AIR POLLUTION
Remedial Activities of the 91st Congress

MARIA H. GRIMES
Analyst in Environmental Policy
Environmental Policy Division

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AIR POLLUTION

With authorizations under the 1967 Air Quality Act expiring by the end of fiscal year 1970, the 91st Congress began to consider new legislation to extend and amend the Act early in the second session. This activity was given added impetus by heightened public concern for air quality, and the President’s message on the environment. This included several specific proposals for emission controls, which were later incorporated in Administration bills sent to the Congress. Public dissatisfaction with some aspects of air pollution control, such as the lengthy and cumbersome enforcement procedures set up in the 1967 Act, the less-than-effective automotive emission controls, concern over leaded gasoline, and the inability of citizens to bring effective suit against polluters, were certain to produce attempts at a major overhaul of Federal air pollution control legislation.

Legislation

While consideration of new amendments to the Air Quality Act were under scrutiny, portions of that Act approached termination. Legislation was introduced and passed to extend for one year the authorization for research relating to fuels and vehicles under the Clean Air Act. This enabled programs to continue until more comprehensive legislation was cleared.

Clean Air Act, Amendments

Comprehensive legislation came in the form of additional amendments to the Clean Air Act—the Clean Air Act Amendments of 1970. The Senate and House had each passed their own versions of the bill which were reconciled in conference. When the final bill—largely the Senate version—was presented to the House and Senate for approval it was indeed a thoroughly considered measure. In the Senate alone it had passed through a total of twenty days of hearings, twelve executive sessions of the panel, ten executive sessions of the full Committee on Public Works, two days of debate on the Senate floor and twelve conference meetings with the House.

The major provisions of the law, which is deemed the toughest environmental legislation on record, are:

**Air Quality Control Regions:** Areas of states not designated otherwise will be considered as air quality control regions. The EPA Administrator designates interstate regions.

**Air Quality Criteria and Control Techniques:** Remaining air quality criteria for major pollutants are to be issued within 13 months of date of enactment.

**National Ambient Air Quality Standards:** Procedures are established for setting primary National ambient air quality standards to protect public health and secondary national quality standards necessary to protect public welfare. Following promulgation of the standards, (four months after issuance of criteria) the States will have nine months to develop and to adopt, after public hearings, a plan to implement the primary standards. Additional time will be provided to set implementation plans for secondary standards.

**Implementation Plans:** The Administrator has six months to approve a submitted implementation plan or if no plan is submitted or the
plan is inadequate, to substitute a plan of his own. The plan must be designed to achieve the level of air quality established by the primary standard within three years, and must include a description of steps which will be taken, including transportation and land use controls, emission requirements, and other enforcement procedure.

**State Standards:** States or local subdivisions may adopt air quality emission standards that are stricter than the National standard.

**New Source Performance Standards:** Regulations are authorized to require that new major industry plants such as power plants, steel mills, and cement plants achieve a standard of emission performance based on the latest available control technology, processes, operating methods, and other alternatives.

**Hazardous Substance Emissions:** The Administrator is required to regulate emissions of pollutants found to be hazardous to health.

**Federal Enforcement:** Violation of any air quality implementation plan, emission standard, etc. prohibited. The law provides criminal penalties and the authority to issue abatement orders; requires record keeping; authorizes subpoenas; requires emission monitoring; and authorizes right of entry.

**Federal Facilities:** The agreement requires Federal facilities to control air pollution. The President may exempt a Federal facility from compliance only if control technology is not available and the facility's operation is of paramount importance to the national security. Lack of appropriations is no excuse unless the President has specifically requested, and the Congress has refused, to provide needed funds.

**Moving Sources:** Standards - The law requires emission standards based on protection of public health and welfare without regard to the propulsion system and provides that the 1975 model cars must achieve at least a 90% reduction from emissions of the 1970 models. This would approximate the 1980 standards projected currently for automobiles. Violation of standards is prohibited.

**Aircraft Emissions:** The law provides for regulation of aircraft emissions and Federal preemption of authority to regulate such emissions. Aviation fuels regulation is also authorized.

**Penalties:** The law sets penalties of up to $10,000 per vehicle and provides authority to seek injunctions against violators.
Certification: The law authorizes the EPA Administrator to test any new vehicle submitted for certification for compliance with standards and authorizes certification for a year. It also provides for production line testing of vehicles.

On-The-Road Testing and Compliance: The law requires warranty of 50,000 miles on emission system performance. The Administrator can test cars on the road, and can require recall if a representative sample fails the test.

State Grants for Vehicle Inspection: The law authorizes 2-1 grants to the States for developing emission inspection systems.

Pre-emption: The law preempts State emission standard-setting authority, except for California.

Low Emission Vehicle: Certification and purchase of Low-Emission Vehicles are authorized.

General

Research: The law authorizes $75 million for fiscal 1971, $125 million for fiscal 1972, and $150 million for fiscal 1973 research relating to fuels and vehicles. It authorizes research concerning the health effects of air pollution and authorizes an additional $15 million for long-term contracts to carry out these investigations.

State Planning Grants: The law provides 3 to 1 funding to States with a bonus now available only to interstate and intermunicipal programs; it also provides for the option of assignment of Federal personnel in lieu of cash grants.

Emergency Powers: The Administrator is authorized to abate any pollution that presents an imminent and substantial danger to health.

