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By: Andreas Illies, Mark J. McClements, & Gerald A. Takacs
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Air Pollution August 1974

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by
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Summary

The 1970 amendments to the Clean Air Act recognized the national problem of air pollution and the effect that it has on the public's health and welfare. This Act mandated national emission standards for certain pollutants and national air quality standards and deadlines for meeting them.

Supreme Court decisions have strengthened the Environmental Protection Agency's (EPA) powers under the law. The first federal legal steps to weaken the Act are included in the Energy Supply and Environmental Coordination Act of June 1974. These include both delays and limitation of EPA's powers. RCSI finds that the goals of the Clean Air Act Amendments are almost entirely attainable, and that the Act is succeeding in its purpose. If all costs are considered, the economic cost is probably less than the cost of continued pollution.

The Clean Air Act is summarized and opposing views to it are analyzed. It is possible to meet the deadlines in the original law if industry, government, and the public are willing to make the effort. In addition to cleaner running cars and stack scrubbers, conservation of energy and restricted land use will be necessary in some areas until we develop non-polluting sources. Suggestions for motorists to improve the air quality are listed.

Many Monroe County industries and R G & E have agreed to schedules for air contamination abatement and are awaiting equipment. Iola, a major polluter, is not having its boiler converted because of the energy problem even though money was allocated for this in the 1972 Environmental Quality Bond Act.. Rochester was originally on the list of 33 cities that would require transporation controls to meet the standards, but it has been removed and it is now believed that, except for particulates in the center of the city, we will be in compliance by 1976 or 1977. The high particulate reading comes from multiple small (complex) sources such as house furnaces and tires and will be difficult to control.

Introduction

RCSI has encouraged public awareness of air pollution through publication of bulletins dealing with sources, kinds of pollutants, and their effect on the environment (1) including: air pollution from incinerators in Monroe County (2,3); asbestos pollution (4); air quality in Monroe County (5); and discussion of possible automobile engine alternatives as a means of air pollution abatement (6). There are also

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bulletins concerned with governmental action for clean air in New York State (7,8,9,10) and Monroe County (11). This bulletin describes the 1970 Amendments to the Clean Air Act and some of the attempts of EPA to implement them(12,13,14).It ends with a brief discussion of the air pollution abatement program in Monroe County.

The Clean Air Act amendments, which were signed into law on December 31, 1970, evolved out of the first Clean Air Act of 1963 and the modifications which followed in 1965, 1966, and 1967, and also from experience of the individual state air pollution control programs. While the 1970 amendments reiterated the policy of earlier laws that the prevention and control of air pollution is primarily the responsibility of state and local governments, it was officially recognized for the first time that air pollution is a national problem because polluted air is carried by wind and can cross the boundary lines of local jurisdictions to extend into two or more states.

By this legislation, the federal government was given the power to establish national air quality standards and to set the deadlines by which these standards must be met. In addition, the federal government received powers to take action, if state and local governments do not. The Act also gave concerned citizens the right to file citizen suits to compel industries and governments at all levels to comply with the deadlines and provisions of the law.

Congress specifically included transportation emission standards with the 1970 Clean Air Act instead of delegating administrative authority for them to the EPA. Carbon monoxide and hydrocarbon automobile emissions were to be reduced by ninety percent of their 1970 levels by 1975, while nitrogen oxides were to be reduced by ninety percent of their 1971 levels by 1976. EPA was authorized to delay standards by one year if they determined that effective control technology was not or would not be available to meet the standards on schedule, despite "good faith" efforts by automobile manufacturers.

The 1970 Act also provided means to meet emergencies, or "air pollution episodes" which have occurred in some urban areas. Such emergencies accompany certain known weather conditions. The EPA was authorized to take the necessary action whenever air pollution poses a threat to health. Court orders can be sought to shut down polluters.

Other provisions of this Act were designed "to initiate and accelerate a national research and development program to achieve the prevention and control of air pollution; to provide technical and financial assistance to state and local governments in connection with the development and execution of their air pollution prevention and control programs; and to encourage and assist the development and operation of regional air pollution control programs" (13).

