's Hospital Medical Center, Boston.
Dr. JOHN A. OATES.	Professor of Medicine and Pharmacology, Vanderbilt University
Dr. SIDNEY RIEGELMAN	Chairman, Department of Pharmacy, University of California at San Francisco.
Dr. FREDERICK E. SHIDEMAN	Head, Department of Pharmacology, University of Minnesota.
Dr. MARVIN ZELLEN	Director, Statistical Laboratory, State University of New York at Buffalo.
Dr. FREDERICK C. ROBBINS	Dean, Case Western Reserve Medical School, Case Western Reserve University.