Citizens Suits: Citizens may sue to enforce violation of standards; suits against the Administrator are limited to mandatory functions.

Federal Contract Compliance: The law prohibits the Federal Government from signing contracts with any company convicted of violation of air quality laws.

Judicial Review: The law permits review of the standards, implementation plans, or other action taken pursuant to the Act.
Mandatory Licensing: The law authorizes mandatory licensing of patents on technology not otherwise reasonably available to facilitate compliance with provision of this Act.


Environmental Policy: The Administrator is required to review any National Environmental Policy Act statements and major Federal actions and make his comments public.

Noise Pollution: The bill establishes an Office of Noise Abatement and Control in the Environmental Protection Agency and authorizes $30 million to carry out its functions.

Legislative Proposals

Citizen concern for more effective automotive pollution abatement, safer fuels, better industrial control technology, and incentives to acquire abatement, was reflected in dozens of bills introduced during the 91st Congress. While many ideas were incorporated in the House and Senate versions of the Clean Air Act amendments, several others might suggest future air pollution control legislation.

Administration Proposal

Following his message to the Congress on the environment, the President transmitted a 10-point air pollution control program, which proposed the following:

1. New, more stringent motor vehicle emission standards for 1973 and 1975 models, to include control of nitrogen oxides by 1973 and of particulates by 1975;

2. Revision of automotive emissions enforcement procedures, calling for sampling of assembly line vehicles rather than prototypes;

3. Regulation by HEW of gasoline composition and additives;
4. A Federal research and development program to produce unconventionally-powered, low pollution automobiles within 5 years;

5. Guarantee of privately sponsored development of unconventionally powered vehicles.

6. Establishment of national air quality standards and a one-year limit on preparation of State abatement plans to meet such standards. Abatement plans would cover all areas of the State whether or not a part of an air quality control region and would include emission standards for stationary sources;

7. Accelerated designation of interstate air quality control regions;

8. National emission standards for pollutants extremely hazardous to health, and for selected classes of new facilities which could become major air polluters;

9. Extension of Federal authority to seek court action in both inter- and intra-State air pollution situations involving local failure to enforce standards, air quality below national standards, or violation of emission standards or implementation timetables.

10. Court-imposed fines of up to $10,000 per day for failure to meet established air quality standards or implementation timetables.

Motor Vehicle Pollution

Legislation was introduced calling for a Federal low emission vehicle procurement Act:

This measure would stimulate the development, production, and distribution in interstate commerce of low emission motor vehicles in order to provide increased protection against the hazards of vehicle exhaust emission. The bill would also authorize the Federal government to acquire low emission vehicles in lieu of standard vehicles.

Joint hearings were held on this measure in January 1970 before the Subcommittee on Energy, Natural Resources and the Subcommittee on Air and Water Pollution.
Comprehensive Automobile Legislation—A comprehensive eleven-part package of automotive air pollution control legislation was introduced. Its major provisions included:

1. Setting auto emission standards on the basis of the cleanest feasible propulsion system;
2. Phasing out in 1975 of large engines which cannot meet standards;
3. Developing a large-scale Federal prototype program for pollution-free vehicles;
4. Using part of the Federal automobile excise tax to provide the necessary financing for the air pollution program;
5. Authorizing the Federal Government to purchase pollution-free vehicles, even if more costly;
6. Encouraging the States to purchase pollution-free vehicles by authorizing the use of the highway trust fund to compensate for any added cost;
7. Increasing interim auto emission standards to those already established for California, and strengthening enforcement procedures;
8. Establishing auto emission standards for used cars by 1972;
9. Establishing rigorous emission standards by 1972 for fleet owned vehicles;
10. Banning leaded gasoline by mid-1972 and authorizing the Federal Government to regulate the composition of fuel; and

Amendments were offered to this measure.

Other Automotive Proposals—Several other proposals were introduced to control air pollution from automobile sources. They included measures to:

-- require all passenger cars used by the Federal Government to be equipped with control devices;
require that after a certain date, the GSA and Post Office Department would have to purchase a certain type of motor vehicle; and

prohibit the introduction, transportation, or distribution in interstate commerce of gasoline containing lead.

Incentives to Construct Abatement Facilities

Although accelerated amortization for industrial air pollution abatement facilities was provided in the Tax Reform Act of 1969 (P.L. 91-172), bills continued to be introduced to enable industry to make the necessary investments for construction, operation and maintenance of such facilities. Examples include the following:

Provide priority in the processing of applications for patents on air pollution;

Amend the Small Business Act to encourage the development and utilization of new and improved methods of waste disposal and pollution control; assist small business concerns to effect conversions to meet pollution control standards by insuring loans at rates below commercial rates;

Amend the Internal Revenue Code of 1954 to allow an incentive tax credit for a part of the cost of constructing or providing facilities for air or water pollution control, and permit the amortization of such cost within a period of from 1 to 5 years;

Amend the Internal Revenue Code of 1954 to provide for an income tax deduction for additions to reserves for estimated air and water pollution control expenses;

Amend the Internal Revenue Code of 1954 to encourage the abatement of pollution by allowing an individual taxpayer to deduct from gross income the cost of eligible pollution control equipment; and

Amend the Small Business Act to provide "disaster loan assistance to any small business required to install antipollution equipment to meet national, State or local environmental quality standards" below rates available from commercial institutions.
Federal Contracts

A proposal was introduced to ensure compliance by Federal contractors with applicable Federal, State and local air and water pollution standards. Contractors who failed to comply with this clause and whose contract activities resulted in further air and/or water pollution would be required to take corrective measures to abate the pollution. No payment could be made to the contractor until the anti-pollution clause had been satisfactorily met.