Executing the Law

The federal Environmental Protection Agency (EPA) has the first responsibility of implementing the Clean Air Act. States must submit implementation plans which will be carried out with the cooperation of local governments and industry.

National air quality standards for six air pollutants - sulfur oxides, particulates, carbon monoxide, photochemical oxidants, hydrocarbons, and nitrogen oxides - were issued by the EPA in April, 1971. These standards consist of two parts, primary and secondary, and are based on the effects of these pollutants on public health and welfare, respectively. The primary standard of outdoor air is that level which is considered to be safe for humans; while the secondary is not harmful to animals, crops, vegetation, metals, buildings, and fabrics.

After holding a public hearing, each state was required to prepare and submit an implementation plan to the EPA for review and approval for achieving the national air quality standards by January 30, 1972. The EPA then had until May 31, 1972, either to approve the state plan or to send it back for improvement. Once a state's implementation plan is approved, it has three years in most instances, and five years under certain conditions, to meet national primary air quality standards. Secondary standards were to be met in a reasonable length of time after the primary standards were achieved. The Clean Air Act also gave the EPA the right to grant two-year extensions in the event that control technology was not available to meet the national standards. The EPA also was given authority to order compliance with state implementation plans and to undertake enforcement of a state plan in the event of widespread violations.

A requirement in each implementation plan is that the state must set emission standards for a specific source in order to achieve national air quality standards. An emission standard is the maximum amount of a given pollutant that may be discharged.

If a polluter cannot comply immediately with an emission standard, the state must impose a compliance schedule: a timetable of actions that the polluter must accept in order to ensure compliance with emission limits needed to meet national standards no later than 1977. A typical compliance schedule contains a sequence of dates by which the polluter must a) sign a contract (enforceable in court) to purchase emission control equipment or make process changes; b) begin installation or construction of the equipment; c) complete the installation, test the equipment, put it into operation, and achieve the emission limitation. Each state is also given the power to review and veto the location of proposed factories and other pollution sources. The EPA was required to establish national performance standards which limit emissions of particulates, sulfur dioxide, nitrogen oxides, and sulfuric acid mist in sources such as fossil fuel power plants, sulfuric and nitric acid plants, cement plants, and large incinerators (2, 3). The EPA can move directly against violators of source performance standards and hazardous emission limitations.

The Clean Air Act also requires federal emission standards for extremely hazardous pollutants. National standards have been established for asbestos (4), beryllium, and mercury. Exposure to high levels of asbestos fibers over a long period of time results in a serious chronic lung condition called asbestosis or the accumulation of large amounts of fibrous asbestos in the lung. This physically obstructs the air passages and in other ways damages the lungs' ability to function. Beryllium dust, which can also cause chronic lung disease, is emitted from some machine shops, ceramic plants, propellant plants, extraction plants, and foundaries. Mercury can damage the central nervous system; it is emitted from mercury-cell chlor-alkali plants (which make chlorine and alkali caustic), from mercury mines, gold recovery operations, and in the vapors from burning some coals.

Regulating Transportation Emissions

The EPA also has authority to enforce automobile control regulations. Ford Motor Company was fined $10,000 in 1971 for shipping cars to dealers before the cars were certified as meeting emission standards and fined $7 million in 1973 for violating test requirements designed to assure that new cars meet the standards. The law also prohibits an auto manufacturer or dealer from eliminating or "rendering inoperative" pollution control devices on cars. Court action was taken against an Orlando, Florida car dealer in 1973 for such an offense.

EPA also set emission standards covering hydrocarbons, carbon monoxide, and nitrogen oxides for gasoline and diesel powered trucks and buses, as well as smoke for diesels. Standards for aircraft emissions were proposed in late 1972, and, when accepted, will be enforced by the Federal Aviation Administration.

The 1970 law accelerated federal research programs on fuels and encouraged development of low emission motor vehicles. EPA was granted authority to control or prevent use of fuel additives which endanger public health and welfare or impair the efficiency of emission control devices. The EPA has required all oil companies to have at least one grade of lead and phosphorous-free gasoline by July 1, 1974, because lead is hazardous, and both lead and phosphorous impair emission control with catalytic converters. This provision is being met in the Monroe County area. A phased reduction of lead in all gasoline has also been proposed by the EPA: a maximum lead content of 0.50 grams per gallon by January 1, 1979, as compared to the average of 2.3 grams per gallon in 1973 (16). These averages are a "total pooling average" which allows refiners to average over all grades of gasoline produced.