Reporting Pollution Sources

Another measure introduced, but failing to receive action, was a bill to require each air pollution control agency receiving a Federal grant for air pollution control programs to provide information and data on air pollution sources within its jurisdiction.

Financing Air Pollution Programs

An environmental financing act was introduced which sought to provide a continuing source of funds for pollution control programs. This measure sought to achieve its objective through: (1) guaranteed long-term loans to State and local governments to finance programs to control or abate pollution; (2) the issuance of "Environmental Savings Bonds" to increase citizen investment and participation in environmental programs; and (3) establishment of an Environmental Trust Fund to provide a perpetual and guaranteed source of funds for environmental control programs.
Recent Reports and Their Recommendations

A number of significant reports and studies containing legislative proposals are pertinent to activities undertaken in the 91st Congress. They are annotated briefly and their recommendations are reproduced. In addition, several reports by the National Air Pollution Control Administration (now the Air Pollution Control Office of the Environmental Protection Agency) called for under provisions of the 1967 Air Quality Act also were received by Congress in the past year, and are included in this section.


This report is the culmination of a three year study by a panel of 26 leading environmental scientists and engineers. It deals with air and water pollution, solid waste disposal and pesticides, and contains a total of 73 recommendations for better and more efficient utilization of the environment without degrading or destroying it.

Recommendations: The Air Environment

Flow, dispersion, degradation.--

Recommendation A1: Systematic measurement should be undertaken for a number of relatively long-lived substances in the general atmosphere, including carbon monoxide, nitrous oxide, methane, carbon dioxide, and sulfur hexafluoride. The general turbidity of the atmosphere should be measured systematically on as wide a basis as possible, and more effort should be devoted to determining the nature of the aerosols that cause such turbidity.

Recommendation A3: Research should be continued and selectively expanded on atmospheric reactions of many kinds. Such work should extend to measurements in the field in order to help relate the results of laboratory and smog-chamber work to what actually happens in the urban and regional atmospheres.
Recommendation A5: Study of urban diffusion processes should be continued and selectively expanded, including coordinated use of long-lived tracers and work on optimum deployment and use of air monitoring instruments.

Motor vehicles.—

Recommendation A6: Development of procedures and equipment by government and industry for periodic inspection of emission control systems in normal use should be stimulated to move ahead at the best possible rate.

Recommendation A7: The development of improved instrumentation for measuring automotive emissions should be supported by all interested to a degree that will assure rapid progress in the ability to assess emissions in terms of both their amount and their reactivity in the atmosphere.

Recommendation A8: Federal emission standards more stringent than those to take effect in 1970 should be developed and promulgated at an early date so that auto makers will have sufficient time to develop the necessary control systems. Such standards should be designed to counteract the effects of the rising population of motor vehicles until at least 1980, and should include standards for nitrogen oxides.

Recommendation A9: The effects of the lead compounds in gasoline on possible control systems of the future should be assessed carefully in terms of the emission levels that might be achieved with and without lead, or with reduced amounts of lead, and in terms of the associated costs to the industries involved and to the consumer. Economic studies should include the relationship of lead to projected emission control systems, to the gasoline and lead additive manufacturing industries, and to the design and performance of the internal combustion engine itself.

Recommendation A10: The Federal Government should press its assessment of advanced, low-polluting power systems, including steam and electric power, to provide the basis for sound industrial research and development on such systems.

Recommendation A12: More attention should be given to the development of acceptable means of public transportation.

Industrial facilities.—

Recommendation A13: The promulgation of air quality criteria by the Federal Government should be supported in a manner that will allow it to proceed with all possible speed.

Recommendation A14: The development of new and improved control technology and equipment for industrial emissions must be stimulated, particularly for types of industries for which economic means of control do not now exist. Low-cost equipment for small industries is particularly essential.
Utility power plants (also pertinent to industrial power generation).--

Recommendation A16: Translation of federal air quality criteria for sulfur oxides and particles into air quality standards should proceed rapidly so as to speed widespread application of the available means of controlling these emissions.

Recommendation A17: Existing research to define the overall effectiveness of the tail stack in meeting air quality standards should consider the effects of mass emissions of pollutants not only on local, ground-level concentrations, but on the local and regional air masses and on ground-level concentrations outside the local area.

Recommendation A18: Investigations of techniques for desulfurizing fuels must be carried to the point where economic evaluation is possible. Particularly desirable would be early definition of the amounts and locations of coals that can be cleaned economically of significant amounts of pyritic sulfur. The development of economical coal cleaning processes is a responsibility of the coal industry, and more comprehensive studies should be made than have been made in the past. Further research appears to be required on hydrodesulfurization catalysts that are not deactivated by the heavy metals in residual fuel oils.

Recommendation A19: The development of first-generation processes for removing sulfur oxides from utility stack gases should be supported and stimulated so as to achieve early commercialization, particularly in order to offer a control option for existing power plants. Research and development on new and original methods of removing sulfur oxides from utility stacks should proceed rapidly to the point at which specific processes can be selected for advanced development.

Recommendation A20: Current studies of nitrogen oxides emissions by stationary sources should define the economics and effectiveness of modifying existing power plants, where possible, or of using alternative fuels to reduce such emissions.

Space heating.--

Recommendation A22: In its development of national fuels policies and inventories, the Federal Government should take proper account of the needs of present and developing urban areas for low-pollution fuels for space heating.

Recommendation A24: The economics of centralized production of heat for space heating should be re-evaluated. Such studies should consider the distribution of energy in the form of hot air, electricity, steam, or high-temperature water (450°F. and 274 pounds per square inch).

Effects of air pollutants.--

Recommendation A25: Epidemiological and laboratory studies of the effects of air pollution on humans, including model experiments on animals, should be carefully coordinated and selectively accelerated. Body burdens and environmental levels of potentially harmful metals should be monitored to the extent feasible on a systematic and continuing basis.
Recommendation A26: Economic and scientific research on the effects of air pollutants on vegetation and materials should be maintained at a level in consonance with work on effects on humans.

Recommendation A27: A concerted research program on the ecological effects of air pollutants should be developed and carefully coordinated as a multidisciplinary effort.

Analytical chemistry and instruments.--

Recommendation A30: Development of simplified, less costly instrumentation for air monitoring should be accelerated markedly. Means should be found for stimulating industrial research and development in this area.

Recommendation A31: The development of better in-stack and remote source-monitoring instrumentation for pollutants is essential and should be accelerated. Federal stimulation may be necessary to achieve adequately rapid innovation and dissemination.

Recommendation A32: Standardization of analytical methods and instruments should also be accelerated. Such standardization should include criteria for acceptable methods of sampling and storage as well as for the analytical methods themselves and for the interpretation and use of the resulting data. A program should be considered for certification of air-monitoring instruments on the basis of federally-established standards of performance.

* * *

2. The Automobile and Air Pollution: A Program for Progress.

The Panel's report contains an appraisal of the complex problem of automotive transportation in relation to the current and critical problem of air pollution.

RECOMMENDATION 1

The national goal for air quality should be the achievement of an atmosphere with no significant detectable adverse effect from air pollution on health, welfare, and the quality of life.

RECOMMENDATION 2

The Environmental Science Services Administration of the Department of Commerce should establish a research program to determine the effects of air pollution on atmospheric processes.
RECOMMENDATION 3

The Department of Health, Education, and Welfare should develop and promptly implement an expanded program to establish quantitative information regarding the effects of air pollution upon health and welfare of the population.

RECOMMENDATION 4

The Federal Government should continue to establish standards for all harmful automotive emissions, and realistic timetables for the achievement of such standards.

RECOMMENDATION 5

The Federal Government should immediately establish standards for the lead content in gasoline which will prevent any further increase in the total quantity of lead emitted to the atmosphere. The Department of Health, Education, and Welfare should begin an intensive study of the long-term health effects of lead in the atmosphere to determine requirements for future action.

RECOMMENDATION 6

The Federal Government should set standards for emissions, including smoke and odor, for gasoline and diesel powered trucks and buses.

RECOMMENDATION 7

The Federal Government should increase its support for mass transportation research, development, and demonstration programs related to the reduction of air pollution.

RECOMMENDATION 8

All Government standards concerning vehicle emissions should be developed in terms of the total mass of specific pollutants emitted under an appropriate driving cycle, rather than as the percent of pollutant in the exhaust.

RECOMMENDATION 9

The creation of effective local inspection mechanisms to enforce vehicle emission standards should be encouraged by the use of Federal matching grants for training, equipment, and operation.

RECOMMENDATION 10

The Federal Government should develop cooperative mechanisms to accelerate the worldwide interchange of information relating to air pollution, its effects, and control.
RECOMMENDATION 11

The Department of Health, Education, and Welfare should establish primary operating responsibility for the air pollution control program at the highest possible organizational level.

RECOMMENDATION 12

The Secretary of Health, Education, and Welfare should establish a Technical Advisory Board reporting to the Secretary to assist in the development of plans, programs and research activities and to more effectively use the resources of the scientific and industrial communities.

RECOMMENDATION 13

A mechanism for coordination of all Federal activities relating to air pollution should be established as a continuing function at a high level in the Executive Branch.

RECOMMENDATION 14

The Federal Government should initiate a five-year program, in total amount of approximately 60 million dollars, to support innovative developments useful in the establishment of future emission standards, in the following areas:

a. energy sources for vehicles.
b. vehicular propulsion systems
c. emission control devices
d. special purpose urban cars
e. general purpose vehicles

RECOMMENDATION 15

Federal, state, and local governments should incorporate low emission performance criteria as factors in the purchase of vehicles for their requirements.

RECOMMENDATION 16

The National Science Foundation should review its basic research and educational programs in atmospheric physics, electrochemistry and other scientific and engineering disciplines relating to the air pollution problem and ensure that such activities are receiving adequate support.

* * *

The report is concerned "with problems and programs dealing with air, soil and water pollution in relation to agriculture and agriculture-related industries." It gives attention to agriculture as a contributor to pollution and as it in turn is affected by pollution.