Special Urban Controls

In highly populated areas with heavy concentrations of motor vehicles and traffic congestion, national air quality standards will be difficult to achieve, even if every new vehicle is operating under federal limits. Congress knew this and gave the Administrator of the EPA the right to require "land use and transportation controls". The specific controls are not listed. Controls later suggested include raising parking fees and banning street parking in highly polluted areas; encouraging car pooling (for example, by reducing toll fees as the number of passengers goes up); staggering working hours to cut traffic volume; improving public transportation systems; and inspecting emission controls on cars. Gas rationing was proposed in January, 1973, to reduce auto travel in the Los Angeles basin. (Interestingly, this was before public awareness of the energy crisis.) Controls such as these were required for 35-45 urban areas.

Suggested transportation controls resulted in so much opposition from the States that the power of EPA to require parking surcharges was cancelled in the Energy Supply and Environmental Coordination Act passed in June, 1974 (21). States may still require these controls if they decide to do so on their own. The Act also required a study to be completed by the end of August, 1974, on the need and costs of other transportation controls.

EPA Regulations on Growth

EPA has required States to identify those regions where significant growth may lead to violations of air quality standards by 1985. This directive refers to indirect sources of pollution such as shopping plazas which encourage the parking of large numbers of automobiles. The test case for the emergency powers of the EPA came when county health officials asked 23 industries in Birmingham, Alabama, to cut back production voluntarily in order to avoid a serious air pollution crisis in November, 1971. Several companies refused and the EPA ordered all 23 plants to stop or reduce pollution until episode conditions cleared away. Federal courts affirmed the authority of the EPA in this action.

Opposing Views to the Clean Air Act and Actions by EPA to Implement it

From the first day of its conception, the 1970 amendments to the Clean Air Act were the subject of national debate. Opposition has developed on two levels: 1) disagreement with the standards proposed and the time table for meeting them and 2) disagreement over the degree of power that Congress meant to give to EPA.

Automobile manufacturers immediately requested a one year delay, as provided by the law, claiming that the national emission standards for hydrocarbons and carbon monoxide for 1975 models were too strict. After a public hearing, the EPA denied this request in 1972. The auto makers appealed the decision; in early 1973, a federal court ordered the EPA to reconsider. Further public hearings were held, and in April, 1973, the EPA issued a compromise decision. The EPA, although aware that alternate automobile engines (such as the Stratified Charge engine (6)) and improvements (such as catalytic converters) held promise for meeting the standards, suspended the 1975 standards for one year. Two new sets of interim hydrocarbons and carbon monoxide standards were established for 1975 cars. These emission standards are reported in Table 1.

Table 1. Exhaust Emission Standards (17)

Standards	Hydrocarbons		Carbon Monoxide	
	Level, grams per mile	Reduction %	Level, grams per mile	Reduction %
Pre-1968 Vehicles (no pollution control)	8.7	--	87	--
1970/71	4.1	53	34	61
1973/74	3.0	66	28	67
1975 National Interim	1.5	83	15	83
1975 Calif. Interim	0.9	90	9.0	90
1976 (1975 Clean Air Act)	0.41	95	3.4	96

Fuel companies, automobile manufacturers, private electric utilities, and other industries have attacked both the emission standards and the investments necessary for control facilities. They have questioned whether the economy can afford such protective standards. This led Russel E. Train, Chairman of the Council on Environmental Quality, to state in 1972 that: *"The price tag for pollution control does not pose any threat to the economic health of the nation. Furthermore, we must also consider the cost of not cleaning up and protecting our environment - in terms of the effects of pollution on human health and property, and in terms of ecological damage to the basic life support systems which sustain us. The costs and risks of not cleaning up our environment are infinitely greater than the price of clean-up."*(12)

Cost studies by the EPA, the Council on Environmental Quality, and the Department of Commerce in 1972 supported this statement and indicated that an investment of $10.65 billion a year to control air pollution would eliminate the (conservative) estimate of $16.1 billion a year in pollution damages. The potential effects of environmental protection standards on the economy have been studied and the evidence reassured the nation that it can absorb the cost of pollution control and can benefit from the added jobs in manufacture and installation of control equipment (12,15).