Areas of emphasis (as applicable to air pollution).--

a. Measurement and monitoring of air pollutants

An organized effort is needed to establish air pollution monitoring networks in agricultural and forest areas where present or potential damage exists. An assessment should be made of background levels, especially of photochemical oxidants, and the interface between urban and non-urban areas.

b. Effects on plants and animals

Increasing emphasis is being placed on the long-term effects of low concentrations of pollutants singly and in combination.

c. Economic impact

Research is needed to develop more accurate methods of assessing economic damage to crops, forests, and livestock. A remote-sensing system [from aircraft] is needed to provide for a comprehensive economic analysis. Pending development and installation of this system, economic research is needed on smaller areas that are severely affected by air pollutants.

d. Genetic and environmental control

The ability of vegetation in buffer zones to "filter out" air pollutants requires further study as does the development of efficient filter systems for greenhouses and animal houses.

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This wide-ranging series of papers and discussions focuses on how to provide a rational basis for setting air quality standards.

Features.--

a. What information is necessary for setting up an adequate air quality standard.

b. What the standard should specify in addition to pollution concentration.

c. How previous work done on other types of environmental exposures can be helpful.

d. What the acceptable levels of human tolerance are and when does exceeding them become critical.

e. How to set goals and set up specific objectives for pollution concentration and effects.

f. How to use the new decision-making techniques to create an air quality standard setting model which takes various alternatives into account.

g. An assessment of the strengths and weaknesses of air pollution abatement.

h. How much "give" in life style can be expected in exchange for vehicular pollution control.

i. Why policy decisions on air quality fall short in reflecting public opinion and what can be done about it.

j. What are the stumbling blocks in securing legislation for adequate standards.

k. What legal framework will work best in administering air quality standards.

l. Why it is important to differentiate between air quality standards and emission standards.
m. Why it is dangerous to set standards without regard to synergism.

n. What additional support will the states need from the federal government for establishing standards.

***


This report, prepared for the Environmental Studies Board, assesses "the state of knowledge concerning the effects on human health of carbon monoxide...it sets forth what is reasonably well established about these effects and recommends research needed..."

Recommendations on needed research.--

Because of the limitations of present knowledge about the effect of CO at low levels, additional research is needed. Problem areas that should be given high priority in future research programs are detailed in behavioral, medical, physiologic (biochemical), epidemiologic and environmental categories.

***


This report "seeks to describe the conditions of our environment, and to identify major trends, problems, actions under way and opportunities for the future."

What needs to be done (air pollution).--

a. The President's legislative program should be enacted to deal more effectively with stationary sources by setting national air quality standards and national emission standards on substances harmful to health, by streamlining enforcement procedures, and by providing fines of up to $10,000 a day.
b. If the President's legislative program is enacted, the major Federal efforts on stationary sources should be directed toward the prompt establishment of national air quality standards covering a wide range of pollutants, and toward development of emission control limits for harmful pollutants such as asbestos, beryllium, cadmium, and other toxic materials.

c. Programs must be developed to improve State and local control agencies.

d. Federal research and development on sulfur oxides and nitrogen oxide control technology should be accelerated.

e. A more balanced research and development program is necessary to hasten the development of more efficient energy processes.

f. Incentives to accelerate industry support for research and to stimulate corrective actions should be considered.

g. The President's legislative proposals for regulating fuel and fuel additives, taxing lead to be used in gasoline, and testing emission systems on the production line are critical for meeting motor vehicle emission standards and should be enacted.

h. Alternatives available to assure continued control of motor vehicle emissions under actual road conditions should be evaluated.

i. The development and widespread testing of an inexpensive and effective emission control system for installation on used cars should be accelerated. Consideration should be given to requiring its use on all automobiles or on vehicles in areas with severe pollution problems.

j. The program for development of an unconventional vehicle propulsion system (e.g., steam, gas turbine, or hybrid) should be accelerated to assure that the technology will be available if conventional propulsion systems are incapable of meeting increasingly stringent Federal standards.

k. Increased research should be conducted on the development of transportation systems that not only move people and goods efficiently but also help reduce both dependency on the private car and, with it, air pollution.

l. More research should be conducted on the effects of air pollutants on man.

m. Federal, State, and local monitoring programs must be improved considerably.

n. Land use planning and control should be used by State, local, and regional agencies as a method of minimizing air pollution.

o. The United States should work toward cooperative arrangements with other nations in limiting total amounts of air pollutants emitted into the atmosphere.

** **


Recommendations

a. Exposure measurement.--

Recommendation 1-1: Studies should be initiated to determine the usefulness of personal air pollutant samplers to measure the exposure dose to representative individuals.

Recommendation 1-2: Efforts should be made to extend existing studies to determine the characteristic biologic response times which affect the requirements for sampling duration, frequency, and averaging times for different pollutants.

Recommendation 1-3: The development of modeling techniques for air basins should be extended. The objective should be to predict concentrations of pollutants at ground level and at elevations, taking into account that such techniques should be consistent with the biologic response pattern of human beings for the pollutant in question.

Recommendation 1-4: The Subtask Force encourages the development of simpler and less expensive methods for sampling and analyzing suspended particulate matter, sulfur dioxide, nitrogen dioxide, carbon monoxide, and other pollutants.

Recommendation 1-5: Studies should be initiated to determine the feasibility and reliability of a random sampling scheme based on use of a mobile sampling unit. These studies should include the necessary macro- and micro-meteorologic investigations.

Recommendation 1-6: Studies to assess the relevance of existing National Air Sampling Network and Continuous Air Monitoring Program network information to the different aims of air quality monitoring and measurement of human exposure should be extended. Again, this will necessitate supporting meteorologic studies.

Recommendation 1-7: The Subtask Force encourages the development and improvement of statistical methodology for dealing with the problems of dose-response relationships over long periods of time.

b. Indices of the effects of air pollution.--

Recommendation 1-8: Further epidemiologic studies are needed to establish more precisely the relationship between pollutant concentrations and mortality, morbidity, physiologic and psychologic impairment. Such studies should be carried out in representative samples of the general population, in suitable occupational groups and in persons who are thought to be particularly susceptible to pollution.
c. Studies in experimental animals.--

Recommendation 1-9: Much more study is needed on common air pollutants to determine mechanisms of response and relationships between reactions to acute and to prolonged exposure. Such information would improve the basis for air quality criteria development.

Recommendation 1-10: Increased attention should be given to the newer emission products associated with developments in industrial, military and aerospace operations.

Recommendation 1-11: Increased emphasis should be placed on studies of the combined actions of gaseous and particulate pollutants.

Recommendation 1-12: Attention should also be given to the possible synergistic effects of other environmental components and of modifying factors in the organism itself. Examples would be meteorologic variables (temperature, fog) and factors in the organism such as exercise, disease or allergic states, adaptation, and presence of other foreign chemicals or drugs.

Recommendation 1-13: Effort should be directed toward the development or selection of animal disease models which resemble air pollution-sensitive individuals or groups in the human population.

Recommendation 1-14: Comparative studies of the physiology, biochemistry, and morphology of the lung should be encouraged in order to provide a logical basis for a) understanding the mechanisms of environmental influence, and b) comparing results in animals and man. Additional fundamental work is especially needed on pulmonary clearance mechanisms; the production of surfactants; release, uptake, and metabolism of endogenous pharmacologically active compounds; and immunologic reactions.

d. Laboratory studies of human beings.--

Recommendation 1-15: More studies are needed to quantify the responses of the human respiratory, cardiovascular, and central nervous systems to acute and chronic exposures to single pollutants and to combinations of pollutants in association with various climatic factors. This should include normal and "sensitive" subjects under appropriate safeguards. The effects of stresses such as exercise should also be studied in the above conditions where feasible.

Recommendation 1-16: There is a need for more studies to correlate clinical symptoms and tests of pulmonary function performed during life with findings at autopsy. These efforts should include study of the in vitro mechanical properties of the lung, with the purpose of providing a better understanding of the ways that inhaled agents may be related to development of pulmonary disease, aging processes, susceptibility to infection, and allergic manifestations.
Recommendation 1-17: Autopsies resulting from accidental death should be studied in relation to previous exposures. Information on smoking habits, occupation, areas of residence and previous illnesses should be obtained from the next of kin. The reliability of information from the next of kin should be assessed when possible by comparing it with information obtained from the decedent before death.

* * *


In examining the status of governmental and nongovernmental preparations for the 1972 United Nations Conference on the Human Environment...an initiative such as this Study [was concluded] to provide an important input into planning for that Conference and for numerous other national and international activities.

Recommendations: (concerning air pollution)

a. Influence of atmospheric pollutants on climate.---

1. We recommend that current computer models be improved by including more realistic simulations of clouds and air-sea interaction and that attempts be made to include particles when their properties become better known. Such models should be run for periods of at least several simulated years. The effects of potential global pollutants on the climate and on phenomena such as cloud formation should be studied with these models.
2. We recommend that possibilities be investigated for simplifying existing models to provide a better understanding of climatic changes. Simultaneously, a search should be made for alternative types of models which are more suitable for handling problems of climatic change.

b. Carbon dioxide from fossil fuels.---

1. We recommend the improvement of present estimates of future combustion of fossil fuels and the resulting emissions.
2. We recommend study of changes in the mass of living matter and decaying products.
3. We recommend continuous measurement and study of the carbon dioxide content of the atmosphere in a few areas remote from known sources for the purpose of determining trends. Specifically, four stations and some aircraft flights are required.

4. We recommend systematic scientific study of the partition of carbon dioxide among the atmosphere, the oceans, and the biomass. Such research might require up to 12 stations.

c. **Particles in the atmosphere.**

1. We recommend studies to determine optical properties of fine particles, their sources, transport processes, nature, size distributions, and concentrations in both the troposphere and stratosphere, and their effects on cloud reflectivity.

2. We recommend that the effects of particles on radiative transfer be studied and that the results be incorporated in mathematical models to determine the influence of particles on planetary circulation patterns.

3. We recommend extending and improving solar radiation measurements.

4. We recommend beginning measurements by lidar (optical radar) methods of the vertical distribution of particles in the atmosphere.

5. We recommend the study of the scientific and economic feasibility of initiating satellite measurements of the albedo (reflectivity) of the whole earth, capable of detecting trends of the order of 1 percent per 10 years.

6. We recommend beginning a continuing survey, with ground and aircraft sampling, of the atmosphere's content of particles and of those trace gases that form particles by chemical reactions in the atmosphere. For relatively long-lived constituents about 10 fixed stations will be required, for short-lived constituents, about 100.