The Mideast oil embargo during the winter of 1973-74 brought the energy crisis before the American public and provided additional grounds for attacking the Clean Air Act. Claims were made that more efficient use of energy resources could be attained by removal of auto emission controls. Locally, the Rochester Automobile Dealers Association ran full page newspaper ads (18) including a clip-out coupon to be filled in by each reader asking for a temporary suspension of automobile emission control standards for the duration of the energy crisis. Richard Henry, president of Fincher Motors, suggested removal of emission control devices from cars (19). Removal of such equipment, which is against the law (1970 amendments to the Clean Air Act), may bring a court suit, void the new car warranty, increase gasoline consumption (according to the EPA tests (20)), and add difficulties to tuning engines.

Attacks on the Clean Air Amendments of 1970 are now resulting in legislative changes. The recently passed Energy Supply and Environmental Coordination Act of 1974 (21) permits power plants to switch from low-sulfur oil or natural gas to coal with higher sulfur content so as to conserve scarce fuels. This Act grants automobile manufacturers a further one and possibly two year delay in meeting the motor vehicle emission standards. Both of these provisions will result in increased air pollution. The Act also prohibits the EPA from requiring extra transportation controls such as parking surcharges, although each State may use this method of reaching standards if it wants to.

Greater effort can be made in applying available control technology to reduce air pollution and conserve scarce fuels. For example, the addition of small quantities of water to fuel oils and gasoline can produce more efficient combustion and at the same time reduce the output of noxious gases like the nitrogen oxides. Adelphi University has adopted such a system, and they claim to have saved 3,500 gallons of oil per week and reduced soot output by 93% during the winter of 1973-74 (22).

Each motorist can do many simple things to improve air quality and save gasoline at the same time (23). Quick starts and stops waste gasoline and cause more exhaust fumes than normal, gradual acceleration. Driving at 50 mph instead of 70 or 80 lowers emissions and increases gas mileage. Poorly tuned engines waste fuel and increase emission. Servicing the PCV (positive crankcase ventilation) system at recommended intervals could materially reduce automobile emissions. The PCV system recycles unburned fuel and combustion gases (which slip by the piston rings and enter the crankcase) back into the combustion chambers. Until the early 1960's, PCV controlled emissions contributed about 20 percent of the noxious total. Changing oil at appropriate intervals maintains engine and PCV valve cleanliness, maximizing control and reducing engine wear with increased emission problems. Poor batteries mean slow starts and increased pollution. Clean air filters increase air flow to the carburetor, reducing fuel waste and emissions. Use of non-leaded gasoline also reduces some emissions.

State and local governments add monies to Federal Clean Air Act funds toward developing and executing their own air pollution prevention and control programs. For example, New York State provided $150 million in the Environmental Quality Bond Act of 1972 (9, 10). However, these funds are not sufficient and further money must be sought for air pollution control.

One means of raising additional state funds for air pollution abatement is the Environmental License Plates (ELP). ELPs are personalized license plates displaying a combination of no less than two, nor more than six letters and or numbers. (Lawrence Welk has A1 AN A2). More than half of the fifty states already have some kind of personalized license plates. However, California by passage of the Marks-Badham Environmental Act of 1970, is the only state to specifically designate the funds from the sale of such plates toward fighting pollution. Each ELP in California costs $25, and the car owner must contribute a $10 a year renewal fee. In a little over three years, more than $3 million has been raised by California for environmental protection by this device (24).