7. We recommend monitoring several specific particles and gases by chemical means. About 100 measurement sites will be required.

d. **The role of clouds.**

1. We recommend that there be global observations of cloud distribution and temporal variations. High spatial resolution satellite observations are required to give "correct" cloud population counts and to establish the existence of long-term trends in cloudiness (if there are any).
2. We recommend studies of the optical (visible and infrared) properties of clouds as functions of the various relevant cloud and impinging radiation parameters. These studies should include the effect of particles on the reflectivity of clouds and a determination of the infrared "blackness" of clouds.

e. Surface changes and the climate.--

We recommend that before actions are taken which result in some of the very extensive surface changes described mathematical models be constructed which simulate their effects on the climate of a region or, possibly, of the earth.

f. Thermal pollution.--

Although by the year 2000 global thermal power output may be as much as six times the present level, we do not expect it to affect global climate. Over cities it does already create "heat islands," and as these grow larger they may have regional climatic effects. We recommend that these potential effects be studied with computer models.

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This report presents information on the efforts of Federal departments and agencies to abate and control air pollution at Federal facilities in the 50 States, D.C., Puerto Rico, Guam, and the Virgin Islands. It is based on data submitted to the Bureau of the Budget by the various departments and agencies in accordance with Executive Order 11282 (superseded by EO 11507 February 5, 1970).

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10. **Progress in the Prevention and Control of Air Pollution.**
   Third report of the Secretary of HEW to Congress. March 1970.
   (Senate doc. No. 91-64, 91st Cong., 2d Session, April 27, 1970).

This report documents accomplishments in the national program of air pollution research, control and training activities in concert with State and local control programs. The more significant activities discussed are adoption of criteria, public participation in air quality hearings, automotive standards, research and development on low-pollution engines, and expansion of State and local control activities."

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A comprehensive report on the need for and effect of national emission standards for stationary sources.

**Recommendations**

In view of the growing seriousness of the problem of air pollution, efforts to bring it under control must be broadened and accelerated. Insofar as stationary sources are concerned, this means that all major stationary sources must be subject to emission limitations and that the timetable for adoption and application of such limitations must be shortened.

There is a need to insure adoption and enforcement of emission restrictions applicable to all significant stationary sources of air pollution. It is recommended that the Clean Air Act be amended in such a way as to provide for adoption of national air quality standards, State adoption of implementation plans for all areas, adoption of national emission standards for major new stationary sources of air pollution and all stationary sources of extremely hazardous pollutants, broadening of Federal enforcement authority, and streamlining of Federal enforcement procedures.

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Provides "estimated costs of applying control techniques to meet selected standards as well as implementing governmental air pollution control programs." Covers governmental and private expenditures for the next 5 years.

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Events Pertinent to Air Pollution

Governmental agencies, industry, citizens organizations and individuals in all walks of life evidenced concern about air pollution following the President's environmental message, as well as a proliferation of special articles in the press and programs on radio and TV. Inquiries about various aspects of air pollution and its control poured into congressional offices as Members and committees tried to ascertain which aspects of air pollution were of greatest concern to their constituents.

While bills to amend the Clean Air Act were being introduced, hearings conducted, and committee meetings held, some important steps were taken outside the Congress to deal with the air pollution problem on a national scale, complementing and influencing the legislative process.

On February 5, 1970 the President issued Executive Order 11507 dealing with the prevention, control and abatement of air and water pollution at Federal facilities. Reiterating the intent that Federal facilities "provide leadership in the nationwide effort to protect and enhance the quality of
our air and water resources," the Order set forth specific responsibilities to be carried out. For example, Federal facilities are to be designed, operated and maintained to conform to standards of the area in which they are located; identify potential new air pollution problems and take steps to prevent and control them; establish appropriate procedures at existing and new facilities, to ensure compliance; and consult with NAPCA as to the best protection techniques and methods available.

On April 30, 1970 the Council on Environmental Quality published interim guidelines to Federal agencies "for statements on major Federal actions affecting the environment, to insure that environmental considerations are given careful attention and appropriate weight in all Federal government decision making."

On another tack, the President, on April 11, 1970 established the National Industrial Pollution Control Council, composed of representatives of business and industry appointed by the Secretary of Commerce. This Council is to advise the President and the Council on Environmental Quality on plans and actions of industry with regard to environmental quality, evaluate industrial practices in the light of possible detrimental effects on the environment, recommend solutions to pollution problems and provide liaison among businessmen and industrialists on environmental quality matters.

To "provide an incentive for the rapid development of gasoline with a low and eventually lead-free content," according to a Treasury Department statement, the President on May 19, 1970 proposed an "environmental control
tax" on lead additives to gasoline. The tax would allow unleaded gasoline at present more expensive than ordinary fuel "to be marketed more competitively," and hopefully result in reduction and eventual elimination of leaded gasoline. In addition, it would raise revenue in fiscal year 1971 by an estimated $1.6 billion. However, the proposal received considerable criticism in Congress and was rejected by the House Ways and Means Committee on November 23 pending more information on the idea.

Meanwhile, the National Air Pollution Control Administration continued its efforts to produce a non-polluting automobile engine and to insure that emission devices on existing automobiles were functioning properly. In July, NAPCA announced a program designed (1) to produce a non-polluting unconventional car by 1975, and (2) to improve test procedures for conventional engine emissions to ensure that production line vehicles meet Federal standards.