Under ce tain conditions, meeting the emission standards for smokestacks and cars will not result in meeting the air quality standards. This is true in very crowded cities, in cities where pollution is caused by numerous small sources rather than large industries, and in virgin country where the air may not de degraded below its present standard. In all three cases, EPA has suggested that standards be reached by land use controls such as zoning against parking lots. As part of the program to control indirect sources of pollution, EPA has required states to identify those

areas where significant growth is expected in the next 10 years. This has resulted in a storm of protest from builders and local governments who claim that EPA is not the proper agency to make land-use decisions. The Energy Supply and Environmental Coordination Act of 1974 responded to this fear with a section that banned EPA from imposing parking surcharges as part of a transportation control plan.

The National Resources Defense Council and the Sierra Club have each sued once to force EPA to recognize the breadth of their responsibility - and have won.

The Clean Air Act is expected to be reviewed by Congress this year and a key issue is to what extent EPA regulations written to protect air quality should guide local land use decisions. Another is time schedules for compliance, and a third the reliability of stack cleaning technology at present in relation to cost.

Since standards can be obtained most efficiently in some cases by land-use controls, it is RCSI's conclusion that opposition to the approach is a convenient means of attacking the Clean Air Act itself. The Act is succeeding in implementation, and proposed changes are likely to bring only unnecessary delays and reduction in attainable air quality.

State Action Under the Clean Air Act in Monroe County (25, 26, 27)

The Clean Air Act required each state to submit an implementation plan to control air pollutants. In practice, New York State has submitted a number of plans, or modification of plans for each region, and these are constantly being altered in response to EPA directives and after public hearings. The first plan for this region was submitted in January, 1972. It contained a request for an extension of time to 1977 to meet the standards for hydrocarbons and oxidants, and no plan to abate such emissions.

EPA did not accept Plan 1. They said a plan must include the techniques that will be used to meet the air quality standards by 1975, regardless of cost. Once the plan is in hand, EPA will decide whether or not to give an extension of time.

To work out an implementation plan, a metropolitan area (city and suburbs) must consider three sources of pollution: 1) large stationary sources such as smelting plants or Kodak; 2) indirect complex sources which include all small polluters such as parking lots; and 3) moving sources (cars). In Monroe County, most of the major industries such as Rochester Smelting and Refining Co., General Railway Signal Co. and R G & E that are responsible for the high readings at the monitoring station located at the Fire House on North Street have agreed to compliance schedules which are realistic considering the time lag in obtaining equipment. The Clean Air Act requires that proposed abatement schedules be discussed at public hearings and there have been many held in Rochester; nobody appeared at a half dozen of them. Rochester no longer allows incineration by smaller sources such as supermarkets.

The Environmental Quality Bond Act of 1972 had funds for controlling emissions from State owned coal burners (State Hospital, here) and some municipal buildings. Early in 1974, Monroe County applied for Environmental Quality Bond funds to put in a combination oil and coal boiler system at Iola Sanitorium which is the worst polluter of its kind in the area. The application coincided with the oil embargo, and the State responded that oil for the burner cannot be guaranteed and that they, therefore, cannot authorize the project. The County plans to submit another application before the end of the year. The money is reserved; however, as yet, no E Q Bond monies to control air pollution have been spent here.

In April, 1973, the Department of Environmental Conservation held hearings in Monroe County (Genesee Finger Lakes Region) on a proposal to outfit older cars with emission controls - called retrofit devices. Public objection was strong. Estimated

costs varied. One source states $30-59 for pre-1968 cars and $90-140 for later vehicles. There was considerable question as to whether the retrofit devices would work and inspection stations would have to be set up. Speakers at the hearings pointed out that simpler, less expensive and surer methods exist to control the problem. Winds in the area are such that we may expect an inversion only 30% of the time, and actual inversions are much less frequent. At such times, cars could be stopped from entering the city.

The plan submitted to EPA by the State in mid 1973 included a suggestion for special inspection of all cars registered in Monroe County to make sure that emission limits mandated by EPA are being met.

In February, 1974, EPA published a list of air quality control regions requiring transportation controls(28). There were 33, and Rochester was one of 7 which was expected to comply by 1975 and might require parking restrictions and/or an inspection maintenance system.