A month later, HEW announced a $20 million Clean Car Incentive Program, offering financial incentives in three phases: prototype, demonstration, and fleet test. Vehicles successfully completing phase 1 would be purchased in lots of ten for demonstration purposes. Manufacturers qualifying for the third phase would receive an order for 300 cars for intensive testing under driving conditions. A car which successfully completes all phases becomes eligible for certification for procurement by government agencies for fleet use.
At the same time a congressional communication requested the Administration to designate the Lewis Research Center laboratory, a well-equipped facility for propulsion analysis, as the official government agency to study methods of emission control from the internal combustion engine and to review alternate propulsion methods.

In August, more than 70 low-pollution vehicles from universities and high schools across the nation participated in a 3,600-mile Clean Air Car Race sponsored by MIT, California Institute of Technology and NAPCA. Cars had to meet 1975 proposed emission standards, and winners were considered candidates for the Clean Car Incentive Program.

NAPCA also proposed that cars be labeled to show fuel octane needs, in conformity with Federal air pollution emission standards. Such labels could eliminate consumer overbuying of premium gasolines with a high lead content. It is similar to the proposed labeling of gasoline pumps as to the octane rating of the fuel they dispense, which is being considered by the Federal Trade Commission.

Continuing the Federal effort to discourage the use of lead in gasoline, President Nixon issued an order on October 26, 1970 decreeing that all Federal vehicles must operate on low-lead or unleaded gasoline wherever practical. He also appealed to all State governors to use the same restrictions for State-owned cars. According to the General Services Administration, 54% of Federally owned vehicles could now be operated on low-lead fuel and new vehicles would be purchased to run on low-lead gasoline exclusively, so that leaded fuel purchases would be eliminated by 1974.
In a major effort to consolidate the anti-pollution efforts of many Federal departments, President Nixon on June 5 submitted a reorganization plan to Congress to establish the Environmental Protection Agency. This agency, established on December 2, will take over the clean air programs from the Department of HEW by transferring the National Air Pollution Control Administration to its jurisdiction.

The past year has witnessed a breakthrough in the judicial system with regard to anti-pollution law suits. Scores of suits were filed by organizations, private citizens, and public officials against polluters who are mostly industrial corporations. While courts formerly contended that a claimant had no standing in a pollution case unless he could prove direct personal economic harm, they have lately been permitting suits by members of the public alleging damage to the public interest. The entry into court by State attorneys general as lawyers for the people has had additional impact on State and local enforcement activities. Increasingly, concepts of nuisance and negligence are being expanded to cover environmental questions.

In the area of air pollution, an example of a citizen's suit involves four persons in Phoenix, Arizona who are suing six copper companies that operate nearly all copper smelters in the State. The suit charges that the smoke from the smelters not only is injurious to health but also restricts visibility.

A prime example of a State suit is one filed in August in the Supreme Court by 15 States to force the big four automobile manufacturers to improve
anti-pollution control equipment and provide pollution-free engines "at
the earliest feasible date." Basing their case on a violation of the
Sherman Antitrust Act, the States contend that the major auto manufacturers
conspired amongst themselves for 17 years to squeeze out competition for
manufacturing and installing air pollution control devices, and to conduct
all research and development of such equipment on a noncompetitive basis.
Other antitrust cases of this type across the nation were cleared for action
by a decision of the Federal District Court in Los Angeles to permit State
and city governments and private individuals to seek triple damages from
the major auto manufacturers for allegedly conspiring to prevent the
development and installation of antismog devices.

While the provision for citizen suits was being written for the Senate
amendments to the Clean Air Act, and bills incorporating similar measures
were introduced in both the House and the Senate, the State of Michigan
passed a landmark measure permitting a citizen to file suit against anyone,
including the State, for seriously contaminating air, water and land re-
resources. At the same time, citizens were being urged by a law professor
to "plead the ninth amendment" of the Bill of Rights which states: "The
enumeration in the Constitution of certain rights shall not be construed
to deny or disparage others retained by the people." Cited as an example
of the abridgement of one of such rights, the right of privacy, is pollution
from factories. Coincidentally, a suit filed in Long Island by a group of
citizens cited their rights under both the Ninth and the 14th Amendments
quoting the phrase, "No state shall make or enforce any law which shall
abridge the privileges or immunities of citizens...without due process of law."
Numerous civic organizations chose environmental quality as the theme for studies at the request of their memberships. Some, such as the League of Women Voters already involved in some aspects of environmental deterioration, added air pollution to their areas of active concern.

The United Auto Workers, in letters to members of the Senate, proposed a "Plan for Clean Air by 1975." Taking issue with the proposed air pollution legislation in both the House and the Senate, the organization felt it contained less than "the minimum provisions acceptable." Six other organizations joined the UAW in this effort.

An international organization to regulate air pollution on a continental and global scale was called for at a joint symposium of the American and Canadian Chemical Societies in Toronto. Dr. Arthur Stern of the University of North Carolina defined as functions of such an organization the publication of air quality criteria, an assessment of control technology, and the promulgation of international emission standards. Each nation would agree to abide by such standards for its new installations while retaining the right to set more rigorous standards.