However, later in 1974, a study was done by NYS DEC using new automobile emission data and considering the ages of automobiles in the Rochester area. Rochester was found to have a higher proportion of new cars than originally estimated. As a result, cars contribute less to our air pollution than originally expected (indirect sources make up the difference). The State has, therefore, decided that no special controls will be needed in this area to meet the air quality standards by May 31, 1975.*

Table 2. 1970 Motor Vehicle Emissions - Monroe County (26)

	A	B	C	D	E	
			Emission Factors			
Model Year	Vehicle Mix %	Miles x 10^6	Exhaust	Evapo-rative	Deterio-ration	Emissions B(CE + D)
1970	12.4	758	3.6	3.0	1.0	5,508
1969	14.7	848	4.4	3.0	1.10	7,320
1968	13.9	748	4.5	3.0	1.18	6,843
1967	12.9	649	8.8	3.8	1.00	9,003
1966	12.3	577	8.8	3.8	1.00	8,005
1965	9.2	400	8.8	3.8	1.00	5,549
1964	8.0	317	8.8	3.8	1.00	4,398
1963	6.9	249	8.8	3.8	1.00	3,454
1962	4.1	134	8.8	7.1	1.00	2,346
1961	2.6	76	8.8	7.1	1.00	1,330
Pre '61	2.9	75	8.8	7.1	1.00	1,313
						55,069

* "Clean Air and Your Car", published by EPA in March 1974 lists Rochester, N.Y. as one of urban areas requiring transportation control plans; this was printed before reevaluation.

Table 3. 1975 Motor Vehicle Emissions - Monroe County (26)

	A	B	C	D	E	
			Emission Factors			
Model Year	Vehicle Mix %	Miles x 10^6	Exhaust	Evapo-rative	Deterio-ration	Emissions B(CE + D)
1975	12.4	921	1.5	0.2	1.00	1.724
1974	14.7	1,030	2.7	0.2	1.05	3,442
1973	13.9	909	2.7	0.2	1.10	3,172
1972	12.9	789	2.7	0.2	1.13	2,824
1971	12.3	701	2.9	0.5	1.15	2,960
1970	9.2	486	3.6	3.0	1.17	3,859
1969	8.0	385	4.4	3.0	1.25	3,603
1968	6.9	302	4.5	3.0	1.30	2,943
1967	4.1	163	8.8	3.8	1.00	2,258
1966	2.6	92	8.8	3.8	1.00	1,302
1965	1.5	47	8.8	3.8	1.00	652
1964	0.5	16	8.8	3.8	1.00	217
1963	0.3	9	8.8	3.8	1.00	130
Pre '63	0.6	19	8.8	7.1	1.00	329
						29,415

This recalculation of data and resulting decision to do nothing in the Genesee Finger Lakes Region is called the non-plan by Edward Davis, Director, Bureau of Abatement Planning, Division of Air Resources, DEC, Albany. He feels that the particulate problems that will remain in this area after 1975 are among the most difficult to control in the State because they result from multiple small sources. In cities like Buffalo, the DEC can require further reduction from large industries if need be, but here it is difficult to know what to do.

The State has submitted a maintenance plan to the EPA which is now under consideration. This is needed because suburbs are expected to grow, increasing the indirect sources contributing to air pollution as well as the number of cars.

There is presently some disagreement in the County over methods of measuring air contaminants from cars, particularly carbon monoxide. The DEC and the Health Department both believe that measurements taken at the constant air monitor on Farmington Road is the fairest way to measure since nobody is exposed to levels of carbon monoxide equal to those in the Midtown Plaza garage 24 hours a day. Others think measurements should be made at "nose level" in center city so that we know the maximum exposure of anyone in the city. The argument is theoretical; no new monitoring device is likely to be installed this year because funds are limited. There will be a carbon monoxide monitoring program carried on for six weeks on three

State highways - Route 104 in Irondequoit, Route 47, and the Genesee Expressway. This program is being initiated as the result of a ruling that the Department of Transportation may not say that traffic on a road does not increase pollution significantly without actual sampling.

In summary, the most recent data of the EPA and the DEC indicate that Monroe County will meet the air pollution standards for everything except particulate matter by the original date of May 31, 1975, as required by the Clean Air Act.

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